Ecodesign Impact Accounting Annual Report 2021

Overview and Status Report

Prepared by VAN HOLSTEIJN EN KEMNA (VHK)

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Ecodesign Impact Accounting
Annual Report 2021

Overview and Status Report

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Contents

The Ecodesign Impact Accounting (EIA) Annual Report 2021 consists of three parts that can be read separately: the Overview Report, the Status Report and the Special Report Materials.

Part 1: Overview Report

The Overview Report is intended for a general audience.

It is organised per product group (e.g. space heating, water heating, space cooling, ventilation, lighting, electronics, food preservation, cooking, cleaning, tyres, industrial components, transformers), presenting the main product features and results. The report provides a summary of EU27 total results, a summary of the material resource impacts of products regulated by ecodesign and/or labelling, and info-graphics.

Part 2: Status Report

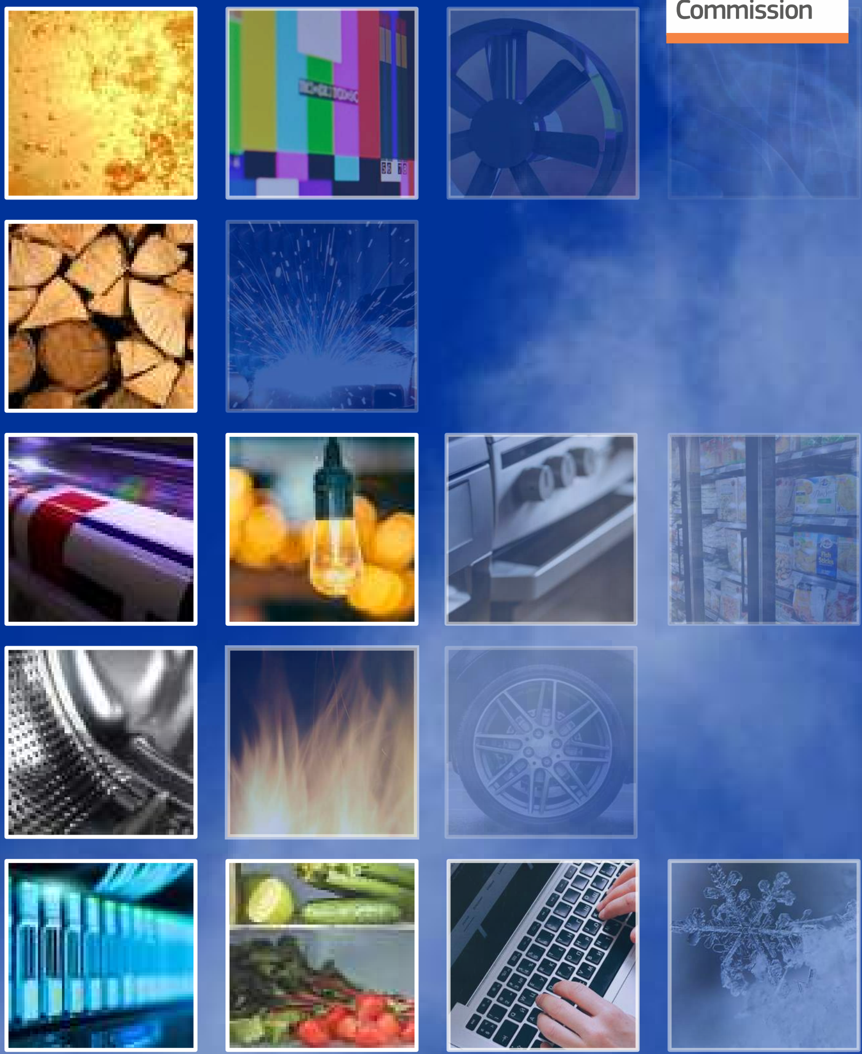
The Status Report is intended for experts and analysts.

It is organised per parameter (e.g. sales, stock, load and efficiencies, energy consumption, user expenses, business revenues, associated jobs). The report provides a full description of the EIA methodology and the Annexes include all input and output data over the 1990-2050 period in 5-year intervals. In addition, the report presents main results, explains differences with previous editions, presents a sensitivity analysis for GWP factors, energy rates and non-compliance, and compares EIA results with Eurostat's energy balance sheets and with the PRIMES reference scenario.

Part 3: Special Report Materials

The report provides the material content of the regulated energy-related products (ErP, as accounted in the EIA) that were sold in EU27 in 2020, or that were in use (stock) in EU27 in 2020. The information is based on the Bills-of-Materials (BoMs) in EcoReport format, that were compiled during ecodesign studies over the period 2005-2021. These BoMs have been collected, harmonised and elaborated. The material content of the ErPs is compared to the total EU27 material consumption for metals, plastics, glass, cardboard/paper and rubber in 2020. This report is an update of the 'Special Report Material Inputs for Production' that was issued in 2016.

European Commission



ECODESIGN IMPACT ACCOUNTING

OVERVIEW REPORT 2021

Energy

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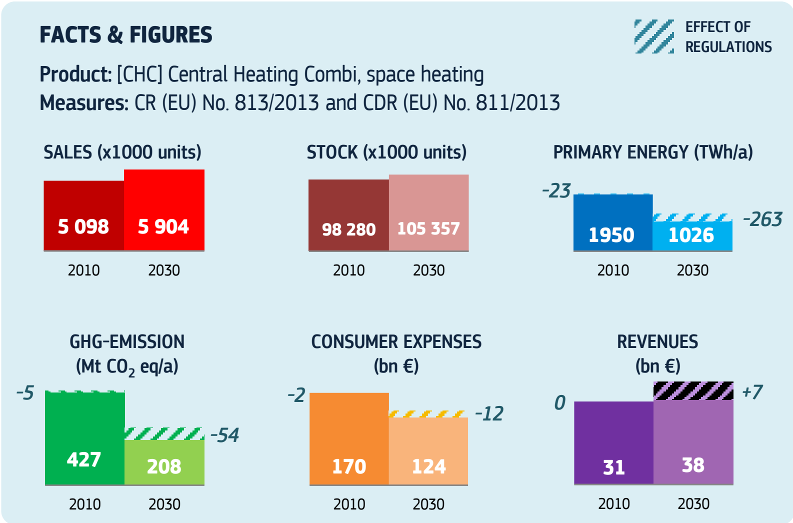
Ecodesign Impact Accounting
Overview Report 2021

Contents

Abbreviations and acronyms

a	annum
AEC	Annual Electricity Consumption
BAU	Business-As-Usual (scenario without measures)
bn	billion (10^9)
CR	Commission Regulation
CDR	Commission Delegated Regulation
ECO	Scenario with ecodesign and/or energy labelling applied
EEI	Energy Efficiency Index
EIA	Ecodesign Impact Accounting
EU27	European Union of 27 member states (after withdrawal of the UK from the European Union in 2020)
eq	equivalent
GHG	Greenhouse Gas
GWP	Global Warming Potential
hh	household
HT	High Temperature
IA	Impact Assessment
kt	kilotonne (10^3 tonnes)
ktoe	kilotonne of oil equivalent
LT	Low Temperature
LULUCF	Land Use, Land Use Change and Forestry
M	mega (10^6)
MEErP	Methodology for the Ecodesign of Energy-related Products
MEI	Minimum Efficiency Index
mln	million (10^6)
MT	Medium Temperature
Mt	megatonne (10^6 tonnes)
Mtoe	megatonne of oil equivalent
PEF	Primary Energy Factor
SRI	Self Regulatory Initiative
t	tonne (1000 kg)
T	tera (10^{12})
VA	Voluntary Agreement
WD	Working Document
Wh	watt hour

Facts & figures



Each product sheet contains a 'Facts & figures' graphic providing key information on the product group.

It shows the sales, stock, energy consumption (primary, electric or fuel), greenhouse gas emissions, consumer expenses and business revenues for years 2010 and 2030. The values inside the graph bars are those from the EIA ECO-scenario, i.e. they include the effects of ecodesign and energy labelling measures. The difference with the (BAU) scenario without these measures is shown next to the graph bar. These figures indicate the savings obtained due to the measures.

EIA2021 Summary

SUMMARY

Introduction

WHAT IS EIA?

The Ecodesign Impact Accounting (EIA) collects, elaborates and sums data for all products regulated under Ecodesign, Energy Labelling, ENERGY STAR* and Tyre Labelling.

Input data from extensive preparatory-, review-, and impact assessment-studies for the period 1990-2050, including historical data and projections, are processed in a common calculation method. These data have been verified by the Commission policy officers for the various product groups, by representatives from the Member States, industry organisations, consumer organisations and NGOs, in stakeholder meetings, Consultation Forums and written comments.

The accounting now covers 330 base case products from 40 product groups, organised in 12 functional groups: space heating, space cooling, water heating, ventilation, lighting, electronics, food preservation, cooking, cleaning, industry components, transport (tyres) and energy sector (utility transformers).

EIA provides EU27 totals for sales, stock, user-demand for product output (load), energy consumption (electricity, fuel, final energy, primary energy), energy-related greenhouse gas emissions, user expenses (for purchase, installation, energy, maintenance), business revenues, and associated jobs. Subtotals are provided per usage sector (residential, services, industry, other), per functional group, per product group, and per base case product. EIA also includes data per average EU27 household.

The 2020 energy consumption of products included in EIA represents 62% of the EU27 primary energy consumption reported in the Eurostat Energy Balance [1], 50% of the final energy, close to 100% of electricity, and 34% of non-electric final energy consumption (EIA: fuel).

Energy totals in the EIA are compatible with those in Eurostat when considering the differences in scope. The EIA has a high coverage of the energy consumption in the residential and services sectors. Due to its scope, the coverage is lower for industry and transport. The EIA-Eurostat comparison is presented later in this summary, and in chapter 3.9 of the Status Report.

For the products covered, EIA is the best bottom-up data collection available in EU, which can be used by itself as scenario modelling tool for policy options on energy efficiency of products, or as input to models like PRIMES [2] and POTEnCIA [3].

* *The EU ENERGY STAR programme followed an Agreement between the European Community (EU) and the Government of the US to coordinate energy labelling of office equipment. It was managed by the European Commission. The US partner was the Environmental Protection Agency (EPA), which started the scheme in the US in 1992. The EU-US agreement expired on 20 February 2018. ENERGY STAR definitions and requirements were used in the Ecodesign regulations for Computers and Imaging Equipment. These regulations continue to exist, so the end of EU-US agreement on Energy Star did not change the data in EIA.*

REPORTING

The separately issued Status Report is the main EIA document, containing full and detailed data and a description of the EIA-methodology. It is mainly organised per parameter, e.g. sales, stock, load, efficiency, energy, emissions, prices, expenses. The Status Report is intended for insiders/experts and for analysts requiring detailed figures.

The Overview Report (this document) addresses a wider, non-technical audience and aims at making the EIA data more easily accessible. The first part of the report summarises the main EIA results, presenting the combined impact of all EIA products on EU energy consumption, emissions, user expenses, business revenues and jobs. This section also includes the main results from the 'Special Report on Materials' and the 'EcoReport for the Average EIA product'.

The second part of the Overview Report is organised per product, giving a quick overview and discussion of the key facts and figures for that product, and describing the product and its most relevant features. A summary of results per household and a survey of key-facts for all products can be found at the end of the document.

HISTORY

In 2013, the European Commission identified a need to systematically monitor and report on the impact of Ecodesign, Energy Labelling, Energy Star and Tyre Labelling measures, including potentially new forthcoming actions, with a view to improve its understanding of the impacts over time as well as its forecasting and reporting capacity.

The Ecodesign Impact Accounting is the answer to this need. The 2013-2015 EIA I study [4] developed the EIA-methodology (explained in the separate Status report) and applied the accounting method in the reports of May 2014 and December 2015 [5, 6].

The Ecodesign Impact Accounting was continued in the 2015-2018 EIA II study [7], annually updating and extending the data and enhancing the methodology.

In 2016 a 'Special Report Material Inputs for Production' (updated in 2021) and an 'EcoReport for the average EIA product' (not updated) were published [8]. These reports provide insight in the non-energy resources (material resources) associated with the products accounted in EIA, and in the energy use and emissions for the production, distribution, and end-of-life phases (non-use phases).

The ongoing 2019-2022 EIA III [9] study updates existing data following ecodesign review studies, adds new product groups where new measures are decided, further details and enhances the accounting method, and compares EIA results with Eurostat and PRIMES. The EIA2019 reports (status December 2019) were issued in June 2020 [10], followed by the EIA2020 annual report (status December 2020) in May 2021 [11]. The current document is part of the EIA2021 reporting (status December 2021), and the last to be issued under this contract.

[x] - References and notes are on page 32

SCENARIOS AND PROJECTIONS

The projections in EIA are taken from the impact assessment reports, integrated with data from preparatory- and review-studies where necessary. These projections are the result of various years of study and have been discussed with stakeholders (see input-data verification above). They consider e.g. the historical and ongoing trends, the expectations from manufacturers, boundary conditions from EU policy, climate change effects, changes in EU population and households, trends in new-building and renovation, changes in user-demand (more comfort, larger displays and fridges, more light sources, rebound effects), and expected energy efficiency developments. Where the projection in the underlying studies does not cover the entire accounting period up to 2050, EIA extrapolates the existing trends without assuming any new measures, i.e. it is not in the scope of EIA to develop new policies.

Projections use **two scenarios**:

- a 'business-as-usual' (BAU) scenario, which represents what was perceived to be the baseline without measures at the time of the (first) decision making, and
- an ECO scenario that is derived from the policy scenario in the studies which comes closest to the most recent measures taken, adapted to the final published regulation where necessary and possible.

The differences in outcomes between the two scenarios are presented in EIA as 'savings' due to the policy measures.

EIA takes into account product interactions, e.g. between ventilation units and space heating, the comments from the European Court of Auditors [12], and corrects for double counting in a transparent manner [13]. The EIA methodology is explained in detail in chapter 2 of the Status report.

MAIN CHANGES IN THIS EDITION

After the extensive updates in EIA2020, including the change from EU28 to EU27 (Brexit) and product updates for e.g. space heating, water heating and ventilation units, the impact variations in EIA2021 are limited (see table below), except for GHG-emissions, and due to:

- **General updates:**

  Price level: Monetary amounts in EIA2021 are expressed in 2020 euros (was 2015 euros in previous editions, increase 5.8%).

  Energy rates: EIA2021 reporting now uses the rates for electricity, natural gas, heating oil and LPG of the PRIMES 2020 Reference scenario. A sensitivity analysis is performed for other rates.

  GWP-factors: EIA2021 reporting now uses the GWP-factors for electricity of the PRIMES 2020 Reference scenario. A sensitivity analysis is performed for other GWP-factors.

  Primary Energy Factor (PEF) for electricity: the PEF is 2.5 until 2020 and 2.1 from 2021 onwards. This is the same as in EIA2020. EIA2021 adds a sensitivity analysis for different PEFs.

- **Product updates:**

  Vacuum cleaners: a complete product update was performed, for existing measures only, based on the 2019 review study [14] and the ongoing impact assessment. Due to the update, electricity savings in 2030 reduce from 23 TWh to 15 TWh. This derives from a lower projected stock, the modelled partial shift to cordless and robots (for which savings are zero under the current regulation), and changed assumptions on real-life loads and efficiencies. These data are preliminary, awaiting the final IA and the adoption of new measures.

  Water pumps: a complete product update was performed, for existing measures only, based on the 2018 review study [15] and the ongoing impact assessment. The update uses the extended product approach (EPA), including also motor and VSD losses. Combined with a more detailed approach, changes in stock, and updates for loads and efficiencies, the accounted energy consumption increases, but energy savings remain more or less the same. These data are preliminary, awaiting the final IA and the adoption of new measures.

  Compressors: standard air compressors have now been removed as a product group in EIA because there is no ecodesign regulation, and no regulation is expected at a short term.

  Circulators: the double counting factor for stand-alone circulators was reduced from 1.0 to 0.38. This means that 62% of the energy consumption of stand-alone circulators now contributes to the EU energy totals.

  Dedicated water heaters: following the ongoing impact assessment, Brexit factors for electric DWHs have been changed, removing 90% of the electric instantaneous shower water heaters. This reduces the EU27 stock of DWHs in 2020 by approximately 6%, from 147 to 138 mln units. The electricity consumption and savings for DWHs follow this reduction. In addition product prices for DWHs have been updated.

  External power supplies: revenues and jobs now take into account double counting factors.

MAIN DIFFERENCES BETWEEN EIA2021 (in bn euros 2020), EIA2020 AND EIA2019 (both in bn euros 2015)

	Primary Energy Savings (TWh)		User Expense Savings (bn euros)		Extra Business Revenues (bn euros)	
	2020 (PEF 2.5)	2030 (PEF 2.1)	2020	2030	2020	2030
EIA2019 for EU28	1777	2718	64	150	64	91
EIA2019 for EU27	1523	2339	55	130	55	77
EIA2020 for EU27	1037	1533	60	118	21	29
EIA2021 for EU27	1039	1513	57	110	22	31

Main results

RESULTS FOR EU27

The table summarises the main results of the accounting in terms of savings in 2020 and 2030 due to ecodesign and labelling measures, compared to a scenario without measures (BAU).

The primary energy savings due to ecodesign and labelling measures are 1039 TWh in 2020 and 1513 TWh in 2030. This represents a saving of respectively 10% (2020) and 18% (2030) compared to BAU. The savings are respectively 7% (2020) and 10% (2030) of the total EU27 primary energy consumption in 2020.

Due to the measures taken, the GHG-emissions decrease by 114 Mt CO_2eq (-9% vs BAU) in 2020 and 160 Mt CO_2eq (-17% vs BAU) in 2030. The reduction is respectively 3.2% (2020) and 4.4% (2030) of the EU27 total emissions in 2019 (3610 Mt CO_2). Additional reductions result for NO_X, CO, OGC and PM [16].

Due to the measures for washing machines and dishwashers, in 2020 consumers save 1507 million m^3 (> 50%) of (drinking) water (1885 Mm^3 in 2030). The measures on imaging equipment (duplexing, N-print) save 0.23 million tonnes (15%) of graphic paper in 2020 and 0.15 Mt (15%) in 2030. The ecodesign regulation on welding equipment saves 82 kt (5%) of filler wire and electrodes in 2030.

The combined measures entail a € 63 bn (5%) saving in 2020 on consumer expenditure (80 bn euros energy cost saving, 7 bn euros consumables saved, 25 bn euros extra acquisition costs). In 2030 this increases to 125 bn euros (8%)**. The consumer's monetary saving is 0.4% (in 2020) and 0.9% (in 2030) of the GDP of the European Union (13 300 bn euros in 2020) [17].

Business revenues increase by 22 bn euros in 2020 and 31 bn euros in 2030 (5-6%), implying an increase of 323 thousand direct jobs in 2020 and 433 thousand in 2030.

ANNUAL SAVINGS AND REDUCTIONS IN THE ECO-SCENARIO (WITH MEASURES) COMPARED TO THE BAU-SCENARIO (WITHOUT MEASURES) FOR YEARS 2020 AND 2030. EU27 TOTALS IN ABSOLUTE VALUES IN THE INDICATED UNIT, AND RELATIVE SAVINGS VS BAU IN %

		2020		2030*	
	unit	**Saving vs. BAU**	**Saving vs. BAU (%)**	**Saving vs. BAU**	**Saving vs. BAU (%)**
Primary Energy *(PEF 2.5 in 2020; 2.1 in 2030)*	TWh	1039	10%	1513	18%
	PJ	3740		5448	
	Mtoe	89		130	
Electricity	TWh	335	12%	522	17%
	PJ	1205		1880	
	Mtoe	29		45	
Final Fuel *(non-electric final energy)*	TWh	202	7%	417	17%
	PJ	728		1501	
	Mtoe	17		36	
Final Energy *(excl. energy sector)*	TWh	531	9%	922	17%
	PJ	1912		3321	
	Mtoe	46		79	
Energy related GHG-emissions	Mt CO_2 eq	114	9%	160	17%
NO_X emissions	kt SO_2 eq	83	33%	128	64%
CO-emissions	k ton	143	7%	504	32%
OGC-emissions	k ton	10	7%	22	30%
PM-emissions	k ton	10	6%	39	34%
Drinking water (washing)	M m^3	1507	52%	1885	61%
Paper (printing)	M ton	0.23	15%	0.15	15%
Filler wire/electrode (welding)	k ton	0	0%	82	5%
Acquisition costs	bn euros	-25	-6%	-35	-7%
Energy costs **	bn euros	80	12%	151	18%
Consumable costs	bn euros	7	18%	10	26%
Total user expense **	bn euros	63	5%	125	8%
Business revenues	bn euros	22	5%	31	6%
Associated jobs	thousands	323	5%	433	6%

* The cumulative primary energy savings (with PEF 2.5 until 2020, PEF 2.1 from 2021 onwards) are:
- Period 2021-2030 (10 years): 12871 TWh
- Period 2011-2030 (20 years): 19051 TWh

** The energy cost savings and user expense savings reported in this table use the EIA traditional energy rates. When using the rates from the PRIMES 2020 Reference scenario, the energy costs savings are 74 bn euros in 2020 and 136 bn euros in 2030, corresponding to user expense savings of respectively 57 bn euros and 110 bn euros. See details in in the Expense and Savings section of this summary, and in section 3.6.1 of the Status Report.

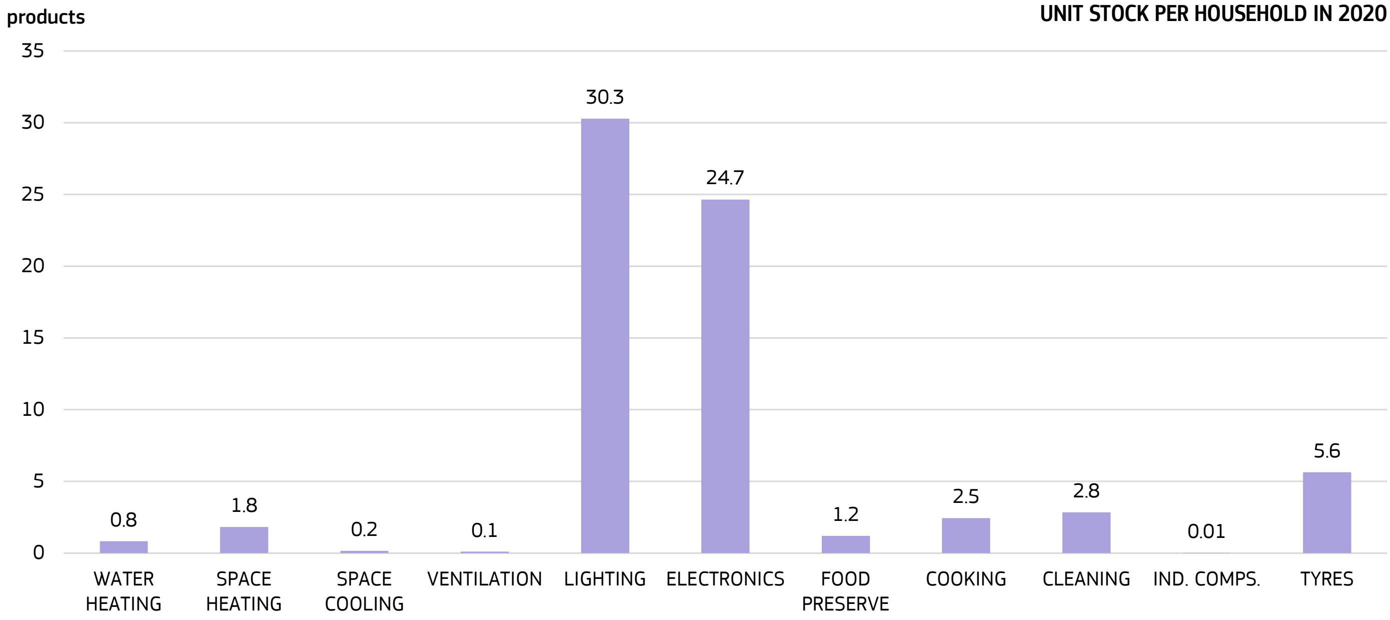
Main results

RESULTS FOR EU27 HOUSEHOLDS

The average EU27 household in 2020:

- Bought 10 regulated products of which 4 light sources, 4 electronics products.
- Used 70 regulated products of which 30 light sources, 25 electronics products.
- Saved 1000 kWh (27%) of electricity and 700 kWh (6%) of fuel (gas, oil coal, wood) in 2020 compared to a scenario without Ecodesign and Labelling measures. In 2030 this is projected to increase to 1200 kWh electricity (33%) and 1400 kWh of fuel (12%).
- Avoided 360 kg CO_2eq of greenhouse gas emissions in 2020 compared a scenario without Ecodesign and Labelling measures. In 2030 this is projected to increase to almost 440 kg CO_2eq/household.
- Saved 198 euros (7%) in user expenditure in 2020, expected to increase to 312 euros per year per household in 2030 (8%) compared to a scenario without Ecodesign and Labelling measures. This considers only the direct savings for products used in households. Additional financial benefits for households might arrive from the savings in the tertiary and industry sectors, if these are translated in lower tariffs, lower product prices, or higher wages.

More about expenses and savings for EU households can be found in the section Households.

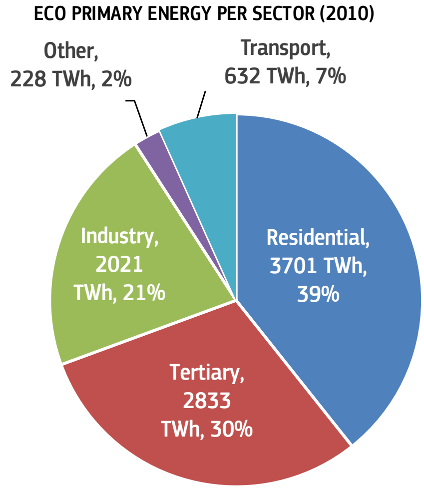


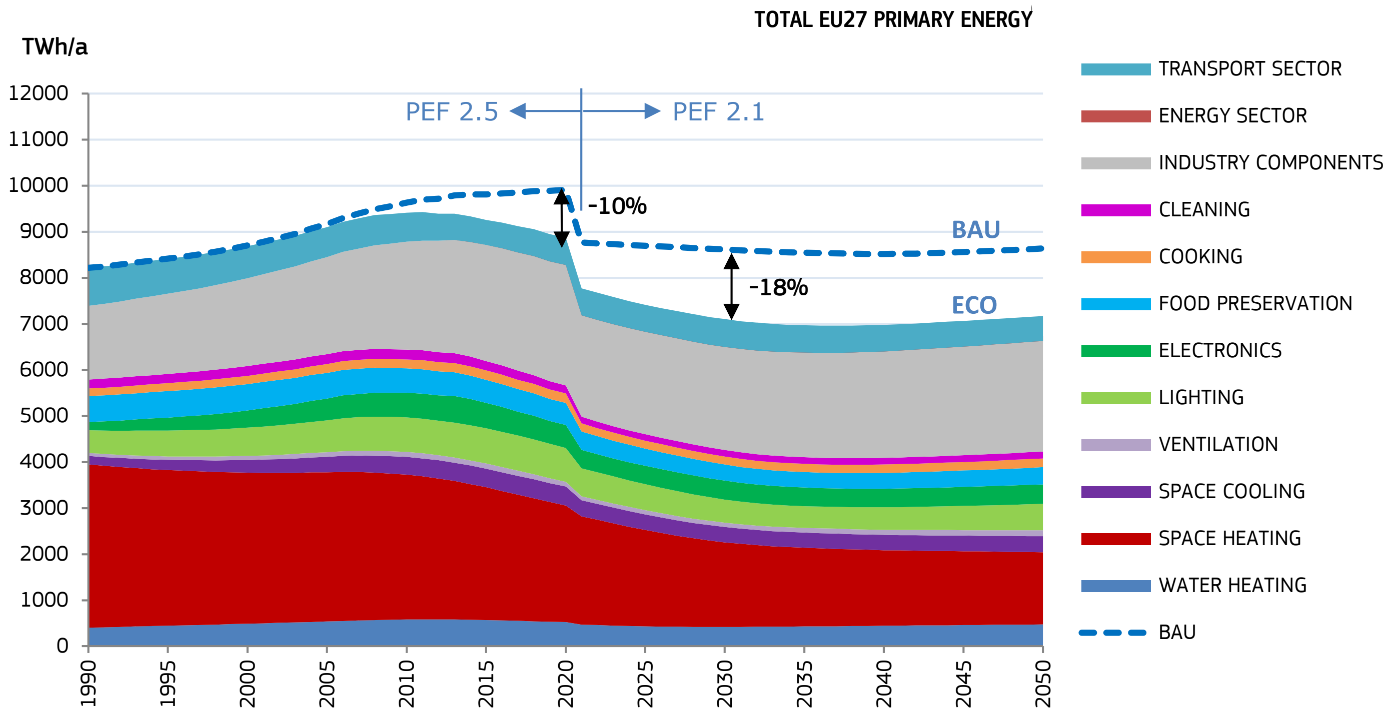
Primary energy

PRIMARY ENERGY 2010

In 2010 the products included in the accounting represent 9415 TWh (810 Mtoe, 33 893 PJ) of direct and indirect primary energy consumption. This is 56% of the total EU27 primary energy consumption in 2010 (1485 Mtoe, source: Eurostat Energy Balance, April 2022). The major energy consumers are Space Heating (33% of total), Industry Components (25%), Lighting (8%), Tyres (7%), Water Heating, Electronics and Food preservation (6% each).

As regards the sector subdivision of primary energy: 39% is consumed for the residential sector, 30% for the tertiary sector, 21% for industry, 7% for transport (rolling resistance losses for tyres only), and 2% for other sectors (e.g. agriculture, forestry, fishing).





ASSUMPTIONS

- Net caloric value of fuels used, in line with Eurostat.
- 40% efficiency for electricity generation and distribution until 2020 (PEF=2.5); 47.6% from 2021 onwards (PEF=2.1).
- 0.85% load reduction per year for space heating (better insulation, climate change, ventilation).
- Increase in load where appropriate (trend towards more and bigger appliances, lamps, computers, displays).
- Product interactions assessed, e.g. Ventilation Units have own electricity savings but their use also leads to savings on Space Heating.
- Double-counting issues addressed for Motors, Fans, Circulators, Condensing Units, External Power Supplies, Standby and Utility Transformers. Full data are reported at the lowest level. Double-counted amounts are removed from the aggregated totals.

PRIMARY ENERGY SAVING 2020 AND 2030

In 2020 the primary energy savings due to Ecodesign and Energy Labelling measures (ECO 2020 versus BAU 2020) are 1039 TWh (89 Mtoe, 3740 PJ) , i.e. a saving of 10% versus BAU 2020 for the average product in scope (with PEF=2.5).

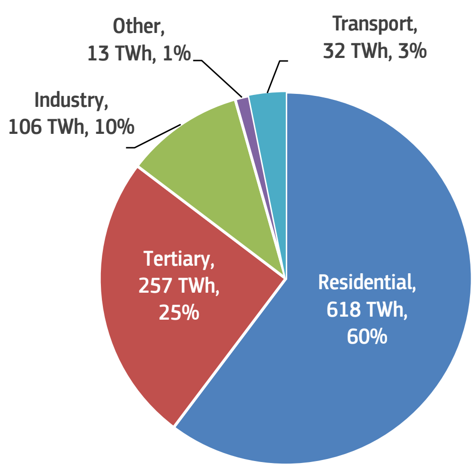
This primary energy saving is due to saving 329 TWh (28 Mtoe, 1184 PJ) of electricity, and 202 TWh (17 Mtoe, 728 PJ) is direct fuel saving. The sum of electricity saving and direct fuel saving ('final' energy saving) is 531 TWh (46 Mtoe).

Over 60% of the 2020 savings comes from the residential sector, 24% from the tertiary sector, 9% from the industry sector and 7% from transport and other sectors (agriculture, forestry, tyres).

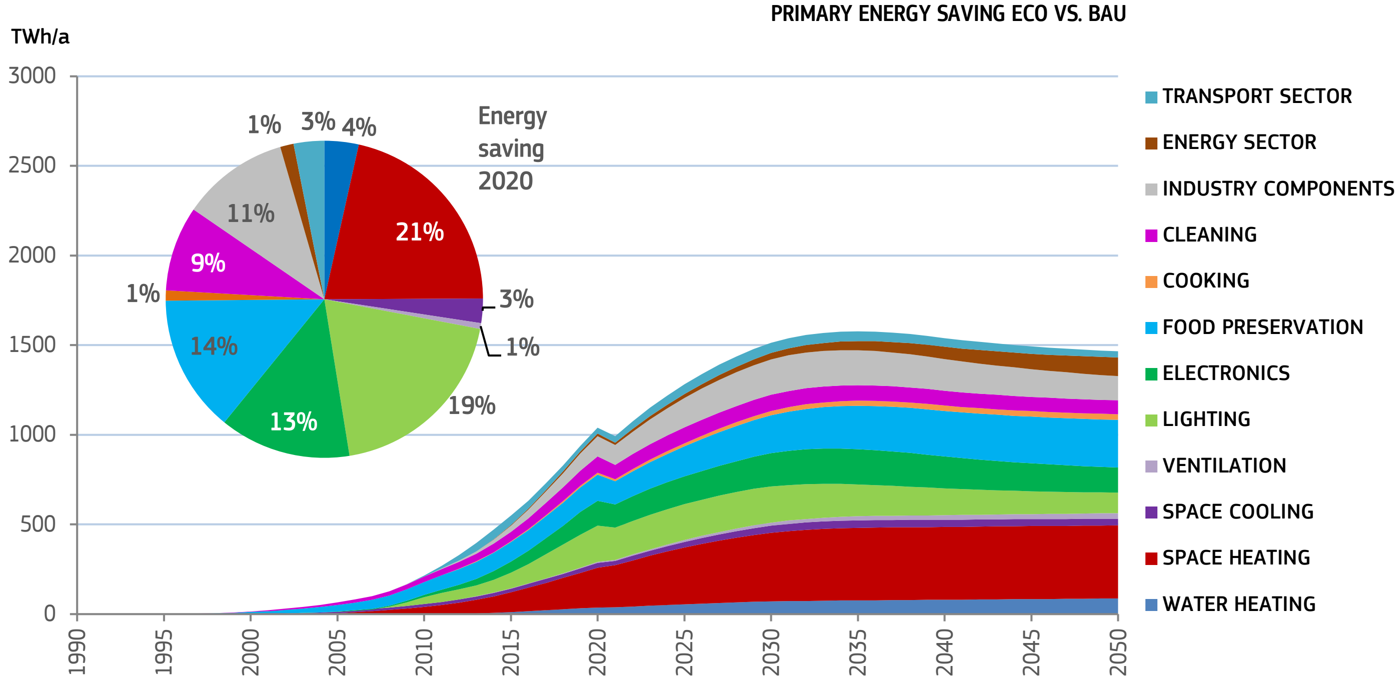
In 2030 the primary energy savings increase to 1513 TWh (130 Mtoe, 5448 PJ), i.e. a saving of 18% versus BAU 2030 for the average product (with PEF=2.1 in 2030).

The savings represent 7.2% (in 2020) or 10.5% (in 2030) of the total EU27 primary energy consumption in 2019 (1236 Mtoe).

PRIMARY ENERGY SAVINGS PER SECTOR (2020)



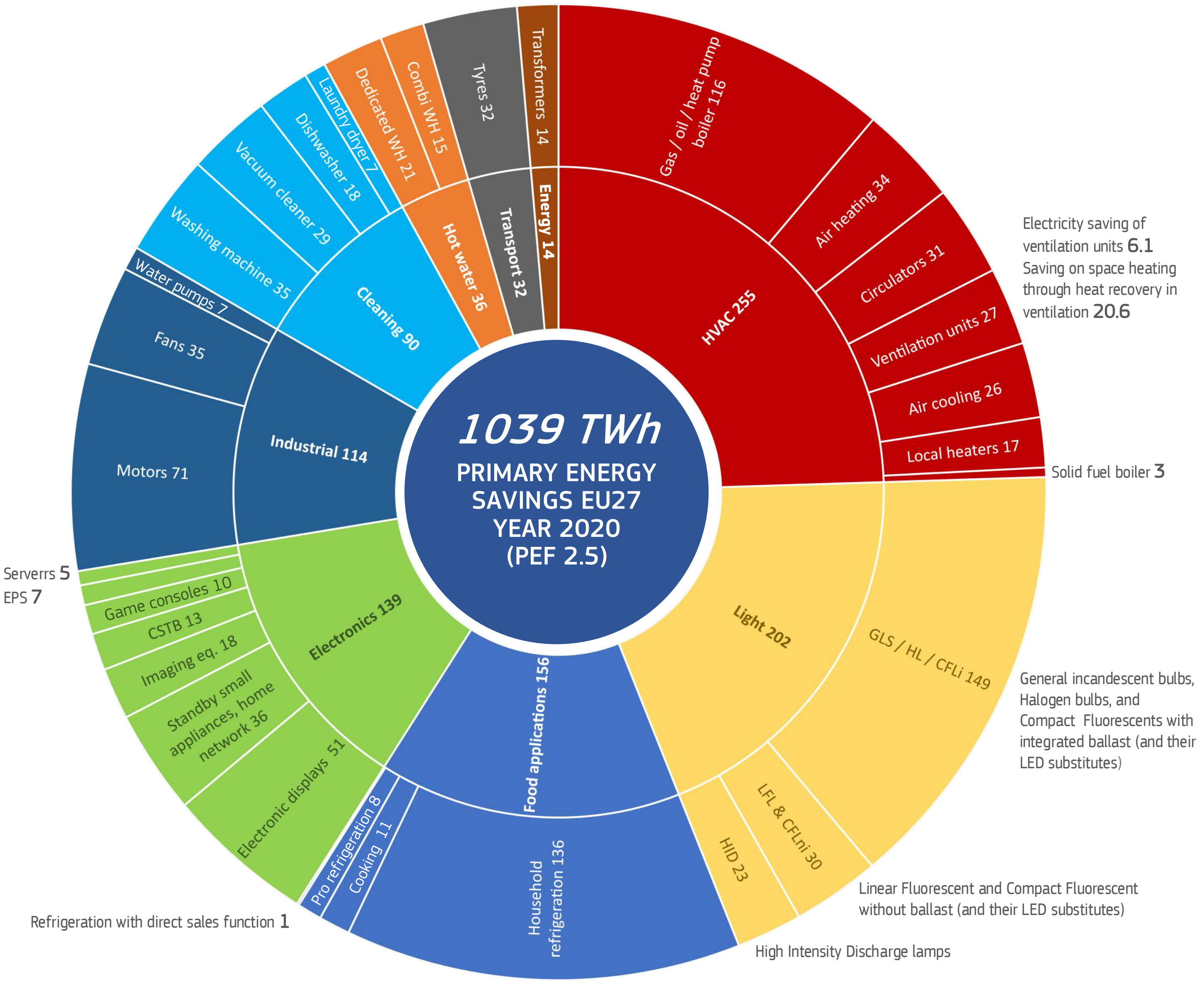
PRIMARY ENERGY SAVING ECO VS. BAU



Primary energy

2020

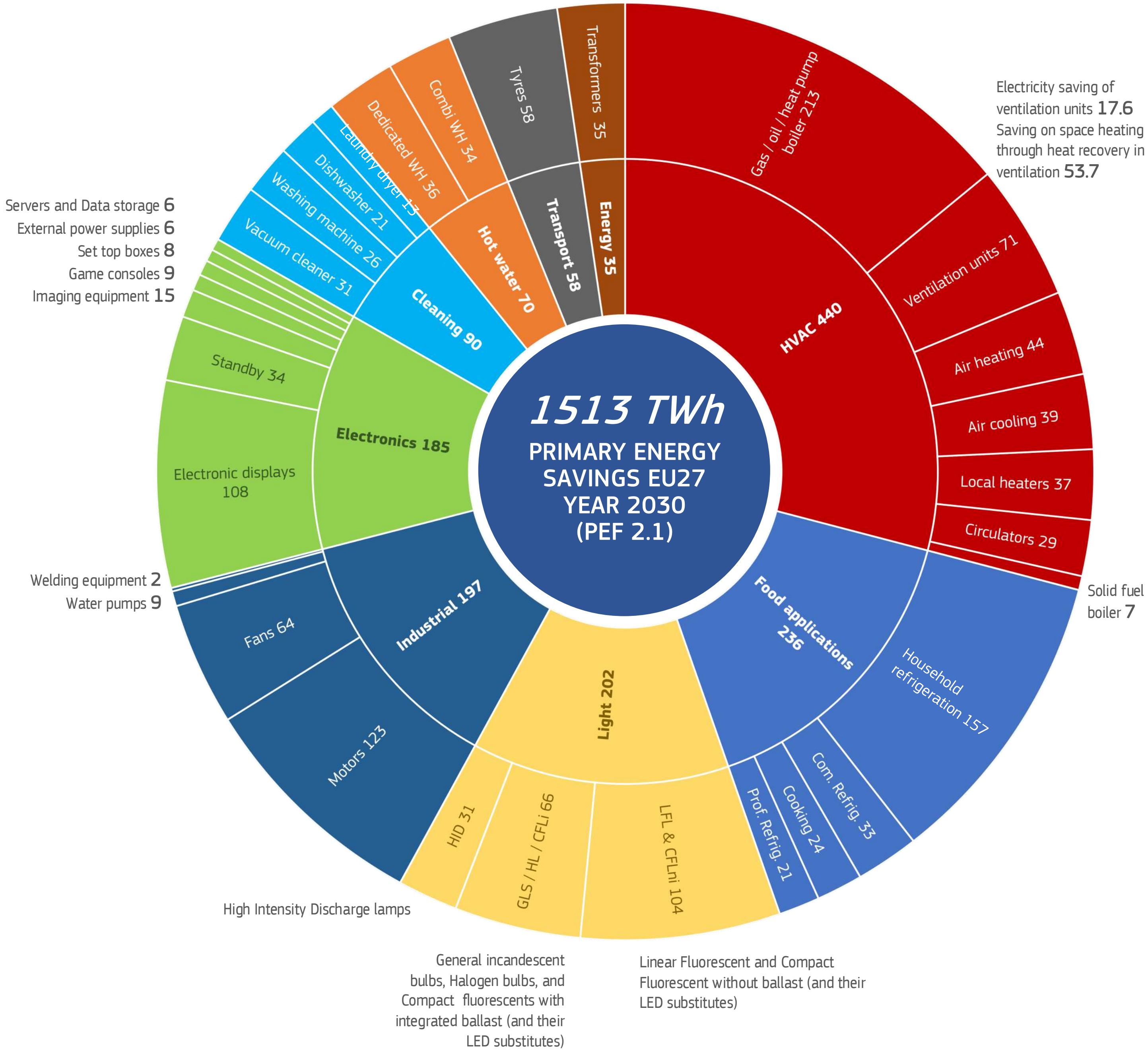
PRIMARY ENERGY SAVINGS (AT PRIMARY ENERGY FACTOR 2.5) WITH ECODESIGN AND ENERGY LABEL VS. BUSINESS-AS-USUAL (BAU) FOR EU27



Primary energy

2030

PRIMARY ENERGY SAVINGS (AT PRIMARY ENERGY FACTOR 2.1) WITH ECODESIGN AND ENERGY LABEL VS. BUSINESS-AS-USUAL (BAU) EU27



SUMMARY

Primary energy

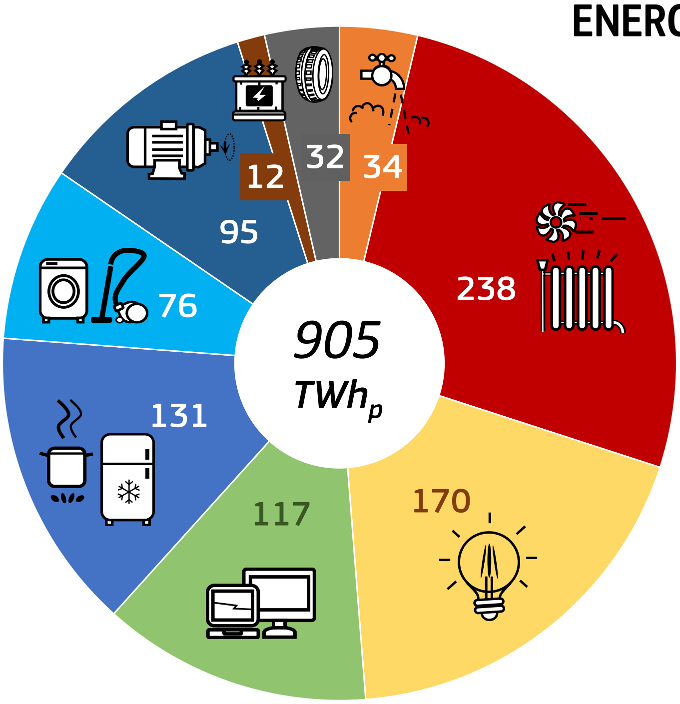
2030

PRIMARY ENERGY SAVINGS (AT PRIMARY ENERGY FACTOR 2.5) WITH ECODESIGN AND ENERGY LABEL VS. BUSINESS-AS-USUAL (BAU) FOR EU27

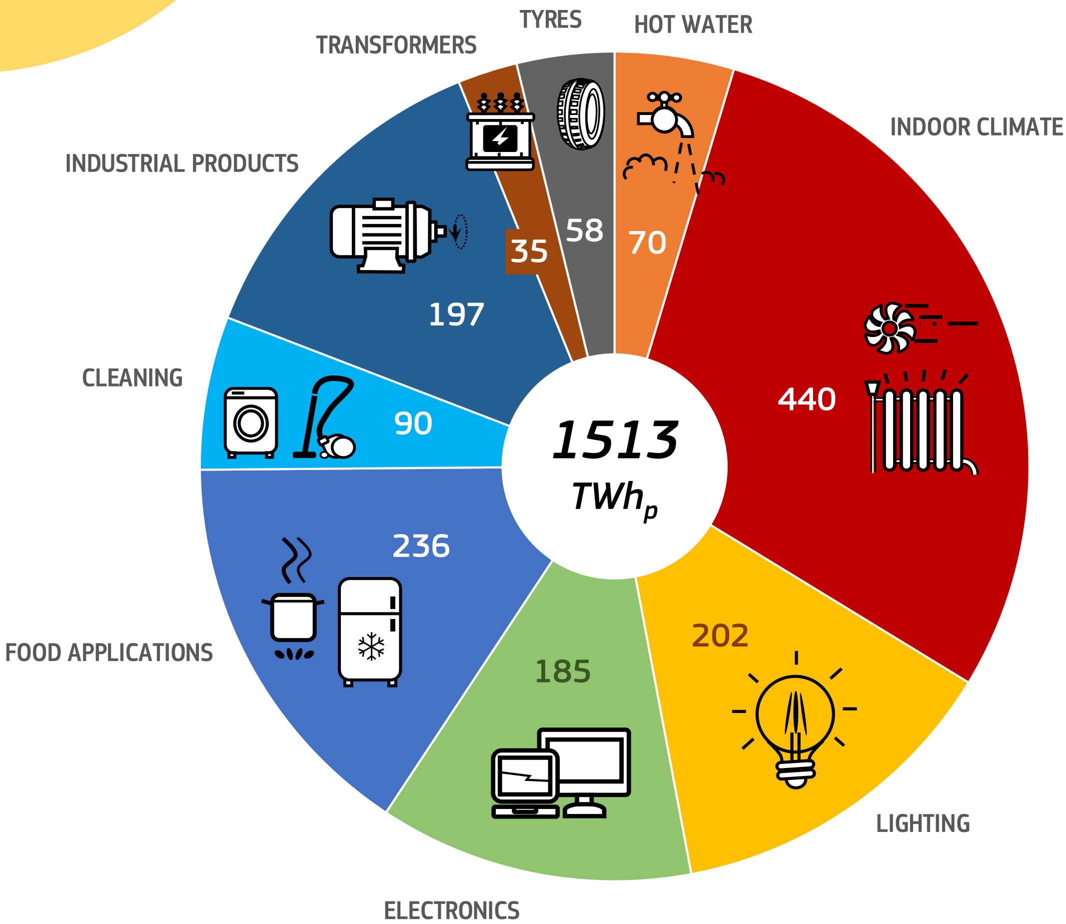
EU27 ENERGY SAVINGS 2020 & 2030 FROM ECODESIGN AND ENERGY LABELLING

ALL AMOUNTS EXPRESSED IN TWh PRIMARY ENERGY AT PRIMARY ENERGY FACTOR 2.1

ENERGY SAVINGS 2020



ENERGY SAVINGS 2030



Primary energy

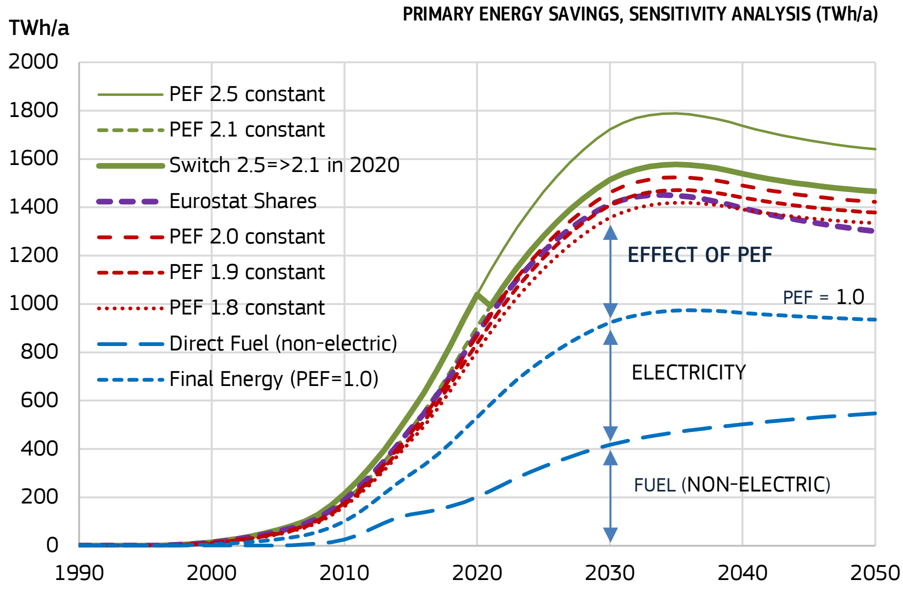
SENSITIVITY ANALYSIS, PEF

The results for primary energy consumption and savings reported in EIA2021 use a primary energy factor for electricity (PEF) of 2.5 until 2020, and 2.1 from 2021 onwards. The graph below shows how the primary energy savings due to ecodesign and labelling measures change when different PEFs are assumed.

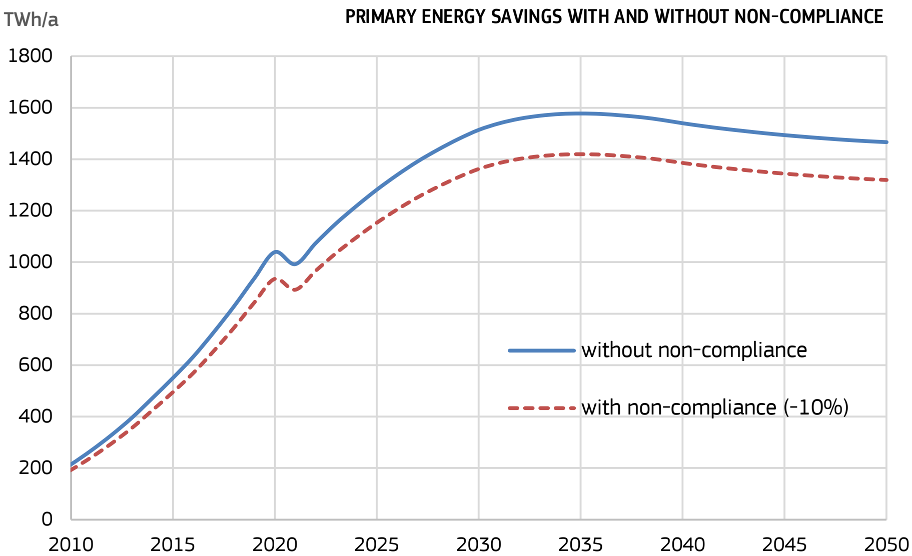
In 2030, the savings on fuel consumption are 417 TWh and the electricity savings 505 TWh, summing up to final energy savings of 922 TWh (excluding distribution transformers). Multiplying the electricity by a PEF of 2.1 the primary energy equivalent for electricity savings is 1096 TWh (including distribution transformers), and summing this with the fuel savings gives total primary energy savings of 1513 TWh. Applying a PEF of 2.5 this would increase to 1722 TWh (+13%). Applying a PEF of 1.8 it would decrease to 1357 TWh (-10%).

SENSITIVITY ANALYSIS, NON-COMPLIANCE

Following recommendations from the European Court of Auditors (ECA) [12], since 2019 EIA includes an estimate for the possible reduction of reported savings due to non-compliance (NC). ECA refers to 10% of energy savings being lost due to non-compliance, which is based on information from the Commission and from other stakeholders but is uncertain. During 2020, the EIA team performed further online search for data on loss of energy savings due to non-compliance, but no new information was found. Consequently, EIA2021 continues to use the 10% lost savings, for all years and all products, for the sensitivity analysis.



EU27 total primary energy savings versus BAU in TWh/a, for 7 different sets of primary energy factors (PEF) for electricity generation and distribution. The graph also indicates the direct (non-electric) fuel savings, which is a constant part of the total primary energy savings, not affected by the changes in PEF for electricity. The graph also indicates the final energy savings, which correspond to using PEF=1.0 for electricity.



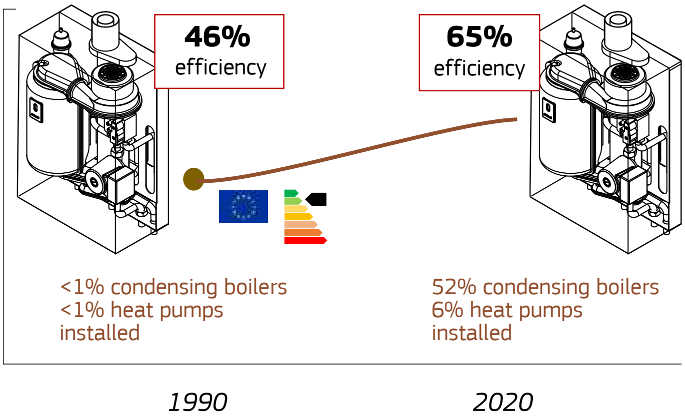
Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

Product energy consumption

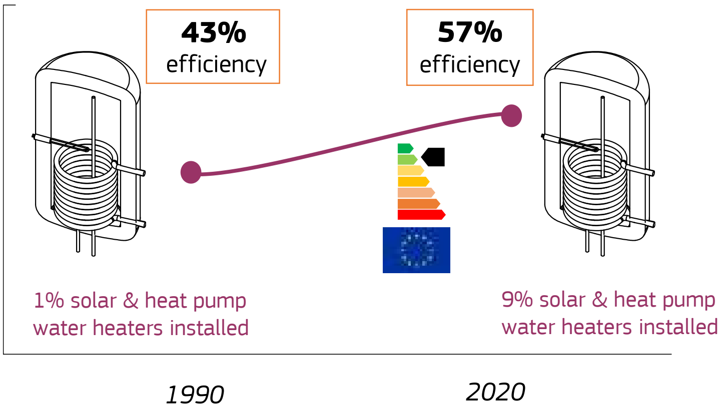
EFFECT OF ECODESIGN AND ENERGY LABEL ON PRODUCT ENERGY CONSUMPTION

These graphs show the development of product energy consumption in the product groups over the years since the introduction of ecodesign regulation and the energy label in the EU.

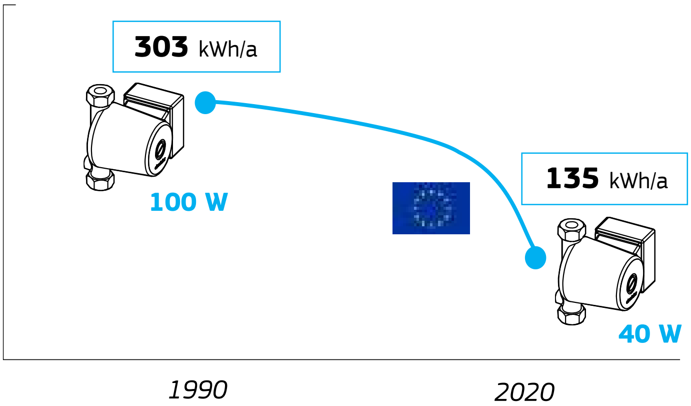
Hydronic central space heaters < 400 kW
(excl. solid fuel)



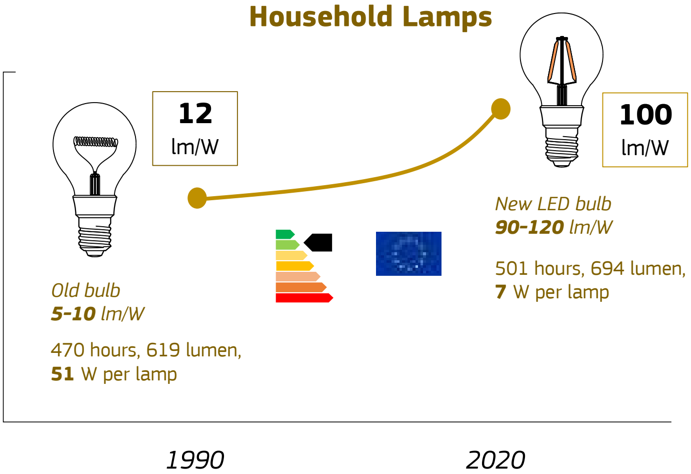
Water heaters
(combi & dedicated)



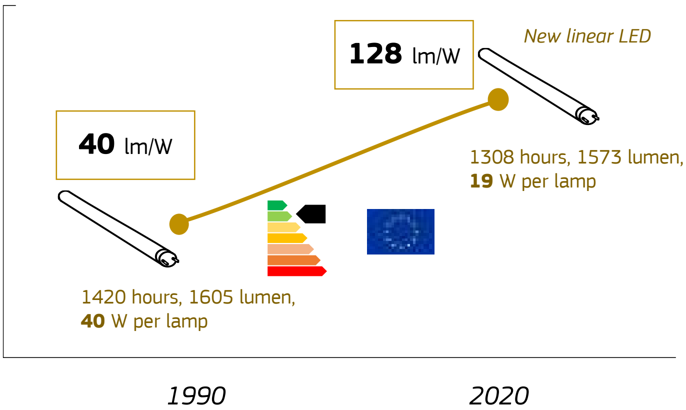
Integrated Circulator (central heating pump)



Household Lamps

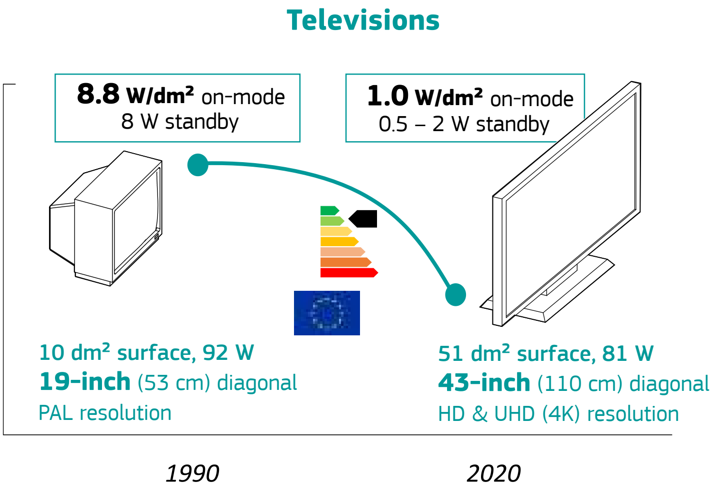


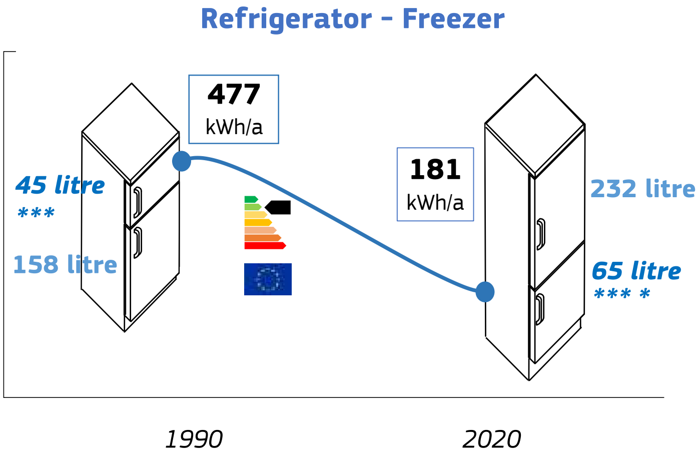
Non-Household Lamps

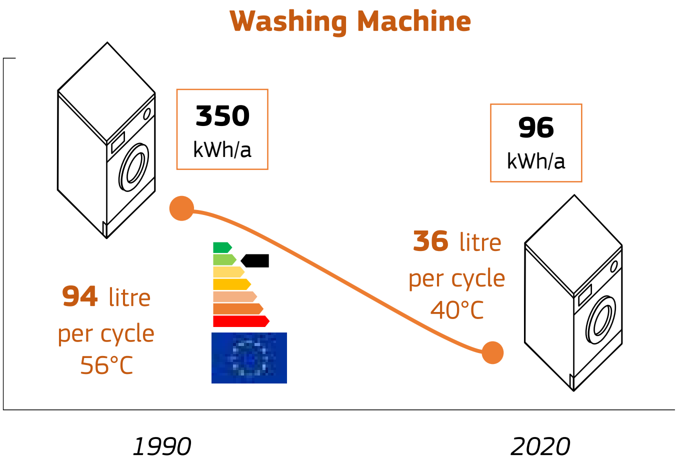


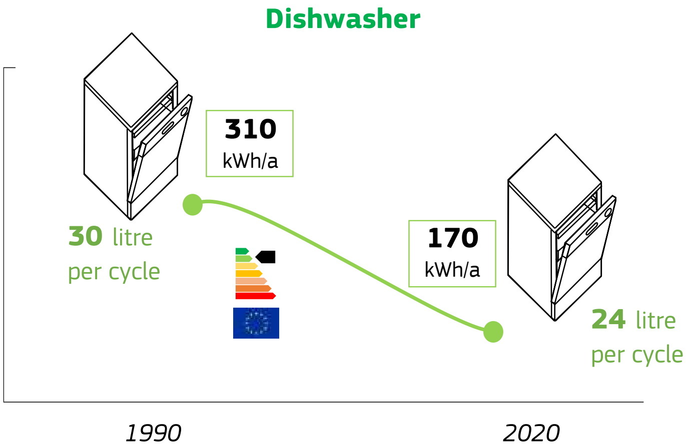
Product energy consumption

EFFECT OF ECODESIGN AND ENERGY LABEL ON PRODUCT ENERGY CONSUMPTION



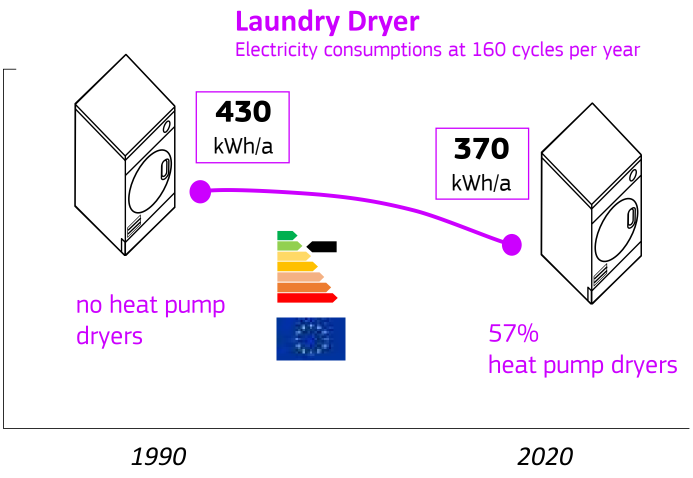


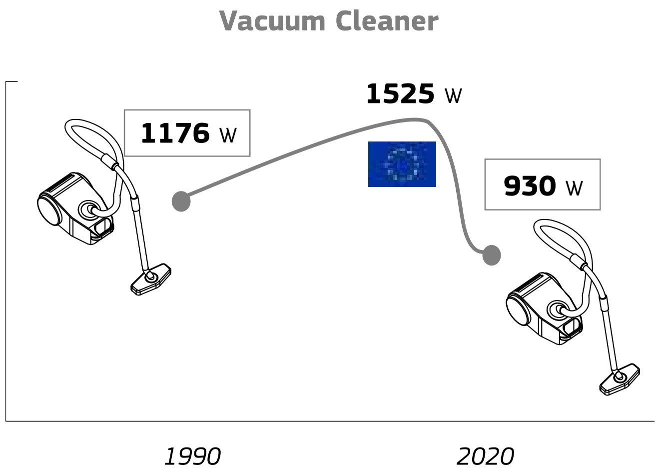


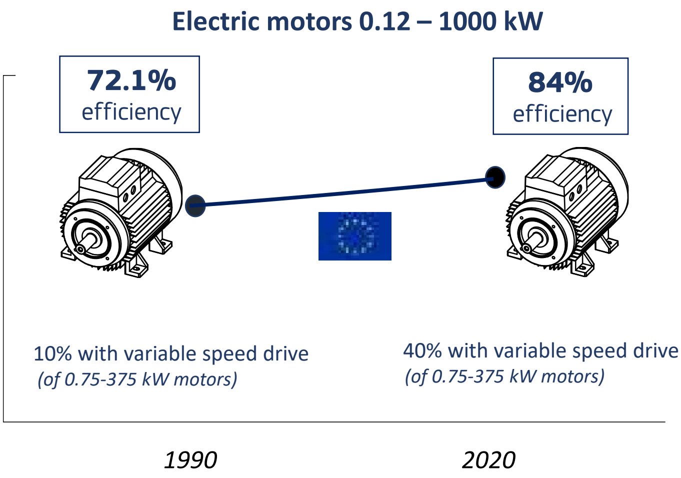


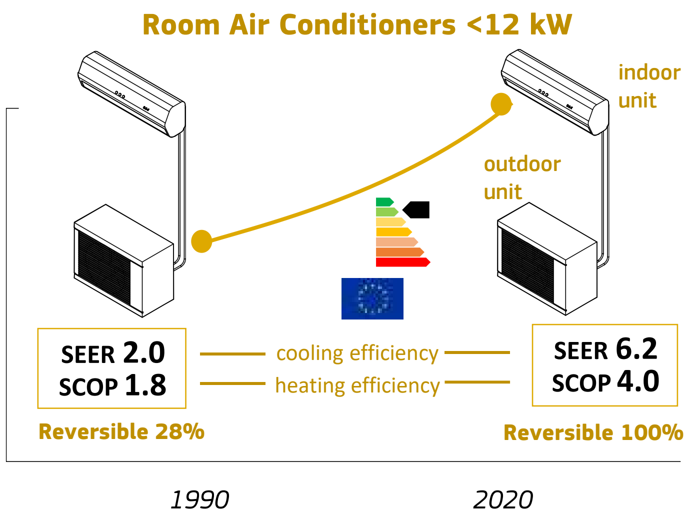
Product energy consumption

EFFECT OF ECODESIGN AND ENERGY LABEL ON PRODUCT ENERGY CONSUMPTION





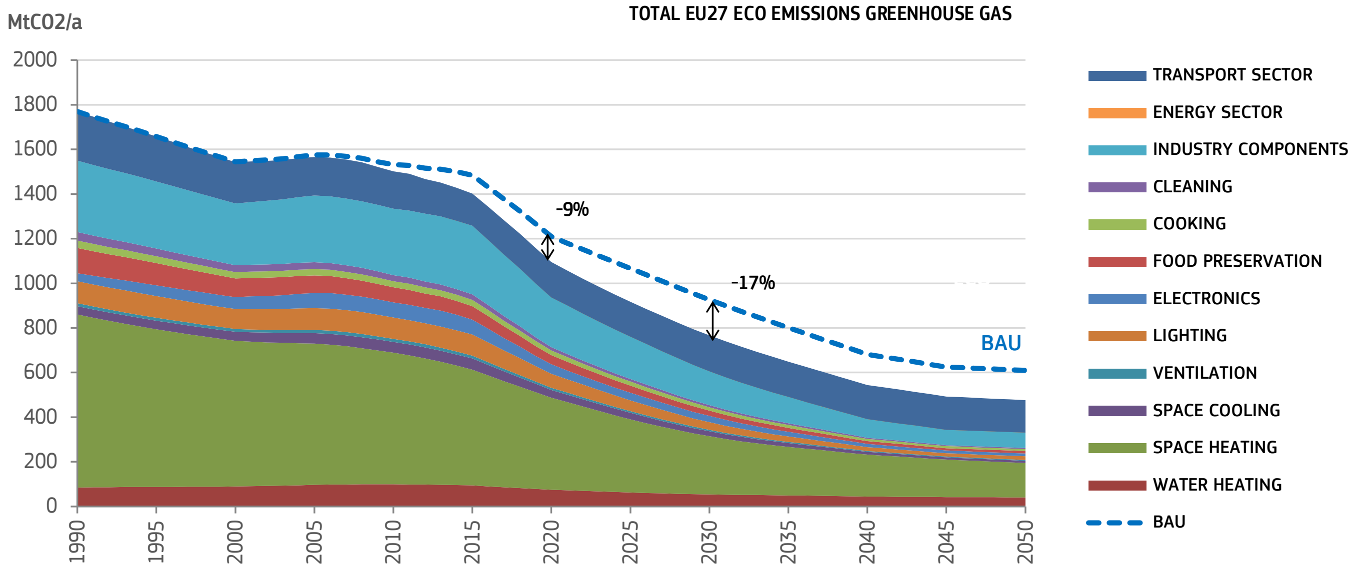




SUMMARY

Emissions

GREENHOUSE GAS EMISSIONS



Greenhouse gas (GHG) emissions in EIA are the sum of energy related emissions, expressed in their Global Warming Potential (GWP100 in megatonnes CO_2-equivalent). For reporting, EIA2021 uses the GWP factors for electricity from the PRIMES 2020 Reference scenario.

In 2010 the products included in the accounting for EU27 were responsible for 1502 Mt CO_2eq of GHG-emissions. This was 36% of the total EU27 emissions of 4188 Mt CO_2eq (source: EEA 2021, Annual European Union greenhouse gas inventory 1990–2019, excl. LULUCF).

In 2020 the reduction in GHG-emissions due to Ecodesign and Energy Labelling measures (ECO 2020 versus BAU 2020) is 114 Mt CO_2eq, i.e. a saving of 9% versus BAU 2020 for the average product. The reduction is 3.2% of the EU total emissions in 2019 (3610 Mt CO_2eq, EEA 2021).

In 2030 the emission reduction increases to 160 Mt CO_2eq, i.e. a saving of 17% versus BAU 2030 for the average product. The reduction is 4.4% of the EU total in 2019.

For electricity the GWP (in kg CO_2-equivalent/kWh) is assumed decreasing from 0.32 in 2010 to 0.14 in 2030. For fuels the GWP is taken constant over the years, see details in the EIA Status Report.

OTHER EMISSIONS

Direct emissions are intended here as those that occur during the use of products burning fuels (mainly for heating). This does not include emissions during the generation of electricity or emissions during non-use phases, e.g. manufacturing, distribution, end-of-life. Direct emissions are included in EIA as far as available data permitted.

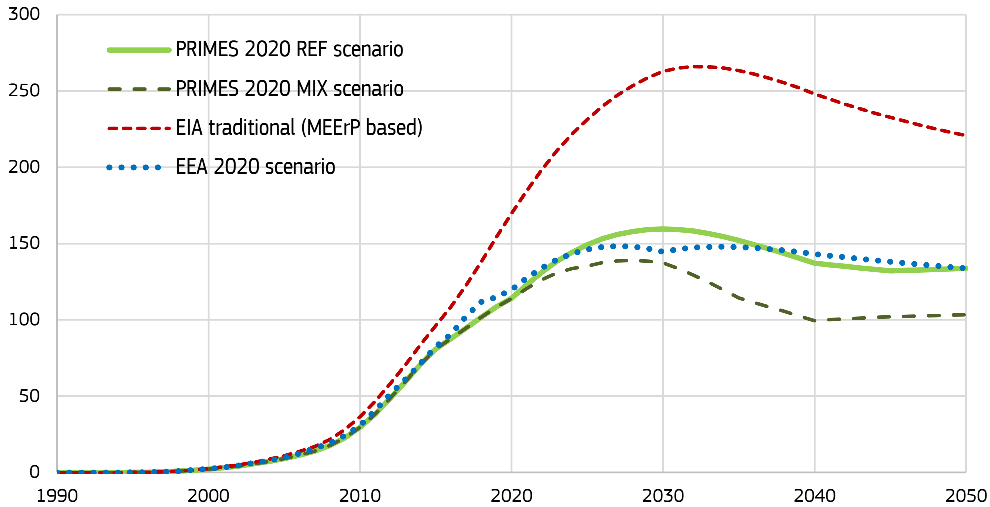
Other direct emission reductions in 2030

- Nitrogen Oxides (NO_X): **-128 kt** SO_2equivalent (2.0% of EU-total in 2018)
- Carbon Monoxide (CO): **-504 kt** (2.8% of EU total in 2018)
- Organic Gaseous Carbon (OGC): **-22 kt** (0.4% of EU-total in 2018)
- Particulate Matter (PM): **-39 kt** (2.1% of EU total in 2018)

SENSITIVITY ANALYSIS, GWP

The results for greenhouse gas emissions reported in EIA2021 use the GWP-factors for electricity of the PRIMES 2020 Reference scenario. The graph shows how the reduction of GHG-emissions changes when different GWP-factors are used. The traditional EIA values, based on the 2011 MEErP and now considered obsolete, would lead to much higher GHG-reduction. The PRIMES 2020 Mix scenario leads to lower GHG-reduction due to ecodesign and labelling measures, in particular after 2030.

GHG EMISSION REDUCTION, SENSITIVITY ANALYSIS ($MtCO_2eq/a$)

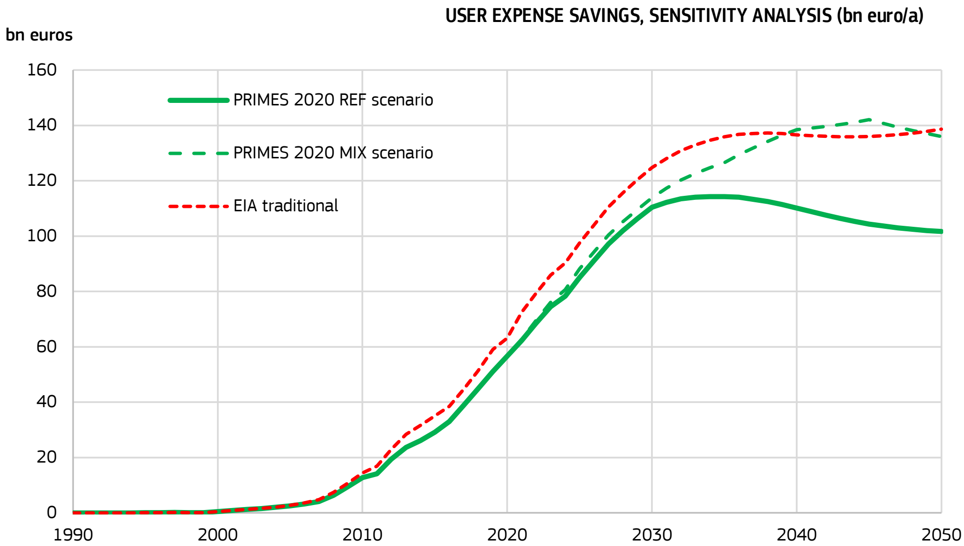


EU27 total reduction of GHG emissions due to ecodesign and energy labelling measures for four different sets of GWP-factors for electricity (in $MtCO_2eq/a$). EIA2021 uses the GWP-factors of the PRIMES 2020 REF scenario.

Expense and savings

In the previous edition (EIA2020), user expense savings of 60 bn euros in 2020 and 118 bn euros in 2030 were reported. This was expressed in 2015 euros and used the EIA traditional approach to energy rates. In EIA2021, prices and costs are expressed in 2020 euros (+5.8%) while (slightly lower) energy rates from the PRIMES 2020 reference scenario are used [18].

The sensitivity analysis of the graph shows how the user expense savings in the EIA change when different energy rates are used. The user expense savings in 2020 are 57 bn euros when using the rates of the PRIMES 2020 reference scenario (PRIMES rates) or 63 bn euros when using the EIA traditional rates (EIA rates). In 2030 this is respectively 110 and 125 bn euros.



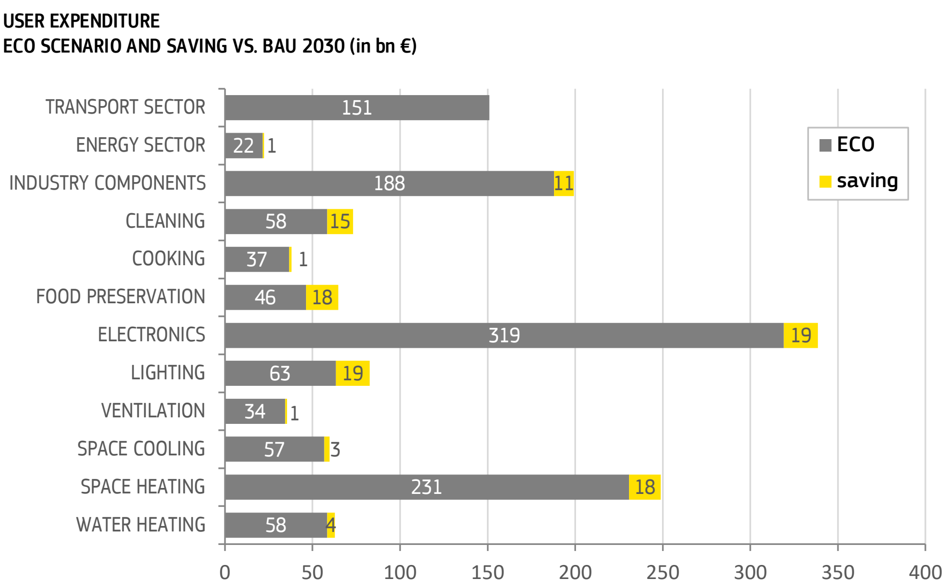
EU27 total user expense savings due to ecodesign and energy labelling measures for three different sets of rates for electricity, natural gas, heating oil and LPG (in bn euros/a). EIA2021 uses the rates of the PRIMES 2020 REF scenario.

	2010	2020			2030		
bn euros	BAU	BAU	ECO	inc.	BAU	ECO	inc.
Acquisition	372	407	432	25	494	529	35
Energy cost (EIA rates)	689	709	628	-81	827	677	-150
Energy cost (PRIMES rates)	630	641	567	-74	743	607	-136
Maintenance	60	71	71	0	79	79	0
Consumables	48	40	32	-7	37	28	-10
Total expense (EIA rates)	**1 168**	**1 227**	**1 164**	**-63**	**1 437**	**1 312**	**-125**
Total expense (PRIMES rates)	**1 110**	**1 160**	**1 103**	**-57**	**1 353**	**1 242**	**-110**

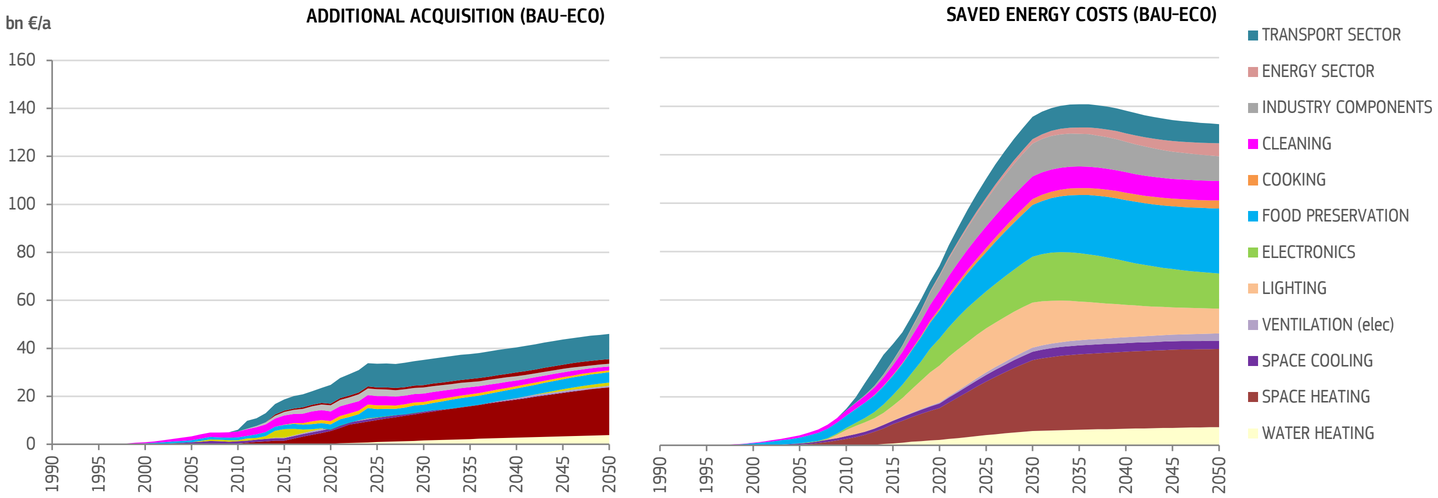
Using PRIMES' energy rates, in 2010 users spent 1110 billion euros for EIA-products, of which 372 bn for acquisition, 630 bn for energy, 60 bn for maintenance and 48 bn for consumables.

Without measures, by 2020 this would have increased to 1160 bn euros, but due to Ecodesign and Labelling regulations this has been limited to 1103 bn euros. The saving of 57 bn (using PRIMES' energy rates) is the balance of 25 bn euros additional acquisition costs (for better products), 74 bn euros savings on energy costs and 7 bn euros savings on consumables (e.g. 1507 million m³ drinking water and 0.23 Mt printer paper saving). By 2030 the total expense savings are expected to increase to 110 bn euros. The consumer's monetary saving is 0.4% (in 2020) and 0.9% (in 2030) of the GDP of the European Union (13 300 bn euros in 2020).

In 2030, the largest contributors to user expense savings are Lighting and Electronics (19 bn euros each), Space Heating and Food Preservation (18 bn euros each), followed by Cleaning and Industry components.



Expense and savings



The user expenses for EIA products include acquisition costs (purchase and installation) and Running costs (energy, consumables and maintenance). All prices and costs are in 2020 euros.

Acquisition costs are computed multiplying a unit product price by the number of products sold in a given year. For most products, prices in EIA are defined in function of the product efficiency. In the ECO-scenario the average product efficiency is typically higher, leading to a higher product price than in the BAU scenario. Prices cover purchase and installation and include 20% VAT for residential users.

Energy costs are computed multiplying the energy consumption by the electricity- or fuel-rate. Separate rates are used for the residential, tertiary and industry sectors. Reporting in EIA2021 uses the rates of the PRIMES 2020 Reference scenario. Consumable costs are computed multiplying the consumption (e.g. paper, toner, water, detergents, vacuum cleaner bags, shielding gas, electrodes) by a unit price.

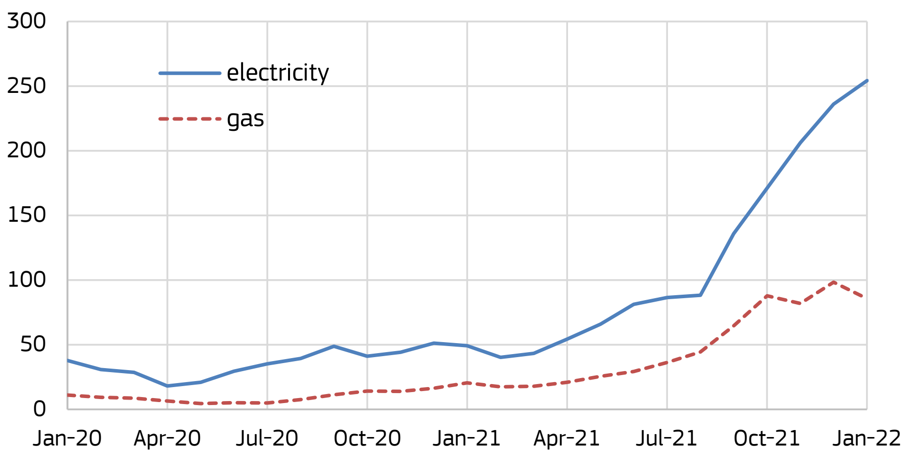
Maintenance costs are computed multiplying the maintenance cost per product per year by the quantity of products installed (stock) in the EU27 in a given year. In EIA there are no differences in maintenance costs between the BAU and ECO scenarios.

PEAK ENERGY RATES

In the last months of 2021 and the first months of 2022, a strong increase in energy rates occurred. The impacts of this increase are not yet reflected in the data presented above and were therefore estimated separately (details in section 3.6.2 of the Status Report).

Due to the 2021/2022 increase in electricity and gas rates, user expense savings in 2021 roughly double compared to 2020, reaching 126 bn euros. Savings could again double in 2022 compared to 2021, reaching 259 bn euros if prices in 2022 will stay at January 2022 levels, and not taking into account the effect of potential government intervention on components of the energy price (taxes and network costs) or of changes in consumer behaviours (e.g. advanced or delayed appliance purchases, or more careful behavioural patterns triggered by higher prices).

REFERENCE PRICES IN €/MW/h FOR ELECTRICITY AND NATURAL GAS



sources: European Power Benchmark (EPB7) (EC-AAENM00); NL TTF Day Ahead (GTFUX00)

Business revenue and jobs

The unit product price in EIA is split in revenue shares for business sectors: industry, wholesale, retail, installation (and VAT). The total EU27 revenues per sector are calculated by multiplying the total acquisition costs by the sector share. In general, in the ECO-scenario, the products sold have a higher average efficiency, a higher price and therefore lead to higher business revenues than in the BAU-scenario.

The direct sector jobs related to EIA products are derived from dividing the revenue by a revenue per employee. The latter values differ per sector (see details in the Status Report). For industry the jobs include OEM's and industry services. Direct jobs means jobs in the value-added chain. Indirect employment effects may be a factor 3 to 5 higher, but no consensus or agreed factor is available.

In 2020 the additional business revenue due to Ecodesign and Energy Labelling measures is 22 billion euros and this can increase to 31 billion euros by 2030. The related jobs increase by 323 thousand in 2020 to 433 thousand in 2030.

TOTAL REVENUE BY FUNCTIONAL GROUP (bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	12	15	15	0	15	16	0	17	18	1
SPACE HEATING	38	56	56	1	55	60	5	59	69	10
SPACE COOLING	3	15	16	1	20	21	1	26	27	0
VENTILATION	5	18	18	0	21	21	1	24	24	1
LIGHTING	8	16	17	0	20	19	-1	19	18	-1
ELECTRONICS	47	179	179	0	188	188	0	242	242	0
FOOD PRESERVATION	10	12	13	1	12	14	2	13	15	2
COOKING	10	14	14	0	15	16	1	15	16	1
CLEANING	8	14	16	2	18	21	3	20	23	3
INDUSTRY COMPONENTS	14	22	22	0	26	29	3	29	32	3
ENERGY SECTOR	3	5	5	0	6	6	1	7	8	1
TRANSPORT SECTOR	20	26	26	1	33	40	7	43	52	9
TOTAL in bn euros	178	390	395	5	431	453	22	515	546	31

TOTAL REVENUE BY SECTOR (bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	72	181	184	2	199	211	12	241	256	15
Wholesale	15	31	31	0	35	37	2	40	43	3
Retail	39	86	88	2	93	99	6	119	127	8
Installation	21	38	38	0	40	42	3	44	51	6
Maintenance	31	54	54	0	64	64	0	70	70	0
TOTAL in bn euros	178	390	395	5	431	453	22	515	546	31

TOTAL direct jobs by sector (in 1000 jobs)

	1990	2010			2020			2030		
Sector	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry (incl. OEM & business services)	1269	3173	3215	42	3482	3690	207	4223	4484	261
Wholesale	53	108	109	2	122	128	6	139	149	10
Retail	570	1259	1287	27	1363	1449	86	1737	1847	110
Installation	180	331	335	4	349	372	23	388	443	54
Maintenance	269	474	474	0	559	559	0	615	611	-3
TOTAL in 1000 jobs	2340	5346	5421	75	5875	6198	323	7102	7533	433

Comparison with Eurostat

Energy totals in the EIA are compatible with those in Eurostat Energy Balances when considering the differences in scope. EIA has a high coverage of the energy consumption in the residential and services sectors for electricity, natural gas, liquid fuels, and solid fuels. Due to its scope, the coverage is lower for industry and transport. See section 3.9 of the Status Report for details.

The table presents the EIA-Eurostat comparison for the residential sector in 2019, per end-use application and energy type. It indicates the final energy consumption in Eurostat [19] and in the EIA in TWh, and the difference EIA minus Eurostat in TWh and in percent.

District heating (column 'heat' in the table), ambient heat used by e.g. heat pumps, solar heat and biogas (column 'rnw other') are not accounted in the EIA. EIA coverage of primary solid biofuels (column 'rnw psb') is partial (only wood for space heating). In addition, water heating and cooking using LPG (part of the column 'oil' in the table) is not in the EIA scope. This explains large part of the differences between Eurostat and the EIA.

The most relevant remaining differences (red figures in the table) are electricity consumption for space heating, cooking using gas and electricity, and electricity for lighting and appliances. The latter difference is mainly due to ironing, small appliances and part of ICT- and entertainment equipment not being in the EIA scope. Further work to investigate the differences is ongoing.

COMPARISON EIA-EUROSTAT RESIDENTIAL SECTOR 2019

TWh/a in 2019		solid	gas	oil	rnw psb	rnw other	elec	heat	TOTAL
All uses	Eurostat	83	919	337	475	100	708	239	2861
	EIA	89	883	300	256	0	632	0	2159
	dif	6	-36	-37	-219	-100	-76	-239	-702
	dif %	7%	-4%	-11%	-46%	-100%	-11%	-100%	-25%
Space Heating	Eurostat	76	691	264	438	70	96	184	1819
	EIA	89	684	271	255	0	166	0	1464
	dif	13	-7	7	-183	-70	70	-184	-355
	dif %	17%	-1%	3%	-42%	-100%	**73%**	-100%	-20%
Space Cooling	Eurostat	0	0	0	0	0	12	0	12
	EIA	0	0	0	0	0	9	0	9
	dif	0	0	0	0	0	-3	0	-3
	dif %	0%	0%	0%	0%	0%	-25%	0%	-25%
Water Heating	Eurostat	6	174	48	28	27	86	54	424
	EIA	0	173	30	0	0	74	0	278
	dif	-6	-1	-18	-28	-27	-12	-54	-146
	dif %	-100%	-1%	-38%	-100%	-100%	-14%	-100%	-34%
Cooking	Eurostat	1	54	23	7	3	87	0	175
	EIA	0	25	0	0	0	63	0	88
	dif	-1	-29	-23	-7	-3	-24	0	-87
	dif %	-100%	**-54%**	-100%	-100%	-100%	**-28%**	0%	-50%
Lighting & Apps	Eurostat	0	0	0	0	0	404	0	404
	EIA	0	0	0	0	0	319	0	319
	dif	0	0	0	0	0	-85	0	-85
	dif %	0%	0%	0%	0%	0%	**-21%**	0%	-21%
Other end-uses	Eurostat	0	0	2	2	0	23	0	27
	EIA	0	0	0	0	0	0	0	0
	dif	0	0	-2	-2	0	-23	0	-27
	dif %	0%	0%	-100%	-100%	0%	-100%	0%	-100%

solid: Eurostat's solid fuels (referred to in the EIA as 'coal') do not include biomass (in the EIA referred to as 'wood'), which is registered in Eurostat under renewables (primary solid biofuels).

oil: Oil and petroleum products, including LPG.

rnw psb: Eurostat's primary solid biofuels (psb), registered as part of renewables (rnw). EIA considers only what is in the scope of Ecodesign, i.e. wood logs, -pellets and -chips for space heating by solid fuel boilers and local space heaters, not e.g. for water heating and cooking.

gas: Natural gas, does not include LPG (propane, butane), which is registered in Eurostat under oil and petroleum products.

rnw other: Eurostat's renewables other than primary solid biofuels (psb): e.g. ambient heat used for heat pumps, solar thermal, biogas, other. Not accounted in the EIA.

elec: Electricity

heat: Derived heat, distributed heat, e.g. used for district heating. Not accounted in the EIA.

Material resources

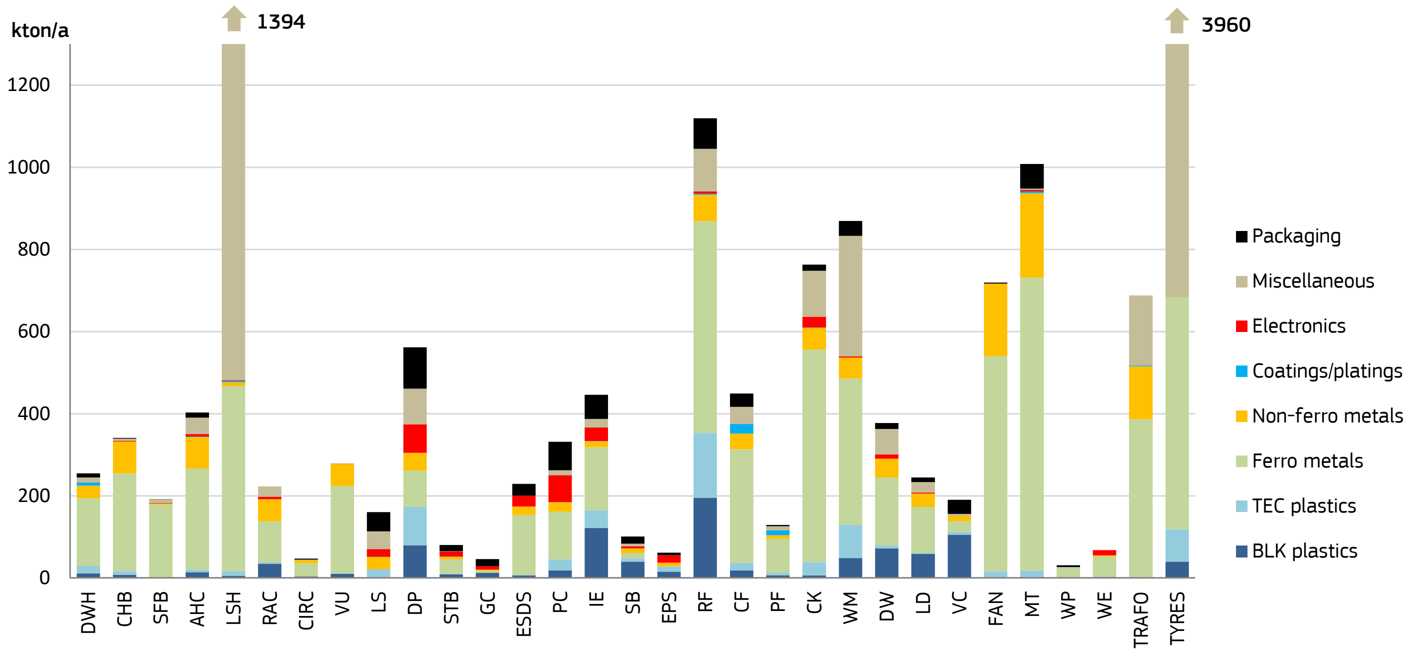
EIA SPECIAL REPORT ON MATERIALS

In the Ecodesign preparatory studies, Bills of Materials (BoM) have been defined for typical products. Multiplying the BoM masses per material category (metals, plastics, electronics, etc.) by the EIA-sales or –stock, the total amount of materials contained in sold or installed regulated products is obtained. Summing the contributions of all products, the total material in all EIA-products is derived, subdivided in material categories. The 'EIA Special Report Material Inputs for Production' first issued by VHK in 2016, has been updated in EIA2021, providing material resource data for year 2020 in EU27.

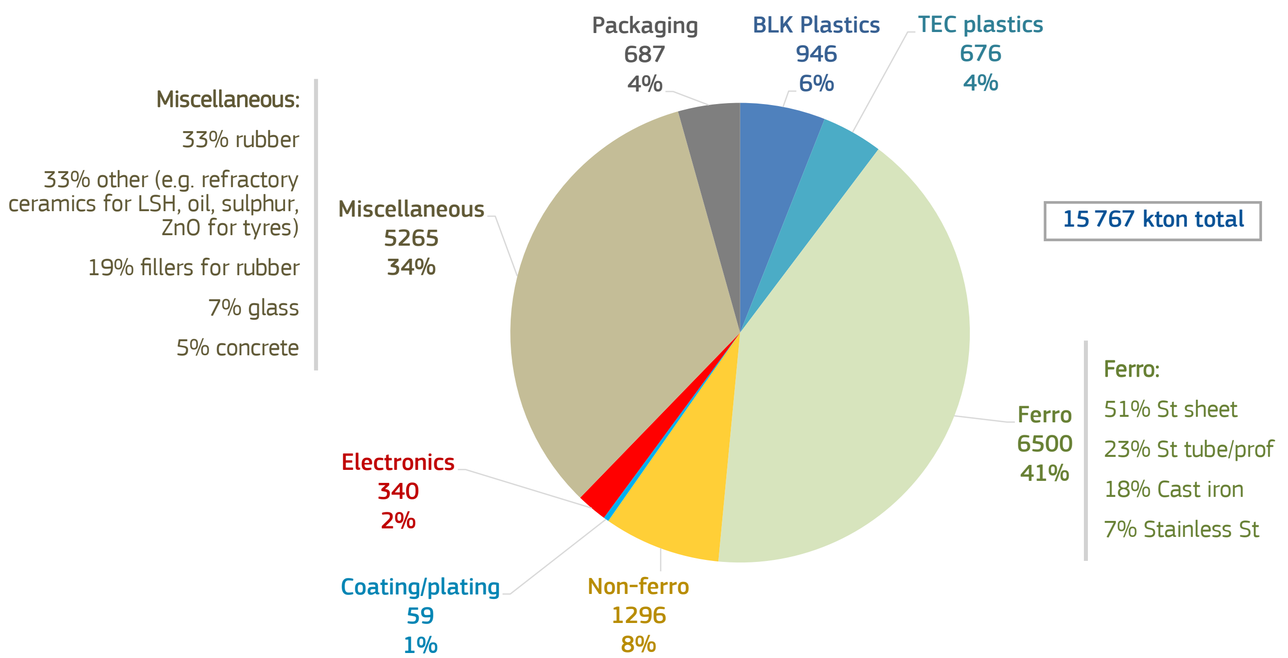
The total mass of EIA-products sold in 2020 is 15.8 Mt, of which 12.2 Mt for plastics, metals, glass, cardboard, paper and rubber. This is around 4% of the total EU consumption of these materials. The 'heaviest' product groups are Tyres (3960 kt, 25% of total), Local Space Heaters (1394 kton, 9%), Household Refrigerators (1119 kt, 7%) and Electric Motors (1008 kt, 6%).

Ferrous metals (galvanised steel sheet, cast iron, steel tubes and profiles, stainless steel) represent 41% of the total weight. Plastics (bulk and technical) account for 10%, and non-ferrous metals (e.g. aluminium, copper) for 8%. The 'miscellaneous' category mainly consists of material for the tyres (natural and synthetic rubber, fillers, oil sulphur, ZnO) and refractory ceramics for slow heat release stoves.

MASS (in kton) OF EIA PRODUCTS SOLD IN 2020 PER PRODUCT GROUP AND MATERIAL CATEGORY

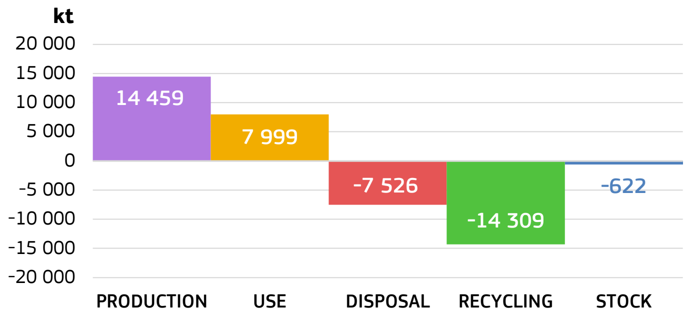


MASS (in kton) OF EIA PRODUCTS SOLD IN 2020 PER MATERIAL CATEGORY



Material resources

In the 2016 analysis [20], for products sold in 2010 in EU28, in addition to 14.6 Mt of materials contained in EIA products, 8 Mt per year of spare parts, consumables and refrigerants were related to the use of EIA products, for a total of 22.5 Mt. Of this material, 66% is recycled (including re-use and incineration with heat recovery) and 34% is disposed of (landfill, fugitive, incineration without heat recovery).



AMOUNT OF MATERIAL CONTAINED IN EIA PRODUCTS IN EU28, CONSUMED DURING USE (EXCL. ENERGY), AND END-OF-LIFE WASTE DESTINATIONS
(source: Eco-report for average EIA product, 2016)

ECOREPORT

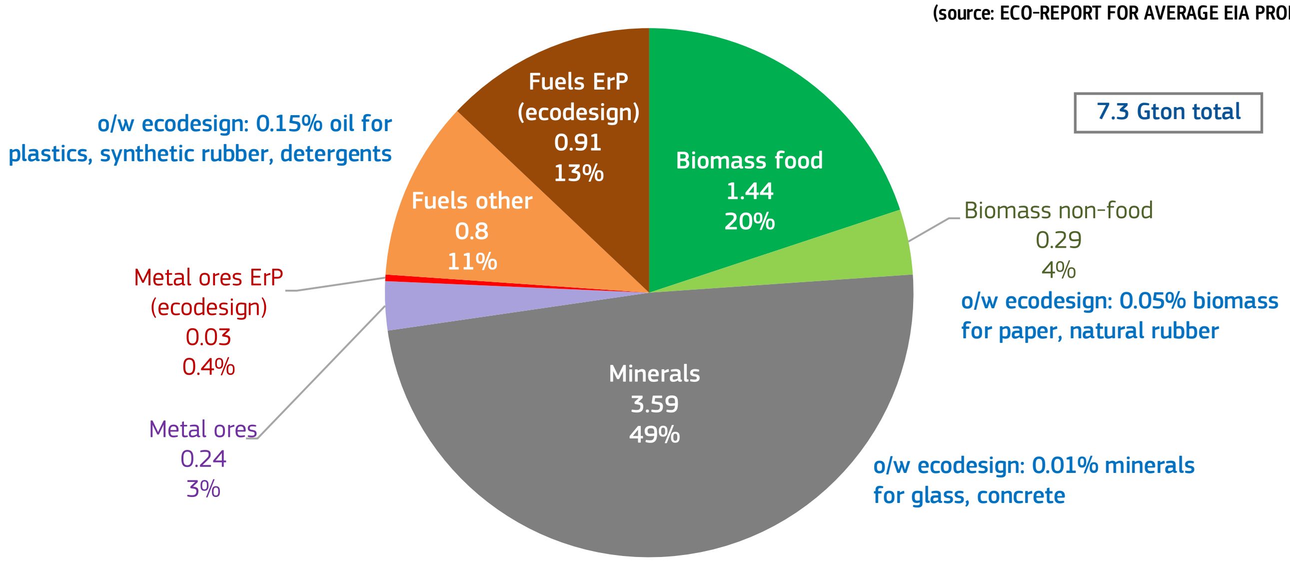
The EcoReport is a standard Excel tool to assess life cycle environmental and economic impacts of products. It has been developed as part of the 'Methodology for the Ecodesign of Energy-related Products' (MEErP).

For EU28 a single EcoReport has been created for the average EIA-product, using e.g. the Bill-of-Materials of the average product (total EIA-material of the previous page divided by total sales of all products), total sales and stock, and average unit energy consumption and price.

This EcoReport confirmed the EIA data regarding energy consumption, GHG-emissions and costs related to the Use-phase of the products, but provides additional information on spare parts, consumables and refrigerants (that are not present in the BoMs), on the end-of-life distribution of materials over 'disposal' and 'recycling', on the energy and emissions due to materials processing, manufacturing, distribution and end-of-life phases, and on waste caused by materials processing, manufacturing and energy generation. For details see the 'EcoReport for the average EIA product'.

The EcoReport shows an additional waste due to materials extraction, materials processing, product manufacturing, and generation and distribution of energy (fuel or electricity) of 21.3 Mt per year. Adding this to the 22.5 Mt derived above, the total waste related to EIA-products is 43.8 Mt per year. This is 0.6% of the total EU domestic material consumption of 7300 Mt. The weight of fuel consumed by EIA products is 910 Mt (13%), and thus a factor 20 higher than non-energy materials related to EIA products.

TOTAL EU DOMESTIC MATERIAL CONSUMPTION, 7.3 Gton.
NON-ENERGY MATERIALS RELATED TO EIA-PRODUCTS REPRESENT ONLY 0.6%.
FUEL CONSUMED BY EIA PRODUCTS REPRESENTS 13%.
(source: ECO-REPORT FOR AVERAGE EIA PRODUCT, 2016)



SUMMARY

References and notes

1. Eurostat Energy Balance nrg_bal_c, ed. April 2022, PEC (Europe 2020-2030). Eurostat data in 2020 are lower than in preceding years due to the Covid-pandemic, which is not considered in the EIA data. In 2019 (prior to Covid), the Eurostat primary energy consumption was 1352 mtoe, and EIA products covered 57% of this. The 2020 savings in EIA are 6.6% of these 1352 mtoe
2. The PRIMES model is part of the suite of models used in the Commission's climate policy impact assessments – e.g. for the 2030 climate and energy policy framework. For details see: https://ec.europa.eu/clima/policies/strategies/analysis/models_en
3. POTEnCIA (Policy Oriented Tool for Energy and Climate Change Impact Assessment) is a modelling tool that allows for assessment of the impact of different policy futures on the EU energy system. For details see: https://ec.europa.eu/jrc/en/potencia
4. SPECIFIC CONTRACT No ENER/C3/412-2010/FV575-2012/12/SI2.657835 (EIA I study)
5. ECODESIGN IMPACT ACCOUNTING Part 1 – Status Nov. 2013, VHK May 2014 for European Commission, https://ec.europa.eu/energy/sites/ener/files/documents/2014_06_ecodesign_impact_accounting_part1.pdf
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8. Ecodesign Impact Accounting, 'Special Report Material Inputs for Production', and 'EcoReport for the average EIA product', VHK for the European Commission, December 2016, https://ec.europa.eu/energy/en/studies/ecodesign-impact-accounting-0
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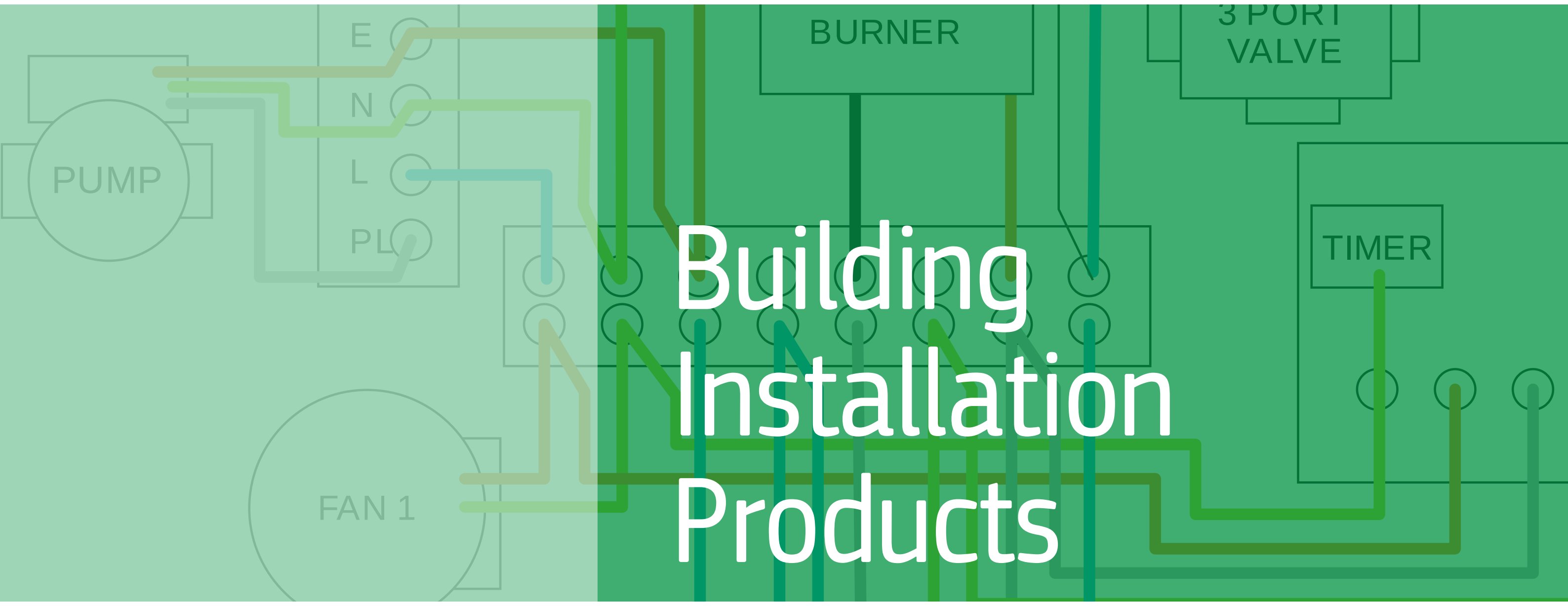
10. Ecodesign Impact Accounting – Status Report 2019 – VHK for the European Commission, June 2020, https://www.vhk.nl/research/eia.htm
11. Ecodesign Impact Accounting Annual Report 2020 - Overview and Status Report – VHK for the European Commission DG ENER B.3, May 2021, Publications Office of the European Union, ISBN 978-92-76-43550-1, ISSN 2600-4771, doi: 10.2833/72143, MJ-AW-21-001-EN-N
12. 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report 01, January 2020, European Court of Auditors. Following these comments, since the 2019 edition:
    - EIA takes into account, as far as feasible, differences between the preferred policy option of the impact assessment and the final published regulation;
    - EIA does not take into account new proposed measures (in review studies or (draft) impact assessments) that have not been finalised yet;
    - EIA includes an estimate for the reduction of savings due to non-compliance of products with the regulations;
    - EIA no longer reports data on product groups / operational modes for which no Ecodesign or Energy Labelling regulation exists
13. There are several product groups, for which whole or a part of the energy consumption / savings are implicitly included in other parts of the accounting. Ignoring this fact leads to double counting and, consequently, unrealistic energy savings and energy figures, inconsistent with Eurostat total figures. The most frequent case of (partial) double counting occurs when a product is regulated both at the level of components and at the level of the product as a whole. This occurs for example for electric motors, industrial fans, circulators, external power supplies, condensing units, and utility transformers. At product level, EIA presents full data, including double counted amounts, but when summing results for several products, the double counted amounts are removed from the totals (details in section 2.7 of the Status Report).
14. Review study on Vacuum cleaners, Final report, June 2019, Viegand Maagøe and VHK
15. Ecodesign Pump Review, Study of Commission Regulation (EU) No. 547/2012 (Ecodesign requirements for water pumps) Extended report (final version), Viegand Maagøe and Van Holsteijn en Kemna B.V., December 2018
16. NO_X: nitrogen oxides (acidifying agent), CO: carbon monoxide, OGC: Organic Gaseous Compounds, PM: particulate matter
17. Eurostat [nama_10_gdp], Gross Domestic product at market prices, accessed April 2021
18. The EIA traditional approach (EIA rates) uses Eurostat and Oil Bulletin energy rates for reference residential and industrial user bands until 2021 and then assumes a 1-1.5% annual increase (on top of inflation) for future years. See the EIA Status Report for details.
    PRIMES uses a more complex modelling of energy rates, both for the past and for the future, involving a different mix of representative users. In the PRIMES 2020 reference scenario (PRIMES rates) this leads to slightly lower energy rates than in the EIA approach.
19. Eurostat data per residential end-use application from online data code nrg_d_hhq for year 2019 (accessed April 2022).
20. EIA contains data on products that are regulated in Ecodesign, Energy Labelling, Energy Star and Tyre Labelling regulation. This excludes e.g. district heating (derived heat), central heating boilers > 400 kW, water heating using solid fuels and biomass, cooking using solid and liquid fuels and biomass, ironing, a large part of the energy consumed by small appliances, and part of the energy consumed by information-, communication- and entertainment-products. In addition, EIA does not account e.g. solar heat and ambient heat for heat pumps while the coverage of biomass-fired devices is partial (only woody biomass for space heating). PRIMES and Eurostat cover the energy consumption of all products together. This difference in scope was taken into account during the comparison.



Building Installation Products

Overview

GENERAL INFO

Building installations include heating, cooling, ventilation and lighting products. In terms of energy, space heating products are the most important. This section introduces the basic terminology used in this area.

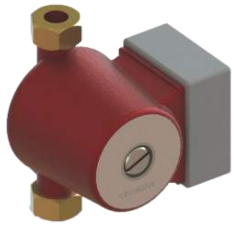
PRODUCTS

Installation products covered by Ecodesign and Energy Label regulations are:

- Central Heating Boilers (CH)
- Solid Fuel Boilers (SFB)
- Local Space Heaters (LH, Solid Fuel and Other)
- Room Air Conditioners (RAC)
- Central Air Cooling and Heating equipment (CAC, ecodesign only)
- Circulators (CIRC, ecodesign only)
- Ventilation Units (VU)
- Light Sources (LS)

Ventilation Units (VU) and Light Sources (LS) are indirectly related to space heating and cooling but are part of installation products especially in non-residential buildings.

Central heating boiler



Circulator

Air conditioner

Solid fuel boiler

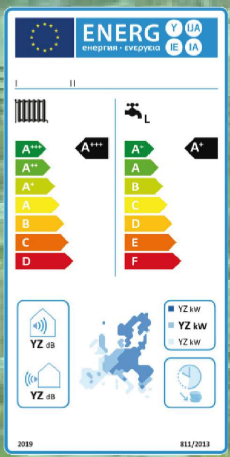
Local space heater

Central air heating and cooling

Ventilation units

Light sources

Overview



REGULATIONS

Energy losses due to the building shell (insulation, fighting infiltration) are not (yet) regulated through ecodesign, but primarily through Energy Performance of Buildings (EPB) legislation. Ecodesign and Energy Labelling concern the efficiency with which installation products provide heating, cooling or lighting. Improvements of the building shell are inherently slow, because of the large inertia of the building stock (average life 40-50 years), whereas heating and cooling appliances are changed about every 18 years.

Space heating products covered by Ecodesign and Energy Label measures represent approximately 70% or 1650 TWh/year of the building heat load. Not covered are district heating and very large appliances, e.g. boilers over 400 kW.

Building installation products, including but not limited to space heating and cooling appliances, make up almost half of the energy use and greenhouse gas emissions of all ecodesign-regulated products.

CLIMATE

The second factor is climate. Almost two-thirds of the EU population lives in a relatively mild climate (green area in map figure on the right). Around 10% live in a colder winter-climate, in Eastern and Northern regions or in mountain areas (blue area in figure). One quarter of Europeans live in a warm Mediterranean climate. Almost 70% live in a city, which is 1-2°C warmer than the countryside and 41% live in coastal regions, which is also warmer in winter. The orange area in the figure indicates these warmer climate zones. It should be noted that small areas with the hottest European climate, such as cities in the south and the Mediterranean coast, were not split into a separate category.

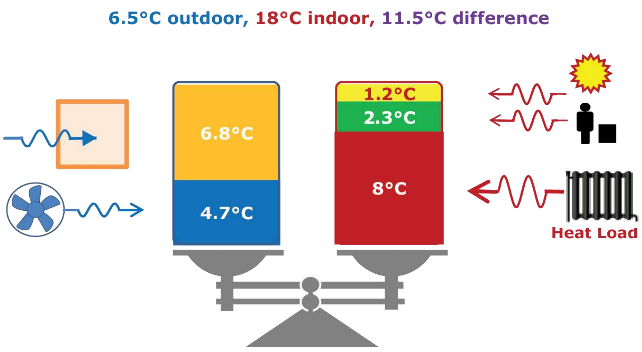
In Europe, the average outdoor temperature is 6.5°C during the 7 months buildings are heated (5 months in a warm climate, 9 months in a colder climate).

Three indicative heating season zones as defined by EC

HEAT BALANCE

The average indoor temperature, 24/7 and over all rooms, is 18°C. This means that on average heating systems are required to offset a temperature difference of 11.5°C. The sun and the heat from people and equipment inside the buildings increase 3.5°C. On average 8°C is needed from the heating system during the heating season, to compensate for the heat dissipated through the building shell (60%) and the cold air entering the building from ventilation and infiltration (40%). These are EU-averages, i.e. the proportion between transmission and ventilation losses varies and depends on the insulation and type of ventilation (e.g. windows or mechanical). For individual cases also the orientation, wind, etc. are relevant.

From the previous can be estimated that the space heating demand, i.e. the 'heat load' that space heating solutions have to deliver, is around 2360 TWh and the space cooling load around 860 TWh in 2020. This heat load is the total EU heat demand. The heat load of EIA products covers 70% of this amount.

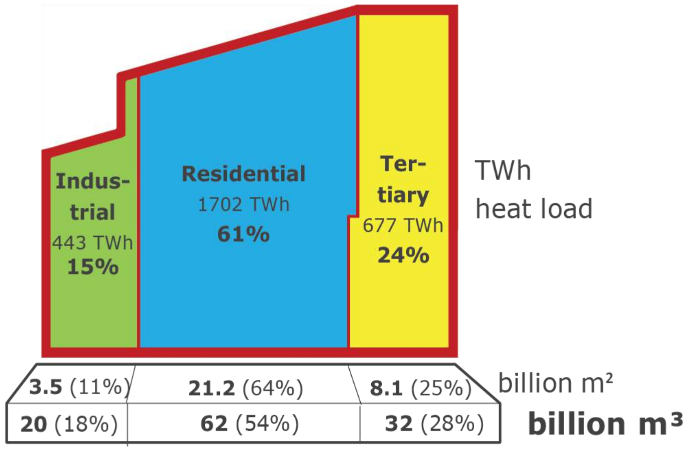


EU building stock heat balance

Overview

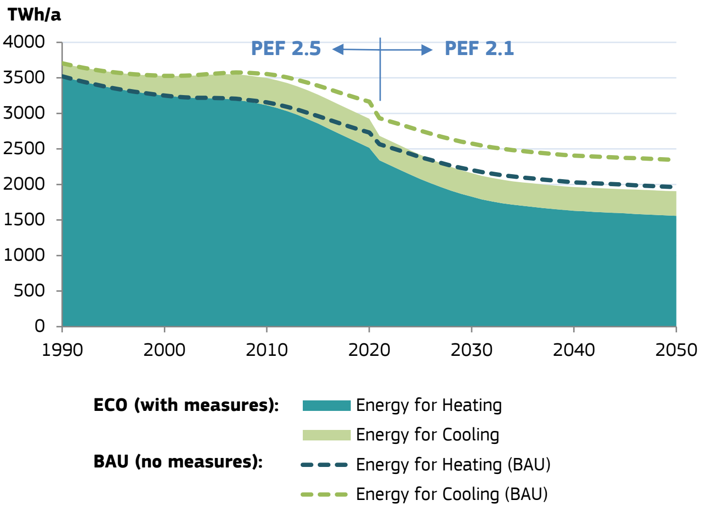
BUILDING STOCK

The total heat output that is required from heating and cooling appliances depends first of all on the size and the geometry of the buildings. For EU28 in 2010 the total heated surface area of all buildings is approximately 32 800 km² (32.8 billion m²). Spread out at ground floor level, this surface is comparable to that of a country like Belgium. The land surface covered, taking into account on average 3.1 floors, is a little over 10 billion m². The total heated indoor volume is estimated at 114 billion m³ (EU28 in 2010). The geometry is also relevant, because it determines the outer surface of the building walls, roof and floor in proportion to its volume, the so-called 'S/V ratio'. The next page shows reference buildings that are used to estimate the S/V ratio. The diagram on the right gives the split-up of heat load, floor area and volume by sector.



EU28 building heat load by sector in 2010
Data refer to heated volumes and surfaces at equivalent of constant 18°C indoor temperature in EU28 (source: Building Heat Demand, VHK 2014)

TOTAL EU27 PRIMARY ENERGY CONSUMPTION OF SPACE HEATING AND COOLING FOR SCENARIOS WITH AND WITHOUT MEASURES

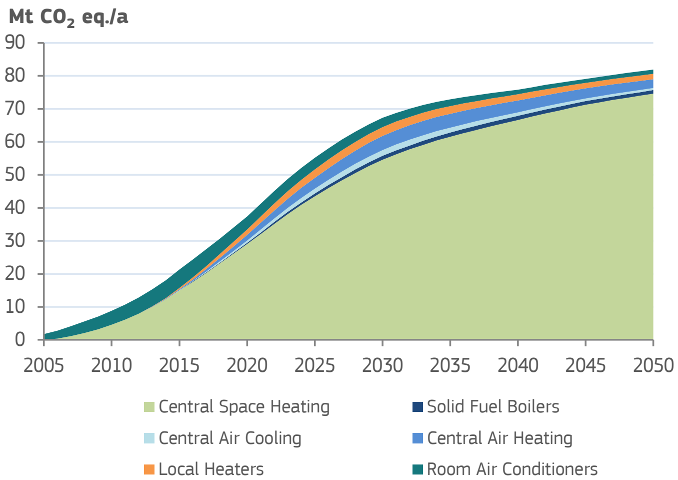


ENERGY

Although only introduced in 2013, the Ecodesign and labelling measures for space heaters and coolers were anticipated by industry since 2011. There are large differences of up to a factor 10 in primary energy efficiency of space heating appliances, ranging from 30% for an open fire place to over 300% for the best heat pumps. Average efficiency is less than 66% (EU27 in 2020), leading to an energy consumption of over 2500 TWh/a to provide the required heat output of 1650 TWh heat/a for ecodesign-regulated products.

The graph shows the primary energy consumption (direct fossil fuels plus fuels to generate electricity) from 1990 till 2050. In 2020 the savings with respect to a scenario without measures were 213 TWh/a (heating) and 26 TWh/a (cooling). Combined, this equals 23% of the total 1037 TWh/a savings on primary energy by regulated products. In 2030 savings are expected to be 376 and 39 TWh/a respectively, which then accounts for 27% of the total 2030 savings. The cumulative savings in the 2020-2030 period (for both heating and cooling) would be 3658 TWh.

TOTAL EU27 GREENHOUSE GAS EMISSION SAVING OF SPACE HEATING AND COOLING FOR SCENARIOS WITH AND WITHOUT MEASURES



EMISSIONS

Reduced energy consumption also causes less greenhouse gas emissions. The combined 2020 GHG-emissions for space heating and cooling amount to 447 Mt CO_2eq/a. This is 12% of the total EU GHG-emissions (3 610 Mt CO_2eq/a in 2019). Through Ecodesign and Energy Label measures a saving of 38 Mt CO_2eq/a is accounted for 2020. In 2030, these savings rise to 68 Mt CO_2eq/a, which would then be 43% of the savings on EU GHG-emissions by regulated products.

Several regulations for space heaters have limit values for other emissions (NO_X, CO, C_XH_Y and PM).

GEOMETRY

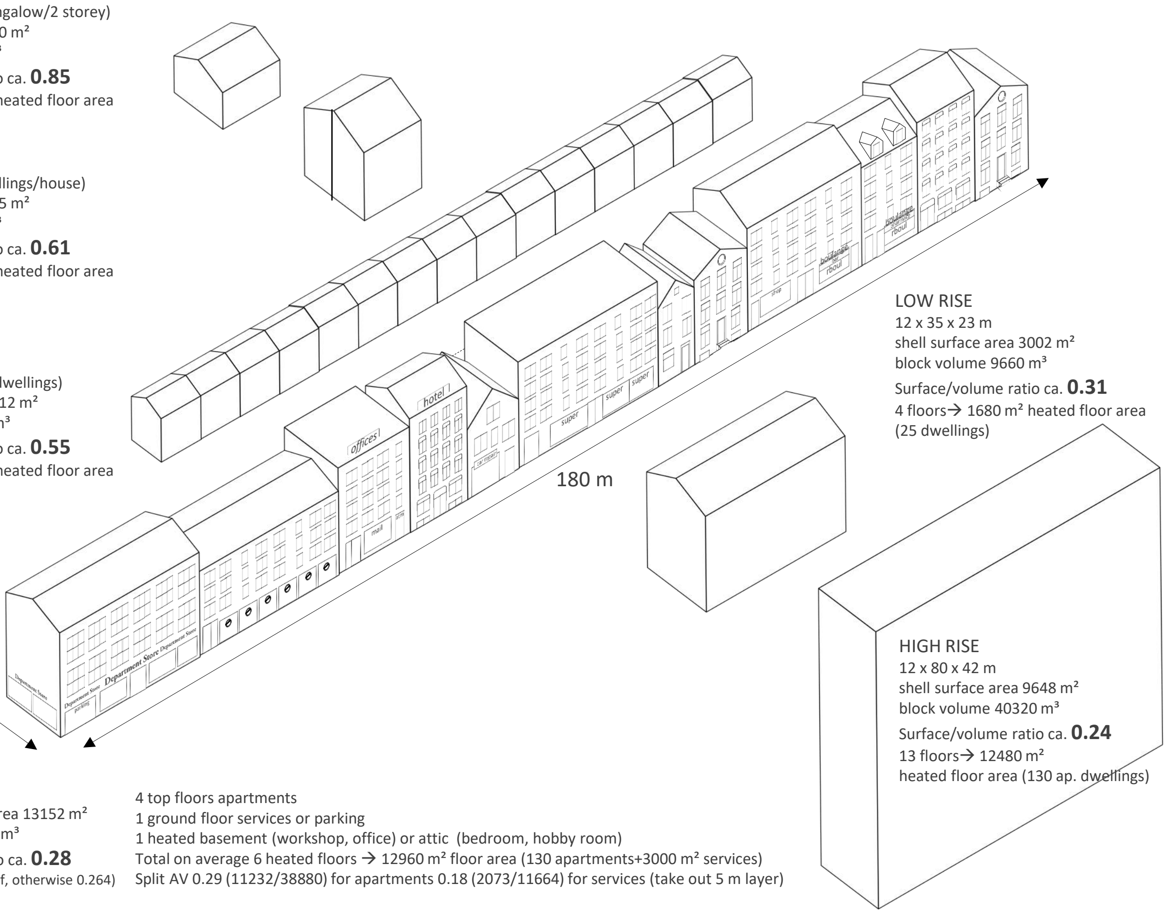
RESIDENTIAL REFERENCE BUILDINGS

OVERALL SURFACE/VOLUME RATIO **0.51**

DETACHED
8 x 10 x 5 m (mix bungalow/2 storey)
shell surface area 340 m²
block volume 400 m³
Surface/volume ratio ca. **0.85**
1.6 floors→ 128 m² heated floor area

SEMI-DETACHED
12 x 9 x 7.5m (2 dwellings/house)
shell surface area 495 m²
block volume 810 m³
Surface/volume ratio ca. **0.61**
2.5 floors→ 128 m² heated floor area

TERRACED
90 x 7.5 x 7.5 m (15 dwellings)
shell surface area 3712 m²
block volume 6750 m³
Surface/volume ratio ca. **0.55**
2.5 floors→ 128 m² heated floor area



LOW RISE
12 x 35 x 23 m
shell surface area 3002 m²
block volume 9660 m³
Surface/volume ratio ca. **0.31**
4 floors→ 1680 m² heated floor area
(25 dwellings)

HIGH RISE
12 x 80 x 42 m
shell surface area 9648 m²
block volume 40320 m³
Surface/volume ratio ca. **0.24**
13 floors→ 12480 m²
heated floor area (130 ap. dwellings)

CITY BLOCK
block shell surface area 13152 m²
block volume 49680 m³
Surface/volume ratio ca. **0.28**
(corrected for slant roof, otherwise 0.264)

4 top floors apartments
1 ground floor services or parking
1 heated basement (workshop, office) or attic (bedroom, hobby room)
Total on average 6 heated floors → 12960 m² floor area (130 apartments+3000 m² services)
Split AV 0.29 (11232/38880) for apartments 0.18 (2073/11664) for services (take out 5 m layer)

NON-RESIDENTIAL REFERENCE BUILDINGS

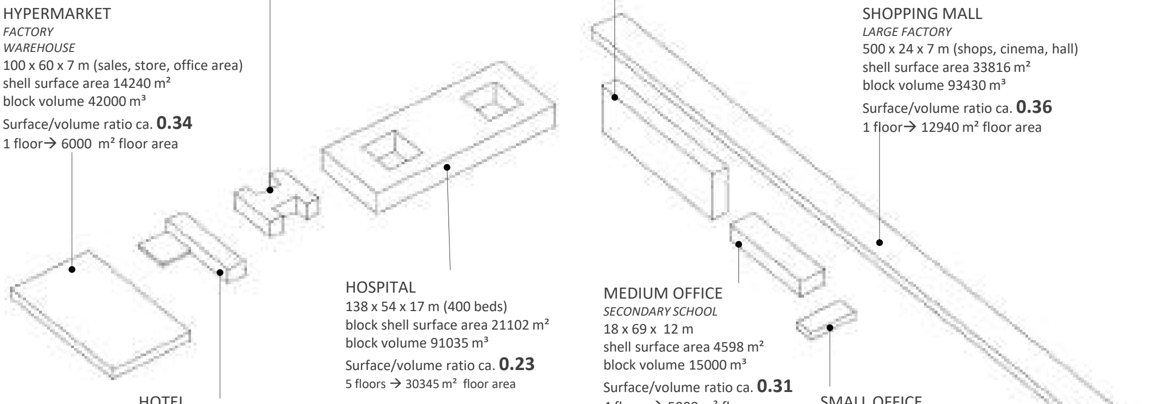
NON-RESIDENTIAL
SURFACE/VOLUME RATIOS

RETIREMENT HOME
36 x 37 x 13
shell surface area 4195 m²
block volume 11750 m³
Surface/volume ratio ca. **0.36**
4 floors→ 3916 m² floor area

LARGE OFFICE
109 x 11.5 x 36 m
shell surface area 11154 m²
block volume 45000 m³
Surface/volume ratio ca. **0.25**
12 floors→ 15000 m² floor area

HYPERMARKET
FACTORY
WAREHOUSE
100 x 60 x 7 m (sales, store, office area)
shell surface area 14240 m²
block volume 42000 m³
Surface/volume ratio ca. **0.34**
1 floor→ 6000 m² floor area

SHOPPING MALL
LARGE FACTORY
500 x 24 x 7 m (shops, cinema, hall)
shell surface area 33816 m²
block volume 93430 m³
Surface/volume ratio ca. **0.36**
1 floor→ 12940 m² floor area



HOSPITAL
138 x 54 x 17 m (400 beds)
block shell surface area 21102 m²
block volume 91035 m³
Surface/volume ratio ca. **0.23**
5 floors → 30345 m² floor area

MEDIUM OFFICE
SECONDARY SCHOOL
18 x 69 x 12 m
shell surface area 4598 m²
block volume 15000 m³
Surface/volume ratio ca. **0.31**
4 floors→ 5000 m² floor area

HOTEL
61(23)x 35(14) x 17(3) L-shape
shell surface area 4428 m²
block volume 9832 m³
Surface/volume ratio ca. **0.45**
4 floors→ 3668 m² floor area

SMALL OFFICE
PRIMARY SCHOOL
36 x 14 x 6 m
shell surface area 1451 m²
block volume 2721 m³
Surface/volume ratio ca. **0.53**
2 floors→ 1008 m² floor area

BUILDING INSTALLATION PRODUCTS

Central space heating

GENERAL INFO

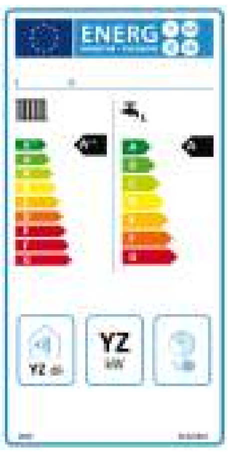
Central heating boilers are the largest Ecodesign- and Energy Label regulated product group in terms of energy and other impacts, making up 20% of the total.

In 2020, 103 million CH-boilers were installed in the EU, 42 million more than in 1990. They covered a building heat load of around 954 TWh/a, i.e. 58% of the total heat load of regulated space heating products. The efficiency of the average installed CH-boiler is 65% and thus consumed 1462 TWh of primary energy annually to realise the 954 TWh output. The energy input consisted of fossil fuels (89%) and electricity (11%). The electricity, expressed in primary energy equivalent, was used for heat pumps, resistance boilers and auxiliaries such as the circulator pump.

The 1462 TWh primary energy input caused 297 Mt of greenhouse gas (GHG) emissions as well as direct emissions of 173 kt nitrogen -oxides (NO_X).

For 2030 an annual energy use of 1026 TWh is foreseen, i.e. 30% less than in 2020, due to an increased share of condensing boilers, heat pumps, better controls, smarter heating packages and increased use of ventilation units. For 2040 an annual energy use of 861 TWh is expected, with a 23% share of electricity mainly for heat pumps. Around 11% of the savings is due to increased use of (improved) ventilation units that decrease the heat load for CH-boilers.

The emissions from combustion processes are expected to decrease proportionally to these saving figures.



Energy label for a Central Heating combi-boiler, showing space heating efficiency class and (sanitary) water heating efficiency class

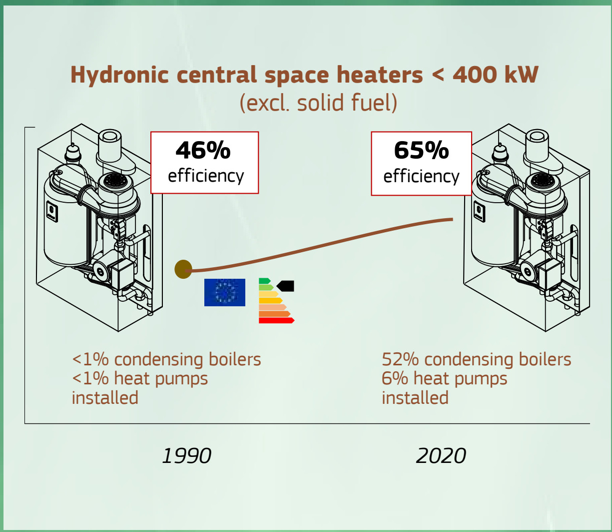
INTRODUCTION

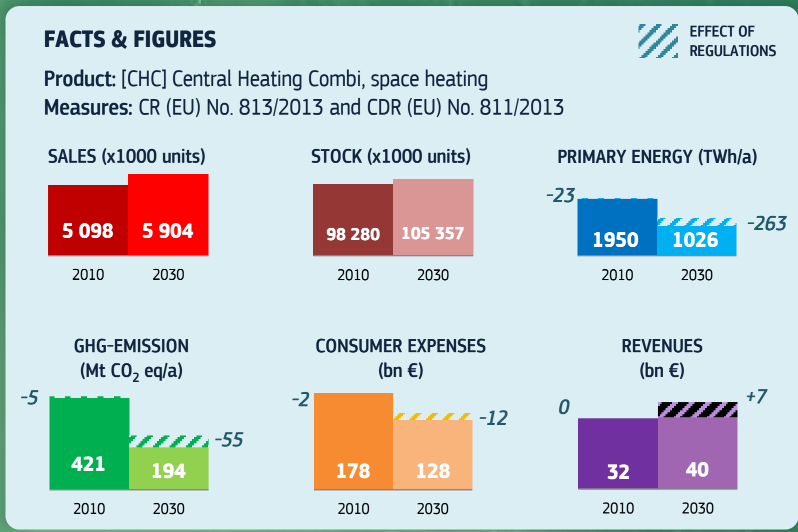
Since 2013 Ecodesign and Energy Label measures are in place for Central Heating Boilers (CHB). The Ecodesign-scope includes gas- and oil-fired boilers, electric resistance boilers and electric or gas-fired hydronic heat pumps with power output ≤400 kW (≤70 kW for the Energy Label) as well as cogeneration boilers producing both heat and electricity having a maximum electric output ≤50 kW.

Solid fuel or biomass boilers, central air heaters and local space heaters are excluded here but addressed through other Ecodesign and Labelling measures. District heating end-use equipment as well as very large, typically custom-made CH-boilers are excluded because they are outside the scope of the Ecodesign Directive. The Ecodesign and Labelling measures rate the space heating performance. If the boiler also provides sanitary hot water ('combi-boiler'), that functionality is rated separately to make them comparable to the Ecodesign-rating of dedicated water heaters for which there are separate regulations.

Ecodesign introduced –for the first time– the space heating performance rating not only of single boilers, but also of boiler-packages with possibly a series of boilers ('cascades'), multiple boiler-technologies ('hybrids' e.g. of conventional boiler and heat pump), thermal solar assistance and temperature control devices. This increases transparency for in-

Central space heating





stallers and consumers and promotes the use of these often more energy efficient but also more complex heating solutions.

Ecodesign also introduced a 'seasonal' boiler efficiency rating, comparable across technologies, that is based on real-life boiler-operation with an important role for part-load efficiency, start-stop losses, etc. The measures thus aim to realise real-life energy savings, real-life greenhouse gas emissions and also, through specific requirements, realise decrease of NO_X-emissions and noise power level.

To address the very frequent problem of 'oversizing', the Ecodesign and Energy Label measures introduced a new and easy-to-understand metric for boiler capacity, ranging from very small sizes (3XS) for 'Near-Zero' dwellings to very large (4XL) boiler-solutions for apartment blocks.

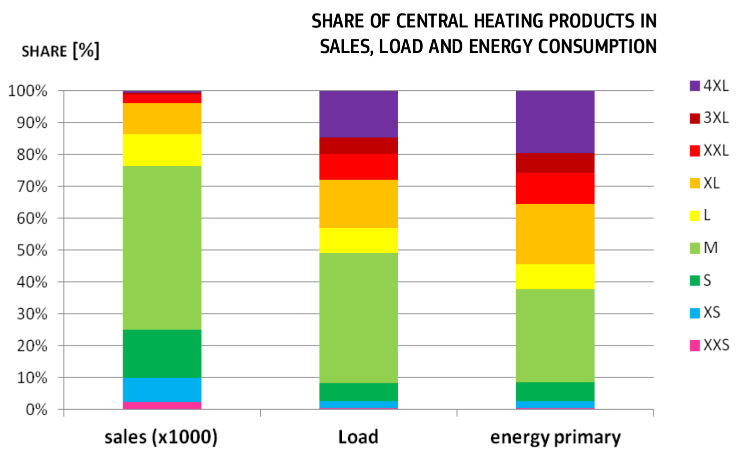
Because the measures cover such a wide range of technologies and efficiencies, and because –depending on local circumstances— not all boiler-solutions are feasible, the 7 standard classes A to G are not enough and the Energy Label uses 9 classes ranging from A++ to G.

The preparation of the new Ecodesign and Energy Label measures for CH-boilers took 7 years, involving a myriad of stakeholders and their experts. It is probably the most ambitious and innovative piece of legislation ever developed in the field of space heating, and firmly places the sector in the 21st century, far ahead of other continents.

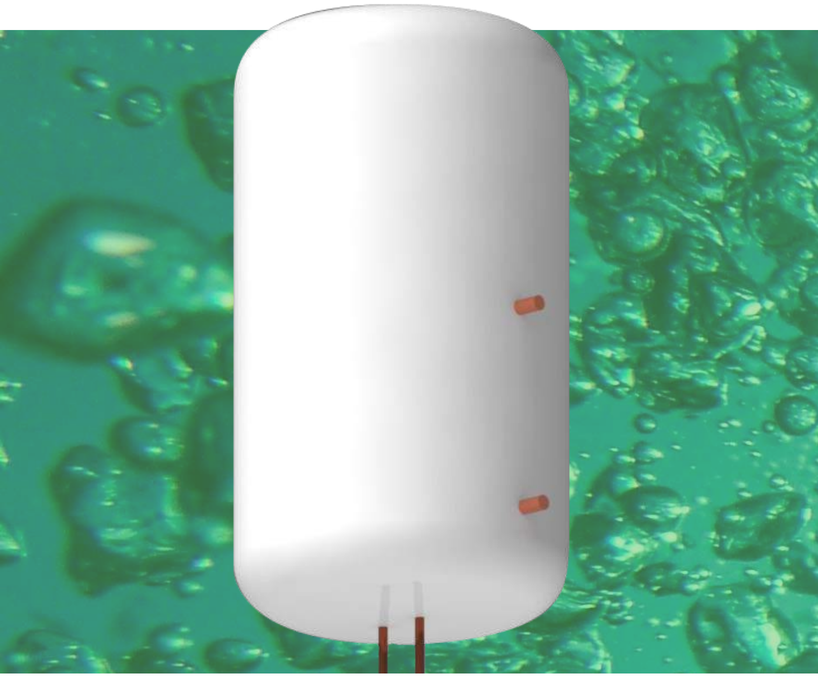
The implementation of the measures, i.e. the obligation to display the labelling information and phase out less efficient products, started only in 2015 and will probably take many years for consumers and other market actors to get used to. The European Commission has anticipated that process and has foreseen regular reviews, for the first time in 2018, to optimise the methodology and repair possible flaws.

SIZES AND MARKETS

More than half of the systems (51%) are medium-sized and meet e.g. the heat demand of an apartment in an older building. However, since energy consumption of these systems is also moderate, the total energy consumption of all M-sized systems accounts for only 29.4% of the total energy consumption of central heating. Most energy is consumed by systems of size 4XL (19.8% of total) and XL (18.9% of total) with related sales shares of respectively 0.6% and 9.8%. This phenomenon can be seen in all of the larger products: System sizes L to 4XL only have a 23.5% sales share, but consume 62.6% of the energy.



Water heating

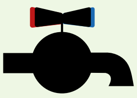


GENERAL INFO

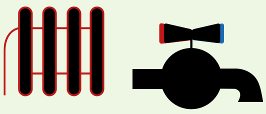
In 2020, EU27 citizens and businesses owned 226 million water heaters, producing almost 5.2 billion cubic metres of hot water (60 °C equivalent) for showers, baths and taps. This is an average of 72 litres per household per day, compared to 55 litres in 1990. For 2030 this is expected to remain fairly constant at 73 litres per day. Hot water consumption per capita varies greatly within the EU, with the Scandinavians using twice as much and Mediterranean countries using considerably less than the EU average. Roughly three quarters of hot water volume is consumed in private households, with the service sector using the rest. Water heaters take up as much as 6% of the total EU primary energy consumption.

In 2013 two different sets of Ecodesign and Energy Label regulations entered into force: one set for dedicated water heaters and one set for combi-boilers, i.e. integrated with the space heating functionality of these boilers discussed in the previous section.

WATER HEATER DESIGN OPTIONS



dedicated water heater

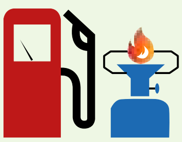


combi boiler

Functionality

There are several types of water heaters. Dedicated water heaters [WH] will supply hot water for sanitary purposes only. Combination boilers [CHC] combine space heating of the dwelling with the supply of sanitary hot water.

solar

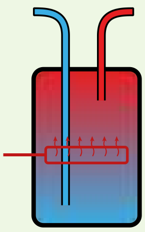


liquid and gas

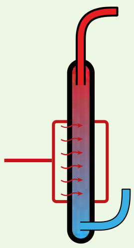
electricity

Energy source

The majority of the products is either electric, gas or liquid fuel powered. Newer technologies involve solar (assisted) powered systems or heat pump systems.



storage tank

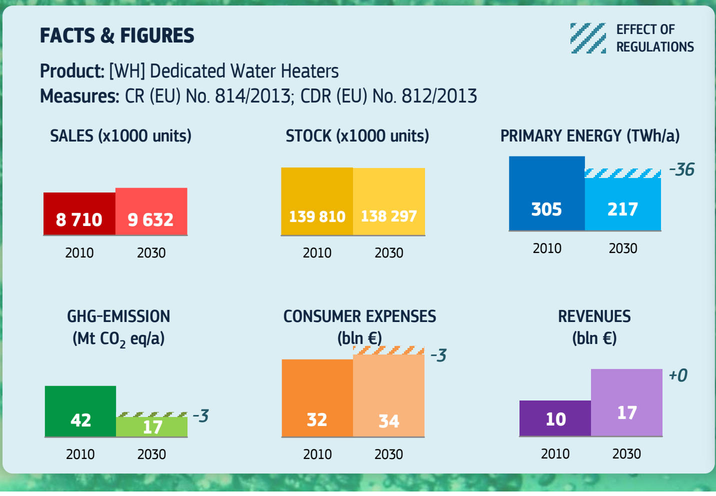


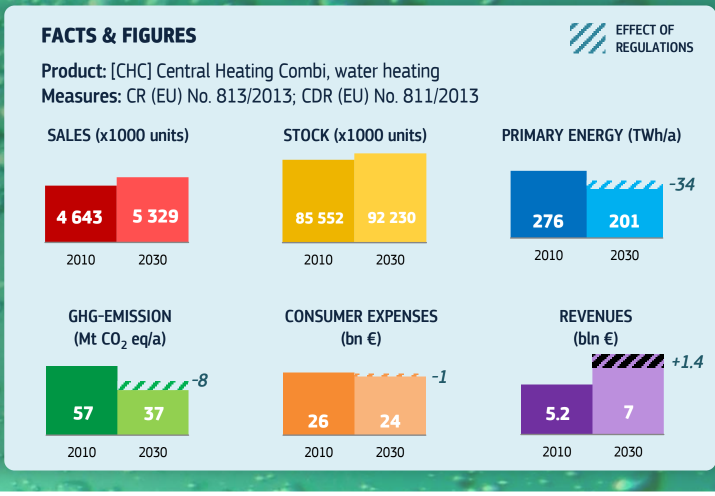
instantaneous

Storage

Water heaters may have a storage tank or heat the water instantaneously when you open the tap. A storage water heater has the advantage that hot (pre-heated) water is immediately available and that the heating element inside the tank can be relatively small. On the other hand, the capacity of the storage tank heater is limited and it takes energy to keep the water warm. Instantaneous heaters might take 10-30 seconds to start and require a larger heater (more kW), but hot water supply is limitless and there is no energy loss when not in use. Hybrid solutions of an instantaneous heater with a small storage to shorten the waiting time also exist.

Water heating



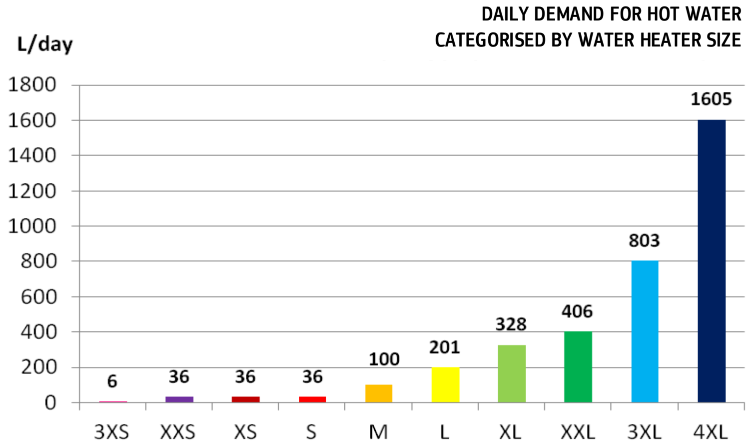


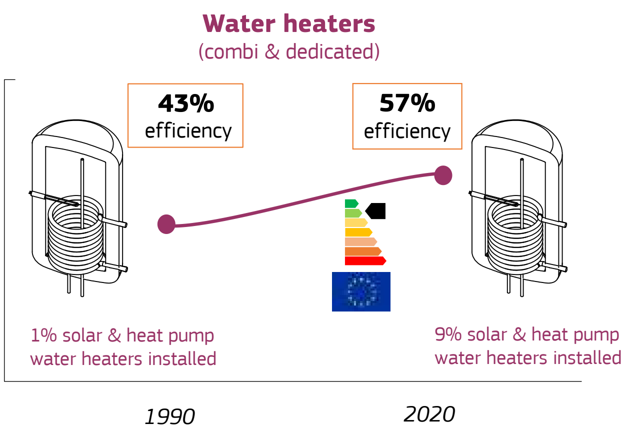
SIZE

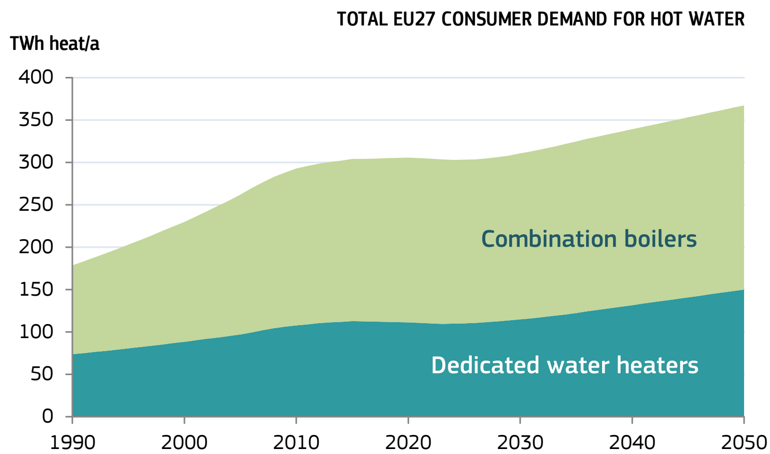
The EU Energy Label introduced –for the first time after 20 years of struggle at the level of standards– a reference for the capacity ('size') of water heaters that helps consumers to make the right choice.

The capacity is determined by the ability to deliver a certain tapping pattern, ranging from very small 3XS electric water-heaters up to very large 4XL indirectly fired water heaters that can serve a multitude of apartments.

Most individual households use water heaters in the medium (M) or large (L, XL) range for their main hot water supply. For example, an 'M'-appliance can deliver a 7 minute shower (6 litre/minute) in morning and evening, with intermediate draw-offs for kitchen and other taps. An 'L'-appliance can deliver twice as much and would be enough to take a bath.







Water heating

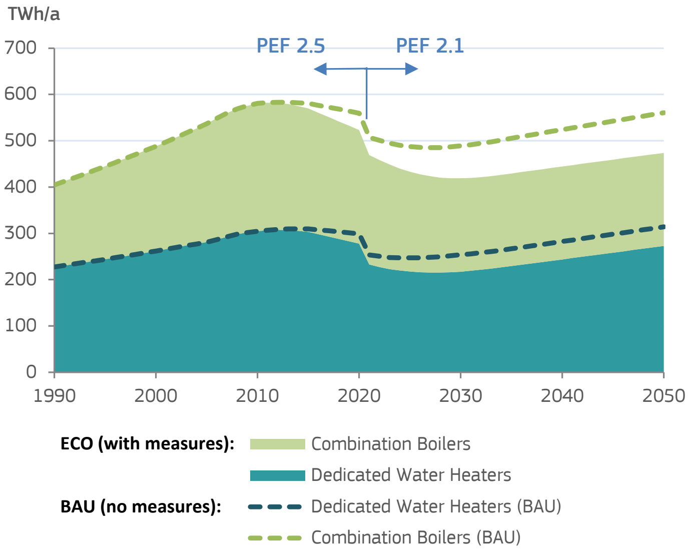
ENERGY

In 2020, despite a 31% higher hot water use, the energy consumption per capita increased only by 1% with respect to 1990. With a continued growth of hot water use, energy consumption per capita in 2030 is expected to be lower than in 1990 because primary energy efficiency of new water heaters will have more than doubled over that period. This is due to using more efficient combi-boilers, more solar and –recently— heat pump water heaters. It is only because of the inertia of the market, i.e. it takes 18 years before all existing water heaters are replaced, that the efficiency of the average installed water heater is not even higher. E.g., the water heating efficiency of combi-boilers selling in 2020 is 65%, but the average of installed boilers in the same year will be only 56% as many older less efficient models are still in use.

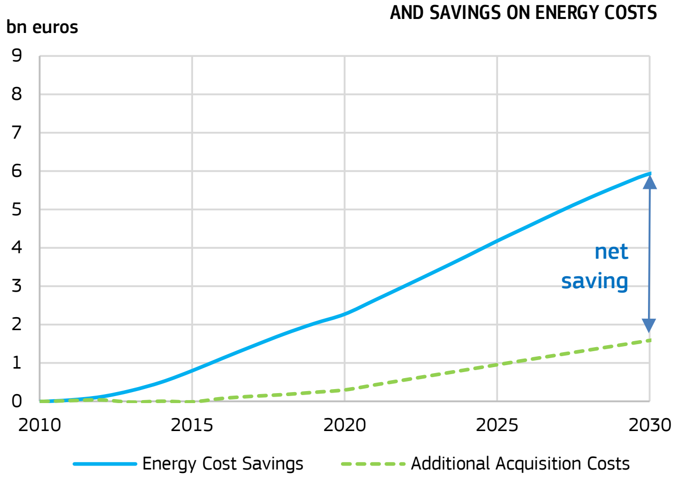
CONSUMER EXPENDITURE

Water heater efficiency has been promoted through national rulemaking for years, but it is believed that EU Ecodesign and Energy labelling act as a catalyst. Due to the introduction of the EU Ecodesign and Energy Label, the consumer expenditure for water heating has decreased by 2.0 billion euros in 2020 compared to a 'Business-as-Usual' scenario without those measures. In 2030 this is projected to increase to 4.5 bn euros. The direct annual savings per household are 7 euros in 2020 and 16 euros in 2030.

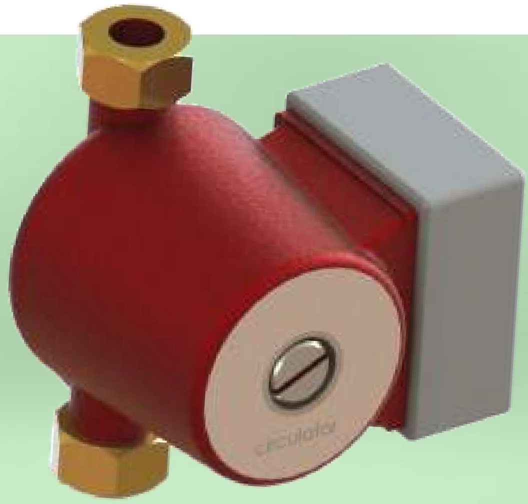
TOTAL EU27 PRIMARY ENERGY CONSUMPTION OF WATER HEATING FOR SCENARIOS WITH AND WITHOUT MEASURES



CONSUMER EXPENDITURE SAVING DUE TO ECODESIGN MEASURES ON WATER HEATING: ADDITIONAL ACQUISITION COSTS AND SAVINGS ON ENERGY COSTS



Circulators

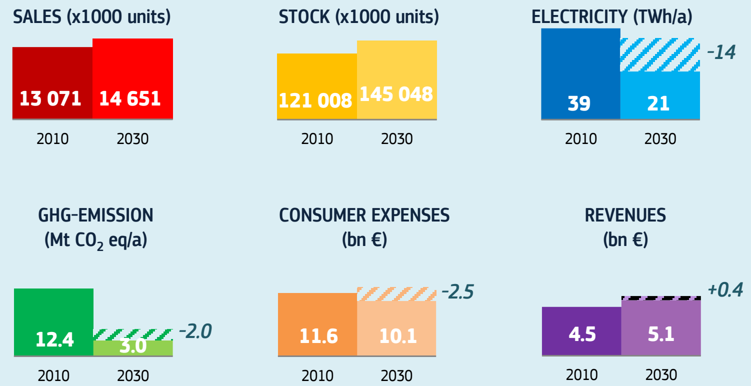


FACTS & FIGURES

EFFECT OF REGULATIONS

Product: [CIRC] Circulators

Measures: CR (EC) No. 641/2009, CR (EU) 622/2012 [amendment]



GENERAL INFO

Circulators are special pumps which are being used to circulate a substance through a closed loop system. A common use is in central heating systems, with the function of transporting hot water. In the product study for circulators, two base cases were identified: standalone and boiler integrated devices. Both types are included in the final Ecodesign regulation.

The circulator pumps included in the regulations are ‘glandless’, which means that the shaft of the motor is directly coupled to the pump, while ‘glanded’ circulators have an external shaft to which the motor can be attached. This specification was introduced to prevent an overlap with the Ecodesign regulation for ‘Pumps’. The energy consumption and savings for circulators are fully reported in EIA, but only 62% of stand-alone circulators is considered in EIA totals, because the rest is already included in data for ‘Central Heating Boilers’.

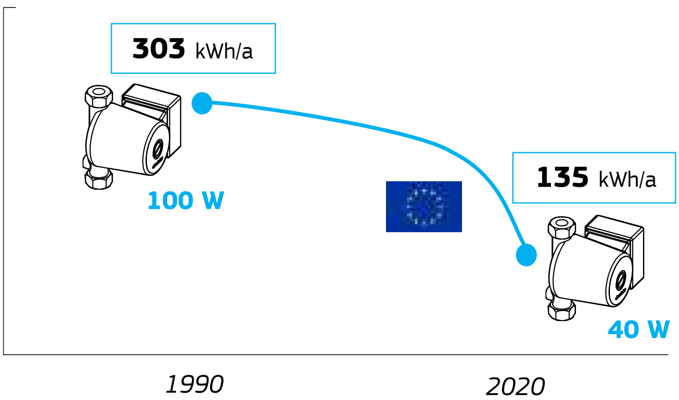
ELECTRICITY CONSUMPTION

Circulators are a typical example where forward-looking manufacturers, WILO and Grundfos, pressed the Commission to investigate the eligibility for an Ecodesign regulation for their products, because they believe that ambitious standards in energy efficiency are not only good for the environment but also good for business.

Circulators pumps up to 2.5 kW are typically, but not exclusively, used to pump water through (closed) central heating systems. Although power consumption may be limited, they are ubiquitous and make very long operating hours (typically 5 000 hours per year). They may be a component in a heating boiler (‘integrated’), or used as a standalone product mounted by the installer somewhere in the heating circuit.

At the time when the Commission first investigated the product in 2008 - 2009, their electricity consumption amounted to 39 TWh/year, comparable to e.g. the energy use of washing machines in the EU in 2010 (36 TWh/a). Furthermore, the energy saving potential was substantial due to the tendency in the sector to vastly over-dimension the pump and use only basic controls. The new metrics of the Ecodesign regulation played an important role in turning the market around, with a drop in electricity use to 33 TWh/a in 2015, 24 TWh/a in 2020 and projected 21 TWh/a in 2030. This is a 40% saving in electricity and CO_2 emissions, while at the same time the product contributed in achieving a higher and more even heating comfort.

Integrated Circulator (central heating pump)

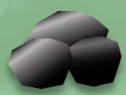


Solid fuel boilers

GENERAL INFO

Solid fuel boilers are similar to central heating boilers. Their purpose is to heat multiple rooms by means of the transport of hot water through a plumbing system. The difference is the input source, which are solid fuels instead of gas, liquid fuels or electricity.


wood log


coal

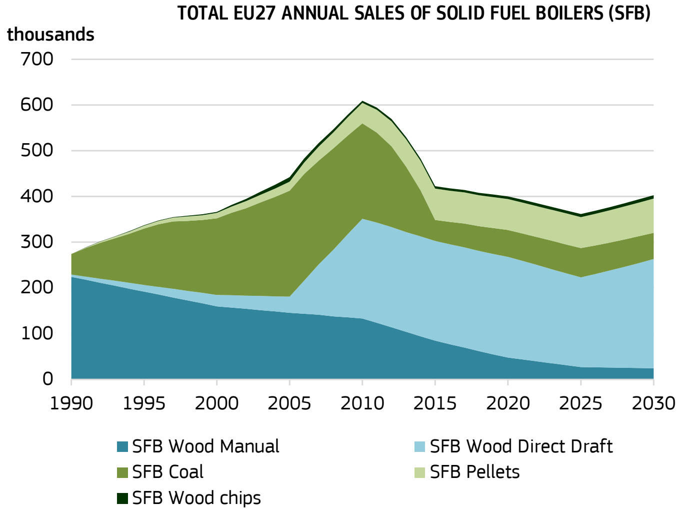

pellets


wood chips

SALES

The market for solid fuel boilers (SFB) has been variable over the last two decades. Their use was mainly popular in Eastern European countries. At the beginning of the 21st century, modern SFBs came onto the market, e.g. more efficient automatic wood boilers and pellet boilers, which led to a peak annual sales of 610 thousand units in 2010. The underlying cause can be found in measures encouraging the use of biomass fuels. Additionally, the increasing prices of gas and oil played a part in these increasing sales numbers. After this sales peak, numbers are decreasing again, with an expected low in 2025 of 362 thousand units, a decrease of 40% compared to 2010. After this low, sales of the biomass fuelled product are expected to grow once again.

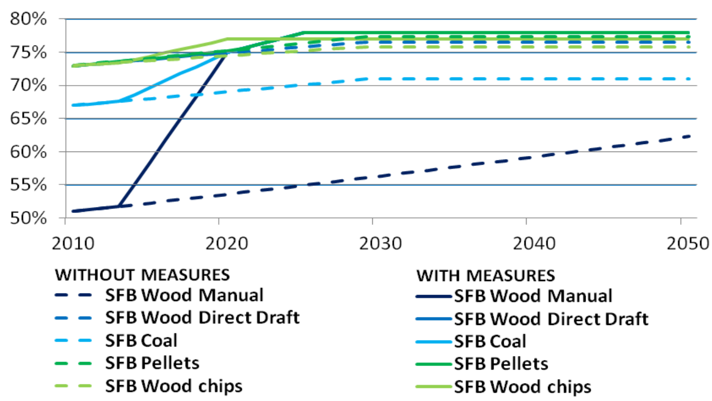
TOTAL EU27 ANNUAL SALES OF SOLID FUEL BOILERS (SFB)



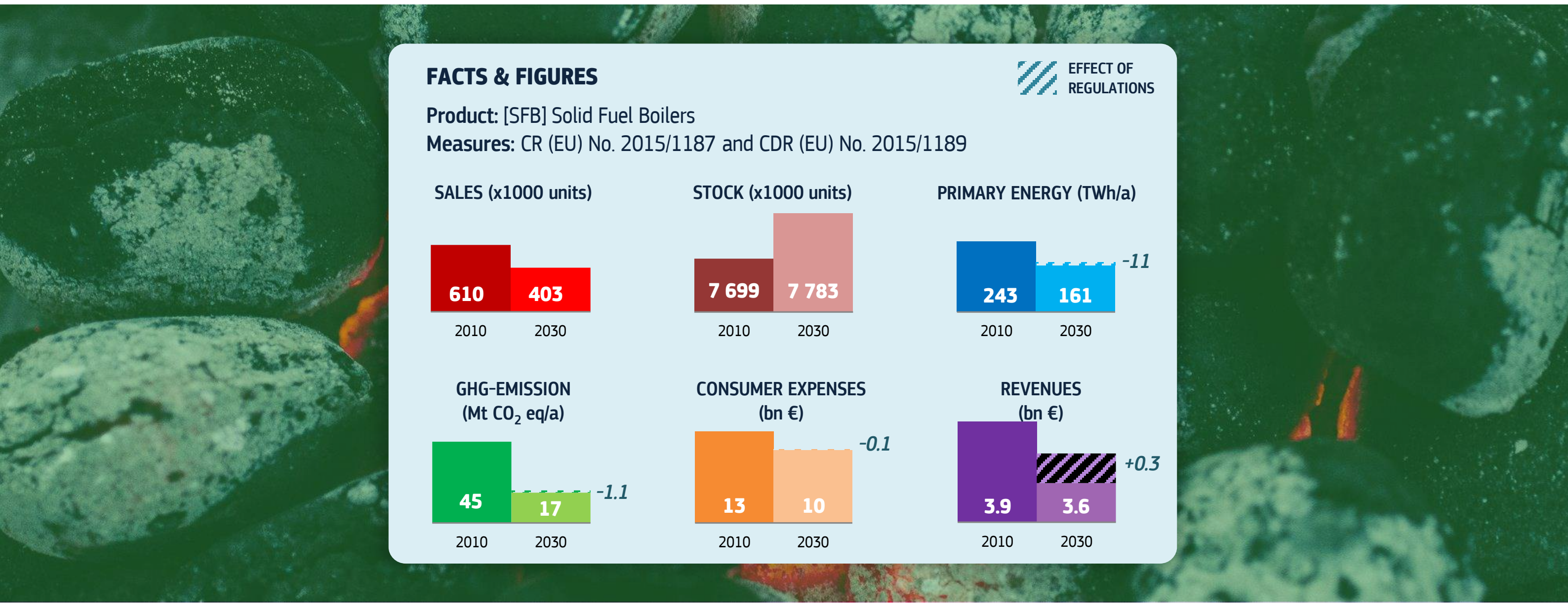
ENERGY EFFICIENCIES

Ecodesign measures and labelling for Solid Fuel Boilers were introduced in 2015. The graph on the right shows how the efficiencies increase over time. Especially improvements for manual wood boilers (20 %point) in 2030 are significant. In 2030, all SFB are expected to reach an efficiency of either 77% or 78%. These improvements (combined with increased use of ventilation units) yield energy savings of 11 TWh/a in 2030, with corresponding GHG-savings of 1.1 Mt CO_2eq/a. A large part of these savings are due to manual wood boilers, which account for 4.3 TWh/a primary energy savings (39%) and 90 kt CO_2eq/a (8%). A third of the energy savings on SFB come from increased use of (improved) ventilation units which lower the heat load.

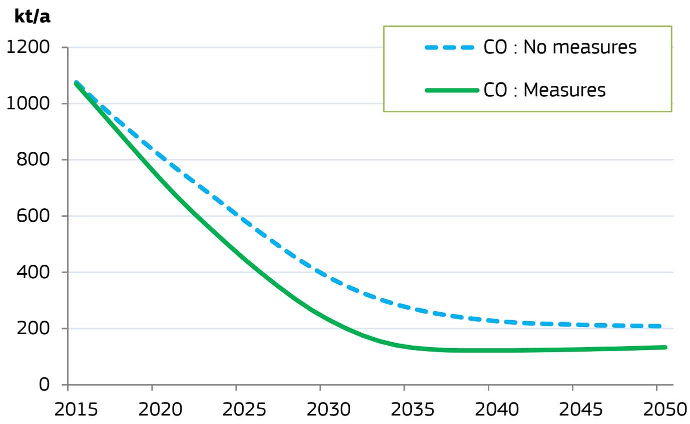
EFFICIENCIES SOLID FUEL BOILERS (SFB) WITH AND WITHOUT MEASURES



Solid fuel boilers



TOTAL EU27 ANNUAL CO EMMISSIONS FOR SOLID FUEL BOILERS WITH AND WITHOUT MEASURES

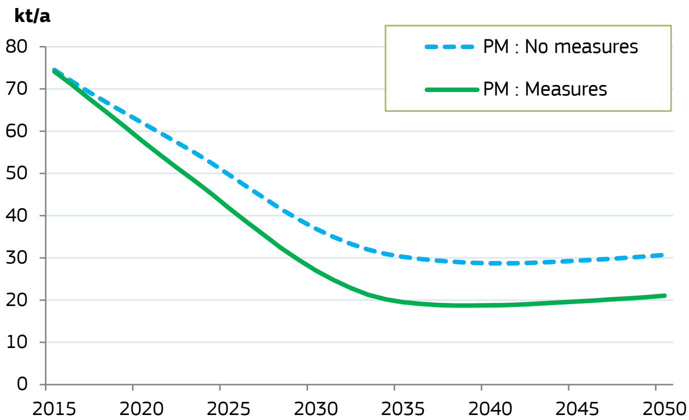


EMISSION SAVINGS

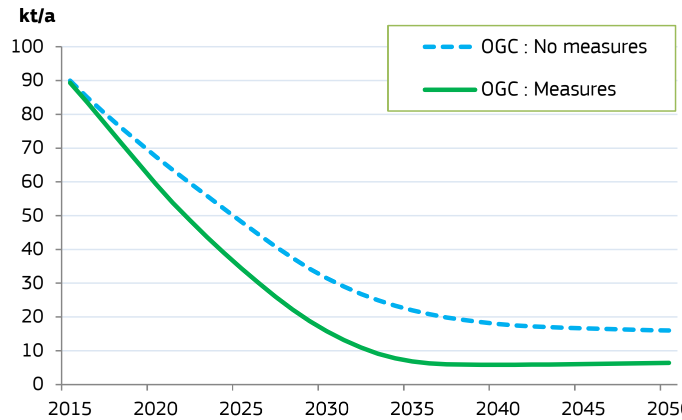
In addition to minimum efficiency requirements, the regulations also enforce limitations on emissions. Besides GHG-emissions, SFBs produce organic gaseous compounds (OGC), particulate matter (PM) and carbon monoxide (CO). These emissions arise when the combustion of fuels is incomplete, due to a lack of oxygen or too low combustion temperatures. The use of improved combustion technology can not only result in more energy efficiency, but also cleaner products.

Since introduction of Ecodesign and labelling measures in 2015 to 2030, OGC-emissions will decrease from 89 kt/a to 16 kt/a (-48% vs. no measures in 2030), PM-emissions from 74 kt/a to 27 kt/a (-27% vs. no measures in 2030), and CO-emissions from 1069 kt/a to 231 kt/a (-40% vs. no measures).

TOTAL EU27 ANNUAL PM EMMISSIONS FOR SOLID FUEL BOILERS WITH AND WITHOUT MEASURES



TOTAL EU27 ANNUAL OGC EMMISSIONS FOR SOLID FUEL BOILERS WITH AND WITHOUT MEASURES



Local space heaters

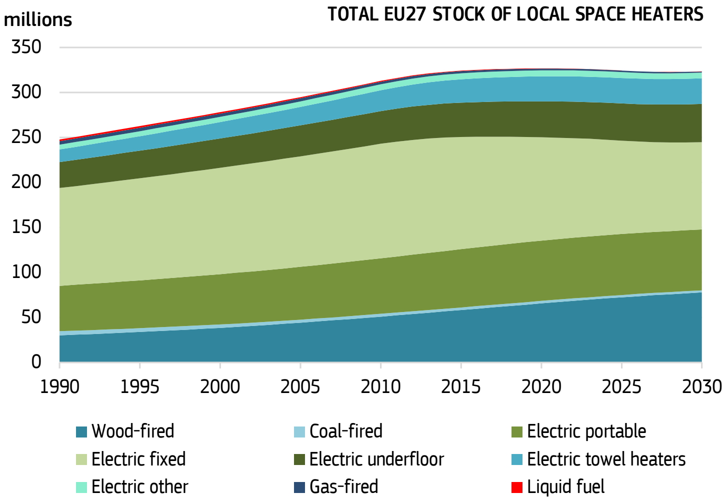
GENERAL INFO

Local space heaters (LH) are heating products that heat the room they are installed in. The products range from simple open fireplaces fuelled by wood to tube heaters used for commercial and agricultural applications. The variety of products led to two separate Ecodesign regulations, separating the solid fuel devices from oil/gas-fired and electric products. Energy labelling also applies to LH, except electric-, tube- and luminous-heaters.

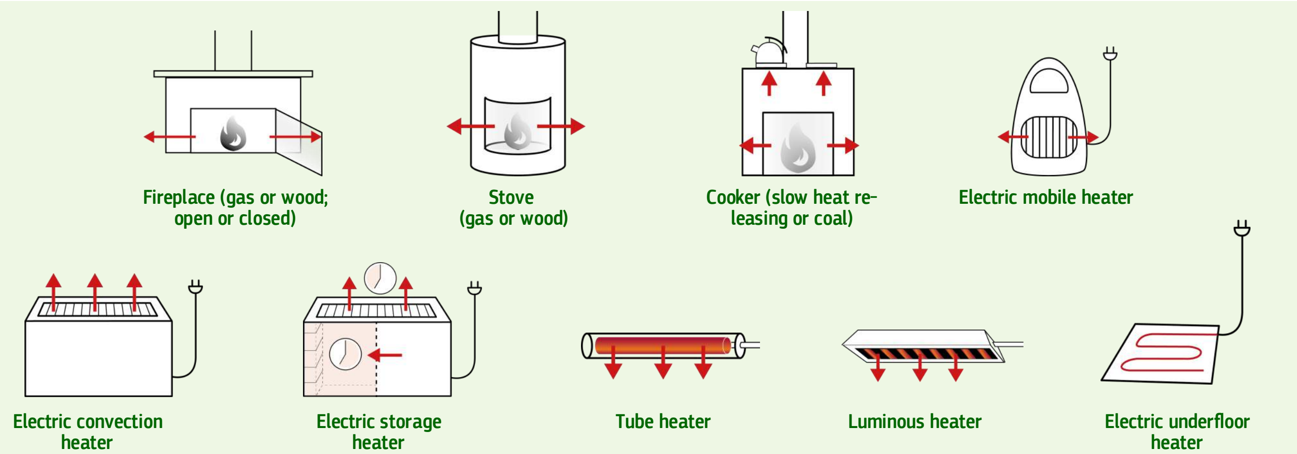
STOCK

The wide scope of local space heaters (LH) makes it one of the largest groups of EIA in terms of stock units and definitely the largest of the Space Heating segment, with almost 327 million units installed in 2020, remaining almost constant in later years. Electric LHs are by far the largest group with 256 mln installed in 2020 (including 113 mln fixed convectors, 67 mln portable, 40 mln underfloor, and 27 mln towel heaters), followed by 68 mln solid fuel LHs (65 mln on wood, 3 mln on coal). Noteworthy, after Brexit the number of gas-fired LHs is small (2 mln installed in 2020). The contribution of LHs using liquid fuels is negligible (0.3 mln units).

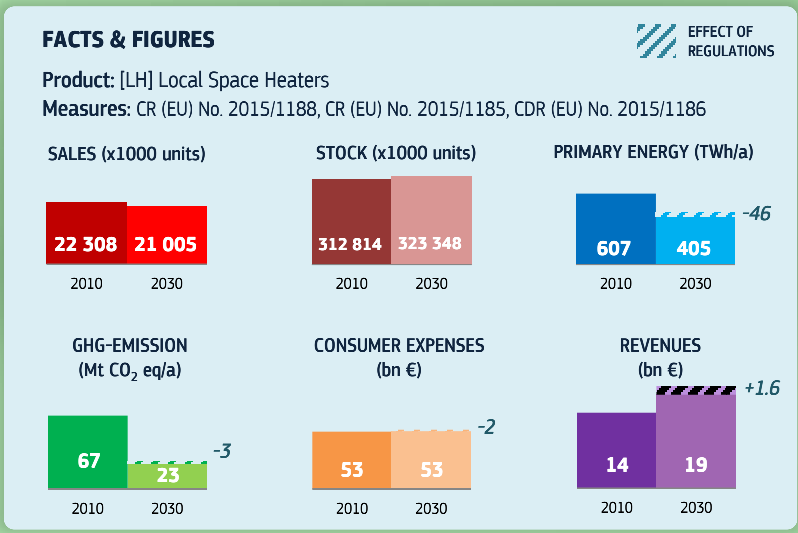
Comparing the 2010 and 2030 stocks, wood-fired closed fireplaces (+84%), cookers (+70%), slow heat release stoves (+61%) and electric underfloor (+17%) gain in popularity, while coal-fired stoves (-35%) and fixed electric (-24%) decrease. Liquid fuel flueless heaters are expected to disappear from the market by 2026.



LOCAL HEATER TYPES



Local space heaters



SAVINGS ON ENERGY

The Ecodesign requirements and labelling promote improved product design by manufacturers. This will lead to products with higher energy efficiency, but also with higher prices.

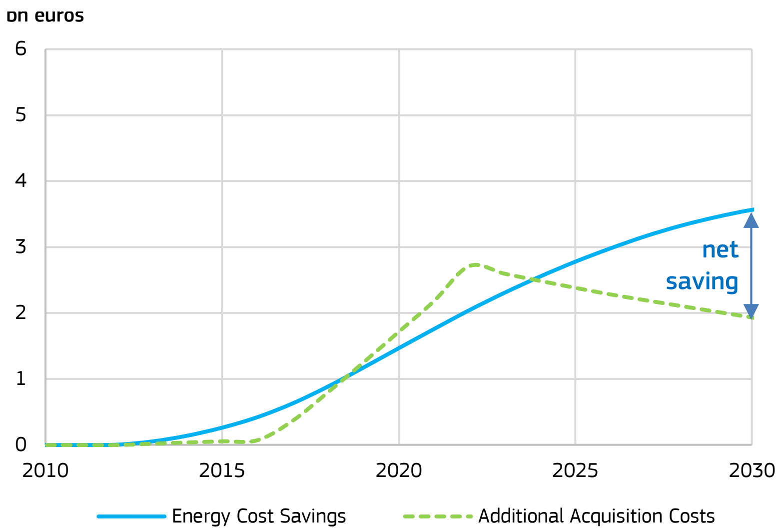
The highest energy savings are expected on electric local heaters. Total primary energy savings of LH are 46 TWh/a in 2030, of which 61% (28 TWh/a) on electric appliances. This is due to their high share of installed LH (75%). Most opportunities for improvements are found in electric convector appliances (accounting for 38% of the expected 2030 LH energy savings). A fifth of the energy savings on LH come from increased use of (improved) ventilation units which lower the heat load.

SAVINGS ON EXPENSES

The improved product quality leads to an increase of product prices. The highest additional annual acquisition costs for LH are expected in 2022 (2.7 billion euros). These additional costs are mainly caused by increased prices for wood -fuelled appliances that include open and closed fireplaces, stoves and cookers.

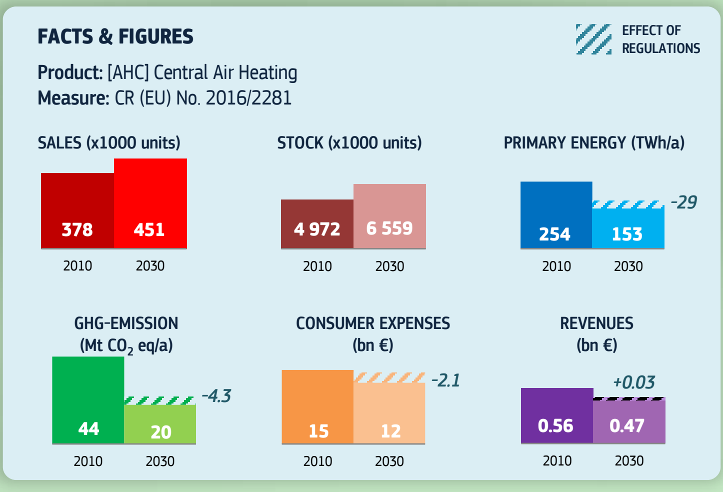
Costs of electric appliances are not expected to change significantly, except for minor increases for electric storage heaters. On the long term, the additional acquisition costs are more than compensated for by lower energy costs. Projected consumer expenditure savings for LHs in 2030 are 1.6 billion euros.

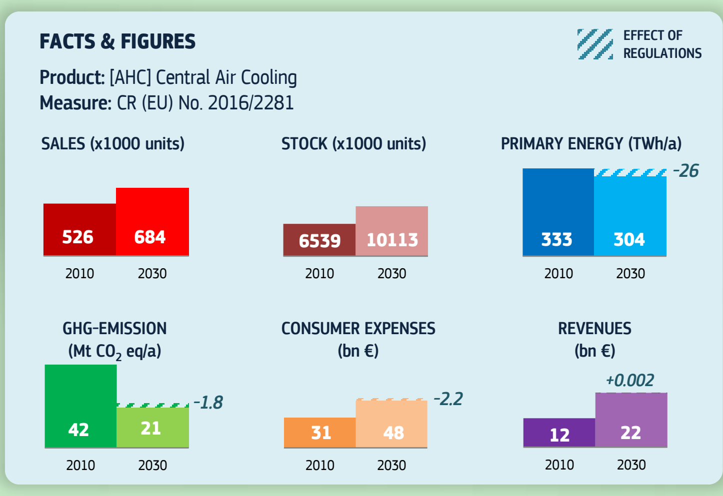
CONSUMER EXPENDITURE SAVING DUE TO ECODESING MEASURES ON LOCAL SPACE HEATERS: ADDITIONAL ACQUISITION COSTS AND SAVINGS ON ENERGY COSTS



BUILDING INSTALLATION PRODUCTS

Air heating and cooling





GENERAL INFO

In 2016 a new regulation has been adopted regarding Ecodesign requirements for (central) air heating products, cooling products and high temperature (process) chillers. The corresponding data have been inserted in EIA and cover the following product types:

- Air Heaters (AH)
- Air conditioners (AC)
- Chillers (CH)
- High-Temperature Process Chillers (HT-PCH)

AIR CONDITIONERS

The Air Conditioners considered here are:

- the larger ones, not covered by CR (EU) No 206/2012, i.e. with a rated cooling capacity > 12 kW (the smaller ones are discussed later as Room Air Conditioners),
- often reversible, meaning that they have both a cooling function and a heating function,
- using air as the medium to cool/heat the space.

AIR HEATERS

The Air Heaters considered here are:

- central heating systems, which distinguishes them from the Local Space Heaters,
- working on liquid fuel or gas (AHF) or on electricity (AHE), which distinguishes them from the Solid Fuel Boilers,
- using air as the medium to heat the space, which distinguishes them from Central Heating Boilers, that use water as the heating medium.

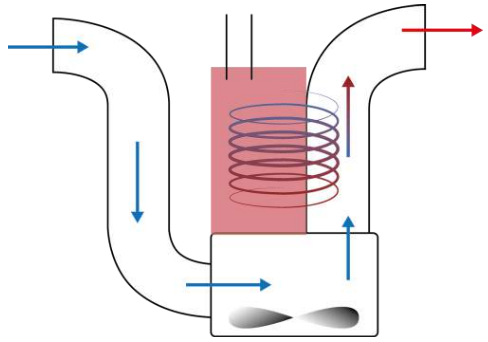
CHILLERS

The Chillers use a liquid (water or brine) as the cooling medium, which distinguishes them from the AC. They are used in systems that cool spaces to provide thermal comfort to human beings.

HIGH-TEMPERATURE PROCESS CHILLERS

High-Temperature Process Chillers also cool spaces, but for other reasons than comfort of human beings, e.g. to cool spaces with computers in data centres.

Air heating and cooling



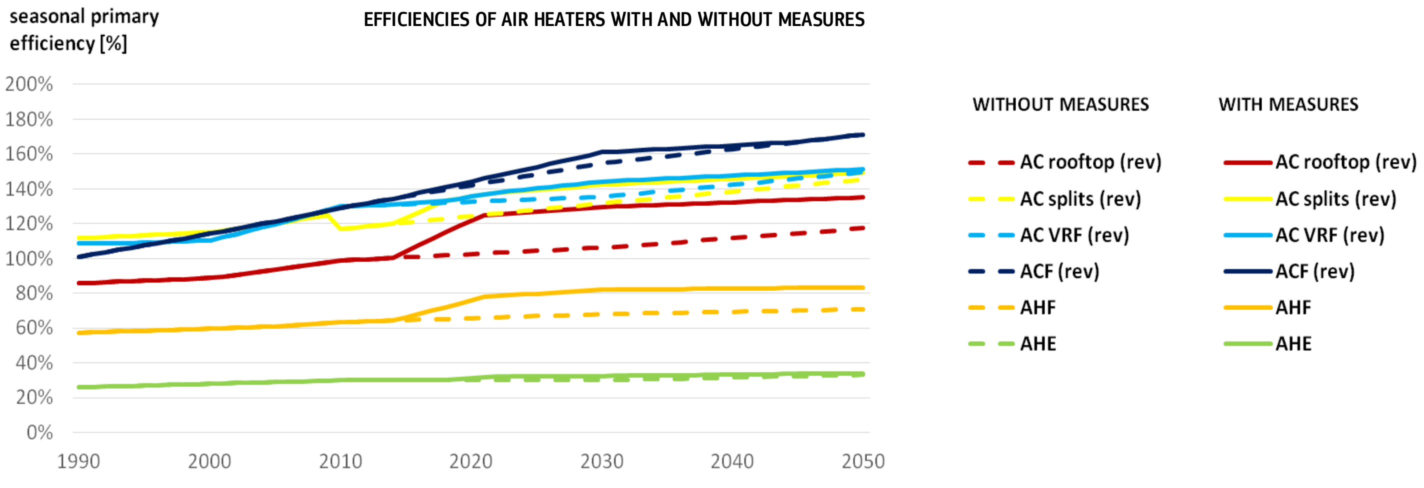
Airflow in an electric heater:
Fresh, outside air is sucked in by a fan and led through a heating chamber. In the heating chamber a heating element is placed which heats the cold air. This warm air is then released to the indoor environment.

AIR HEATING

The air heating products can be split into two groups. The first group includes reversible air conditioners (AC rev), also referred to as heat pumps, and the second group are dedicated air heaters (AH). Heat pumps work according to the reversed vapour compression cycle (see below on cooling). Instead of extracting heat from an enclosed space and releasing this to the ambient, now the heat is extracted from the outside air and released in the enclosed space.

Dedicated air heaters use fuel combustion or electricity to generate heat which is transferred to the indoor air. The choice for either an air heater or a heat pump depends on the place of installation. The efficiency of heat pumps will reduce as the outdoor temperature drops, because less heat can be extracted from the outdoor environment at the same effort. The efficiency of air heaters does not depend on the outdoor climate.

AIR HEATING, EFFICIENCY



The efficiency of heat pumps (AC rev) is generally higher than that of air heaters (AH). This can be explained by the fact that air heaters have to generate the required heat, while heat pumps use fuel or electricity to move heat from one space to another. This enables energy efficiencies of over 100%, since the output energy (which is heat in this particular case) can be higher than the input energy. Ecodesign requirements will be implemented in 2018 and 2021. To meet the 2018 requirements, the rooftop heat pumps need to improve their average efficiency of sold products by 11% with respect to the 2015 average efficiency. For fuelled air heaters a 16% improvement is required. The average efficiency of electric air heaters (AHE) and fuelled heat pumps (ACF rev)* sold in 2015 already meet the 2018 requirements.

* *Comments have been received on the graph, that ACF efficiencies should not be higher than those for AC VRF and AC splits. A change in ACF efficiencies would have negligible influence on the overall impacts. The topic will be addressed in the review study on CR 2016/2281 that is expected to start in 2022.*

Air heating and cooling

AIR HEATING, ENERGY SAVINGS

Without measures, AH and reversible AC would be expected to consume 182 TWh/a primary energy in 2030. Due to the measures this can be reduced to 153 TWh/a (-29 TWh, -16%, of which 38% due to increased use of Ventilation Units). The largest savings (16.7 TWh or 58%) are obtained on the 1 mln installed fuel-fired air heaters (AHF), due to an increase in efficiency from 66% in 2015 to 82% in 2030, and due to heat load reduction by Ventilation Units.

Split heat pumps (AC splits rev) have the largest stock (3 mln units, 46% of total) but consume only 22% of the total energy of air heaters. Their contribution to the energy savings is 5.3 TWh/a (18%).

Although rooftop heat pumps (AC rooftop rev) show a large efficiency improvement (122% in 2020 to 130% in 2030), their contribution to energy savings is modest (2.2 TWh/a or 7.6%), because the stock is much lower (162 thousand units or 2.5% of the stock in 2030).

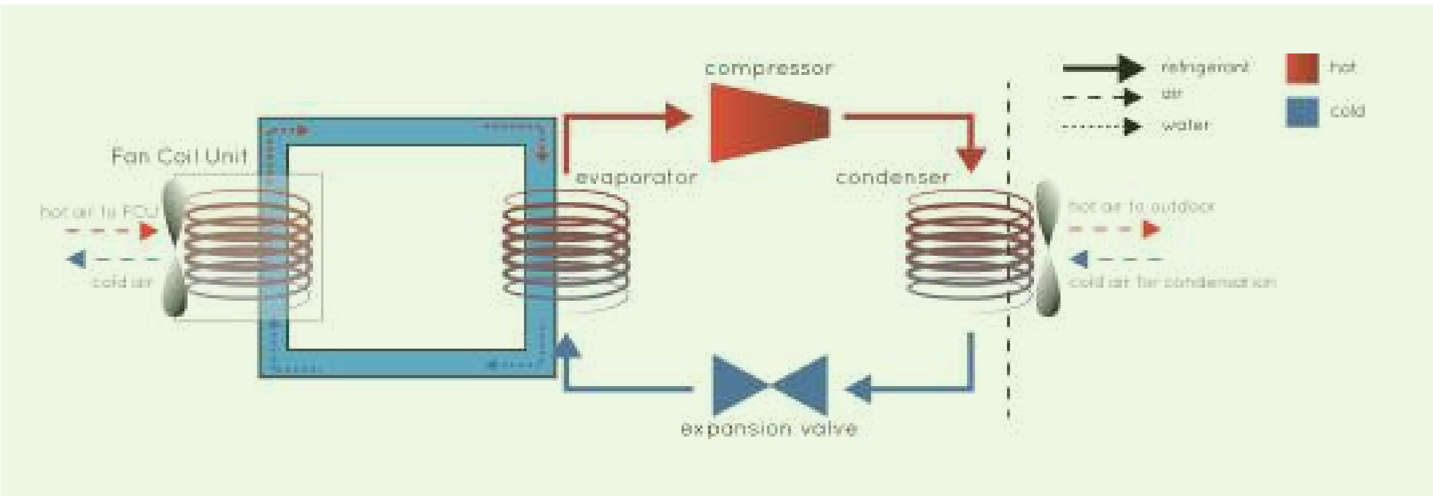
Variable refrigerant flow systems (AC VRF rev) are the only air heating products with increasing stock (0.9 mln in 2015 to 2.2 mln in 2030). Their average efficiency will increase from 131% in 2015 to 144% in 2030, with a contribution of 4.6 TWh/a (16%) to the total primary energy savings in 2030.

SPACE COOLING, CHILLERS

Chillers are centralised systems, that use a liquid (water or brine based) to transport cooling/heating to indoor fan coil units (FCUs), comparable to how a central boiler heating system with radiators works in a house, but usually much larger. Depending on how the chiller dissipates its heat there are two types: air-cooled (CHA), where the condenser (the hot part of the refrigeration circuit) is cooled by large fans, or water-cooled (CHW), where the cooling action of the fans in a 'wet' cooling tower is enhanced by spraying also water drops on the chiller's hot heat exchanger.

In 2020 there were 2.3 mln chillers installed in EU27 of which 1.7 mln smaller air-cooled models (< 400 kW). Most chillers are electric: fuel-driven CHF are only 0.3% of the stock.

High-Temperature process chillers (HT-PCH) differ from the other chillers (CH) mainly by their application. HT-PCH are often used in e.g. data-centres to cool computer-rooms. In 2020 there were around 380 thousand installed in EU27.



Air heating and cooling

SPACE COOLING, LARGE AIR CONDITIONERS

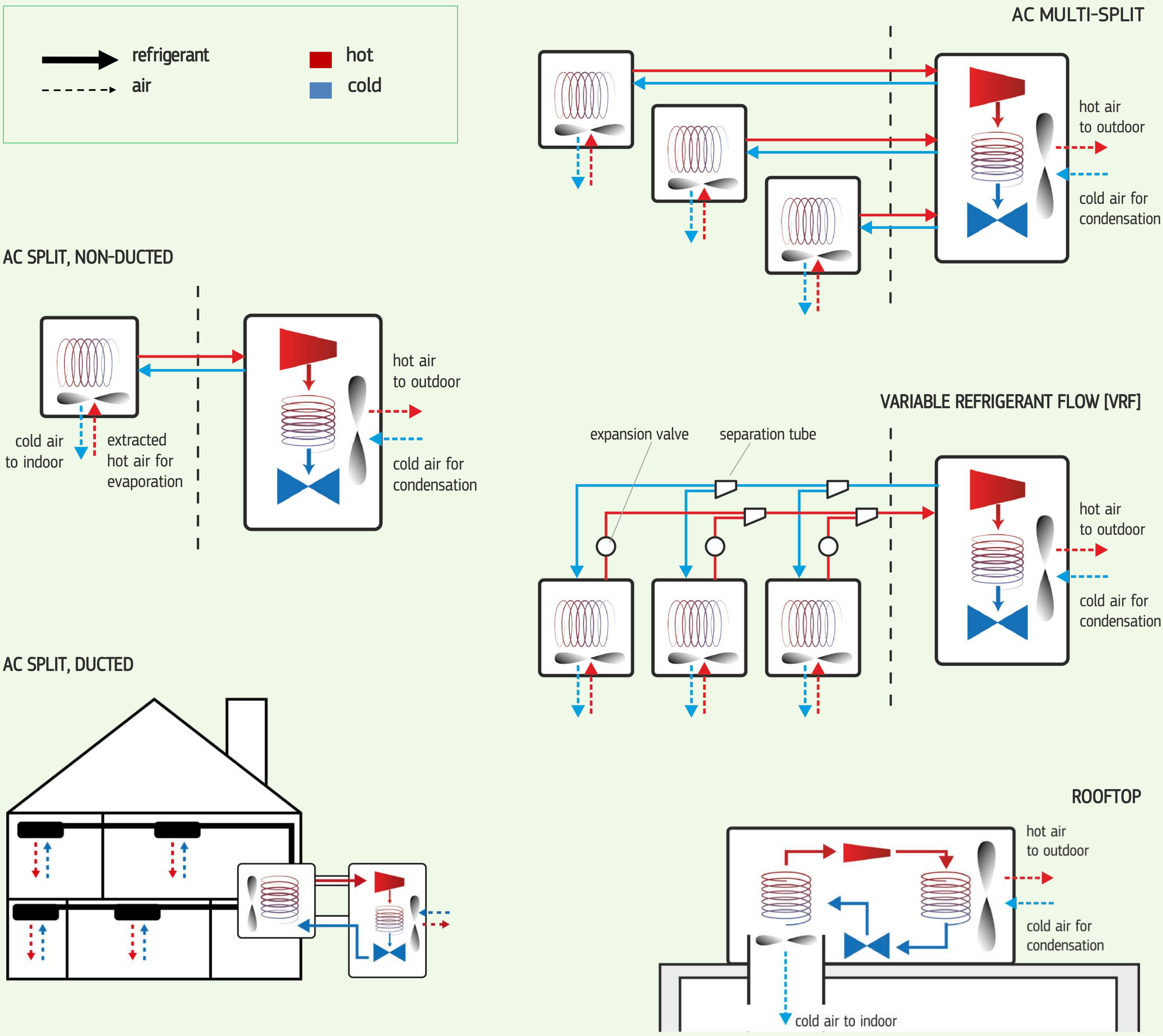
Commission Regulation (EU) 2016/2281 targets air conditioners (AC) with a rated cooling capacity above 12 kW. This excludes the smaller Room Air Conditioners (RAC) that are separately regulated in CR (EU) No 206/2012 (see Room Air Conditioners).

In 2020 there were 6.5 mln AC installed in EU27, of which 4.7 mln (72%) were reversible, meaning that they can cool in summer and supply some heating in winter. Apart from the fuel-driven ACF, that represent only 0.1% of the stock, EIA reports on three types of AC: 'split' (or multi-split), 'rooftop' and 'variable refrigerant flow' (VRF).

Schemes of vapour-compression cooling cycle

A refrigerant in a closed circuit is evaporated (absorbing heat) by warm in-house air, thus cooling it. Next the refrigerant vapour is compressed (energy use) and then condensed by e.g. external ambient air, releasing heat.

Following this the refrigerant is expanded in a valve and the cycle recommences. In some appliances the cycle can be reversed so that heat is extracted from the external environment and released indoor (heating function, heat pump)



Air heating and cooling

Space cooling, large air conditioners (continued)

By far the most numerous (4.5 mln units installed in 2020) are relatively small 'split' units in the range of 12-23 kW cooling capacity. These units are 'split' between an indoor and an outdoor unit with a refrigerant feed- and return-tube inbetween. There is a distinction between single split and multi-split systems, the latter meaning that one outdoor unit can work with multiple indoor units.

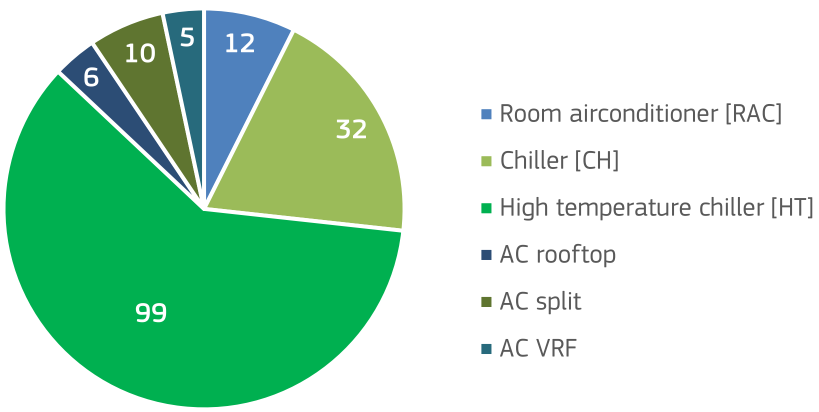
VRF-units are basically large multi-split installations, e.g. 28 kW, where a (cascade of) outdoor unit(s) is feeding a 2-, 3- or 4-pipe (if heat recovery) refrigerant-line circuit with several indoor units and is able, through the use of a so-called 'inverter' to adjust refrigerant flow to the system needs. The quantity of installed VRF is growing, from 1.5 mln in 2020 to expected 2.6 mln in 2030.

The borderlines between RACs, professional split units, multi-splits and VRF systems are becoming more and more blurred as even the smallest unit (RAC) can have an inverter and be reversible. The main difference is in size (capacity), quality, service, additional functionality, and possibly heat recovery. But what all above non-ducted units have in common is that they use refrigerant lines to transport the heat/cooling from the indoor to the outdoor units.

This is different for the traditional ducted AC, usually placed outdoors on the roof ('rooftop') or side of the building. There the transport medium is air, which is cooled by the AC and subsequently transported through air ducts by an air handling unit (AHU) that might also have a ventilation function. The stock of these traditional air conditioners is decreasing, amongst others because of energy efficiency issues, installation volumes required, maintenance costs, and problems related to pollution in the air ducts..

SPACE COOLING, ELECTRICITY CONSUMPTION

EU27 TOTAL ELECTRICITY CONSUMPTION OF SPACE COOLING APPLIANCES IN 2020



The 8.8 mln installed cooling products covered by the proposed regulation consumed 151 TWh/a of electricity in 2020. For comparison: the separately regulated 46 mln (smaller) Room Air Conditioners consumed 12 TWh/a.

Although there are relatively few HT-PCH (4% of stock), they have high cooling outputs (ranging from 865 to 6375 MWh/a/unit), and as a result consume 65% (99 TWh) of the total electricity. Chillers represent 22% of the stock, have medium cooling outputs (25 to 900 MWh/a/unit), and are responsible for 21% of total electricity use for space cooling. Air conditioners (excluding RAC) represent 74% of the stock but have relatively low cooling outputs (9 to 40 MWh/a/unit) and therefore use only 14% of the electricity.

The proposed measures on cooling products are expected to save 12 TWh/a of electricity in 2030, corresponding to 25 TWh/a of primary energy for the generation and distribution of this electricity (at PEF=2.1). Most of these savings are obtained on high-temperature process chillers.

SPACE COOLING, EMISSIONS

The total GHG emissions due to cooling products covered by the regulation were 32 Mt CO_2eq/a in 2020. (An additional 3 Mt CO_2eq/a is due to the separately regulated RACs.)

GHG emissions due to energy use are calculated by multiplying the energy consumption (kWh) by the Global Warming Potential of the fuel or of the electricity (GWP in kg CO_2-equivalent / kWh energy).

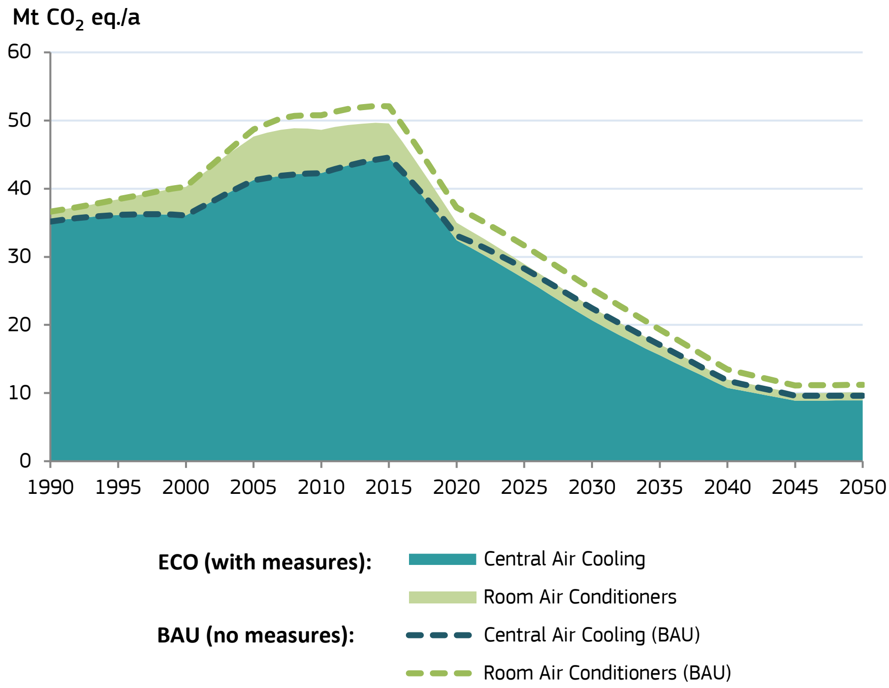
Additional GHG emissions could be due to leakage of refrigerants during product use and/or to release of refrigerants at product end-of-life.

Starting from EIA2019, these refrigerant contributions to the GHG-emissions are no longer accounted, because they are not regulated by Ecodesign.

The use of refrigerants with high GWP is increasingly being limited by national- and EU-legislation (F-gas regulation) and by worldwide agreements. This is beyond the scope of Ecodesign, but some Ecodesign measures do take into account the trade-off between energy efficiency and GWP of refrigerants.

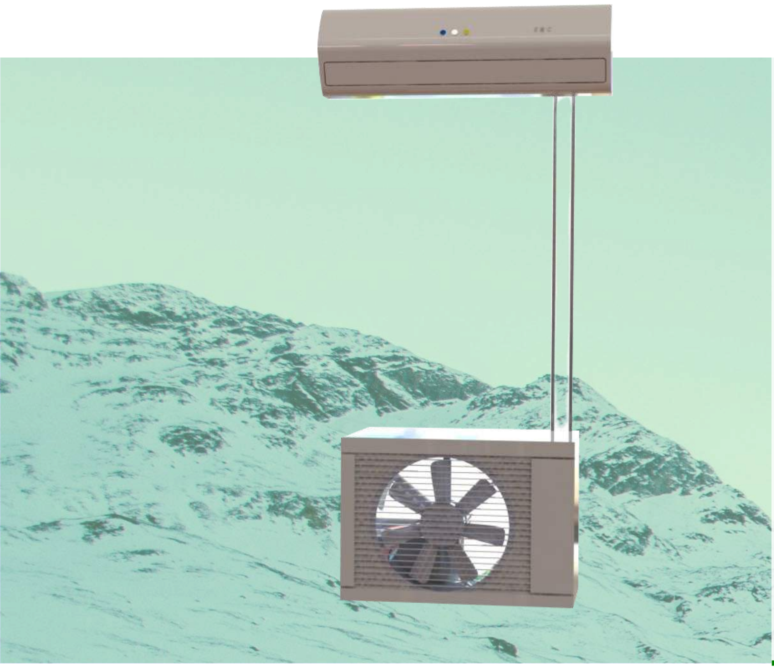
The demand for space cooling is expected to grow with 12% over the 2020-2030 period (see also introductory section on building installation products). Nevertheless, due to the energy efficiency measures for ACs and the decreasing CO_2-emissions during electricity generation, the GHG-emissions are expected to be lower in 2030 (21 Mt CO_2eq/a) than in 2020 (32 Mt).

TOTAL EU27 GREENHOUSE GAS EMISSION OF SPACE COOLING FOR SCENARIOS WITH AND WITHOUT MEASURES



BUILDING INSTALLATION PRODUCTS

Room air conditioners



GENERAL INFO

In the relatively mild European climate, space cooling equipment is still a bit uncommon compared to e.g. the US, Japan or South Korea. Not surprisingly, much of the EU air conditioner (AC) and chiller market is dominated by companies originating from those parts of the world and –with time, increased income of Europeans, a sharp decrease in product price and more frequent heat waves– have succeeded in realising market growth not only in offices but also in the home.

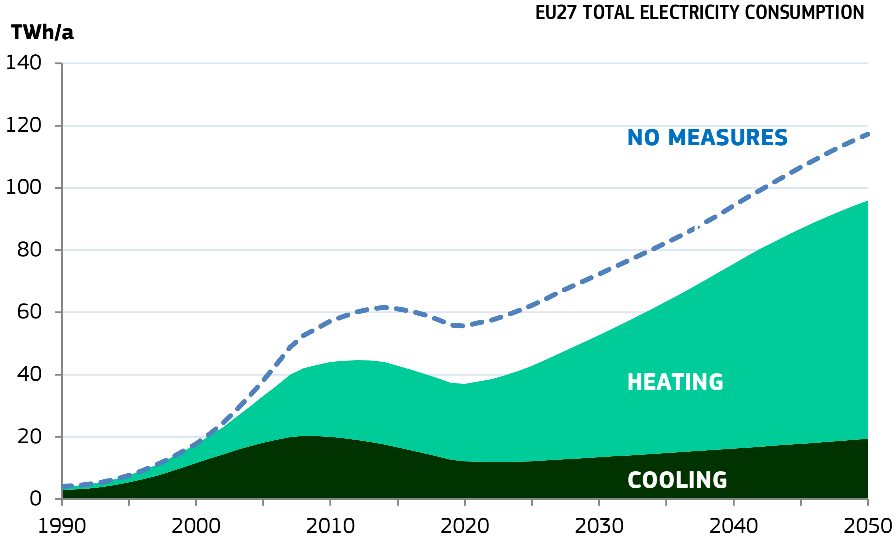
While in 1990 less than 5 million room air conditioners (RACs) were installed, this number has increased to over 46 million in 2020. A conservative estimate for 2030 is that over 59 million RACs will be installed. Put into perspective, this equals to 30% of the European households having 1 RAC for space cooling.

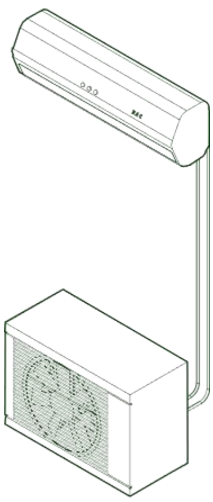
In 2020, almost all sold RACs were reversible, meaning that in addition to the cooling function for the summer they can also have a heating function during the winter. However, it is estimated that only 60% of the RAC owners is actually using it also for heating.

ELECTRICITY CONSUMPTION

Despite the large numbers, the electricity use of RACs in cooling mode (12 TWh in 2020) is modest compared to the 151 TWh consumed in cooling mode by the 8.8 million larger, mostly centralised, air conditioning and chiller systems in commercial buildings that are subject to a separate Ecodesign regulation (see section on Air Heating and Cooling).

The electricity use of RACs in heating mode is 25 TWh/a in 2020 and thus higher than the consumption in cooling mode. This is mainly due to the average annual demand for heating output per unit (5000 kWh heat/a) being larger than the demand for cooling output (1400 TWh cool/a). In addition, efficiencies are higher in cooling mode than in heating mode. The measures lead to savings on both functions.

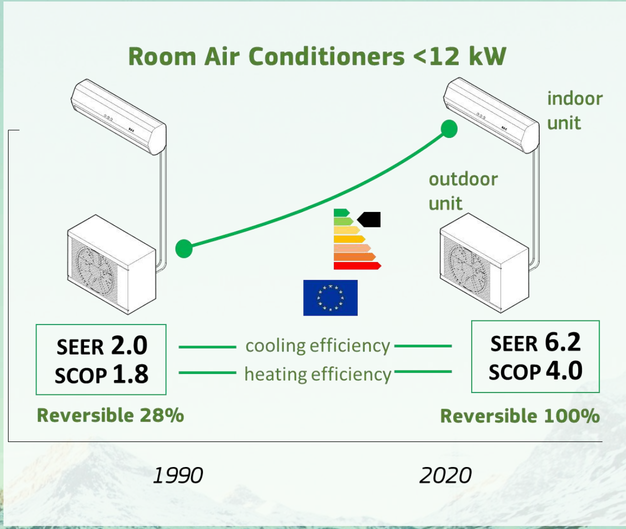


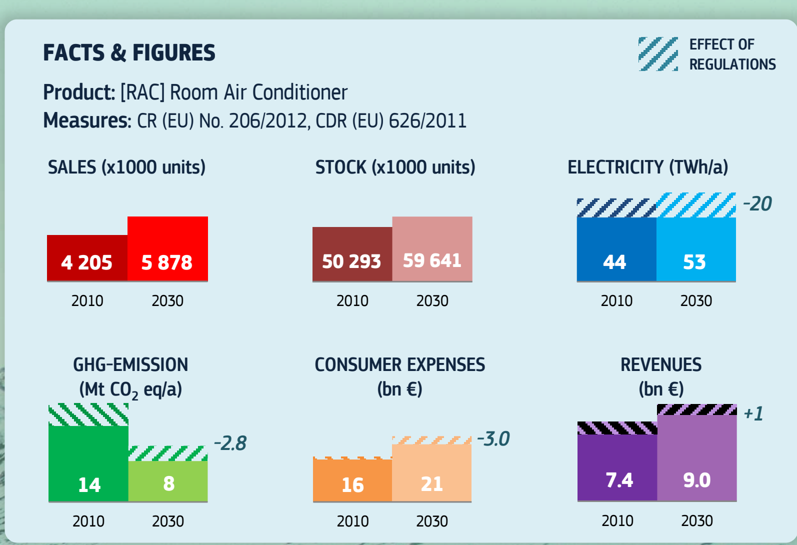


Single-split unit room air conditioner. Upper part: in-house cooling unit; Lower part: external heat-rejection unit.

For schemes of the employed vapour-compression cooling cycle, and for additional information on (larger) air conditioners and chillers, see section on Air Heating and Cooling.

Room air conditioners

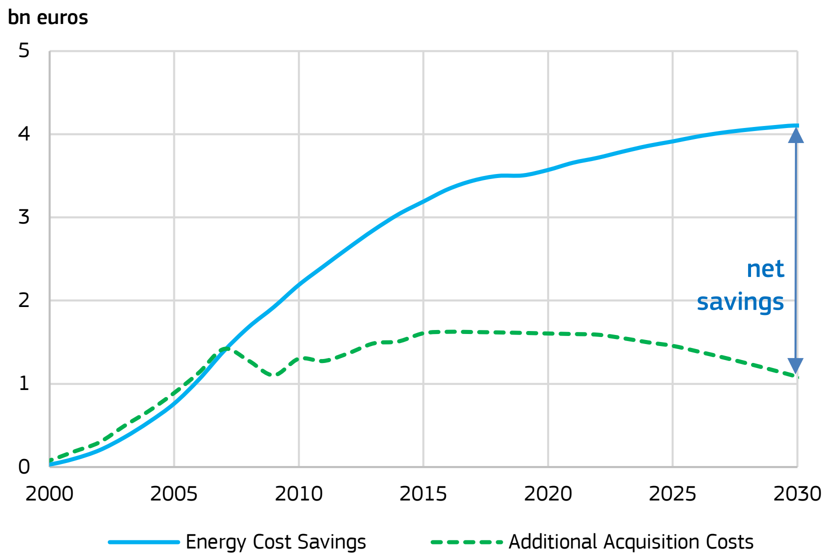




EXPENSE SAVINGS

Due to the Ecodesign and Labelling measures the average cooling efficiency of RACs increases by a factor 1.46 and the heating efficiency by a factor 1.27 over the 2010-2030 period. These improved products have higher acquisition costs (+1 bn euros in 2030) but lead to savings on energy costs (-4 bn euros in 2030), for net consumer expense savings of 3 bn euros (fixed euros 2020 incl. VAT for residential users). Around 7% of these savings is due to heat load reduction by Ventilation Units.

CONSUMER EXPENDITURE SAVING DUE TO ECODESIGN MEASURES ON ROOM AIR CONDITIONERS: ADDITIONAL ACQUISITION COSTS AND SAVINGS ON ENERGY COSTS



BUILDING INSTALLATION PRODUCTS

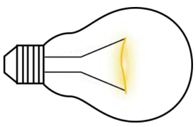
Lighting

GENERAL INFO

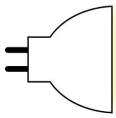
Light sources (lamps) are the largest Ecodesign product group in terms of installed units. In 2020, almost 11 billion lamps were in use in Europe, which is more than 24 lamps per EU27 citizen.

Although a single light source uses a relatively small amount of energy compared to other Ecodesign products, the huge quantity of installed products makes lighting the third largest energy consumer (following industry components and space heating), covering 8% of the primary energy accounted in EIA for year 2020. The various Ecodesign studies distinguish many different lamp types, but EIA summarises their data in the six main groups explained below (GLS, HL (tungsten), CFL, LFL, HID and LED).

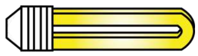
TYPES



GLS = General Lighting Service: the classical 'Edison' filament lamp. When an electric current is made to pass through a thin metal wire (the 'filament'), the metal opposes the current flow (electrical resistance) and as a result heats up and starts to glow (becomes 'incandescent'), emitting electro-magnetic radiation of which a small part is visible, called light. Dominated sales until 2008-2010, but now phased-out due to Ecodesign. Efficacy around **10 lm/W**.

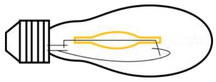


Tungsten (Halogen, HL) = modern version of the filament lamp. The filament is contained in a small capsule (often placed inside a larger bulb) that is filled with a halogen gas. This extends the lifetime and allows a slightly higher efficacy. HL are available in mains-voltage or low-voltage. Typical efficacies **12 to 20 lm/W**. Halogen lamps were popular as substitutes for GLS, but Ecodesign imposes the phase-out of many types in the coming years (2016-2018).

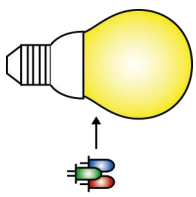


CFL = Compact fluorescent lamp. In a fluorescent lamp an electric current passes through a gas containing some milligrams of mercury vapour. Excited by the current, this vapour emits an ultraviolet light, that is converted to visible white light by a phosphor coating on the inside of the glass tube (fluorescence). In CFLs the tube is U-bent or a spiral, allowing a compact design that can substitute GLS or HL. Efficacy **50-70 lm/W**. CFLs have a warm-up time.

LFL = Linear Fluorescent lamp. Use technology similar to CFL, but are straight tubes with electric connections on both sides. Available in different lengths (e.g. 0.9, 1.2, 1.5 m) and in different diameters (e.g. T8: 25 mm, T5: 16 mm), often applied for **office lighting**. Older models (T12 and T8 halo-phosphor) now phased-out by Ecodesign. LFL T8 tri-phosphor have efficacy around **80 lm/W** (operating on old electro-magnetic ballast). Still widely used, but many substituted in recent years by modern LFL T5 with an efficacy of around **90 lm/W** (operating on more efficient electronic ballast).

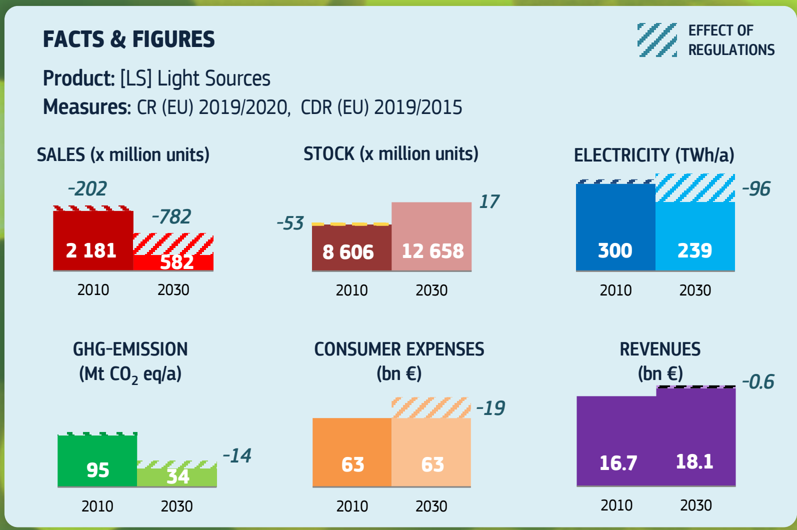


HID = High-Intensity Discharge lamp. Creates an electric discharge arc between two electrodes in a quartz or ceramic tube-like enclosure that contains a gas and metal salts. Provides high-intensity light from a small space. Often used in **street lighting**. High-pressure mercury lamps phased-out by Ecodesign in 2015. High-pressure sodium lamps (characteristic orange light, not suitable for indoor use) have efficacy **90-140 lm/W**. Recent metal-halide lamps produce white light with efficacy **80-120 lm/W**.



LED = Light Emitting Diode. Light emission derives from electrons that fall back from a high-energy state to a low-energy state, emitting the difference in energy as a photon (a small quantity of light). Emission occurs in a solid material consisting of very thin (microns) semi-conductor layers ('solid state lighting (SSL)'. **In 2015: 80-140 lm/W. Expected > 200 lm/W in future.**

Lighting



UNITS

The quantity of light emitted by a lamp is measured in lumen (lm). A lamp emits a spectrum of electro-magnetic radiation, consisting of different wavelengths (colours), of which a large part cannot be perceived by the human eye. The other part (called light) still consists of different colours, and the sensitivity of the human eye depends on the colour. The lumen-measure takes these different sensitivities into account and consequently can be conceived as the useful amount of emitted light, as perceived by humans. The instantaneous amount of electrical input to a lamp is called the input power, expressed in watt (W). The efficacy (efficiency) of a lamp is the ratio of the light output (in lm) and the power input (in W) and therefore expressed in lm/W.

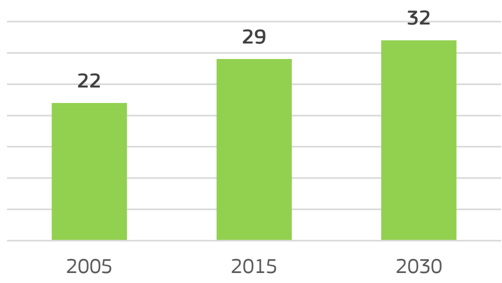
RESIDENTIAL LIGHTING

In 2005 around 3.8 bln lamps were installed in the EU27 residential sector (22 lamps per household (hh) on average), consuming 91 TWh/a electricity (521 kWh/a/hh). Almost 60% of these lamps were low-efficiency incandescent lamps (GLS). Ecodesign regulations 244/2009 (non-directional household lamps) and 1194/2012 (directional lamps) introduced a gradual phase-out (2009-2014) of most GLS-types, expecting consumers to mainly substitute them by the 5 times more efficient CFL. However, CFLs were initially not well received by consumers due to their unpleasant light, warm-up times, mercury content, higher prices and dimming problems. As a consequence, many GLS were replaced by the 'only' 1.5-2 times more efficient halogen lamps (HL).

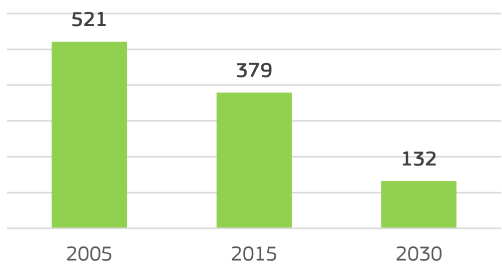
In 2015 around 5.1 bln lamps were installed in the EU27 residential sector (29 lamps per hh), consuming 72 TWh/a electricity (376 kWh/a/hh). Without measures this would have been 92 TWh/a. 70% of these lamps were CFL or HL, 10% was still GLS, and less than 8% was already LED.

In the period 2016-2018 many types of halogen lamps were phased-out by regulations 244/2009 and 1194/2012. The new Single Lighting Regulation, CR (EU) 2019/2020, phases out CFLi (with integrated control gear) by 2021 and most of the remaining halogen lamps (and LFL T8) by 2023.

NUMBER OF LIGHT SOURCES PER HOUSEHOLD

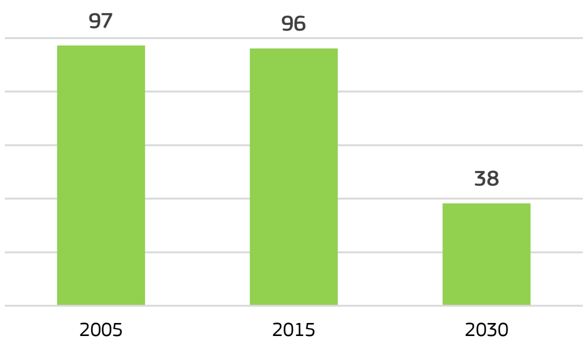


EU27 ANNUAL ELECTRICITY CONSUMPTION FOR RESIDENTIAL LIGHTING PER HOUSEHOLD WITH MEASURES (kWh/a/hh)

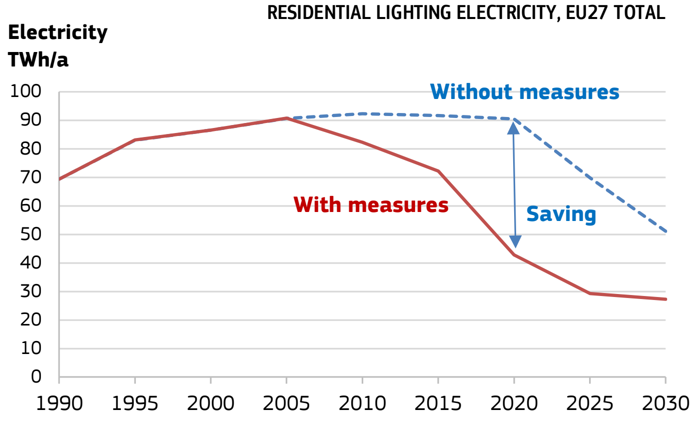


Lighting

EU27 ANNUAL CONSUMER EXPENSE FOR RESIDENTIAL LIGHTING PER HOUSEHOLD
(euro/a/hh, fixed euros 2020, incl. VAT)



RESIDENTIAL LIGHTING ELECTRICITY, EU27 TOTAL



For 2030 it is expected that 6.4 bln lamps will be installed in the EU27 residential sector (32 lamps per hh), consuming 27 TWh/a electricity (132 kWh/a/hh). This is 75% less than in 2005, while the number of installed lamps per household increased by 62%. Over 96% of these lamps is expected to be LED. Without measures the 2030 electricity consumption would have been around 51 TWh/a.

HL and CFL have higher lifetimes than GLS. In households, LEDs have lifetimes of decades. The shift from GLS, first to HL and CFL, and now to LED therefore implies a much lower need to replace lamps. This resulted in a collapse in sales quantities of lamps for the residential sector, from 1.3 bln units/a in 2005, to 1.1 bln in 2015, and expected 0.2 bln in 2030. Lamp manufacturers are trying to compensate this by offering new features: smart lamps allowing remote dimming and colour control (through internet or from mobile devices), acting as WiFi transmitters, integrating audio and sensory functions, etc.

In 2005 residential consumers spent 17 bln euros (incl. VAT) for lighting their homes (97 euros/hh), of which 2.7 bln euros for light source acquisition and 14.3 bln euros for electricity costs. In 2015 this rose to 18.4 bn euros (96 euros/hh), of which 6.2 bln euros for light source acquisition and 12.2 bln euros for electricity costs.

In 2030 total residential expenses for lighting are expected to decrease to 7.7 bln euros (38 euros/hh), of which 1.1 bln euros for acquisition and 6.6 bln euros for electricity (based on PRIMES 2020 Reference projections for electricity prices).

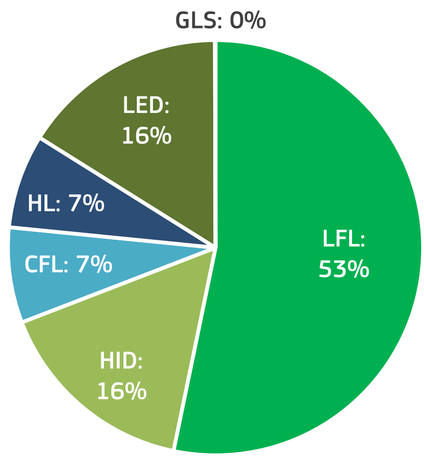
NON-RESIDENTIAL LIGHTING

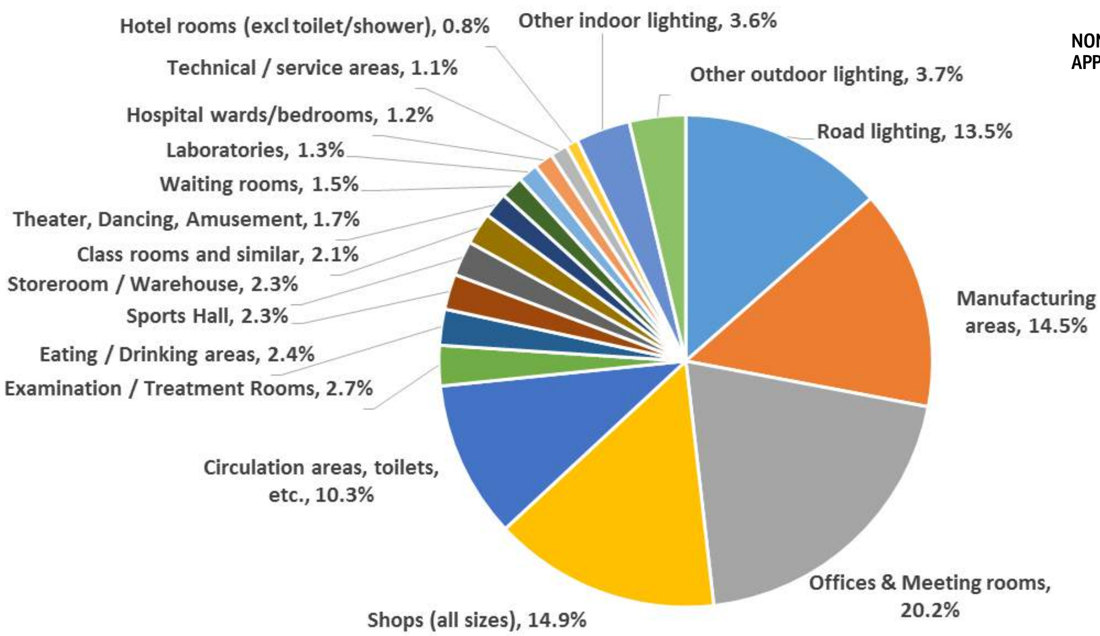
Around 85% of lighting electricity is consumed in the non-residential (NRES) sector in 2020, of which 53% by linear fluorescent lamps (LFL), 16% by high-intensity discharge lamps (HID), and the remainder by CFL, HL and LED. The major consumers are offices (20%), shops (15%), manufacturing areas (15%), road lighting (14%) and circulation areas in buildings (halls, corridors, stairs, toilets, etc., 10%).

In 2005, 2.9 bln light sources were installed in the non-residential sector, consuming 189 TWh/a electricity. In 2020 the quantity of light sources increases to 4.8 bln (+65%) and the consumption to 251 TWh/a (+33%). That electricity use increased far less than the number of light sources is due to Ecodesign regulation 245/2009, which phased-out the least performing and most mercury containing LFLs (T12s and T8s with halo-phosphor coating) and high-pressure mercury lamps. The same regulation also set minimum efficiency requirements for the ballasts (control gears) that manage the power supply to LFLs and HIDs, promoting the substitution of electro-magnetic ballasts by more efficient electronic ballasts.

In 2030 the quantity of NRES light sources is expected to increase to 6.1 bln (+28% vs. 2020) while electricity consumption is expected to decrease to 239 TWh/a (-5% vs. 2020). This positive effect is mainly due to LFL and HID being substituted by LED lighting products, which is the ongoing trend.

EU27 NON-RESIDENTIAL LIGHTING ELECTRICITY SHARES PER TECHNOLOGY





NON-RESIDENTIAL ELECTRICITY SHARES PER APPLICATION FOR EU27 (source: VHK 2015)

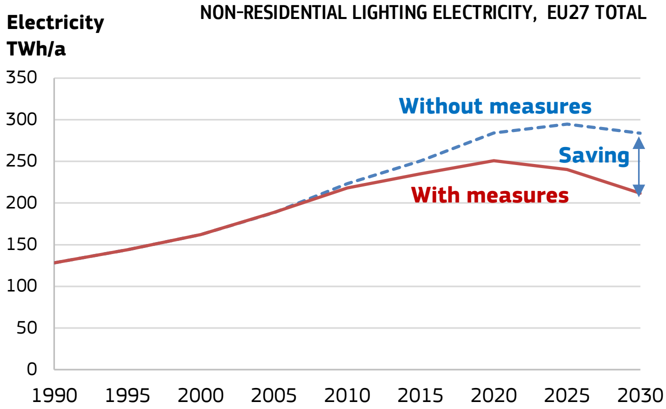
This trend is accelerated by Ecodesign regulation 2019/2020 that phases out the most common types of LFL T8 from 2023. The regulation continues to allow CFLni, LFL T5 and HID lamps on the market, considering that:

- Following the 2009 regulation, many NRES users recently substituted phased-out lamps by more efficient LFL T5, high-pressure sodium lamps, metal-halide lamps. They need time to amortise these investments before they are forced to switch to LED.
- While residential users can often use retrofit LED lamps that fit in existing luminaires, in many situations NRES users have to buy a new LED luminaire, because LED retrofits for LFL T5, HID and CFLni are not always available (status 2017; improvement ongoing). This increases substitution costs.
- In the NRES sector, lighting installations are often designed to supply the minimum light levels required by standards. Shifting to LED, these designs may have to be reviewed, implying additional costs.
- The efficiency advantage of LEDs is much smaller for LFL T5 and HID than for the typical residential lamps (GLS, HL, CFL). Consequently payback times for an investment in LEDs are longer in the NRES sector.

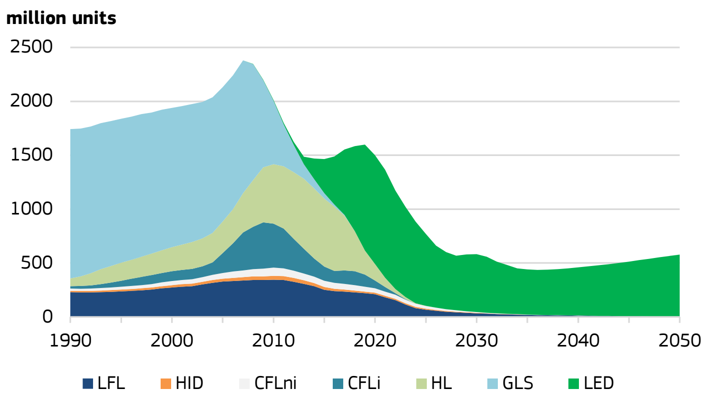
Major additional future energy savings on NRES lighting can be obtained in particular by:

- Phasing-out all LFL T5 and CFLni, also because of their mercury content. The 2021 revision of RoHS regulation already went further than Ecodesign, phasing out LFL T8, LFL T5 and CFLni for general lighting purposes from 2023. This impact is not yet modelled in EIA.
- Introducing measures on Lighting Systems in addition to those on Light Sources. This could be done in Ecodesign or in the context of e.g. the Energy-Performance of Buildings Directive (EPBD). These measures can promote improvement of lighting designs (more efficient luminaires, better distribution of luminaires in the room), and the installation of lighting controls that regulate the light in function of e.g. daylight availability and/or room occupancy. Lighting Systems are the subject of the ENER Lot 37 preparatory study that was completed in December 2016.

NON-RESIDENTIAL LIGHTING ELECTRICITY, EU27 TOTAL



TOTAL EU27 LIGHT SOURCE SALES FOR SCENARIO WITH MEASURES



Decrease in light source sales due to longer lifetimes of LEDs as compared to conventional lamp types (sum of residential and non-residential)

Ventilation units

GENERAL INFO

Ventilation units (VUs) use electricity to expel stale air from a room, replacing it with fresh air from the outside.

In the heating season, the incoming outside air is colder than the outgoing indoor air. An efficient ventilation unit therefore preferably includes a heat recovery system that uses the heat contained in the outgoing air to warm up the incoming air. In this way heat losses due to ventilation are reduced (as compared to natural ventilation, e.g. opening windows) and energy can be saved on the space heating system.

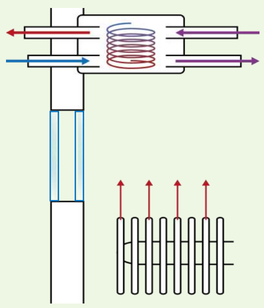
Consequently energy efficiency of VUs has two aspects: (1) the reduction of electricity consumed by the VU itself, and (2) the reduction of the space heating load and associated reduction of energy consumed by space heating products.

Note that the latter also depends on the space heating efficiency: if this efficiency is low, the reduction in the load due to VUs becomes relatively more important.

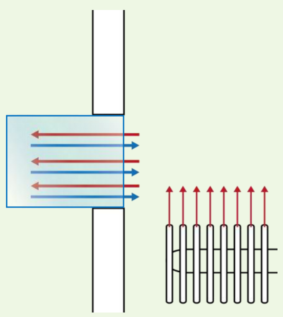
In the Ecodesign Impact Accounting both aspects are taken into account (see details in the EIA Status report).

Ecodesign regulation 1253/2014 on VUs acknowledges that there may be an interaction between the two efficiency aspects: non-residential VUs having a higher heat-exchange efficiency are allowed to consume more power for the fans they employ.

MECHANICAL VENTILATION VS NATURAL VENTILATION



Using a mechanical ventilation unit, the air exchange is controlled and heat contained in the outgoing air can be used to warm up the incoming air. This saves energy on the space heating system.



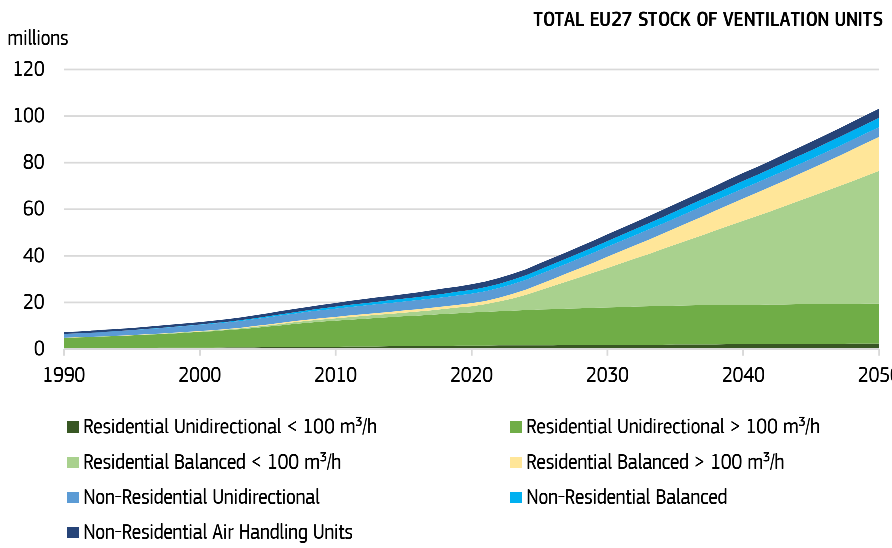
Using natural ventilation (opening windows, stack ventilation), cold fresh air enters a room and warm stale air goes out. The heat of the outgoing air is lost and needs to be reintroduced by space heating .

STOCK AND AIRFLOW

In 2020, 28 mln continuously operating VUs were installed in EU27, of which 20 mln in residential dwellings and 8 mln in non-residential buildings. This does not include intermittently operating exhaust fans (e.g. in toilets or bathrooms) as these are not covered by Ecodesign regulation.

The 20 mln residential VUs supplied a total of 32 Tm³/a of fresh air in 2020 to 25% of the EU dwellings. Especially the number of small (< 100 m³/h) balanced VUs with heat recovery is projected to increase strongly, leading to a total in 2040 of 65 mln residential VUs of which over 70% are balanced VUs. The VUs will supply a total of 57 Tm³/a of fresh air to 46% of the EU dwellings. The rising number of VUs is linked to the EU policy on building renovation. The ventilated air per m² dwelling area decreases as a balance between improved controls adapting airflow to demand and increasing ventilation airflow to meet indoor air quality requirements.

The 8 mln non-residential VUs supplied a total of 100 Tm³/a of fresh air in 2020 to 72% of the EU non-residential building area. In 2040 the number of non-residential VUs is projected to increase to 11 mln. These VUs will supply a total of 133 Tm³/a of fresh air to 88% of the EU building area.

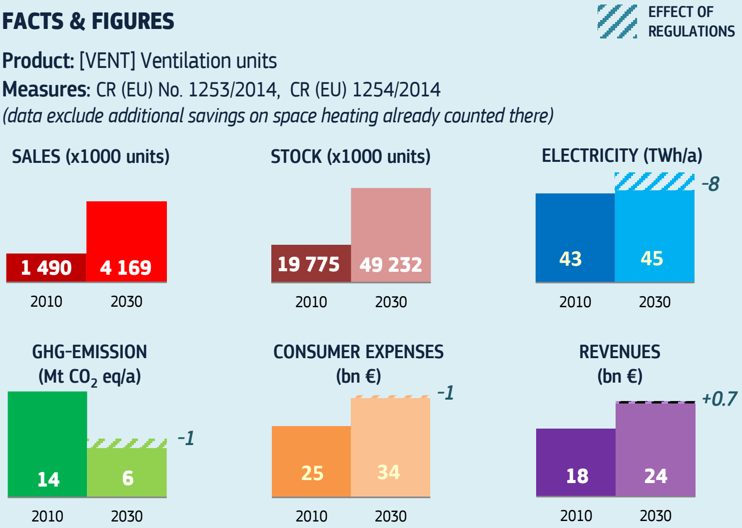


Ventilation units

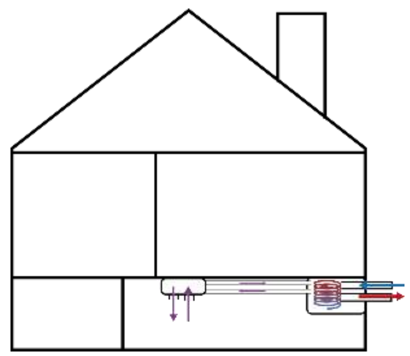
Not shown in the graph are the energy savings on space heating due to heat load reduction by Ventilation Units. These savings amount to 54 TWh/a in 2030 and are already included in the reported savings for Space Heating appliances.

FACTS & FIGURES

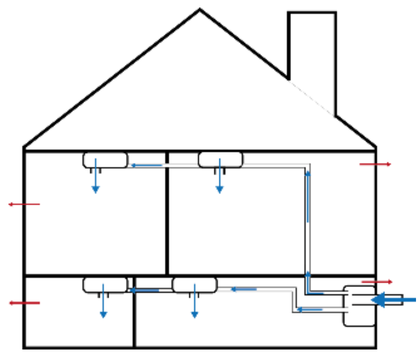
Product: [VENT] Ventilation units
Measures: CR (EU) No. 1253/2014, CR (EU) 1254/2014
(data exclude additional savings on space heating already counted there)



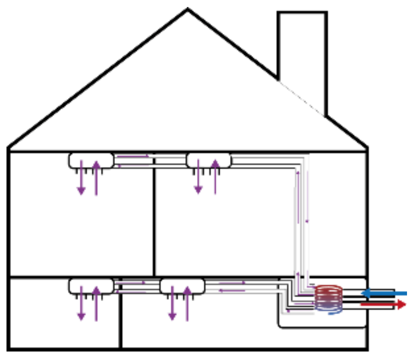
MECHANICAL VENTILATION SYSTEMS



Local balanced



Central unidirectional



Central balanced

Local ventilation units will only ventilate the room they are installed in.

Central ventilation systems have a ductwork to supply multiple rooms in a building with fresh air.

Unidirectional ventilation systems provide an air flow in one direction. This means that the ventilation unit either supplies or exhausts air only. The ventilation equilibrium is balanced by natural air exhaust or supply.

Balanced ventilation systems supply fresh air with the same rate as they expel stale air. This maintains a balanced pressure system in the building. If the ventilation systems is ducted, it should be separated from other ducted systems such as air conditioning, to prevent the disturbance of the pressure balance.

Ventilation Units

SAVINGS ON ENERGY

In 2015, VUs consumed 44 TWh/a of electricity for a total ventilated airflow of 113 Tm^3/a, implying an average consumption of 0.39 Wh/m^3. In 2030, without measures, VUs would consume 53 TWh/a of electricity for a total ventilated airflow of 162 Tm^3/a, with an average consumption of 0.33 Wh/m^3. Due to the measures the electricity consumption can be further reduced to 45 TWh/a or 0.28 Wh/m^3 (28% less compared to 2015, 15% less compared to the 2030 situation without measures). The electricity savings of 8 TWh in 2030 (corresponding to 17 TWh primary energy) are expected to further increase to 15 TWh in 2050 (32 TWh primary).

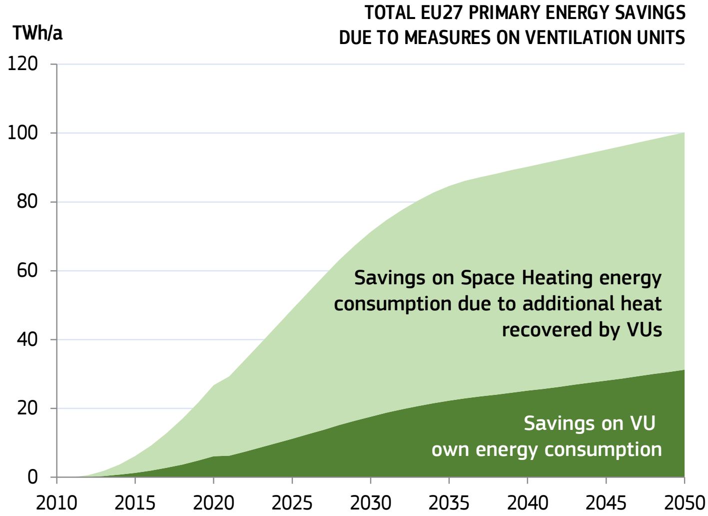
In 2015, VUs recovered 70 TWh of heat from a total of 43 Tm^3/a of air ventilated by balanced VUs in the heating season, with a stock-average heat recovery efficiency of 43%. In 2030, without measures, VUs would recover 109 TWh of heat from 57 Tm^3/a of ventilated air, with an efficiency of 51%. Due to the measures, the recovered heat in 2030 is projected to increase to 158 TWh (+45%) from 60 Tm^3/a of ventilated air (+5%), with a higher heat recovery efficiency of 70%.

The recovered heat difference by VUs in 2030 in the scenario with measures compared to the scenario without measures is 158 – 109 = 49 TWh. This recovered heat difference due to VUs leads to an additional primary energy saving on space heating of 54 TWh/a (with a stock-average primary energy efficiency for space heating in 2030 of 90%, net calorific value). These savings are projected to increase to 69 TWh/a in 2050.

Consequently, the net positive effect in 2030 of Ecodesign measures on VUs is 71 TWh/a of primary energy. This is 4% of the total expected primary energy consumption for space heating in 2030.

The electric energy saving corresponds to a reduction in greenhouse gas emissions in 2030 of 1.2 Mt CO_2eq/a. An additional 7.6 Mt CO_2eq/a come from induced savings on space heating.

TOTAL EU27 PRIMARY ENERGY SAVINGS DUE TO MEASURES ON VENTILATION UNITS



SAVINGS ON EXPENSES

In 2015, the EU27 spent 18 bn euros on purchase and installation of ventilation units (of which 17 bn euros in the non-residential sector). Without Ecodesign measures this would increase to 21 bn euros in 2030 (+18%), mainly due to an increase in sales quantities. Ecodesign measures will result in 0.7 bn euros extra for acquisition of VUs in 2030 (higher price for products with higher efficiency).

The total EU27 energy costs related to VUs in 2030 are expected to drop by 5.9 bn euros due to the Ecodesign measures (1.7 bn euros due to lower electricity costs for VUs and 4.2 bn euros due to lower energy costs for space heating).

Consequently, the net expenditure saving due to Ecodesign measures for VUs is 5.2 bn euros in 2030, increasing to a projected 8.4 bn euros in 2050.

Electronic Products

Electronic displays

Set top boxes

Computers

Video (game consoles)

External power supplies

Standby

Imaging equipment

Servers and data storage products

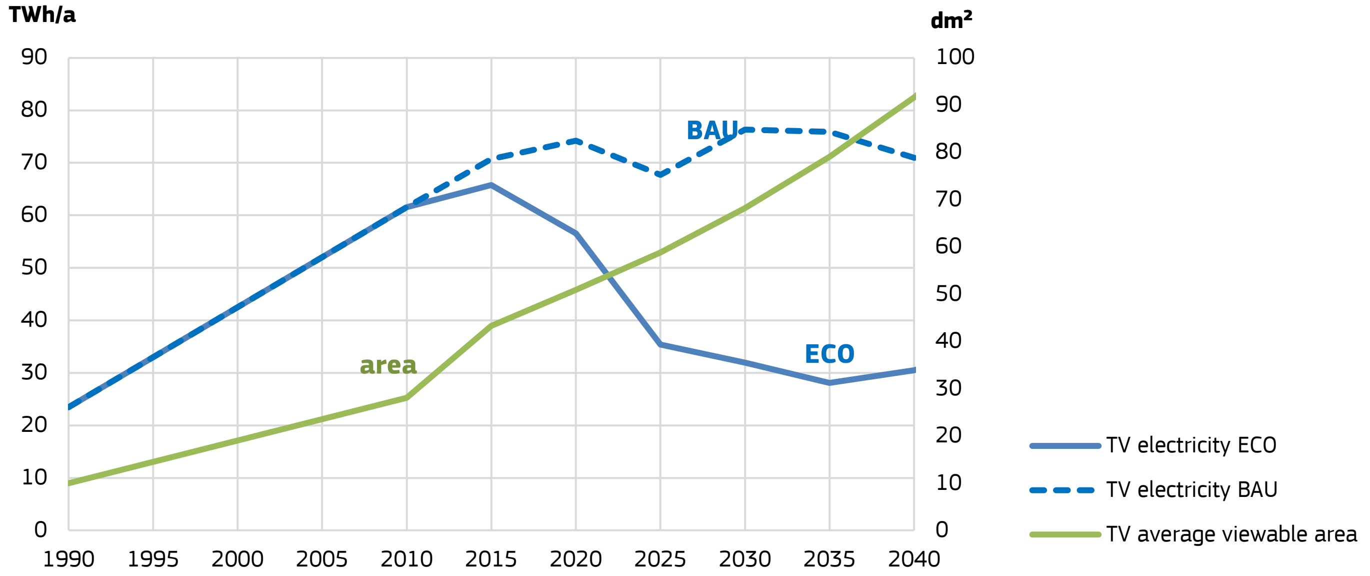
Electronic displays

GENERAL INFO

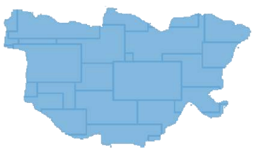
The December 2019 regulation revision expands the scope from televisions to electronic displays in general, including also computer displays (monitors) and signage displays. Excluded are e.g. small displays (<100 cm²), digital photo frames, projectors, medical displays and status displays.

ELECTRICITY CONSUMPTION

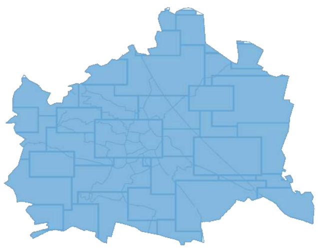
TOTAL EU27 ON-MODE ELECTRICITY CONSUMPTION FOR TVS VS. AVERAGE VIEWABLE DISPLAY AREA



The total demand for displays in Europe is rapidly growing. The total viewing area of televisions and pc monitors in 2020 was 242 km², larger than the surface area of the city of Amsterdam. In 2030. This viewing surface area is expected to increase to 398 km², and comparable with the surface area of Vienna.

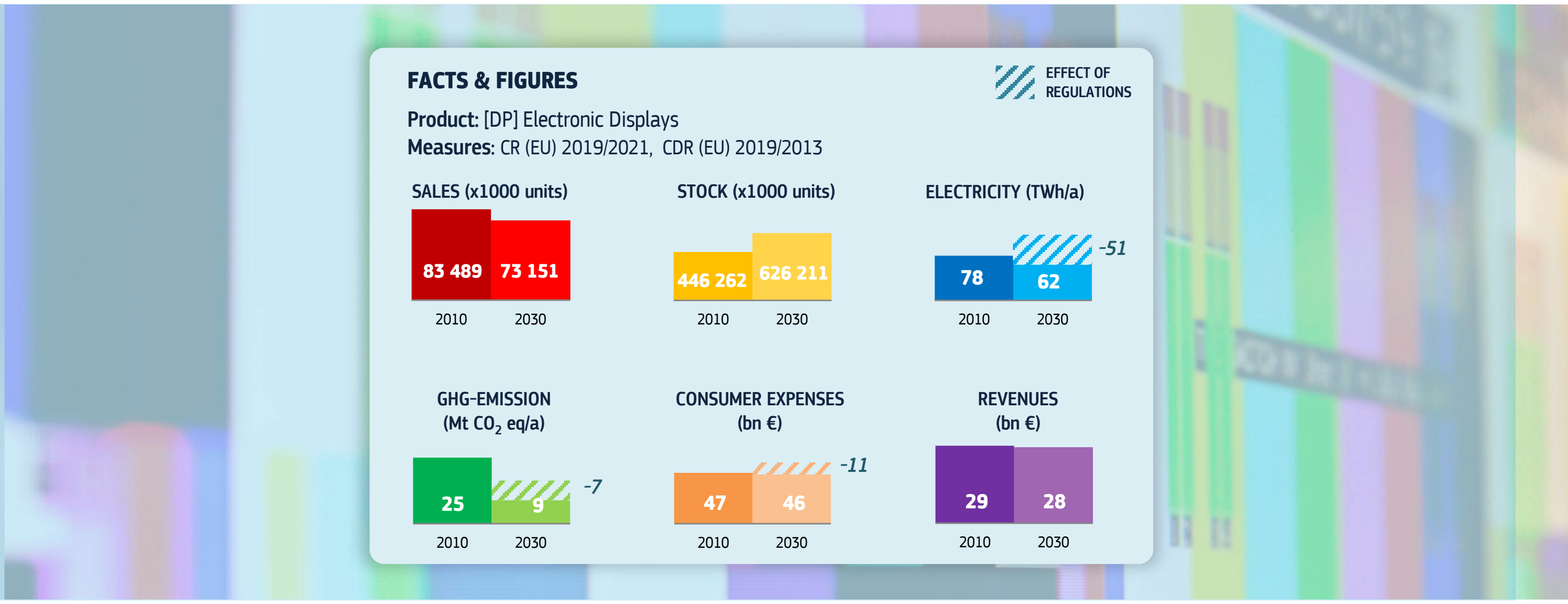


AMSTERDAM



VIENNA

Electronic displays



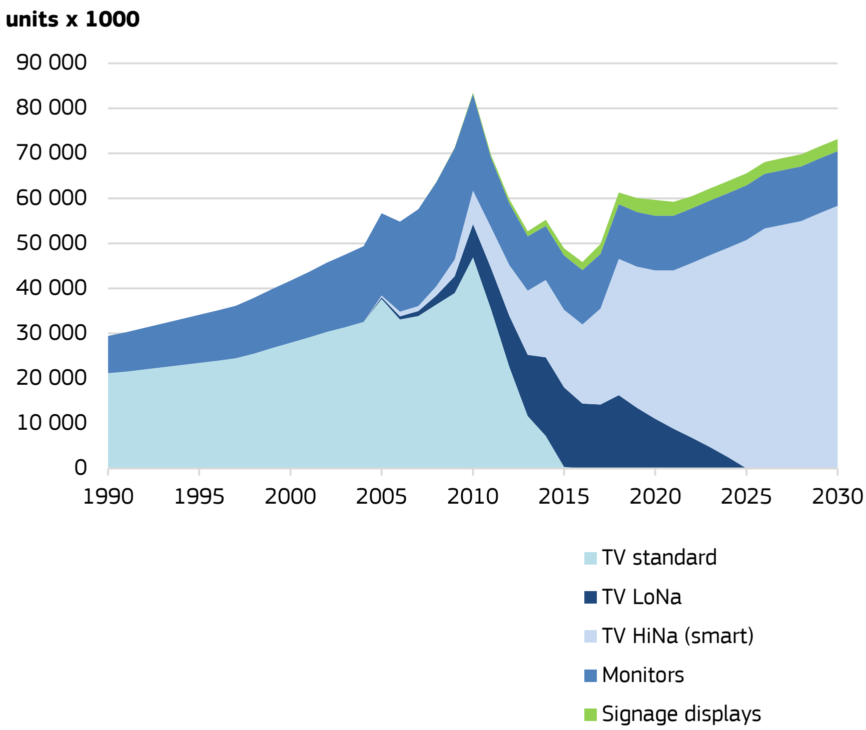
SALES

EIA distinguishes three TV types, PC monitors and Signage displays. TVs are split up in standard (NoNa), low network availability (LoNA) and high network availability (HiNA or Smart) types. Sales of all types experienced a sharp increase in 2007-2008 with the introduction of new affordable LCD technology, followed by a decrease in 2011-2012.

From 2005 onwards, the LoNA and Smart TVs have had significantly increasing sales numbers. LoNA TVs work with a complex set top box (CSTB) which provides the information content. In Smart TVs this technology is integrated, so that the device can be directly connected to a network to get its content.

In 2020, around 11 million LoNA TVs are sold and 32 million smart TVs. The annual sales of LoNA TVs are expected to drop to zero in 2025, while those of Smart TVs will increase to 50 million (+54%). PC monitors are expected to have constant sales of 12 million units from 2013 onwards, with the declining sales of desktops. The multi-connectivity of monitors and TVs (usable as an external screen for a laptop or desktop as well) makes displays become more interchangeable.

TOTAL EU27 SALES OF ELECTRONIC DISPLAYS



Electronic displays

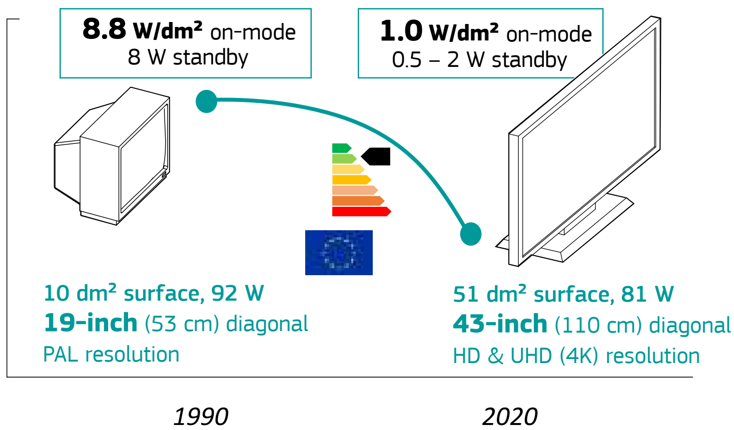
EFFICIENCY

Despite the increasing stock and size of displays and the addition of functionalities, their total electricity consumption is expected to decrease from 84 TWh/a in 2015 to 62 TWh/a in 2030.

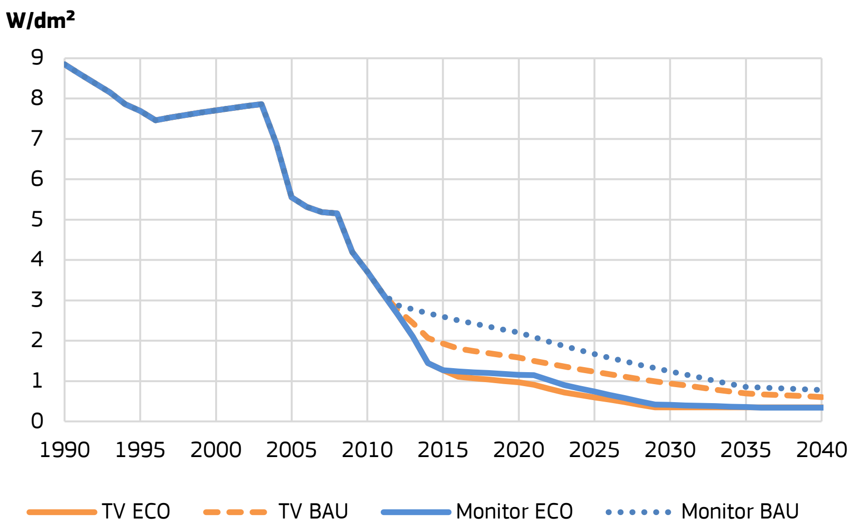
Over the past decades, the power consumption (in on-mode) per unit display area has been rapidly decreasing. In 1990, TVs and Monitors consumed 9.2 W per dm^2 display surface. In 2020 this dropped to 1.6 W/dm^2. The prognosis for 2030 and later is that specific power consumption will further reduce to 0.4 W/dm^2 for both display types.

As the power consumption in on-mode drops, the power consumption in standby-mode becomes relatively more important. In 2020 10% of the overall energy consumption of displays was consumed in standby-mode, but this is expected to increase to 18% in 2030. Due to the regulations, the standby power consumption of smart TVs is expected to decrease from 6.4 W in 2015 to 4 W in 2030.

Televisions



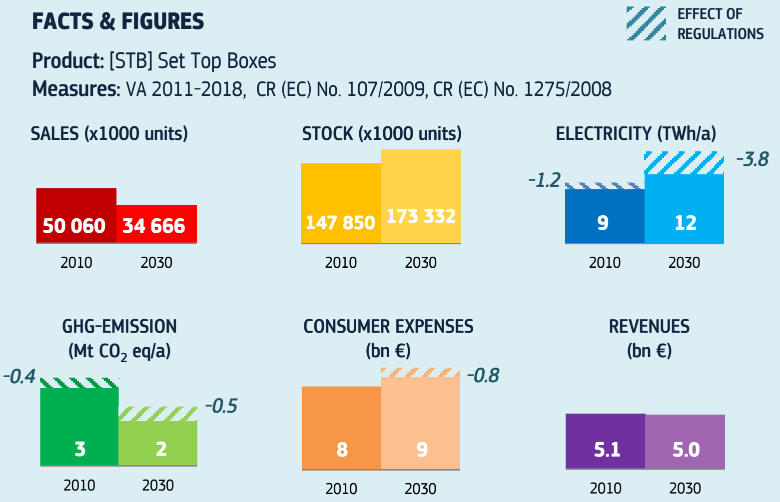
AVERAGE ON-MODE EFFICIENCY FOR TVS AND MONITORS



Set top boxes

FACTS & FIGURES

Product: [STB] Set Top Boxes
Measures: VA 2011-2018, CR (EC) No. 107/2009, CR (EC) No. 1275/2008



GENERAL INFO

Older TV-sets were designed to process and display analogue video and audio signals. However, modern broadcasting uses digital signals. A **Simple Set Top Box** (SSTB) is a standalone device that converts free-to-air digital broadcast signals to analogue signals suitable for analogue television or radio. However, SSTBs do not have a 'conditional access' function. If the STB has, amongst others, also the functionality to decrypt signals for which a user has to pay or to be authorised, it becomes a **Complex Set Top Box** (CSTB).

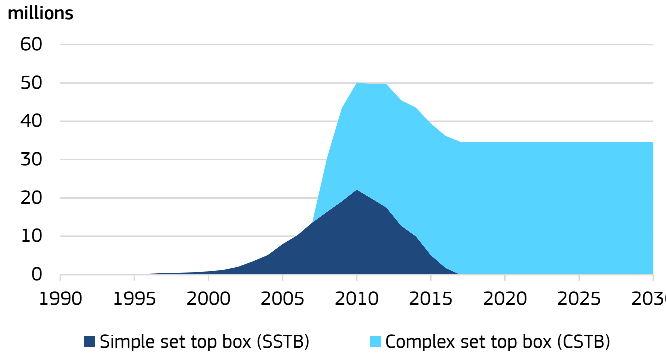
SSTBs are subject to Ecodesign regulation 107/2009, while for CSTBs there is an Ecodesign Voluntary Agreement (VA). CSTBs are also subject to the standby regulation 1275/2008. The VA defines the differences between SSTB and CSTB (see https://cstb.eu).

SALES

SSTBs have been sold in an analogue-to-digital transition period, from 2000 to 2016, with a peak of 22 million units in 2010. They are disappearing from the market because their functions are already integrated in modern TVs.

CSTB sales started around 2008, quickly increased to 34 mln units per year, and in EIA are assumed to remain more or less stable around 34 mln units per year over 2015-2030.

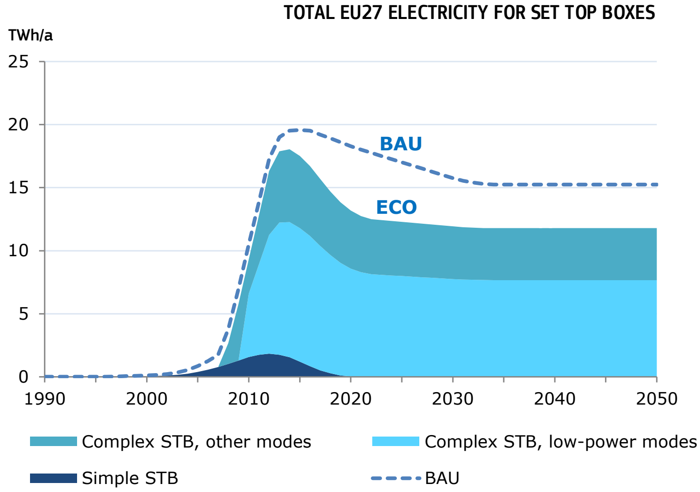
TOTAL EU27 SALES OF SET TOP BOXES



ELECTRICITY CONSUMPTION

In 2020, CSTBs consumed 13 TWh/a of electricity, of which 8.6 TWh in low-power modes. With respect to the situation without the VA and the standby regulation, this is a saving of 5.1 TWh/a (of which 3.3 TWh low-power modes). From 2035 onwards, the positive effect of the measures is expected to stabilise around 3.5 TWh/a (-30%).

TOTAL EU27 ELECTRICITY FOR SET TOP BOXES



Computers

GENERAL INFO

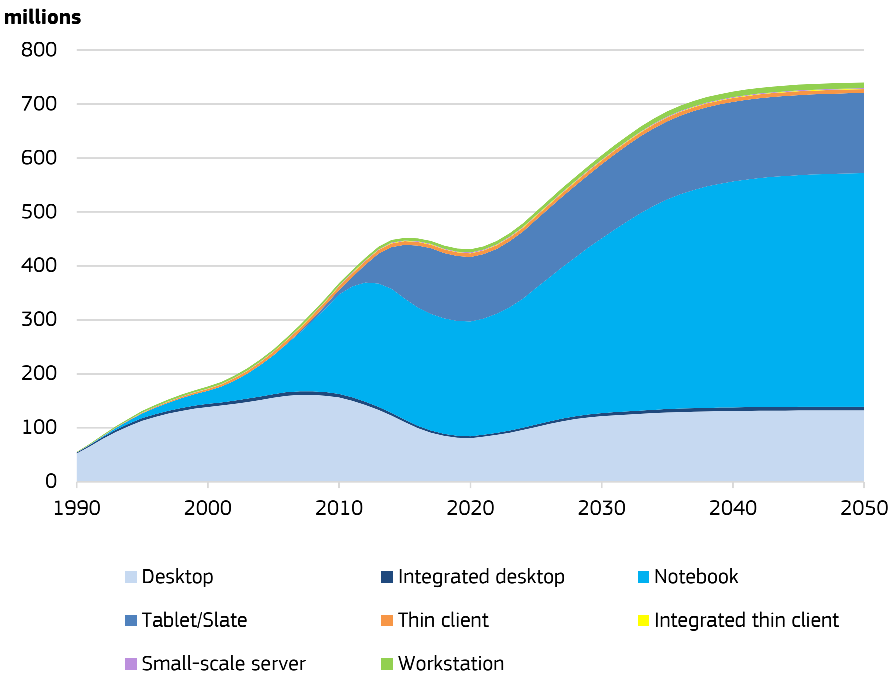
Personal computers (PCs) comprise desktops, notebooks, tablets, thin clients and workstations. Technology and consumer habits in this product group are changing very quickly, making it difficult to regulate. Currently, energy efficiency measures are implemented amongst others through Ecodesign and the voluntary EU ENERGY STAR programme where the EU has worked together with the USA. In the past many desktops have been replaced by notebooks and more recently tablets are replacing them or employed as a secondary device.

STOCK

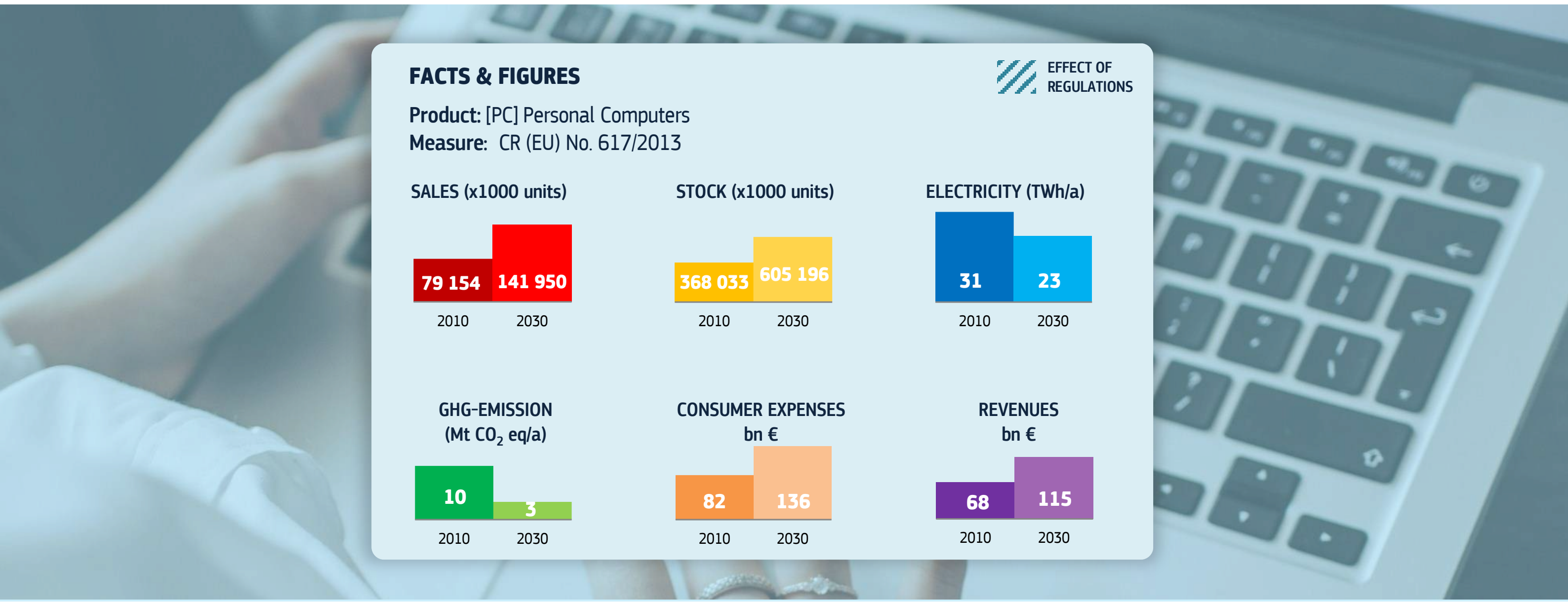
It is estimated that in 2020 there are around 431 million PCs in use, of which 20% desktops, 49% notebooks and 23% tablets. Thin clients, i.e. terminal-like computers that largely or exclusively depend on servers or cloud computing, and workstations, i.e. high-end computers for advanced computing tasks, are very specific niche markets with less than 17 million units (3% of all PCs). For comparison: in 1990, roughly marking the start of public internet use in Europe, less than 56 million (mainly desktop) PCs were in use.

By 2030 the stock of products is expected to reach 605 mln. The share of notebooks will increase up to 54% of all products. Desktops (21%) and tablets (22%) shares will stay relatively constant. Workstations and thin clients will have stable sales numbers as well, leaving their stock share in 2030 at only 2.5%.

TOTAL EU27 STOCK OF COMPUTERS



Computers



ELECTRICITY

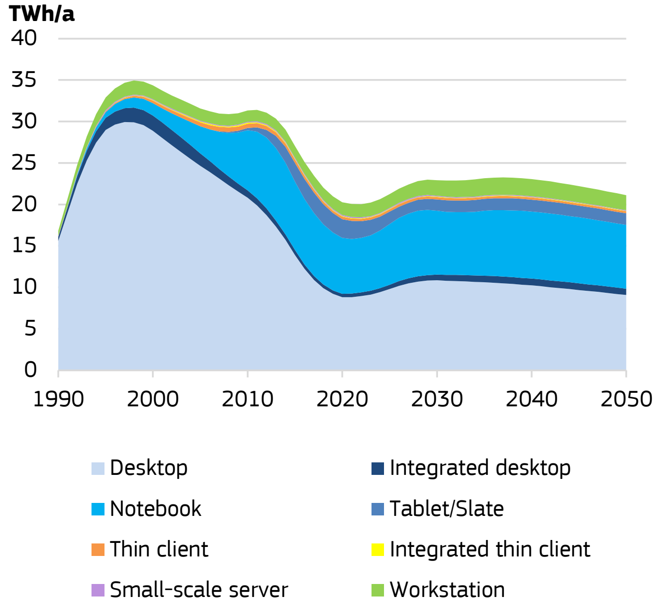
In the years from 1990 to the early 2000s, the sales of desktop computers increased to its peak. After this peak in desktop sales, laptops gained popularity. Since the average energy consumption of laptops is approximately a third of a desktop, the total electricity consumption is decreasing. A similar situation occurs in the 2010-2020 period, where laptops are replaced by tablets or slates, again reducing the average electricity consumption to a third. Meanwhile, notebook technologies also find their way into desktops, leading to more energy efficient desktops as well. This explains the decrease in electricity consumption up to 2020, even without the effects of Ecodesign measures included.

EFFICIENCY

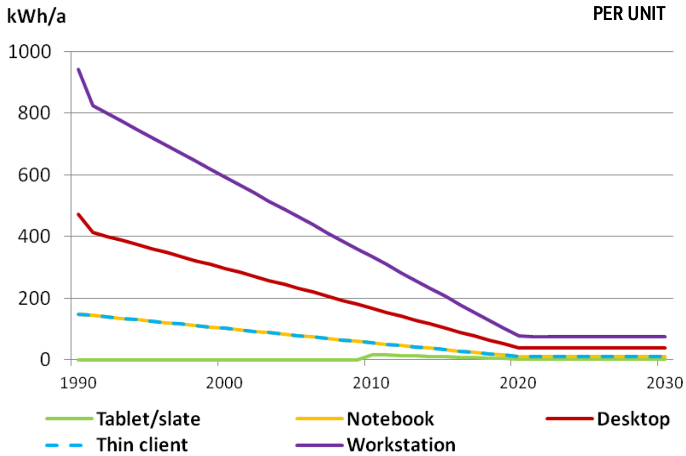
Energy-efficiency improvement of PCs, currently including a large share of battery-operated hardware, has been spectacular as the graph on annual electricity consumption per device shows.

Despite a tenfold growth in numbers since 1990, the total EU27 electricity consumption in 2020 (20 TWh/a) is barely 18% more than in 1990 (17 TWh/a). For 2030 an additional rise of +3 TWh/a electricity consumption is foreseen for a stock growing with +40%.

TOTAL EU27 ELECTRICITY CONSUMPTION OF COMPUTERS



AVERAGE ANNUAL ELECTRICITY CONSUMPTION OF COMPUTERS PER UNIT



ELECTRONIC PRODUCTS

Video (game consoles)

GENERAL INFO

Under the heading ‘VIDEO’, EIA reports only data on game consoles. For other products addressed in Ecodesign ENTR Lot 3 ‘Sound and Imaging Equipment’, i.e. video players and recorders (e.g. from DVD, Blu-Ray) and video projectors (as used in schools, offices, homes), only standby is regulated in Ecodesign, and being reported in EIA under the Standby heading.

REGULATION

The power consumption of game consoles in standby mode is subject to Ecodesign regulations 801/2013 (networked standby) and 1275/2008 annex II (standby).

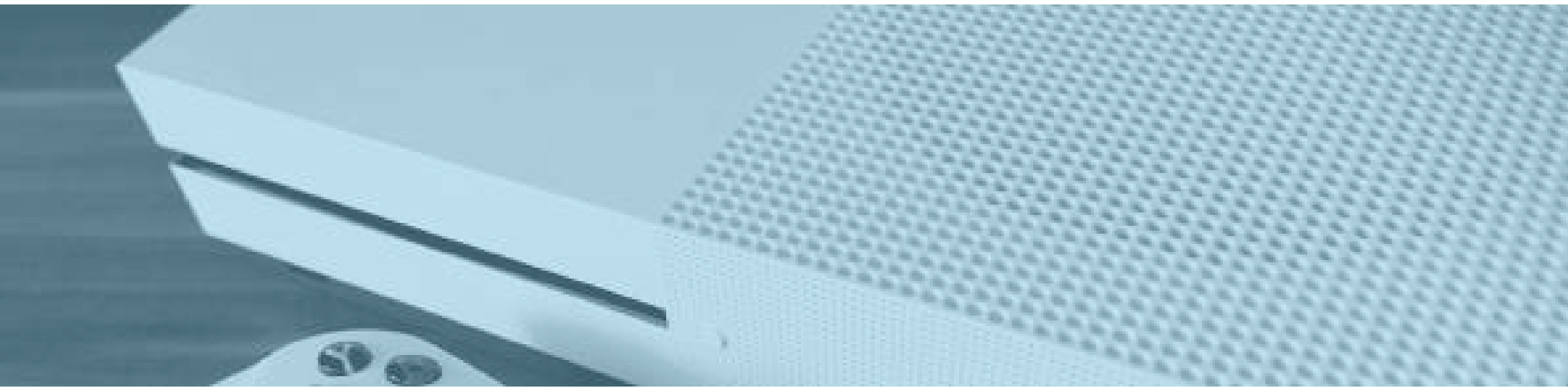
For other power consumptions, game consoles are regulated under the Ecodesign Self-Regulatory Initiative that started in 2015. This SRI sets requirements for the auto-power down (APD) function and for the maximum power during console operation in navigation or media-playback mode. The power for gaming mode is not regulated in the SRI.

SALES AND STOCK

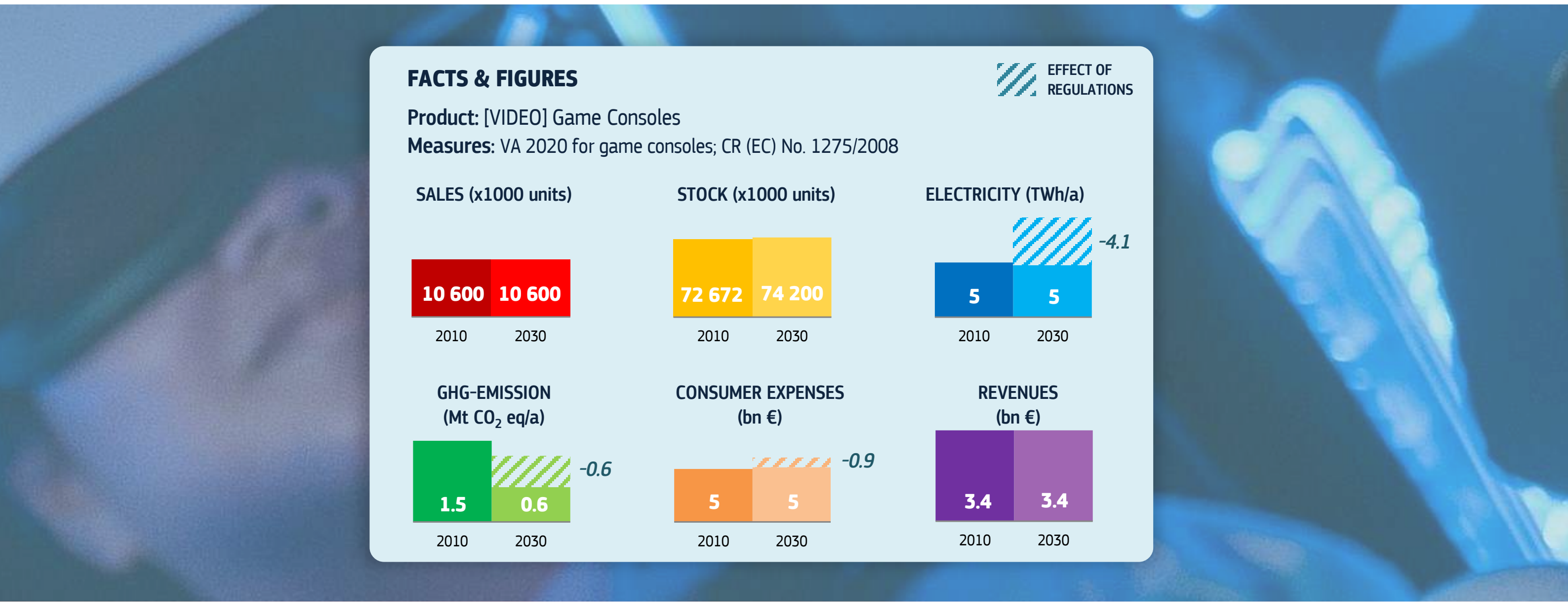
Sales of game consoles are expected to remain stable at 10.6 mln units per year, corresponding to an installed stock of 74 mln units. Every few years new models are introduced and many consumers tend to substitute their console with the ‘next generation’ model.

ELECTRICITY CONSUMPTION

The electricity consumption by game consoles is increasing, from 4.7 TWh/a in 2010, to 5.1 TWh in 2020 and expected 4.5 TWh in 2030. The initial rise is partly due to an increase in functionality (and thus power) of new models. As this added functionality becomes standard, technology improvements result in lower electricity consumption in following generations. Savings due to SRI and standby regulations are estimated to be stable at 4 TWh/a from 2020.

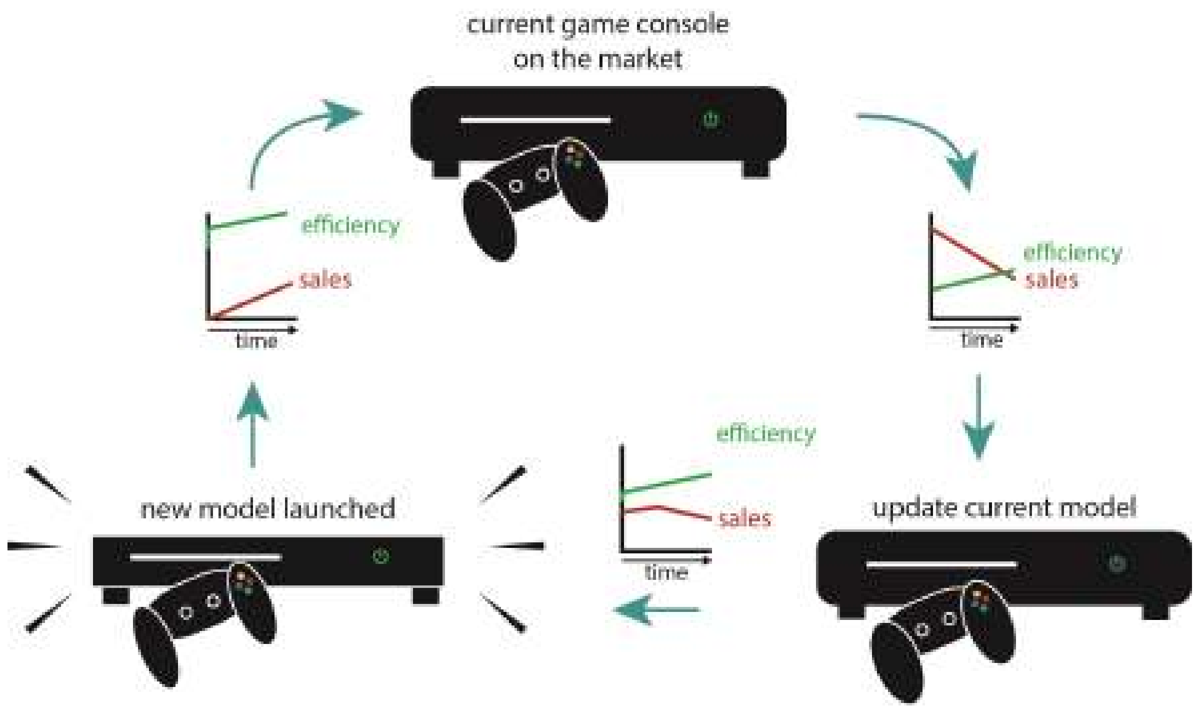


Video (game consoles)

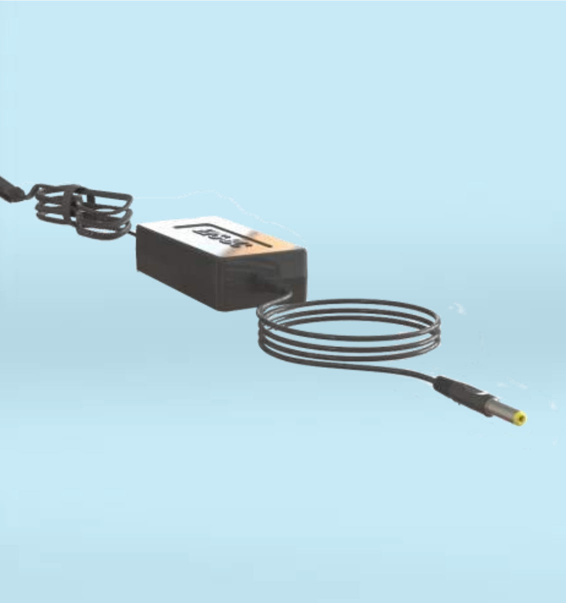


GAME CONSOLES

As a general trend, manufacturers launch a new version of their product every 6-8 years. In the gaming world, older consoles are soon 'old fashioned', no longer delivering the desired graphic performance. New technologies, better graphics and faster processing speed can be offered, but at the price of higher electricity consumption. Hence, new models initially tend to consume more. In the years following a new product launch, efficiency is then often gradually improved. This repeating product development cycle explains the ups and downs in the average annual electricity consumption per console.



External power supplies



GENERAL INFO

External Power Supplies (EPS) are devices used to supply electricity to, and to charge built-in batteries of, electronic and electric devices ("primary load products") such as laptops, mobile phones, tablets, MP3 players, electronic cigarettes, electric tooth brushes, electric shavers, etc. For products without built-in batteries, they serve as the main continuous source of power – for example standalone loudspeakers or computer network equipment such as modems and routers. The EPSs are not the same as battery chargers, which charge batteries in isolation (extracted from the product), and which are exempted from Ecodesign Regulation.

An EPS transforms the voltage supplied by an electric socket, normally at 230 V, to a lower voltage level suitable to the primary load product – often between 5 V and 20 V. It also often rectifies the Alternating Current (AC) from the electric socket to Direct Current (DC) typically used for portable electric and most electronic products. An EPS is contained in a physical enclosure separate from the device that constitutes the primary load, and it is connected to that device via a removable or hard-wired male/female electrical connection, cable, cord or other wiring.

Only EPS with nameplate output power not exceeding 250 Watts are in scope of Ecodesign.

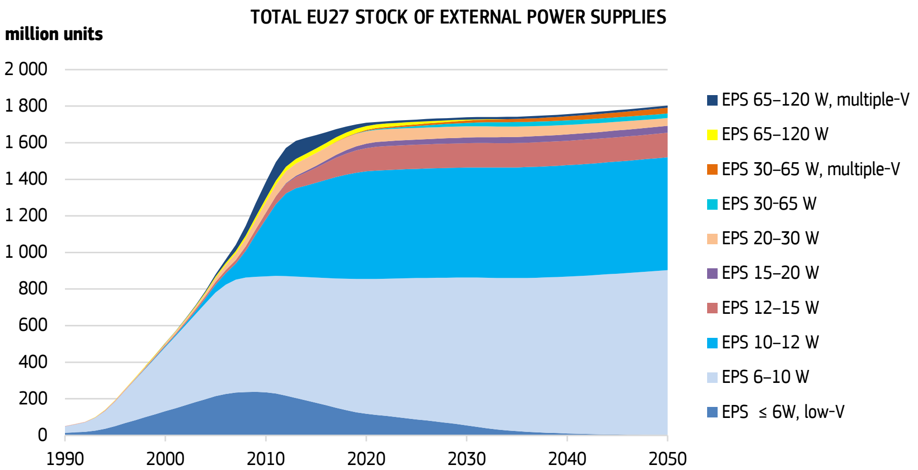
REGULATION REVIEW

Ecodesign regulation 278/2009 sets requirements for EPS, in particular as regards the electric power consumption in no-load condition (EPS attached to the 230 V mains but not supplying power to the equipment), and the average active efficiency (power-output/power-input) when supplying power to the equipment. The regulation does not cover the charge/discharge efficiency of the batteries that may be contained in the equipment.

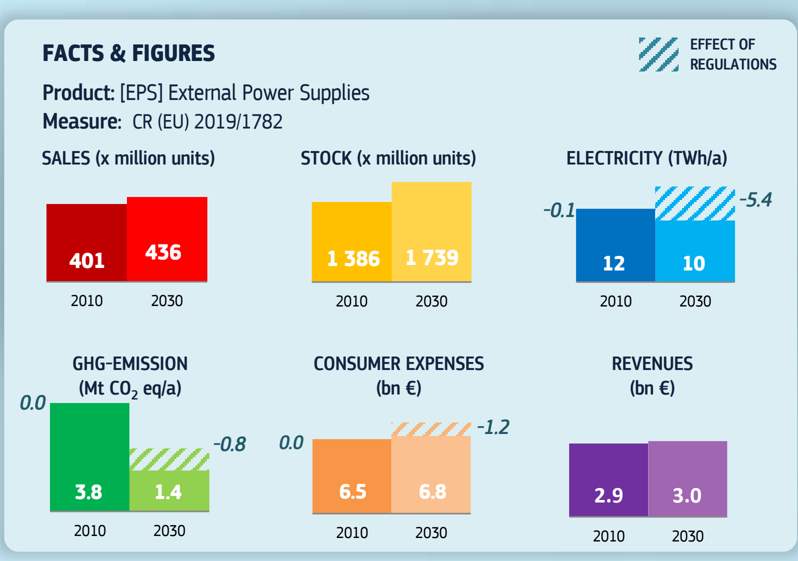
This regulation was reviewed, leading to a new regulation in 2019, adding multi-voltage output EPS to the scope and setting more stringent requirements for the no-load power consumption and for the active efficiency, aligning the requirements with those in force in the USA.

STOCK

Since 1990 there has been a fast increase in number of EPSs in use, reaching around 1.4 billion units in 2010 and 1.7 billion in 2020. For later years, the number is assumed to remain more or less constant. The largest contribution to the stock comes from EPSs with 6 to 12 W output power.



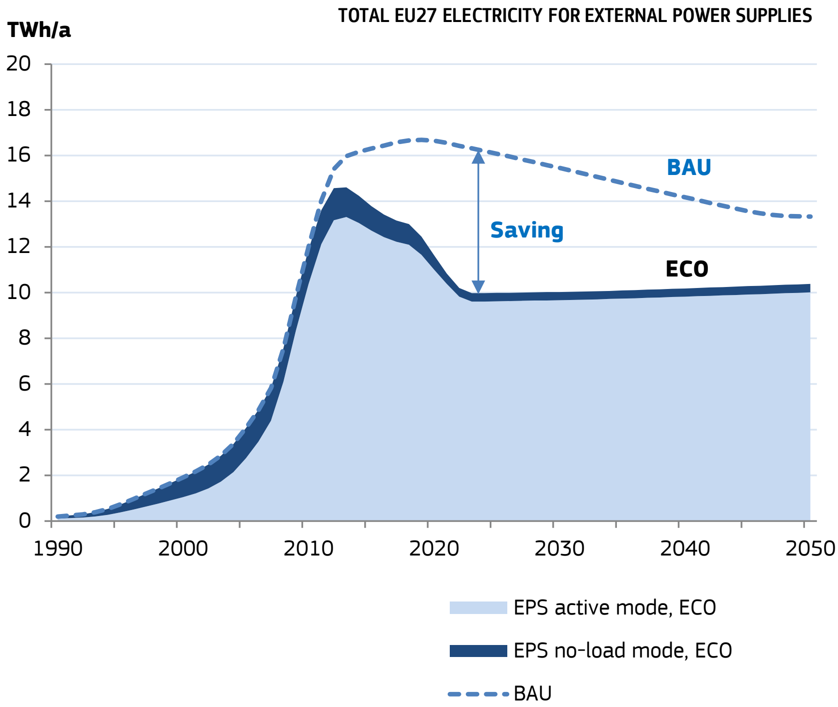
External power supplies

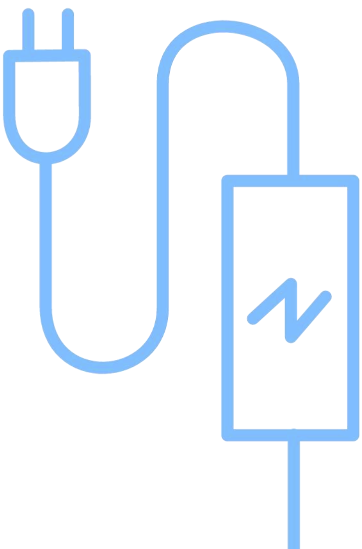


EPS IN ECODESIGN IMPACT ACCOUNTING

In active mode, EPSs pass on a large part of their input power to the connected primary loads, which in several cases are also accounted separately in EIA. Therefore, EIA considers only the active EPS losses (input minus output), not the entire electricity input.

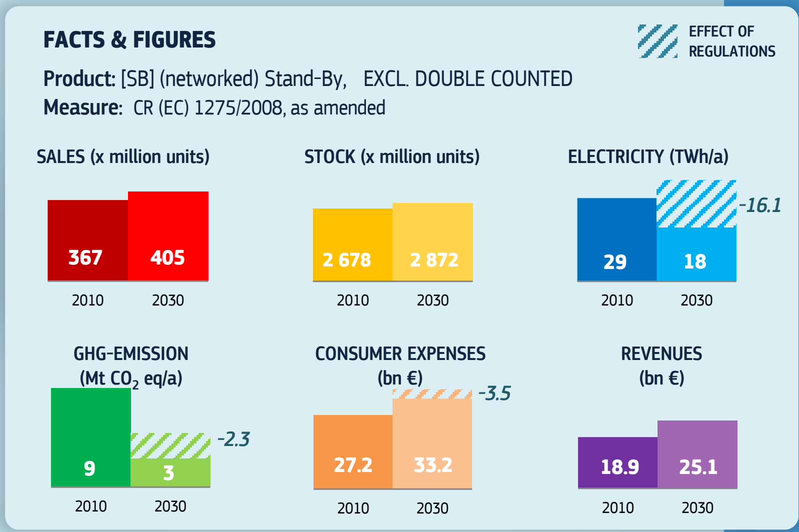
In 2020, EPS consumed 11.6 TWh of electricity of which 0.6 TWh in no-load mode, but half of this is already accounted in EIA for the primary load products.





ELECTRONIC PRODUCTS

(Networked) Standby



GENERAL INFO

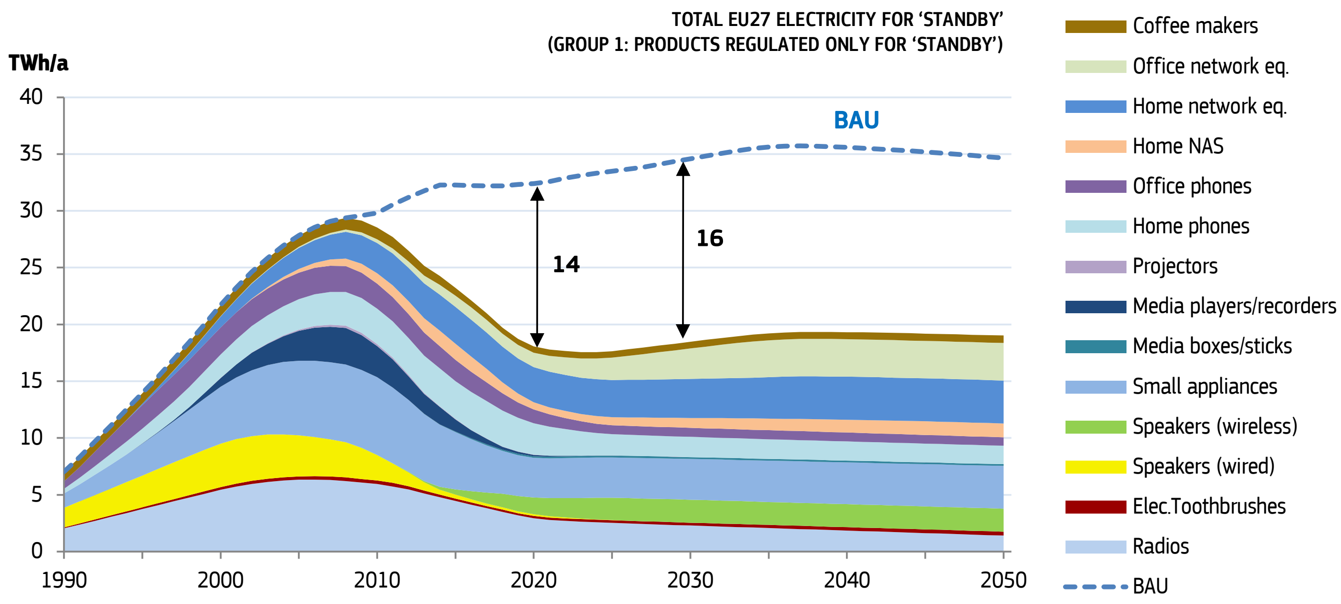
The 2008 Ecodesign regulation on energy consumption in 'off' and various 'standby' modes was designed as a horizontal piece of legislation, covering a myriad of relevant electronic and electrical products. In 2013 the regulation was updated to include also 'networked standby' and add rules on standby of household coffeemakers. In parallel, the policy on standby regulation has changed from a horizontal to a vertical approach. This means that requirements on 'standby' are now gradually being made part of product-specific Ecodesign regulations when available, and the corresponding parts are then removed from the standby-regulation.

'Standby' (SB) data in EIA are split in two groups (see graphs below for the products included):

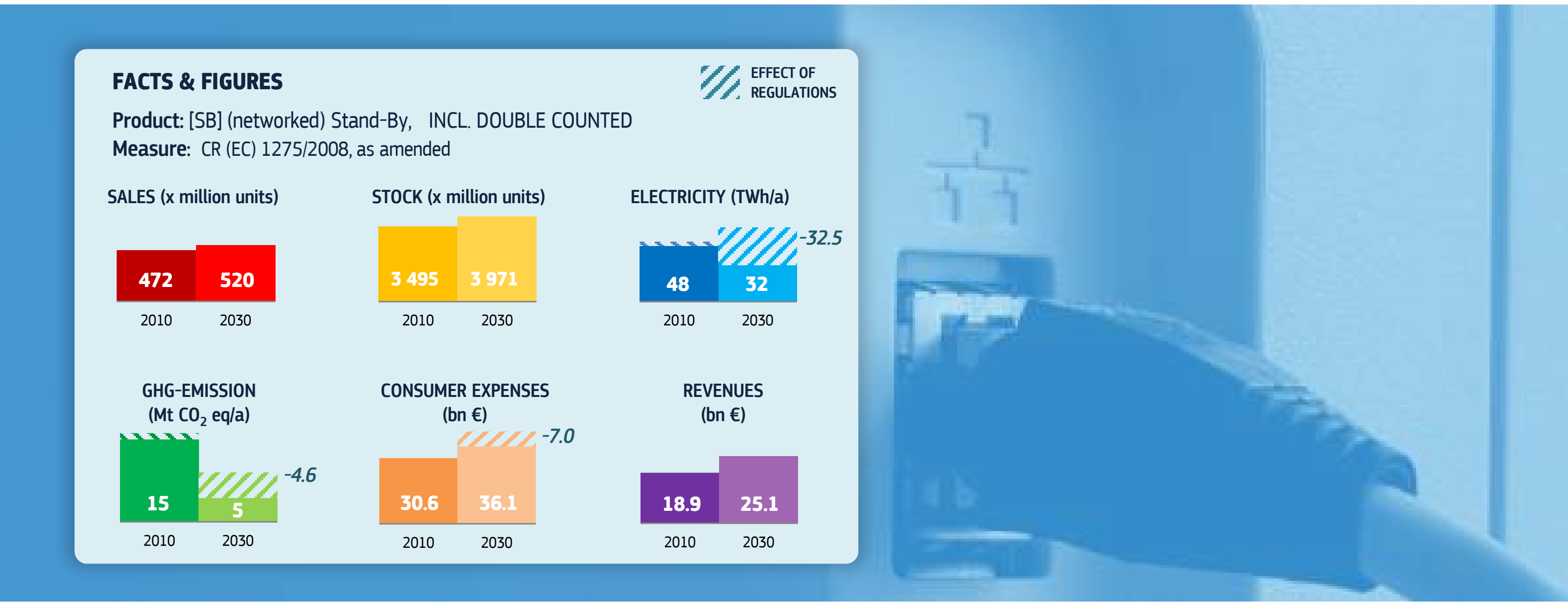
(1) Products for which only 'standby' is regulated in Ecodesign. Data for these products are reported directly under the SB heading and accounted in EIA totals as normally (excluding double-counted).

(2) Products for which both 'standby' and active/on-modes are regulated. Data for these products are reported primarily under the heading of the corresponding product group. They are also reported under the SB heading, but for information only, and signalled as being double-counted. These data are not taken into account (again) when computing EIA totals.

EIA reports two totals for SB: for group (1), excluding double-counted amounts, and for groups (1) and (2) together, including double-counted amounts. The latter value is more representative for the overall impact of regulation 1275/2008 (as amended).



(Networked) Standby

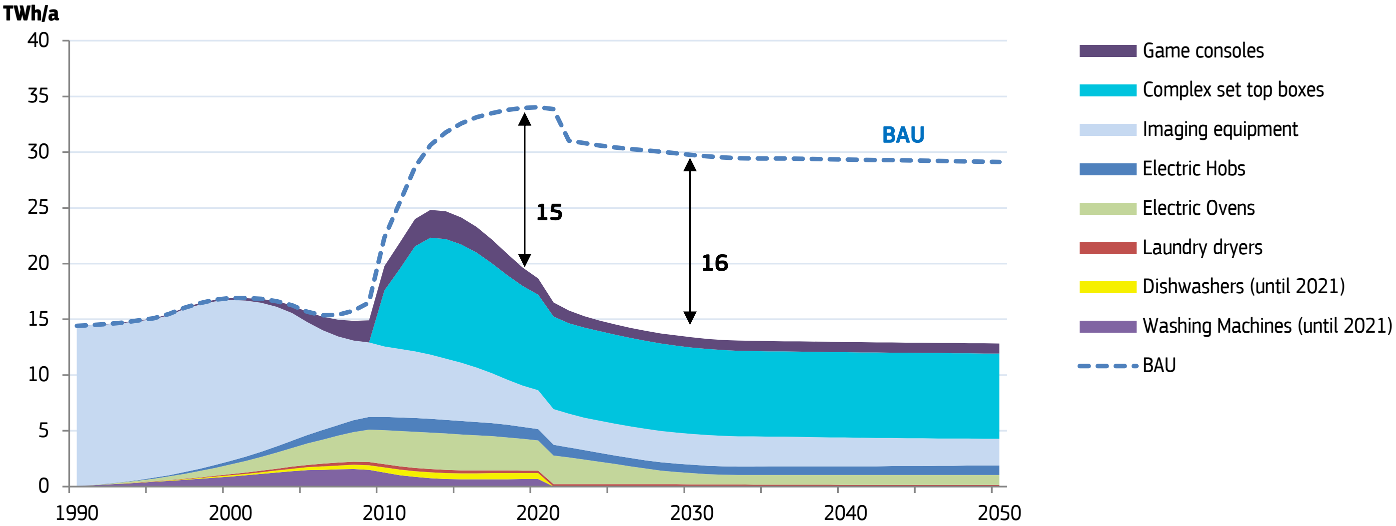


ELECTRICITY CONSUMPTION

In 2008, when the standby regulation was adopted, the products in scope of the regulation consumed 45 TWh/a of electricity in 'off' or (networked) 'standby' mode. In the BAU scenario, this would have increased to 66 TWh/a in 2020, but due to the measures taken it has been reduced to 37 TWh/a: a saving of 29 TWh or 44%. In 2030 the savings are projected to increase further to 32 TWh/a, even when removing washing machines and dishwashers from the scope.

The main contributors to the 2020 savings are imaging equipment (5.4 TWh), small appliances (3.9 TWh), complex set top boxes (3.3 TWh), electric ovens (2.2 TWh), wireless audio speakers (1.8 TWh) and radios (1.5 TWh).

TOTAL EU27 ELECTRICITY FOR 'STANDBY'
(GROUP 2: PRODUCTS REGULATED FOR 'STANDBY' AND ON-MODE)



Imaging equipment

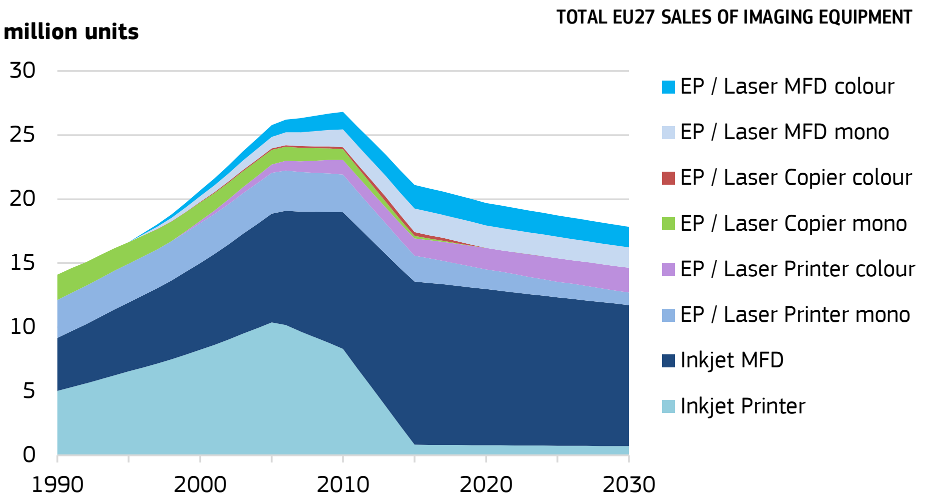
GENERAL INFO

Imaging equipment includes single functionality devices (SFD) such as printers and copiers as well as multi-functional devices (MFD). Main printing technologies are electrophotography (EP or 'laser') and inkjet (IJ). Imaging equipment is subject to an Ecodesign Voluntary Agreement (EuroVAPrint.org) and was part of the (voluntary) EU ENERGY STAR labelling programme. In addition the equipment is subject to the standby regulation. The global market for this equipment is dominated by a handful of Japanese and US manufacturers and thus a voluntary agreement aiming at saving energy and paper resources was deemed an adequate solution.

SALES

Of the eight Imaging Equipment product types included in EIA, the multifunctional inkjet printers have the highest share since 2008. In 2020 sales of multifunctional inkjets are 12 million units (62%).

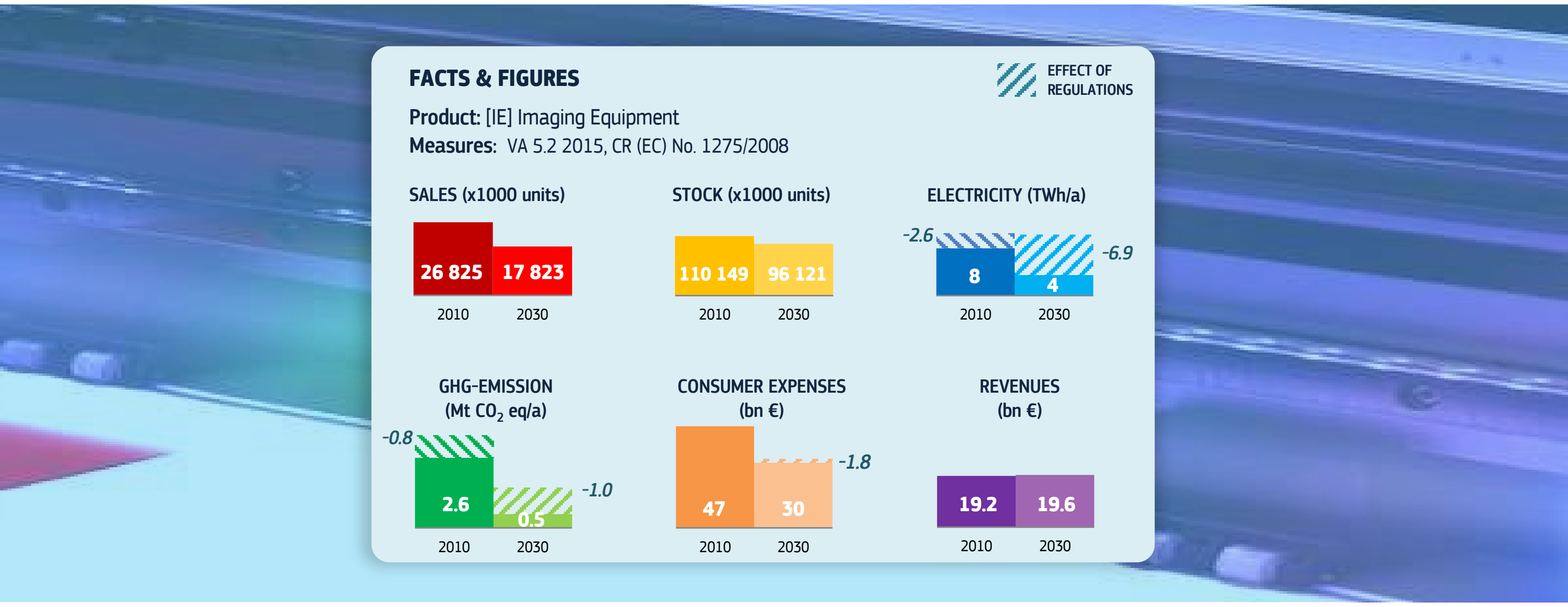
Laser Copiers are expected to disappear from the market in 2020. In general, since 2010, sales of imaging equipment are declining, and also the number of images printed per year per device is decreasing.



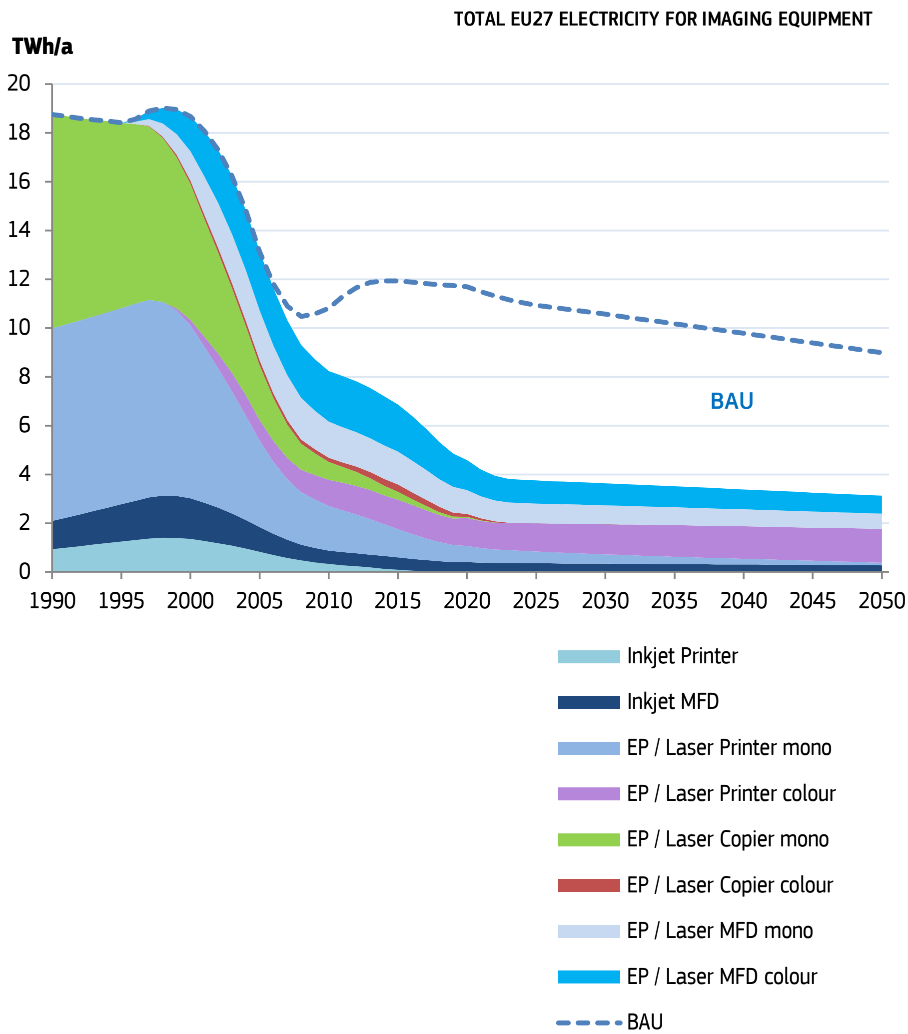
OPERATIONAL COSTS

In 2020, user expenses related to imaging equipment amount to 37 bn euros (€350 per device), of which 12.9 bn euros for acquisition of the equipment and 24.5 bn euros (66%) for running costs. Of the latter, 11.1 bn euros were spent for ink and toner, 3.7 bn euros for paper, 8.8 bn euros for repair and maintenance and 'only' 0.9 bn euros for electricity costs. Without measures, the electricity costs in 2020 would have been 1.3 bn euros higher (more than double), and the paper costs 0.6 bn euros higher, a saving of €17 per device.

Imaging equipment



ELECTRICITY CONSUMPTION



Despite the continuously growing stock until 2010, the EU27 electricity consumption of imaging equipment has been decreasing, in particular since year 2000. Pushed by policy measures and enabled by advancements in electronics and printing technology, the electricity consumption has dropped from 19 TWh/a in 1990 to under 5 TWh/a in 2020. The electricity consumption is projected to drop further to below 4 TWh/a in 2030, also due to a decrease in sales and stock and a decrease in number of prints per device.

The annual number of prints ('images per year, ipy') increased from 595 billion in 1990 to 832 billion in 2010 (+40%), but then decreased to 505 bn ipy in 2020. A further decrease to 'only' 322 billion ipy is projected for 2030.

Through increased duplexing and N-print, 0.2 Mt/a of paper is saved in 2020. The energy for paper production, even taking into account recycling, represents the highest energy impact at an estimated 15 TWh/a of primary energy in 2020. In that sense, the paper reduction due to measures saves 2.6 TWh/a in paper production versus a Business-as-Usual scenario without those measures.

Servers and data storage products

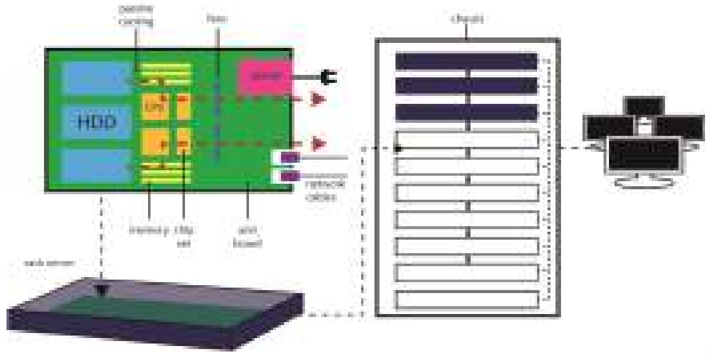
GENERAL INFO

'Computer server' (or Enterprise Server, ES) means a computing product that provides services and manages networked resources for client devices, such as desktop computers, notebook computers, desktop thin clients, internet protocol (IP) telephones, or other computer servers. It is typically placed on the market for use in data centres and office/corporate environments, and primarily accessed via network connections, not through e.g. keyboard or mouse.

Some servers were covered by CR 617/2013 (Computers), but since 2019 medium-sized servers and online data storage products have their own regulation CR 2019/424 (small-scale servers remain in CR 617/2013; very large servers with >32 slots are exempt).

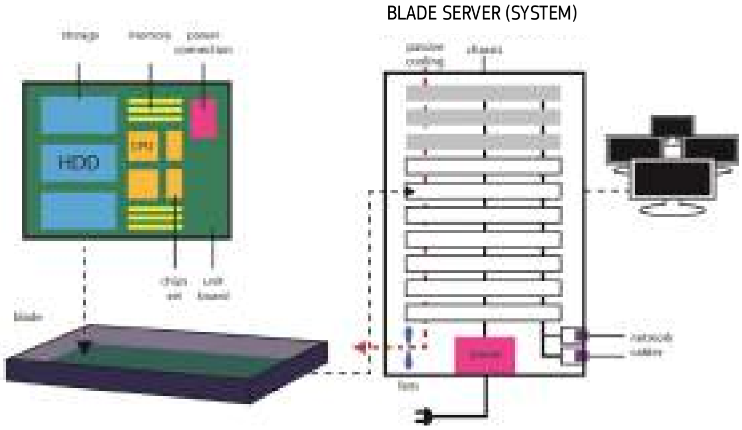
EIA base cases for servers depend on their configuration (tower, rack, blade), number of sockets (1, 2, 4), resilience (yes/no, extensive reliability, availability, serviceability, scalability), and access type (traditional or cloud). Rack-, blade- and data storage servers are shortly and schematically explained below.

RACK SERVER (SYSTEM)



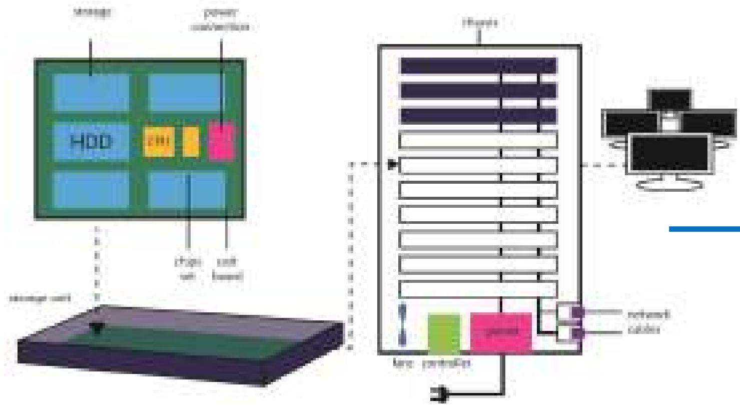
Rack servers are stand-alone devices, comprising all necessary components to operate. The rack servers can be stacked in a standardised U-rack (hence their name), for ease of management and interconnection for combined computing power.

BLADE SERVER (SYSTEM)



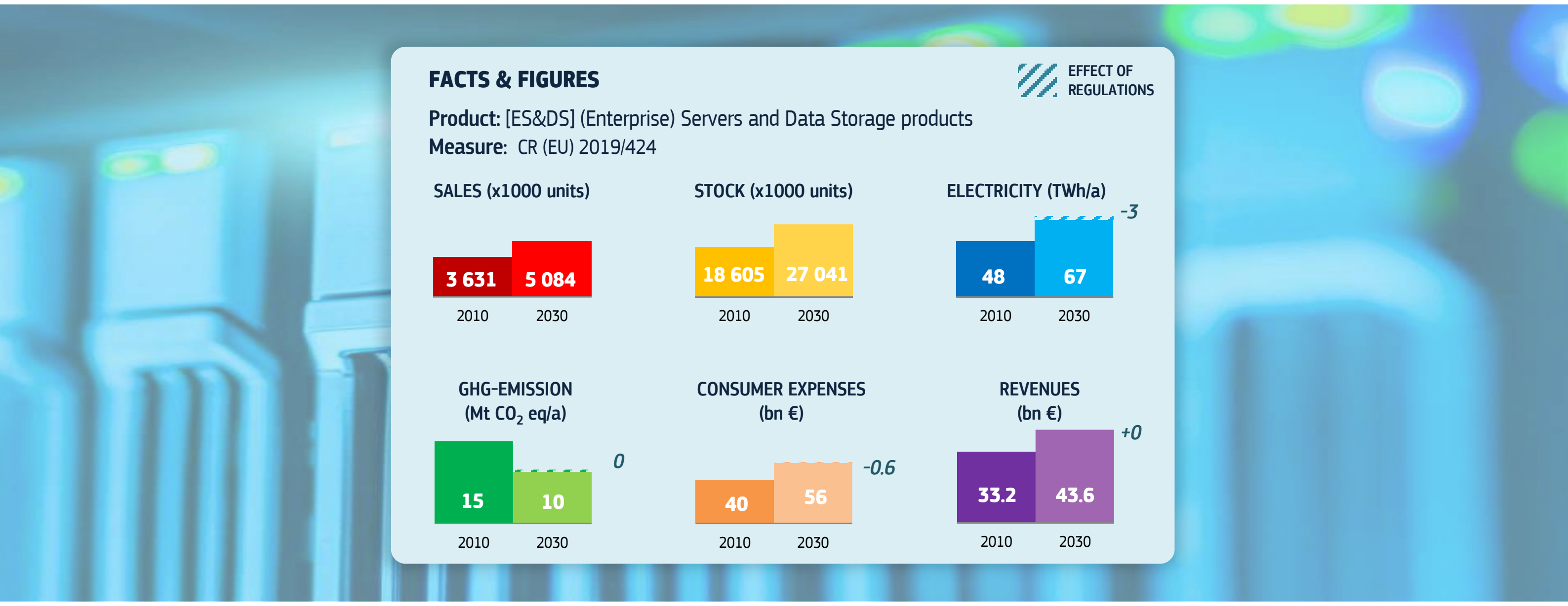
Blade servers consist of a single chassis and multiple blades. Blades comprise only part of the essential server components, such as CPUs, memory and storage. Other components, e.g. power supply, cooling and interconnectivity, are mounted in the chassis, and shared by the various blades The blades are inserted in the chassis and directly coupled to the shared components. Only then they can actually operate.

STORAGE SERVER (SYSTEM)



Data Storage products do not have a computational function. Their function is to store data of multiple clients and give on-line access to those data.

Servers and data storage products



ENERGY EFFICIENCY REQUIREMENTS

The 'server performance' is the number of transactions per unit of time performed by the server under standardised test conditions. The 'server efficiency' is the ratio between server performance and server power demand in active state, evaluated using the SERT (Server Efficiency Rating Tool). The 2019 regulation contains an information requirement on the server efficiency, but energy efficiency requirements are not (yet) set in terms of this 'server efficiency'.

Instead, what is regulated is the efficiency of the Power Supply Unit (PSU, integrated in the server, not external) at 10%, 20%, 50% and 100% of the rated output power. First requirements are set for 2020 with more severe tiers following in 2023 and 2026.

In addition, for most server types, there is a requirement on the maximum power consumption in 'idle state' (server operational, but not performing any useful work).

TEMPERATURE EFFECTS

When ES and DS become more energy efficient, they do not only require less electricity in input, but they also emit less heat. This means that less cooling is required for the space in e.g. data centres where the equipment is installed.

The 2019 regulation has an information requirement on the ASHRAE operating class, including the maximum allowed operating temperature for the equipment. The intention of this requirement is to stimulate data centres to choose equipment that supports higher operating temperatures, to enable further reduction of the cooling load.

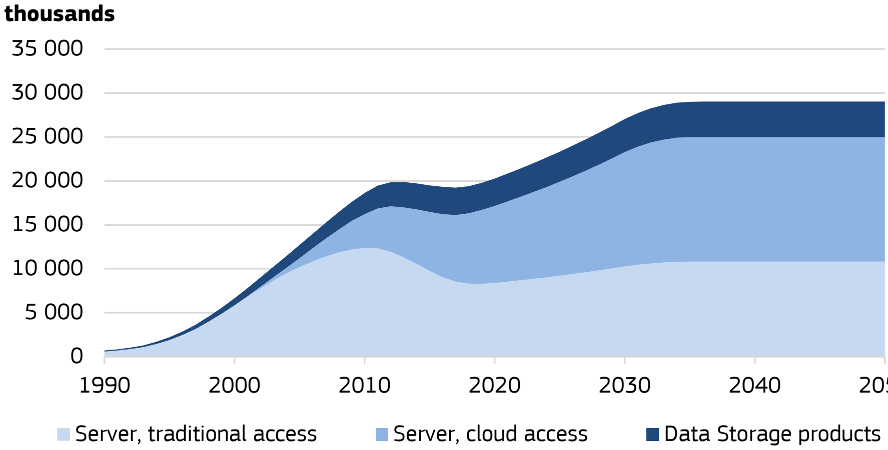
EIA considers only the direct effects of the measures on the energy consumption of ES and DS. The indirect infrastructural effects (i.e. reduction of cooling demand of data centres) is not included.

Servers and data storage products

STOCK

The need for computational and storage capacity in enterprises has grown rapidly over the past 25 years. In 1990, there were 707 thousand installed units. During the 1990s, this quantity increased by over a factor 9, reaching 6.6 million units in 2000. Afterwards, growth continued at a slower pace, reaching 18.6 mln installed by 2010 and 20 mln by 2020. This growth is expected to continue, reaching 27 mln units in 2030 (+26% vs. 2020).

TOTAL EU27 STOCK OF SERVERS AND DATA STORAGE PRODUCTS



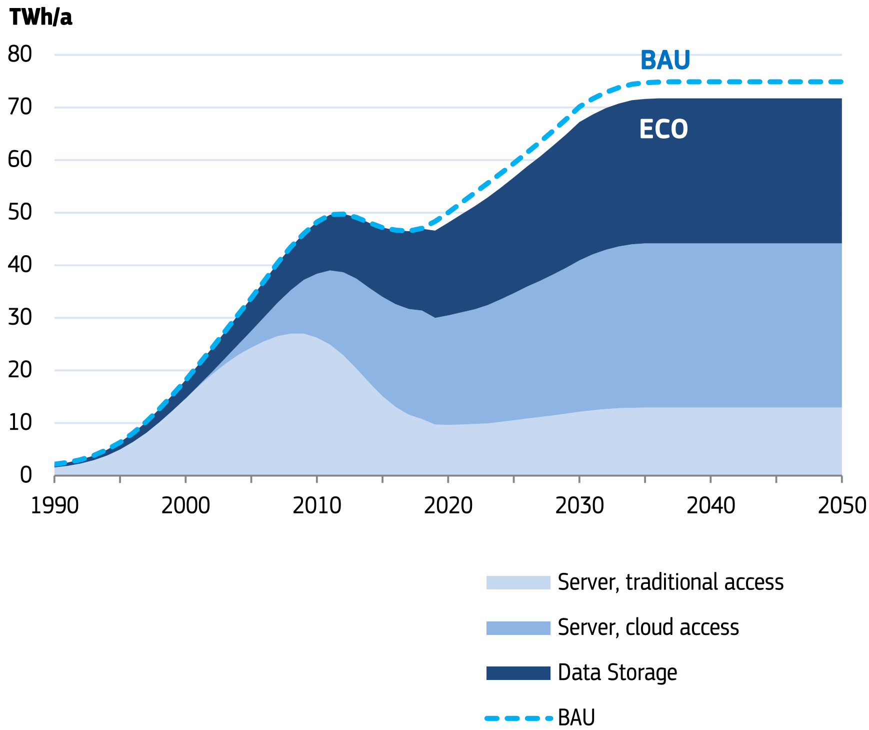
SAVINGS

In 2020, Servers and Data Storage products consumed 48 TWh/a of electricity. Without measures, this is projected to increase to 70 TWh/a in 2030 (+45%). Due to the proposed measures this can be reduced to 67 TWh/a, a saving of 4%.

This electricity saving corresponds to a reduction of 0.4 Mt CO_2eq/a of greenhouse gas emissions in 2030.

The efficiency improvement of the Power Supply Units and the reduction of idle state power for ES & DS is assumed not to lead to additional acquisition costs, so the entire energy cost savings of 0.6 bn euros in 2030 are equal to the expense savings (-1%).

TOTAL EU27 ELECTRICITY FOR SERVERS AND DATA STORAGE PRODUCTS (EXCL. COOLING OF DATA CENTRE SPACES)



Appliances

Household refrigeration

Refrigeration with direct sales function

Professional refrigeration

Cooking appliances

Washing machines

Dishwashers

Laundry dryers

Vacuum cleaners

Household refrigeration

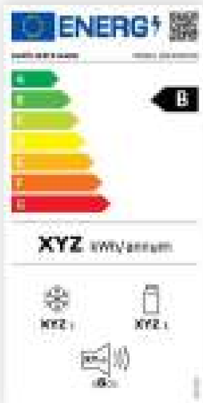
GENERAL INFO

In 1995, household refrigerators and freezers were the first product group for which 'Brussels' prescribed a mandatory Energy Label. The measure for energy efficiency, an index with base value of 100, was derived from the average efficiency of fridges and freezers in 1992. Since 2016, this index is lower than 40, implying an energy efficiency improvement of 60% over what was believed to be a technically 'mature' and efficient product in 1992.

EU-LOAD

The total EU load for household refrigeration is expressed as the demand for cooling or freezing volume. This demand has been rising and will continue to rise. In 2020 the total EU-load for freezing was 16.8 million m³. This volume equals approximately 6.5 times the Great Pyramid of Giza. This volume is expected to increase by 27% to 20 million m³ in 2030. The refrigerating demand is even higher: 59.7 million m³ in 2020, so over 3 times larger than the freezing volume. In 2030 this is projected to be 70.8 million m³ (+18%).

The increased cooling demand is a result of increasing EU population and comfort standards. The number of appliances in use rose from 219 million in 1990 to 258 million in 2020 (+18%), and is expected to grow further to 269 million units in 2030 (+4%).

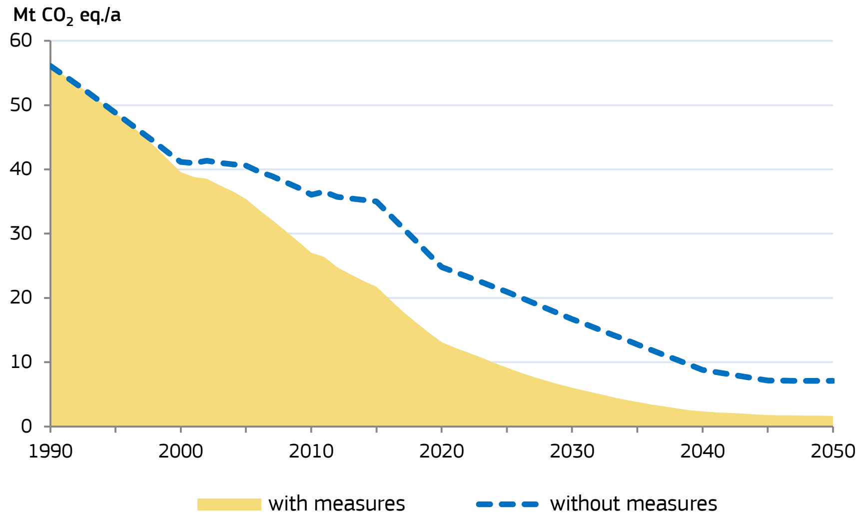


EMISSIONS

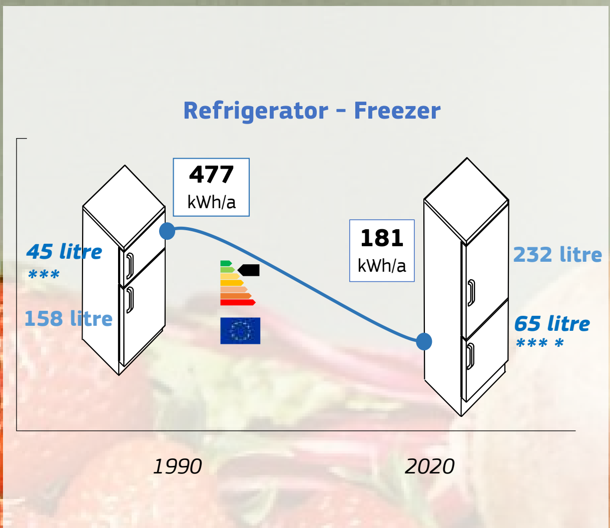
The increased efficiency of refrigeration appliances compensates for the increased product stock. The total GHG emissions for refrigerating are decreasing since the 1990s, but introduction of measures accelerated the reduction.

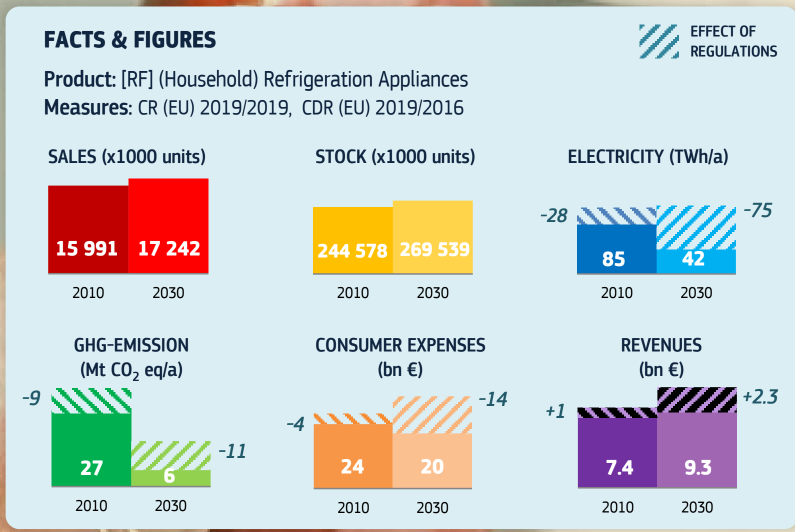
In 2020 total EU27 GHG-emissions due to household refrigeration were 13 Mt CO_2-equivalent (with the effect of measures included). By 2030 this is expected to be more than halved to 6 Mt. Without measures, the 2030-emissions were projected to be 17 Mt CO_2eq/a. Hence, the effect of Ecodesign and Energy Labelling measures is 64% less emissions in 2030.

TOTAL EU27 ANNUAL GHG EMISSION OF HOUSEHOLD REFRIGERATORS AND FREEZERS FOR SCENARIOS WITH AND WITHOUT MEASURES

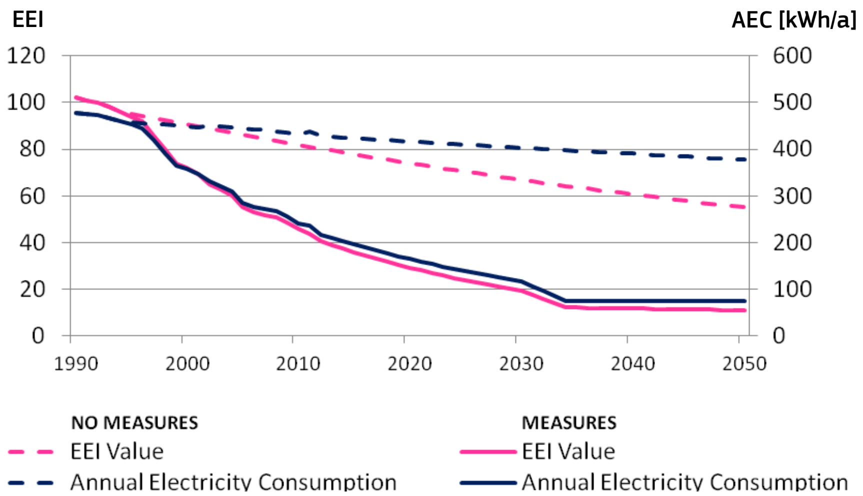


Household refrigeration





ENERGY EFFICIENCY INDEX (EEI) EXPRESSED IN ANNUAL ELECTRICITY CONSUMPTION (AEC) FOR SCENARIOS WITH AND WITHOUT MEASURES



The 2019 regulations include a revision of the Standard Annual Energy consumption (SAE) and hence change the meaning of the EEI values (the graph shows values according to the previous regulation). A new A-G label scale is also introduced. Special requirements are set for wine storage appliances -including those used in non-household context like e.g., restaurants- and low-noise appliances.

EFFICIENCY

The energy efficiency of refrigerator appliances is expressed as the Energy Efficiency Index (EEI). Both Ecodesign regulation and Energy Labelling schemes have stimulated lower EEI values for refrigerating appliances.

The ECO scenario in EIA represents the situation from the moment of introduction (1992) of the first energy efficiency requirements Directive. It shows the combined effects of these initial measures and of the ones that followed. In this scenario, the average EEI of refrigerating appliances was 32 in 2020, which corresponds to an annual electricity consumption (AEC) of 181 kWh/a/unit. If no measures would have been introduced, the EEI value would have been 74, corresponding to 410 kWh/a/unit.

As a consequence, the 2020 total EU27 electricity use was 61 TWh/a instead of the 116 TWh/a that would have been reached without measures (-55 TWh/a).

The projected EEI value for 2030 is 19, equalling an A+++ label (old scale), and corresponding to 114 kWh/a, 37% less than in 2020. Total electricity consumption in EU27 in 2030 is expected to be 42 TWh/a. This is 19 TWh/a less than in 2020 and 75 TWh/a less than the 2030 consumption in a scenario without measures.

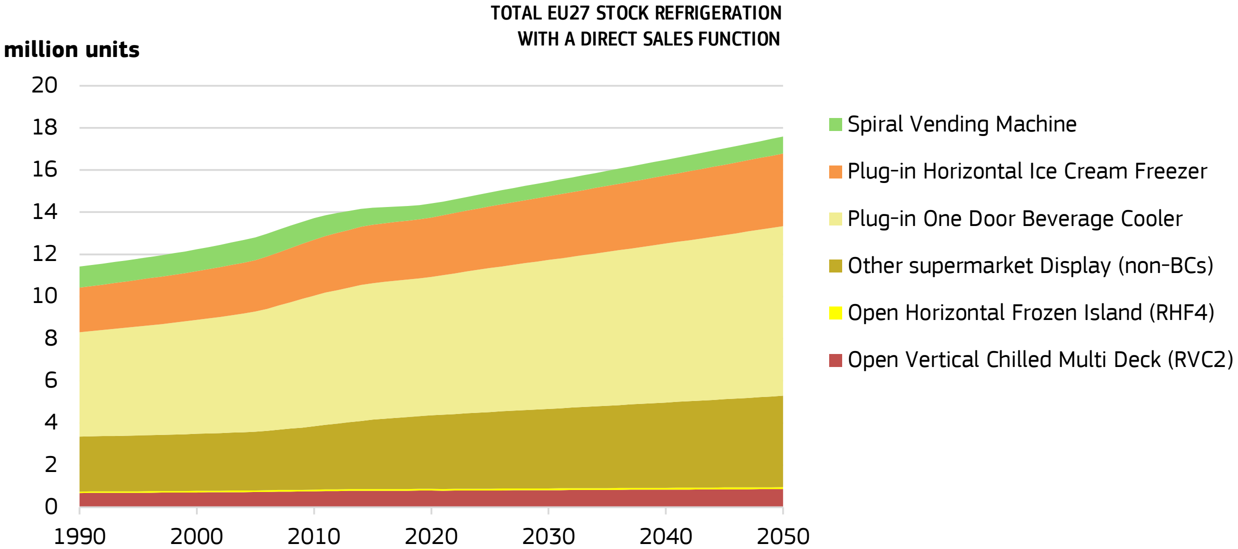
Refrigeration with direct sales function

PRODUCT SCOPE

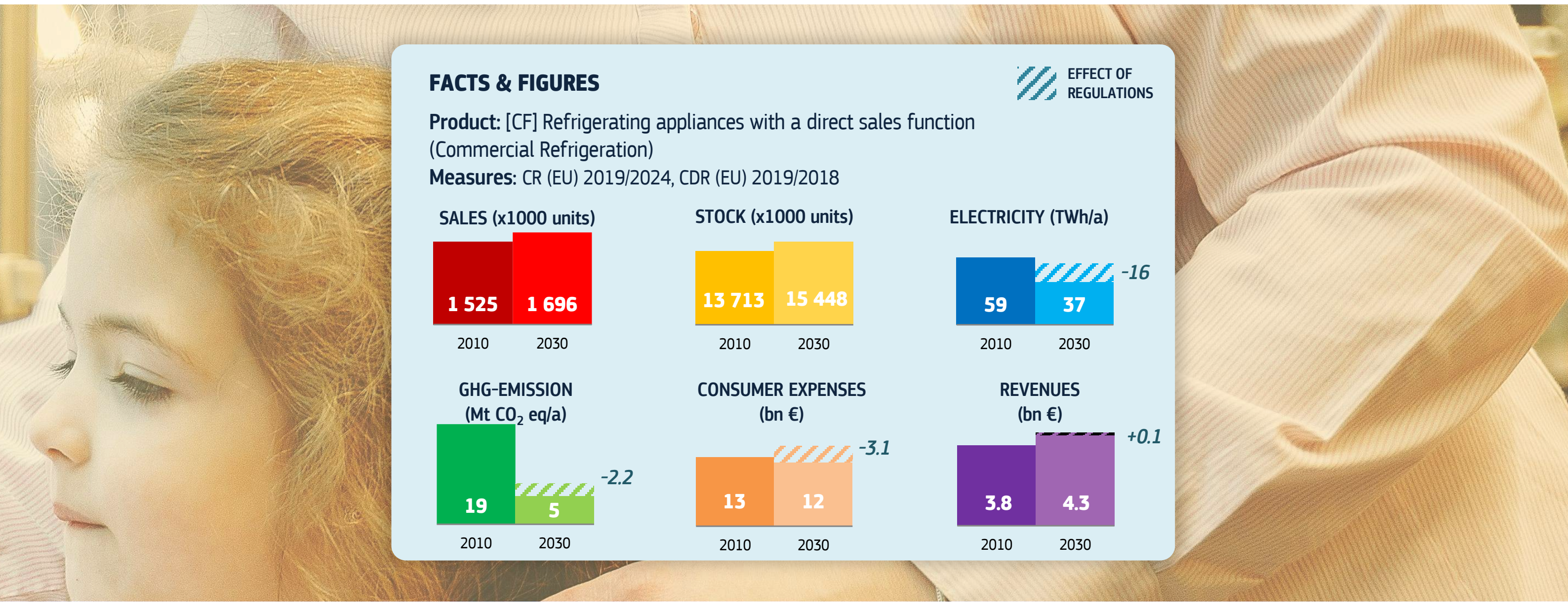
Refrigerating appliances with a direct sales function (formerly Commercial Refrigeration (CF)) are those used to display refrigerated or frozen foods or drinks. Typically they can be accessed directly by the consumers in e.g. supermarkets, public indoor spaces and offices.

Many supermarket models are vertical cabinets with various shelves from which people take e.g. their milk, butter, cheese. Others are more like horizontal chests, e.g. for ice-cream, pizzas, meat. Refrigerated models can be open (direct access) or closed (typically by glass doors or lids); freezers are usually closed. EIA distinguishes 3 supermarket models: the '**open chilled vertical multi deck**' (RVC2), the '**open horizontal frozen island**' (RHF4) and '**other supermarket display (non-BCs)**'. For space, noise and efficiency reasons, supermarket models can have a remote configuration (R), meaning that the condensing unit (CU), which releases the heat extracted from the cabinets to the environment, is not integrated in the display but located elsewhere. The energy consumption of a remote CU is anyway counted as part of that of the CF-appliance. CUs are also regulated (and reported in EIA) as separate products (see Professional refrigeration, PF), but double-counting of energy and savings is avoided when computing PF-totals.

CF-appliances used in public indoor spaces and offices are mostly 'plug-in' (with integrated CU). The user puts money in the appliance, chooses the desired snack or beverage, and then collects it from the drawer. EIA reports data for '**beverage coolers**' and '**spiral vending machines**'. The last EIA product group in CF is '**plug-in horizontal ice-cream freezers**'.



Refrigeration with direct sales function

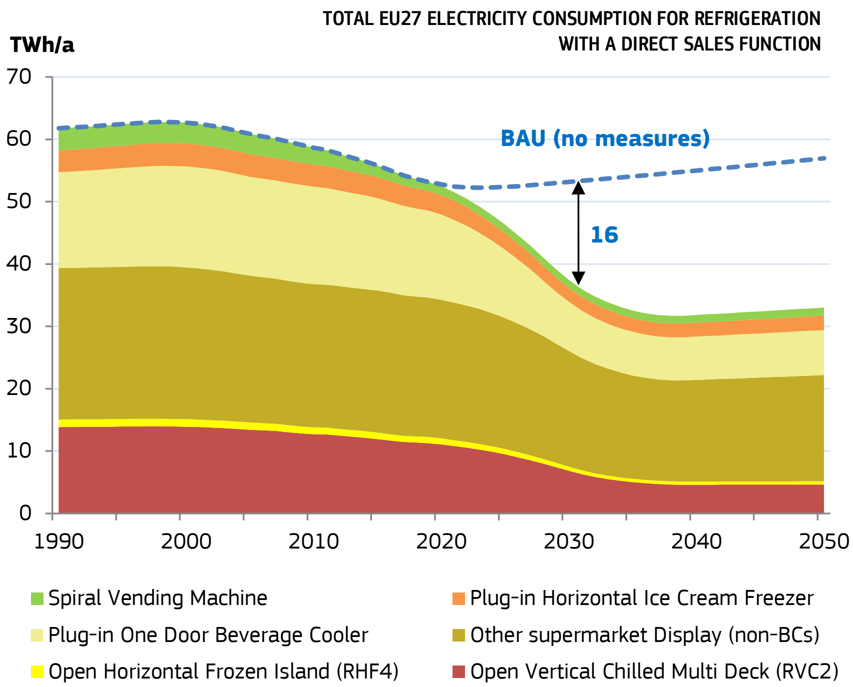


GREENHOUSE GAS EMISSIONS

In 2010, total EU27 GHG-emissions due to use of CF-appliances amounted to 19 Mt CO_2equivalent, not including refrigerant losses. By 2020 this is expected to decrease to 11 Mt CO_2eq/a, notwithstanding the increase in stock. Introducing Ecodesign and Labelling measures the total 2030 GHG-emissions can be further reduced to 5 Mt (-30% compared to BAU in 2030), due to lower electricity use.

Refrigerators employing the vapour compression cycle use refrigerants that can leak from the appliance during use or be released at the products' end-of-life, thus causing additional GHG-emissions (see also section on space cooling). As Ecodesign does not regulate refrigerant losses (which are being covered by the F-gas regulation), EIA does not account for them.

STOCK AND ENERGY



In 2020, 14.4 million CF-appliances were installed in EU27 and this number is expected to increase to 15.4 mln (+7%) by 2030. Around 45% are beverage coolers. A minority (30%) of the appliances is installed in supermarkets.

However, this minority is responsible for 65% of the electricity consumption. Total EU27 electricity use by CF was 52 TWh/a in 2020. Without measures this would remain at 53 TWh/a in 2030, notwithstanding the 8% stock increase. The introduction of Ecodesign and Labelling measures is projected to reduce this consumption in 2030 to 37 TWh/a (-16 TWh/a or -30%).

In 2030 this corresponds to 2.9 billion euros savings on (commercial) expenditure in 2030, due to lower electricity costs.

Professional refrigeration

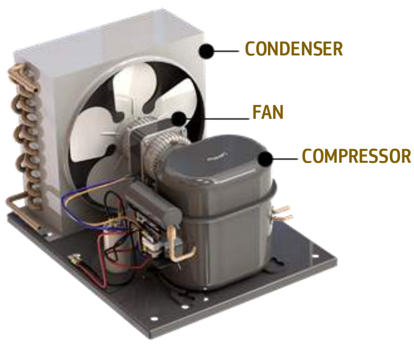
GENERAL INFO

Professional refrigeration (PF) includes refrigerators, chillers and freezers that are used and/or accessed by professionals in non-household environments. Their only purpose is to preserve goods or cool processes, as opposed to refrigeration products with direct sales function that also have a display and consumer-access function.

The 2015 Ecodesign regulation applies to three PF-appliance groups: storage cabinets, condensing units, and process chillers. Storage cabinets also have Energy Labelling.

Blast cabinets (used to quickly cool or freeze hot food) are subject to information requirements only, while Walk-in cold rooms are not regulated yet, so these two PF-types do not appear in EIA.

PRODUCT TYPES, SALES AND STOCK



Storage cabinets are used to preserve food or other goods. They come in horizontal or vertical configuration, and can be refrigerators (between −1°C and 5°C) or freezers (below -15˚C). They are used in e.g. restaurants, bars, canteens, hospitals and supermarkets (in locations not accessible to customers). In 2020 around 371 thousand storage cabinets were sold in EU27 (407 thousand expected by 2030) and 3.2 million units were installed (3.5 mln expected by 2030).

A **Chiller** is a refrigerating machine (with a refrigerant circuit) that cools a liquid (water, water/glycol, brine) in a separate circuit. The Ecodesign regulation applies to chillers with a heat exchanger outlet temperature that is medium (MT,-8°C) or low (LT,-25°C) (cooled liquid will be somewhat warmer). Cooling liquids at these temperatures are used mainly in industrial processes, hence the name Process Chiller.

High temperature chillers (HT,+7˚C) are excluded here, because they are mainly used in non-comfort space cooling, e.g. in data centres (see section on 'Space Cooling').

In addition to MT/LT, EIA distinguishes between **Process Chillers** that release their heat on the condenser side to water or to air as cooling medium (WC/AC). In addition, a capacity distinction is made between small (S) or large (L), for a total of 8 process chiller base cases.

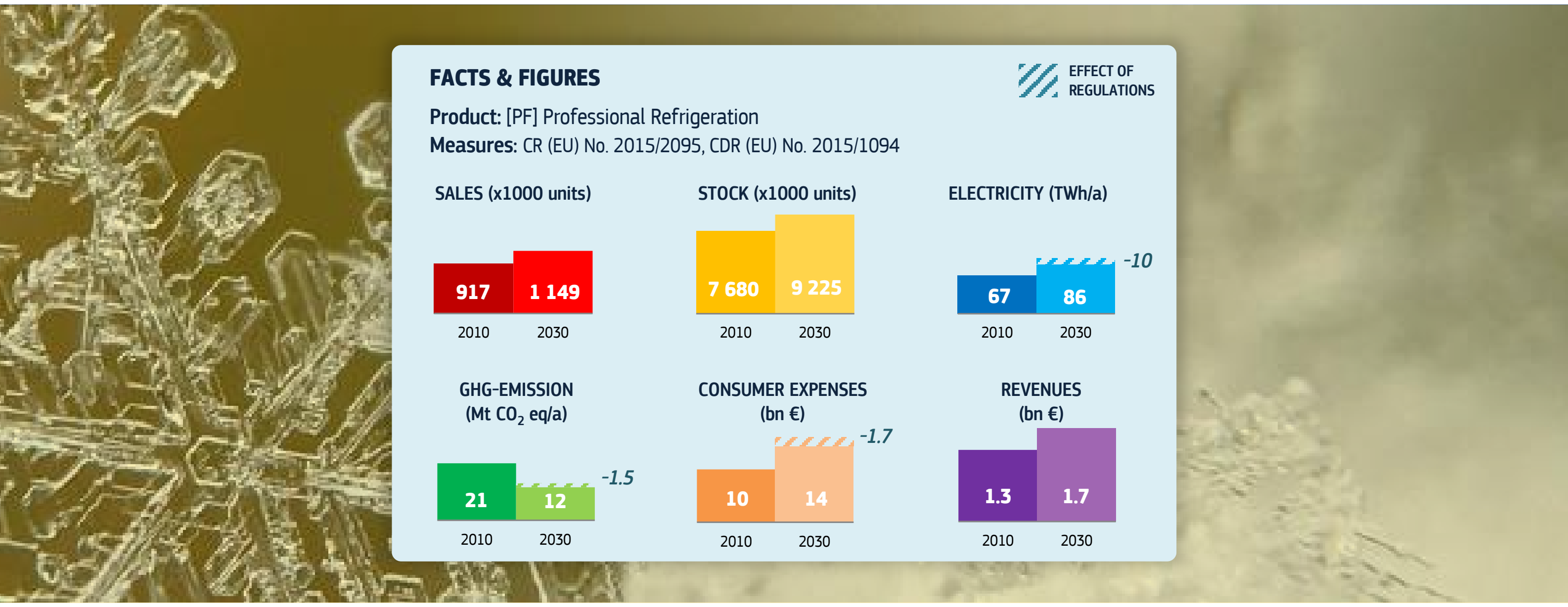
In 2020 around 7 thousand MT/LT process chillers were sold in EU27 (9 thousand expected by 2030) and 95 thousand units were installed (117 thousand expected by 2030).

Condensing units (CUs) are components of a refrigerating, chilling or freezing system that release the heat extracted by the system to ambient air or to another cooling medium. The Ecodesign regulation applies to MT and LT CUs that are sold as separate products, and that are typically installed as separate remote units for commercial- or professional refrigeration appliances that do not have an integrated CU (see also section Refrigeration with direct sales function). A single CU can serve more than one refrigerating appliance. In addition to the MT/LT division, EIA distinguishes 4 capacity sizes (S, M, L, XL).

In 2020 around 632 thousand MT/LT condensing units were sold in EU27 (expected 733 thousand by 2030) and 4.8 million units were installed (expected 5.6 million by 2030).

In EIA, the energy used by CUs is first reported fully, but when determining totals for Professional Refrigeration, the estimated 60% of CU-energy that is already considered in other EIA products is not taken into account, thus avoiding double counting.

Professional refrigeration



EEI AND LABEL FOR STORAGE CABINETS

The energy efficiency of storage cabinets is defined using an energy efficiency index (EEI), just as for commercial and household refrigerators. The EEI thresholds for label classes range from >95 (G) to <25 (A) or <5 (A+++). Label 1 (G-A) is mandatory from July 2016. Label 2 (G-A+++) is optional from that date but mandatory from July 2019. Besides the EEI class, the label provides chilling and freezing volumes, annual energy consumption and climate class (range of temperature and humidity in which the product will work properly).

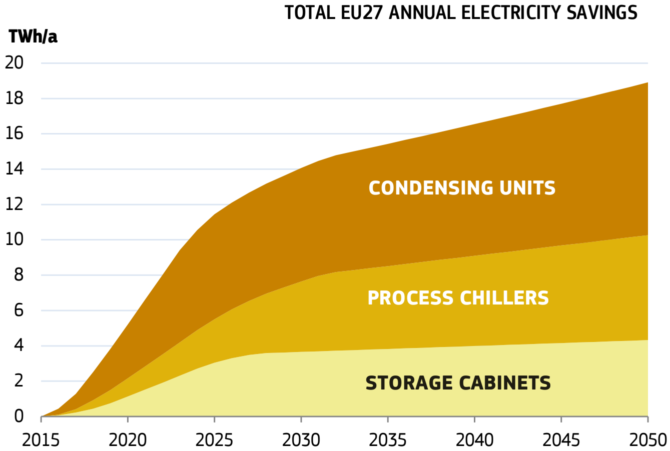
In 2015, the average storage cabinet has an EEI of 98 (label class G). By the time of the first Ecodesign phase (2017) the average EEI is expected to improve to 82 (class E), by 2019 to 66 (class D) and by 2020 to an EEI of 58 (class D).

SAVINGS

In 2020, the total EU27 electricity consumption for PFs was 118 TWh/a (of which 38 TWh/a for CUs already counted in other products). Without measures, this would have increased to 141 TWh/a in 2030 (45 TWh/a already counted) due to the increasing stock. Ecodesign and Energy Labelling measures are expected to lower this to 127 TWh/a in 2030 (41 TWh/a already counted). This is a saving of 10% or 14 TWh (of which 4 TWh for CUs already counted elsewhere).

The reduction in GHG emissions is 1.5 Mt CO_2eq/a in 2030. PF-users will save 1.7 billion euros in 2030, due to lower electricity costs.

TOTAL EU27 ANNUAL ELECTRICITY SAVINGS



Cooking appliances

GENERAL INFO

Ecodesign regulation 66/2014 covers domestic ovens and hobs (gas and electric) and range hoods (electric). Electric ovens and hobs are also subject to the standby regulation CR (EC) 1275/2008. Energy labelling is mandatory for ovens and range hoods. In EIA these products are grouped under cooking appliances (CA).

SALES AND STOCK

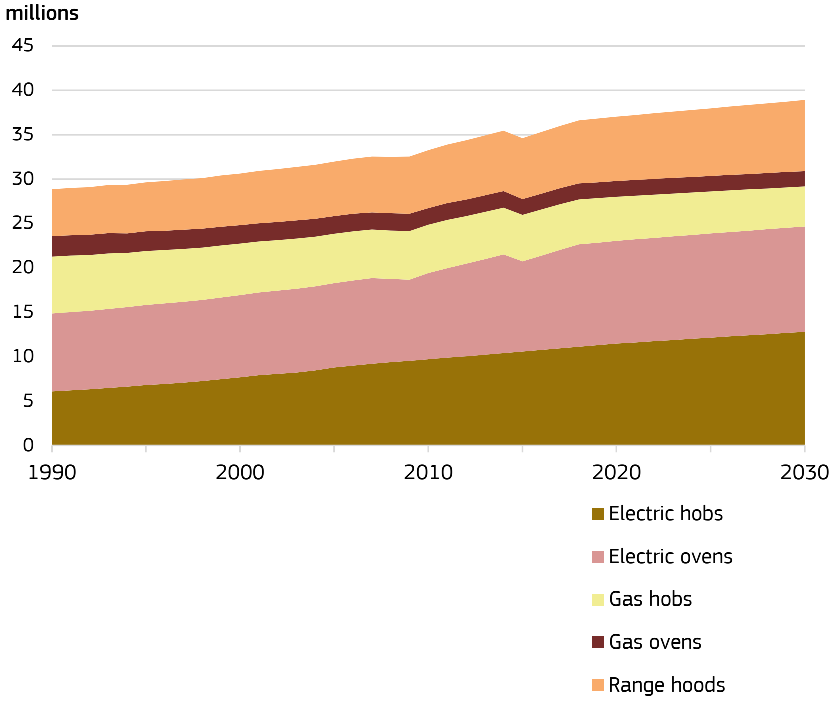
In 2020, 233 million **hobs** were installed in EU27 of which 66% electric and 34% gas. In the 2020 – 2030 period, sales of electric hobs are expected to increase by 21% from 11.5 to 12.8 million, while those of gas hobs are decreasing by 10%, from 5 to 4.5 mln. The result is an increase in the hobs stock to 250 mln in 2030 (+8%), and an increase in the electric share (71% of installed hobs in 2030).

For **ovens** the picture is similar, with 230 mln installed in 2020 (84% electric and 16% gas). Sales of electric ovens are slightly increasing from 11.6 mln in 2020 to 11.9 mln in 2030 (+2.5%), while those of gas ovens decrease from 1.77 to 1.72 mln (-3%). The result is an increase in the stock of ovens to 250 mln in 2030 (+8%), and an increase in the electric share (87% of installed ovens in 2030).

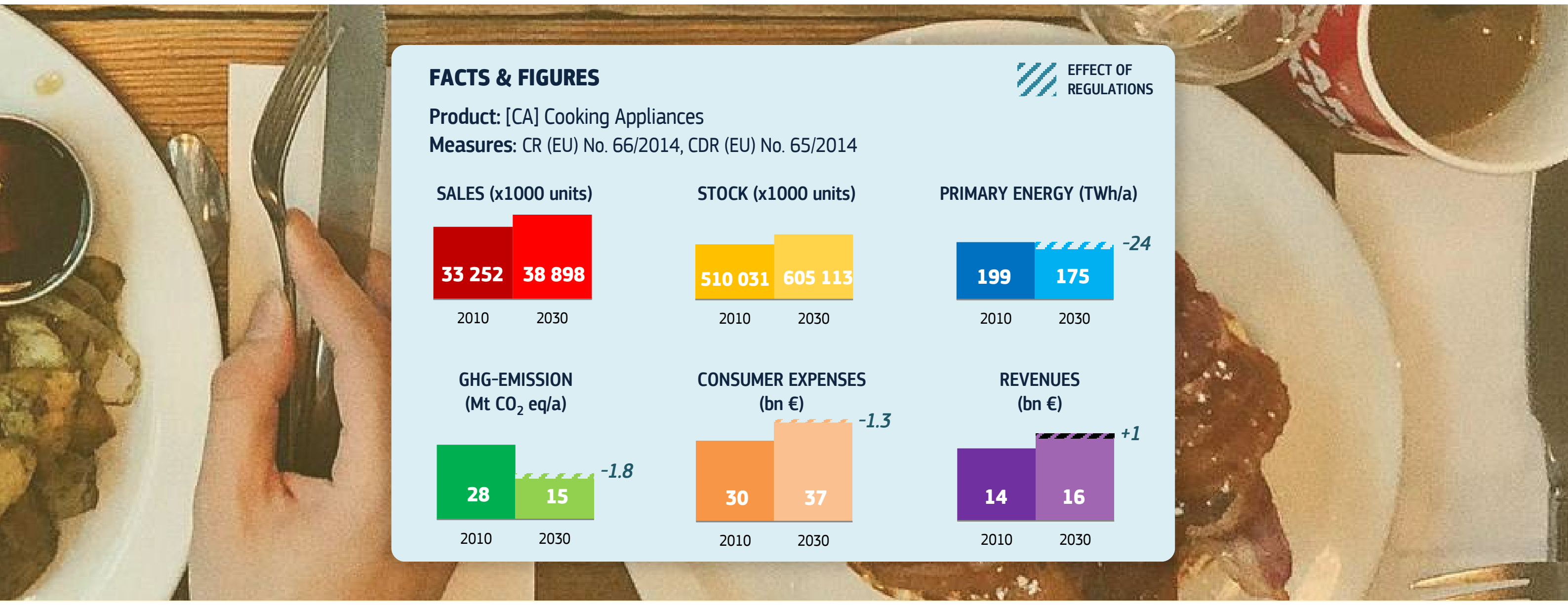
In 2020, there were 95 mln electric **range hoods** installed. Also here sales are increasing from 7.2 mln in 2015 to 8 mln in 2030 (+10%), raising the stock to 105 million units in 2030.

Overall, the cooking appliance stock is expected to increase by 12% from 557 million in 2020 to 605 million in 2030.

TOTAL EU27 SALES OF COOKING APPLIANCES



Cooking appliances



CONSUMER EXPENSES

Increasing the energy efficiency of cooking appliances leads to a higher unit price. Consequently consumers initially spend more on product acquisition, and this investment is paid back over later years due to lower energy costs.

The variation in consumer expenses due to the Ecodesign measures on cooking appliances shows additional expenses up to 2024, with a peak of 0.5 billion euros extra around 2020. Following 2024, consumers will start to save money (1.3 bn euros in 2030), in particular due to lower energy costs for electric ovens.

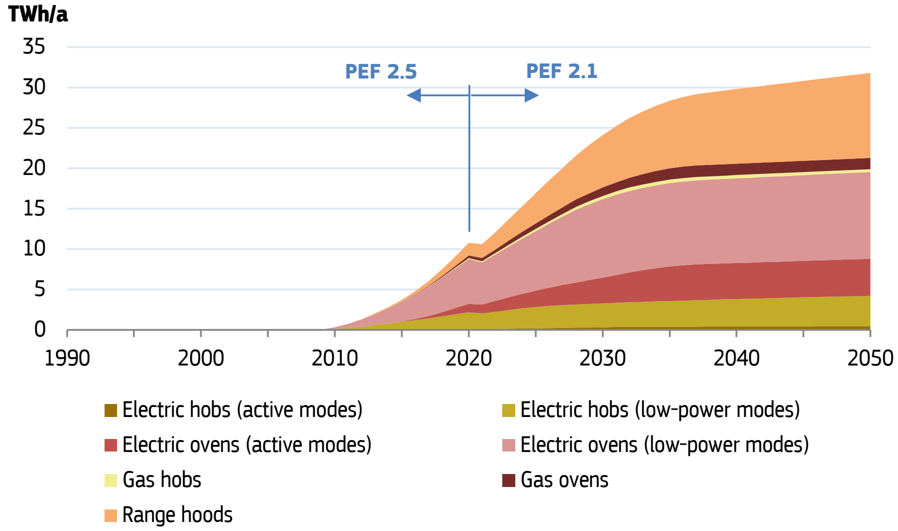
SAVINGS

The Ecodesign regulation sets gradually more severe energy efficiency requirements in 3 tiers, in 2015, 2016 and 2019. Energy Labelling for ovens and range hoods is compulsory from January 2015.

The total primary energy consumption by CAs (gas consumed plus fuel needed to generate the consumed electricity at PEF 2.5) was 205 TWh/a in 2020, of which 10 TWh for electric hobs and ovens in low-power modes. Without measures, the energy consumption in 2030 is expected to be 199 TWh/a (at PEF 2.1). With measures this is expected to drop to 175 TWh/a (-24 TWh/a, -12%). The major part of these savings is due to low-power modes of electric hobs and ovens (53%), range hoods (27%) and on-mode of electric ovens (13%).

Due to the lower primary energy use, the 2030 GHG-emissions related to the use of cooking appliances decrease from 17 Mt CO_2eq/a (without measures) to 15 Mt CO_2eq/a.

TOTAL EU27 PRIMARY ENERGY SAVING FOR COOKING APPLIANCES



Washing machines

GENERAL INFO

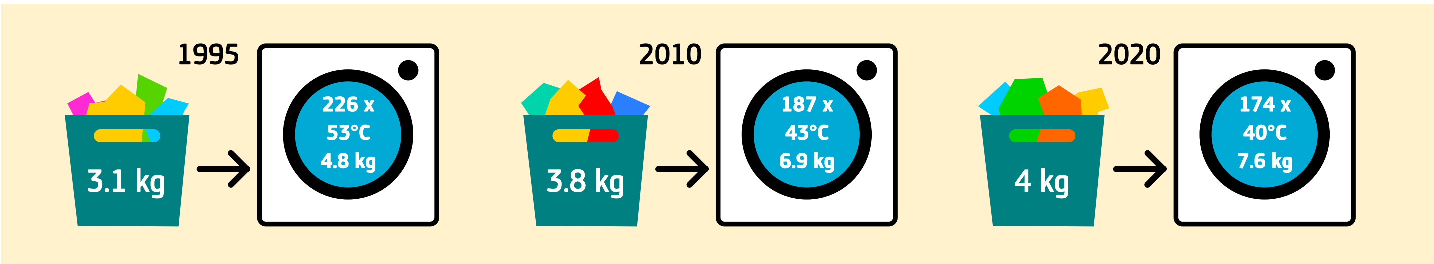
The first labelling measures for washing machines (WM) came into force in 1995. Since then, the product group made big improvements in terms of energy efficiency, requiring an update of the labelling scheme in 2010. Ecodesign measures were also introduced in the same year.

The 2019 regulations revise the basis for labelling and requirements again, requiring WM and washer-dryers (WD) to have an 'eco 40-60' washing cycle, able to clean normally soiled cotton declared washable at 40°C or 60°C, together in the same cycle, and a washing cycle called '20°C', which is able to clean lightly soiled cotton laundry, at a nominal temperature of 20°C. Requirements for efficiency, function, duration and water-use apply to the 'eco 40-60' program.

LOAD

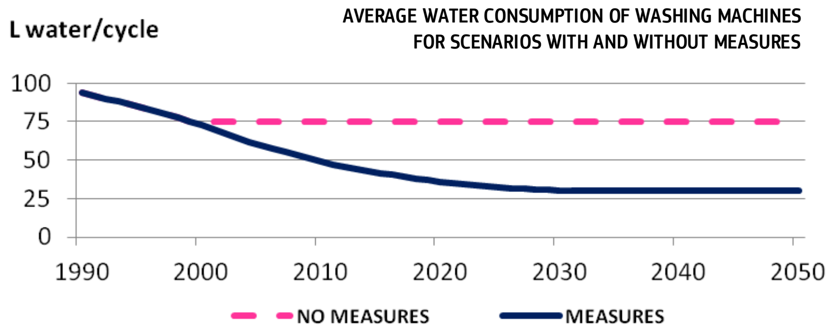
The average rated capacity (maximum kg of laundry per cycle) of EU washing machines (WM) is continuously increasing, from 4.8 kg in 1995, to 7.6 kg in 2020. The real average amount of laundry washed per cycle is much lower than the capacity, and increasing more slowly: from 3.1 kg/cycle in 1995 (65% of capacity), to 4 kg in 2020 (53%). After 2020, capacities are expected to remain the same.

In parallel, the average number of washing cycles per year per WM decreased from 226 in 1995, to 174 by 2030. Combining these data with an increase in installed WM/WDs (174 mln units in 2020), the total quantity of laundry washed yearly in EU27 (EU-load) increased from 95 Mton (95 billion kg) in 1995 to 121 Mton in 2020 and expected to be 124 Mton by 2030. This laundry is washed (on average) at ever lower temperatures: 53˚C in 1995, 40˚C in 2020, and expected 38˚C by 2030. Obviously, this trend has a positive effect on electricity consumption.

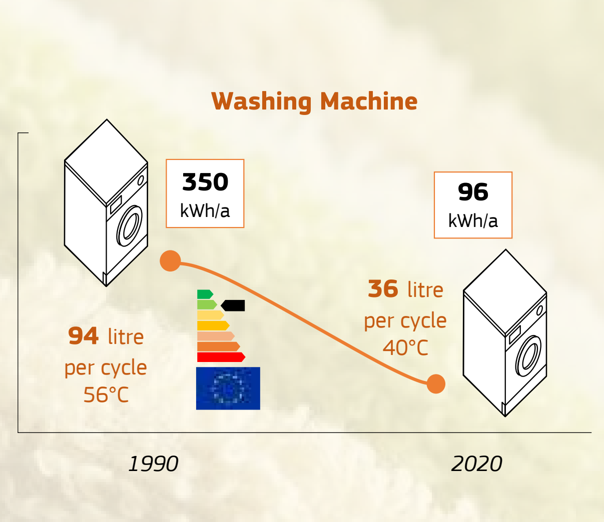


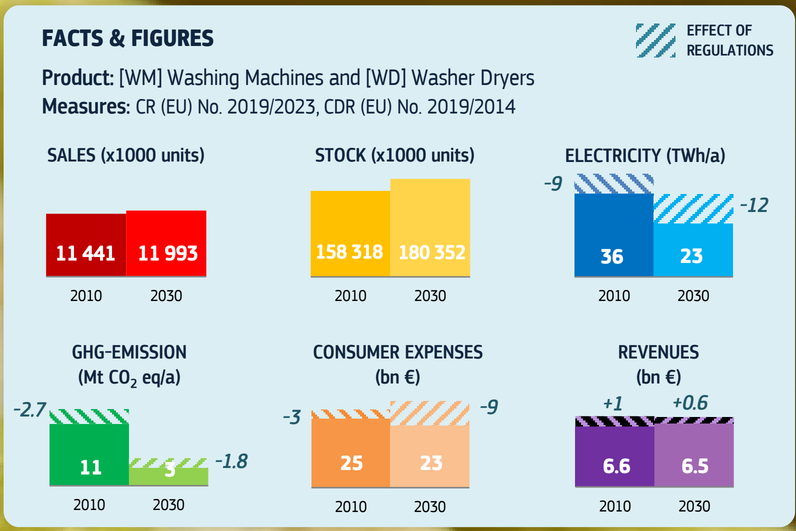
WATER

The Ecodesign regulations also set limits on the water consumption of WMs. In 1995, the average WM consumed 84 litres per cycle. Without measures this was projected to drop to 75 l/cycle in 2000. Due to the measures this can be reduced to 36 l/cycle in 2020 and an expected 30 l/cycle by 2030.



Washing machines



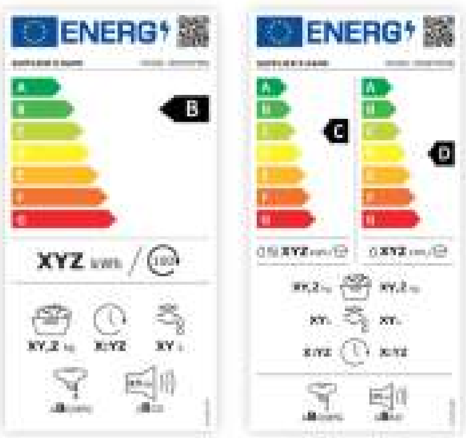


At EU27 level the **water saving** is 1042 million m³ of water per year in 2015 and roughly the same at 1050 million m³ in 2030, the latter equalling a 0.4 m deep pool with the size of Luxemburg (2586 km²).

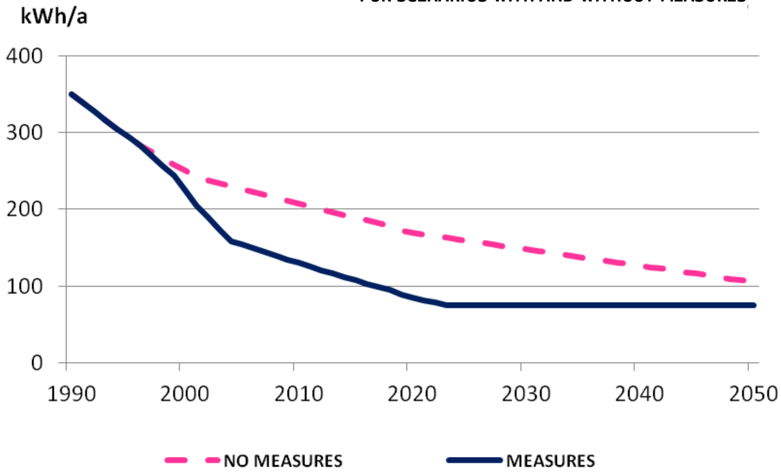
EFFICIENCY AND ENERGY

In 1995, before the first measures, the average newly sold WM consumed 294 kWh/a of electricity. Without measures, this was projected to be 169 kWh/a in 2020 and 148 kWh/a in 2030. Due to the combined measures, this has been reduced to 99 kWh/a in 2020 (-70 kWh, -41%) and expected 96 kWh/a by 2030 (-52 kWh/a, -35%).

At EU-level, considering also the increasing quantity of installed WMs and WDs, this enabled a reduction of total WM/WD electricity consumption from 41 to 27 TWh/a in 2020 (-34%), and from expected 36 to 23 TWh/a in 2030 (-36%).



AVERAGE ELECTRICITY CONSUMPTION OF WASHING MACHINES FOR SCENARIOS WITH AND WITHOUT MEASURES



Dishwashers

GENERAL INFO

Energy labelling measures for household dishwashers (DW) came first into force in 1997, and were updated in 2010. Ecodesign measures were also introduced in 2010. The 2019 regulations revise the basis for labelling and requirements again, requiring DWs to have an 'eco program'. Efficiency- and functional-requirements apply to this program. In addition there are requirements for low-power-mode, resource efficiency, and information requirements.

LOAD ASPECTS

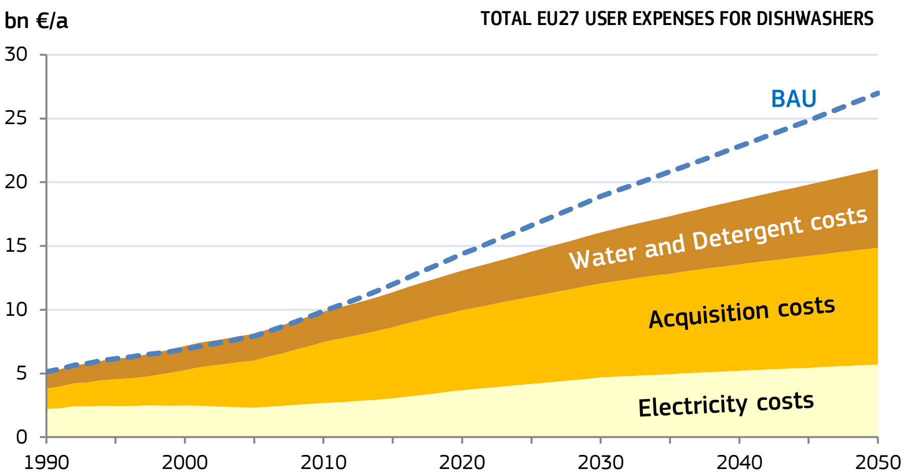
The capacity of dishwashers (DW) is expressed in place settings (ps), which is a defined set of crockery, glass and cutlery for use by one person. The average rated capacity of EU dishwashers is fairly constant, varying from 12.1 ps in 1995 to 12.8 ps in 2030. The average amount of place settings actually washed per cycle is lower: 7.2 ps/cycle in 1995 (60% of capacity) to 9.3 ps in 2020 (72%) and further. On average a DW is used for 220 cycles per year.

The EU27 stock of installed DW is strongly increasing from 37 mln units in 1995, to 96 mln in 2020 and expected 126 mln by 2030.

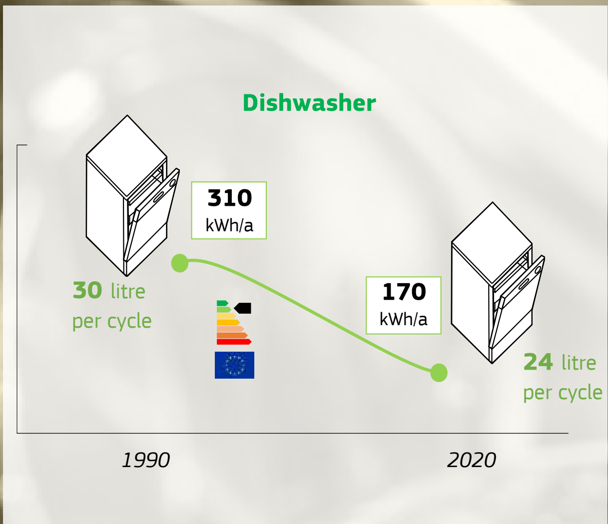
Combining the above data, the total quantity of place settings cleaned yearly in EU27 (EU-load) increased from 59 billion ps in 1995 to 197 billion in 2020 and expected 257 billion by 2030. The average temperature at which these dishes are washed is slightly decreasing with the years, from 60.6˚C in 1995 to expected 53.6˚C by 2030.

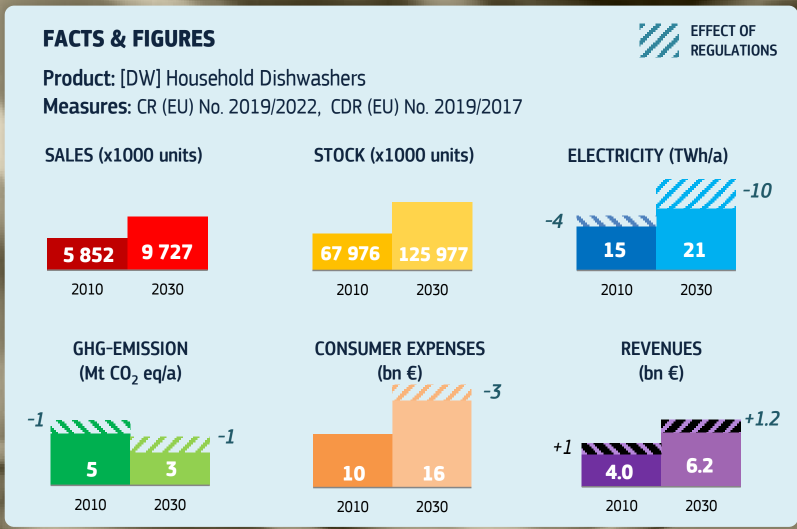
EXPENSES

More efficient DWs have higher acquisition cost. In 2020 EU-consumers spent 1.5 bn euros extra buying such DWs, but this was compensated for with 1.5 bn euros lower electricity costs and 1.3 bn euros lower water and detergent costs, for a net expenditure savings of 1.3 bn euros. In 2030, these savings are expected to be 2.8 billion euros, of which 2.0 bn on water and detergents.



Dishwashers



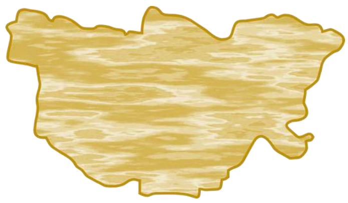


WATER CONSUMPTION

The Ecodesign regulation does not explicitly set limits on the amount of water that a DW is allowed to use, but the limits on electricity consumption indirectly also lead to lower water use. In addition, the declaration of the annual water consumption on the label has had a positive effect on reducing water consumption.

In 1995, the average DW consumed 27 litres of water per cycle, and without measures this was expected to remain at a constant 24 l/cycle from 1999 onward. Due to the measures, the consumption decreased to 10 l/cycle in 2020 and expected 9 l/cycle by 2030.

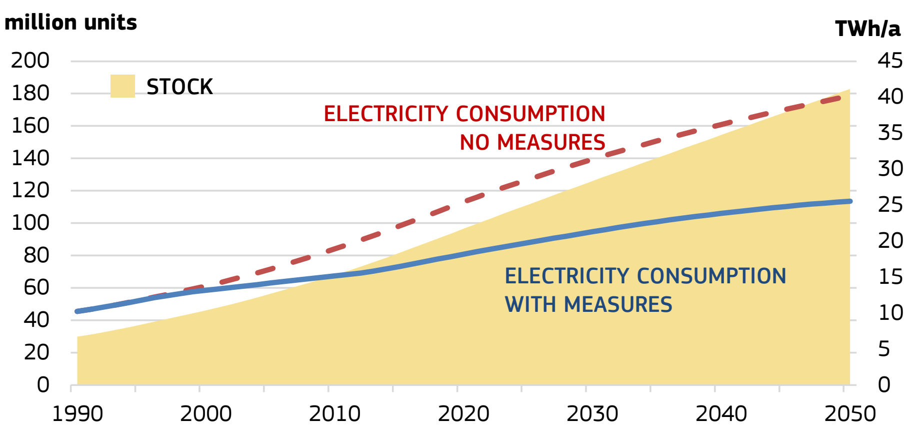
At EU level this enabled saving 295 million m³ of water per year in 2020 and expected 421 million m³ per year in 2030, the latter approximately equalling 168 thousand Olympic swimming pools (of 2 meters deep) or a swimming pool with the size of the city of Amsterdam.



Amsterdam

Water savings on dishwashers in EU27 are equivalent to the content of 168 thousand Olympic swimming pools of 2 meters deep: a pool with the size of Amsterdam (219 km²).

TOTAL EU27 ELECTRICITY CONSUMPTION AND STOCK DEVELOPMENT OF DISHWASHERS



EFFICIENCY AND ENERGY

In 1995, before the first measures, the average newly sold DW consumed 291 kWh/a of electricity. Without measures, this was projected to be 254 kWh/a in 2020 and 239 kWh/a in 2030. Due to the combined measures, this has been reduced to 174 kWh/a in 2020 (-80 kWh, -31%) and expected 159 kWh/a by 2030 (-80 kWh/a, -33%).

At EU27-level, considering also the strongly increasing quantity of installed DW, this enabled a reduction of the total DW electricity consumption from 25 to 18 TWh/a in 2020 (-28%), and from expected 31 to 21 TWh/a in 2030 (-32%).

Laundry dryers

GENERAL INFO

Energy labelling measures for household laundry tumble dryers (LD) came first into force in 1995, and were updated in 2012. Ecodesign measures were also introduced in 2012.

There are two main types of LD: Air-vented dryers and Condenser dryers. Air-vented dryers draw air from the room in which they are installed, heat it and lead it through the humid clothing in the drum to evaporate the moisture. The humid air is then expelled to the external environment. Air-vented dryers thus require an exhaust to the outside, making them less practical. Condenser dryers use a similar process but have an additional heat exchanger to cool the humid air, thus condensing the water. The liquid water is stored in a tray or fed into the drain. Condenser dryers do not require an exhaust to the outside, but due to the additional components they are more costly. Condensing requires additional energy, but the technology has the potential for efficiency improvement by heat recovery from the outgoing air (in particular when applying heat pump technology).

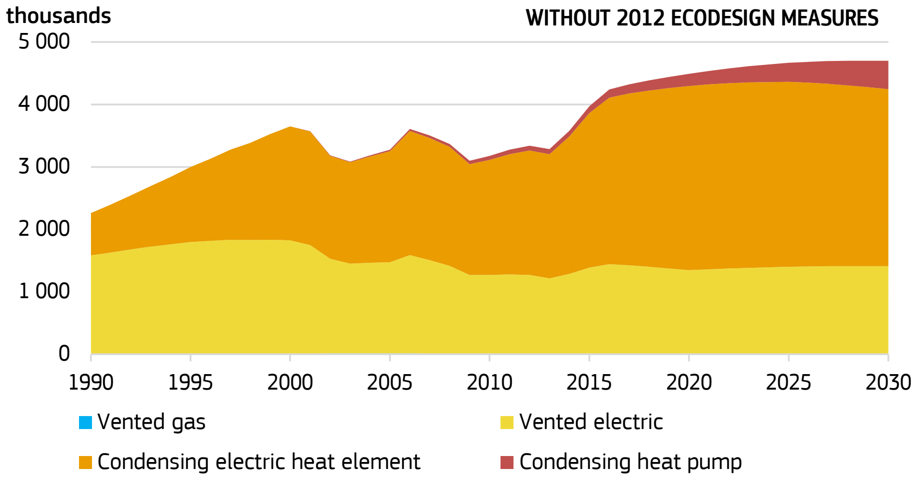
SALES AND STOCK

In 2020, 4.5 million LDs were sold in EU27 of which 11% electric air-vented dryers and 89% condenser dryers. Sales of gas-fired air-vented dryers are negligible. Due to the 2012 Ecodesign measures, and due to a reduction in price, the sales of heat pump condenser dryers have been rapidly increasing, representing 57% of the market in 2020, and projected 80% in 2030. The other 20% sold in 2030 will be condenser dryers with electric heating element, while sales of vented dryers are expected to drop to zero by 2030. Without the 2012 measures this would have been quite different, with a minor share of (expensive) heat pump dryers, more or less constant sales of vented dryers, and a market dominated by condenser dryers with electric heating element (see graphs).

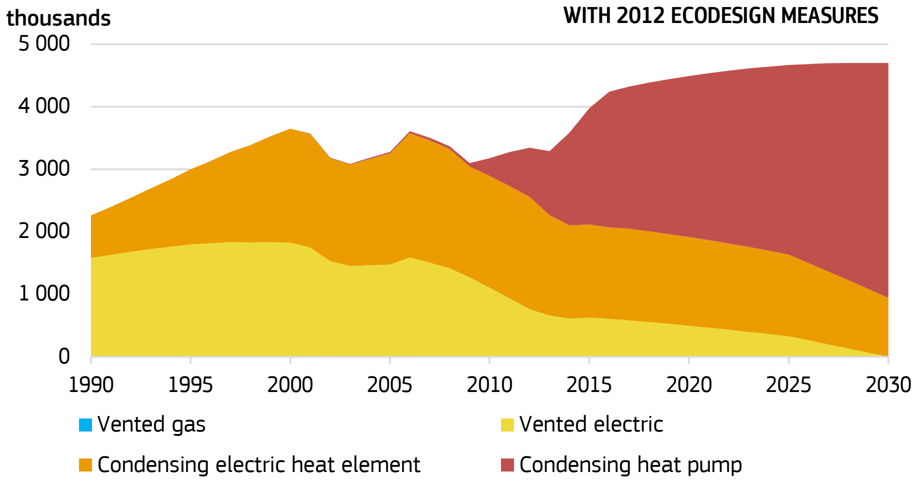
The difference in sales composition between the scenarios with and without measures is one of the main drivers for the computed energy savings.

The installed stock of LDs was 18 mln in 1990, 40 mln in 2010, 45 mln in 2020, and expected to increase to 55 mln in 2030 (26% of households). In later years the stock remains stable. The total stock is the same for the scenarios with and without measures, only the composition differs.

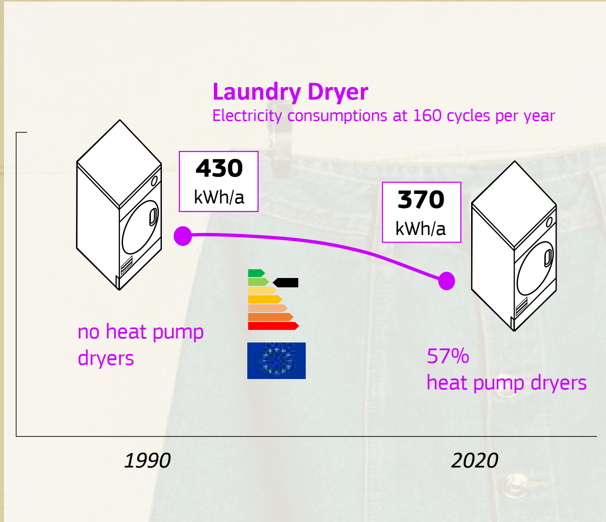
TOTAL EU27 SALES OF LAUNDRY DRYERS WITHOUT 2012 ECODESIGN MEASURES

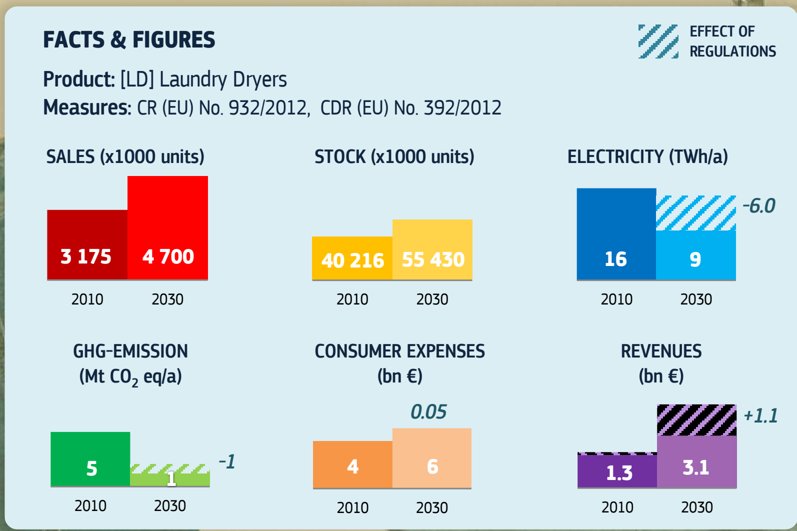


TOTAL EU27 SALES OF LAUNDRY DRYERS WITH 2012 ECODESIGN MEASURES



Laundry dryers



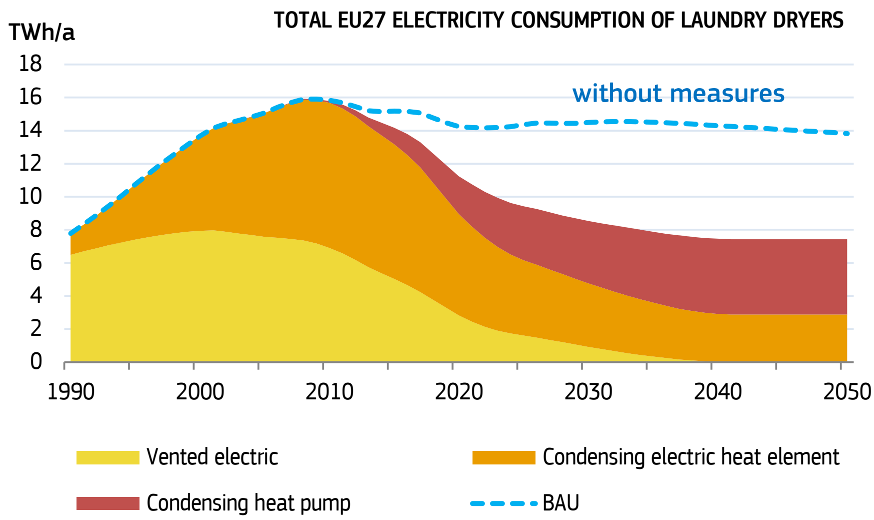


LOAD

The average moisture content of the clothing to be dried is decreasing (65% in 2000; expected 55% in 2030) due to increasing spin speeds of washing machines. This facilitates the task of the LDs (shorter drying cycles). In parallel, the maximum capacity of LDs has been increasing, from 5.0 kg/cycle in 2000 to 7.3 kg/cycle in 2020. On average, consumers in 2020 run their LD 107 times per year, using 60% of its declared capacity. Combining these data with the installed stock, the total amount of laundry dried in LDs is projected to increase from 21 Mton in 2020 to 26 Mton in 2030.

The number of cycles per year is uncertain. The 2008 studies found 160 cycles, and this is also used in the regulation. The 2019 review study found 107 cycles per year in 2018. Therefore, EIA modelling assumes (for both scenarios) a decrease in number of cycles per year from 160 to 107 over the 2008-2018 period. As energy consumption is directly proportional to the number of cycles, this has a high impact on results.

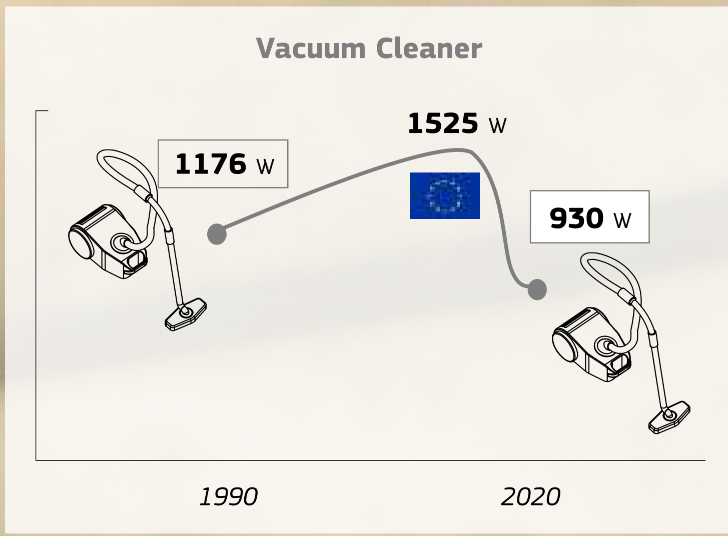
EFFICIENCY AND ELECTRICITY



In 2010, LDs in EU27 consumed 16 TWh of electricity. This corresponds to 393 kWh/a/unit or 2.6 kWh/cycle. Without measures, this would have decreased in 2030 to 14.5 TWh (due to the decrease in number of cycles per year), corresponding to 261 kWh/a/unit or 2.4 kWh/cycle. Due to the measures, the 2030 consumption is expected to reduce to 8.5 TWh, corresponding to 154 kWh/a/unit or 1.4 kWh/cycle, mainly due to de strong increase in number of heat pump dryers. The 6 TWh electricity savings represent a 40% improvement in 2030 compared to the situation without measures.

The heat pump laundry dryer was a major energy-saving innovation, of which commercial success was mainly due to the ambitious energy labelling scheme. In 2020, heat pump dryers consumed 1.2 kWh/cycle, compared to 3.0 kWh/cycle for vented electric dryers and condenser dryers with electric heating element.

Vacuum cleaners



GENERAL INFO

Until some years ago, consumers tended to select their vacuum cleaner (VC) based on its input power, assuming that higher power equals better cleaning performance. Manufacturers stimulated this by producing VCs with ever higher power and advertising with this. Without measures, this trend led to an increase in domestic VC power from 1200 W in 1990 to 2300 W in 2020. However, a higher input power does not always imply better cleaning performance.

Considering that this situation was largely induced by a lack of information and communication, the 2013 Energy Labelling for VCs prescribes a label that informs consumers not only on the energy efficiency of VCs, but also on their cleaning performance on carpets and hard-floors, on the dust re-emission, and on generated noise.

In parallel, the 2013 Ecodesign regulation limits the maximum power and annual energy consumption of VCs (max 1600 W, 62 kWh/a from 2014; max 900 W, 43 kWh/a from 2017), while at the same time requesting an improvement in the cleaning performance.

ENERGY LABEL ANNULMENT

Measurements for an energy label formerly required an empty vacuum cleaner bag. Dyson, a manufacturer of bagless vacuum cleaners, filed and won a lawsuit against the regulation at the European Court of Justice in Luxembourg (Dyson ruling – Case T-544/13 RENV). As a result, this voided and annulled EU Regulation (EU) 665/2013 on energy labelling of VCs.

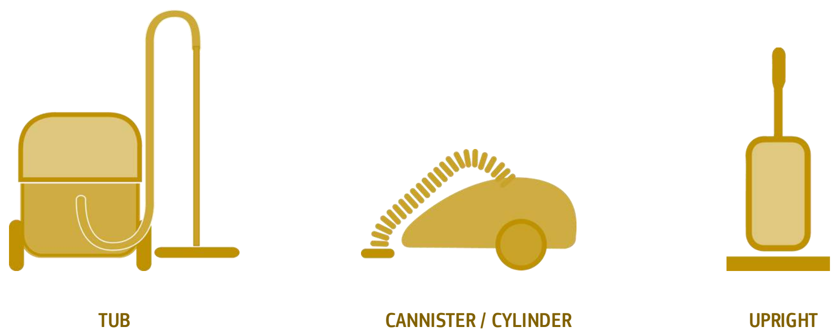
VACUUM CLEANERS IN EIA2021

EIA2021 updated its data for vacuum cleaners based on the 2019 review study and a draft 2022 impact assessment, and this update takes into account the effects of the annulment. The update revises real-life loads and efficiencies, and also considers a partial shift of sales from mains-operated VCs to battery-operated VCs (cordless, robots). Although the latter are not in scope of CR 666/2013, EIA reports their energy consumption (otherwise the overall picture would be misleading), but without savings. EIA2021 data are to be considered preliminary, awaiting the final impact assessment.

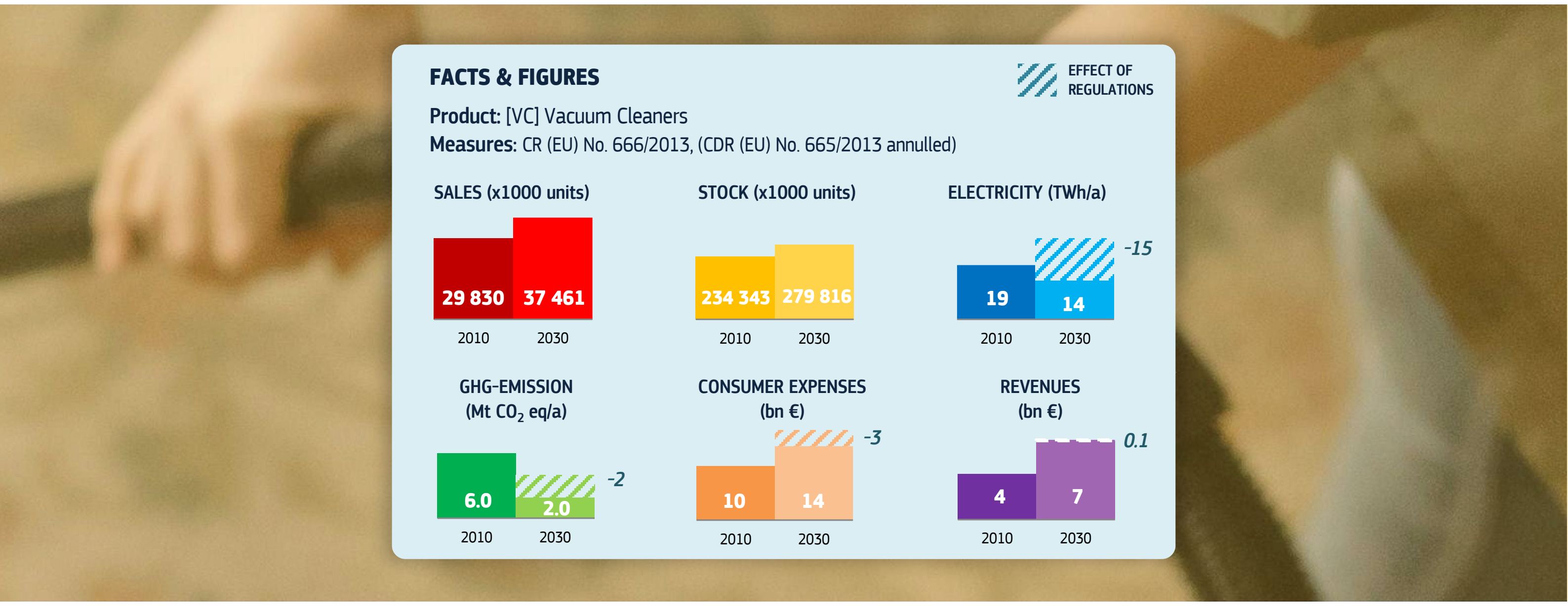
TYPES AND STOCK

Several types of vacuum cleaners, both domestic and non-domestic, are included in the scope of the regulation. The cylinder type vacuum cleaner is most common in European households. The upright type is preferred in England. The tub type is generally used for non-domestic applications.

In 1990, 121 million VCs were in use in EU27, increasing to 271 mln in 2020. A further increase to 280 mln units is expected by 2030.



Vacuum cleaners



EU-LOAD

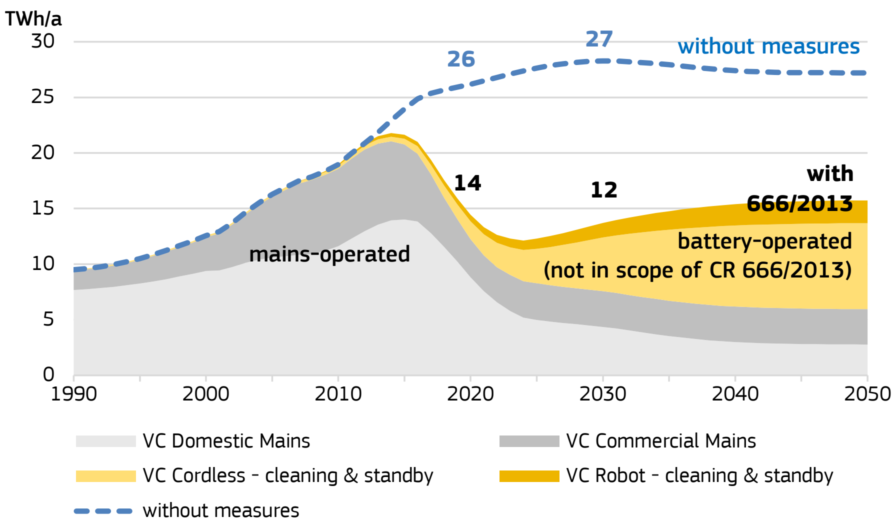
The EU-load represents the total demand for vacuum cleaner 'output' in EU27. It is expressed in the annual floor surface area to be cleaned. In 2020, this was 1.29 million km², which roughly equals the combined land surface areas of France, Germany and the Benelux. This surface area is expected to increase slightly to 1.34 million km² in 2030.

SAVINGS

Without measures, average power of domestic VCs would have been around 2300 W in 2020 and 3000 W in 2030. Due to the measures this decreased to 948 W in 2020 and expected 900 W by 2030. Combining this with the increasing large quantities of VCs, the energy savings are significant.

Without measures, total EU27 electricity consumption by VCs would have been 26 TWh/a in 2020 and 28 TWh/a in 2030. Due to measures this was reduced to 14 TWh/a in 2020 (-45%) and an expected 14 TWh/a in 2030 (-52%).

TOTAL EU27 ANNUAL ELECTRICITY SAVINGS OF VACUUM CLEANERS



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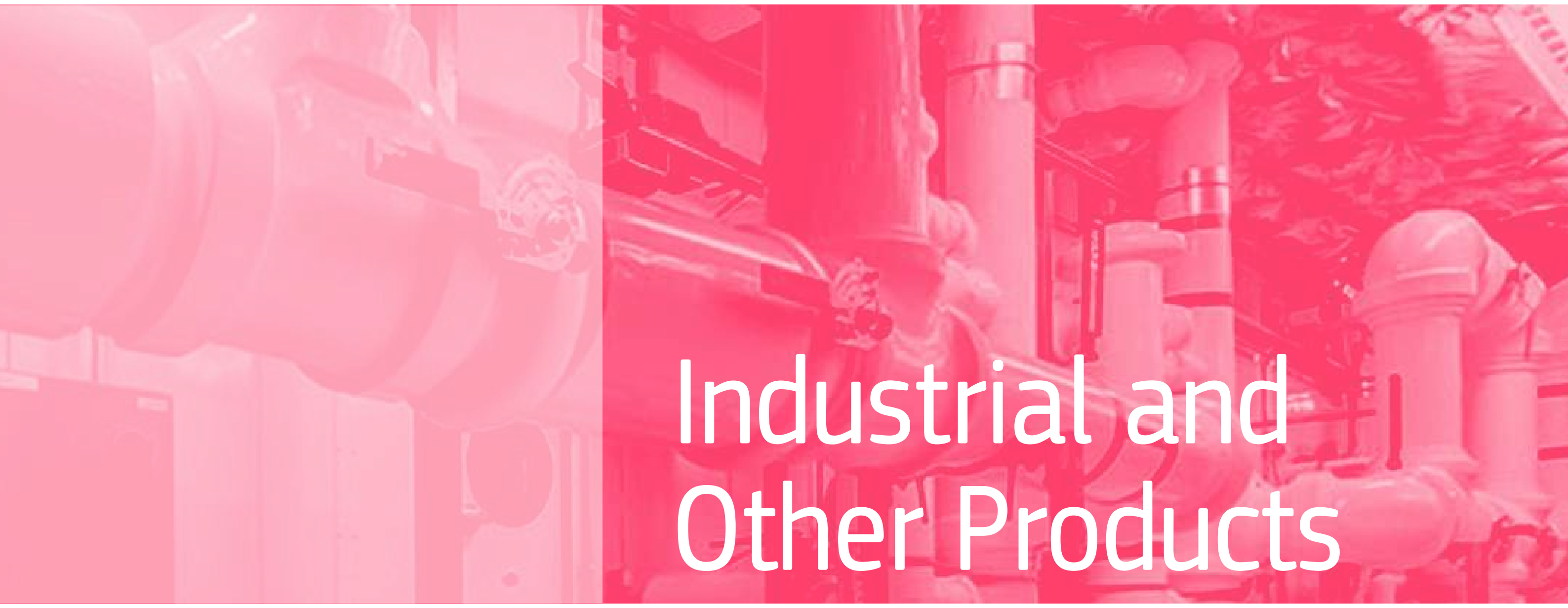


Industrial and Other Products

Industrial fans

Electric motors

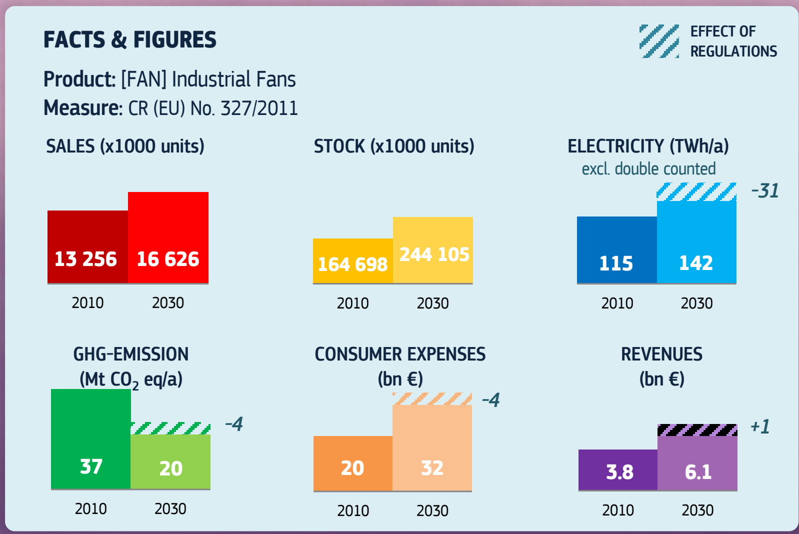
Welding equipment

Water pumps (clean water)

Utility transformers

Tyres

Industrial fans



GENERAL INFO

Fans typically blow air and have a low output pressure. This distinguishes them from compressors (higher output pressure) and from pumps (act on liquids).

Ecodesign regulation 327/2011 applies to industrial fans driven by an electric motor with an input power between 125 W and 500 kW. This range covers around 5% of the nearly 4 billion fans in use in EU, but they are responsible for 80% of the electricity consumption by fans.

Different types of fans (for different applications) have different efficiencies and are therefore separately addressed in the regulation.

Smaller fans (< 125 W) are often integrated in products that are already regulated (or for which regulation is judged not effective), and therefore excluded here. They represent more than 90% of all installed units but use only 10% of total fan electricity.

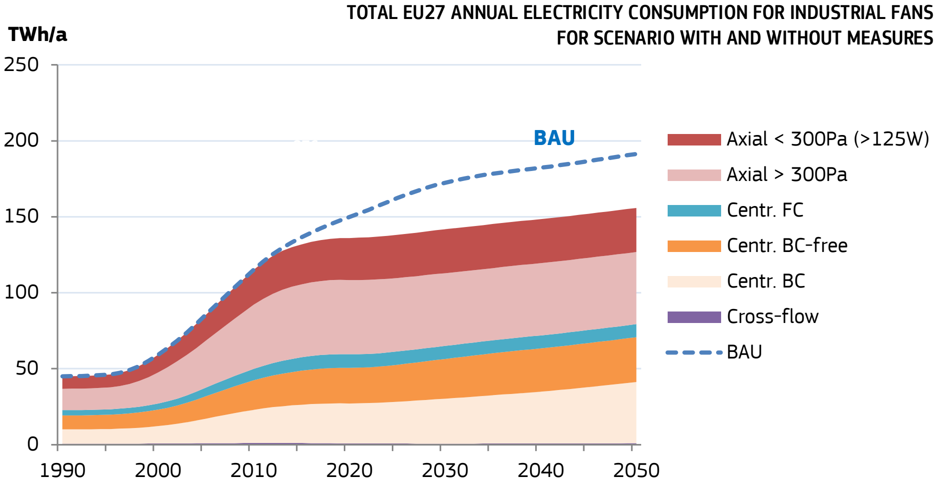
Very large fans (> 500 kW) sell less than 1000 units per year, but anyway account for 10% of total fan electricity. They are applied in e.g. cogeneration and power plants and industrial processes. The energy awareness of their end-users is very high and market forces are assumed to ensure use of energy-efficient solutions; therefore they are also excluded here.

ELECTRICITY

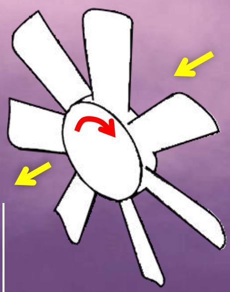
In 2010, fans in scope of the regulation consumed 230 TWh/a of electricity. Without measures, this was expected to increase to 300 TWh/a in 2020 and 345 TWh/a in 2030. Due to the measures this can be reduced to 272 TWh/a (-9%) in 2020 and 284 TWh/a (-18%) in 2030 (these figures include double-counted electricity).

Almost half of the 2030 savings come from improvements on axial fans. Another 35% comes from centrifugal backward curved fans, 11% from centrifugal forward curved fans and 4% from cross-flow fans.

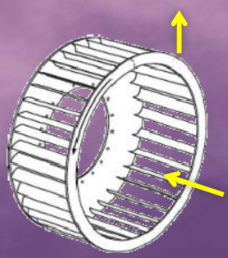
TOTAL EU27 ANNUAL ELECTRICITY CONSUMPTION FOR INDUSTRIAL FANS FOR SCENARIO WITH AND WITHOUT MEASURES



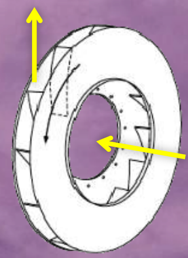
Industrial fans



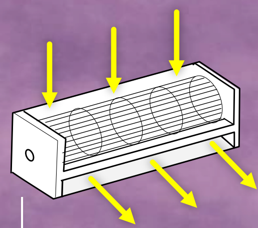
Axial-propeller
2020 sales: 11.8 mln (72%)
Efficiency: 31-37%
Improvable to: 39-44%



Centrifugal forward curved
2020 sales: 2.4 mln (15%)
Efficiency: 32%
Improvable to: 45%



Centrifugal backward curved
2020 sales: 1.5 mln (9%)
Efficiency: 54-56%
Improvable to: 65-67%



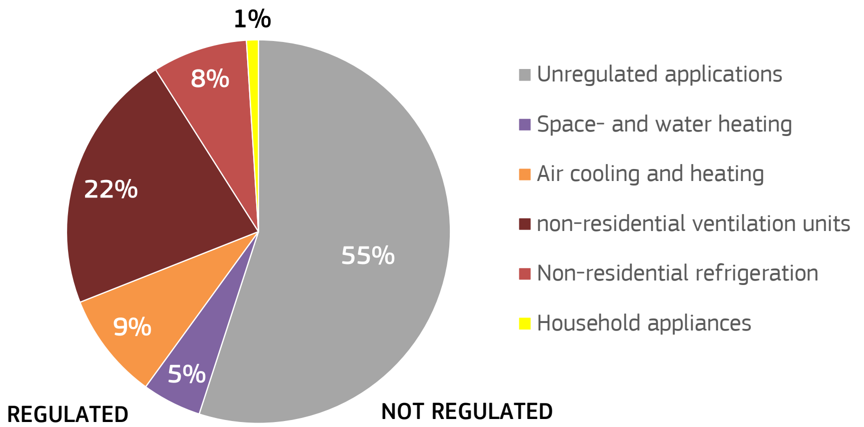
Cross-flow
2020 sales: 0.6 mln (4%)
Efficiency: 7%
Improvable to: 21%

DOUBLE-COUNTING

The fans in the scope of the fan-regulation may be included in products for which a separate regulation exists. In that case energy and savings in EIA could be counted twice. To resolve this, EIA first reports the full data for each fan type (for transparency reasons and to enable comparison with the original studies), but then considers only the non-double-counted share when computing the fan-group total and the totals over all product groups.

Recent detailed studies show that 45% of the fan-electricity is already counted in other EIA-products, such as non-residential ventilation units, air heating and cooling, and non-residential refrigeration (see graph). This increases to approximately 50% if the interaction with the motor regulation is also taken into account. EIA therefore counts only 50% of fan energy and savings when computing totals.

ASSUMED DIVISION OF ELECTRICITY CONSUMPTION FOR FANS



Electric motors

GENERAL INFO

Regulation 640/2009 applied to 3-phase AC induction motors with powers between 0.75 - 375 kW and input voltage < 1000 V. In 2020 this regarded 88 million installed motors that consumed 903 TWh/a of electricity.

Regulation 2019/1781 extends the scope (details below) to include 380 mln motors, consuming 1326 TWh/a of electricity in 2020. This is 56% of the final electricity consumption in EU27 in 2020 of 205 061 ktoe = 2385 TWh (Eurostat Energy Balance, Apr. 2022).

REGULATIONS

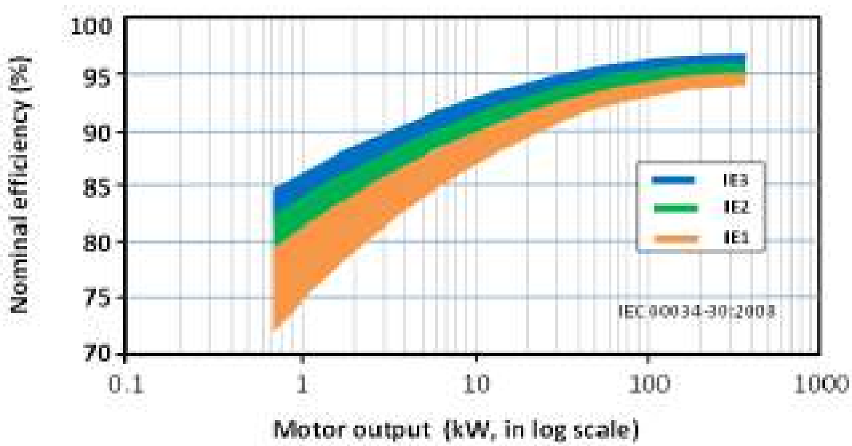
Regulation 640/2009 provided manufacturers with two options to reduce the energy consumption of a motor system. Either the motor had to comply with efficiency class IE3, or an IE2 motor (lower efficiency) could be combined with a Variable Speed Drive (VSD). As shown in the graph, the regulation had a strong positive effect on the motor market: the sales share of motors in the lowest efficiency class (IE1) dropped from 62% in 2009 (before the regulation) to 14% in 2015. Sales shifted to the higher efficient IE2 and IE3 motors.

The 2019 regulation involves a scope extension, covering:

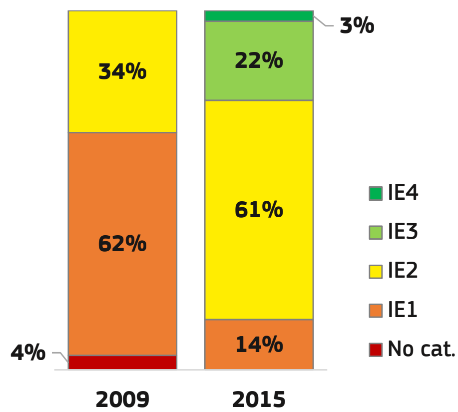
- Powers from 0.12 to 1000 kW
- 1-phase and 3-phase motors
- Special purpose motors (brake-motors, motors for explosive atmospheres, 8-pole motors)

With this extension the 2020 stock to consider increases more than 4 fold, from 88 mln to 380 mln. The corresponding electricity consumption increases by 45% from 903 to 1326 TWh/a (including double counted). EIA data reflect the final 2019 regulation, as voted.

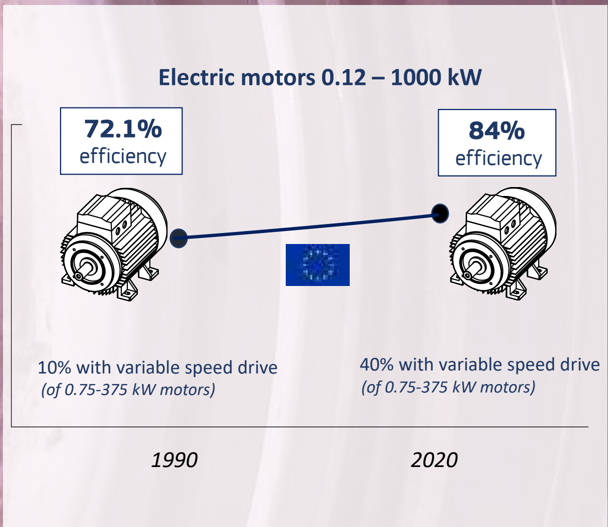
The efficiency of electric motors is indicated using classes (IE1, IE2, IE3) according to IEC600034-30: 2008.
In the same class, the efficiency depends on the motor output power, e.g. an IE3 motor of 1 kW output has an efficiency around 85%, but an IE3 motor of 100 kW output has an efficiency around 96%.

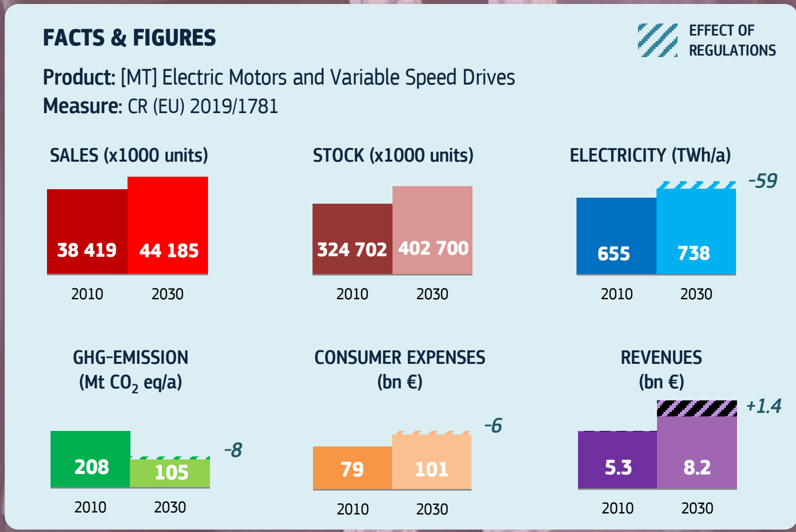


EU MARKET SHARE MOTOR EFFICIENCY CLASSES IN 2009 AND 2015



Electric motors





figures in graph are without double counted amounts

VARIABLE SPEED DRIVES

Most electric motors run at a constant speed and this determines the output of the application in which the motor is used, e.g. the amount of liquid pumped, air ventilated or air compressed. If the load of the application is more or less constant, and the motor is of the correct size/speed, this is no problem. Otherwise, the output has to be controlled by switching the motor on and off, or by throttling the output of the application. In that case large losses occur, because the motor runs at full power/speed while this would not be necessary.

These losses can be avoided by controlling the power supply to the motor using a Variable Speed Drive (VSD). Although VSDs themselves consume some additional power and may also have a small negative effect on motor efficiency, the avoided losses are much higher so that large electricity savings can be obtained.

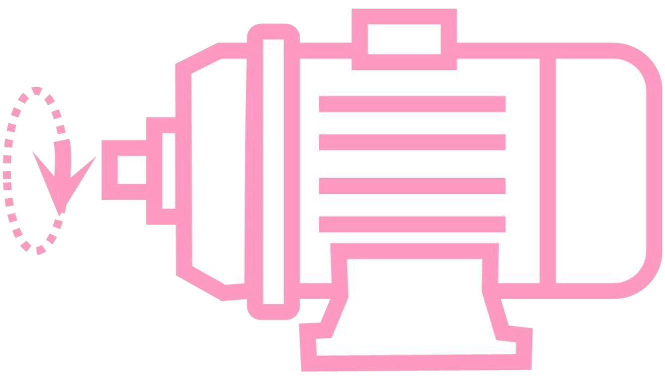
Regulation 640/2009 therefore promoted the use of VSDs in variable load applications. The 2019 regulation no longer has this promotion, but sets efficiency requirements also for VSDs.

DOUBLE COUNTING

A part of the electric motors in the scope of the motor-regulation is used in products for which a separate regulation exists. In that case energy and savings in EIA could be counted twice. To resolve this, EIA first reports the full motor data (for transparency reasons and to enable comparison with the original studies), but then considers only the non-double-counted share when computing the totals over all product groups.

For the scope of the current regulation the double-counted share, as now applied in EIA to both energy and savings, is estimated to be 45%.

A detailed estimate of the double counted part is performed in the impact assessment accompanying the 2019 regulation, for the extended motor scope.



Electric motors

EFFICIENCY AND SAVINGS

Numbers in text and graphs are full amounts, including double-counted. To remove double-counted amounts, multiply values by 0.55.

Due to the existing motor regulation (640/2009), the average efficiency of 0.75-375 kW AC 3-phase motors increased from 77.5% in 2009 to 82.1% in 2016. In parallel the share of motors sold with VSD increased from 17% in 2009 to 30% in 2016. These trends were expected to continue, even without the new 2019 regulation. Based on the 2018 Impact Assessment, CR 640/2009 will deliver electricity savings in EU27 of 52 TWh/a in 2020 and projected 99 TWh/a in 2030.

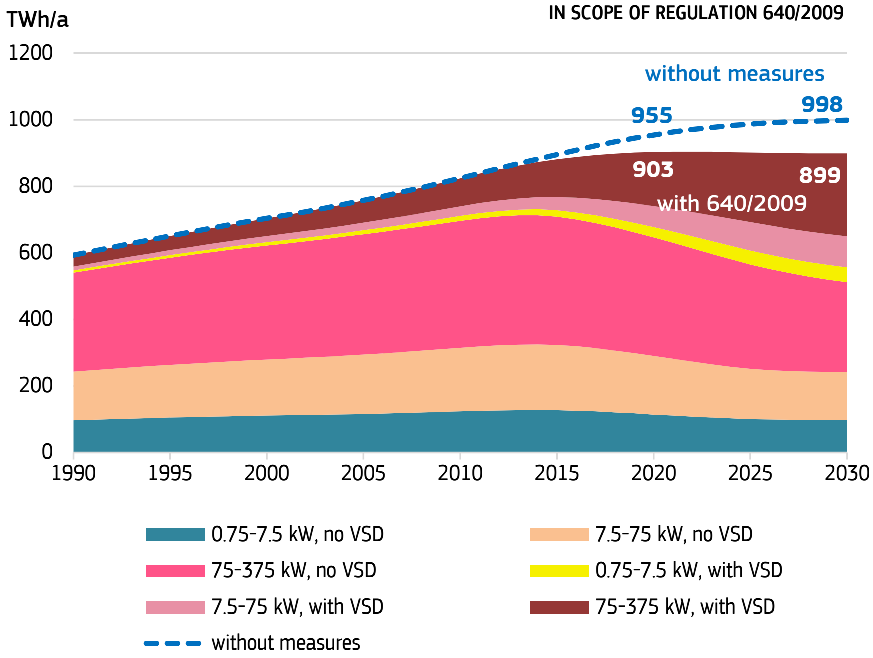
The 2019 regulation foresees an extension of the scope (see Electric Motors Regulation). For this extended scope, if no measures would have been taken in 2009, the electricity consumption of electric motors would have increased from 1192 TWh in 2010 to 1378 TWh in 2020 and 1449 TWh in 2030. Due to the revised regulation, this can be reduced by 52 TWh in 2020 and 107 TWh in 2030. The latter savings represent 4.3% of the total EU27 final energy consumption in 2019.

Considering that regulation CR 640/2009 (without revision) is expected to save 99 TWh in 2030, the 2019 regulation and scope extension lead to an additional 8 TWh/a savings in 2030.

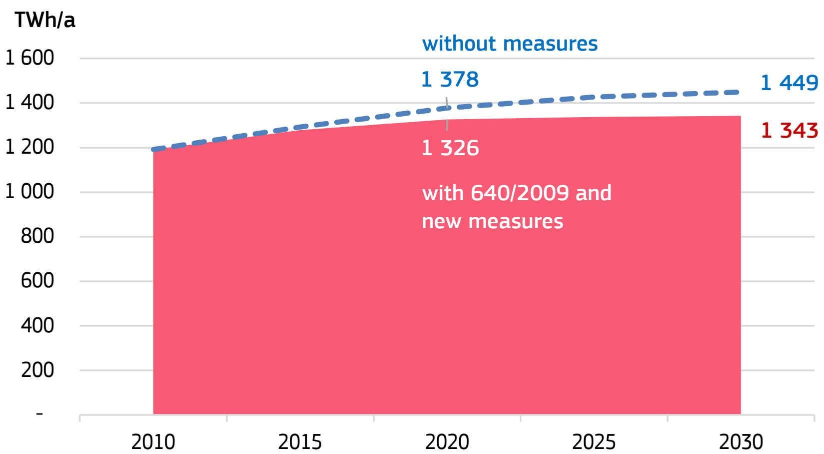
The electricity savings for the revised regulation entail a reduction of GHG emissions by 15 Mt CO_2eq/a in 2030, compared to a scenario without any regulation.

In 2030, considering 2.5 bn euros additional acquisition costs for higher efficiency motors and for VSDs, and 13.5 bn euros lower electricity costs, the net savings on total EU27 expenses for electric motors in scope of the revised regulation are 10.9 bn euros.

ELECTRICITY, MOTORS 3-PHASE 0.75-375 KW
IN SCOPE OF REGULATION 640/2009



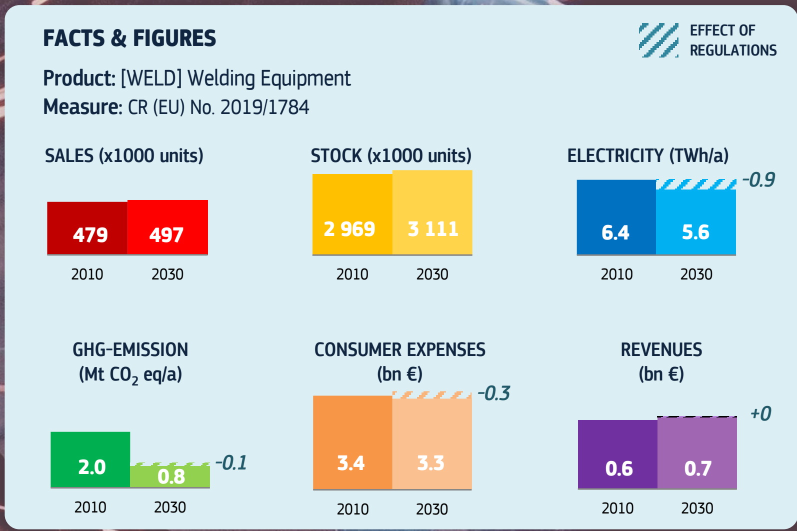
ELECTRICITY, MOTORS, EXTENDED SCOPE EU27



Welding equipment

GENERAL INFO

Regulation 2019/1784 applies to electrical mains-operated welding equipment, including manual metal arc; shielded metal arc; self-shielded flux-cored; flux cored arc; metal active gas and metal inert gas; tungsten inert gas -welding; and plasma arc cutting. The Regulation does not apply to submerged arc welding; limited-duty arc welding; resistance welding; stud welding.



From 1 January 2023, the regulation sets a minimum efficiency for power sources of welding equipment, and a maximum power consumption in idle state. In addition there are resource requirements and information requirements. Among these: Where a display is provided for a welding equipment it shall provide an indication of the use of welding wire or filler material in grams per minute or equivalent standardised units of measurement. This is expected to reduce the consumption of wires and electrodes. A similar information requirement on shielding gas consumption did not make it to the final regulation.

Ecodesign Lot GROW 5 originally intended to cover all machine tools, but an Ecodesign regulation was developed and voted only for welding equipment.

SALES AND STOCK

In 2020, 486 thousand welding units in scope of the regulation are sold and this number is projected to slightly increase to 497 thousand in 2030. This leads to an installed stock of 3.1 mln units in 2030.

CONSUMABLES

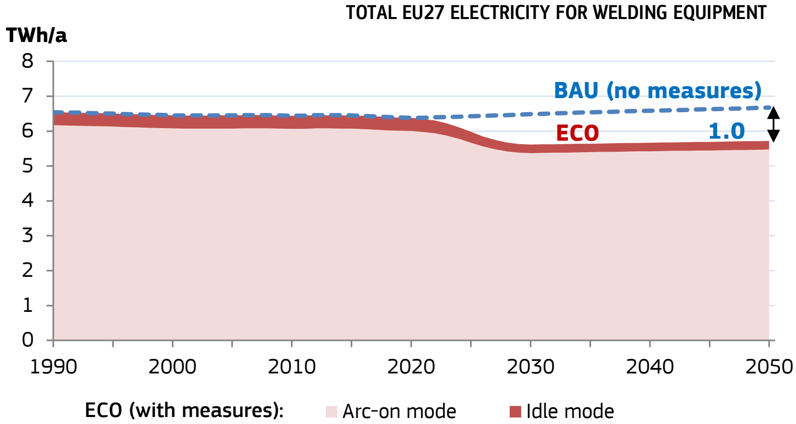
In 2020, the welding equipment in scope consumed 1614 kt/a of filler wire and electrodes, with a primary energy content of 9 TWh. Without the information requirements of CR 2019/1784 this is projected to increase to 1647 kt/a in 2030, of which 82 kt can be saved due to the regulation, corresponding to a cost saving of 37 million euros.

The consumption of shielding gas in 2020 is around 652 kt/a. The impact assessment data indicate that 10% of this could be saved in 2030. However, considering that the final regulation does not contain the information requirement on shielding gas consumption, it is doubtful if this reduction will be realised.

ELECTRICITY AND SAVING

In 2020, welding equipment in scope of the regulation consumed 6.4 TWh/a of electricity, and without measures this would increase to 6.5 TWh/a in 2030. By far the largest part is consumed in active (arc-on) modes. Due to the measures, 0.9 TWh/a can be saved in 2030.

TOTAL EU27 ELECTRICITY FOR WELDING EQUIPMENT



Water pumps

GENERAL INFO

Ecodesign ENER Lot 11 includes (small) clean water pumps and circulators, Lot 28 is for wastewater pumps, and Lot 29 addresses pumps for private and public swimming pools, ponds, fountains and aquariums, as well as clean water pumps larger than those of Lot 11.

REGULATIONS

Regulation 547/2012 is limited to pumps for clean water (Lot 11), and only their data are currently reported in EIA. The scope includes rotodynamic pumps that move clean water (as defined in the regulation; temperatures -10° to 120°C) using hydrodynamic forces. Excluded are: displacement pumps (that enclose a volume of clean water and force this volume to the outlet), self-priming pumps (that can start and/or operate also when only partly filled with water) and pumps designed only for fire-fighting applications.

The regulation applies to 'glanded' pumps, meaning that there is a sealed shaft connection between the impeller in the pump body and the motor: The driving motor component remains dry (except for MSS, see below). This distinguishes the pumps from the 'glandless' circulators that are subject of regulation 641/2009 (am. 622/2012).

Regulation 547/2012 specifically addresses end suction (ES), submersible multistage (MSS) and vertical multistage (MS-V) pumps. Each of these types is defined very strictly within certain performance boundaries in terms of flow rate, pressure, fluid temperature and even discrete rotary speeds or borehole diameters, thus limiting the applicability.

An important use of clean water pumps is in the agricultural sector (25% of total energy consumption by pumps), where ES and MSS pumps are used for irrigation and drainage. ES pumps are used for pumping from surface water and shallow wells. MSS pumps are used (submersed) in deep wells. MS-V pumps are typically used as pressure boost in high-rise buildings above 3-4 floors. Other clean water pump applications include garden irrigation, public drinking water production (including purification) and cleaning and cooling in the industrial sector.

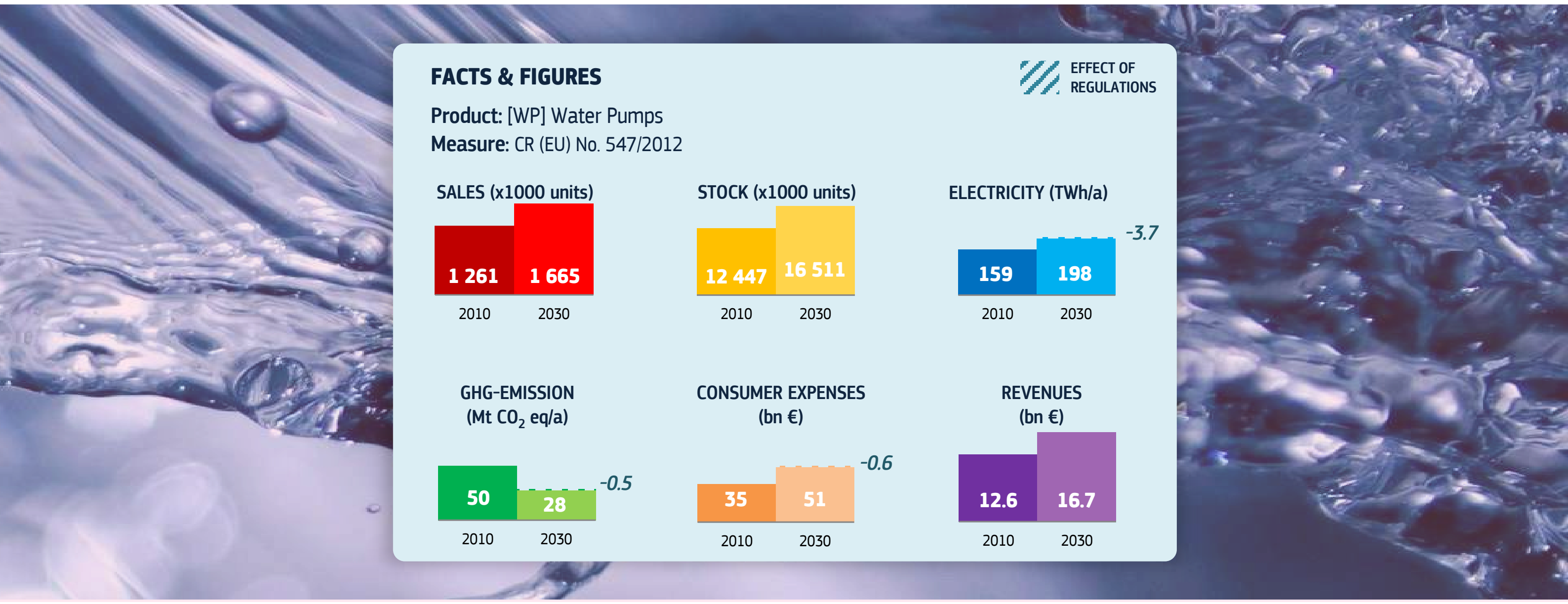
EFFICIENCY

Ecodesign requirements apply to the hydraulic pump efficiency, which is the ratio between the mechanical power transferred to the liquid during its passage through the water pump and the mechanical input power transmitted to the pump at its shaft. This means that the efficiency of the motor driving the pump is not covered by this regulation, i.e. the regulation requires an efficient pump to be used but would allow it to be driven by an inefficient motor. Consequently the separate motor regulation (see previous section) is complementary here.

The minimum required efficiency depends on the flow rate (m^3/h), on the 'head' (the column of water in meters that the pump is able to produce), on the working point (best efficiency point, part load or overload) and on a Minimum Efficiency Index (MEI, a dimensionless scale unit for hydraulic pump efficiency). MEI=0 indicates poor design and manufacturing quality. MEI>0.7 is not practically attainable in mass production and can only be achieved by special hydraulic design (aiming only at high efficiency and neglecting e.g. good cavitation performance), and by exceptional measures in mechanical design and manufacturing. From 1st January 2015, regulation 547/2012 requires MEI=0.4, meaning that 40% of the products on the market will need to improve their efficiency level.

In 2008 the average hydraulic efficiency of clean water pumps in scope of the regulation was 66.5% and without measures this was not expected to change. Due to Ecodesign measures the efficiency has increased to 68.5% from 2020 onwards.

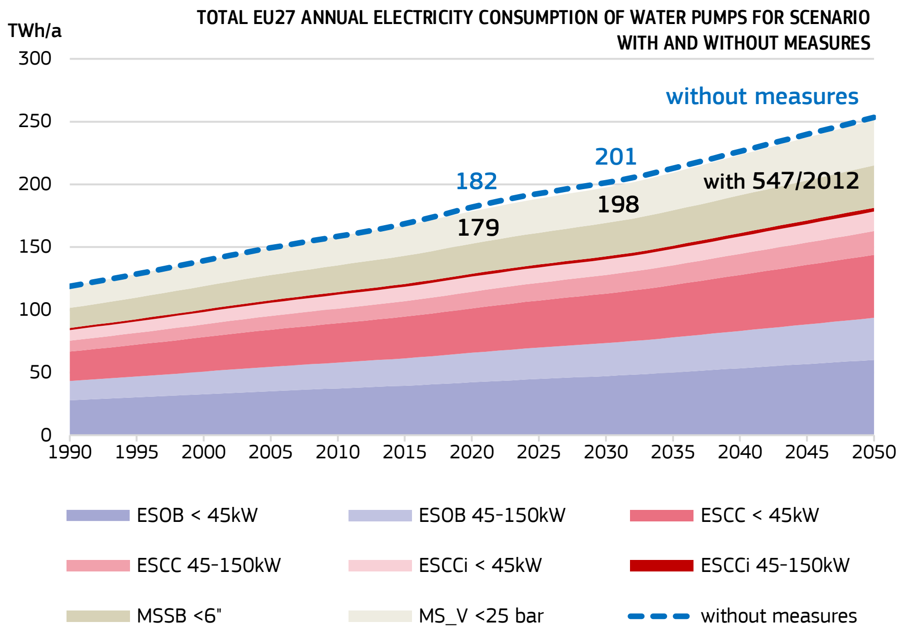
Water pumps



SAVINGS

In 2020, clean water pumps consumed 180 TWh/a of electricity (input energy to motors driving the pumps), corresponding to 39 Mt CO_2eq/a of GHG emissions. Due to an increasing stock this would have increased to 200 TWh/a and 29 Mt CO_2eq/a in 2030. Measures are expected to realise savings of 4 TWh/a and 0.5 Mt CO_2eq/a in 2030.

ESOB: End-Suction Own Bearing
ESCC: End-Suction Close Coupled
ESCCi: ESCC in-line
MSSB: Multi-Stage Submersible Borehole
MS-V: Multi-Stage Vertical



A review study on pumps has been completed in 2018. In addition to reviewing the Lot 11 clean water pumps, this study took also into account the wastewater and pool pumps of Lots 28/29.

The study proposes an extension of the scope of the regulation, but more importantly introduces the concept of 'Extended Product Approach' (EPA). The EPA considers not only the hydraulic efficiency of the pump itself, but the entire system of pump, motor, drive and controls. The aim is to ensure that the most energy efficient combination of components is used for each pumping application (intended flow-time water pumping profile). Instead of the 4 TWh/a savings of the current regulation this approach, with extended scope, is expected to deliver 43 TWh/a savings by 2030.

EIA2021 has been updated based on the 2018 review study and a 2022 draft impact assessment. The update is limited to the scope and requirements of CR 547/2012, but already uses the EPA, including motor losses and VSD-impacts. EIA data are to be considered preliminary, awaiting the final impact assessment..

Utility transformers

GENERAL INFO

Utility transformers (or power transformers, TRAFO) transform an incoming alternating current (AC) power system into an outgoing AC power system, often converting from higher voltage to lower voltage or vice versa.

As TRAFOs essentially pass the upstream electricity (input) on to the downstream users (output), only the losses (input minus output) are accounted as electricity consumption in EIA.

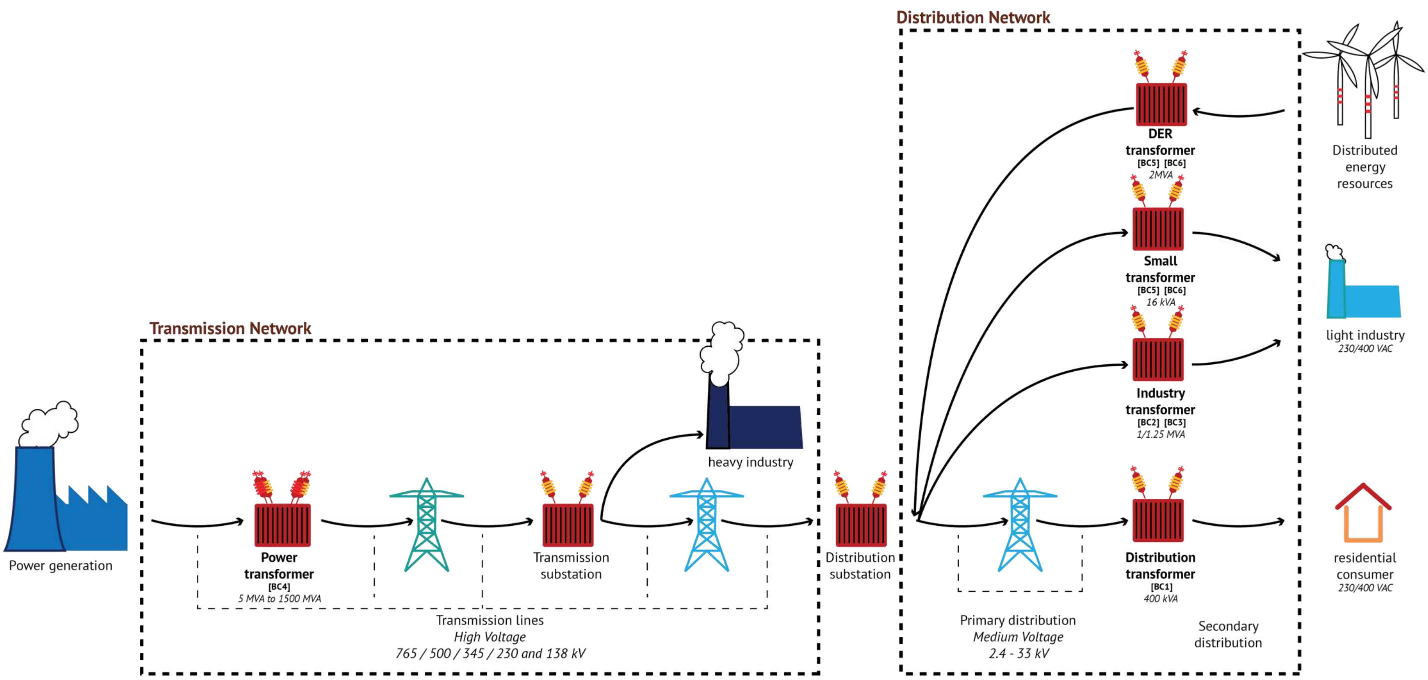
TRAFOs are used in the transmission and Distribution of electricity, between the point of generation and the point of use. The associated losses are already considered in EIA as part of the efficiency assumed for electricity generation and distribution (PEF). This PEF is used when determining the primary energy (fuel) necessary to supply a given amount of electricity to the end -user.

POWER GRID

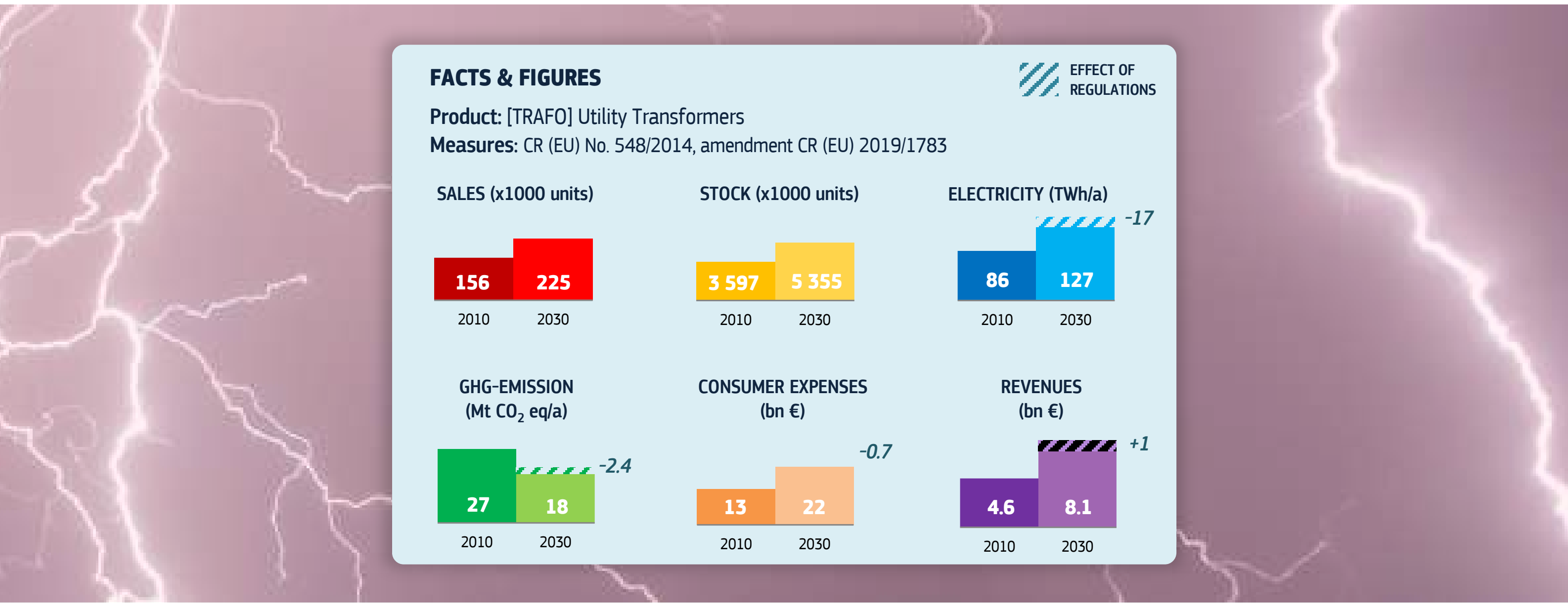
TRAFOs are part of the system that transports electricity from power plant to customer (households, industries, tertiary sector clients). A transmission network transports high voltage electricity to a distribution network. In the transmission network, power transformers may be used to step up or step down the voltage. Only large industries may tap from this network; all other consumers will get electricity supplied by the distribution network. Distribution substations convert the high voltage input from the transmission network to medium voltage power, which is transported to the primary distribution system by different types of transformers.

Utility transformers supply electricity for residential use (230 V). Higher power Industry transformers (either oil filled or dry) supply industrial consumers with low voltage electricity. DER-transformers (oil-filled or dry) connect Distributed Energy Resources (e.g. wind turbines, solar panels) to the distribution grid.

Dry or oil-filled refers to the cooling method of the transformer. Oil-cooled appliances have lower losses, but entail higher risks (fire). TRAFOs below 500 kVA are usually dry; those above 2.5 MVA usually oil-cooled.

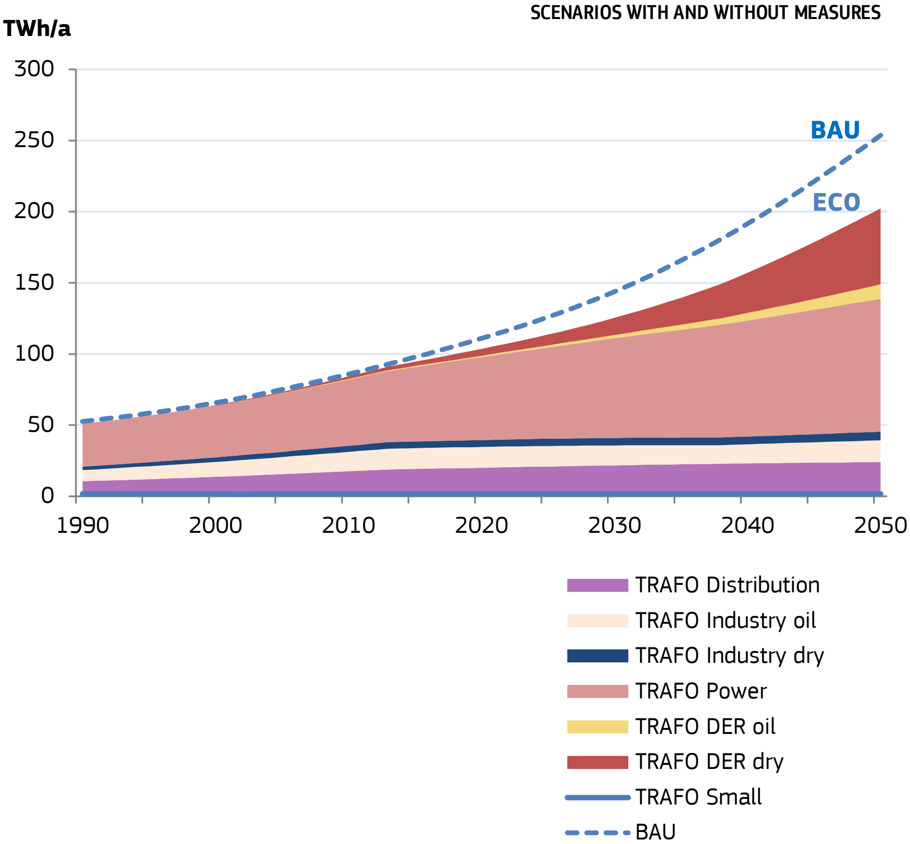


Utility transformers



STOCK, LOSSES AND SAVINGS

TOTAL EU27 ANNUAL ELECTRICITY CONSUMPTION OF UTILITY TRANSFORMERS FOR SCENARIOS WITH AND WITHOUT MEASURES



The total EU27 stock of TRAFOs in scope of regulation 548/2014 was 4.4 mln units in 2020 and had 105 TWh/a of electricity losses. The largest part (63%) are distribution TRAFOs (0.4 MVA) but they account for only 19% of overall TRAFO losses. Industry TRAFOs (oil and dry, 1-1.25 MVA) are 17% of the stock and responsible for another 19% of the losses. Small TRAFOs (0.016 MVA) are 15% of the stock, but associated to only 2% of the losses. Power TRAFOs (100 MVA) are only 2% of the stock but cause 55% of the losses.

To avoid that losses are counted twice, EIA sets the electricity consumption of TRAFOs to zero for the BAU scenario and then considers the savings (smaller losses) due to Ecodesign measures as negative electricity consumption in the ECO scenario.

Small TRAFOs and Power TRAFOs have no associated electricity savings. The savings due to Ecodesign measures on the other TRAFO-types are 17 TWh/a in 2030, reducing their electricity losses from 144 TWh/a (without measures) to 127 TWh/a.

INDUSTRIAL AND OTHER PRODUCTS

Tyres

GENERAL INFO

General info

The rolling resistance of tyres accounts for 16-20% of the fuel consumption of vehicles. Therefore, improving the rolling resistance can realise significant savings on fuel consumption and CO_2 emissions. However, it is important that other properties of tyres, such as wet grip and durability, are not negatively affected when improving energy efficiency.

REGULATIONS

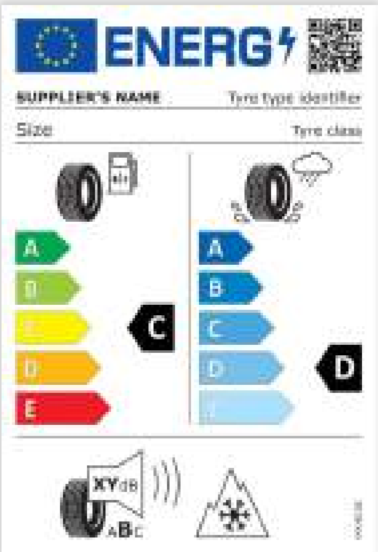
The EU adopted in 2009 two sets of rules relating to tyres:

1. The Tyre Labelling Regulation 1222/2009 (TLR, entered into force in 2012) harmonising the information on tyre parameters to be provided to end-users allowing them to make informed purchasing choices.

2. Regulation 661/2009 on type-approval requirements for the general safety of motor vehicles ("General Safety Regulation" or GSR), putting in place harmonised technical requirements that tyres must satisfy before they can be placed on the Union market.

The GSR sets minimum requirements for e.g. rolling resistance, noise and wet grip performance of tyres, from November 2012. International UNECE test methods form the basis of the tests in both TLR and the GSR. Subsequent, more stringent requirements are introduced in 2016 and 2018. New requirements will be enforced in 2022 with Regulation 2019/2144.

The TLR was reviewed in 2018, leading to a Commission proposal for a new label layout, using a modified scale of label classes for energy efficiency and wet grip, and adding symbols for snow- and ice-grip when applicable. The revision entered into force in 2021 under Regulation 2020/740.



ENERGY LABELLING

The new label for tyres, to be used from 2021, shows the label class for fuel efficiency, the label class for wet-grip, the noise-emission level, and the symbol for use on snow or ice, if applicable.

The fuel efficiency label class is determined based on the 'rolling resistance coefficient' (RRC) which is measured according to UNECE Regulation 117 and subsequent amendments. The RRC is expressed in kg rolling resistance per ton of vehicle weight, kg/t.

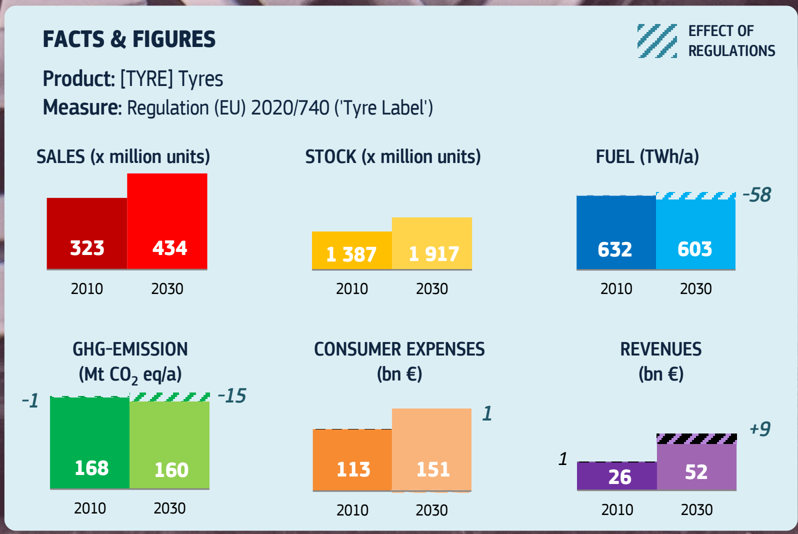
TYRE TYPES

The Labelling regulation covers tyres for passenger cars (C1), light commercial vehicles (C2) and heavy duty trucks and busses (C3).

Labelling applies to replacement tyres and to OEM-tyres mounted under vehicles being sold. The revised regulation will also apply to re-treaded tyres once a suitable testing method for such tyres is in place. Re-treading of tyres is frequently applied for C3 tyres. It is a reworking process in which the worn tread of tyres is replaced. This method allows 90% of the tyre-material to be spared while costs are only 20% of the manufacturing costs of a new tyre.

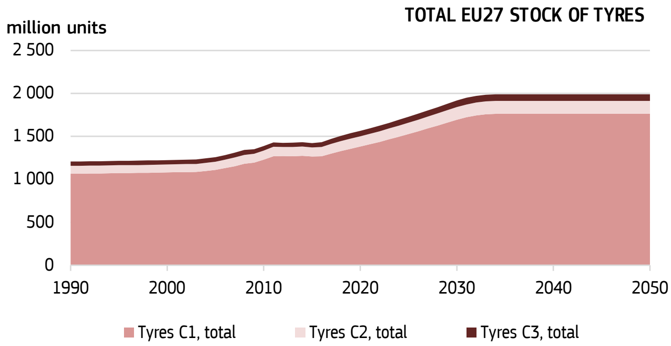
Some special types of tyres are excluded, e.g. off-road professional tyres, racing tyres, studded tyres, spare tyres for older vehicles (before 1990), spare tyres for temporary use, etc.

Tyres



STOCK

Together with light sources and external power supplies, 'Tyres' are the largest product group in EIA in terms of units in use. In 2020 there were 1.5 billion units 'installed', of which 88% car tyres (C1), 8% van tyres (C2) and 4% truck tyres (C3). In 2030, this is expected to increase to 1.9 billion units (+23%).



ENERGY CALCULATION

The fuel consumption by vehicles due to the rolling resistance (RRC) of tyres is computed in EIA multiplying the average annual kilometres driven (in 100 km) by the fuel losses per 100 km per vehicle due to RRC (in litres/100 km), by a kWh/L conversion factor, and by the vehicle stock.

The annually travelled distance is taken as 13 500 km for C1, 21 000 km for C2 and 57 500 km for C3.

The kWh/L factor converts the litres of fuel losses in kWh NCV of energy, which is the energy measure used in EIA. The factor depends on the share of vehicles that is assumed to use petrol (9.7 kWh/L) or diesel (10.8 kWh/L). For C1, 44% diesel is assumed, for C2 88% and for C3 96%. The remaining share is petrol (EIA does not consider electric vehicles).

The average fuel consumption of new sold vehicles decreases with the years due to e.g. changes in motor efficiency, aerodynamic resistance, and rolling resistance of tyres (RRC). For the current scenario (with current RRCs, including effects of the existing TLR), this fuel consumption varies from 8.6 L/100km in 2005 to 4.8 L/100km in 2030.

In the EIA BAU scenario (without effects of the existing TLR), RRCs are higher, leading to higher fuel consumption. In the EIA ECO scenario (with effects of existing and new TLR), RRCs are lower, leading to lower fuel consumption. The variation in fuel consumption due to a variation in RRC of the tyres has been studied by IDIADA: a 10% change in RRC leads to a 1.64% (C1), 1.17% (C2) or 1.12% (C3) change in vehicle fuel consumption.

Given time-series for the RRCs in the various scenarios, this allows computation of the vehicle fuel consumption for each scenario and each year (L/100km/vehicle). The difference between the BAU and ECO scenarios gives the fuel savings due to RRC improvements.

EIA does not report the entire vehicle fuel consumption, but only the fuel losses caused by the RRC, assumed to be 16% of vehicle fuel consumption for C1 and C2 and 20% for C3.

Tyres

TYRE EFFICIENCY

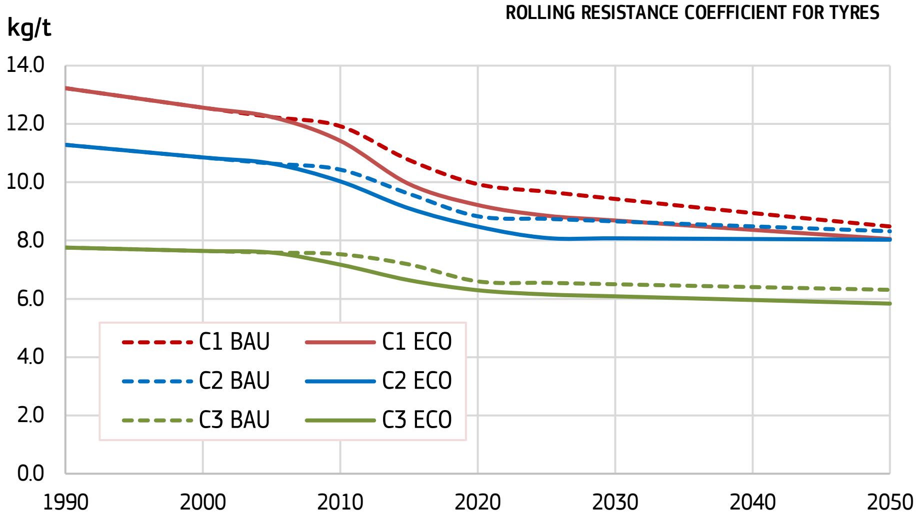
The "Rolling Resistance Coefficient" (RRC) is the resisting force by tyres (rolling friction) on a vehicle in motion related to its weight, expressed in kilograms resistance per ton of vehicle weight (kg/t). A lower value indicates a more energy efficient tyre. The RRC has been improving since 1990, but the labelling regulation accelerated the pace.

In 2005, the average car tyre (C1) had an RRC value of 12.2 kg/t, expected to drop to 9.4 kg/t (without measures) or to 8.7 (with measures, -8% due to measures) by 2030.

For van tyres (C2) the values are 10.6 kg/t (2005), 8.7 kg/t (2030 without measures) and 8.1 kg/t (2030 with measures, -7% due to measures).

For truck tyres (C3) the values are 7.6 kg/t (2005), 6.5 kg/t (2030 without measures) and 6.1 kg/t (2030 with measures, -6% due to measures).

ROLLING RESISTANCE COEFFICIENT FOR TYRES



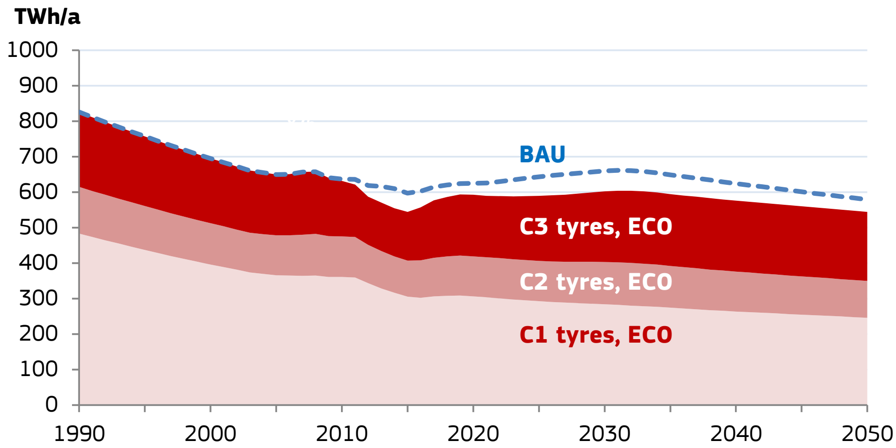
SAVINGS

The annual fuel consumption related to the rolling resistance of tyres was 650 TWh/a in 2005, before the introduction of measures. By 2030 this is expected to become 660 TWh/a in absence of measures. The labelling regulation, including the 2020 revision, is projected to reduce this to 603 TWh/a (-57 TWh, -9%).

These savings correspond to 15 Mt CO_2eq/a lower GHG-emissions in 2030.

EIA does not consider the indirect societal effects of the Tyre Labelling regulation, e.g. the decrease in health costs due to less victims and injuries from road incidents, due to better wet-grip of tyres, or the decrease in health costs due to lower emissions.

TOTAL EU27 FUEL LOSSES DUE TO RRC OF TYRES



Households

Sales and stock

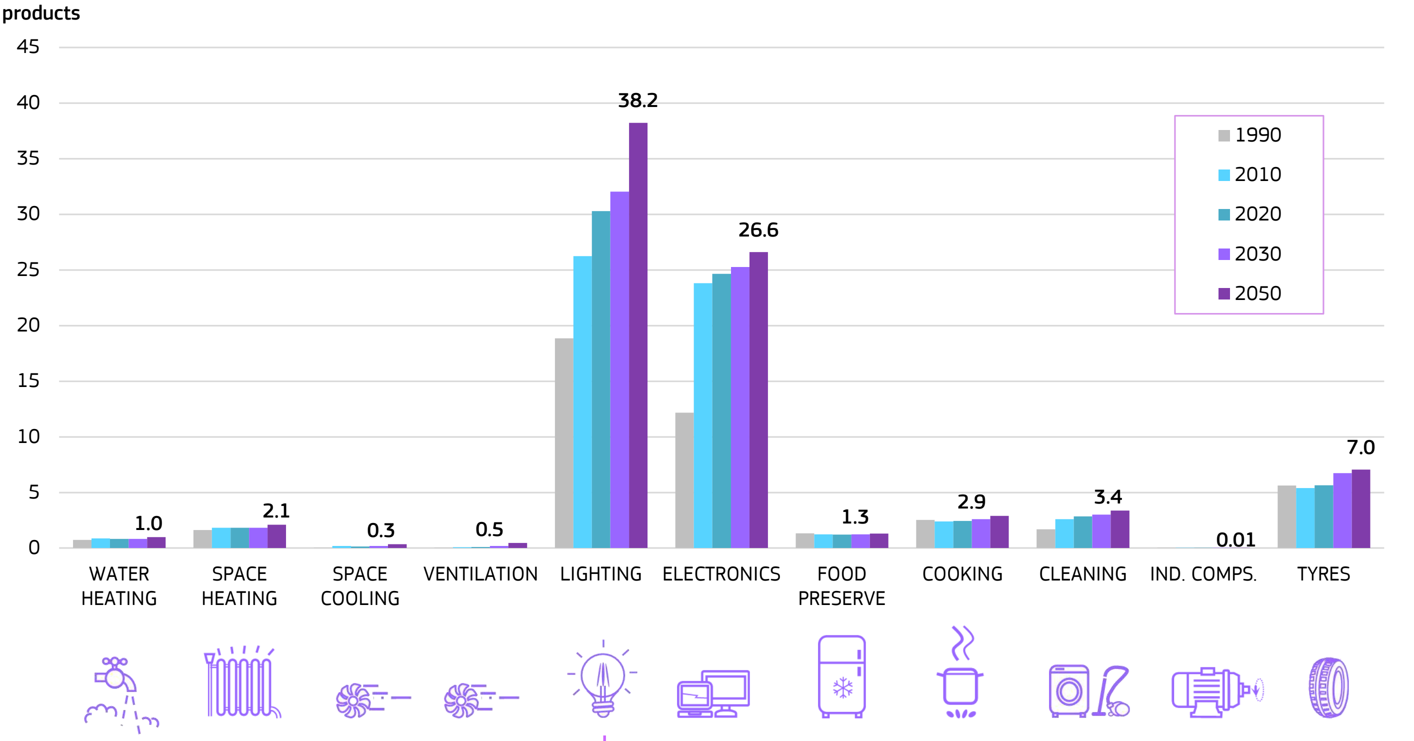
Energy consumption

Expense savings

Sales and stock

In 2020, the average EU27 household bought 10 products that are regulated by Ecodesign or Energy Labelling, of which 4 light sources, 4 electronics products and 1 tyre. On average a household used 70 regulated products in 2020, of which 30 light sources and 25 electronics products.

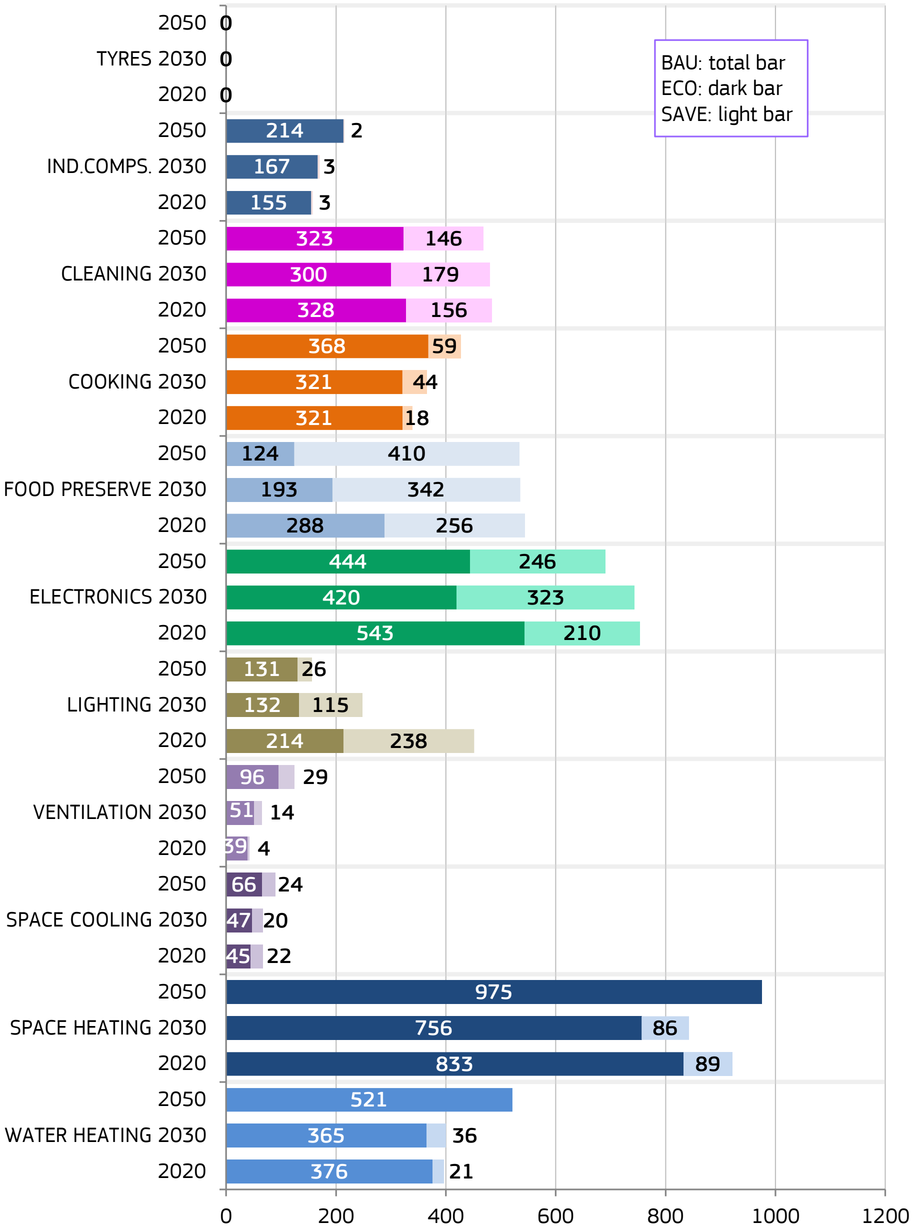
STOCK OF PRODUCTS PER EU27 HOUSEHOLD PER YEAR



Noteworthy is the drop in sales for light sources from 7-8 units per year in 1990-2010 to less than 1 unit per year in 2030-2050. Notwithstanding this drop, due to the long lifetime of LEDs, the stock of light sources per household continues to increase from less than 20 in 1990, to 30 in 2020 and projected 38 in 2050.

Energy consumption

ELECTRICITY PER EU27 HOUSEHOLD
ECO SCENARIO AND SAVINGS VS. BAU, 2020-2030-2050



In 2020, due to Ecodesign and Energy Labelling regulations, the average EU27 household saved 1015 kWh/a of electricity, projected to grow in 2030 to 1163 kWh/a. This is respectively 28% (2020) and 32% (2030) of the total annual electricity consumption of the average household in 2020.

The major savings come from food preservation (refrigerators), electronics (largest contributions from TVs and standby), lighting, and cleaning (vacuum cleaners, washing machines and dishwashers).

In addition, the average household saved almost 700 kWh of fuel (gas, oil, coal, wood) in 2020, projected to double in 2030. This is respectively 6% (2020) and 12% (2030) of the total annual fuel consumption of the average household in 2020. These savings are mainly the results from the measures on space heating, water heating and tyres.

Due to these reductions in energy consumption, an average household avoided the emission of 360 kg CO_2-equivalent of greenhouse gases in 2020. In 2030 this is projected to increase to 440 kg CO_2eq/household.




Expense savings

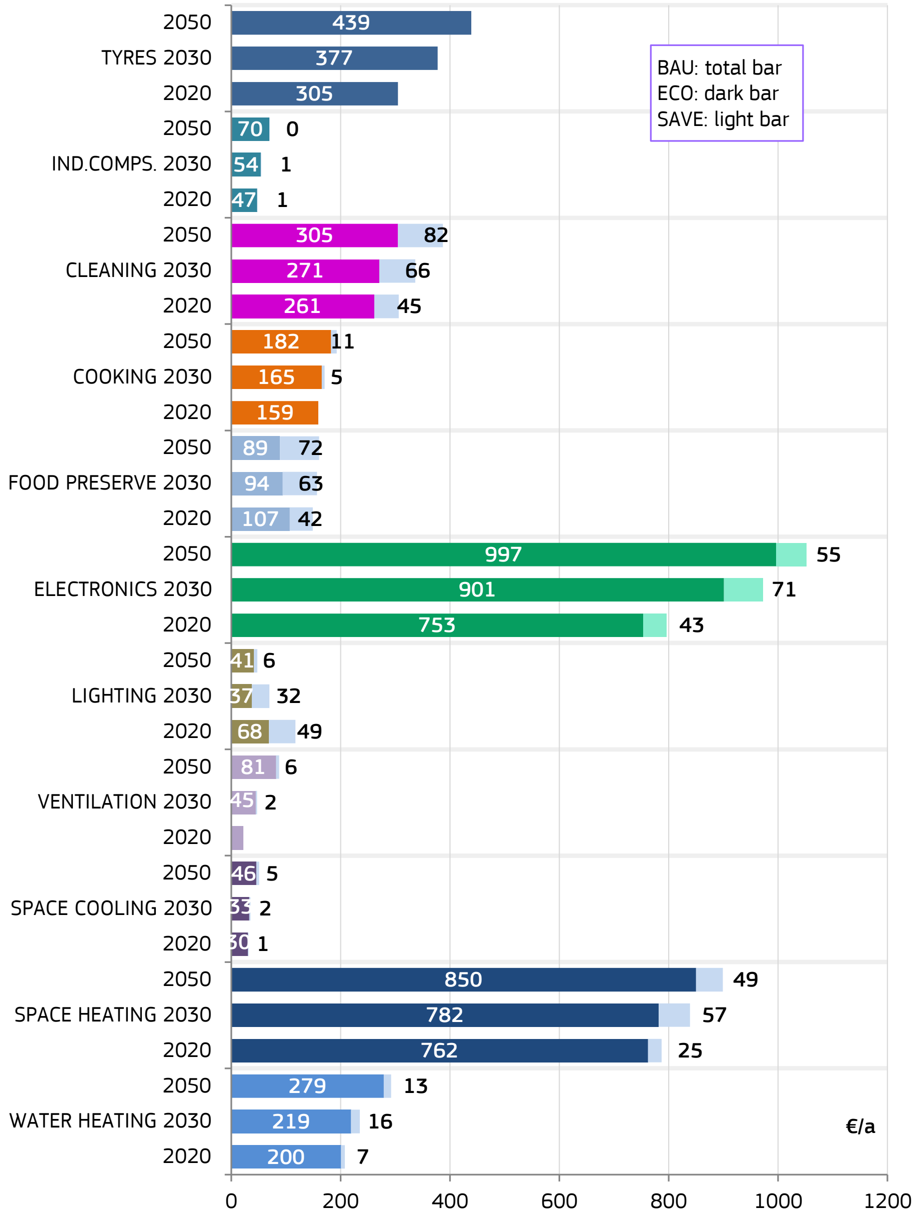
In 2020, the average EU27 household spent 2715 euros for the acquisition, installation, operation, and maintenance of regulated products. Without the Ecodesign and Energy Labelling regulation this would have been 2913 euros: a saving of 198 euros per year per household, or a saving of 7% compared to the situation without measures.

Direct savings are only on products used in the households themselves, and a breakdown is shown on the right.

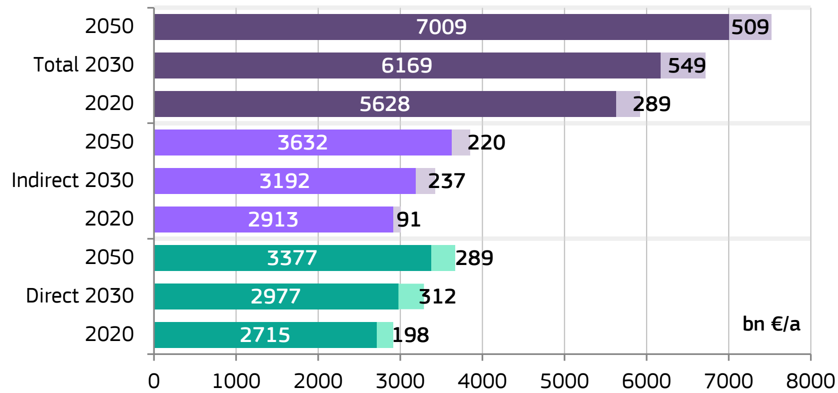
In addition, there are expense savings in the services sector and the industry sector on the regulated products used there. If these savings are translated by these sectors in lower tariffs for their services, or lower costs for their products (or higher wages for their employees), this could lead to an additional benefit per household. This is indicated in the chart below as indirect savings per household, which should be considered as maximum values. In 2020 the maximum additional indirect savings per household are 91 euros.

Summarising, the total expense savings in 2020 are between 198 and 289 euros per household. In 2030, this is projected to increase to between 312 and 549 euros per household.

DIRECT USER EXPENSE PER EU27 HOUSEHOLD (incl. VAT, 2020 EUROS)
ECO SCENARIO AND SAVINGS VS. BAU, 2020-2030-2050



TOTAL USER EXPENSES EU27 HOUSEHOLDS
(incl. VAT, 2020 EUROS)



Ecodesign Impact Accounting Overview Report 2021

prepared by Van Holsteijn en Kemna BV (VHK)
for the European Commission, Directorate-General for Energy

Part 2 : Status Report

Ecodesign Impact Accounting

Status Report 2021

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Prepared for the European Commission, DG Energy, unit B.3
SPECIFIC CONTRACT No ENER/C3/FV 2018-445/06/FWC 2016-542/06/SI2.805274

ACRONYMS & ACCOUNTING UNITS

../a	.. per annum (year)
€	Euro
AC	Air-Cooled (refrigeration)
AC	Air Conditioning (electric)
ACF	Air Conditioning, Fossil fuel fired
ADD	EIA addition for non-regulated products
AHC	Air Heating & Cooling equipment
AHE	Air Heaters, Electric
AHF	Air Heaters, Fossil fuel fired
AP	Appliance
BAU	Business as usual (scenario)
BC	Base Case
BC	Backward curved (fan)
bn	billion (10^9)
BW	Black and white (copier, printer)
C1	Tyres designed primarily for vehicles of cat. M1, N1, O1 and O2 ('passenger cars')
C2	Tyres designed primarily for vehicles of cat. M2, M3, N, O3 and O4 with a load capacity index in single formation ≤ 121 and the speed category symbol ≥'N' ('vans')
C3	Tyres designed primarily for vehicles of categories M2, M3, N, O3, O4 with specific load capacity indices ('trucks', 'busses')
CA	Cooking appliances
CC	electricity to primary energy Conversion Coefficient (CC= 1 /PEF); efficiency of electricity generation and distribution in %
CDR	Commission Delegated Regulation
CEXH	Central exhaust VU
CF	Commercial refrigeration (Refrigeration appliances with a direct sales function)
CFL	Compact fluorescent light source
CH	Central heating
CHAE-L	Chiller, Air-cooled, Electric, Large
CHAE-S	Chiller, Air-cooled, Electric, Small
CHC	Central heating combi (boiler)
CHF	Chiller combustion engine driven
CHWE-L	Chiller, Water-cooled, Electric, Large
CHWE-M	Chiller, Water-cooled, Electric, Medium
CHWE-S	Chiller, Water-cooled, Electric, Small
CIRC	Circulator
CK	Cooking
CM	Coffee maker
CO	Carbon Monoxide (emission)
CO_2	Carbon Dioxide
CP	Compressor
CR	Commission Regulation
CSTB	Complex set-up box
ctrl	controls (e.g. for lighting)
CU	Condensing Unit
cyc	Cycles
dB(A)	Decibel (A)
dm^2	square decimetre (surface area)
DP	Electronic Display
DS	Data Storage product
DW	Dishwasher
DWH	Dedicated Water Heater
EC	European Commission
ECA	European Court of Auditors
ECO	Ecodesign (scenario)
ED	Ecodesign
EED	Energy Efficiency Directive
EEI	Energy efficiency index
EFN	Efficiency of new sold products (EU average of sales)
EFS	Efficiency of the stock of products in use (EU average of stock)
EIA	Ecodesign Impact Accounting
EL	Energy Labelling
elec	(as column header) electricity-related share in primary energy
ELEC	Electric energy
EP	Electrophotographic ('laser')
EPA	Extended Product Approach (pumps)
EPS	External Power Supply
eq.	equivalent
ES	Energy Star; Enterprise Servers
ESCC	End-Suction Close-Coupled (water pump)
ESCCi	End-Suction Close-Coupled in-line (pump)
ESOB	End-Suction Own Bearing (water pump)
ESTAT	Eurostat
FC	Forward curved (fan)
FNRG	Final energy, sum of ELEC and FUEL
FUEL	Non-electric energy (gas, petroleum products, wood, coal, etc.)
GCV	Gross calorific value
GHG	Greenhouse gas emissions
GJ	Giga Joule = 10^9 J
GLS	General lighting service ('incandescent')
GSR	General Safety Regulation (vehicles, tyres)
GWh	Giga watt hours= 10^9 Wh
GWP	Global warming potential (GWP-100)
h on/d	Hours 'on' per day
h sb/d	Hours 'standby' per day
hh	household
h/a	annual (operating) hours
HICP	harmonized index of consumer prices (inflation from Eurostat)
HID	High intensity discharge lamp
HiNA	High network availability
HT PC	High Temperature Process Chiller
IA	Impact Assessment
IE	Imaging Equipment
IJ	Ink jet
IM	Imaging Equipment
IND	Industry (manufacturing) sector
ipm	Images per minute
ipy	Images per year
kg	Kilogrammes
km^2	square kilometre
kt, kton	Kilo-ton (1 million kg)
kWh	Kilowatt hour
kWh cool	kWh cooling output (formula: P as for kWh heat minus losses for condensation)
kWh elec	kWh electricity
kWh flow	kWh fluid-dynamic output (P=Δp·Q with P power in W; Δp pressure difference in Pa;

	Q flow in m³/s)
kWh heat	kWh heating output (P=ΔT·V·c with P power in W; ΔT temperature difference in K; V volume in m³ (or mass in kg), c specific heat capacity in Wh/m³.K (or Wh/kg.K)
kWh output	kWh output (for motors: P=Ω·τ with P power in W; Ω angular speed in rad/s; τ torque in Nm)
kWh prim	kWh primary energy consumption in --unless indicated differently-- Net Calorific Value of the fuel(s) used
LD	Laundry dryer
LED	Light emitting diode
LFL	linear fluorescent lamps
LH	Local heaters
LIFE	Lifetime
lm	Lumen
LoNA	Low network availability
LS	Light source
LSH	Local Space Heater
LT	Low-Temperature (refrigeration)
ltr	Liters
m, mln	million
m €	million euro
max.	maximum
MELISA	Model for European LIght Sources Analysis
MeNA	Medium network availability
MFD	Multi-function device
mg	milligrams (0.001 grams)
min.	minimum
MSSB	Multi-stage Submersible Borehole (pump)
MS-V	Multi-Stage Vertical (water pump)
MT	Medium-Temperature (refrigeration)
MT	Industrial motors
Mt	Mega tonnes (10^9 kg)
mtoe	mega tonne oil equivalent
MVU	Mechanical Ventilation Unit
MWh	Megawatt hours (1000 kWh)
NAS	Network attached storage
NCV	Net calorific value
NGO	Non-governmental organization
NMVOC	Non-Methane Volatile Organic Compound
NOx	Nitrogen Oxides (emission)
NRG	Primary energy (ELEC / CC + FUEL)
NRVU	Non-residential VU
NSB, nsb	Networked standby
OEM	Original Equipment Manufacturer
OGC	Organic Gaseous Carbon (emission)
OTH	Other sector (all except RES, TER and IND, e.g. agriculture, forestry, fishing)
PC	Personal computer
PEF	Primary Energy Factor (inverse of CC)
PF	Professional refrigeration products
PJ	Peta Joule = 10^{15} J
PM	Particulate Matter (emission)
PRM	PRIMES model
ps	Place setting (dishwasher load unit, consisting of a defined set of different plates, cutlery, etc.)
R...1	Rate (price per unit), residential customers
R…2	Rate (price per unit), industry customers
R…3	Rate (price per unit), tertiary sector
R…4	Rate (price per unit), other sector
RAC	Room air conditioner
RES	Residential (domestic) sector
rpm	Rotations per minute
RR	Rolling resistance
RRC	Rolling resistance coefficient
RVU	Residential VU
SAE	Standard Annual Energy consumption
SB, sb	Standby
SC	Space Cooling
SCOP	Seasonal coefficient of performance (for space heating of heat pump)
SEER	Seasonal energy efficiency ratio (for space cooling of heat pump)
SER	Services (tertiary) sector
SFB	Solid fuel boilers
SFD	Single function device
SH	Space Heating
SHR	Slow Heat Release (stoves)
SPL	Special Purpose Lamp
SRI	Self-Regulatory Initiative (same as VA)
SSTB	Simple set-up box
STB	Set-up box
T	metric tonne (1000 kg)
TEC	Typical or Test Energy Consumption
TER	Tertiary (services) sector
Th	Tera (10^{12}) hours
Th on	Tera hours 'on'
Th sb	Tera hours 'standby'
TL, TLR	Tyre Labelling (Regulation)
Tlm	Tera lumen
Tm³	Tera cubic metre
toe	Tonne of oil equivalent
TRAFO	Distribution transformer
TWh	Terawatt hours=10^{12} Wh = 10^9 kWh
TYRE	Replacement Tyre
UPS	Uninterruptable Power Supply
UV, UVA, UVB, UVC	Ultraviolet, types A, B, C (radiation)
VA	Voluntary Agreement (same as SRI)
VAT	Value Added Tax
VC	Vacuum cleaner
VRF	Variable Refrigerant Flow (AC)
VSD	Variable Speed Drive
VU	Ventilation unit
W	Watt
WC	Water-Cooled (refrigeration)
WE	Welding Equipment
WH	Water heater or Water Heating
WM	Washing machine
WP	Water pump

Energy units conversion for statistics (source: Eurostat)

From | /To →	TJ	Gcal	Mtoe	GWh
TJ	1	238.8	2.388×10^{-5}	0.2778
Gcal	4.1868×10^{-3}	1	1×10^{-7}	1.163×10^{-3}
Mtoe	4.1868×10^{4}	1×10^{7}	1	11630
GWh	3.6	860	8.6×10^{-5}	1

Net Calorific Values, as used in statistics. (source: Eurostat, 2019)

EBBT code	Product	unit	TJ (NCV)	ktoe (NCV)	
	Oil equivalent	1 kt	41.868	1.000	note 3
	solid fossil fuels				
C0110	anthracite	1 kt	26.7	0.638	
C0121	coking coal	1 kt	28.2	0.674	
C0129	other bituminous coal	1 kt	25.8	0.616	
C0210	sub-bituminous coal	1 kt	18.9	0.451	
C0220	lignite	1 kt	11.9	0.284	
C0320	patent fuels	1 kt	20.7	0.494	
C0311	coke oven coke	1 kt	28.2	0.674	
C0312	gas coke	1 kt	28.2	0.674	
C0340	coal tar	1 kt	28.0	0.669	
C0330	brown coal briquettes	1 kt	19.0	0.454	note 1
	manufactured gases				
C0360	Gas works gas	1 TJ GCV	0.9	0.021	
	Gas works gas	1 kt	38.7	0.924	note 2
C0350	Coke oven gas	1 TJ GCV	0.9	0.021	
	Coke oven gas	1 kt	38.7	0.924	note 2
C0371	Blast furnace gas	1 TJ GCV	1.0	0.024	
	Blast furnace gas	1 kt	2.5	0.059	note 2
C0379	Other recovered gases	1 TJ GCV	1.0	0.024	
	Oxygen steel furnace gas	1 kt	7.1	0.169	note 2
	Carbon monoxide	1 kt	10.1	0.241	note 2
P1100	peat	1 kt	9.8	0.233	
P1200	peat products	1 kt	16.0	0.382	note 1
S2000	oil shale and oil sands	1 kt	8.9	0.213	
	shale oil	1 kt	38.1	0.910	note 2
	Oil and petroleum products				
O4100_TOT	crude oil	1 kt	42.3	1.010	
O4200	natural gas liquids	1 kt	44.2	1.056	
O4300	refinery feedstocks	1 kt	43.0	1.027	
O4400X4410	additives and oxygenates (w/o bio)	1 kt	42.5	1.015	note 1
O4500	other hydrocarbons (w/o bio)	1 kt	42.5	1.015	note 1
O4610	refinery gas	1 kt	49.5	1.182	
O4620	ethane	1 kt	46.4	1.108	
O4630	liquefied petroleum gases	1 kt	47.3	1.130	
O4652XR5210B	motor gasoline (w/o bio)	1 kt	44.3	1.058	
O4651	aviation gasoline	1 kt	44.3	1.058	note 1
O4653	gasoline-type jet fuel	1 kt	44.3	1.058	note 1
O4661XR5230B	kerosene-type jet fuel	1 kt	44.1	1.053	note 1
O4669	other kerosene	1 kt	43.8	1.046	
O4640	naphtha	1 kt	44.5	1.063	
O4671XR5220B	gas oil and diesel oil (w/o bio)	1 kt	43.0	1.027	
O4680	(residual) fuel oil	1 kt	40.4	0.965	
O4691	white spirit and SPB	1 kt	40.2	0.960	
O4692	lubricants	1 kt	40.2	0.960	
O4695	bitumen	1 kt	40.2	0.960	
O4694	petroleum coke	1 kt	32.5	0.776	
O4693	paraffin waxes	1 kt	40.2	0.960	
O4699	other oil products	1 kt	40.2	0.960	
	Orimulsion	1 kt	27.5	0.657	note 2
G3000	Natural gas	1 TJ GCV	0.9	0.021	
	Natural gas	1 kt	48.0	1.146	note 2
	Methane	1 kt	50.0	1.194	note 2

EBBT code	Product	unit	TJ (NCV)	ktoe (NCV)	
	Renewables and biofuels				
RA100	Hydro	1 GWh	3.6	0.086	
RA500	Tide, wave, ocean	1 GWh	3.6	0.086	
RA300	Wind	1 GWh	3.6	0.086	
RA420	Solar photovoltaic	1 GWh	3.6	0.086	
RA410	Solar thermal	1 TJ NCV	1.0	0.024	
RA200	Geothermal	1 TJ NCV	1.0	0.024	
R5110-5150_W6000RI	Primary solid biofuels	1 TJ NCV	1.0	0.024	
	Wood/Wood waste	1 kt	15.6	0.373	note 2
	Other primary solid biomass	1 kt	11.6	0.277	note 2
R5160	charcoal	1 kt	29.5	0.705	
R5300	Biogases	1 TJ NCV	1.0	0.024	
	Landfill gas	1 kt	50.4	1.204	note 2
	Sludge gas	1 kt	50.4	1.204	note 2
	Other bio gas	1 kt	50.4	1.204	note 2
W6210	Renewable municipal waste	1 TJ NCV	1.0	0.024	
R5210P	pure bio gasoline	1 kt	27.0	0.645	
R5210B	blended bio gasoline	1 kt	27.0	0.645	
R5220P	pure biodiesels	1 kt	27.0	0.645	
R5220B	blended biodiesels	1 kt	27.0	0.645	
R5230P	pure bio jet kerosene	1 kt	44.0	1.051	note 1
R5230B	blended bio jet kerosene	1 kt	44.0	1.051	note 1
R5290	other liquid biofuels	1 kt	27.4	0.654	
	Waste oils	1 kt	40.2	0.960	note 2
RA600	Ambient heat (heat pumps)	1 TJ NCV	1.0	0.024	
	Non-renewable waste				
W6100	Industrial waste (non-renewable)	1 TJ NCV	1.0	0.024	
W6220	Non-renewable municipal waste	1 TJ NCV	1.0	0.024	
N900H	Nuclear heat	1 TJ NCV	1.0	0.024	
H8000	Heat	1 TJ NCV	1.0	0.024	
E7000	Electricity	1 GWh	3.6	0.086	

Sources:

EBG: Energy balance guide, Methodology guide for the construction of energy balances & Operational guide for the energy balance builder tool, Eurostat 31 January 2019 (pages 9/10)

EBBT: Energy-balance-builder-90409.xlsm, sheets 'Calorific values' and 'Balance Conversion' (EBBT codes come from this source)

COMMISSION REGULATION (EU) No 601/2012 of 21 June 2012 on the monitoring and reporting of greenhouse gas emissions pursuant to Directive 2003/87/EC of the European Parliament and of the Council, (OJ L 181, 12.7.2012, p. 30), consolidated version incl. amendments up to 1/1/2019, Annex VI point 1

Note 1: Eurostat estimate; not specified in CR 601/2012 Annex VI

Note 2: Value from CR 601/2012 Annex VI; not specified in Eurostat

Note 3: The tonne of oil equivalent is a conventional standardized unit defined on the basis of a tonne of oil with a net calorific value of 41868 kilojoules/kg (or 41.868 Tera joules/kiloton). The conversion coefficients from the specific units to ktoe (kiloton of oil equivalent) are thus computed by dividing the conversion coefficients to the Tera joules by 41.868.

The order of the products in the table corresponds to the order in which they are presented in the EBG and the EBBT. Additional products specified in CR 601/2012 Annex VI have been inserted in the list.

EXECUTIVE SUMMARY

What is EIA?

The Ecodesign Impact Accounting (EIA) collects, elaborates and sums data for all products regulated under Ecodesign, Energy Labelling and Tyre Labelling. The legacy of Energy Star is also included [1].

Input data from extensive preparatory-, review-, and impact assessment-studies for the period 1990-2050, including historical data and projections, are processed in a common calculation method. These data have been verified by the Commission policy officers for the various product groups, by representatives from the Member States, industry organisations, consumer organisations and NGOs, in stakeholder meetings, consultation forums and written comments.

The accounting is performed for 330 base case products. The results for these base cases are first summed to 40 product group totals, and then to 12 functional group totals: space heating, space cooling, water heating, ventilation, lighting, electronics, food preservation, cooking, cleaning, industry components, transport (tyres) and energy sector (utility transformers). Table 1 provides an overview of product groups and functional groups [2].

The EIA provides EU27 totals for sales, stock, loads [3], energy consumption (electricity, fuel, final energy, primary energy), energy-related GHG-emissions, user expenses (for purchase, installation, energy, maintenance, consumables), business revenues, and associated jobs. Subtotals are provided per usage sector (residential, services, industry, other [4]), per functional group, per product group, and per base case product. The EIA also includes data per average EU27 household.

The 2020 energy consumption of products included in the EIA represents 62% of the EU27 primary energy consumption reported in the Eurostat Energy Balance sheets [5], 50% of the final energy, close to 100% of electricity, and 34% of non-electric final energy consumption (i.e. what in the EIA is referred to as ‘fuel’).

Energy totals in the EIA are compatible with those in Eurostat when considering the differences in scope. The EIA has a high coverage of the energy consumption in the residential and services sectors. Due to its scope, the coverage in the EIA is lower for industry and transport. More details on the EIA-Eurostat comparison are provided at the end of this executive summary and in chapter 3.9.

This EIA2021 Status report provides a full description of the methodology and includes all input and output data in 5-year intervals in Annex A, organized per parameter. The report is intended for experts and analysts. The separately issued Overview report is intended for a wider audience, less technical, and organized per product group [6].

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[1] The EU ENERGY STAR programme followed an Agreement between the European Community (EU) and the Government of the US to coordinate energy labelling of office equipment. It was managed by the European Commission. The US partner was the Environmental Protection Agency (EPA), which started the scheme in the US in 1992. The EU-US agreement expired on 20 February 2018. ENERGY STAR definitions and requirements were used in the Ecodesign regulations for Computers and Imaging Equipment. These regulations continue to exist, so the end of EU-US agreement on Energy Star did not change the data in the EIA.

[2] The parameter tables in Annex A provide a complete listing of the base cases. See also Annex D. For example, the functional group ‘Space Heating’ contains inter alia the product group ‘Central Heating Boiler (CHB)’ which contains 12 base case products: gas boiler non-condensing, gas boiler condensing, gas jet-burner non-condensing, gas jet-burner condensing, oil jet-burner non-condensing, oil jet-burner condensing, electric Joule-effect CHB, Hybrid (gas-electric) CHB, electric heat pump, gas heat pump, micro-CHP and solar combi (16 m^2).

[3] The ‘load’ in the EIA indicates the user demand for product output.

[4] The ‘other’ sector in the EIA includes e.g. agriculture, forestry and fishing

[5] Eurostat Energy Balance nrg_bal_c, ed. April 2022

[6] Since the 2020 edition, the Status Report and the Overview Report are published together in a single pdf.

For the products covered, the EIA is the most comprehensive and updated bottom-up data collection available in EU, which can be used by itself as scenario modelling tool for policy options on energy efficiency of products, or as input to models like PRIMES [7] and POTEnCIA [8].

Table 1 List of functional groups, product groups and number of base cases (BCs) represented in the Ecodesign Impact Accounting

Lot	Acronym	Product Group	BCs
Water Heating functional group			
2	DWH	Dedicated Water Heater	11
1	CHC	Central Heating Combi, water heating	10
Space Heating functional group			
1	CHB	Central Heating Boiler, space heating	12
15	SFB	Solid Fuel Boiler	5
21/G6[9]	AHC-AC	Central Air Heating – reversible Air Conditioners	4
21/G6	AHC-AH	Central Air Heating – Air Heaters	2
20	LSH	Local Space Heaters	26
10	RAC	reversible Room Air Conditioners	3
11	CIRC	Circulator pumps	3
Space Cooling functional group			
E21/G6	AHC-CH	Central Air Cooling – Comfort Chillers	6
E21/G6	AHC-PCH	Central Air Cooling – high-temperature Process Chillers	5
E21/G6	AHC-PCH	Central Air Cooling – Air Conditioners	4
10	RAC	Room Air Conditioners	3
Ventilation functional group			
10/G6	NRVU	Non-Residential Ventilation Units	7
10/G6	RVU	Residential Ventilation Units	9
Lighting functional group			
8/9/19	LS	Light Sources	12
Electronics functional group			
5	DP	Electronic Displays	8
18	STB	Set-Top Boxes	3
G3	VIDEO	Game Consoles	4
G9	ESDS	(Enterprise) Servers and Data Storage products	18
3	PC	Personal Computers	8
4	IE	Imaging Equipment	8
6/26	SB	Products regulated only by CR 1275/2008, as amended	14
7	EPS	External Power Supplies	20
Food Preservation functional group			
13	RF	(household) Refrigerating Appliances	1
12	CF	Refrigerating appliances with a direct sales function	6
G1	PF-SC	Professional refrigeration – Storage Cabinets	4
G1	PF-PC	Professional refrigeration – Process Chillers	8
G1	PF-CU	Professional refrigeration – Condensing Units	8
Cooking functional group			
22/23	CA	Cooking Appliances	7
Cleaning functional group			
14	WM-WD	Washing Machines and Washer-Dryers	4
14	DW	Dishwashers	2
16	LD	Laundry Dryers	5
17	VC	Vacuum Cleaners	13

[7] The PRIMES model is part of the suite of models used in the Commission's climate policy impact assessments – e.g. for the 2030 climate and energy policy framework. For details see: https://ec.europa.eu/clima/policies/strategies/analysis/models_en

[8] POTEnCIA (Policy Oriented Tool for Energy and Climate Change Impact Assessment) is a modelling tool that allows for assessment of the impact of different policy futures on the EU energy system. For details see: https://ec.europa.eu/jrc/en/potencia

[9] The letter 'G' indicates DG GROW; The letter 'E' indicates DG ENER; other lots are from DG ENER

Lot	Acronym	Product Group	BCs
Industrial Components functional group			
11	FAN	Industrial Fans	6
11/30	MT	Electric Motors and Variable Speed Drives	22
11	WP	Water Pumps	24
G5	WE	Welding Equipment	2
Energy Sector functional group			
G2	TRAFO	Utility Transformers	7
Transport Sector functional group			
T	TYRE	Tyres	6
Total		**40 product groups**	**330**

Main results, Sales

In 2020, approximately 2 billion products with an Energy Label were sold in EU27, of which 1.5 billion light sources, 350 million tyres and 150 million other products.
In 2030 this is expected to decrease to 1.2 billion, of which 580 million light sources, 430 million tyres and 190 million other products (section 3.4.1).

In 2020, approximately 3 billion products with Ecodesign and/or Energy Labelling regulation were sold in EU27, of which 1.5 billion light sources, 880 million electronics products [10], 350 million tyres and 240 million other products.
In 2030 this is expected to decrease to 2.2 billion, of which 950 million electronics products, 580 million light sources, 430 million tyres and 250 million other products.

Main results, Energy

In year 2020 the products included in the accounting represent 8869 TWh (31 929 PJ, 763 Mtoe) of primary energy consumption (Figure 1). This is 62% of the total EU27 primary energy consumption in 2020 (1236 Mtoe) [11].

For these products, the main results for the EU27 in 2020 and 2030 (ECO versus BAU, savings/reductions) are reported in Table 2.

The primary energy savings due to ecodesign and labelling measures are 1039 TWh (3740 PJ, 89 mtoe) in 2020 and 1513 TWh (5448 PJ, 130 mtoe) in 2030 (Figure 2). This represents a saving of respectively 10% (2020) and 18% (2030) compared to BAU. The savings are 7.2% (2020) and 10.5% (2030) of the total EU27 primary energy consumption in 2020 (1236 mtoe [11]).

In 2020, 81% of the primary energy savings come from electricity savings (with PEF 2.5 [12]) and 19% from direct fuel savings. In 2030, this is respectively 72% (electricity, with PEF 2.1) and 28% (fuel).

The projections for the period 2030-2050 show that without new measures the pace of improvements slows down and eventually evens out.

[10] Approximately half of the Electronics are various products regulated only for (networked) standby.

[11] Eurostat Energy Balance nrg_bal_c, ed. April 2022, PEC (Europe 2020-2030). Eurostat data in 2020 are lower than in preceding years due to the Covid-pandemic, which is not considered in the EIA data. In 2019 (prior to Covid), the Eurostat primary energy consumption was 1352 mtoe, and EIA products covered 57% of this. The 2020 savings in EIA are 6.6% of these 1352 mtoe.

[12] PEF = primary energy factor for electricity generation and distribution. In EIA, PEF=2.5 until 2020 and 2.1 from 2021 onwards.

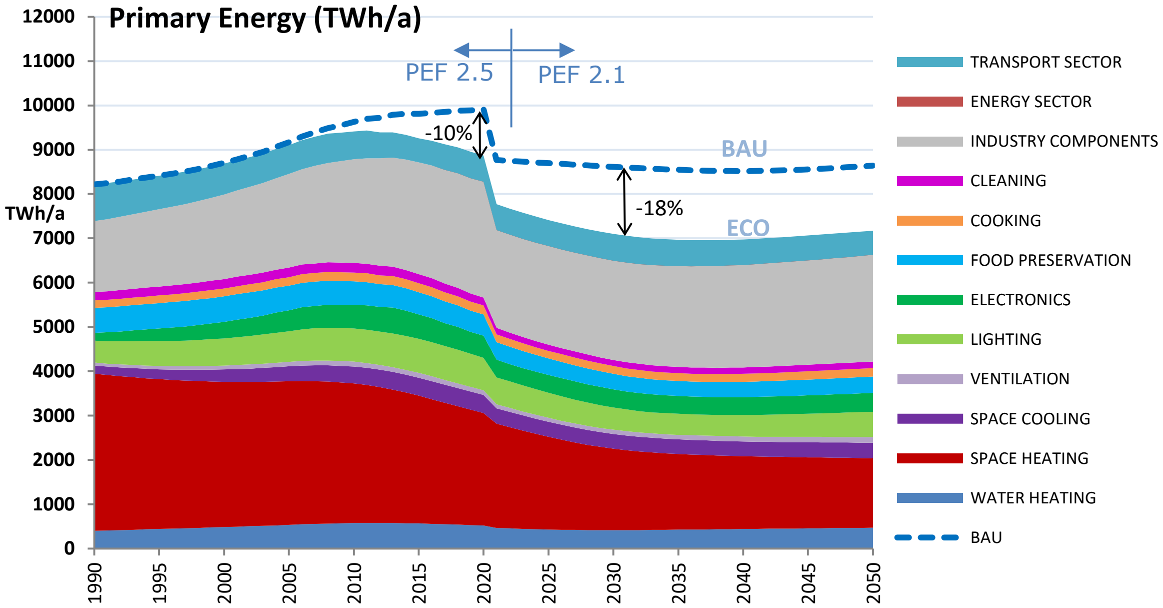

Figure 1. Primary energy consumption of products included in the ecodesign impact accounting, status 31 December 2021 (the contribution of the energy sector (distribution transformers) is negative and therefore not visible in the graph)

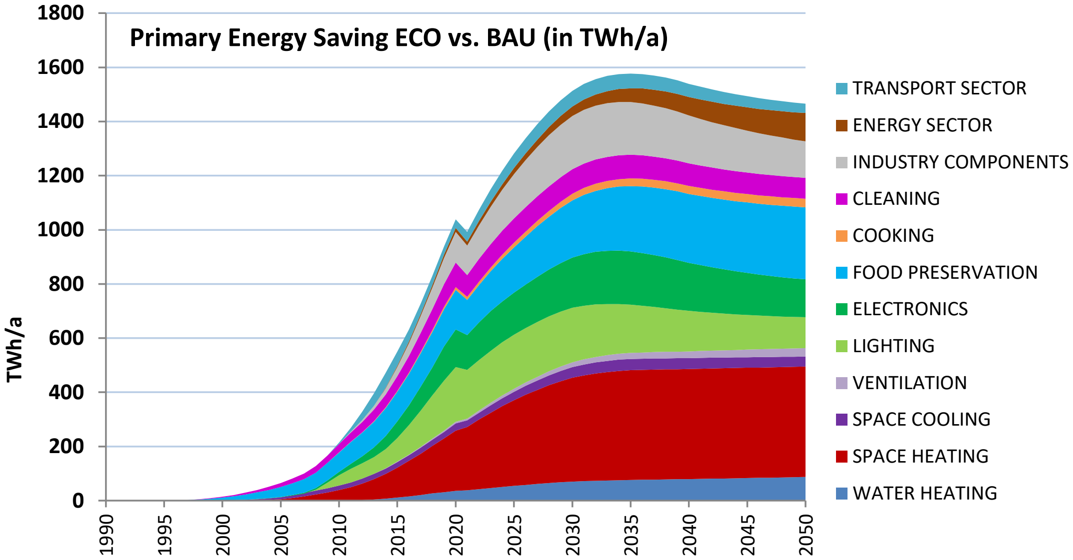

Figure 2. Primary energy saving of ECO versus BAU of products in the ecodesign impact accounting, status 31 December 2021

The distribution of the primary energy savings over the functional groups is shown in Figure 3 for years 2020 and 2030. The major contributions to the savings come from space heating (21% in 2020, 25% in 2030), lighting (19%,13%), food preservation (14%,14%), electronics (13%,12%), industrial components (11%,13%), and cleaning appliances (9%,6%).

The primary energy savings derive for 60% (2020) or 50% (2030) from the residential sector, 25% (2020) or 32% (2030) from the services sector, 10% (2020) or 13% (2030) from industry, 3-4% transport, and 1% other sector.

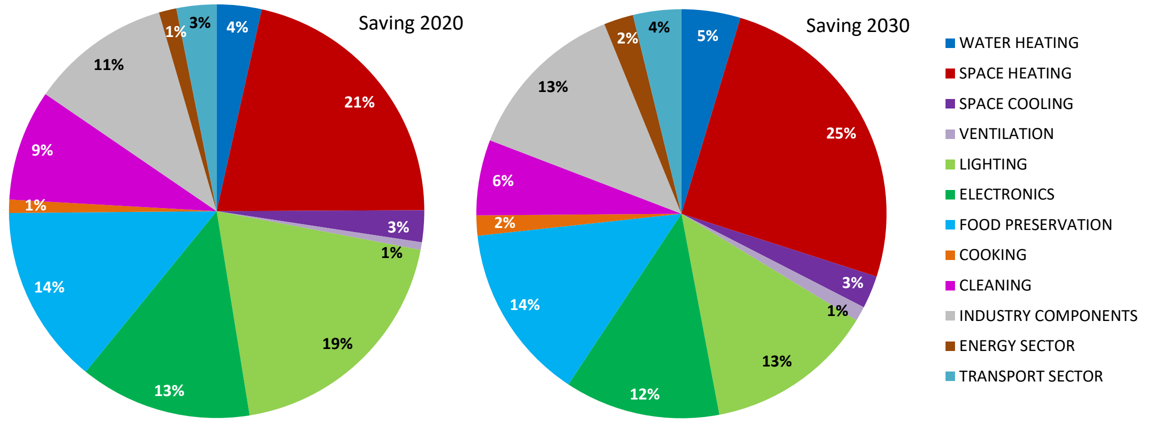

Figure 3. Share of primary energy saving per functional group, in 2020 and 2030.

Main results, Other parameters

Due to the measures taken, the greenhouse gas emissions decrease by 114 $MtCO_2eq$ (-9% vs BAU) in 2020 and 160 $MtCO_2eq$ (-17% vs BAU) in 2030. The reduction is lower than in EIA2020 due to using the lower GWP-factors for electricity from the PRIMES 2020 REF scenario. The reduction is respectively 3.2% (2020) and 4.4% (2030) of the EU27 total emissions in 2019 (3610 Mt CO_2 [13]). Additional reductions result for NOx, CO, OGC and PM (Table 2) [14].

Due to the measures for washing machines and dishwashers, in 2020 consumers saved 1507 million m^3 (> 50%) of (drinking) water (1885 Mm^3 in 2030). The measures on imaging equipment (duplexing, N-print) save 0.23 million ton (15%) of graphic paper in 2020 and 0.15 Mton (15%) in 2030. The ecodesign regulation on welding equipment saves 82 kton (5%) of filler wire and electrodes in 2030.

The combined measures entail a € 63 bn (5%) saving in 2020 on consumer expenditure (€ 80 bn energy cost saving, € 7 bn consumables saved, € 25 bn extra acquisition costs). In 2030 this increases to € 125 bn (8%). The consumer's monetary saving is 0.4% (in 2020) and 0.8% (in 2030) of the GDP of the European Union (€ 13300 bn in 2020 [15]).

Business revenues increase by 22 bn euros in 2020 and 31 bn euros in 2030 (5-6%), implying an increase of 323 thousand direct jobs in 2020 and 433 thousand in 2030.

[13] Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021

[14] NOx: nitrogen oxides (acidifying agent), CO: carbon monoxide, OGC: Organic Gaseous Compounds, PM: particulate matter

[15] Source: Eurostat [nama_10_gdp], Gross Domestic product at market prices, accessed April 2021

Table 2: Annual savings/reductions in the ECO-scenario (with measures) compared to the BAU-scenario (without measures) for years 2020 and 2030. EU27 totals in absolute values in the indicated unit, and relative saving vs. BAU in %.

		2020		2030	
	unit	Saving vs. BAU	Saving vs. BAU (%)	Saving vs. BAU	Saving vs. BAU (%)
Primary Energy (PEF 2.5 in 2020; 2.1 in 2030)	TWh PJ mtoe	1039 3740 89	10%	1513 5448 130	18%
Electricity	TWh PJ mtoe	335 1205 29	12%	522 1880 45	17%
Final Fuel (non-electric final energy)	TWh PJ mtoe	202 728 17	7%	417 1501 36	17%
Final Energy (excl. energy sector)	TWh PJ mtoe	531 1912 46	9%	922 3321 79	17%
Energy related GHG-emissions	Mt CO2 eq	114	9%	160	17%
NOx emissions	kt SO2 eq	83	33%	128	64%
CO-emissions	k ton	143	7%	504	32%
OGC-emissions	k ton	10	7%	22	30%
PM-emissions	k ton	10	6%	39	34%
Drinking water (washing)	M m3	1507	52%	1885	61%
Paper (printing)	M ton	0.23	15%	0.15	15%
Filler wire/electrode (welding)	k ton	0	0%	82	5%
Acquisition costs	bn euros	-25	-6%	-35	-7%
Energy costs [16]	bn euros	80	12%	151	18%
Consumable costs	bn euros	7	18%	10	26%
Total user expense [16]	bn euros	63	5%	125	8%
Business revenues	bn euros	22	5%	31	6%
Associated jobs	thousands	323	5%	433	6%

Main results per household

The average EU27 household in 2020:

- Bought 10 regulated products of which 4 light sources, 4 electronics products.
- Used 70 regulated products of which 30 light sources, 25 electronics products.
- Saved 1000 kWh (27%) of electricity and 700 kWh (6%) of fuel (gas, oil coal, wood) in 2020 compared to the situation without Ecodesign and Labelling measures. In 2030 this is projected to increase to 1200 kWh electricity (33%) and 1400 kWh of fuel (12%).
- Avoided 360 kgCO_2eq of greenhouse gas emissions in 2020 compared to the situation without Ecodesign and Labelling measures. In 2030 this is projected to increase to almost 440 kgCO_2eq per household.
- Saved 198 euros (7%) in user expenditure in 2020, expected to increase to 312 euros per year per household in 2030 (8%) compared to the situation without Ecodesign and Labelling measures. This considers only the direct savings for

[16] The energy cost savings and user expense savings reported in this table use the EIA traditional energy rates. When using the rates from the PRIMES 2020 Reference scenario, the energy costs savings are 74 bn euros in 2020 and 136 bn euros in 2030, corresponding to user expense savings of respectively 57 bn euros and 110 bn euros. See details in section 3.6.1.

products used in households. Additional financial benefits for households might arrive from the savings in the tertiary and industry sectors, if these are translated in lower tariffs, lower product prices, or higher wages.

Sensitivity analysis for energy rates

The results for energy costs and user expenses reported in EIA2021 use the rates for electricity, natural gas, heating oil and LPG of the PRIMES 2020 Reference scenario. Figure 4 shows how the user expense savings due to ecodesign and labelling measures change when different energy rates are used (details in section 3.6.1). Using the PRIMES 2020 Reference scenario rates, expense savings are 57 bn euros in 2020 and 110 bn euros in 2030. Using EIA traditional rates, the savings increase to respectively 63 and 125 bn euros.

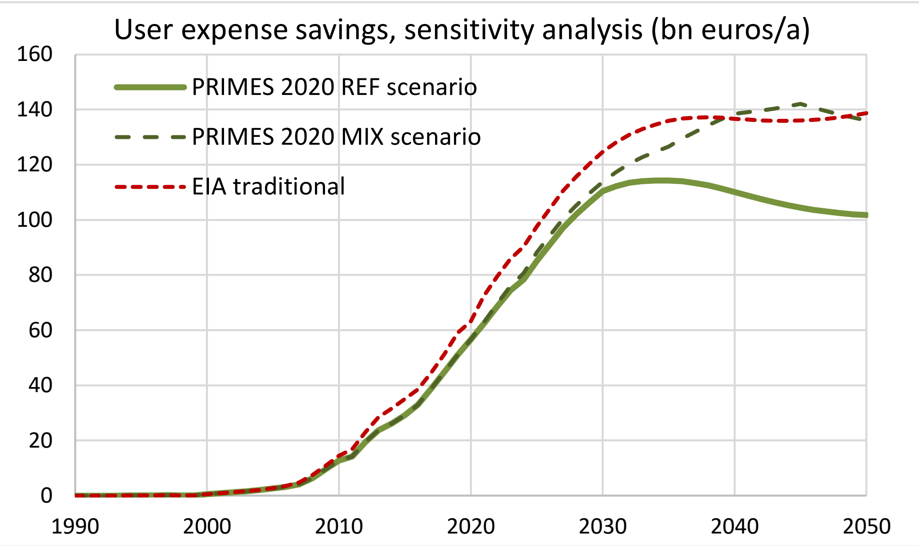

Figure 4: EU27 total user expense savings due to ecodesign and energy labelling measures for three different sets of rates for electricity, natural gas, heating oil and LPG (in bn euros/a). EIA2021 reporting uses the rates of the PRIMES 2020 REF scenario.

In the last months of 2021 and the first months of 2022, a strong increase in energy rates occurred (Figure 5). This increase is not yet reflected in the sensitivity analysis of Figure 4. The effect of the increase in electricity and gas rates on user expense savings in the EIA was therefore estimated separately [17] (details in section 3.6.2).

Due to the 2021/2022 increase in electricity and gas rates, user expense savings in 2021 roughly double compared to 2020, reaching 126 bn euros. Savings could again double in 2022 compared to 2021, reaching 259 bn euros if prices in 2022 will stay at January 2022 levels, and not taking into account the effect of potential government intervention on components of the energy price (taxes and network costs) or of changes in consumer behaviours (e.g. advanced or delayed appliance purchases, or more careful behavioural patterns triggered by higher prices).

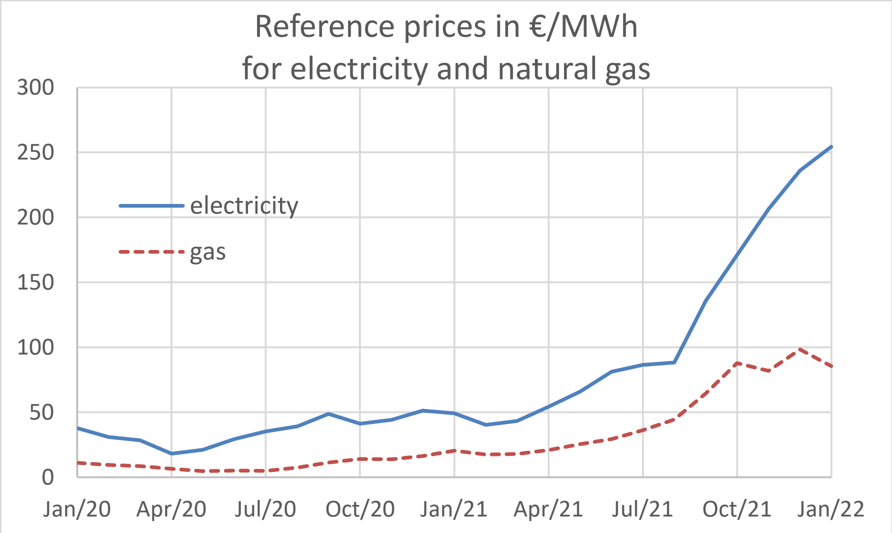

Figure 5: Reference prices in €/MWh for electricity (source: European Power Benchmark (EPB7) (EC-AAENM00)) and for natural gas (source: NL TTF Day Ahead (GTFUX00) [17]

Sensitivity analyses for global warming potential factors (GWP) for electricity

The results for greenhouse gas emissions reported in EIA2021 use the GWP-factors for electricity of the PRIMES 2020 Reference scenario. Figure 6 shows how the reduction of GHG-emissions changes when different GWP-factors are used. The traditional EIA values, based on the 2011 MEErP and now considered obsolete, would lead to much higher GHG-reduction. The PRIMES 2020 Mix scenario leads to lower GHG-reduction due to ecodesign and labelling measures, in particular after 2030. Details and references in sections 1.2.1.5 and 3.7.1.

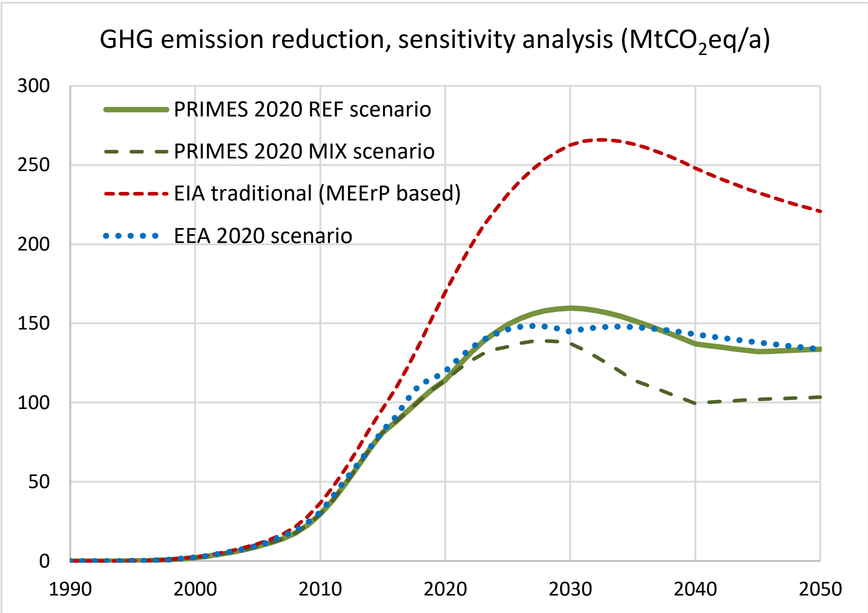

Figure 6: EU27 total reduction of GHG emissions due to ecodesign and energy labelling measures for four different sets of GWP-factors for electricity (in MtCO2eq/a). EIA2021 reporting uses the GWP-factors of the PRIMES 2020 REF scenario.

[17] The reference market prices in Figure 5 are without taxes, levies, network and distribution costs, etc. and thus cannot be used directly in EIA as final consumer rates. For the analysis, the consumer rates for 2021 and 2022 have been derived from the EIA rates for 2020 applying reference price increase factors to the energy-part of the rate (excluding taxes, levies and network/distribution costs). New rates are computed as: [X%*increase factor + (1-X%)]*rate in 2020. The energy-part (X%) of the rates is 32% for electricity in households, 46% for electricity in industry, 45% for gas in households, 67% for gas in industry. For electricity, the increase factor compared to 2020 is 2.96 in 2021 and 7.18 in 2022. For gas, the increase factor is 4.84 in 2021 and 9.13 in 2022. Assumed that rates for January 2022 are representative as 2022 average.

Sensitivity analyses for primary energy factor (PEF) for electricity

The results for primary energy consumption and savings reported in EIA2021 use a primary energy factor for electricity (PEF) of 2.5 until 2020, and 2.1 from 2021 onwards (see also Figure 1). Figure 7 shows how the primary energy savings due to ecodesign and labelling measures change when different PEFs are assumed.

In 2030, the savings on fuel consumption are 417 TWh and the electricity savings 505 TWh for final energy savings of 922 TWh [18]. Multiplying the electricity by a PEF of 2.1 the primary energy equivalent for electricity savings is 1096 TWh [19], and summing this with the fuel savings gives total primary energy savings of 1513 TWh. Applying a PEF of 2.5 this would increase to 1722 TWh (+13%). Applying a PEF of 1.8 it would decrease to 1357 TWh (-10%). Details and references in sections 1.2.1.6 and 3.7.2.

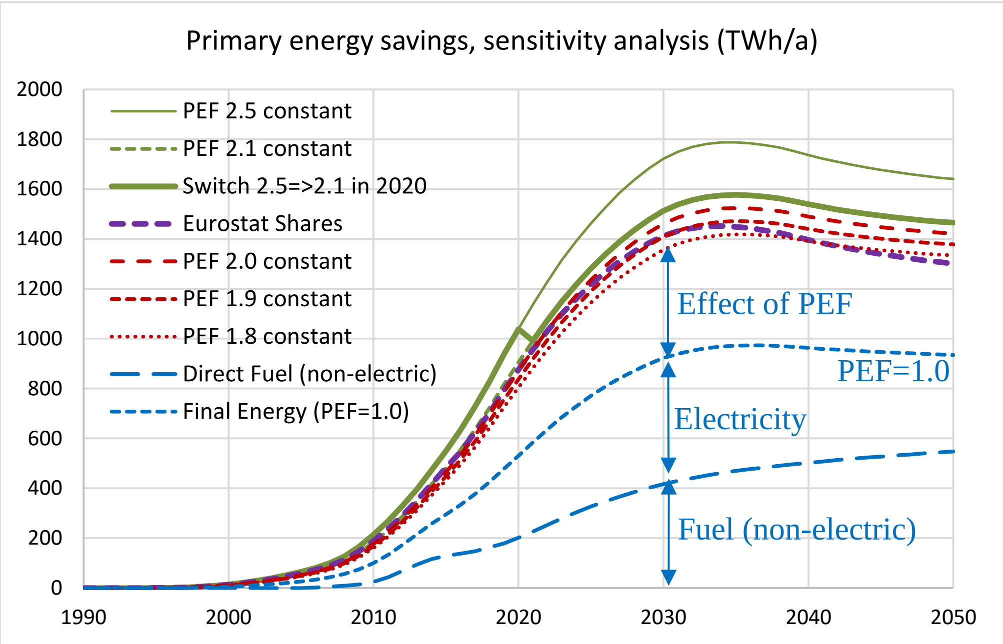

Figure 7: EU27 total primary energy savings versus BAU in TWh/a, for 7 different sets of primary energy factors (PEF) for electricity generation and distribution. The graph also indicates the direct (non-electric) fuel savings, which is a constant part of the total primary energy savings, not affected by the changes in PEF for electricity. The graph also indicates the final energy savings, which correspond to using PEF=1.0 for electricity.

Sensitivity analyses for product non-compliance

EIA data are based on preparatory-, review- and impact assessment-studies, and these studies typically do not consider the possibility that a share of products on the market might be non-compliant with the regulations due to shortcomings in market surveillance. Hence, all reported EIA data are without considering non-compliance.

Following recommendations from the European Court of Auditors (ECA) [20], since 2019 EIA includes an estimate for the possible reduction of reported savings due to non-compliance (NC). ECA refers to 10% of energy savings being lost due to non-compliance, which is based on information from the Commission and from other stakeholders but is uncertain. During 2020, the EIA team performed further online search for data on loss of energy savings due to non-compliance, but no new information was found. Consequently,

[18] Excluding 17 TWh electricity savings on distribution transformers, which are not considered final energy.

[19] Including 17*PEF TWh savings on distribution transformers.

[20] ‘EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance’, Special Report 01, January 2020, European Court of Auditors.

EIA2021 continues to use the 10% lost savings (only on the sheet NONCOMPLIANCE in Annex A), for all years and all products. See sections 2.11 and 3.7.3 for further information.

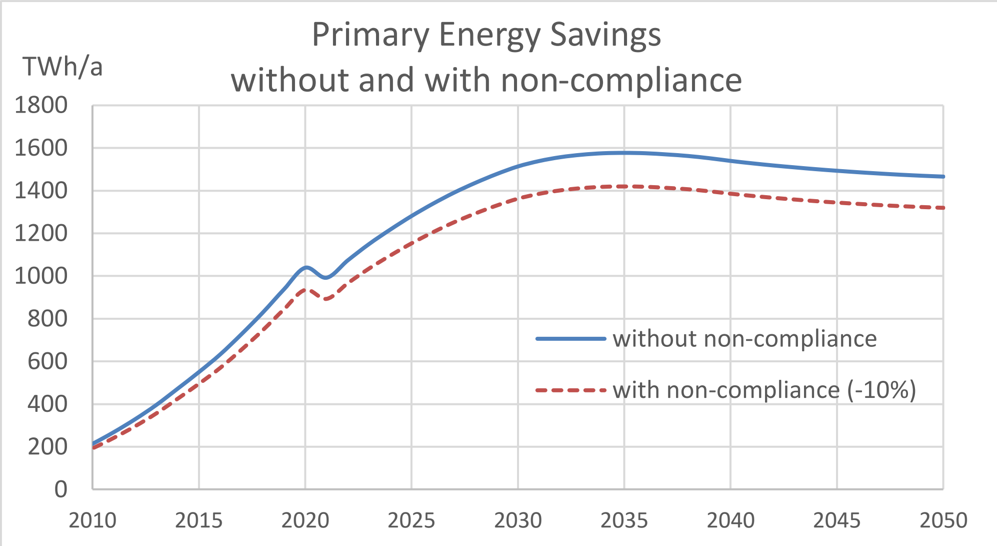

Figure 8. Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

Main changes in the EIA2021 edition

After the extensive updates in EIA2020, including the change from EU28 to EU27 (with the removal of UK) and product updates for e.g. space heating, water heating and ventilation units, there are relatively few changes in EIA2021, with minor variations in impact compared to EIA2020 (Table 3):

- Price level: Monetary amounts in EIA2021 are expressed in 2020 euros (was 2015 euros in previous editions, increase 5.8%, section 1.2.1.2).
- Energy rates: All rates have been updated with the latest available information. EIA2021 reporting now uses the rates for electricity, natural gas, heating oil and LPG of the PRIMES 2020 Reference scenario (section 1.2.1.3). A sensitivity analysis is performed for other rates.
- Non-energy rates: the rates for water and vacuum cleaner bags and filters have been updated (section 1.2.1.4).
- GWP-factors: EIA2021 reporting now uses the GWP-factors for electricity of the PRIMES 2020 Reference scenario (section 1.2.1.5). A sensitivity analysis is performed for other GWP-factors.
- Primary Energy Factor (PEF) for electricity: the PEF is 2.5 until 2020 and 2.1 from 2021 onwards. This is the same as in EIA2020. EIA2021 adds a sensitivity analysis for different PEFs.
- Vacuum Cleaners: a complete product update was performed, for existing measures only, based on the 2019 review study and the ongoing impact assessment. Due to the update, electricity savings in 2030 reduce from 23 TWh to 15 TWh. This derives from a lower projected stock, the modelled partial shift to cordless and robots (for which savings are zero under the current regulation), and changed assumptions on real-life loads and efficiencies. These data are preliminary, awaiting the final IA and the adoption of new measures (section 1.2.2.2).
- Water pumps: a complete product update was performed, for existing measures only, based on the 2018 review study and the ongoing impact assessment. The update uses the extended product approach (EPA), including also motor and VSD

losses. Combined with a more detailed approach, changes in stock, and updates for loads and efficiencies, the accounted energy consumption increases, but energy savings remain more or less the same. These data are preliminary, awaiting the final IA and the adoption of new measures (section 1.2.2.3).

- Compressors: standard air compressors have now been removed as a product group in EIA because there is no ecodesign regulation, and no regulation is expected at a short term. The energy removed for compressors compensates the energy added for water pumps. The impact of the removal on energy savings is modest (section 1.2.2.4).
- Circulators: the double counting factor for stand-alone circulators was reduced from 1.0 to 0.38. This means that 62% of the energy consumption of stand-alone circulators now contributes to the EU energy totals (section 1.2.2.5).
- Dedicated Water Heaters: following the ongoing impact assessment, the Brexit factors for electric DWHs have been changed, removing 90% of the electric instantaneous shower water heaters. This reduces the EU27 stock of DWH in 2020 by approximately 6%, from 147 to 138 mln units. The electricity consumption and electricity savings for DWHs follow this reduction (section 1.2.2.6).
- Dedicated Water Heaters: product prices for DWHs in EIA2020 were based on an older version of the review study; this has been updated in EIA2021.
- External Power Supplies: revenues and jobs in EIA2020 did not take into account double counting factors; this has been corrected in EIA2021.

Table 3 List of energy impact changes in EIA2021 compared to EIA2020. BAU primary energy for year 2010, and primary energy savings for 2020 and 2030.

Product Group updated in EIA2021	BAU Primary Energy in TWh/a **year 2010**	Primary Energy Savings in TWh/a (PEF=2.5) **year 2020**	Primary Energy Savings in TWh/a (PEF=2.1) **year 2030**	Main reason for change
Dedicated Water Heaters (DWH)	was: 317 is: 305 **Variation: -12**	was: 24 is: 21 **Variation: -3**	was: 41 is: 36 **Variation: -5**	Update of Brexit factors for electric DWH (section 1.2.2.6)
Circulators (CIRC)	was: 0 is: 31 **Variation: +31**	was: 0 is: 10 **Variation: +10**	was: 0 is: 7 **Variation: +7**	Change in double counting factor for stand-alone CIRCs (section 1.2.2.5)
Vacuum Cleaners (VC)	was: 45 is: 47 **Variation: +2**	was: 33 is: 29 **Variation: -4**	was: 49 is: 31 **Variation: -18**	Update for existing measures, following review study (section 1.2.2.2)
Water Pumps (WP)	was: 264 is: 396 **Variation: +132**	was: 7 is: 8 **Variation: +1**	was: 9 is: 8 **Variation: -1**	Update for existing measures, following review study (section 1.2.2.3)
Standard Air Compressors (SAC)	was: 132 is: 0 **Variation: -132**	was: 2 is: 0 **Variation: -2**	was: 3 is: 0 **Variation: -3**	Product group removed from EIA (no regulation) (section 1.2.2.4)
Sum all products	was: 9608 is: 9629 **Variation: +21**	was: 1037 is: 1039 **Variation: +2**	was: 1533 is: 1513 **Variation: -20**	Total for all EIA products Variation sum of those above

Table 4 Main recent changes in EIA results

	Primary Energy Savings (TWh, mtoe)		User Expense Savings (bn euros)		Extra Business Revenues (bn euros)	
	2020 (PEF 2.5)	2030 (PEF 2.1)	2020	2030	2020	2030
EIA2019 bn euros 2015	1523 TWh 131 mtoe	2339 TWh 201 mtoe	55	130	55	77
EIA2020 bn euros 2015	1037 TWh 89 mtoe	1533 TWh 132 mtoe	60	118	21	29
EIA2021 bn euros 2020	1039 TWh 89 mtoe	1513 TWh 130 mtoe	63 [21]	125 [21]	22	31

Energy comparison with Eurostat

Energy totals in the EIA are compatible with those in Eurostat [22] when considering the differences in scope. EIA has a high coverage of the energy consumption in the residential and services sectors for electricity, natural gas, liquid fuels, and solid fuels. Due to its scope [23], the coverage in the EIA is lower for industry and transport. See section 3.9 for details.

Table 5 presents the EIA-Eurostat comparison for the residential sector in 2019, per end-use application and energy type. It indicates the final energy consumption in Eurostat and in the EIA in TWh, the absolute difference in TWh, and the relative difference in percent.

District heating (column 'heat' in the table), ambient heat used by e.g. heat pumps, solar heat and biogas (column 'rnw other') are not accounted in the EIA. EIA coverage of primary solid biofuels (column 'rnw psb') is partial (only wood for space heating). In addition, water heating and cooking using LPG (part of the column 'oil' in the table) is not in the EIA scope. This explains large part of the differences between Eurostat and the EIA.

The most relevant remaining differences (red figures in the table) are electricity consumption for space heating, cooking using gas and elecricity, and electricity for lighting and appliances. The latter difference is mainly due to ironing, small appliances and part of ICT- and entertainment equipment not being in the EIA scope. Further work to investigate the differences is ongoing.

[21] For compatibility with the earlier EIA editions, which all used the EIA traditional approach to energy rates, the expense savings for EIA2021 in this table are also for the EIA traditional rates. When applying the energy rates from the PRIMES 2020 Reference scenario (which is the EIA2021 baseline for reporting), user expense savings would be 57 bn euros in 2020 and 110 bn euros in 2030 (both in 2020 euros), see section 3.6.1 for details.

[22] Eurostat Energy Balance from online data code nrg_bal_c, ed. April 2022. Eurostat data per residential end-use application from online data code nrg_d_hhq for year 2019 (accessed April 2022).

[23] Products regulated by ecodesign and/or energy labelling.

Table 5 Comparison of energy consumption between the EIA and Eurostat for the residential sector in year 2019, per end-use application and energy type

Residential TWh/a in 2019		solid	gas	oil	rnw psb	rnw other	elec	heat	total
All uses	Eurostat	83	919	337	475	100	708	239	2861
	EIA	89	883	300	256	0	632	0	2159
	dif	6	-36	-37	-219	-100	-76	-239	-702
	dif %	7%	-4%	-11%	-46%	-100%	-11%	-100%	-25%
Space Heating	Eurostat	76	691	264	438	70	96	184	1819
	EIA	89	684	271	255	0	166	0	1464
	dif	13	-7	7	-183	-70	70	-184	-355
	dif %	17%	-1%	3%	-42%	-100%	**73%**	-100%	-20%
Space Cooling	Eurostat	0	0	0	0	0	12	0	12
	EIA	0	0	0	0	0	9	0	9
	dif	0	0	0	0	0	-3	0	-3
	dif %	0%	0%	0%	0%	0%	-25%	0%	-25%
Water Heating	Eurostat	6	174	48	28	27	86	54	424
	EIA	0	173	30	0	0	74	0	278
	dif	-6	-1	-18	-28	-27	-12	-54	-146
	dif %	-100%	-1%	-38%	-100%	-100%	-14%	-100%	-34%
Cooking	Eurostat	1	54	23	7	3	87	0	175
	EIA	0	25	0	0	0	63	0	88
	dif	-1	-29	-23	-7	-3	-24	0	-87
	dif %	-100%	**-54%**	-100%	-100%	-100%	**-28%**	0%	-50%
Lighting & Apps	Eurostat	0	0	0	0	0	404	0	404
	EIA	0	0	0	0	0	319	0	319
	dif	0	0	0	0	0	-85	0	-85
	dif %	0%	0%	0%	0%	0%	**-21%**	0%	-21%
Other end-uses	Eurostat	0	0	2	2	0	23	0	27
	EIA	0	0	0	0	0	0	0	0
	dif	0	0	-2	-2	0	-23	0	-27
	dif %	0%	0%	-100%	-100%	0%	-100%	0%	-100%

Solid: Eurostat's solid fuels (referred to in the EIA as 'coal') do not include biomass (in the EIA referred to as 'wood'), which is registered in Eurostat under renewables (primary solid biofuels).
Gas: Natural gas, does not include LPG (propane, butane), which is registered in Eurostat under oil and petroleum products.
Oil: Oil and petroleum products, including LPG.
Rnw psb: Eurostat's primary solid biofuels (psb), registered as part of renewables (rnw). EIA considers only what is in the scope of Ecodesign, i.e. wood logs, -pellets and -chips for space heating by solid fuel boilers and local space heaters, not e.g. for water heating and cooking.
Rnw other: Eurostat's renewables other than primary solid biofuels (psb): e.g. ambient heat used for heat pumps, solar thermal, biogas, other. Not accounted in the EIA.
Elec: Electricity
Heat: Derived heat, distributed heat, e.g. used for district heating. Not accounted in the EIA.

EIA History

In 2013, the European Commission identified a need to systematically monitor and report on the impact of Ecodesign, Energy Labelling, Energy Star and Tyre Labelling measures, including potentially new forthcoming actions, with a view to improve its understanding of the impacts over time as well as its forecasting and reporting capacity.

The Ecodesign Impact Accounting is the answer to this need. The 2013-2015 EIA I study [24] developed the EIA-methodology and applied the accounting method in the reports of May 2014 and December 2015 [25] [26].

The Ecodesign Impact Accounting was continued in the 2015-2018 EIA II study [27], annually updating and extending the data and enhancing the methodology.

On a one-time basis, in 2016 a 'Special Report Material Inputs for Production' and an 'EcoReport for the average EIA product' were published [28]. These reports provided insight in the non-energy resources (material resources) associated with the products accounted in EIA, and in the energy use and emissions for the production, distribution, and end-of-life phases (non-use phases).

The 2019-2022 EIA III study [29] updates existing data following Ecodesign review studies, adds new product groups where new measures are decided, and further details and enhances the accounting method. The EIA2019 annual report (status December 2019) was issued in June 2020 [30], followed by the EIA2020 annual report (status December 2020) in May 2021 [31]. The current document is the EIA2021 report (status December 2021), and the last to be issued under this contract.

Methodology aspects

The EIA methodology is explained in detail in chapter 2.

The projections in EIA are taken from the impact assessment reports, integrated with data from preparatory- and review-studies where necessary. These projections are the result of various years of study and have been discussed with stakeholders. They consider e.g. the historical and ongoing trends, the expectations from manufacturers, boundary conditions from EU policy, climate change effects, changes in EU population and households, trends in new-building and renovation, changes in user-demand (more comfort, larger displays and fridges, more light sources, rebound effects), and expected energy efficiency developments. The older studies typically cover a projection period up to 2025 or 2030, recent studies sometimes up to 2040 or 2050. Where the projection in the underlying studies does not cover the entire accounting period up to 2050, EIA extrapolates the existing trends without assuming any new measures, i.e. it is not in the scope of EIA to develop new policies.

Projections use two scenarios: a 'business-as-usual' (BAU) scenario, which represents what was perceived to be the baseline without measures at the time of the (first) decision making, and an ECO scenario that is derived from the policy scenario in the studies which comes closest to the most recent measures taken, adapted to the final published regulation where necessary and possible. The differences in outcomes between the two scenarios are presented in EIA as 'savings' due to the policy measures.

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[24] SPECIFIC CONTRACT No ENER/C3/412-2010/FV575-2012/12/SI2.657835 (EIA I study)

[25] ECODESIGN IMPACT ACCOUNTING Part 1 – Status Nov. 2013, VHK May 2014 for European Commission, https://ec.europa.eu/energy/sites/ener/files/documents/2014_06_ecodesign_impact_accounting_part1.pdf

[26] ECODESIGN IMPACT ACCOUNTING Part 2 - Status May 2015, VHK December 2015 for the European Commission

[27] SPECIFIC CONTRACT No ENER/C3/2013-523/09/FV2015-543/SI2.722015 "Extended impact accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme (EIA II)"

[28] Ecodesign Impact Accounting, 'Special Report Material Inputs for Production', and 'EcoReport for the average EIA product', VHK for the European Commission, December 2016

[29] SPECIFIC CONTRACT No ENER/C3/FV 2018-445/06/FWC 2016-542/06/SI2.805274 " Update of the Impact Accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme ('EIA III')"

[30] Ecodesign Impact Accounting – Status Report 2019 – VHK for the European Commission, June 2020, https://www.vhk.nl/research/eia.htm

[31] Ecodesign Impact Accounting Annual Report 2020 - Overview and Status Report– VHK for the European Commission DG ENER B.3, May 2021, Publications Office of the European Union, ISBN 978-92-76-43550-1, ISSN 2600-4771, doi: 10.2833/72143, MJ-AW-21-001-EN-N, https://data.europa.eu/doi/10.2833/72143

EIA takes into account product interactions, e.g. between ventilation units and space heating, and corrects for double counting in a transparent manner (section 2.7).

Following comments on EIA methodology from the European Court of Auditors [20]:

- EIA takes into account, as far as feasible, differences between the preferred policy option of the impact assessment and the final published regulation;
- EIA does not take into account new proposed measures (in review studies or (draft) impact assessments) that have not been finalized yet;
- EIA includes an estimate for the reduction of savings due to non-compliance of products with the regulations;
- EIA no longer reports data on product groups / operational modes for which no Ecodesign or Energy Labelling regulation exists.
- These new guidelines have been implemented starting from EIA2019.

TABLE OF CONTENTS

Annexes

1. Introduction

1.1. Background and context

This study on the "Update of the Impact Accounting of Ecodesign, Energy Label and Tyre labelling legislation as well as actions under the Energy Star programme ('EIA III')" is part of the framework services contract for 'Technical assistance to the Commission in performing its tasks on Ecodesign, Energy Labelling, Tyre Labelling and Energy Star'.

Ecodesign and Energy Label are prominent tools in achieving key EU policy goals regarding climate change, security of supply (geopolitical and absolute), energy pricing (socio-economic impacts, taxation), air quality (emissions of nitrogen oxides, methane, etc.), circular economy and promoting the single market [32].

As regards the energy aspects, not only the primary energy efficiency targets matter but also the fuel-switch away from fossil fuels and towards (energy carriers based on) renewable, low-carbon energy sources is important, exacerbated by recent energy prices following the economic recovery after the pandemic in the autumn 2021, followed by the war in Ukraine from the end of February 2022 with uncertainties over energy security.

The *REPowerEU* plan seeks to diversify gas supplies, speed up the roll-out of renewable gases and replace gas in heating and power generation [33].

As part of the *European Green Deal* [34] and with the European Climate Law [35], the EU has set itself a binding target of achieving climate neutrality by 2050. As an intermediate step, the EU has raised its 2030 climate ambition, committing to cutting GHG-emissions by at least 55% below 1990 level in 2030 (cf. *'Fit for 55'* package). The newly proposed 2030 target for energy efficiency [36], following the *'energy efficiency first'* (EE1st) principle, entails a reduction of 9% with respect to the projections for 2030 according to the EU Reference scenario 2020 [37]. In absolute terms, this 2030 target translates into 1023 Mtoe of primary energy consumption (PEC) and/or 787 Mtoe of final energy consumption (FEC) for the EU27 (without the UK) [38] [39].

Another priority in the European Green Deal is given by the Commission's 2020 *Circular Economy Action Plan* [40] (CEAP) calling for circularity with requirements regarding inter alia durability, reusability, upgradability, reparability, fighting single use and premature obsolescence as well as promoting recycled content, high-quality recycling and

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[32] These tools will gain prominence as currently Ecodesign relates to energy-related products (ErP) only, but a proposal for the Sustainable Product Initiative (SPI) has been adopted to extend minimum standards also for non-ErP.

[33] REPowerEU: Joint European action for more affordable, secure and sustainable energy, press release, 8 March 2022, Strasbourg.

[34] The European Green Deal, COM (2019) 640 final

[35] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), OJ L 243, 9.7.2021, p. 1–17.

[36] Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652.

[37] Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast), COM (2021) 558 final, Brussels, 14.7.2021. Note that 9% reduction with respect of the projection for 2030 according to the Reference Scenario 2020 a reduction of 36% for final and 39% for primary energy consumption respectively when compared to the 2007 Reference Scenario projections for 2030.

[38] For comparison, the EU27-2020 target was 1312 (PEC) and 959 (FEC) Mtoe. Source : EEA 2021

[39] For comparison, in 2019, the EU27 reached levels of 1357 (PEC) and 990 (FEC) Mtoe. Source: Eurostat, Energy Balance sheets 2019, 2021 edition.

[40] A new Circular Economy Action Plan for a cleaner and more competitive Europe. COM/2020/98 final, Brussels.

remanufacturing. Also, digitalisation of product information (digital passports, tagging and watermarks), 'product-as-a-service' or other models are being mentioned.

In the above political context, it is important to monitor the implementation and performance of legislation relating to the energy and climate goals, and to assess related impacts in real time. Timely and accurate information allows for adjustment of policies and may contribute towards establishing a baseline for reviews. The assessment of impacts will generate information relevant for future policy projections, inter alia for 2030, 2040 and 2050. Such information is needed in particular with regard to ED (including voluntary agreements if any), EL and Tyre Labelling ('TL') legislation, including their implementing measures.

The EC has therefore identified a need to systematically monitor and report on impacts of the above legislation and actions, including potentially new forthcoming actions, with a view to improve its:

- Understanding of the impacts of policies, implementing measures and actions over time.
- Forecasting, based on scenarios considered versus the business-as-usual scenario (baseline).
- Capacity building on reporting [41].

1.2. Updates for the Annual Report 2021

1.2.1. General updates.

1.2.1.1. Brexit

All data in EIA2021 are for EU27 (excl. UK)

- Compared to EIA2020, some Brexit factors have changed

The United Kingdom has left the European Union in 2020 (Brexit) and consequently, starting from EIA2020, all data have been converted from EU28 (incl. UK) to EU27 (excl. UK), for the entire accounting period 1990-2050. The removal of UK-data has been implemented in EIA by applying Brexit factors [42], defined as:

Brexit factor = (EU28 value – EU27 value) / EU28 value (%).

A new EU27 value is derived from an existing EU28 value using:

*EU27 value = (1 - Brexit factor) * EU28 value*

Generic Brexit factors have been derived by comparing Eurostat Energy Balance sheets for EU28 and EU27 [43]. They differ per usage sector (residential, tertiary, industry, other),

[41] The first edition of the Ecodesign Impact Accounting of May 2014 was extensively used during the preparation for a possible review of the EL- and ED-Directives.

[42] EIA takes its data from impact assessments and review studies. All recent studies present data for EU28 and in most cases no breakdown of sales data per member state is provided. For this reason, the EIA team had to derive Brexit factors from Eurostat energy data to enable the conversion to EU27.

[43] https://ec.europa.eu/eurostat/web/energy/data/database,
nrg_bal_c, edition June 2020, for EU28 and for EU27 (2020), years 1990-2018, per year, fuel type and usage sector, and nrg_d_hhq, accessed 18 November 2020, for EU28 and for EU27 (2020), year 2018, residential sector, per fuel type and end-use application.

per fuel type (e.g. electricity, gas, oil, solid fuel), per year (1990-2018), and per end-use application (residential sector, 2018). Brexit factors for each EIA product base case were derived from the generic Brexit factors considering the product usage shares per sector, the mix of fuel types used for the product, and the residential end-use application where relevant. Before 1990 and after 2018, Brexit factors have been assumed to remain constant. Where specific Brexit factors per product group were available from the review studies, these have been used instead of the generic factors.

In EIA2021, specific Brexit factors for dedicated electric water heaters replace the generic factors that were used in EIA 2020. See section 1.2.2.6.

For most electric products, the Brexit factor is 11-15%, which reflects the UK-share in EU28 population and households (13%), or gross domestic product (15%). Brexit factors are higher for gas-fired products (> 20%) and smaller for e.g. solid-fuel fired devices, room air-conditioners, and solar heating (< 10%). Typically, the value slightly decreases from 1990 to 2018.

The Brexit factors are reported on sheet BREXIT in Annex A. They have been applied to the EU28 sales quantities to obtain the EU27 sales quantities reported in Annex A [44]. All other product parameters, e.g. stock, energy consumption, emissions, costs, revenues, follow the change in sales automatically. Average product loads, efficiencies, and product prices have not been changed for the Brexit.

Reference information used in EIA has also been updated from EU28 to EU27, e.g. inflation indices, electricity and gas rates, EU energy consumption, population, households, dwellings, and buildings).

1.2.1.2. Inflation index and price level

EIA2021 uses prices and costs in 2020 euros.

- Compared to EIA2020, which used 2015 euros, prices and costs increase by 5.8%

The Harmonized Index of Consumer Prices (HICP, 2015=100) has been updated with the latest information for EU27 from Eurostat. In 2020 the index is 105.8, indicating a price increase of 5.8% between 2015 and 2020. For details, see sheet General_2 in Annex A.

EIA2021 now uses 2020 euros. Compared to EIA2020, which used 2015 euros, this increases all product prices, installation costs, maintenance costs, energy rates, consumable rates, employee 'wages', etc. by 5.8%.

1.2.1.3. Energy rates

EIA2021 energy rates:

- Nominal rates have been updated until 2021;
- All inflation-corrected rates are now expressed in 2020 euros (was 2015 euros);
- For electricity-, gas- and oil-rates, PRIMES 2020 reference scenario is now the baseline for which EIA results are printed.;

[44] The EIA Masterfile still contains the original EU28 sales data, but to avoid confusion (all other EIA data are for EU27) these EU28 sheets have not been inserted in Annex A.

- Sensitivity analysis for other rates in section 3.6, including also estimated effects of strong increase in energy rates in 2021-2022;
- See sheets General_1 and _2 in Annex A for details and references.

EIA traditionally used energy rates derived from Eurostat (electricity, gas), Oil Bulletin (heating oil, LPG, automotive fuels) and other sources (coal, wood). These nominal rates (not inflation corrected) have been updated in EIA2021 with information for years 2020 and 2021. For the period 1990-2021, these nominal rates are inflation corrected to 2020 euros. For future years, EIA traditionally applies a fixed annual percentage increase (on top of the inflation). In the past this was 4%/year, but in the last editions this has been lowered to 1-2%/year to stay closer to trends projected by PRIMES.

For time-series of the rates, data sources, user-options and remarks, see sheet General_2 (nominal rates up to 2021) and sheet General_1 (rates in 2020 euros for the period 1990-2050) in Annex A.

In EIA2020, EIA traditional rates were the baseline for which all outcomes were printed. For electricity and gas there was a user-option to apply the rates from the PRIMES 2015f reference scenario, and the impacts from using these rates were presented in a sensitivity analysis.

In EIA2021, for electricity, gas, heating oil and LPG, the user-options have been extended with a choice from four sets of rates (details on sheet General_1 in Annex A):

- EIA traditional;
- PRIMES 2020 Reference scenario (converted to 2020 euros / kWh);
- PRIMES 2020 Mix scenario (converted to 2020 euros / kWh);
- User-defined set of rates.

Following comments (for impact assessments) from the Regulatory Scrutiny Board, the baseline for which all EIA2021 results are printed in Annex A is now the PRIMES 2020 Reference scenario. The impacts of using other sets of rates are presented in a sensitivity analysis (section 3.6.1).

In the last months of 2021 and the first months of 2022, a strong increase in energy rates occurred. This increase is not yet reflected in the EIA traditional rates (based on Eurostat data) or in the PRIMES 2020 scenarios, and thus not captured by the sensitivity analysis in section 3.6.1. The effect of the increase in electricity rates and natural gas rates on energy cost savings and user expense savings in EIA was therefore modelled separately, see details in section 3.6.2.

Figure 9 (electricity), Figure 10 (natural gas) and Figure 11 (heating oil) show the differences in rates between the options, for the residential sector, industry sector and tertiary / services sector.

For automotive fuels, solid fuel (coal) and wood (logs, pellets, chips), nominal rates have been updated for EIA2021, but only the traditional EIA approach is available. See sheets General_1 and General_2 in Annex A for details.

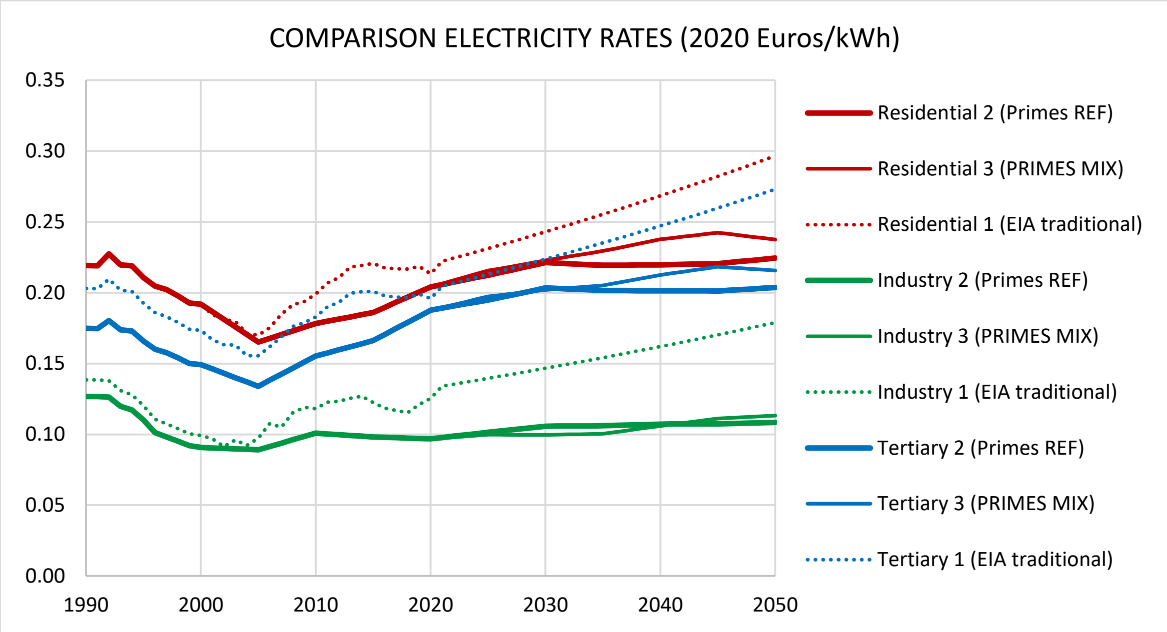

Figure 9: Comparison of rates for electricity (2020 € / kWh electric) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references.

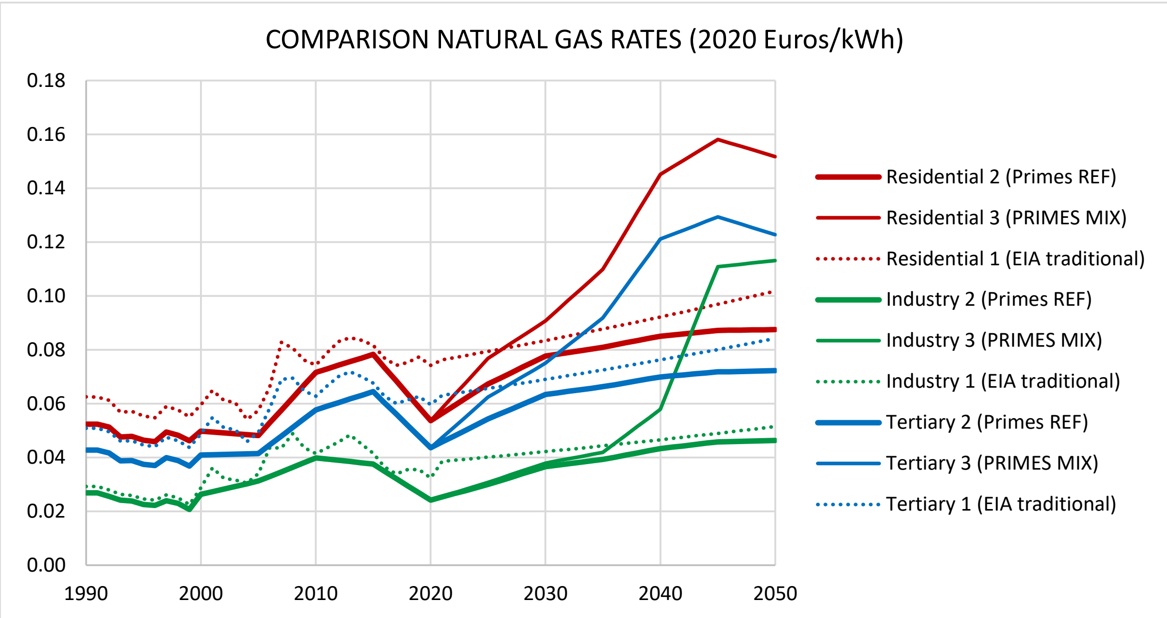

Figure 10: Comparison of rates for natural gas (2020 € / kWh NCV) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references.

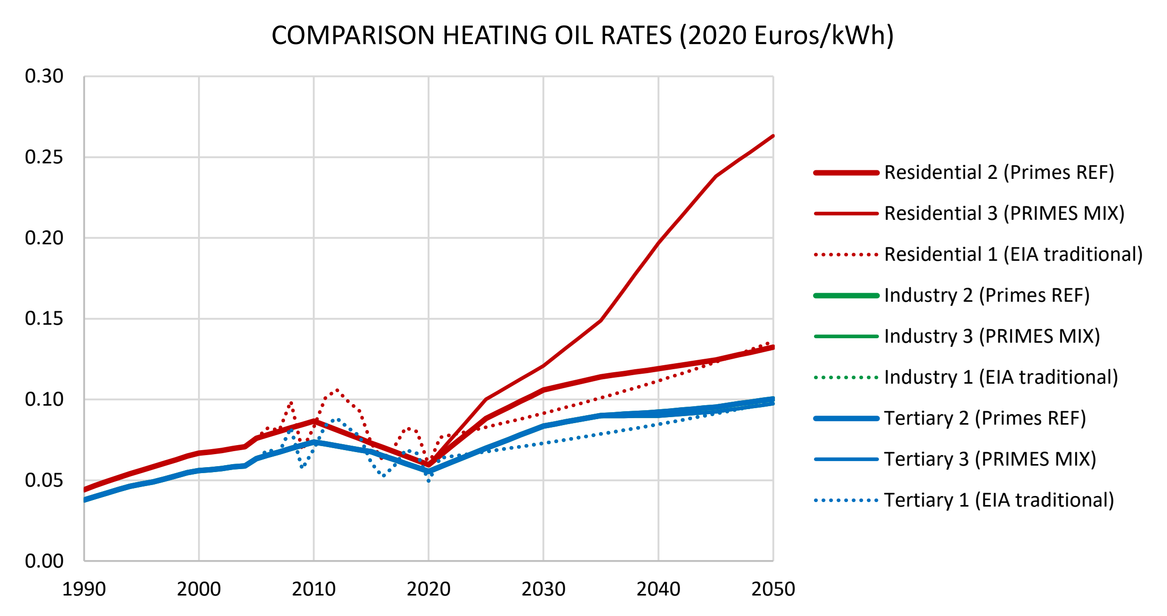

Figure 11: Comparison of rates for heating oil (2020 € / kWh NCV) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references. (curves for industry and services sectors overlap)

1.2.1.4. Non-Energy rates

Non-energy rates regard consumables such as water, paper, ink/toner, detergents, vacuum cleaner bags and filters, welding materials. For EIA2021, all non-energy rates have been converted to 2020 euros. Nominal water rates were updated using the specific Eurostat HICP for water supply. In the context of the update for the review study on vacuum cleaners (section 1.2.2.2), the prices for bags and filters were updated and detailed, see sheet RATES in Annex A.

1.2.1.5. Global Warming Potential updates

EIA2021 GWP factors for electricity:

- PRIMES 2020 reference scenario is now the baseline for which EIA results are printed. Sensitivity analysis for other GWP factors in section 3.7.1;
- Preliminary 2020 MIX scenario has negative GWP factors after 2040.

The GWP-100 factors for electricity generation and distribution traditionally used in EIA are based on the MEErP 2011, and relatively old. More recent data and projections, from the PRIMES 2020 reference and mix scenarios and from the European Environmental Agency, lead to lower values (Figure 12).

A user-option on sheet General_1 in the EIA Masterfile allows quick selection of one of the four sets of factors. The baseline for which results are printed in EIA2021 Annex A is the PRIMES 2020 reference scenario. The impacts of using the other three sets of rates are presented in a sensitivity analysis (section 3.7.1).

Note that in the PRIMES 2020 MIX scenario from 2040 onwards the GWP factors are negative. This implies that in these years electricity savings lead to additional GHG emissions.

For details and references, see sheet General_1 in Annex A.

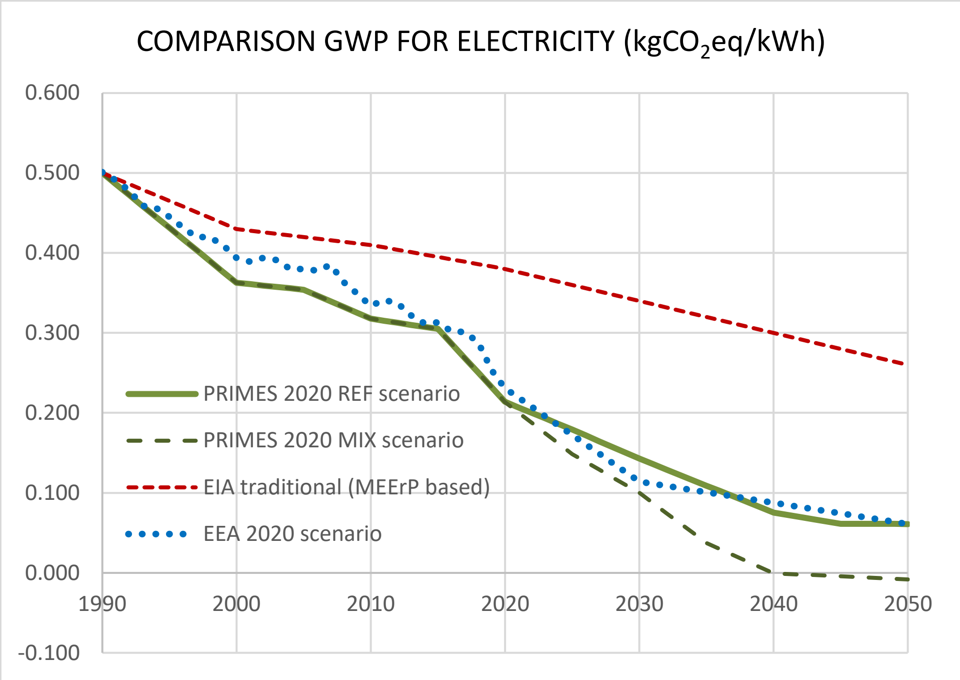

Figure 12: Comparison of GWP-100 factors for electricity generation and distribution (kgCO2eq/kWh electric) for EIA traditional (MEErP), PRIMES 2020 reference scenario and 2020 MIX scenario, and EEA 2020. See sheet General_1 in Annex A for details and references.

1.2.1.6. Primary Energy Factor (PEF) for electricity

EIA2021 PEF for electricity:

- The baseline for which EIA results are printed remains PEF=2.5 until 2020 and PEF=2.1 from 2021 onwards. Sensitivity analysis for other PEF in section 3.6;
- Eurostat SHARES has an efficiency for electricity generation and distribution of 49.7% in 2020, corresponding to PEF=2.01.

The EIA calculation methodology uses a correction coefficient CC (with reverse also known as primary energy factor PEF) to convert electricity to primary energy. The CC value approximately represents the efficiency of electricity generation & distribution. The user of the EIA Master Excel file can choose a set of CC-values to apply (sheet General_1).

In all EIA reports until 2018 a constant value of CC=40% was used (corresponding to PEF=2.5), meaning that 1 kWh of consumed electricity corresponds to 2.5 kWh NCV of primary energy. The factor 2.5 is mentioned as default value in Directive 2012/27/EU (EED), footnote 3 of Annex IV and also used in ecodesign regulations. Amending directive 2018/2002/EU of 11 December 2018 changes the default value to 2.1, corresponding to CC= 47.6% efficiency.

The baseline for which results were printed in EIA2020 Annex A used PEF=2.5 until 2020 (inclusive) and PEF 2.1 from 2021 onwards. This approach does not change in EIA2021. As a consequence, EIA graphs for primary energy consumption show a discontinuity between 2020 and 2021, due to the difference in PEF. Care should also be taken when comparing EIA primary energy values from before and after year 2020, because they include different PEFs.

In EIA2021, an additional user-option has been added to sheet General_1 of the Masterfile, allowing to choose Eurostat SHARES efficiencies. In 2020, these data indicate an efficiency of electricity generation and distribution of 49.7%. Details and references on sheet General_1 in Annex A [45].

The impacts of using the alternate sets of PEFs are presented in a sensitivity analysis (section 3.6).

1.2.2. Product updates.

1.2.2.1. General information on product updates

No new Ecodesign or Energy Labelling measures were published in 2021.

Several preparatory studies on products not yet present in EIA completed in 2021 or earlier, e.g. on smart appliances, building automation control systems, electric kettles, PV panels and inverters, lifts, hand dryers, large storage batteries and high-pressure cleaners (see Annex B-Measures and Annex C-studies), but any proposed ecodesign or energy labelling measures have not been finally adopted yet, and thus have not been inserted in EIA. This is in line with 2020 ECA-comments, see section 1.2.3.

In addition, several review studies on ecodesign and energy labelling regulations were completed in 2021 or earlier, for products already accounted in EIA. These studies provide new, more recent data and new insights in product use and development that are relevant for EIA. Information from these studies has been used to update the EIA BAU scenario (without any measures, typically called BAU0 in the review studies) and the EIA ECO scenario (with impacts from past and current measures, typically called BAU in the review studies). New proposed measures from these review studies (called ECO- or PO-scenarios in those studies) have not been considered for EIA yet, because they were not finalized in December 2021. This is in line with the 2020 ECA comments (section 1.2.3). The EIA ECO scenario will be updated with these new measures in future, based on a new impact assessment study, if and when the new measures will be finally adopted.

For most of these review studies, the update was already performed in EIA2020, e.g. for space heating by central heating boilers, water heating, ventilation units, local space heaters, room air conditioners, circulators, personal computers, games consoles, and laundry dryers. See the EIA Status Report 2020 for details on these updates.

EIA2021 completes the update for review studies, with new data for vacuum cleaners and water pumps.

‘Corrections’ have been applied in EIA2021 for dedicated water heaters, circulators, external power supplies and standard air compressors.

Consequently, in EIA2021 the number of product updates is limited, and changes in energy consumption and savings are small.

1.2.2.2. Vacuum Cleaners (VC)

EIA data for vacuum cleaners have been updated using information from the 2019 review study [46] and a draft impact assessment report. The IA study is ongoing (April 2022) so that the new data inserted in EIA should be considered as preliminary.

The update regards only the impacts of the current ecodesign regulation [47] and takes into account that the energy labelling regulation [48] has been annulled following a law suit by

[45] CCset3 takes the 1990-2019 values from Eurostat Shares (https://ec.europa.eu/eurostat/web/energy/data/shares, η (eta) time series (1990-2019), accessed 25.04.2022). For 2020 and later years the 2010-2019 trend is extrapolated.

[46] Review study on Vacuum cleaners, Final report, June 2019, Viegand Maagøe and VHK

Dyson. Impacts of new proposed measures are not yet taken into account in the EIA update, because they were not finalized in December 2021. This is in line with the 2020 ECA comments (section 1.2.3).

The new EIA data further details the base cases. A partial shift from mains-operated to battery-operated VCs is ongoing. For a better understanding of the projections, cordless VCs and robots have therefore also been added to the accounting, but as these products are not covered by the current ecodesign regulations, they do not have associated savings. EU27 totals for VCs are presented with and without the battery-operated products.

The EIA update also further clarifies the difference between real-life efficiencies and use and standard conditions as referred to in the regulation.

Following the information in the review study, costs for vacuum cleaners bags and filters have been updated and are now reported separately on sheet Rates [49].

Due to the update, electricity savings in 2030 due to CR 666/2013 go down from 23 TWh to 15 TWh. In part this derives from a lower projected stock: the 2030 stock is now 280 mln units (was 430 mln). Other factors are the changed assumptions on real-life efficiencies and the modelled partial shift to cordless and robots, for which savings are zero under the current regulation.

1.2.2.3. Water Pumps (WP)

EIA data for water pumps have been updated using information from the 2018 review study [50] and a draft impact assessment report. The IA study is ongoing (April 2022) so that the new data inserted in EIA should be considered as preliminary.

The update regards only the impacts of the current ecodesign regulation [51]. Impacts of new proposed measures are not yet taken into account in the EIA update, because they were not finalized in December 2021. This is in line with the 2020 ECA comments (section 1.2.3).

In EIA2020, water pumps were represented as a single aggregated base case. The EIA2021 update provides a more detailed insight, distinguishing pumps of types ESOB, ESCC, ESCCi (all in two capacity ranges), MSSB and MS-V, and for each type the usage conditions constant flow (CF), variable flow without VSD (VF) and variable flow with VSD (VF-VSD) [52]. Only pump types in scope of CR 547/2012 have been inserted in EIA. For ESOB, ESCC and ESCCi this is limited to 150 kW, for MSSB to 6” diameter and for MS-V to 25 bar.

The review study and the ongoing impact assessment use an Extended Product Approach (EPA), taking into account not only the bare pump (as done in CR 547/2012 and in EIA2020) but considering the entire pump system, including motor and VSD and controls (if present). The EPA approach changes efficiencies and loads, including the energy losses in the motor and in the VSDs, and considering the beneficial effect of VSDs on the

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[47] COMMISSION REGULATION (EU) No 666/2013 of 8 July 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for vacuum cleaners, OJ L 192, 13.7.2013, p.24

[48] COMMISSION DELEGATED REGULATION (EU) No 665/2013 of 3 May 2013 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of vacuum cleaners, OJ L 192, 13.7.2013, p.1

[49] They have been removed from sheets General_1 and _2.

[50] Ecodesign Pump Review, Study of Commission Regulation (EU) No. 547/2012 (Ecodesign requirements for water pumps) Extended report (final version), Viegand Maagøe and Van Holsteijn en Kemna B.V., December 2018, https://www.ecopumpreview.eu/

[51] COMMISSION REGULATION (EU) No 547/2012 of 25 June 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for water pumps, OJ L 165, 26.6.2012, p.28

[52] ESOB: end-suction own bearing; ESCC: end-suction close-coupled; ESCCi: end-suction close-coupled in-line; MSSB: multi-stage submersible borehole; MS-V: multi-stage vertical; VSD: variable speed drive.

loads (actual user demand for pump output can be better followed). The underlying studies define well the EPA efficiencies under the current regulation (and for new proposed measures), but are less clear as regards the EPA efficiencies in the scenario without any regulation (the EIA BAU scenario). The latter efficiencies have been derived by the EIA team, inspired by information in the review study and draft IA, in such a way that the projected savings due to CR 547/2012 remain approximately the same as in EIA2020.

The EIA update leads to a lower stock (down from 20.8 mln to 16.5 mln in 2030) but a higher electricity consumption in both BAU and ECO scenarios (from 120 to 180 TWh in 2020 and from 140 to 200 TWh in 2030). As said, the electricity savings due to CR 547/2012 remain approximately the same (3-4 TWh in the period 2020-2030) [53].

The EIA update for WPs also introduces a usage share for the residential sector. It leads to a higher electricity consumption in the residential sector (now also reflected on the sheet Households), and to lower consumption in the tertiary, industry and other sectors.

As said, the EIA update is preliminary, and serves mainly to provide further detailed insight and as a preparation for implementation of the impact of future measures. A further update of the ECO scenario is foreseen based on the final impact assessment, if and when the new proposed measures will be finally adopted. These measures are expected to lead to much higher savings.

1.2.2.4. Standard Air Compressors (SAC)

The data for standard air compressors in EIA2020 and earlier editions (including an outdated ECO scenario) were based on the 2014 review study [54] and a 2015 draft impact assessment [55], but to-date there is no approved ecodesign regulation. According to ECA comments (section 1.2.3) this means that data on SAC should not be present in EIA.

Until the EIA2020 edition, SAC data had been maintained in EIA, because work on standard air-, oil-free- and low-pressure-compressors was ongoing, and a regulation was expected soon. According to the latest information, an ecodesign regulation for compressors is not expected on a short term, and data on compressors have therefore been removed in EIA2021.

This reduces the accounted electricity consumption by 130 TWh in 2020 and 115 TWh in 2030, and the electricity savings by 2-3 TWh.

Data on compressors can still be found in previous EIA editions, if needed.

1.2.2.5. Circulators (CIRC)

Most circulators are used in central heating systems. The energy calculations for central heating boilers in EIA already consider the energy consumption by associated circulators, as part of the auxiliary electricity consumption. EIA therefore used a double counting factor of 1.0 for circulators, meaning that their energy consumption was not considered when determining EU27 totals over all products (to avoid double counting).

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[53] In principle, these savings are due only to improvements in the pumps, not to improvements in the motors or to the use of VSDs. However, the energy consumption of WPs now includes motor losses and this raises the question if the double counting factor for electric motors needs adjustment. Note also that standard air compressors have been removed from EIA and that this has an opposite impact on the double counting with motors. This topic needs further study in future EIA editions.

[54] Ecodesign Preparatory Study on Electric motor systems / Compressors, DG ENER Lot 31, FINAL Report, VHK for the European Commission, June 2015

[55] Draft COMMISSION WORKING DOCUMENT implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for compressors for standard air application, Brussels 2015

Circulators have been updated in EIA2020 (see EIA Status Report 2020), adding stand-alone circulators. However, the double counting factor (db) remained 1.0 for both the integrated and the stand-alone circulators. A separate db=0.38 has now been introduced in EIA2021 for stand-alone circulators. This factor has been determined by comparing the stock of central heating boilers [56] with the stock of circulators. The energy of all integrated circulators and of 38% of stand-alone circulators is already included in the auxiliary electricity of central heating boilers.

This means that 62% of the impacts of stand-alone circulators are now counted in EU27 totals; for electricity consumption this is 6.6 TWh in 2020 and 5.1 TWh in 2030.

1.2.2.6. Dedicated Water Heaters (DWH)

Dedicated Water Heaters have been updated in EIA2020 (see EIA Status Report 2020), based on the 2019 review study[57]. The ongoing impact assessment revealed some errors in that update:

- Purchase prices for DWH in EIA2020 had been taken from an older version of the review study. These prices have now been updated following the final version.
- For electric DWH, EIA2020 used the generic Brexit factors for electric water heating (around 7%, see section 1.2.1.1). However, electric instantaneous water heaters for showers (EIWHS) are mainly used in the United Kingdom and Ireland, and the new estimate for the Brexit factor for EIWHS is 90%. For other electric DWH the Brexit factor has been reduced from 7% to 3%.

This change reduces the EU27 stock of DWH in 2020 by approximately 6%, from 147 to 138 mln units. The electricity consumption and electricity savings for DWHs follow this reduction.

1.2.2.7. External Power Supplies (EPS)

The EIA-sheet F-rev accounts the EU27 totals for business revenues. For most products with double counting issues, this sheet refers to the non-double counted revenues, but for External Power Supplies the reference was to the full revenues, including double counted amounts. This has now been corrected. As jobs (sheet G-Jobs) are directly linked to revenues, these changed as well.

This change reduces the total business revenues for EPS considered in EU27 totals from approximately 2.7 bn euros in EIA2020 (in 2015 euros) to 1.6 bn euros in EIA2021 (in 2020 euros). The EPS-related jobs counted in EU27 totals reduce from 41 thousand to 23 thousand.

1.2.2.8. Cooking Appliances (CK)

The 2021 review study on cooking appliances [58] has been considered in the context of the EIA-Eurostat comparison (section 3.9.5), but EIA data have not yet been updated for this study.

The main reason for this is that review study does not allow a complete EIA update because some data are missing. The available review study data are not compatible with existing EIA data, so that it is not feasible to use a mix of review study and EIA data. In

[56] Not including solid fuel boilers.

[57] Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review study Final Report Tasks 1-7, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019

[58] Review study of Ecodesign and Energy Labelling for Cooking appliances, JRC Technical Reports, April 2021 corrected version

addition, using review study data would further increase the already large difference with Eurostat. E.g. for residential cooking on electricity and gas in 2019, the Eurostat final energy consumption is 141 TWh, compared to 88 TWh in EIA and 48 TWh in the review study. This requires further study.

1.2.3. Implementation of ECA comments

The final comments of the European Court of Auditors (ECA) on EIA were published in January 2020 [59] and have been considered starting from EIA2019. In particular:

- EIA now takes into account, as far as available information allows, differences between the preferred policy option of the impact assessment and the final published regulation;
- EIA does not take into account new proposed measures (in review studies or (draft) impact assessments) that have not been finalized yet;
- EIA now includes a reporting on the reduction of savings due to non-compliance (section 3.7.3);
- EIA no longer reports data on product groups / operational modes for which no Ecodesign or Energy Labelling regulation exists.

A sheet 'Noncompliance' has been added to the EIA2019 Masterfile to present the possible impact of non-compliances. This clearly separates the basic EIA data without non-compliance from the data with non-compliance, thus avoiding confusion.

During the 2020 accounting period, VHK performed an additional on-line search for data on the reduction of energy savings due to non-compliance with ecodesign and energy labelling regulations, but no new information was found. The generic 10% reduction of savings applied in EIA2019, for all products and all years, was therefore maintained in EIA2020 and EIA2021, see section 2.11.

1.3. Reporting

This EIA III Annual Report 2021 uses the same layout as the 2016-2020 editions. The documentation is split in a more detailed Methodology report for analysts and experts (this Status report) and a more general, descriptive Overview report targeting a wider, non-technical audience (issued separately). Since the 2020 edition, the two reports are published together as a single pdf.

Except for some additional user-options for primary energy factors for electricity, global warming potential factors for electricity, and energy rates, on sheet General_1, the accounting methodology has hardly changed in the EIA2021 update, and consequently the method description in chapter 2 is almost the same as in the previous EIA edition.

The application of the accounting method, i.e. the inventory of impacts per 31 December 2021, is introduced in Chapter 3, but is mostly performed in the EIA Excel Masterfile. The print-out of this file, for 5-year intervals only, is contained in Annexes A to G of this report. Annex H is a reference list.

[59] 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report 01, January 2020, European Court of Auditors

2. Accounting method

2.1. Overview

The calculation method follows the procedures as laid down in the Methodology for Ecodesign of Energy-related Products (MEErP), which takes into account the relevant requirements of the European Commission's Impact Assessment Guidelines. Having said that, the calculation method is streamlined to make maintenance and reporting as simple as possible.

Also, with respect to the definitions in MEErP and Ecodesign regulations, some concessions have been made to be in line with the Eurostat energy balance accounting that is usually the reference for policy studies at an aggregate level (e.g. PRIMES, POTENCIA).

The following paragraphs describe parameters and equations:

- Scenarios: the BAU ('Business-As-Usual') and ECO scenario;
- Generic parameters: e.g. historical energy prices, future energy price escalation (growth rate corrected for inflation), electricity to primary energy conversion coefficient (CC), global warming potential for energy sources (GWP-100);
- Usage-sector shares: subdivision of the energy consumption over the industry-, tertiary-, residential- and 'other' sector;
- Product specific input variables: e.g. sales volume per year, product lifetime, user-demand for product output (Load), energy efficiencies (for BAU and ECO), product unit prices (for BAU and ECO), price breakdown factors;
- Derived (output) variables: stock (volume installed), energy-, emission- and consumable-impacts of the stock, acquisition costs, energy costs, total user expenses, business revenues, employment impacts;
- Aggregation of data and double counting issues.

2.2. Scenarios

The ecodesign impact accounting distinguishes a BAU scenario (Business as Usual) and an ECO scenario. The BAU represents the situation without measures as assessed during the first preparatory and IA study for a product [60]. It is not necessarily how a 'Business-as-Usual' would be judged today.

The BAU scenario is not a 'freeze' scenario, i.e. in most preparatory studies ongoing market trends in energy efficiency improvement and emission abatement are taken into account in the BAU. It is derived from extrapolating historical trends at the time of the preparatory study analysis.

During a review study, new data are usually gathered on the actual development of product parameters with the Ecodesign measures in force. These data can be used to check if the previously projected ECO-scenario has been realized. Reasoning backwards from these data, a new projection can also be made for what would have happened if the Ecodesign measures had not been introduced, i.e. a new BAU-scenario can be developed. This was done in EIA2018 for e.g. light sources, electric motors and tyres, where the new BAU-scenario in EIA, based on new data and insights, is different from the

[60] Note that for the first products with an Energy Label like household refrigerators and washing machines this may go back to 1992-1993.

previously used BAU-scenario. The same has been done in EIA2020 and EIA2021 for most of the product updates listed in section 1.2, based on new information from the review studies.

As said, the EIA BAU-scenario represents the situation without any Ecodesign and Energy Labelling measures. This scenario will typically differ from the BAU-scenario in the Impact Assessment for a review of the measures, where it represents the situation in which existing measures are maintained but no new measures are introduced. The aim of the IAs is to determine the change in impacts (savings) only for the new proposed measures, while EIA aims at determining the combined savings due to all measures, old, existing, and new [61].

The EIA ECO scenario is the scenario which –in the most recent preparatory and IA studies—comes closest to the (projection of the) situation with measures taken, i.e. with requirements from Ecodesign, Energy labelling, Energy Star and Tyre labelling. Following comments of the European Court of Auditors (par. 1.2.3), starting from the 2019 edition, the EIA ECO scenario aims to reflect the final published regulation(s), taking into account also the differences, if any, between the final regulation and the policy options in the IA [62].

Three ground rules for scenarios were followed in the study:

- Scenarios should be based on the existing preparatory, review and impact assessment (IA) studies and on the final voted regulations. If policy is a ship, accounting is the compass and not the captain. In other words, it is not the task of accounting to propose new measures.
- Scenarios should be as realistic as possible, i.e. the results from the 'bottom-up' approach of the ecodesign impact accounting should ideally be consistent with the results from the 'top down' approach in Eurostat and others.
- Scenarios should be fit for purpose, i.e. in principle they are used to study only the impact of ecodesign and labelling measures, not of other demand-side measures (e.g. EPBD, NEEAP) and not of supply-side measures such as the use of renewables and overall efficiency improvement in electric power generation.

In part, these ground rules are conflicting:

Based on the existing measures

When EIA was first set up, in 2013-2014, the aim was to make the accounting as complete and up to date as possible, collecting all information from available studies. Product groups for which at least a BAU-scenario could be developed were inserted in EIA to have an as-complete-as-possible survey of energy consumption, emissions, user expenses, business revenues and jobs. In some cases, reflecting the availability of information and the status of the regulatory process, the ECO-scenario was set identical to the BAU scenario (no savings accounted), while in some other cases the (temporary) ECO-scenario was based on policy proposals in the preparatory study or in a (draft) Commission Working Document. However, as also stated above, in most cases the EIA ECO scenario was taken as the scenario which –in the most recent IA study—came closest to the (projection of the) situation with measures taken. As IA studies are not

[61] Most review studies (and impact assessments) distinguish three scenarios:
- a BAU0 scenario without any measures (corresponding to the BAU scenario in EIA),
- a BAU scenario including impacts of past and current measures (corresponding to the ECO scenario in EIA), and
- one or more ECO scenarios including the impacts of new proposed measures. These scenarios are initially not present in EIA. Only when the new measures are finally adopted in a new regulation or amendment, the EIA ECO scenario is adapted for the new measures.

[62] As IAs are not updated for last-minute changes in the final regulations, the feasibility to update EIA for differences between the IA and the final regulation depends on the availability of information on the change in impacts due to these differences.

updated for differences between these studies and the final regulation, these differences were usually not considered, for lack of information on their impacts.

As explained in section 1.2.3, following comments from the European Court of Auditors, starting from EIA 2019 this initial approach has been adapted: product groups (or usage modes) for which no regulation exists have been removed from EIA, data on new measures are inserted in EIA only when these measures have been finally decided (at least a positive vote in the Regulatory Committee), and, as far as possible considering the available information, EIA aims to take into account differences between the IA and the final regulation.

The time scope of impact scenarios in existing studies often runs at the most up to 2030 (and in older studies even before that). This is the time by which most installed products have been replaced by products meeting the ecodesign requirements and labelling has lost most of its effectiveness because most of the products are rated in the highest classes [63]. So, given that the study is required to develop scenarios up to 2050, this means that effectively the ECO-scenario assumes that ecodesign and labelling legislation will not be (further) updated and that there will be no additional measures for new products.

The consequence is that in the 2030-2050 period the effect of the measures diminishes and eventually flattens out.

Such a scenario provides a valuable insight for policy decisions, e.g. as reference baseline, and has been maintained, because there is no alternative within the scope of the study. But with input from policy makers it should be possible to calculate alternative scenarios using the EIA Excel Masterfile.

Realistic

Sections 2.3 to 2.6 and 2.9 describe how accounting from ecodesign studies was converted to be consistent with the statistical accounting units and conventions employed by Eurostat. A comparison of the results between EIA ('bottom-up') and Eurostat ('top-down') is presented in (section 3.9) [64].

Double counting, e.g. where products are regulated both at component and product level, has been taken into account (section 2.7) as well as the increase in load where appropriate, i.e. the trend toward more and bigger appliances, lamps, computers, displays, etc. in households (section 2.8).

For future projections, the possible deficiencies in market surveillance or the effectiveness of the policy instruments are not taken into account. Analysts are not commonly asked to correct for fraud and flaws in implementation. However, following 2020 ECA comments (par. 1.2.3), a separate evaluation of possible effects of non-compliance has been provided since EIA2019 (par. 2.11).

Until EIA2019, an ex post re-evaluation where some specific adopted measures were subject to 'last-minute' changes before the vote, was not taken into account. Preparatory and impact assessment studies are primarily an input to decision making; ex post re-evaluation for accounting purposes is not a priority. See also ECA comments in par. 1.2.3, and observations further above on considering the differences between the IA and the final regulation.

[63] For products where the labelling has recently been rescaled according to framework Regulation (EU) 2017/1369 the labelling would be expected to remain effective longer (the rescaled classes should have been designed such that 10 years after the introduction less than 50% of the products is in the highest class).

[64] In EIA2018 the subdivision of energy over the sectors has been improved, to facilitate comparison with Eurostat data. In EIA2020 a split between fuel types has been added to the FUELECO sheet.

On the other hand, for some product groups the accounting has been conservative. This has been the case e.g. for personal computers where in November 2013 (and in December 2020) there were no indications to differentiate between the BAU and the ECO scenario.[65]

Also as regards the effect of labelling of new products -- i.e. beyond the impact of Ecodesign-- there is a large uncertainty and it may well be that the IA reports on which the accounting is based, have been too conservative.

Past experience from household appliances, e.g. household refrigeration appliances which were subject to both energy labelling and a specific directive with minimum requirements in the 1990s, has shown that the energy labelling accounted for two-thirds of the savings and the minimum requirements for one-third. Also the EU Energy Star programme on office equipment has been evaluated in 2011 and proven successful. On the other hand, the energy labelling of light sources (since 1998) has proven to be largely ineffective, while the ecodesign measures introduced in 2009 had a much bigger impact. For professional appliances, where the buyers are assumed to be indeed professionals, stakeholders in all sectors have claimed that energy labelling is not effective at all. Nonetheless, there is the exception of circulator pumps, where manufacturers have pushed for an energy label. Also in other professional sectors it can be observed that 'ErP 2015'-level or similar designations are used in commercial publications.

The transition between BAU and ECO scenario in most studies is smooth. There is no 'big bang' effect whereby large parts of a manufacturer's product range are eliminated overnight on the implementation date. Negative impact for industry is avoided, because the design cycle, i.e. the rate at which the products in the catalogue are renewed, is taken into account. Most manufacturers start anticipating imminent measures already 2-3 years before the decision is taken, i.e. at the outset of studies. Once the decision is taken it still takes another 2-3 years before the first tier of measures is implemented, while the most ambitious second or third tier follows a few years later still.

Fit for purpose

The ecodesign impact accounting aims to identify the impact of ecodesign and labelling measures, not (necessarily) of other measures with the same policy goals, such as building-related measures (EPBD) and supply side measures on renewables, the efficiency of power generation and the fuel mix.

In order to 'neutralize' the possible effect of these other measures:

- In preceding EIA issues, the primary energy factor for electricity PEF (reverse of the efficiency for electricity generation and distribution CC) was 2.5 for all years. Since the EIA2019 issue, the PEF of 2.5 (CC=40%) is maintained for years 2020 and before, while for years 2021 and later the PEF is reduced to 2.1 (CC=47.6%). This is in line with the update of the Energy Efficiency Directive, see section 2.3.7;
- in EIA 2017 and earlier editions, a generic 4% annual escalation rate for the pricing of all energy sources was used, independent of the energy type. However, on request of the Commission this has been changed in the EIA 2018 edition, to have EIA energy rates closer to those used in the PRIMES model. Hence, in this report, escalation rates differ per energy type. The user of the EIA Excel Masterfile can change this on sheets General_1 and _2, see sections 2.3.6 and 1.2.1.3;

[65] For instance, there is no savings for PCs, because it was not possible to quantify them with the data available.

- for space heating and cooling load of buildings, the historical trends are extrapolated using the same percentage for the BAU and ECO scenario [66];
- the BAU and the ECO scenario use the same performance/load, only the product's efficiency differs [67].

2.3. Generic parameters

2.3.1. Overview

Generic parameters are parameters that are not product-specific but apply across the whole range of calculations for regulated products. Furthermore, they are not dependent on a scenario, i.e. they are the same for the BAU and ECO scenarios.

The most important generic parameters are now defined centrally on sheets General_1 and General_2 and can be easily changed by the user of the EIA Excel Masterfile. For this printed report the values are fixed, on the values shown in Annex A.

The generic parameters, further discussed in paragraphs below, include:

- Time-step and year-index;
- Inflation rates;
- EU average percentage VAT;
- Nominal prices/rates of energy and other consumables (not inflation corrected), and the interpolation factors for the rates for the tertiary/services sector;
- Real prices/rates of energy and other consumables (fixed Euros 2020, inflation corrected) and the annual price escalation rates beyond inflation;
- Efficiency of electric power generation and distribution (conversion factor CC; primary energy factor PEF);
- Calorific value of fuels;
- Global Warming Potential (GWP) for a 100 year period in CO_2 equivalent (for electricity, fuels);
- Employment parameters;
- Brexit factor;
- EU population and households;
- EU buildings and dwellings.

[66] In addition, the heat load reduction for space heating in the ECO-scenario due to additional heat savings by ventilation units is taken into account in EIA starting from the 2017 issue.

[67] This is the general rule, but there are some exceptions. For lighting, sales are shifting from conventional base cases to LED base cases, leading to a difference in sales between BAU and ECO. In addition, a rebound effect has been considered for lighting: due to the lower energy consumption of LED lamps, users tend to install more lumens and let the lights on for longer periods, causing a difference in load between BAU and ECO.
Similarly, for electric motors there is a shift in sales from motors without VSD to motors with VSD, causing a difference both in sales and in EU-load between the BAU and ECO scenarios.
Small load differences also exist for Enterprise Servers; these are related to an expected effect of the information requirement on the SERT metrics, leading to an increase in power per server, a decreasing number of servers, and an overall decrease in PSU output power. See sheet EULOADVAR.

2.3.2. Time-step and year-index

In this printed report, EIA data are reported for year 1990 and for years 2010 to 2050 at 5-year intervals.

The time-step of the calculation method in the underlying EIA Excel Masterfile is 1 year [68]. For some products, fractional years are used for the lifetime, for computation of the stock and of the average stock efficiency [69]. To enable realistic stock and average stock efficiency data (EFS) in 1990, input data for sales and average sales efficiency (EFN) go back to years before 1990, in some cases as far back as 1950 (e.g. distribution transformers with 40 years lifetime).

2.3.3. Inflation rates

Inflation rates for the period 1996-2021 (for EU27 excl. UK) have been taken from the Eurostat harmonized index of consumer prices (HICP), reported on sheet General_2. For years before 1996, an inflation of 2%/a has been assumed.

Inflation rates have been used to convert nominal rates (not inflation corrected) to real rates in 2020 euros (see sections on rates below) and to convert product prices, maintenance costs, consumables' costs, etc. from 2010 and 2015 euros (earlier EIA issues) to 2020 euros (EIA2021).

2.3.4. Value Added Tax (VAT)

The EU average percentage of Value Added Tax used in EIA is 20%. This is currently a parameter that cannot be easily changed by the user (hidden in formulas on sheet PRICE2).

All EIA monetary data for the residential sector include VAT. Data for the tertiary, industry and 'other' sectors exclude VAT. The sector-weighted share of VAT in the product prices and in the acquisition costs is reported on sheet PRICE2 (see par. 2.5.8). The sector-weighted share of VAT in energy costs and total user expenses is currently not being reported.

Rates for the residential sector include VAT. Rates for non-residential sectors exclude VAT and other recoverable taxes and levies.

Business revenues (sheets REV) exclude VAT.

2.3.5. Nominal rates (not inflation corrected)

The nominal rates for energy and non-energy consumables, i.e. not inflation corrected, are given for the period 1990 - 2021 [70] on sheet General_2 (see Annex A).

For most energy sources, the rates for the residential sector and for the industry sector have been derived from the indicated external sources (e.g. Eurostat, Oil Bulletin). The rates for the tertiary/services sector (introduced in EIA 2018) are computed as:

Tertiary rate = (100-x%)*Industry rate + x%*Residential rate

where x% is a user-selected interpolation factor. If 'x' is set to 0%, the tertiary rate is identical to the industry rate; if 'x' is set to 100%, the tertiary rate is identical to the residential rate (including VAT). For electricity, x=80% is recommended, and for natural

[68] Users of the Masterfile can unhide columns to access data in intermediate years

[69] The calculation is first done for full years (rounded down) and then for the remaining fractional (oldest) year. This may introduce a small error (some overlap or gap in subsequent time periods), when the product life over the years varies, but the error is still smaller than with a restriction to use only full integer years.

[70] Or to the latest year for which data are available.

gas x=65%, to obtain EIA tertiary rates that are close to the rates used in the PRIMES 2015f reference scenario. For all other energy types, x=0% has been used (same rate for tertiary as for industry). The tertiary rate is also used for the 'other' sector (agriculture, forestry, fishing, etc.).

Apart from rates for energy, sheet General_2 also contains nominal rates for water, printer paper, detergents, and welding materials. These rates are not split per sector. Rates for printer ink/toner have been removed in EIA 2019, because associated costs are now calculated from container/cartridge unit prices, see sheet Resources. Costs for vacuum cleaner bags and filters have been updated in EIA2021 and are now reported separately on sheet Rates.

2.3.6. Real rates (inflation corrected to 2020 euros)

The inflation corrected rates, i.e. whereby all rates are recalculated to fixed 2020 euros, are given on sheet General_1, with a linked copy on sheet RATES (see Annex A). These are the values used to compute energy costs and the costs of consumables.

In the traditional EIA approach, up to 2021 [71] the real rates are derived from the nominal rates considering the inflation from Eurostat's HICP (see par. 2.3.3). From 2022 onwards, an annual escalation rate (on top of the inflation) is applied. The escalation rate can be set by the user, for each type of energy or resource separately, and separately for the residential, tertiary and industry sectors, see sheet General_1.

For electricity, natural gas, heating oil and LPG rates, additional user-options have been introduced in the EIA2021 Masterfile, to allow quick selection of the traditional EIA-approach, the PRIMES 2020 reference scenario, the PRIMES 2020 mix scenario, or a user-defined scenario', see par. 1.2.1.3.

The printed figures in this report use the rates of the PRIMES 2020 reference scenario for electricity, gas, heating oil and LPG. For automotive fuels, coal and wood (logs, pellets, chips) the traditional EIA approach is used, with a 2%/a escalation rate for automotive fuels and 1%/a for wood and coal. The impacts of alternative rates for electricity, gas, heating oil and LPG are shown in the sensitivity analysis of section 3.6.1.

The escalation rate for water (incl. sewage levies) is 1%, whereas for the other resources the escalation rate is 0% (meaning that their average annual price increase equals inflation).

2.3.7. Electricity generation & distribution efficiency (CC, PEF)

In preceding EIA issues, the primary energy factor for electricity PEF (reverse of the efficiency for electricity generation and distribution CC) was 2.5 for all years. Since the EIA 2019 issue the PEF of 2.5 (CC=40%) is maintained for years 2020 and before, while for years 2021 and later the PEF is reduced to 2.1 (CC=47.6%). This is in line with the update of the Energy Efficiency Directive [72], in particular its Annex IV, footnote 3.

The EIA Excel Masterfile facilitates changes in the PEF (or inverse factor CC). On sheet General_1, the user can choose between 4 sets of CC values: constant 40% (PEF=2.5), constant 47.6% (PEF=2.1), switch from PEF 2.5 to 2.1 in 2021 (used in this report), or the Eurostat Shares set of efficiencies. See sections 1.2.1.5 and 3.7.2.

The factor CC has influence only on the primary energy (NRG) that is calculated as ELEC / CC + FUEL. Changes in the factor CC will not affect electric energy (ELEC), non-electric

[71] Or to the latest year for which nominal rates are available.

[72] Directive 2012/27/EU of the European Parliament and of the Council of 25 October 2012 on energy efficiency, amending Directives 2009/125/EC and 2010/30/EU and repealing Directives 2004/8/EC and 2006/32/EC, OJ L 315, 14.11.2012, p.1, consolidated text of 1.1.2021, Annex IV, footnote 3.

energy directly used by products (FUEL), final energy (FNRG), greenhouse gas emissions (EMISS) or energy costs (NRGCOST) [73].

If the user chooses an approach where the PEF varies with the years (CCset3 or CCset4 on sheet General_1), impacts on the primary energy due to Ecodesign (ED) and Energy Labelling (EL) will mix with impacts from improvements in the efficiency of electricity generation and distribution, thus partially confusing the intention of the Ecodesign Impact Accounting.

At the moment EIA does not use a PEF (or CC) for non-electric energy, meaning that 1 kWh of final 'fuel' equals 1 kWh of primary energy (see also remarks in following paragraph).

2.3.8. Calorific value of fuels

With respect to definitions in the MEErP and in most Ecodesign regulations, some concessions have been made to be in line with the Eurostat energy balance accounting.

Notably the Net Calorific Value NCV (a.k.a. lower heating value H_i) of fuels has been used as an accounting basis and not the Gross Calorific Value GCV (a.k.a. higher heating value H_s). This means that for all products using gaseous and liquid fuels directly, the efficiency values in the preparatory and IA studies –which were usually in GCV-- had to be corrected upwards, e.g. with a factor 1.11 for natural gas, 1.08 for LPG and 1.065 for heating oil [74]. For solid fuels the NCV equals GCV; for solid biomass products the humidity content of the fuel plays a role, but this was already taken into account in the various studies and did not require correction.

In Eurostat energy balances, at the level of the final demand, the NCV (in kWh) relates strictly to the combustion value of the fuel end product (heating oil from the tank, the natural gas from the pipe, etc.). There is no record of, or correction for, the energy needed in their procurement outside the EU (exploration, drilling, mining, transport, etc.). Most LCA (Life Cycle Assessment) literature and standards include this energy expenditure at the level of final demand. Also in the MEErP's *EcoReport* tool there is a correction, depending on the fuel, between 5 and 10% [75]. However, apart from some incompatibility with the *EcoReport* outcomes, this practice does not pose too much of a problem, because the (conventional) energy analyses in the various preparatory and IA studies also use the calorific value without an extra correction for fuel extraction and -transport. And also the power generation & distribution coefficient for electricity does not use such a correction and thus a fair comparison between electricity and primary energy is still guaranteed and no correction was applied.

Also in line with Eurostat, no extra energy credit is given to biomass products, because of their renewable character. For the two product groups where this could have an impact, i.e. local heaters (including biomass stoves) and solid fuel boilers, this does not give a problem because the regulations for these product groups treat the credit (BLF=1.45) as an ex-post factor that is clearly separated from the overall calculation, regarding only the determination of the Energy Efficiency Index for energy labelling purposes.

The same goes for the energy efficiency bonus for Room Air Conditioners (RACs) that the Ecodesign regulation applies to RACs using refrigerants with a low-GWP value. This

[73] For EIA base cases that have the efficiency expressed in terms of primary energy, such as space heating and water heating products, the efficiency-values use the same PEF for all years (either 2.5 or 2.1). This is taken into account in EIA when determining the electricity consumption (sheets ELEC). The PEF chosen by the user on sheet General_1 (possibly variable with the years) is then applied when calculating the primary energy (sheets NRG).

[74] An exception has been made in EIA2020 and EIA2021 for space heating by central heating boilers, water heating by central heating combis and water heating by dedicated water heaters, where efficiencies from the review studies have been copied as they are, in GCV (this is clearly indicated on the EFN and EFS sheets). The conversion to NCV is then applied when determining the amounts of fuel consumed, on the FUEL sheets.

[75] MEErP, Part 2, Table 18 (p. 118). For fuel extraction & transport of gas +7%, of oil +10%, of wood pellets and –logs +5% (original data from the GEMIS database v.4).

bonus, which is evidently not a part of the Eurostat accounting, is treated separately in the underlying studies and no correction was needed.

A table with NCV-values (from Eurostat) is given in the acronym section at the beginning of this report.

2.3.9. Global Warming Potential

In accordance with EU legislation, the GWP-100 emission rates for fuels are given by the latest reports from the IPCC (Intergovernmental Panel on Climate Change). Values for the fuels can be found on the sheet EMISSRATES (see Annex A).

Several sets of GWP-100 emission rates for electricity production are given on sheet General_1 (with a linked copy of the selected set on EMISSRATES). In EIA2020 and EIA2021, a user-option has been introduced in the EIA Masterfile, to allow quick selection of the traditional EIA set of GWP factors, the PRIMES 2020 reference set, the PRIMES 2020 mix set, or a fourth set definable by the user, now with data from the EEA (section 1.2.1.5). For details and references, see sheet General_1 in Annex A. All GHG emission data in Annex A are for the PRIMES 2020 reference scenario set. The impact of using alternate sets is shown in the sensitivity analysis of section 3.7.1.

The sheet EMISSRATES also contains emission rates for NO_x, CO, OGC, PM and Noise, but these are product-specific and not generic parameters.

Direct fuel-related NO_x, CO, OGC and PM emissions were addressed in studies on central heating boilers, water heaters, solid fuel boilers, local space heaters and some air heating products using fuel input. In some cases, the associated Ecodesign regulation also specifies emission limits, see details on the EMISS sheets in Annex A.

Indirect fuel-related CO_2 emissions were addressed in all the other studies, i.e. those dealing with electricity consuming products.

GHG emissions from refrigerants were addressed in all studies on cooling appliances: domestic and non-domestic refrigeration as well as domestic and non-domestic air-conditioning. For domestic refrigeration the GHG-emissions did not result in measures because almost all products used low GHG refrigerants (isobutane). For room air-conditioners a bonus on energy efficiency requirements of 10%, when using low GWP refrigerants (GWP = 150), is included in the Ecodesign Regulation.

A similar low-GWP bonus is also present in the regulation on professional refrigeration for Condensing Units and Process Chillers (not for Storage cabinets). The regulation for refrigerating appliances with a direct sales function does not foresee a similar bonus.

In the EIA 2019 update, GWP-factors for the average refrigerant mix for relevant (cooling) products have been removed, because the contribution of refrigerant losses to GHG-emissions has been removed from EIA.

2.3.10. Employment parameters

The direct employment impact of measures - i.e. the increase or decrease of employees in the value-adding chain - is derived from the business revenues in the various sectors, using ‘Wages’ constants. These are not actual wages, but total company revenue divided by staff, expressed in ‘million euros / employee’. EIA uses the same ‘wages’ for all products. Starting from EIA 2021, the ‘wages’ are expressed in 2020 euros (as all other monetary data in EIA2021) and implemented as variables that can be changed by the user of the EIA Excel Masterfile on sheet General_1.

For the printed figures in this report, the following constants have been used (see also Annex A):

- ManuWages: Manufacturer’s ‘wages’ (used with industry revenue):

- 0.057 m euro/employee overall.
- For manufacturing alone, the 'wage' would be 0.171 m euro/employee (±10%). It is assumed that associated OEM jobs and Service jobs are each of the same order of magnitude. Including also these jobs the 'wage' reduces to 0.057 m euro/employee (1/3 manufacturing, 1/3 OEM, 1/3 services), which is the quantity used in EIA;
- WholeWages: Wholesaler's 'wages' (used with wholesale revenue):
- 0.286 m euro/employee (±20%);
- RetailWages: Retailer's 'wages' (used with retail revenue):
- 0.069 m euro/employee (±20%);
- InstallWages: Installer's 'wages' (used with install revenue):
- 0.114 m euro/employee (±20%);
- MaintWages: Maintenance & Repair 'wages' (used with maintenance revenue):
- 0.114 m euro/employee (±20%);

See further remarks regarding jobs in par. 2.6.14.

2.3.11. Brexit factor

The United Kingdom has left the European Union in 2020 (Brexit) and consequently starting from the EIA 2020 edition all EIA data have been converted from EU28 (incl. UK) to EU27 (excl. UK), for the entire accounting period 1990-2050. The removal of UK-data has been implemented in EIA by applying Brexit factors [76], defined as:

Brexit factor = (EU28 value – EU27 value) / EU28 value (%).

A new EU27 value is derived from an existing EU28 value using:

EU27 value = (1 - Brexit factor) * EU28 value

Generic Brexit factors have been derived by comparing Eurostat Energy Balance sheets for EU28 and EU27 [77]. They differ per usage sector (residential, tertiary, industry, other), per fuel type (e.g. electricity, gas, oil, solid fuel), per year (1990-2018), and per end-use application (residential sector, 2018). Brexit factors for each EIA product base case were derived from the generic Brexit factors considering the product usage shares per sector, the mix of fuel types used for the product, and the residential end-use application where relevant. Before 1990 and after 2018, Brexit factors have been assumed to remain constant. Where specific Brexit factors per product group were available from the review studies, these have been used instead of the generic factors.

For most electric products, the Brexit factor is 11-15%, which reflects the UK-share in EU28 population and households (13%), or gross domestic product (15%). Brexit factors are higher for gas-fired products (> 20%) and smaller for e.g. solid-fuel fired devices, room air-conditioners, and solar heating (< 10%). Typically, the value slightly decreases from 1990 to 2018.

The Brexit factors are reported on sheet BREXIT in Annex A. They have been applied to the EU28 sales quantities to obtain the EU27 sales quantities reported in Annex A [78]. All

[76] EIA takes its data from impact assessments and review studies. All recent studies present data for EU28 and in most cases no breakdown of sales data per member state is provided. For this reason, the EIA team had to derive Brexit factors from Eurostat energy data to enable the conversion to EU27.

[77] https://ec.europa.eu/eurostat/web/energy/data/database,
nrg_bal_c, edition June 2020, for EU28 and for EU27 (2020), years 1990-2018, per year, fuel type and usage sector, and nrg_d_hhq, accessed 18 November 2020, for EU28 and for EU27 (2020), year 2018, residential sector, per fuel type and end-use application.

[78] The EIA Masterfile still contains the original EU28 sales data, but to avoid confusion (all other EIA data are for EU27) these EU28 sheets have not been inserted in Annex A.

other product parameters, e.g. stock, energy consumption, emissions, costs, revenues, follow the change in sales automatically. Average product loads, efficiencies, and product prices have not been changed for the Brexit.

Reference information used in EIA, e.g. inflation indices, electricity and gas rates, EU energy consumption, population, households, dwellings, and buildings) has also been updated from EU28 to EU27.

2.3.12. EU population and Households

Sheet General_1 reports the total EU27 population and number of households. These data are not essential for main EIA outcomes, but used e.g. on the sheet Households to report average data per household.

2.3.13. EU buildings and dwellings

Sheet General_1 reports data on the EU27 building stock. This includes number of dwellings, number of permanently occupied dwellings, and number of non-residential buildings. The total size in Mm2 and the average size per dwelling or building are also indicated. These data are not essential for main EIA outcomes, but have been used in the review study on Ventilation Units and are used in EIA on the STOCK sheets to report the share of total EU27 building/dwelling area covered by mechanical ventilation units.

2.4. Usage-sector shares

The sheet SHARES specifies for each base case the share of the total energy consumption of the product that is consumed in the residential sector (share_RES), the tertiary or services sector (share_TER), the industry sector (share_IND), or the 'other' sector (share_OTH, e.g. agriculture, forestry, fishing). These sector shares are estimates, partly derived from information in the preparatory studies, partly 'common sense' estimates, partly 'tailored' to match the Eurostat breakdown per sector.

The shares are assumed to be constant over the years, which is not necessarily true. E.g. for lighting, recent impacts from Ecodesign measures have had effect primarily on the residential energy consumption, and less on the other sectors. Future lighting regulations are expected to have their main impacts on the non-residential sectors. Consequently, the sector shares would change over the years. For this reason, sector energy data for light sources are taken directly from the MELISA model, and the shares on sheet Shares are for indicative information only.

The usage-sector shares are used on the ELEC, FUEL, FNRG, NRG and EMISS sheets to compute energy consumptions and emissions per sector. This sector subdivision facilitates comparison between EIA and Eurostat data.

The usage-sector shares are also used when computing energy costs (sheets NRGCOST): the energy share for a given sector is multiplied by the energy rate for the same sector.

The share for the residential sector is also used as the share of users paying VAT, on sheet PRICE2.

Starting with EIA2020, the share for the residential sector is further used for the determination of the residential share of acquisition costs, energy costs, maintenance costs, and total user expenses. The latter information is presented near the bottom of the ACQ-, NRGCOST-, MAINT- and EXPENSE-sheets and on the sheet HOUSEHOLDS. The use of the residential shares on the monetary sheets is a first estimate, but uncertain: the sector shares are primarily intended to be energy shares, which are not necessarily identical to cost shares.

2.5. Product specific input parameters

The following subparagraphs discuss the main product-specific input parameters for EIA:

- Sales (annual unit sales for relevant years)
- Lifetimes (product service life in years)
- Load (user demand for product output)
- Energy efficiency (ratio between product output and energy input)
- Non-energy ‘efficiency’ (input data for emissions and consumables)
- Product prices (three price-efficiency pairs as anchor points for interpolation)
- Price breakdown (fractions for installation, VAT, industry, wholesale, retail)

In principle, the retrieval of these variables from most preparatory and IA studies did not pose too much trouble. However, in some cases, not all of these variables were given (or not for all years), and this required the contractor to do additional study.

2.5.1. Sales

Starting from the EIA2020 edition, all sales data are for EU27 excl. UK. As explained in section 2.3.11, the EU27 sales have been determined by applying Brexit factors to the EU28 sales that were previously used in EIA or that were reported in the recent review studies used for the EIA2020 and EIA2021 updates (section 1.2.2). The applied Brexit factors are reported on the sheet BREXIT in Annex A. The EIA Masterfile still contains the original EU28 sales, but these have not been included in Annex A, to avoid confusion (all other EIA data in Annex A are for EU27).

For most products in EIA, the Sales data ($Sales_t$, number of units sold in year ‘t’) are identical for the BAU and ECO scenarios. For these products, the difference between the scenarios (the impact of the measures) is mainly a difference in energy efficiency on the EFNBAU and EFNECO sheets.

For some product groups, it is convenient (and more transparent) to model the impact of ED and EL measures using a shift in sales between base cases with different efficiency levels and/or different load factors. This shift can differ between the BAU and ECO scenarios. Typically, the total sales (and stock) for a product group are then the same in BAU and ECO, but the distribution of the sales over the base cases within the product group differs. This is the case for the following product groups:

- Light sources: shift from incandescent, fluorescent and high-intensity discharge light sources to LED light sources,
- Electric Motors: shift from models without VSD to models with VSD,
- Central Heating Boilers: shift from non-condensing to condensing boilers, and shift from gas-fired devices to electric heat pumps or hybrid solutions,
- Central Heating Combis (for water heating): shift from gas-fired devices to electric heat pumps or hybrid solutions,
- Laundry Dryers: shift from vented LDs to condensing LDs and from condensing LDs with electric heating element to condensing heat pump LDs.

The SALESBAU sheet presents EU27 sales data for all base cases. The SALESECO sheet shows sales data only if they are different from SALESBAU, i.e. for the product groups listed above.

2.5.2. Lifetimes

The product life is assumed to be the same for BAU and ECO. For most products, the product life is a fixed integer number *Life*. Only when the product life is relatively short, it is sometimes expressed by a fractional number. This is the case for e.g. tyres, external power supplies (EPS), enterprise servers and data storage products (ES&DS), light sources (LS), vacuum cleaners (VC) and electronic displays (DP) (see also par. 2.3.2).

There are two product groups – imaging equipment and televisions - whose product life (expressed by the year index $Life_t$) varies per year. This approach was required in order to ensure that the stock and sales data match with the real figures.

The product life data (in years) appear in the 3rd column of the STOCK sheets. For televisions and imaging equipment, data are displayed as a time series, below the general table of the STOCK sheets.

Several IA-studies do not use a fixed average lifetime, but a lifetime distribution function (e.g. Weibull) to compute the stock from the sales. This approach can be more realistic, and would be preferable when lifetimes vary with the years, but it requires a lot of (Excel) space and is therefore not suitable for EIA. In some cases, e.g. tyres, vacuum cleaners and external power supplies, this has been resolved in EIA by using slightly higher average lifetimes, such that the stock computed in EIA (see par. 2.6.1) closely matches the stock from the IA study. In these cases, the lifetimes reported on sheet STOCK are somewhat 'artificial'. For light sources, where the MELISA model uses variable lifetimes and lifetime distribution, it has been preferred to copy the stock as fixed values from the MELISA model (adapting to EU27). In this case, the reported lifetimes are indicative only, and not used in the computations.

2.5.3. Load: user demand for product output

The ecodesign measures (e.g. minimum required energy efficiencies) do not stand alone, but are linked to the functional performance of the product for the consumer. EIA uses the term 'Load' for this functional performance, which typically represents the user-demand for product output. Unit Load values are defined on sheets LOADBAU and LOADECO in Annex A. Further explanations, including also a brief introduction to the technical and quantitative assessment of the product performance by test standards, can be found in sheet LOADNOTES. The product load is expressed by parameters such as:

- kWh per year heating or cooling for a given nominal product capacity (in kW),
- the energy equivalent in kWh per year of the annual hot-water volume delivered with a certain temperature according to a declared standardized tapping pattern,
- m^3 of ventilation air per m^2 building surface with acertain effectiveness and heat recovery,
- lumens (lm) emitted by light sources over a certain period of time,
- dm^2 of viewable surface area of TVs displaying standardized dynamic video content,
- standard test cycles, mimicking typical (standby- and) usage pattern as well as usage intensity,
- m^3 of storage volume at chill (e.g. +5°C) and/or freezing (e.g. -18°C) conditions, for food preservation,
- dust pick-up (dpu in grams of test dust) on hard floor and/or carpets, for vacuum cleaners,
- kg of laundry washed and dried according to predefined test cycles,
- kWh of mechanical or aero-/ hydrodynamic labour performed by motors, fans, pumps and compressors,

- annual kilometers driven by vehicles (tyres), etc.

The description is simplified. Typically, the load parameters are based on comprehensive European test standards, which guarantee that the tests are accurate, repeatable and reproducible (i.e. producing the same results independent of the lab), cost-effective, and representative of real-life usage conditions as far as possible.

For some products, the ‘load’ is established through a test cycle which could include simultaneous testing of several functions that a typical product performs. In these cases, the relevant parameter is the energy input (in kWh) for the test cycle. As this is then usually the regulated parameter (maximum allowed cycle energy values specified in the Ecodesign regulation), it is registered in EIA as an efficiency (EFN sheets, see next paragraph). In these cases, the unit Load in EIA is set to 1, with the indication ‘TEC’ (Test Energy Consumption).

For several products, the unit Load is assumed to be constant over the years. However, EIA considers trends in user-demand for product output. Examples include the increase in dm^2 viewing area and in functionality (high-definition, network access) for electronic displays, the increase in capacity for washing machines and dishwashers, the decrease of the average washing temperature, the rebound effect for light sources (more lumens installed, higher burning times), the decrease in space heating load due to better insulation of buildings, etc. Consequently, for various products the Load varies with the years.

In principle, the load in EIA is assumed to be the same for the BAU and ECO scenarios, i.e. the user-demand for product output is assumed not to change due to the ECO-measures. There are four exemptions to this general rule: space heating (SH) appliances, light sources (LS), games consoles (GC) and enterprise servers (ES).

- For SH, the difference in load between BAU and ECO is related to the heat savings by Ventilation Units (VU), as explained in par. 2.6.2.
- For LS, the EIA base case products are aggregates of various light source types, and also represent a mix of usage in the residential and non-residential sectors. The impact of the ECO-measures differs per product and per sector, implying that the average load for the EIA base cases changes with the scenario (see the MELISA model for details).
- For GC, the effects of the Auto-Power-Down (APD) requirements change the distribution of operating times in active and non-active modes.
- For ES, small load differences between BAU and ECO are related to an expected effect of the information requirement on the SERT metrics, leading to an increase in power per server, a decreasing number of servers, and an overall decrease in PSU output power.

The sheet LOADECO in Annex A reports the unit ECO load only when it differs from the unit BAU load, see also sheet EULOADVAR.

Total load data for the entire EU stock of products are provided on the EULOAD sheets (see par. 2.6.2).

The Load data are used in the computations of electric (ELEC) and non-electric (FUEL) energy consumption (par. 2.6.4).

2.5.4. Energy efficiency

The ‘energy efficiency’ [79] is the ratio between the unit product output (Load, see previous paragraph) and the unit product energy input. Efficiency, not the absolute value of the

[79] Or ‘luminous efficacy’ for light sources, ‘Seasonal space heating/cooling energy efficiency for the heating/cooling performance of heat pumps/air-conditioners, ‘Seasonal Energy Performance Ratio, SEPR’ for high temperature process chillers, etc.

energy consumption, is the parameter which is usually regulated by the ecodesign and labelling measures, since – as it is explicitly stated in the legislation—there should be no significant negative impact on functional performance because of these measures.

The efficiency values for new products, sold on the market in a particular year, are shown on the EFNBAU and EFNECO sheets in Annex A. The efficiency of the average installed product (the 'stock') is a derived parameter (see par. 2.6.3), which is displayed on the EFSBAU and EFSECO sheets, and which is the efficiency being used in EIA energy computations (see par. 2.6.4).

When the product output (Load) and the energy input are expressed in the same measuring unit (typically kWh), the efficiency is given in percentage value. Such is the case, for instance, of space cooling and heating, whose energy input and heat output/load are both expressed in kWh. The value then becomes 'dimensionless' (usually a decimal value, often expressed in %).

If product output and energy input are expressed in different measuring units, the efficiency is expressed in energy or power per load unit, or its inverse, e.g. lm/W for light sources, W/dm^2 for electronic displays, L/100km fuel losses due to rolling resistance of tyres, W per hour of standby, etc.

For some products, the 'load' is established through a test cycle which could include simultaneous testing of several functions that a typical product performs. In these cases, the relevant parameter is the energy input (in kWh) for the test cycle. As this is usually the regulated parameter (maximum allowed values specified in the Ecodesign regulation), it is registered in EIA as an efficiency (EFN sheets). In these cases, the unit Load in EIA is set to 1, with the indication 'TEC' (Test Energy Consumption). If the outcome of a test cycle (expressed by TEC) is weighted against the TEC of a predefined reference product having the same performance, we obtain the so-called 'Energy Efficiency Index' (EEI), a parameter commonly used for many household appliances.

Where possible, for reasons of transparency, the same efficiency-unit has been used in EIA as in the Regulation.

In many cases, the efficiency can easily be converted back to energy consumption. It suffices to divide the load by the energy efficiency (using the EFSBAU and EFSECO sheets). Where the 'efficiency' is expressed by a TEC value and the EIA Load is set to 1 (see above), the EFS-value directly represents the energy use in kWh per test cycle or the aggregated kWh data per year (cycle energy multiplied by the number of cycles per year). The assumed number of cycles per year is usually indicated on the LOAD sheet. If for the calculation an EEI has been used, the calculation of the energy consumption from the EEI is less straightforward, because several additional parameters must be estimated.

The largest difficulties arise when the performance test standards are not conceived according to real-life operation, for reasons such as repeatability and accuracy of the performance test findings. This is for instance the case of household washing machines, where the wash temperatures actually set by the consumer are considerably lower than those used in the test standard. In such a case, where 'real-life operation' and the 'standard' base-case findings are provided in the relevant preparatory studies, for the purpose of ecodesign impact evaluation the 'real life' energy consumption has been favoured, because –even if less accurate—it affords a higher level of consistency with other sources (Eurostat, in-situ measurements, etc.).

2.5.5. Non-Energy 'efficiency'

EIA does not have separate sheets specifying 'emission efficiencies'. Emissions are computed depending on the energy input (see par. 2.6.5), multiplying by specific emission factors:

- Generic (product-independent) GWP-factors per energy type (in kgCO2eq/kWh, see par. 2.3.9, sheets General_1 and EMISSRATES);

- Product-specific Emission-factors for NOx, CO, OGC and PM. These factors are different for the BAU and ECO scenarios (in mg/kWh or g/GJ, sheet EMISSRATES).

EIA does not have separate sheets specifying ‘consumable efficiencies’. All data regarding consumption and costs of paper, toner, water, detergents, vacuum cleaner bags, etc. have been collected on sheet RESOURCES in Annex A.

2.5.6. Product prices (price-efficiency anchor points)

The product price in EIA comprises the total acquisition costs per unit, including the installation costs, the price of auxiliary materials (if any), end-of-life costs (if any) and VAT (for the residential sector). In general, the preparatory studies have retrieved the base-case (BC) product prices for various EU countries (Task 2 of the study) and subsequently determined an average sales-weighted price for the reference year of the study, in consensus with the stakeholders.

In order to apply the accounting / calculation method to all products, the authors had to process prices referring to different reference years, and convert them to fixed 2020 prices – i.e. inflation adjusted (par. 2.3.3).

The product price, however, changes not only as a result of inflation, but also as a result of efficiency gains of most products, occurring both in the BAU and in the ECO scenario.

In line with the ecodesign framework directive and as further detailed in the MEErP, the preparatory and IA studies strive to determine the mix of design options for a product at the least life cycle cost (LLCC) point and the point in the curve with the Best Available Technology (BAT), for benchmarking. To this end, technical analysis and costing of design options were carried out. Further explanation on LLCC and BAT can be found in the MEErP.

This implies that, beside the BC price referred to above, information should be available on both the energy efficiency (in % or kWh/a) and the price (in euros) at the LLCC point and BAT point of the curve.

By (linear) interpolation between the three anchor points (price-efficiency pairs) – BC, LLCC (MID) and BAT - the price at any efficiency point can be calculated. The relevant information on the three anchor points is given in the PRICE sheet (Annex A). The outcome of the interpolation - expressed, in €/unit for the average sales efficiency (from EFNBAU and EFNECO sheets) -, is reported on the PRICEBAU and PRICEECO sheets.

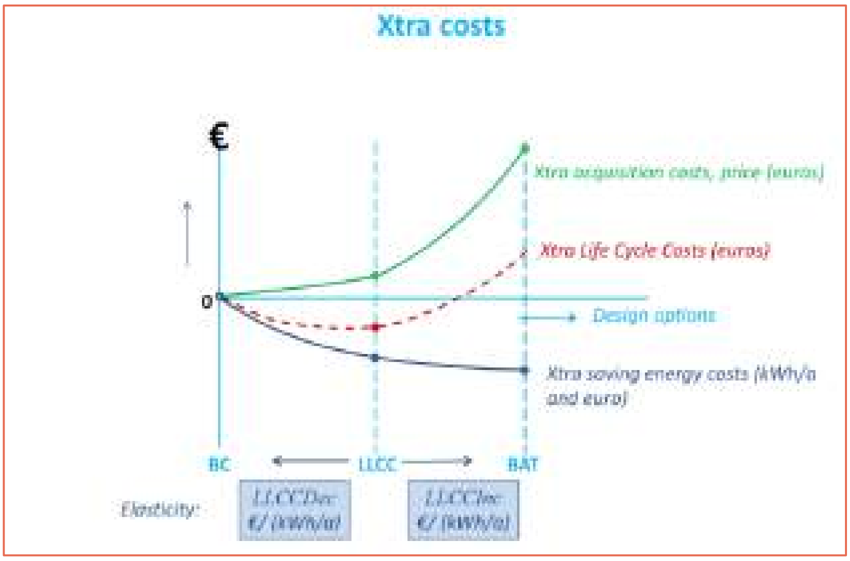

Figure 13. Illustration of anchor points in the calculation of the Least Life Cycle Costs.

Following a change in design, once the product with improved efficiency becomes the baseline and is produced and sold in large quantities, production costs tend to decrease due to the learning curve effect, and prices can be expected to follow. EIA therefore applies an annual price decrease, specified on sheet PRICE in the last column (in %/a). However, to avoid that the effects of this price decrease could be misinterpreted as user expense savings due to ECO-measures, the product price is never allowed to drop below the BC price.

For electronic products, there is no clear relation between product price and product efficiency. Recent, more efficient products even tend to cost less than older, less efficient products. It has therefore been preferred to work with a constant price for most of these products, i.e. not varying with the years.

For light sources, average product prices for a given year have been taken directly from the MELISA model, and consequently the three anchor points are not defined on sheet PRICE. The basic LED purchase cost vs. time curves are reported on sheets PRICEBAU and PRICEECO.

For ventilation units, the derivation of prices in the review study is detailed and complex, depending not only on electric efficiency, but also on heat recovery efficiency, and on the presence of e.g. motor controls, flow controls and sensors. In addition, costs differ for installation in new-built buildings/dwellings, renovated buildings/dwellings, or replacement of existing VUs. EIA does not include all these underlying data, and it has therefore been preferred to copy price data for ventilation units directly from the review study (on sheets PRICEBAU and PRICEECO).

For tyres, no clear relation between price and rolling resistance coefficient could be derived from the preparatory and IA studies, mainly because the pricing also depends on the wet grip coefficient, which is not being reported in EIA. It has therefore been preferred to directly input annual price values on sheets PRICEBAU and PRICEECO.

2.5.7. Installation fraction of product price

Installation costs are a part of the product price (previous paragraph) and thus are assumed to vary with the years, and with the scenarios, in the same way as the product price. To enable separate computation of the business revenue for installers, sheet PRICE2 specifies which fraction of the product price are installation costs (*InstFrac*). This fraction includes VAT for installations in the residential sector.

Several preparatory and IA studies did not consider installation costs, especially when these costs were assumed not to vary with the scenarios. Consequently, installation costs in EIA may be incomplete.

2.5.8. Users paying VAT and VAT fraction of product price

The share of consumers paying 20% VAT (see par. 2.3.4) is taken identical to the residential share of sheet SHARES (see par. 2.4), and also reported on sheet PRICE2 (*VATshare*). The average buyer thus pays *VATavg%= 20%*VATshare*. This amount of taxes is already included in the product price, so the fraction of VAT in the price is *VATfrac = VATavg% / (1+VATavg%)*, see sheet PRICE2.

2.5.9. Business sector fractions of product price

For the estimate of the business revenue for the various stakeholders, several constants need to be assessed to further subdivide the unit prices [P of sheets

PRICEBAU/PRICEECO] or the total acquisition costs for EU27 [ACQ of sheets ACQBAU/ACQECO]. These are given in the PRICE2 sheet [80]:

- Manufacturer fraction of P*(1-Instfrac) (ManuFrac);
- Wholesaler fraction of P*(1-Instfrac) (WholeFrac);
- Retailer fraction of P*(1-Instfrac) (RetailFrac);

Note: the sum of VATfrac, ManuFrac, WholeFrac and RetailFrac is 1.

2.5.10. Maintenance costs per unit

Maintenance costs are specified on sheet PRICE2 in 2020 euros per year per unit (*AnnualUnitMaintCost*). They include VAT for the residential sector. Currently, unit maintenance costs in EIA are the same for all years, and the same for the BAU and ECO scenarios.

Several preparatory and IA studies did not consider maintenance costs, especially when these costs were assumed not to vary with the scenarios. Consequently, maintenance costs in EIA may be incomplete.

2.6. Derived (output) variables

From the core input variables, the following variables can be derived in the BAU & ECO scenarios:

2.6.1. Stock

The Stock is the number of units of a product base case that is installed in EU27, and that is operating and consuming energy. The stock in a given year consists of products sold in that year and of products sold in previous years that have not yet reached their end-of-life. The stock is calculated as the sum of the annual Sales over a number of (previous) years that equals the product Life. Values are reported on sheets STOCKBAU (calculated from SALESBAU) and STOCKECO (calculated from SALESECO), usually in 000 units (but million units for light sources and tyres).

$$Stock_0 = \sum_{t=0}^{-Life} Sales_t \qquad [1]$$

Regarding the use of lifetimes expressed in fractional years, the use of variable lifetimes, and the use of lifetime distributions in IA studies, see remarks in paragraphs 2.3.2 and 2.5.2.

Values for STOCKECO are shown in Annex A only if they differ from STOCKBAU, i.e. for light sources, electric motors, central heating boilers (space heating) and combis (water heating) and laundry dryers (paragraph 2.5.1).

2.6.2. EU-Load

The EU-Load represents the total EU user-demand for product output. It is calculated multiplying the average unit Load in a given year by the Stock in that year. This implies the assumption that the Load does not depend on when a product was bought (i.e. in the considered year or a previous year), but only on how the user actually uses the product in

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[80] ManuFrac, WholeFrac and RetailFrac values differ in principle per product, but –because they tend to be very similar across a large range of products—the current modelling sometimes uses single default values for clusters of products.

the considered year. Values are reported on sheets EULOADBAU (calculated from LOADBAU and STOCKBAU) and EULOADECO (calculated from LOADECO and STOCKECO), in varying measuring units, depending on the type of product output.

$$EULOAD_0 = LOAD_0 \times Stock_0 \qquad [2]$$

Values for EULOADECO are shown in Annex A only if they differ from EULOADBAU, i.e. for space heating products, ventilation units, light sources, games consoles, laundry dryers, enterprise servers, and electric motors.

The sheet EULOADVAR provides the difference in EULOAD between the BAU and ECO scenarios. This difference is reported in Annex A only if it is non-zero. For ventilation units, this sheet reports the heat recovered in BAU, in ECO, and the difference.

For all products except Space Heating (SH) and Ventilation Units, EULOADVAR is simply computed as EULOADBAU – EULOADECO, but for SH-appliances the calculation is more complex, reflecting the reduction in space heating load due to improvements in heat recovery by Ventilation Units (VU). This is further explained below, see also par. 2.7.3, and sheet EULOADVAR in Annex A.

Ventilation Units (VU) - Space Heating (SH) interaction on sheet EULOADVAR:

Mechanical Ventilation Units (MVUs) provide a controlled air ventilation so that compared to natural ventilation (e.g. stack ventilation, or opening windows) less warm air is lost from a heated space. In addition, many VUs can recover heat from the outgoing air stream and use it to pre-warm the incoming air stream. Hence, the installation (and improvement) of VUs reduces the heat to be produced by space heating appliances.

The heat recovery by VUs in the BAU-scenario is already reflected in the BAU-load for space heating appliances, and in its annual decrease (sheet LoadNotes). The additional heat recovery due to improvements of VUs in the ECO-scenario (ECO heat recovery minus BAU heat recovery) are treated as a reduction of the ECO-load for space heating appliances, so that the corresponding energy savings automatically become a part of the overall energy savings on space heating.

The procedure for deriving the ECO-load reduction for space heating appliances is as follows:

- For ventilation units, the LOADBAU and LOADECO sheets report the mechanically ventilated airflows per unit per hour (m3/h). In EIA these are fixed input values, taken from the 2020 review study on VUs [81]
- The EULOADBAU and EULOADECO sheets multiply these unit airflows by the stock, providing ventilated airflows in Mm3/h for the stock of each VU base case. These hourly airflows are summed, separately for the residential and non-residential sectors, and multiplied by the number of MVU operating hours per year indicated on the EULOAD sheets. This is 8760 h/a (continuous operation) for the entire annual flow, and 4910 h/a in 2020, with a 0.85%/a variation, for the mechanical ventilated airflow in the heating season (sheet LoadNotes) [82].
- The EFNBAU and EFNECO sheets report the sales-average heat recovery efficiency of MVUs (%). In EIA these efficiencies are fixed input values, taken from the review study. Stock-average heat recovery efficiencies are computed on the

[81] Ventilation Units, Ecodesign and Energy Labelling, Review study Final Report Tasks 1-7, VHK, Delft (NL), for the European Commission, DG GROW, August 2020

[82] The LOADBAU, LOADECO, EULOADBAU and EULOADECO sheets also report the remaining infiltration airflow (when using MVU) and the reference natural ventilation airflow (when not using MVU), but these values are for information only. These values are not used for EIA computations.

EFSBAU and EFSECO sheets (see next paragraph). These sheets also compute the recovered heat in terms of kWh heat/a/unit, using:

$$HR_t = Flow_t \times HCair \times DeltaT \times SHtime_t \times HReff_t$$

where:

HR_t	Heat recovered in year 't' in kWh/a/unit,
$Flow_t$	Mechanical ventilated airflow in year 't' in m3/h/unit (from LOAD),
HCair	Heat capacity of air, 0.000344 kWh/m3/K (from LoadNotes)
DeltaT	Avg. temperature increase for space heating, 10.9 K (from LoadNotes)
$SHtime_t$	Ventilation hours during heating season in year 't' in h/a (from EULOAD)
$HReff_t$	Stock-average heat recovery efficiency in year 't' in % (from EFS-sheets)

- The amount of heat recovered by the stock of MVUs in the BAU and ECO scenarios, in terms of TWh heat/a, is reported on the EULOADVAR sheet and computed multiplying the HR_t above by the stock in the same year. The same sheet also reports the difference in recovered heat between BAU and ECO. This difference is considered for the heat load reduction for space heating appliances.
- There are many different types of space heating appliances in EIA, so the overall heat load reduction has to be distributed in some way over the single SH base cases. This is done in the upper part of sheet EULOADVAR. As explained more in detail on that sheet (see Annex A), the load reduction distribution is made considering the share of each SH-appliance in the total EULOADBAU of all SH-appliances (this is done separately for the residential and non-residential parts).
- LOADECO for each unit SH-appliance is then computed as LOADBAU – EULOADVAR/STOCK, and EULOADECO is then computed as normally, using LOADECO*STOCK.
- LOADECO for SH is used as normally in EIA to compute ELEC-, FUEL-, FNRG- and NRG-savings for each SH-appliance type. As these appliances have different efficiencies, which also vary with the years, the average SH-efficiency is typically different from the conventional 75% used in CR 1253/2014.
- This procedure mixes the indirect savings on space heating due to ED and EL measures on VUs with the direct savings due to ED and EL measures on the various types of SH-appliances.

For information, the indirect savings on space heating due to ED and EL measures on VUs are also reported under the VU-heading (separate from the savings on own electricity consumption by VUs), but signalled there as being double-counted, because these savings are already included in those reported for the SH-appliances.

The indirect savings have been computed in EIA by considering the difference in savings on space heating for the cases with and without the ECO heat load reduction by VUs. For this purpose, the EIA Masterfile has a control parameter on sheet EULOADVAR, enabling to activate or disactivate the heat load reduction [83].

2.6.3. Average energy efficiency of the stock (EFS)

The stock in a given year consists of products sold in that year and of products sold in previous years that have not yet reached their end-of-life. As energy efficiency typically improves with the years, these products have different energy efficiencies, corresponding to the average sales efficiency (EFN) of the year in which they were bought. The average energy efficiency of the stock in a given year (EFS) is computed as a sales-weighted

[83] The indirect savings on space heating due to ECO heat load reduction by VUs that are reported under the VU heading, do not update automatically after changes in the Masterfile. This has to be done manually, i.e. turn off the heat load reduction on sheet EULOADVAR, copy space heating totals for ELECECO, FUELECO, FNRGECO, NRGECO, EMISSECO, NRGCOSTECO, EXPENSECO, and save them as fixed values one row higher (this is not visible in the printed version in Annex A).

average over efficiencies (EFN) of the products in the stock. This average stock efficiency is used in EIA energy computations. Values are reported on sheets EFSBAU (calculated from SALESBAU and EFNBAU) and EFSECO (calculated from SALESECO and EFNECO), in the same measuring unit as EFN:

$$EFS_0 = \frac{\sum_{t=0}^{\text{-Life}} Sales_t \times EFN_t}{\sum_{t=0}^{\text{-Life}} Sales_t} \qquad [3]$$

2.6.4. EU Energy impacts (ELEC, FUEL, FNRG, NRG)

Starting from the 2018 edition, EIA first calculates electric energy consumption (ELEC) and non-electric energy consumption (FUEL). These two contributions are then summed to obtain the total final energy consumption (FNRG). The corresponding primary energy (NRG) is obtained considering the conversion factor CC (=1/PEF) for electricity (see par. 2.3.7).

The energy impacts are computed per product base case, as EU total for the stock of products in a given year, in TWh/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

ELEC and FUEL are typically computed using one of the following equations, depending on how LOAD and EFN have been defined (see also sheet LoadNotes in Annex A):

$$ELEC_0 = Stock_0 \times LOAD_0 / EFS_0 \times \text{ElecShare} \qquad [4a]$$
$$FUEL_0 = Stock_0 \times LOAD_0 / EFS_0 \times (\text{1-ElecShare}) \qquad [5a]$$

$$ELEC_0 = Stock_0 \times LOAD_0 \times EFS_0 \times \text{ElecShare} \qquad [4b]$$
$$FUEL_0 = Stock_0 \times LOAD_0 \times EFS_0 \times (\text{1-ElecShare}) \qquad [5b]$$

The electricity shares (ElecShare) are provided in the third column of the energy-sheets and can also be found on the sheet SHARES.

For products where efficiencies (EFS) are expressed in terms of primary energy (mainly space- and water-heating), the ELEC is additionally multiplied by the factor CC (=1/PEF,) that was used to define the efficiencies. For some years, this factor can differ from the final CC that is used to compute the primary energy (see section 2.3.7).

For products where efficiencies (EFS) are expressed in terms of GCV of fuels, (mainly central heating boilers and water-heating), the FUEL is additionally divided by the GCV to NCV conversion factor for the type of fuel used (see section 2.3.8).

In some cases, there are two LOAD terms in the equation (e.g. one for power or lumens and another for annual hours), or additional constants are added to the equation (e.g. to convert hourly or daily values or values per cycle to annual values).

Equations [4a], [5a] are typically used when efficiency EFS (and EFN) is expressed as a percentage, or as another output/input ratio. The LOAD then represents the unit product output and dividing by EFS provides the stock average unit energy input.

Equations [4b], [5b] are typically used when 'efficiency' EFS (and EFN) is already the unit input energy (e.g. TEC, Test Energy Consumption). In this case the LOAD is usually 1.

Values are presented on sheets ELECBAU and FUELBAU (based on STOCKBAU, LOADBAU, EFSBAU) and ELECECO and FUELECO (based on STOCKECO, LOADECO, EFSECO). Sheets ELECSAVE and FUELSAVE give the energy savings due to the ECO-measures, computed as BAU – ECO, so positive values represent savings and negative values additional energy consumption.

In all cases, final energy (FNRG) and primary energy (NRG) are computed as:

$$FNRG_0 = ELEC_0 + FUEL_0 \quad [6]$$
$$NRG_0 = ELEC_0 \,/\, CC_0 + FUEL_0 \quad [7]$$

Values are presented on sheets FNRGBAU and NRGBAU (based on ELECBAU and FUELBAU) and FNRGECO and NRGECO (based on ELECECO and FUELECO). Sheets FNRGSAVE and NRGSAVE give the energy savings due to the ECO-measures, computed as BAU – ECO, so positive values represent savings and negative values additional energy consumption.

The second part of the ELEC, FUEL, FNRG and NRG sheets provides the breakdown of energy consumption per usage-sector (see par. 2.4). The breakdown is obtained multiplying the energy consumption of a base case product by the corresponding usage-sector share from sheet SHARES and summing the contributions per functional group. Usage-sector subdivisions are presented in three ways:

- Per sector (industry, tertiary, residential, 'other'): total energy consumption per functional group (in TWh/a),
- Per functional group: total energy consumption per sector (in TWh/a),
- Per functional group: energy consumption shares per sector (in %)

Energy consumption for the Transport sector (tyres) and the Energy sector (distribution transformers) are considered separately and not included in the data for the other sectors. This is in line with the approach on the Eurostat Energy Balance sheets. On the ECO-sheets, a comparison is made between EIA data and Eurostat data.

Starting from the EIA2020 edition, a third part on the FUELECO sheet provides a subdivision of the fuel consumption per usage sector and per fuel type (solid fuel (EIA: coal), natural gas, oil and petroleum products, renewables / biomass (EIA: wood)). This subdivision has been used for a more detailed comparison of EIA data with Eurostat (see section 3.9.4).

2.6.5. EU Emission impacts (EMISS)

The greenhouse gas (GHG) emission impacts are computed per product base case, as EU total for the stock of products in a given year, in MtCO2eq/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

GHG emissions are typically computed using (a variant of) the following equation:

$$EMISS_0 = ELEC_0 \times \mathrm{GWPelec} + FUEL_0 \times \mathrm{GWPfuel} \quad [8]$$

GWPelec is the global warming potential for electricity, see par. 2.3.9, in kg/kWh.

GWPfuel is replaced in the equation by the GWP for the type of fuel being used for the base case product. Values in kg/kWh for various fuel types are reported on sheet EMISSRATES. For products that do not consume fuel, the term is omitted.

Values are presented on sheets EMISSBAU (based on ELECBAU, FUELBAU) and EMISSECO (based on ELECECO, FUELECO). Sheet EMISSSAVE gives the avoided emissions due to the ECO-measures, computed as BAU – ECO, so positive values represent emission reductions and negative values additional emissions.

EIA emissions are compared with values from the European Environment Agency.

The second part of the EMISS sheets provides the breakdown of GHG-emissions per usage-sector (see par. 2.4). The breakdown is obtained multiplying the emissions of a base case product by the corresponding usage-sector share from sheet SHARES and summing the contributions per functional group. The presentation of data is similar to the one on the energy sheets, see previous paragraph.

The third part of the EMISS sheets regards the emissions of NO_X, CO, OGC and PM. These are reported in kt/a, only for products where this is relevant and where data were available in the preparatory or IA studies (water- and space-heating products). No sector subdivision is provided for these emissions.

The non-GHG emissions are calculated as:

$$EMISS_0 = FUEL_0 \times \text{EMISSrate} \times \text{UnitConversionFactor} \qquad [9]$$

Where EMISSrate is the applicable stock average emission rate specified for the type of emission on sheet EMISSRATES for the BAU or ECO scenario. NOx emission rate is specified in mg/kWh NCV; other rates are in g/GJ. The UnitConversionFactor is used to obtain the correct outcome in kt/a.

2.6.6. Other impacts (RESOURCES)

The sheet RESOURCES regards consumption and costs of consumables: paper and ink/toner for imaging equipment, water and detergents for washing machines and dishwashers, bags and filters for vacuum cleaners, shielding gas, filler wire and electrodes for welding equipment.

For consumables, unit data and EU total stock data, for BAU scenario and ECO scenario, are presented on a single sheet. Costs are computed multiplying the consumption by the corresponding rate from sheet General_2 (copy on sheet RATES).

The sheet resources has been reorganized and updated in EIA 2019. For some consumables, the sheet also derives associated GHG-emissions during the production of the consumables, and the primary energy content of the consumables, but these quantities are provided for information only, and not included in the EIA totals on the EMISS and NRG sheets.

Consumable costs are included in the running costs and in the total user expenses, see corresponding sections below.

2.6.7. Product prices (unit prices per year and per scenario)

See paragraph 2.5.6:

For a given product, year and scenario, EIA looks up the efficiency of new sold products in that year on sheet EFNBAU or EFNECO and interpolates the price between the three price anchor points defined on sheet PRICE (price-efficiency pairs for BC, MID and BAT). Considering the learning curve effect, the resulting price is decreased by the AnnualPriceDec (in %/a) of sheet PRICE, starting from the reference year, but the resulting price is not allowed to be lower than the BC-price. The resulting unit prices are reported on sheets PRICEBAU and PRICECO in Annex A.

In situations where the efficiency improvement is relatively low, or where the price-efficiency curve is relatively flat, this procedure leads to a price that is constant over the years (identical to the BC price), or to temporary price increases in a limited number of years following the introduction of ECO-measures. Only where the efficiency improvement is high, or where the price-efficiency curve is steep, the final unit price will show an increase over longer time [84].

2.6.8. EU Acquisition costs

Acquisition costs include purchase costs, installation costs, and end-of-life costs. They include VAT for the residential sector.

Acquisition costs are computed per product base case, as EU total for the sales of products in a given year, in bn euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

Acquisition costs are computed using the following equation:

$$ACQ_0 = SALES_0 \times UnitPrice_0 \qquad [10]$$

Values are presented on sheets ACQBAU (based on SALESBAU and PRICEBAU) and ACQECO (based on SALESECO and PRICEECO). Sheet ACQADD gives the additional acquisition costs due to the ECO-measures, computed as ECO – BAU, so positive values represent additional costs and negative values lower costs.

Starting from EIA2020, the EIA Masterfile contains separate sheets ACQBAU_RES and ACQECO_RES for the computation of the residential share of acquisition costs. These sheets are not included in the printed version in Annex A, but the resulting totals per functional group are displayed near the bottom of the ACQ sheets.

2.6.9. EU Energy costs

Energy costs are computed per product base case, as EU total for the stock of products in a given year, in bn euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

Energy costs are computed using (a variant of) the following equation:

$$\begin{aligned} NRGCOST_0 = ELEC_0 \times \sum_{sectors} SectorShare_i \times SectorElecRate_{i0} \qquad [11] \\ + FUEL_0 \times \sum_{sectors} SectorShare_i \times SectorFuelRate_{i0} \end{aligned}$$

The sector shares are the usage-sector shares from sheet SHARES (par. 2.4).

The sector rates are the usage-sector real rates (2020 euros, inflation corrected), for electricity or fuel, from sheets General_1 and RATES (par. 2.3.6). For fuel, the rate corresponding to the type of fuel consumed by the base case product is used. Where more than one type of fuel is consumed (e.g. diesel and petrol for tyres), each type is considered separately and multiplied by the share of each type in the overall fuel consumption.

Values are presented on sheets NRGCOSTBAU (based on ELECBAU and FUELBAU) and NRGCOSTECO (based on ELECECO and FUELECO). Sheet NRGCOSTSAVE gives the energy cost savings due to the ECO-measures, computed as BAU – ECO, so positive values represent cost savings and negative values additional costs.

[84] It is felt that this procedure requires further study in future: in particular in the case of a review of a regulation with new, more severe energy efficiency measures the current concept presents problems.

Starting from EIA2020, the EIA Masterfile contains separate sheets NRGCOSTBAU_RES and NRGCOSTECO_RES for the computation of the residential share of energy costs. These sheets are not included in the printed version in Annex A, but the resulting totals per functional group are displayed near the bottom of the NRGCOST sheets.

2.6.10. EU Maintenance costs

Maintenance costs are computed per product base case, as EU total for the stock of products in a given year, in bn euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

Maintenance costs are computed using the following equation:

$$MAINT_0 = STOCK_0 \times AnnualUnitMaintCost \quad [12]$$

AnnualUnitMaintCost is the annual maintenance cost per product (in €/a/unit), including VAT for the residential sector. It is identical for BAU and ECO and taken from sheet PRICE2 (par. 2.5.10).

Values are presented on sheets MAINTBAU (based on STOCKBAU) and MAINTECO (based on STOCKECO).

Maintenance costs are included in EIA only for products where preparatory study and/or Impact Assessment study provided the data. Maintenance costs are usually assumed not to change due to the ECO-measures taken, and therefore they are not always being reported in the studies. Maintenance data in EIA therefore tend to be incomplete.

Starting from EIA2020, the EIA Masterfile contains separate sheets MAINTBAU_RES and MAINTECO_RES for the computation of the residential share of maintenance costs. These sheets are not included in the printed version in Annex A, but the resulting totals per functional group are displayed near the bottom of the MAINT sheets.

2.6.11. EU Running costs

Running costs are the sum of energy costs, maintenance costs (if any), and costs for consumables (if any). They are computed per product base case, as EU total for the stock of products in a given year, in bn euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

Running costs are computed using the following equation:

$$RUN_0 = NRGCOST_0 + MAINT_0 + ResourceCost_0 \quad [13]$$

Values are presented on sheets RUNBAU (based on NRGCOSTBAU, MAINTBAU and BAU values from sheet RESOURCES) and RUNECO (based on NRGCOSTECO, MAINTECO and ECO values from sheet RESOURCES).

2.6.12. EU Monetary impact for the consumer (EXPENSE)

Total user expenses are the sum of acquisition costs and running costs. They are computed per product base case, as EU total for the sales and stock of products in a given year, in bn euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.

Total user expenses are computed using the following equation:

$$EXPENSE_0 = ACQ_0 + RUN_0 \qquad [14]$$

Values are presented on sheets EXPENSBAU (based on ACQBAU and RUNBAU) and EXPENSECO (based on ACQECO and RUNECO). Sheet EXPENSSAVE gives the savings due to the ECO-measures, computed as BAU – ECO, so positive values represent expense savings and negative values additional expenses.

Starting from EIA2020, the EIA Masterfile contains separate sheets EXPENSBAU_RES and EXPENSECO_RES for the computation of the residential share of total user expense. These sheets are not included in the printed version in Annex A, but the resulting totals per functional group are displayed near the bottom of the EXPENS sheets. Additional information on expenses per household is supplied on the sheet HOUSEHOLDS.

2.6.13. EU Monetary business impacts (revenues)

Business revenues are the fractions of the acquisition costs that end up as revenues in the industry-, wholesale-, retail-, and installation-sectors. In addition, the revenues for the maintenance-sector are the maintenance costs for the consumers, but subtracting VAT. Revenues are computed per product base case, as EU total for the sales or stock of products in a given year, in m euros/a. The base case contributions are then summed to product group totals, functional group totals, and general totals over all products, considering double counting issues where appropriate, see par. 2.7.
Business revenues are computed from the business fractions of product price (see par. 2.5.9) using the following equations (all excluding VAT):

$$REV\_Industry_0 = ACQ_0 \times (1\text{-}InstFrac) \times ManuFrac \qquad [15]$$

$$REV\_Wholesale_0 = ACQ_0 \times (1\text{-}InstFrac) \times WholeFrac \qquad [16]$$

$$REV\_Retail_0 = ACQ_0 \times (1\text{-}Instfrac) \times Retailfrac \qquad [17]$$

$$REV\_Inst_0 = ACQ_0 \times Instfrac/(1+VATavg\%) \qquad [18]$$

$$REV\_Maint_0 = MAINT_0/(1+VATavg\%) \qquad [19]$$

Values for the BAU scenario are based on ACQBAU and MAINTBAU; for the ECO scenario on ACQECO and MAINTECO. Revenues are reported on the REV_xxx sheets. A summary is provided in Annex F.

2.6.14. Socio-economic (employment) parameters

The direct employment impact of the measures - i.e. the increase of employees in the value-adding chain - is derived from the business revenues in the various sectors (in m euros), dividing by the ‘wages’ constants (in m euros / employee) defined in par. 2.3.10. Equations are given below:

$$JOB\_Industry_0 = REV\_Industry_0/ManuWages \text{ (incl. OEM and Service jobs)} \qquad [20]$$

$$JOB\_Whole_0 = REV\_Whole_0/WholeWages \qquad [21]$$

$$JOB\_Retail_0 = REV\_Retail_0/RetailWages \qquad [22]$$

$$JOB\_Install_0 = REV\_Install_0/InstallWages \qquad [23]$$

$$JOB\_Maint_0 = REV\_Maint_0/MaintWages \qquad [24]$$

The calculation of the jobs from the revenues is performed in EIA on the sheet 'KEYFACTS', see Annex E. The calculation is performed per product group, not for each product base case separately. A summary of jobs per sector or per functional group can be found in Annex G.

Currently, EIA does not distinguish between jobs inside and outside the EU.

2.7. Aggregation

The data aggregation is done at four levels:

1. Base cases: average products –possibly subdivided—covered by a measure (data in normal font in the tables and spread sheets);
2. Product groups: aggregate of the base cases (data in **bold** font);
3. Functional groups: aggregates of one or more product groups having the same basic functionality. These are: water heating, space heating, space cooling, ventilation, lighting, electronics, food preservation, cooking, cleaning, industry components, energy sector, transport sector. (**COLOURED CAPITAL** font)
4. EU totals: aggregate of the functional groups (**BLACK CAPITAL** font).

In principle, each level is the straight sum of the figures at the previous level. Yet, there are some exceptions, as explained hereafter.

2.7.1. Double counting and transparency

There are several product groups, for which whole or a part of the energy consumption / savings are implicitly included in other parts of the accounting. Ignoring this fact leads to double counting and, consequently, unrealistic energy savings and energy figures, inconsistent with Eurostat total figures.

When tackling this problem, the first priority is transparency. Whatever the accounting solution applied, this means that it must be reversible. In other words, the original data need to be provided and it must be possible to adopt another partitioning or accounting method –for whatever reason-. Hence, the table always presents the original data from the underlying studies, be it at the level of base cases or –only if there is no split-up in base cases—at the level of product group totals.

2.7.2. Double counting of components and products

The most frequent case of (partial) double counting occurs when a product is regulated both at the level of components and at the level of the product as a whole. As an example, a part of the industrial motors is included in the industrial fans and a part of the industrial fans is included in non-residential mechanical ventilation units (e.g. centrifugal fans), airconditioning / heatpump / refrigeration products (e.g. axial convection fans), very large boilers (typically centrifugal combustion fans), etc. In such an instance, the regulation takes place possibly at 3 levels and, by and large, the energy figures in the 3 underlying studies relate to these 3 levels separately. Summing the energy data from these three studies could result in a considerable overestimation of the energy consumption and savings. A double counting correction factor ('*db*') has therefore been introduced to avoid this.

The factor *db* is the share of energy of a product base-case that is estimated to be double counted, i.e. the share of energy that is taken into account in EIA totals (double-counted removed) is (1-*db*). A factor *db* applies to:

- Integrated circulators (db=1, auxiliary energy of boilers),
- Stand-alone circulators (db=0.38, auxiliary energy of boilers),

- Heat savings by ventilation units (db=1, details below),
- On-mode of external power supplies (db=0-1, value depending on base case, partial double counting with e.g. notebook computers, tablets, game consoles, set-top boxes, gateways and NAS),
- condensing units (db=0.6, double counting with commercial and professional refrigeration products),
- industrial fans (db=0.5, double counting with e.g. ventilation units, air conditioning, refrigeration products, some space heating products)
- electric motors (db=0.45),
- distribution transformers (db=1, details below).

The factor *db* is listed in the first column of the relevant spreadsheets/tables. For motors and condensing units the value of the *db* is based on a first dedicated study, even if more work remains to be done; for other products the *db* correction factor is a first rough estimate by the author, since there is no comprehensive underlying information on this issue.

For the sake of transparency (see above), the *db* correction is not applied at base case level, but at product-group totals level or –as mentioned above—at the level of functional group totals. The EU total being the sum of the functional groups, a *db* correction applied to a product group or to a functional group total leads to only 50% (*db*=0.5) or 0% (*db*=1) of the original energy data to be considered in the EU total.

As already stated, the double counting correction is something added by the EIA methodology: In product level studies it has so far been treated only in a qualitative way. The correction is very relevant for policy purposes, when the implication of the overall measures is considered.

2.7.3. Complex double counting issues

The *db* correction (*db*=1) also applies to the space heating energy impact (saving) of mechanical ventilation units (VU), and the energy consumption of distribution transformers (TRAFO).

In this case, it is not so much a question of being a physical component of another regulated product group. The double counting issue is more complex.

Ventilation units

Ventilation Units (VUs) consume electricity in order to drive fans, etc., which in a regular aggregation is taken into account without *db* correction. However, VUs also reduce heat losses in buildings compared to the reference case (natural ventilation: stack ventilation, opening windows, infiltration). They allow for a more effective (controlled) and efficient air exchange and for heat recovery. Since ventilation heat losses account for 30-50% of the net heat load of a building, the load decreases and consequently the space heating products (so-called 'Energy related Products' of ventilation units), use less energy.

In EIA2017, the method used to consider the interaction between VUs and space heating appliances has changed, and it has been further adapted in EIA2020, see the explanation in par. 2.6.2. The difference in heat savings by VUs between the ECO- and BAU-scenario is implemented as a heat load reduction in the ECO-scenario for space heating appliances. This means that energy savings on space heating due to VUs are directly accounted as a part of the overall energy savings on space heating. The energy savings on space heating due to VUs continue to be reported also under VUs (because they are due to the ecodesign regulation on VUs), but as information only. The latter energy savings are not counted when determining EIA totals, i.e. *db*=1 for these energy savings.

Distribution transformers

Distribution transformers are part of the 'electricity generation & distribution efficiency' (CC, see par. 2.3.7), which is applied to all electricity consumed. Adding their consumption in the EU final demand totals would lead to double counting. The accounting sets the BAU scenario, at the level of functional group (Energy sector), to zero (0) and only looks at the marginal improvements (the savings), expressed as negative numbers, in the ECO scenario [85].

This approach also solves the problem when –instead of the earlier used CC=40% default value—a more realistic time series for power generation & distribution efficiency is used (see section 2.3.7).

For reasons similar to the above, and for compatibility with the approach in Eurostat Energy Balance sheets, the energy consumed by distribution transformers is not counted as final energy (FNRG sheets). In addition, EU Electric energy totals (ELECECO and ELECSAVE sheets) are reported both with and without the contribution of distribution transformers.

For all usage-sector subdivisions, the Energy sector is treated separately.

2.7.4. Multifunctional product groups

There are two product groups with possibly –if they are reversible- a double function. This occurs with central air conditioners (AC, part of Lot 6/21) and room air conditioners (RAC, Lot 10). Each function is accounted in a separate aggregated functional group, i.e. space heating and space cooling.

The costs of these products have to be partitioned between those two functions. For the running costs this does not pose problems because the cooling and the heating function each has its own energy consumption and also maintenance costs can be considered proportional to the intensity of use. The multifunctional product can thus be treated as two separate products, a cooling product and a heating product, in the accounting.

For the acquisition costs there is a problem because it still is one single product with a single price and installation costs. In that case it would be misleading to partition those costs only to one function (e.g. cooling), because it would make the alternative function extremely cheap (zero costs). A partitioning according to the kWh cooling and heating performance would also not be completely fair, because it means that the climate determines the price and –in the average EU climate with a 7-month heating season and a 3-5 month cooling season this results in a dominance of the heating function. It would also not reflect the consideration of the buyer/user of the product, who definitely –and sometimes mainly—is interested in the cooling functionality.

In short, a simple partitioning according to basic functions (cooling and/or heating) seems most appropriate and was applied. The formula for the price split is: sales of product with (also) cooling functionality divided by the sum of sales of products with (also) cooling and sales of products with (also) heating [86]. This split is done in the ACQBAU and ACQECO sheets.

[85] In the December 2015 issue of EIA the use of BAU=0 as reference was applied to all parameters except acquisition costs (ACQ), running costs (RUN) and total consumer expenses (EXPENS). This was judged confusing because running costs and total expenses included the costs of the entire energy consumption while the energy sheets (NRG, ELEC) counted only the energy savings with respect to BAU. In addition it can be argued that the acquisition costs of distribution transformers are already included in the electricity rates (the electricity consumer also pays for the distribution), so that considering them again would be a double counting. Therefore, in EIA II, BAU=0 as a reference is now applied to all parameters, including ACQ, RUN and EXPENS, and the ECO scenario only considers the improvement over BAU. This changed only the BAU and ECO values but not the savings (BAU-ECO). Revenues and jobs for the Energy sector are determined in the same way as for all other products.

[86] Equation e.g. PRICE_COOL= PRICE* COOL_SALES/(COOL_SALES+HEAT_SALES) and
PRICE_HEAT= PRICE* HEAT_SALES/(COOL_SALES+HEAT_SALES)

2.8. Increase in material wealth and rebound effect

As mentioned in par. 2.2, the BAU scenario is not a 'freeze' scenario; it is derived from extrapolating historical trends, at the time of the preparatory study analysis, including possible ongoing market trends in efficiency improvement and emission abatement.

Both the BAU and ECO scenarios are –in most underlying studies- dynamic in the assumptions on market demand and increase in performance. Population is growing and the trend is towards more and bigger appliances, lamps, computers, televisions, etc. in households. For a small part this is a *'rebound'* effect, i.e. the lower energy consumption (cost) induces more abundant use of the product's services. But in general, it is more a matter of steadily increasing material wealth.

This can be illustrated by the case of televisions, where there has been a –still ongoing- tremendous growth in screen size and the number of televisions per household. Few people would claim that this is a result of a 'rebound' effect that is linked to the energy consumption of the TVs, even though –since the CRT and plasma TVs were replaced by the LCD TVs—there has been a large increase in television energy efficiency (expressed in W/dm² screen area, see Figure 14). It is simply a matter of increased wealth, i.e. satisfying more wants and needs. And both the BAU and ECO scenario assume that these wants and needs continue at roughly the same pace.

The average viewable surface area grew from 10 dm² (19" diagonal) in 1990 to 28 dm² (32") in 2010 and is projected to rise to an average 68 dm² (50") in 2030. In parallel, the number of televisions per households grew from 1.3 in 1990 to 1.7 in 2010 and will be close to 3 TVs per household in 2030. The average viewing hours per TV, or rather per 'electronic display' [87], are assumed the same.

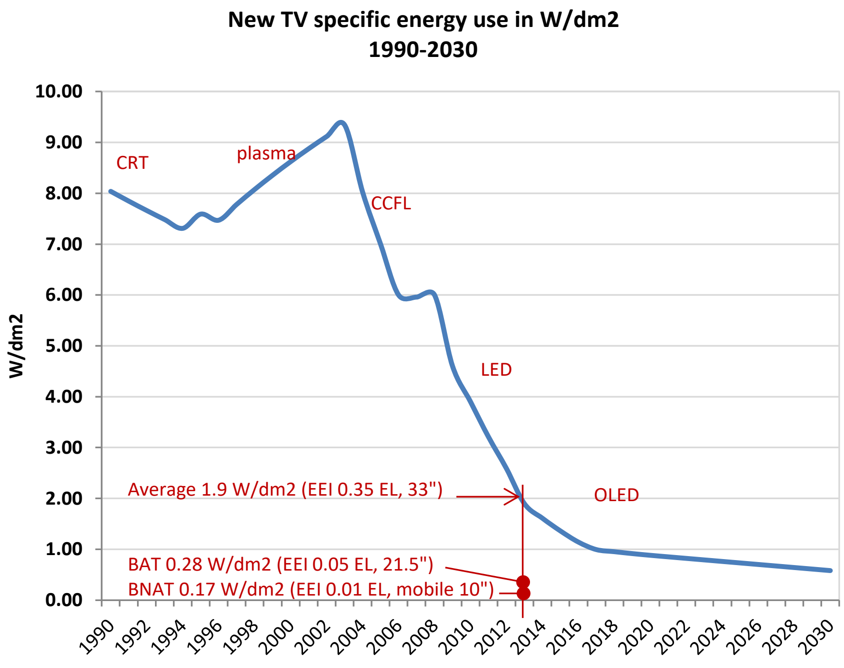

Figure 14. Specific energy use in W/dm² of new TVs

The result is an increase in TV-performance, i.e. viewable surface area per household, of a factor 16 between 1990 and 2030. In an imaginary 'freeze' scenario, with efficiency at 1990 level, this would lead to an increase in electricity consumption with a factor 20. Instead, due to an efficiency improvement with a factor 20 –with technologies largely

[87] There has been a convergence of functionality between TVs and (non-integrated) computer monitors. Therefore, the latest Commission Regulations combine them as 'electronic displays'.

known today- the ECO scenario shows an absolute electricity consumption in 2030 that is even lower than in 1990. The 2030 BAU scenario is higher than in 1990 (factor 2) but still nowhere near the factor 16-20 of a ‘freeze’ scenario.

The text box on the next page gives the numbers at EU level, i.e. also taking into account population growth.

The TVs are an extreme case, but many products in the ‘electronics’ group show a similar pattern. For light sources there has been, and is projected to be, a steady increase in the number per household (and non-residential applications). Water heaters and combi-boilers showed a continuous trend for more hot water (mainly due to more showers). Most household appliances, like fridges, freezers, laundry appliances, etc., showed an increase in capacity (larger refrigerated volume, larger drum of washing machine, etc.) often considerably beyond population growth. The numbers are given in the LOAD and EULOAD sheets of Annex A.

The only product groups where the load per product actually diminishes –following the ongoing historical trend from the last decades—is ‘space heating’. For most base cases, (see sheet LoadNotes) both the BAU and ECO scenarios assume a heat load reduction of 0.85% per year (so there is no effect on the differences between the scenarios), considering the balance of the decrease in heating-degree-days due to climate changes and urbanization, the decrease due to building thermal insulation improvements, the decrease due to increased heat recovery by ventilation units, the increase in heat demand due to the decrease in internal heat gains (more energy efficient lighting and appliances), the increase in average dwelling area, the increase in average age of EU population, the increase in comfort, etc.

CASE: Televisions

The accumulated EU viewable surface area grew from 21 km² in 1990 to 102 km² in 2010. This is a factor 5 growth, while the energy consumption grew only by a factor 2.5. This is a 50% efficiency improvement, but because the absolute energy use went up it passed largely unnoticed.

In 2030 the total viewable surface area is projected to be 415 km², a surface comparable to that of the city of Paris. With the latest miniaturization in electronics and ever more efficient LED backlighting the energy efficiency improvement will be stronger and is projected to result –in the BAU scenario—in an electricity consumption that is only slightly higher than in 2010 (going from 75 to 90 TWh/a). In the ECO scenario it is projected that in 2030, with technologies largely known today, a further 58% reduction versus BAU is possible and the electricity consumption can be contained at 38 TWh according to the latest impact assessment. Compared to 1990 this is an efficiency improvement, in W per dm^2 of viewable area, of around a factor 16.

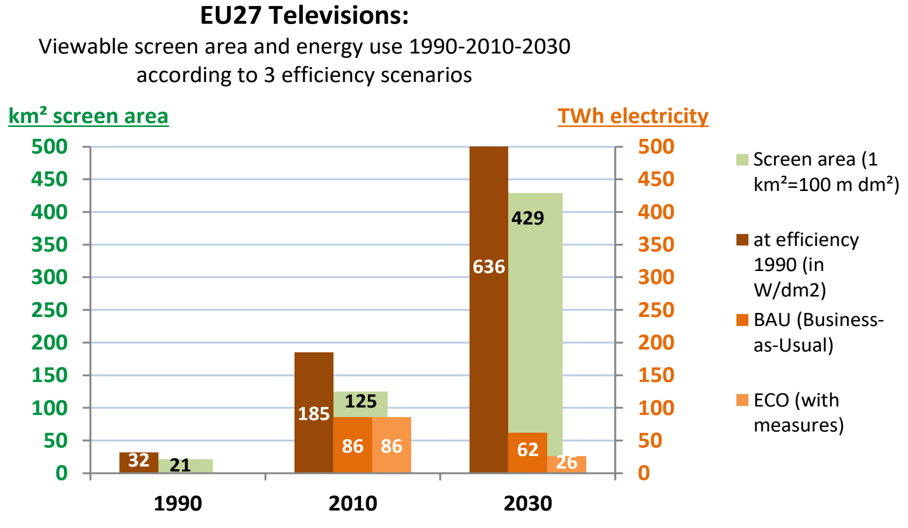

Figure 15. EU-28 television 1990-2030. Evolution of the load as well as the energy consumption according to ‘freeze’, BAU and ECO scenarios (based on EIA2017, values may differ from those in Annex A.

2.9. Compatibility with Eurostat conventions

The results of the EIA calculation method are used for EU policy purposes. This means that they should be comparable to Eurostat data for the whole of Europe and thus preferably be compatible with the main Eurostat conventions in the field of energy statistics.

The efficiency units used in EIA are thus in line with the conventions used in the Eurostat energy balance, i.e.

a) The efficiency of fossil fuel fired space heating devices is expressed in Net Calorific Value (NCV) of the fuel, which means that the latent heat of the combustion is not taken into account and therefore can lead to efficiency numbers higher than 100% for gaseous and liquid fossil fuels.

b) In line with the convention under point a) there is no credit for the renewable character of pellets- or biomass-driven space heating devices.

c) As a result of convention under point b), the efficiency of micro-CHP (cogeneration) is the ratio between the sum of kWh heat and kWh electricity output and Net Calorific Value of the fuel input, i.e. there is no credit for the fact that the electricity output is displacing electricity output, generated with a CC efficiency, from the grid.

The above Eurostat conventions are in line with other national statistics, but they are not in line with the metrics used in most Ecodesign and Energy Labelling (delegated) regulations. There –for various technical and political reasons- indeed bonuses and penalties may be taken into account and for engineering purposes it is considered more appropriate to use the Gross Calorific Value (GCV) of fuels.

In EIA2018, the distribution of energy consumption over the usage-sectors was modified to be easier comparable with Eurostat data [88], and additional data from Eurostat were inserted in EIA. In EIA2020, a split in fuel types was added to the FUELECO sheet to enable more detailed comparison with Eurostat. Reference data from Eurostat data have been updated in EIA2021 (for EU27).

For a comparison between EIA and Eurostat results, see section 3.9.

2.10. Limitations

External Power Supplies (EPS) pass on a large part of their energy input to primary loads connected to their output. Some of these primary loads are also addressed in EIA themselves. Therefore, for EPS, EIA considers only the energy losses of these devices, not the entire energy input.

For Enterprise Servers and Data Storage products (ES & DS), EIA considers only the effects of ECO-measures on the equipment itself, not the potential indirect savings on the space cooling of data centres (savings on infrastructure). This avoids double counting issues with space cooling products in EIA.

For tyres, EIA takes into account only the effects of changes in rolling resistance of the tyres. In particular, the reported fuel consumption and emissions are not the total for the vehicles, but only the parts related to the rolling resistance (this is different from the approach in the impact assessment for tyres).

[88] In particular the energy sector data (utility transformers) and transport sector data (tyres) are considered separately, and no longer included in data for the residential, services, industry and 'other' sectors.

EIA does not consider changes in societal costs due to the ECO-measures. E.g. the effects of changes in wet grip for tyres, related changes in vehicle safety, and associated changes in number of victims/injuries due to road incidents, and related changes in health costs, are not reported. In a similar way, health-related aspects of emission reductions or of indoor air-quality related to ventilation units, are also not taken into account.

EIA does not consider the impacts of resource efficiency / circular economy requirements. Work on this has been postponed awaiting clarity on the methodology to apply. In preparation of future work, the 2016 'Special Report on Material Inputs for Production' has been updated (part of the EIA2021 annual reporting).

EIA takes its data from ecodesign preparatory studies, review studies and impact assessments. For future projections, these studies do not consider special economic or climatic conditions such as rigid winters with higher-than-average space heating, hot summers with higher-than-average space cooling, the Covid-pandemic, the Ucraine war, or the effects on energy consumption of peak energy rates. Eurostat energy balances and PRIMES modelling do take these special conditions into account.

2.11. Non-compliance

EIA data are based on preparatory and review studies and impact assessments, and these studies typically do not consider the possibility that a share of products on the market might be non-compliant with the regulations due to shortcomings in market surveillance.

Following recommendations from the European Court of Auditors (ECA) [89], accepted by the European Commission, since 2019 EIA includes an estimate for the possible reduction of reported savings due to non-compliance (NC). These data are provided for EIA totals over all product groups, not for each single base case.

ECA refers to 10% of energy savings being lost due to non-compliance [89]. This is based on information from the Commission and from other stakeholders [90]. During 2020, the EIA team performed further online search for data on loss of energy savings due to non-compliance, but no new information was found. Although the reference information on non-compliance is limited in scope (geographically and per product groups), sometimes based on unclear methodologies, and does not have the same level of maturity and/or scientific background as the EIA data sets, the 10% energy loss due to non-compliance has anyway been used for the estimate of the NC effect. As currently no information is available on how this % would evolve over time when market surveillance (and product technology) gradually improves, the 10% reduction of savings due to non-compliance has been assumed constant over the years.

A sheet 'NONCOMPLIANCE' has been added to the EIA Masterfile to present the possible impact of non-compliances:

- This sheet first presents copies of the overall EIA totals for BAU, ECO and SAVE from the sheets ELEC, FUEL, FNRG, NRG, EMISS, NRGCOST and EXPENS (results without non-compliance).

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[89] 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report 01, January 2020, European Court of Auditors

[90]
- New energy efficiency labels explained, European Commission, 2019; https://ec.europa.eu/commission/presscorner/detail/en/MEMO_19_1596.
- STEP project – Closing the 'reality gap' – ensuring a fair energy label for consumers, CLASP, ECOS, EEB, Topten, June 2017, page 9; http://eeb.org/wp-content/uploads/2017/06/Reality-Gap-report.pdf
- Impact Assessment of the compliance & enforcement regime of the Energy-Using Products (EuP) & Energy Labelling Dir., Defra, 2009. http://www.legislation.gov.uk/uksi/2011/1524/pdfs/uksiem_20111524_en.pdf
- The Nordic Ecodesign Effect Project, Estimating benefits of Nordic market surveillance of Ecodesign and energy labelling, Troels Fjordbak Larsen, 2015. http://norden.diva-portal.org/smash/get/diva2:859894/FULLTEXT01.pdf

- Next, the reduction in savings due to non-compliance is computed, multiplying the parameter NCloss (%) by the SAVE-total.
- This reduction in savings is subtracted from the SAVE totals to obtain the SAVE_NC totals and added to the ECO totals to obtain the ECO_NC totals.
- The (user-settable) parameter NCloss is defined near the top of the NONCOMPLIANCE sheet, as a time-series from 1990 to 2050, but, as explained above, the value used is now set to 10% for all years.
- The share of non-compliance is currently assumed to have no effects on the average purchase price of products, i.e. non-compliant products are not assumed to be cheaper. Hence, acquisition costs, business revenues and jobs are currently not affected by non-compliance. ECO energy costs are indirectly affected because the electricity and fuel consumption in the ECO scenario increase due to non-compliance. Total user expense varies in the same way as the energy costs.

The use of a separate sheet 'NONCOMPLIANCE' clearly distinguishes the basic EIA data without non-compliance from the data with non-compliance, thus avoiding confusion [91].

2.12. Households

EIA already had a breakdown of energy- and emission-totals per usage sector (residential, tertiary/services, industry, other). In EIA2020, for the residential sector, such a breakdown has now been added also for the monetary sheets. In EIA2021 these data were updated.

In the EIA Masterfile, separate ACQ_RES, NRGCOST_RES, MAINT_RES and EXPENS_RES sheets (for BAU and ECO) define the residential share of these data. It has been assumed that the energy-shares per usage sector (sheet SHARES) are applicable also to the sales, the stock, the acquisition costs, and the maintenance costs.

Data for the residential sector, including sales, stock, electricity consumption, fuel consumption, final energy, primary energy, GHG-emissions, and user expense are now presented on a new sheet HOUSEHOLDS (see Annex A) in terms of values per average EU27 household, for years 1990, 2010, 2020, 2030 and 2050.

This provides additional insights in e.g. the average number of products per household. The information per household also supports the communication of Ecodesign and Energy Labelling results to the EU population (EIA III Task 3). A selection of new information per household is included in paragraph 3.5.

[91] The best approach to taking into account effects of non-compliance in EIA would probably be to modify the average sales efficiencies on sheet EFNECO, because this is what the share of non-compliance actually does: it lowers the average efficiency of sold products. The existing sheet EFNECO could be kept for the efficiencies without non-compliance while a new sheet EFNECO_NC could be defined with the (less favorable) efficiencies with non-compliance. A variable could be added to the model allowing to switch between the use of EFNECO or EFNECO_NC data. Alternatively, results could be computed for both sets of efficiencies in parallel, but this would require introduction of new ECO_NC and SAVE_NC sheets for almost all EIA output parameters.

The advantage of introducing the NC effect on the EFN sheets is that the EIA methodology will automatically compute the effect on the average efficiency of the stock in following years. This is relevant in particular if NC losses are assumed to decrease with the years (improvement of market surveillance). Energy, emissions, costs, revenues, jobs all depend on the average sales efficiency and would follow automatically in a consistent manner. Considering the lack of information on the non-compliance shares per product group and on the possible variation of these shares with time, such a detailed approach would now be excessive. In addition, the efficiencies to be used would have to be specified already in the review studies and impact assessments, so that EIA can copy them. It is not an EIA task to derive new efficiencies.

3. Ecodesign Impact Accounting, Status 31.12.2021

3.1. Product groups

The accounting method from the previous chapter is applied to the data from preparatory, review and/or impact assessment studies that were available on the 31st of December 2021, for product groups where measures have been taken (published in the OJ, or at least a positive vote by the Ecodesign Regulatory Committee on a final text, or a Voluntary Agreement accepted by the Commission).

Following ECA comments, since 2019, EIA does no longer include data on products or operation modes for which a final regulation has not been published (section 1.2.3) [92].

Table 6 presents a survey of the functional groups represented in EIA and of the product groups accounted in them. The number of bases cases (BCs) distinguished in each product group is also indicated. In total, EIA presents data for 330 base cases of 40 product groups, accounted in 12 functional groups.

Table 6 List of functional groups, product groups and number of base cases represented in the Ecodesign Impact Accounting

Lot	Acronym	Product Group	BCs
Water Heating functional group			
2	DWH	Dedicated Water Heater	11
1	CHC	Central Heating Combi, water heating	10
Space Heating functional group			
1	CHB	Central Heating Boiler, space heating	12
15	SFB	Solid Fuel Boiler	5
21/G6[93]	AHC-AC	Central Air Heating – reversible Air Conditioners	4
21/G6	AHC-AH	Central Air Heating – Air Heaters	2
20	LSH	Local Space Heaters	26
10	RAC	reversible Room Air Conditioners	3
11	CIRC	Circulator pumps	3
Space Cooling functional group			
E21/G6	AHC-CH	Central Air Cooling – Comfort Chillers	6
E21/G6	AHC-PCH	Central Air Cooling – high-temperature Process Chillers	5
E21/G6	AHC-PCH	Central Air Cooling – Air Conditioners	4
10	RAC	Room Air Conditioners	3
Ventilation functional group			
10/G6	NRVU	Non-Residential Ventilation Units	7
10/G6	RVU	Residential Ventilation Units	9
Lighting functional group			
8/9/19	LS	Light Sources	12
Electronics functional group			
5	DP	Electronic Displays	8
18	STB	Set-Top Boxes	3
G3	VIDEO	Game Consoles	4
G9	ESDS	(Enterprise) Servers and Data Storage products	18
3	PC	Personal Computers	8
4	IE	Imaging Equipment	8
6/26	SB	Products regulated only by CR 1275/2008, as amended	14
7	EPS	External Power Supplies	20
Food Preservation functional group			
13	RF	(household) Refrigerating Appliances	1
12	CF	Refrigerating appliances with a direct sales function	6

[92] For vacuum cleaners, battery-operated products (cordless, robots) are included in the accounting even if they are not covered by CR 666/2013. This is necessary to understand the decrease in stock for mains-operated VCs, but there are no energy savings for battery-operated VCs (section 1.2.2.2).

[93] The letter 'G' indicates DG GROW; The letter 'E' indicates DG ENER; other lots are from DG ENER

Lot	Acronym	Product Group	BCs
G1	PF-SC	Professional refrigeration – Storage Cabinets	4
G1	PF-PC	Professional refrigeration – Process Chillers	8
G1	PF-CU	Professional refrigeration – Condensing Units	8
Cooking functional group			
22/23	CA	Cooking Appliances	7
Cleaning functional group			
14	WM-WD	Washing Machines and Washer-Dryers	4
14	DW	Dishwashers	2
16	LD	Laundry Dryers	5
17	VC	Vacuum Cleaners	13
Industrial Components functional group			
11	FAN	Industrial Fans	6
11/30	MT	Electric Motors and Variable Speed Drives	22
11	WP	Water Pumps	24
G5	WE	Welding Equipment	2
Energy Sector functional group			
G2	TRAFO	Utility Transformers	7
Transport Sector functional group			
T	TYRE	Tyres	6
Total		**40 product groups**	**330**

3.2. Measures and studies

Annex B gives an overview of the various ED, EL, ES and TL measures and their status on the 31st of December 2021. The full references are given in **Annex H**.

The accounting is based on the information in the available preparatory, review and impact assessment reports. An overview of these reports is given in **Annex C**.

The contractor did not change --and does not assume responsibility for-- the original data in the underlying studies, but performed the following tasks:

- retrieving Excel files, IA reports, preparatory and review studies,
- understanding and selectively copying data from Excel files to templates,
- checking compatibility of review studies with data already present in EIA,
- checking calculation methods and formats,
- correcting calculation errors,
- updating data where newer data are available (from later Review or IA studies),
- complementing/estimating lacking core data (exception where external sources were consulted),
- updating and harmonizing tariffs and price data as much as possible,
- preliminary total calculations to check compatibility with Eurostat conventions.

Annex D provides an overview of the base cases considered in underlying studies, together with a mapping of these base cases on the EIA base cases, where relevant.

Annex B, C and D give a complete overview also of studies (product groups, base cases) that are still ongoing or have been abandoned for Ecodesign.

3.3. Structure of presentation of results

A harmonized accounting method aims to treat the same parameter across all product groups in the same way. Therefore, in **Annex A**, which summarizes the core calculation in the MS Excel Masterfile, the sheets are organized per parameter.

The order of the sheets reflects the order of input and output parameters as described in chapter 2 and a sheet index is also provided at the start of Annex A. The order of the products on each sheet corresponds to the order in Table 6. For a summary of the results per product group instead of per parameter, see **Annex E 'Key-Facts'** or the separately issued EIA Overview report.

Starting from EIA2020, all data refer to EU27 (2020), excl. UK.

Monetary data are in 2020 euros and include 20% VAT for the residential sector.

All data in Annex A are without considering possible effects of non-compliance, with the exception of the sheet NONCOMPLIANCE.

Figure 16 gives the main calculation structure with the sheet-names. For many sheets there is a BAU-version, an ECO-version, and sometimes a SAVE-version. A short description is given below (for more detailed information see chapter 2):

- The sheets **GENERAL**_1 and GENERAL_2 collect non-product-specific parameters, e.g. inflation index, energy rates, consumable rates, GWP-factors for electricity, PEF (CC) for electricity, 'wages' (revenue per employee), EU27 population, households, dwellings, buildings. The sources for the data are indicated in footnotes. There are user-options on these sheets, see section 2.3. All data in Annex A are for the user-settings shown on sheets GENERAL.
- The sheet **SHARES** provides (energy) shares per usage sector and provides an overview of the type(s) of energy input used for each product base case, see section 2.4.
- The **BREXIT** sheet provides the Brexit factors that have been used to convert the original EU28 sales data (incl. UK) to EU27 (excl. UK), see section 2.3.11.
- The **SALES- and STOCK**-sheets (incl. Life) are essential to most calculations and expressed in **1000 units per year** (light sources and tyres in million units). Data are for EU27 (excl. UK). See sections 2.5.1, 2.5.2 and 2.6.1.
- The **LoadNotes** provide background information on the products and their implementation in the EIA model. The focus is on loads (product output), efficiencies, and test- and calculation methods. For some products, this sheet contains product-specific parameters (non-year-dependent) that are used in the calculations.
- The **LOAD**-sheets contain information related to the user demand for product output. The data are **per unit**. The performance parameter in the LOAD sheets is product-dependent, e.g. space heat in kWh/a, laundry load in kg/a, viewable screen surface of a television in dm², luminous flux and burning hours for lighting, etc. See the LoadNotes sheet and section 2.5.3.
- The **EULOAD**-sheets provide the total EU27 user demand for product output, for the **entire stock of products**. It aggregates the LOAD data to EU totals, expressed in appropriately up-scaled units like TWh/a, Mt/a, km². See section 2.6.2.
- The **EFN- and EFS**-sheets give the energy efficiencies of new products (EFN, sales-average) and of the average product installed (EFS, stock-average). They are expressed **per unit**. The energy efficiency may be an actual efficiency percentage (% of ratio between in- and output) or – e.g. for computers and other products where

it is difficult to quantify an output—an annual energy consumption during use in kWh/a. See sections 2.5.4 and 2.6.3.

- The **ELEC-** and **FUEL-**sheets give the electric and non-electric energy consumption for the whole of the EU stock, derived from LOAD- and EFS-, and expressed in TWh/a. Results are summed to final energy (**FNRG**) and primary energy (**NRG**), for the latter considering the efficiency of electricity generation and distribution (**CC**=1/PEF). At the end of these sheets there is a summary per functional group. Here also the mtoe equivalent of the TWh is given for reasons of convenience for readers that are more familiar with that unit, and for comparison with Eurostat data. Separate **–SAVE**-sheets provide a survey of the energy savings (BAU-ECO). Near the end of all energy-sheets a subdivision per functional group is provided for the residential, tertiary, industry and 'other' sectors. See section 2.6.4. At the end of the **FUELECO**-sheet a further subdivision per fuel-type is provided.
- The **EMISSRATES**-sheet collects unit factors for GHG-emissions, i.e. GWP-factors. Those for electricity are linked to the user-choice on sheet GENERAL_1. GWP-factors for fuels are directly defined on the EMISSRATES sheet, in kg CO_2 eq/kWh. Data related to the emissions of NOx, CO, OGC and PM are near the bottom of the sheet. See section 2.3.9.
- The **EMISS-**sheets calculate the (energy-related) EU totals for GHG-emissions in Mt CO_2 eq/a. A split of data per usage-sector is also provided. The emissions of NO_x, CO, OGC and PM (in kt/a) are calculated near the bottom of the sheets. A separate EMISSSAVE sheet provides details on the reduction of emissions. See section 2.6.5.
- The **PRICE- and PRICE2**-sheets contain the price-efficiency anchor points, the annual price decrease, the price breakdown information, and the annual maintenance costs per unit. See sections 2.5.6 - 2.5.10.
- The **PRICEBAU and PRICEECO** sheets provide the unit prices as an annual time-series, depending on efficiency, price-elasticity, and annual price decrease. See section 2.6.7.
- The **ACQ**-sheets aggregate the unit prices to EU27 totals. The ACQADD sheet provides the additional costs in the ECO-scenario as compared to BAU. A summary for the residential share is provided near the end of the sheets. See section 2.6.8.
- The **RATES**-sheet collects energy rates and consumable rates. Most of these rates are linked to those on sheet GENERAL_1 and depend on the user-options there. See sections 2.3.5 and 2.3.6.
- The **NRGCOST**-sheets compute the EU total user expenses for energy consumed by the products (from the ELEC- and FUEL-sheets), considering the RATES per usage sector and the energy shares per sector (sheet SHARES). The _SAVE sheet provides the energy cost savings in ECO vs. BAU. A summary for the residential share is provided near the end of the sheets. See section 2.6.9.
- The **MAINT**-sheets aggregate the unit annual maintenance costs to EU level. For most products these costs are the same for BAU and ECO, so no _SAVE sheet is provided. A summary for the residential share is provided near the end of the sheets. See section 2.6.10.
- The **RESOURCES** sheet combines monetary cost and usage data as well as the BAU and ECO scenarios per unit, because it relates only to few products: imaging equipment (using paper and toner), washing machines and dishwashers (detergent, water), vacuum cleaners (bags, filters), and welding equipment (shielding gas, filler wire, electrodes). In the structure it is given only as part of the monetary calculation, but it also supplies the physical savings on resources, and in some cases the related GHG-emissions and primary energy content. See section 2.6.6.

- The **RUN**-sheets provide the total EU running costs, as sum of energy costs, maintenance costs and cost of consumables (RESOURCES). See section 2.6.11.
- The **EXPENS**-sheets provide the total EU consumer expenditure, as sum of acquisition costs (ACQ) and running costs (RUN). The difference between the BAU and ECO expenses, calculated on the EXPENSSAVE sheet, gives the total annual saving in consumer expenditure. A summary for the residential share is provided near the end of the sheets. See section 2.6.12.
- The revenues of the measures for the various business sectors are derived from the ACQ-scenarios. For the BAU scenario they are given in the **REV_IND_BAU** (for industry), **REV_IND_WHOLE** (for wholesale), **REV_RETAIL_BAU** (for the retail sector), **REV_INST_BAU** (revenue for installers) and **REV_MAINT_BAU** (maintenance revenue). Similarly, but with suffix ECO instead of BAU, these revenues are calculated for the ECO scenario. See section 2.6.13.
- The number of **direct jobs** that are a result from these various revenues are not calculated in Annex A, but in the summary sheets of Annexes E and G.
- The sheet **NONCOMPLIANCE** provides an overview of the possible effects of product non-compliance on the data presented in the other sheets of Annex A. See section 2.11.
- The sheet **HOUSEHOLDS** provides an overview of data per average EU27 household, for sales, stock, energy consumption, GHG-emissions, and user expenses, for years 1990, 2010, 2020, 2030 and 2050. These data are obtained by dividing the totals for the residential sector by the number of households in EU27 in the given year. See section 2.12.

For Annexes B, C and D, see the previous paragraph.

Annex E gives the **key facts per product**. In the Excel Masterfile it takes its data from the calculations per parameter in Annex A.

Annex F shows the summary tables of the Business Revenues per product group and functional group.

The direct employment (jobs) is calculated in **Annex G**, based on the stakeholder revenues, see section 2.6.14.

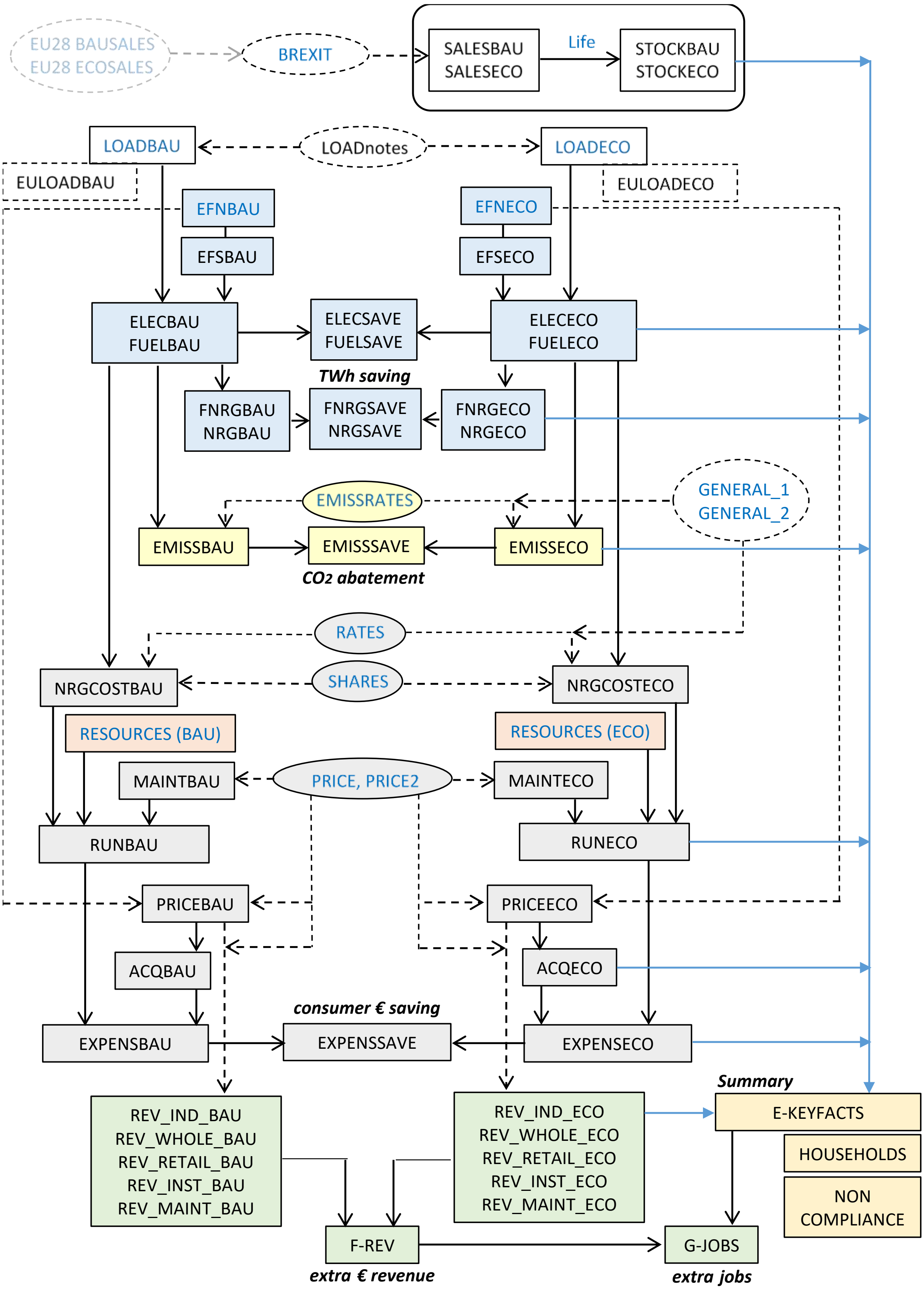

Figure 16. Structure of Annex A and of the EIA core calculation.

3.4. Main results

3.4.1. Introduction

The Ecodesign Impact Accounting (EIA) collects, elaborates and sums data for all products regulated under Ecodesign, Energy Labelling, (past) Energy Star and Tyre Labelling. These studies vary in data availability and quality of the analyses performed. The contractors harmonised the calculation method (chapter 2) and the generic parameters (section 2.3), considered product interactions and double counting (section 2.7), and where it was indispensable for the accounting, attempted to complete data.

Input data from the underlying studies for the period 1990-2050, including historical data and projections, have been verified by the Commission policy officers for the various product groups, by representatives from the Member States, industry organisations, consumer organisations, and NGOs, in stakeholder meetings, Consultation Forums and written comments.

Nonetheless, the aggregate ecodesign impact accounting contains a part of the imperfections of the sources used. The individual studies were never conceived from the 'top down' perspective of having to be consistent with overall energy and monetary data. Thus, at individual product level there is always a margin for specific interest groups to exaggerate or downplay the results. Nonetheless, taking into account scope differences, the EIA totals show a good match with Eurostat energy data, especially for the residential and services sectors (section 3.9).

Secondly, the scenarios in preparatory studies and impact assessments are primarily used as an ex-ante input for decision making. Rarely there is room, unless at a review several years after the implementation, for an ex-post analysis that would consider all aspects of the final legislation. This implies that in some cases there may be a difference between the actual measure and the EIA ECO scenario, i.e. the scenario in the studies underlying EIA that comes closest to what was decided as a measure. Starting from EIA 2019, and following comments from the European Court of Auditors, an attempt is made to take into account also the differences between the impact assessment and the final regulation, but the information for such an evaluation is not always available.

Finally, as regards the implementation-phase of measures, all preparatory studies and impact assessments (have to) assume an ideal implementation and effective market surveillance, despite the fact that such perfection is rare in the real world. Following the recommendations from the European Court of Auditors, since 2019, EIA includes a reporting on the possible reduction of savings due to non-compliant products. See also sections 2.11 and 3.7.3. Also, a few studies do not anticipate 'rebound' effects from efficiency improvements, i.e. that the lower energy impacts and costs induce the users to consume more.

The results follow from the most comprehensive accounting of ecodesign and labelling measures to date. The following paragraphs show only a small fraction of the assessments that can be made with the Excel files, which are summarized in the annexes to this report.

The results presented in sections 3.4.2 through 3.4.7 are valid for the user settings shown in Annex A on sheet General_1, i.e.:

- primary energy factor (PEF) for electricity is 2.5 until 2020 and 2021 from 2021 onwards, as agreed with the Commission services (section 2.3.7);
- energy rates of the PRIMES 2020 reference scenario for electricity, natural gas, heating oil and LPG (sections 1.2.1.3, 2.3.5, 2.3.6), and
- global warming potential factors for electricity of the PRIMES 2020 reference scenario (sections 1.2.1.5, 2.3.9).

The results presented in sections 3.4.2 through 3.4.7 do not include the possible effects of product non-compliance (sections 1.2.3, 2.11). A sensitivity analysis for different PEFs, for different energy rates, for different GWP factors for electricity, and for non-compliance can be found in section 3.6.

3.4.1. Sales

The Commission services are often questioned on the number of products traded in EU27 that are involved in ecodesign requirements and/or in energy efficiency labelling. This information has been added in EIA2021, and sales totals are reported below. This is in addition to the detailed sales data presented on sheets SALESBAU and SALESECO in Annex A. The following rules have been applied when determining the sales totals:

- Data are based on the SALESECO sheet [94];
- Sales of Combi boilers that provide both Space Heating and Water Heating are counted only under Space Heating (not under Water Heating);
- Sales of reversible air conditioners are counted only under Space Cooling (not under Space Heating);
- Sales of integrated circulators are not counted (assumed sold together with central heating boilers). Standalone circulators are counted under Space Heating;
- Sales of products regulated only for (networked) standby are counted under Electronics;
- External power supplies (EPS) that are sold together with other accounted products are not included;
- Condensing units that are sold together with commercial refrigeration products are not included;
- Industrial fans sold together with e.g. ventilation units or air conditioners are not counted in the sales;
- Electric motors sold together with e.g. fans, compressors, pumps, some appliances are not counted in the sales;
- Vacuum cleaners are assumed not to have an energy labelling regulation (CDR 665/2013 has been annulled). Battery-operated VCs (cordless, robots) are not counted because not in scope of CR 666/2013);
- Tyres have been considered as products with energy efficiency label;
- Energy Star (now obsolete) has not been considered as an energy efficiency label.

3.4.1.1. Sales of products with an Energy Efficiency Label

In 2020, approximately 2 billion products with an Energy Label were sold in EU27, of which 1.5 billion light sources, 350 million tyres and 150 million other products.

In 2030 this is expected to decrease to 1.2 billion, of which 580 million light sources, 430 million tyres and 190 million other products.

[94] A new sheet SALESLBL (not printed in Annex A) has been added to the EIA2021 Master Excelfile, with flags allowing to show the sales for all products with ecodesign or labelling measures, or only the sales for products with energy labelling regulation. SALESLBL takes its data from the SALESECO sheet. For most products there is hardly any difference with SALESBAU, but light sources are an exception: due to the much longer lifetimes of LEDs, sales go down faster in the ECO scenario.

Table 7 EU27 total sales of products with an energy efficiency label

SALES Summary, 000 units, EU27	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	7 947	8 710	8 284	8 515	9 074	9 632	10 190	10 749	11 307	11 866
SPACE HEATING	6 596	8 973	9 039	9 738	9 951	10 246	10 479	10 709	10 952	11 214
SPACE COOLING	373	4 205	3 767	4 377	5 145	5 878	6 701	7 745	8 768	10 009
VENTILATION	373	1 012	1 147	1 554	3 342	3 522	3 856	5 221	6 021	6 448
LIGHTING	1 742 509	2 010 500	1 465 712	1 500 169	769 270	582 010	441 296	459 995	514 174	578 361
ELECTRONICS	29 455	83 489	48 871	59 668	65 541	73 151	73 996	73 996	73 996	73 996
FOOD PRESERVATION	15 814	17 857	18 239	18 691	19 018	19 345	19 673	20 004	20 336	20 670
COOKING	16 345	18 093	18 801	20 583	21 076	21 590	22 106	22 624	23 145	23 668
CLEANING	12 580	20 469	22 340	24 786	25 436	26 420	27 369	28 319	29 269	30 218
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	263 216	323 320	320 581	352 545	391 150	433 983	433 983	433 983	433 983	433 983
SALES TOTAL (000 units)	2 095 206	2 496 629	1 916 782	2 000 626	1 319 004	1 185 776	1 049 650	1 073 345	1 131 951	1 200 432

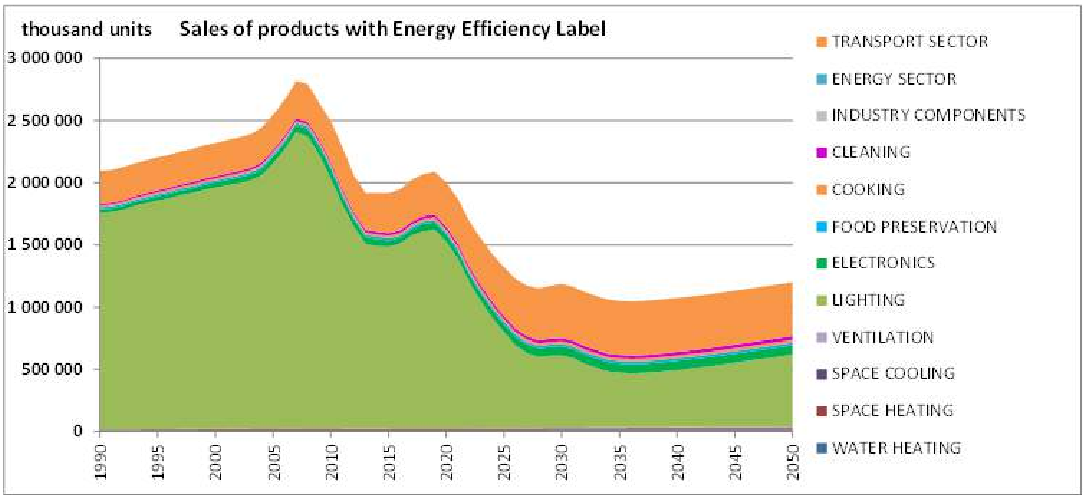

Figure 17: EU27 total sales of products with an energy efficiency label (thousands of units)

3.4.1.2. Sales of products with Ecodesign and/or Energy Labelling regulation

In 2020, approximately 3 billion products with Ecodesign and/or Energy Labelling regulation were sold in EU27, of which 1.5 billion light sources, 880 million electronics products [95], 350 million tyres and 240 million other products.

In 2030 this is expected to decrease to 2.2 billion, of which 950 million electronics products, 580 million light sources, 430 million tyres and 250 million other products.

Table 8 EU27 total sales of products with ecodesign requirements and/or energy efficiency label

SALES Summary, 000 units, EU27	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	7 947	8 710	8 284	8 515	9 074	9 632	10 190	10 749	11 307	11 866
SPACE HEATING	26 378	33 750	31 971	32 165	32 040	31 880	32 110	32 335	32 575	32 834
SPACE COOLING	496	4 731	4 344	4 997	5 798	6 562	7 425	8 507	9 560	10 824
VENTILATION	568	1 490	1 662	2 119	3 936	4 169	4 544	5 928	6 767	7 225
LIGHTING	1 742 509	2 010 500	1 465 712	1 500 169	769 270	582 010	441 296	459 995	514 174	578 361
ELECTRONICS	311 698	875 225	865 613	876 847	912 026	948 692	969 469	977 953	984 019	989 020
FOOD PRESERVATION	16 091	18 091	18 480	18 951	19 298	19 647	19 999	20 355	20 714	21 077
COOKING	28 835	33 252	34 606	37 026	37 960	38 898	39 837	40 779	41 723	42 669
CLEANING	27 617	48 276	50 347	50 427	47 580	44 549	43 168	43 655	44 605	45 555
INDUSTRY COMPONENTS	17 625	29 496	31 811	33 499	34 152	34 774	35 468	36 172	36 888	37 615
ENERGY SECTOR	107	156	169	184	201	225	252	278	305	331
TRANSPORT SECTOR	263 216	323 320	320 581	352 545	391 150	433 983	433 983	433 983	433 983	433 983
SALES TOTAL (000 units)	2 443 086	3 386 998	2 833 580	2 917 445	2 262 485	2 155 020	2 037 740	2 070 689	2 136 620	2 211 358

[95] Approximately half of the Electronics are various products regulated only for (networked) standby.

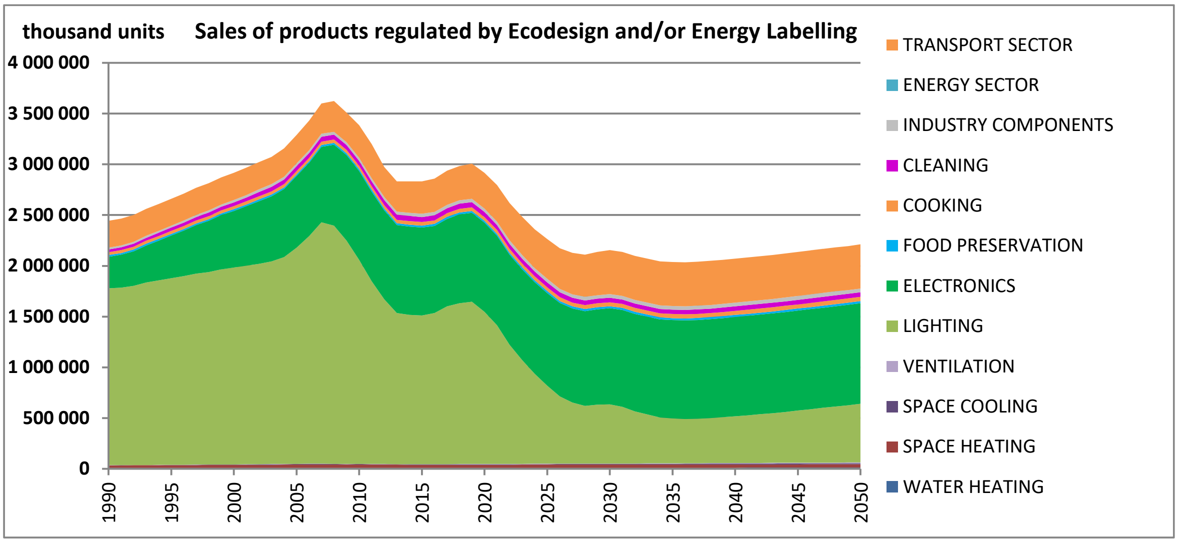

Figure 18: EU27 total sales of products with ecodesign requirements and/or energy efficiency label (thousands of units)

3.4.2. Energy

In year 2020, the products included in the accounting represent 8869 TWh (31 929 PJ, 763 Mtoe) of primary energy consumption (Figure 19). This is 62% of the total EU27 primary energy consumption in 2020 (1236 Mtoe) [96].

In **2020**, the primary energy saving due to Ecodesign, Energy Labelling, Energy Star and Tyre Labelling regulations (ECO versus BAU) is 1039 TWh (3740 PJ, 89 mtoe), i.e. a saving of 10% versus Business-As-Usual (Figure 20).

Of this, 81% (3012 PJ, 72 mtoe, 837 TWh) is primary energy saving due to saving 335 TWh (29 mtoe, 1205 PJ) of electricity (with PEF 2.5), and 19% (728 PJ, 17 mtoe, 202 TWh) is direct fuel saving. The sum of electricity and direct fuel saving (final energy saving) is 537 TWh (46 mtoe).

The 2020 primary energy savings come for 21% from space heating, 19% from lighting, 14% from food preservation, 13% from electronics, 11% from industrial components and 9% from cleaning appliances (Figure 21).

In **2030**, the primary energy saving increases to 1513 TWh (5448 PJ, 130 mtoe), which represents a saving of 18% versus BAU (Figure 20) and is 46% higher than in 2020, notwithstanding the use of a lower PEF for electricity in 2030.

Of this, 72% (3947 PJ, 94 mtoe, 1096 TWh) is primary energy saving due to saving 522 TWh (45 mtoe, 1880 PJ) of electricity (with PEF 2.1), and 28% (1501 PJ, 36 mtoe, 417 TWh) is direct fuel saving. The sum of electricity and direct fuel saving (final energy saving) is 939 TWh (81 mtoe). The smaller 'weight' of electricity in the primary energy savings compared to 2020 (72% vs. 81%) is due to the change in PEF (2.1 vs. 2.5) but also to a shift from gas boilers to electric heat pumps in central space heating.

The 2030 primary energy savings come for 25% from space heating, 13% from lighting, 14% from food preservation, 12% from electronics, 13% from industrial components and 6% from cleaning appliances (Figure 21). The smaller contribution of lighting to the

[96] Eurostat Energy Balance nrg_bal_c, ed. April 2022, PEC (Europe 2020-2030). Eurostat data in 2020 are lower than in preceding years due to the Covid-pandemic, which is not considered in the EIA data. In 2019 (prior to Covid), the Eurostat primary energy consumption was 1352 mtoe, and EIA products covered 57% of this. The 2020 savings in EIA are 6.6% of these 1352 mtoe.

primary energy savings compared to 2020 (13% vs. 19%) is in part also due to the change in PEF. The electricity savings on lighting continue to increase from 81 TWh in 2020 to 96 TWh in 2030, but with the change in PEF this means that the primary energy savings for lighting approximately remain the same (202 TWh), while the total primary energy savings over all products increase.

The 2020 savings represent 7.2% of the total EU27 primary energy consumption (1236 mtoe in 2020 [96]). In 2030 this is projected to grow to 10.5% of the 2020 EU27 energy consumption.

The graphs below, taken from the summary at the end of sheets NRGECO and NRGSAVE (Annex A), show the primary energy consumption time series for the period 1990-2050.

Figure 19 and Figure 20 demonstrate that, without new measures, the savings even out after 2030. For instance, in 2050 the saving is 17% for the average included product, which is similar to the 18% in 2030. Note that EIA considers only currently adopted measures and does not consider possible additional future measures. The sudden drop in both BAU and ECO primary energy after 2020 is due to the change in PEF for electricity in 2021 in the EIA modelling (section 2.3.7).

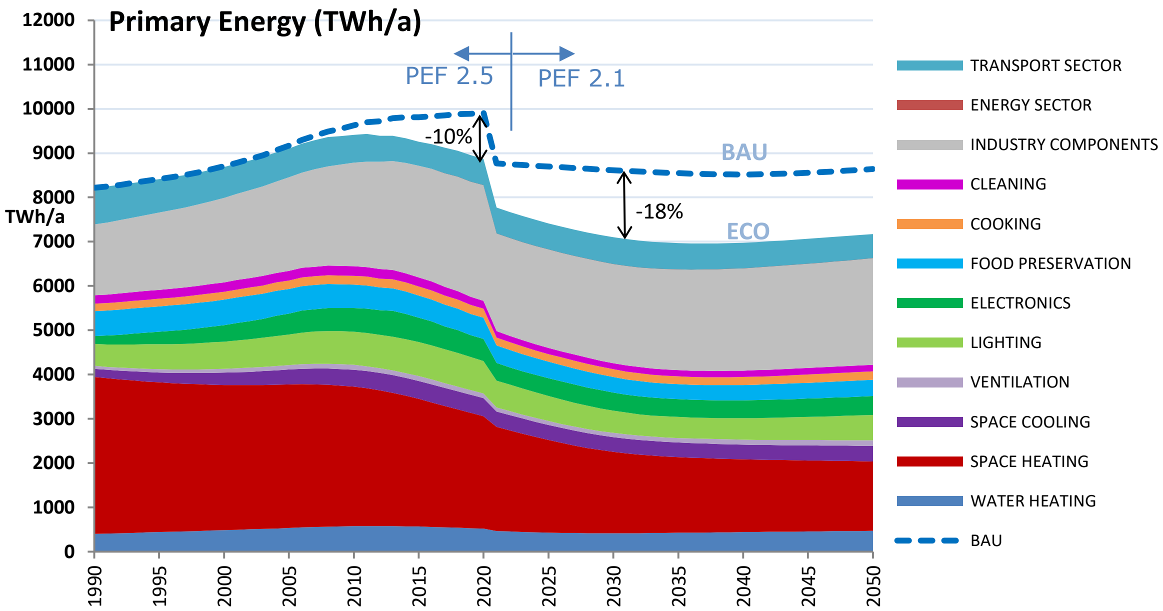

Figure 19. Primary energy consumption of products included in ecodesign impact accounting, status 31 December 2021 (the contribution of the energy sector (distribution transformers) is negative and therefore not visible in the graph)

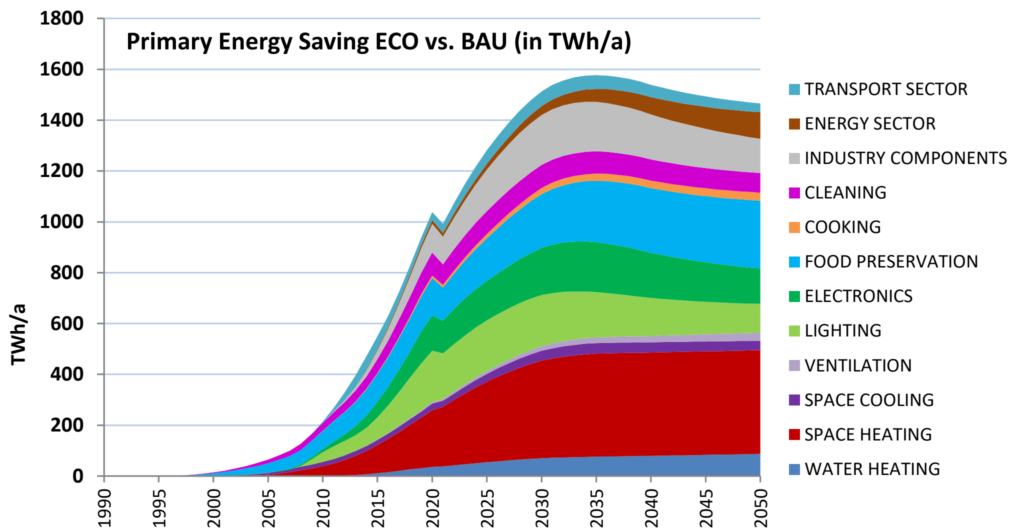

Figure 20. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 31 December 2021

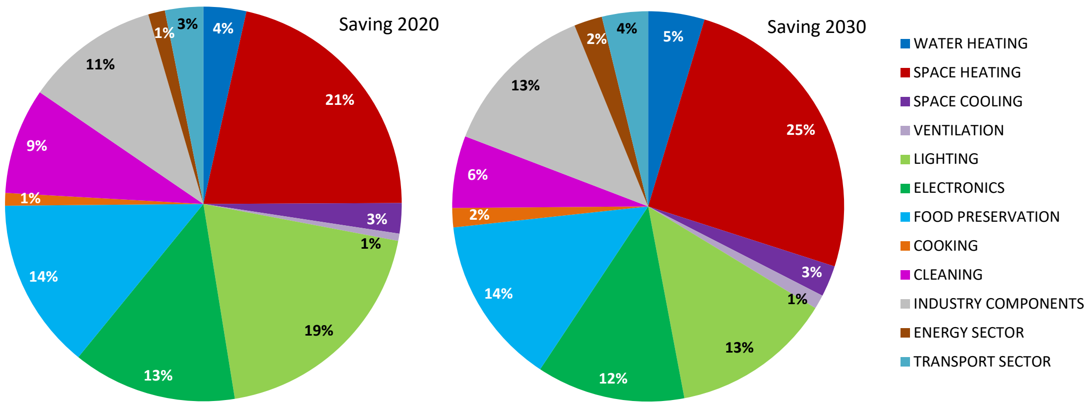

Figure 21. Share of primary energy saving per functional group, in 2020 and 2030.

Sector subdivision

EIA provides the subdivision of energy consumption over the usage-sectors: residential, tertiary, industry and other [97]. This subdivision is based on the sector energy shares per base case that are defined on sheet SHARES in Annex A. The results are reported near the end of the ELEC-, FUEL-, FNRG- and NRG-sheets in Annex A, in three ways:

- Summary table per sector over all functional groups;
- For each functional group the subdivision over the sectors, in TWh;
- For each functional group the subdivision over the sectors, in %.

Figure 22 shows the 2010 ECO Primary Energy consumption per sector (total is 9415 TWh/a). The sectors contributed for respectively 39% (residential), 30% (tertiary), 21% (industry), 7% (transport) and 2% (other).

The residential sector is the major energy consumer for water heating, space heating, electronics, cooking, and cleaning (Table 9). The tertiary sector is dominant for space cooling (includes high temperature process cooling), ventilation and lighting, and the industry sector for industry components (fans, pumps, motors, compressors, welding equipment). For food preservation and transport (tyres) the energy consumption in the residential and tertiary sector is close to 40% each.

For many functional groups, the 2010 sector distribution shown in Table 9 is approximately valid also for other years, although overall the share of the residential sector tends to decrease (from 39% in 2010 to 31% in 2030) while the share of industry increases (from 21% in 2010 to 26% in 2030).

[97] The ‘other’ sector in EIA includes e.g. agriculture, forestry, fishing. Transport sector (tyres) and Energy sector (distribution transformers) are considered separately and not included in the data for the other four sectors.

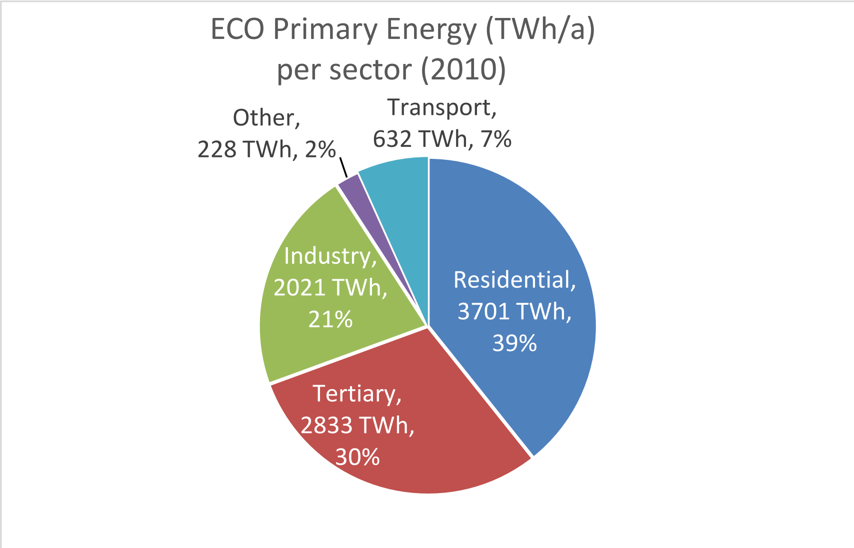

Figure 22. Subdivision per sector of the ECO primary energy consumption in 2010, for products in scope of the ecodesign impact accounting.

Table 9 Sector Primary Energy shares per functional group (year 2010)

2010 Primary Energy shares	Residential	Tertiary	Industry	Other
WATER HEATING	**73%**	**23%**	**3%**	**1%**
SPACE HEATING	**66%**	**27%**	**6%**	**2%**
SPACE COOLING & HT PROCESS	**9%**	**63%**	**22%**	**6%**
VENTILATION	**16%**	**72%**	**11%**	**1%**
LIGHTING	**27%**	**58%**	**13%**	**1%**
ELECTRONICS	**59%**	**36%**	**4%**	**0%**
FOOD PRESERVATION	**37%**	**44%**	**17%**	**2%**
COOKING	**88%**	**12%**	**0%**	**0%**
CLEANING	**88%**	**10%**	**1%**	**0%**
INDUSTRY COMPONENTS	3%	27%	65%	5%
TRANSPORT SECTOR* (separate)	*46%*	*34%*	*17%*	*3%*

* Energy losses due to rolling resistance of tyres.

The 2020 primary energy savings of 1025 TWh/a (excl. Energy sector) derive for 60% from the residential sector, 25% tertiary, 10% industry, 3% transport and 1% other sector (Figure 23).

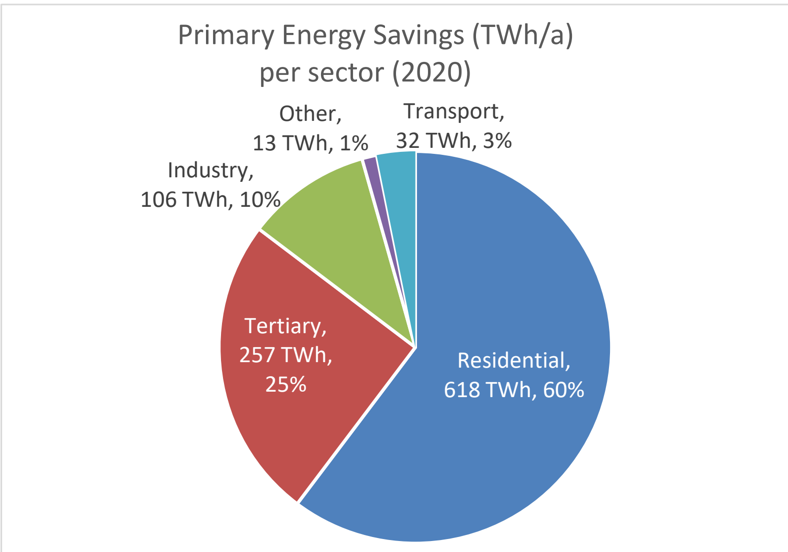

Figure 23. Subdivision per sector of the primary energy savings in 2020 (Energy sector not shown).

Space heating load

In the EU Building Heat Demand (BHD) report [98], the total EU28 space heating load is estimated as 2823 TWh, of which 60.3% in the residential sector, 24% in the tertiary sector and 15.7% in the industrial sector. Of this total, 2009 TWh (71%) is estimated to be in the scope of heating systems addressed by the Ecodesign directive. The rest relates to buildings heated by district heating, process waste heat, the low-temperature output of large (steam) boilers, CHP installations, etc. Subtracting approximately 14% for Brexit, this means that the BHD estimated a space heating load around 1688 TWh for products represented in EIA for EU27.

In EIA2021, the total EU27 space heating load is 1719 TWh heat/a (in 2010), which corresponds well with the estimate from the BHD. The 60%-24%-16% sector distribution for the heat load from the BHD is not directly comparable with EIA data, but in 2010 the EIA distribution for primary energy consumption by space heaters is 66%-26%-6%-2%. So the EIA-share seems somewhat higher for the residential and tertiary sectors, and lower for industry.

3.4.3. Emissions

Using the GWP-factor for electricity from the PRIMES 2020 reference scenario, the reduction of greenhouse gas emissions in the EU27 in 2020, due to energy-related CO_2 [99], amounts to 114 Mt CO_2 equivalent (ECO versus BAU). This is 9% of the BAU 2020 total emissions of the products included in EIA and 3.2% of the EU27 total emissions in 2019 (3610 Mt CO_2 [100]). For 2030 a reduction of 160 Mt CO_2 equivalent is projected. This is a 17% reduction for the average included EIA product (Figure 24) and 4.4% of the EU27 total in 2019.

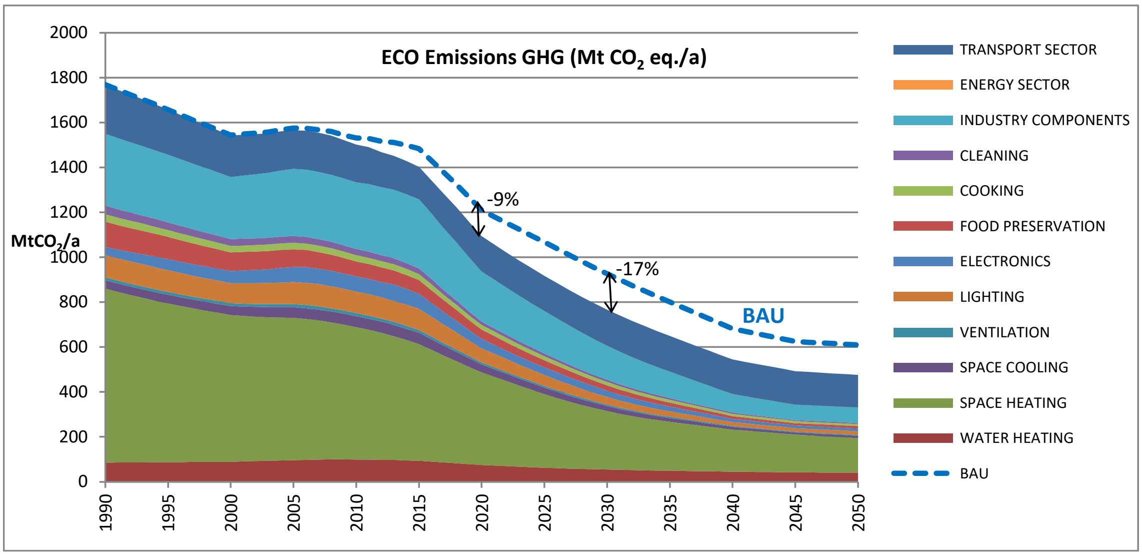

Figure 24. Greenhouse gas emissions due to energy consumption of products included in the ecodesign impact accounting, status 31 December 2021. This uses GWP-factors for electricity from the PRIMES 2020 reference scenario, see section 3.7.1 for the impacts of using other GWP factors.

[98] "Average EU building heat load for HVAC equipment", VHK for the European Commission, 2014, https://ec.europa.eu/energy/sites/ener/files/documents/2014_final_report_eu_building_heat_demand.pdf

[99] This uses GWP-factors for electricity from the PRIMES 2020 reference scenario. These factors are lower than the factors from the MEErP that were used as a baseline in EIA2020. Consequently, GHG-emissions in EIA2021 are lower, both for BAU and ECO, and therefore also the reduction in emissions is lower. See section 3.7.1 for the impacts of using other GWP factors for electricity.

Starting from EIA 2019, the contribution of refrigerant losses to GHG-emissions is no longer considered. EIA does not account emissions during the production, distribution or end-of-life phases: only emissions due to energy consumption during the use-phase of products is taken into account.

[100] Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021.

The reduction of nitrogen-oxides (NO_x) emissions (acidifying agent and ozone precursor, smog) is 83 kt SO_2 equivalent [101] in 2020 (ca. 2% of EU27 total NO_x emissions in 2019 [102]). This is a result from the Ecodesign emission limits set for central heating boilers, water heaters, solid fuel boilers, local space heaters and air heating products. However, this result is incomplete because insufficient data were available from the preparatory studies and impact assessments to quantify the NO_x emissions for the Solid Fuel Boilers and for a part of the Local Space Heaters.

EIA also reports the reductions of CO- (carbon monoxide), OGC- (organic gaseous carbon) and PM- (particulate matter) emissions. Limits on these emissions have been set in the regulations on Solid Fuel Boilers and Local Space Heaters.

The reduction of CO-emissions is 143 kt/a in 2020 and 504 kt/a in 2030. The latter is 18% of the 2819 kt/a emissions of products involved in 2010. For comparison: in 2019 the total EU27 CO-emissions were 16 091 kt/a [103].

The reduction of OGC-emissions is 10 kt/a in 2020 and 22 kt/a in 2030. The latter is 10% of the 219 kt/a emissions of the products involved in 2010. For comparison: in 2019 the total European NMVOC-emissions were 5612 kt/a [104].

The reduction of PM-emissions is 10 kt/a in 2020 and 39 kt/a in 2030. The latter is 19% of the 206 kt/a emissions of the products involved in 2010. For comparison: in 2018 the total European PM10-emissions were 1813 kt/a [105].

3.4.4. Non-energy resources

The water consumption of washing machines, washer-dryers and dishwashers is addressed through measures, resulting in a drinking water saving of 1507 million m³ in the EU27 in 2020 (7-10 % of EU residential total [106]).

The self-regulatory initiative under Ecodesign for imaging equipment (copiers, printers) sets targets for duplexing to reduce printer paper consumption. The impact assessment estimates that 0.23 Mt/a of printing paper will be saved in 2020 (15% of EU27 total paper for imaging equipment [107]).

More details can be found in the RESOURCES sheet, Annex A.

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[101] Equals 119 kt NOx. (factor 0.7)

[102] 5520 kt NOx in 2019 (Source for Ref. EU27-total: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021, Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.8 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021. (Data for 2018/2019 without Poland ?).

[103] 16091 kton in 2019. Source for Ref. EU27-total: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.9 (EU27+UK, subtracting UK), (Data for 2018/2019 without Poland ?) https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021.

[104] 5612 kton NMVOC in EU27 in 2018. Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.10 (EU27+UK, subtracting UK), (Data for 2018/2019 without Poland ?) https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021. NMVOC= Non-Methane Volatile Organic Compounds, similar to OGC but without the methane contribution.

[105] 1813 kton PM10 in EU27 in 2018. Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.7 (EU28 minus UK; adjusted data used).

[106] EU residential total water consumption, from public grid, is 27 billion m³ in 2008 (source: VHK, MEErP, 2011) => 6.7%. From Eurostat, dataset 'Water abstracted by sector of use [TEN00006]', for 'Water abstraction for public water supply', accessed 18/6/2020, a total of 17.4 billion m3 in 2017 can be derived for EU28, estimating some of the lacking country data. Subtracting 16% for Brexit: 14.6 billion m3 in 2017 in EU27 =>10 %.

[107] According to the 2019 review study, the sales of graphic paper have been steadily declining during the last decade, from 40 Mton/a in 2007 to 26.5 Mton/a in 2017. See Figure 11 in 'Revision of Voluntary Agreement on Imaging Equipment, Task 1-7 Final Report, Viegand Maagøe and VHK, October 2019'. The EIA estimate for the consumption of paper by imaging equipment in scope of ecodesign regulations is 1.58 Mton/a in 2020 in the BAU scenario and 1.35 Mton/a in the ECO scenario, a saving of 15%.

3.4.5. User expenditure

In 2020 approximately € 57 bn (in 2020 euros) will be saved by end-users resulting from Ecodesign and labelling measures (Table 10) [108]. This is the result from a € 81 bn saving on running costs (€ 74 bn energy costs, € 7 bn consumables) and € 25 bn extra acquisition costs for more efficient products. Given the BAU-total in the EU27 in 2020 of € 1160 bn spent on running costs (€ 752 bn) and acquisition costs (€ 407 bn), for the products included in the accounting the consumer will save some 5% in total. The saving on running costs is close to 11%, while the average product price [109] will rise by 6% for these products.

In 2030 the expense saving (ECO versus BAU) is projected to grow to € 110 bn, saving the EU consumers 8% on total costs versus the situation without measures. Figure 25 gives the total expenditure in the ECO scenario (running + acquisition costs) per product group and –in orange—the saving versus the BAU scenario.

The highest expense savings in 2030 come from lighting and electronics (€ 19 bn each), followed closely by space heating and food preservation (€ 18 bn each), cleaning (€ 15 bn) and industry components (€ 11 bn). Lower expense savings are projected for water heating (€ 4 bn), space cooling (€ 3 bn), ventilation and cooking (€ 1 bn each), and the energy sector (€ 1 bn). With the assumed petrol and diesel rates, and 2%/a escalation, the user expense savings for tyres result slightly negative (€ -1 bn).

More information on user expenses can be found especially in the summaries at the end of the sheets EXPENSECO, EXPENSSAVE, ACQECO, ACQADD, NRGCOSTECO and NRGCOSTSAVE in Annex A.

User expense savings per average EU27 household are reported on the HOUSEHOLDS sheet in Annex A, see also section 3.5.

Table 10 Breakdown of total user expenses and savings for years 2010, 2020 and 2030, in bn euros 2020

	2010	2020			2030		
	BAU	BAU	ECO	inc.	BAU	ECO	inc.
Acquisition	372	407	432	25	494	529	35
Energy Cost	630	641	567	-74	743	607	-136
Maintenance	60	71	71	0	79	79	0
Consumables	48	40	32	-7	37	28	-10
Total Expense [108]	1110	1160	1103	-57	1353	1242	-110

[108] The 57 bn euros expense savings in 2020 and 110 bn euros in 2030 are based on the use of energy rates from the PRIMES 2020 Reference scenario. When using EIA traditional energy rates, these expense savings would be respectively 63 and 125 bn euros (see section 3.6.1), with corresponding increase in energy cost savings to respectively 81 and 150 bn euros.

[109] Prices include installation and VAT for residential and are all expressed in fixed euros 2020. For electricity, natural gas, heating oil and LPG, the rates from the PRIMES 2020 reference scenario have been used. See section 3.6.1 for the impact of different energy rates.

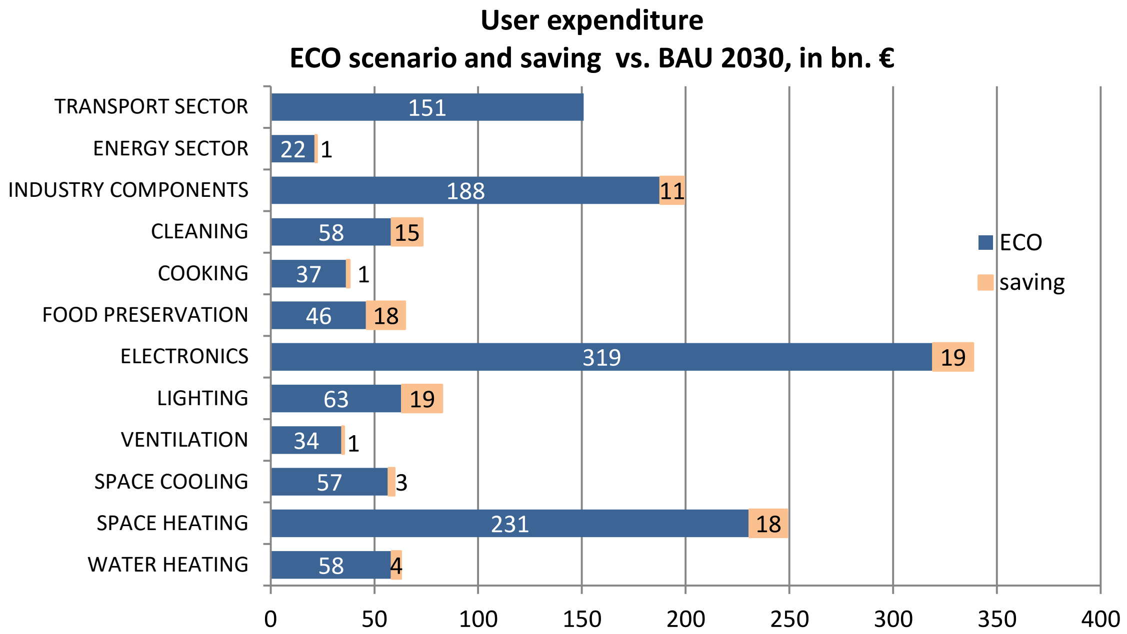

Figure 25. EU27 total user expenditure in 2030 on products included in the accounting.

3.4.6. Business revenue

The increase in acquisition costs for the users translates into higher business revenue for market actors (plus more tax-incomes). It is calculated that for 2020 the extra revenue will be € 22 bn and for 2030 it will grow to € 31 bn compared to a situation without measures. Approximately 48% of the extra revenue in 2030 will go to industry, 9% to wholesale, 24% to retail, 20% to installers (there is a large share of installed products) and none to maintenance (EIA does not consider differences in maintenance due to ECO measures).

More information on revenues can be found in Annex F (summary sheets) and in the REV-sheets in Annex A.

3.4.7. Employment

The direct jobs are calculated from the increase in revenue and the average turnover per employee in the various sectors (see par. 2.3.10, 2.6.14). The results and split up are given in Annex G.

All in all, an estimated 323 thousand additional direct jobs due to the measures are calculated in 2020, and 433 thousand in 2030. The total employment effect (including indirect jobs) is difficult to assess, as there is no consensus on the indirect employment factor (i.e. the new employees spending their money on goods and services, thereby creating new jobs for people that in turn also spend their money, etc.). In literature estimates are found setting indirect employment a factor 3-5 times the direct number of jobs.

3.5. EIA results per average EU27 household

The HOUSEHOLDS-sheet in Annex A (introduced in EIA2020) provides data per average EU27 household for years 1990, 2010, 2020, 2030 and 2050, for sales, stock, energy consumption, GHG-emissions, and total user expense. These data have been derived by dividing the residential share of the EIA-data (determined using sheet SHARES) by the number of households in EU27 (sheet General_1). See also section 2.12.

Sales and stock per household

In 2020, the average EU27 household bought 10 products that are regulated by Ecodesign or Energy Labelling, of which 4 light sources, 4 electronics products and 1 tyre. **On average a household used 70 regulated products in 2020**, of which 30 light sources and 25 electronics products (Figure 26). Noteworthy is the drop in sales for light sources from 7-8 units per year in 1990-2010 to less than 1 unit per year in 2030-2050. Notwithstanding this drop, due to the long lifetime of LEDs, the stock of light sources per household continues to increase from less than 20 in 1990, to 30 in 2020 and projected 38 in 2050.

Energy consumption per household and avoided emissions of CO2

In 2020, due to Ecodesign and Energy Labelling regulations, the average EU27 **household saved 1015 kWh/a of electricity**, projected to grow in 2030 to 1163 kWh/a. This is respectively 28% (2020) and 32% (2030) of the total annual electricity consumption of the average household in 2020 [110]. The major savings (Figure 27) derive from food preservation (refrigerators), electronics (largest contributions from TVs and standby), lighting, and cleaning (vacuum cleaners, washing machines and dishwashers).

In addition, the average **household saved almost 700 kWh of fuel** (gas, oil, coal, wood) in 2020, projected to double in 2030. This is respectively 6% (2020) and 12% (2030) of the total annual fuel consumption of the average household in 2020 [111]. These savings derive mainly from the measures on space heating, water heating and tyres.

Due to the reduction in energy consumption, the average **household avoided the emission of 361 kg CO_2-equivalent of greenhouse gases in 2020**. In 2030 this is projected to increase to 441 kg CO_2 eq/household [112].

Expense savings per household

In 2020, the average EU27 household spent 2715 euros for the acquisition, installation, operation, and maintenance of regulated products. Although difficult to compare, this order of magnitude is in line with Eurostat data [113]. Without the Ecodesign and Energy Labelling regulation this would have been 2913 euros: a saving of 198 euros per year per household, or a saving of 7% compared to the situation without measures. A breakdown of the savings over the functional groups is provided in Figure 28. These direct savings are only on products used in the households themselves.

[110] According to the Eurostat Energy Balance ed. Apr. 2022, the EU27 households in 2020 consumed 61.4 mtoe of final electricity, corresponding to 714 TWh. Dividing this by 196 mln households, the average annual electricity consumption per household in 2020 was 3642 kWh/a.

[111] According to the Eurostat Energy Balance ed. Apr. 2022, the EU27 households in 2020 consumed 187 mtoe of non-electric final energy, corresponding to 2173 TWh. Dividing this by 196 mln households, the average annual 'fuel' consumption per household in 2020 was around 11000 kWh/a (not including transport).

[112] This uses the GWP-factors for electricity from the PRIMES 2020 reference scenario. These factors are lower than those derived from the MEErP used as baseline in the EIA2020 analysis.

[113] According to Eurostat's database NAMA_10_CO3_P3, in 2019 the EU27 households spent 7343 bn euros, of which 588 bn euros for water supply, electricity and fuels, household appliances and audio-visual, photographic and information processing equipment. Dividing this by 195 mln households, the total expense per household in 2019 was € 37700, of which approximately € 3000 for the listed items, which approximately coincide with the EIA costs coverage.

In addition, there are expense savings in the services sector and the industry sector on the regulated products used there. If these savings are translated by these sectors in lower tariffs for their services, or lower costs for their products (or higher wages for their employees), this could lead to an additional benefit per household. This is indicated in the bottom part of Figure 28 as indirect savings per household, which should be considered as maximum values. In 2020 the maximum additional indirect savings per household are 91 euros.

Summarizing, the **total expense savings in 2020 are between 200 and 290 euros per household**. In 2030, this is projected to increase to between 310 and 550 euros per household.

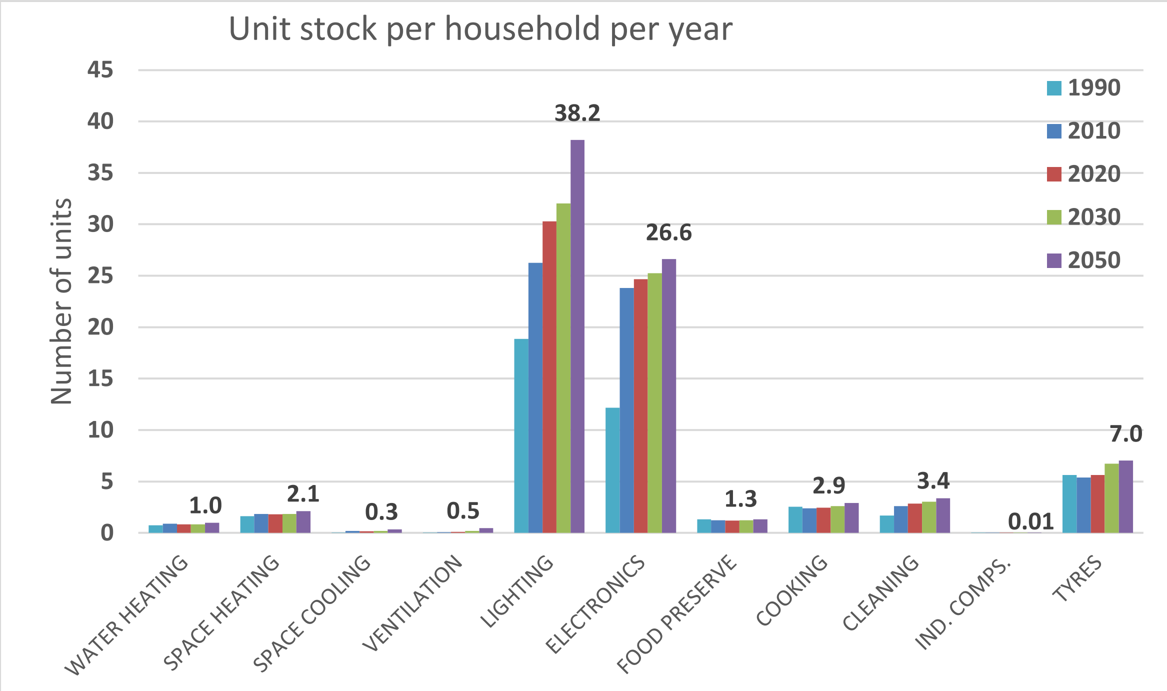

Figure 26. Stock of products used in the average EU27 household and regulated by Ecodesign or Energy Labelling. Source: EIA sheet Households

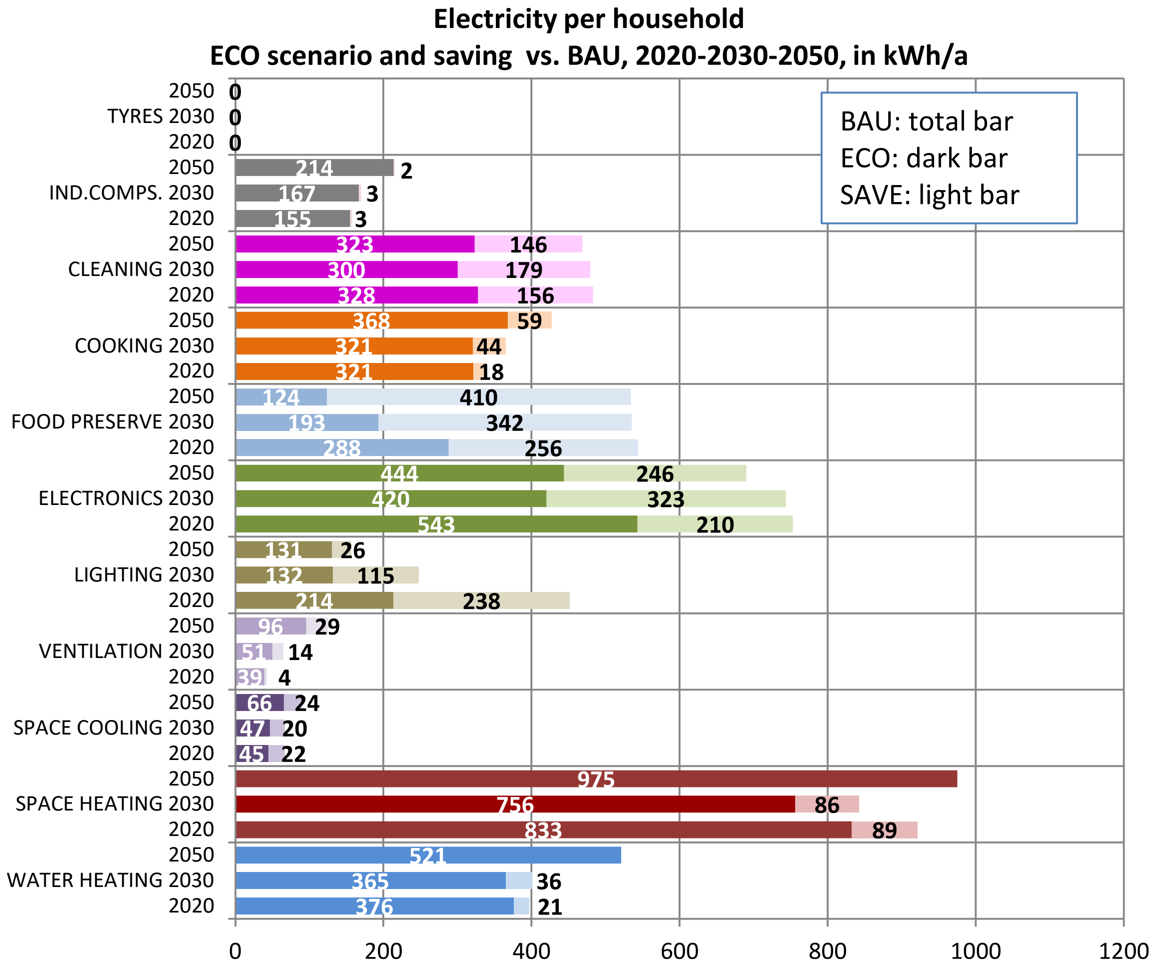

Figure 27. Electricity consumption per average EU27 household in kWh/a for regulated products (included in EIA). Consumption in the ECO-scenario (with impact of measures), and savings vs. BAU (without measures). Source: EIA sheet Households

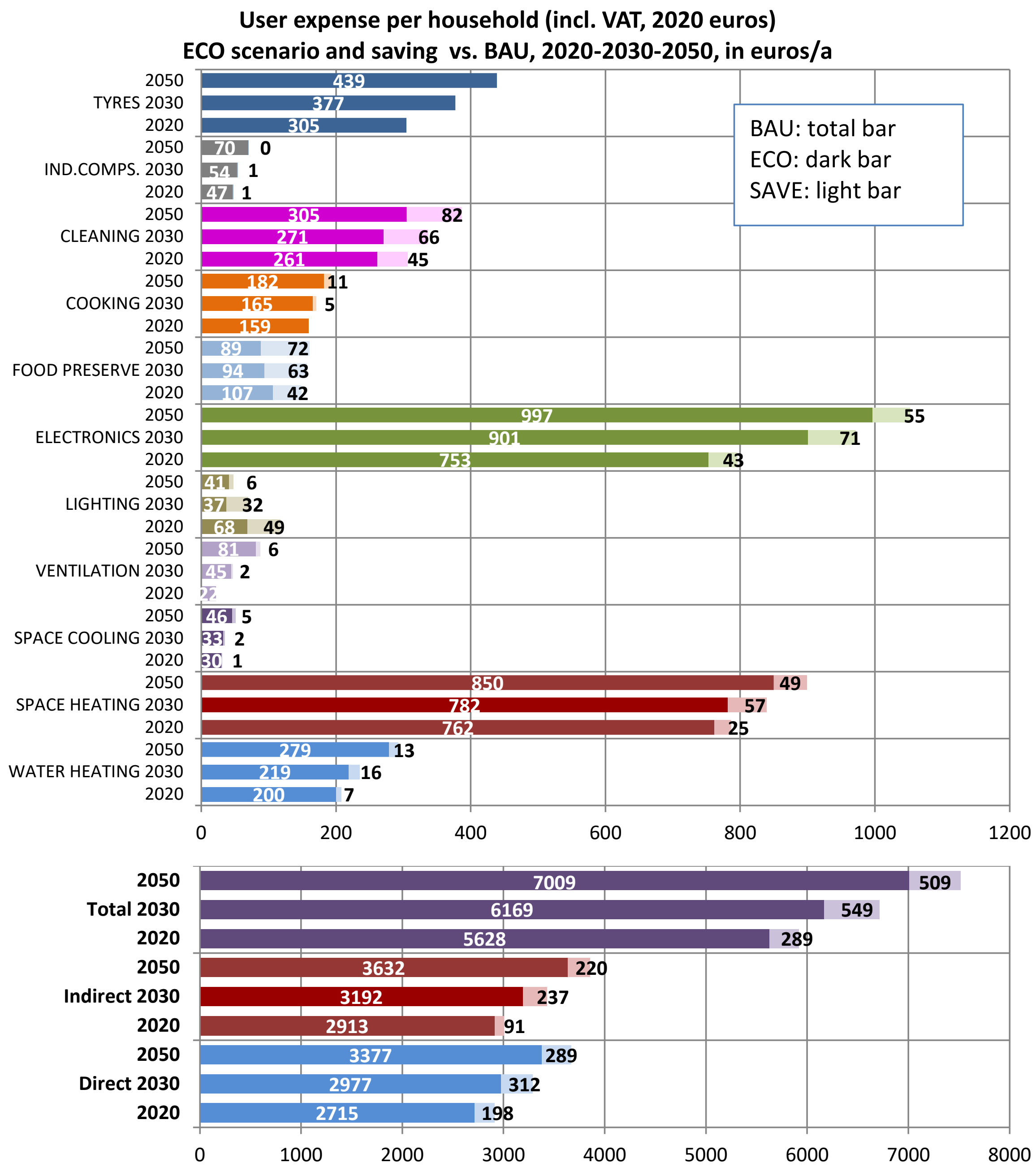

Figure 28. User expenses per average EU27 household in 2020 euros/a (incl. VAT) for regulated products (included in EIA). Includes product purchase, installation, energy costs, and maintenance and repair. Expenses in the ECO-scenario (with impact of measures), and savings vs. BAU (without measures). The upper part of the graph provides direct savings, only on products used in households. Indirect savings are maximum values (see text) for products not used in households, but in the tertiary sector or in industry. Source: EIA sheet Households

3.6. Sensitivity analysis for energy rates

3.6.1. Sensitivity of user expenses to changes in energy rates.

As anticipated in sections 1.2.1.3, 2.3.6 and 3.4.5, for reporting EIA2021 uses the energy rates of the PRIMES 2020 reference scenario for electricity, natural gas, heating oil and LPG.

For each of these energy carriers, a user-option in the EIA Masterfile on sheet General_1 (see Annex A) allows quick selection of the traditional EIA set of rates, the PRIMES 2020 reference scenario rates or the PRIMES 2020 MIX scenario rates. Figure 29 (electricity), Figure 30 (gas) and Figure 31 (heating oil) compare the rates for the three sets. The user-option has been used by the EIA team to present the sensitivity data reported below.

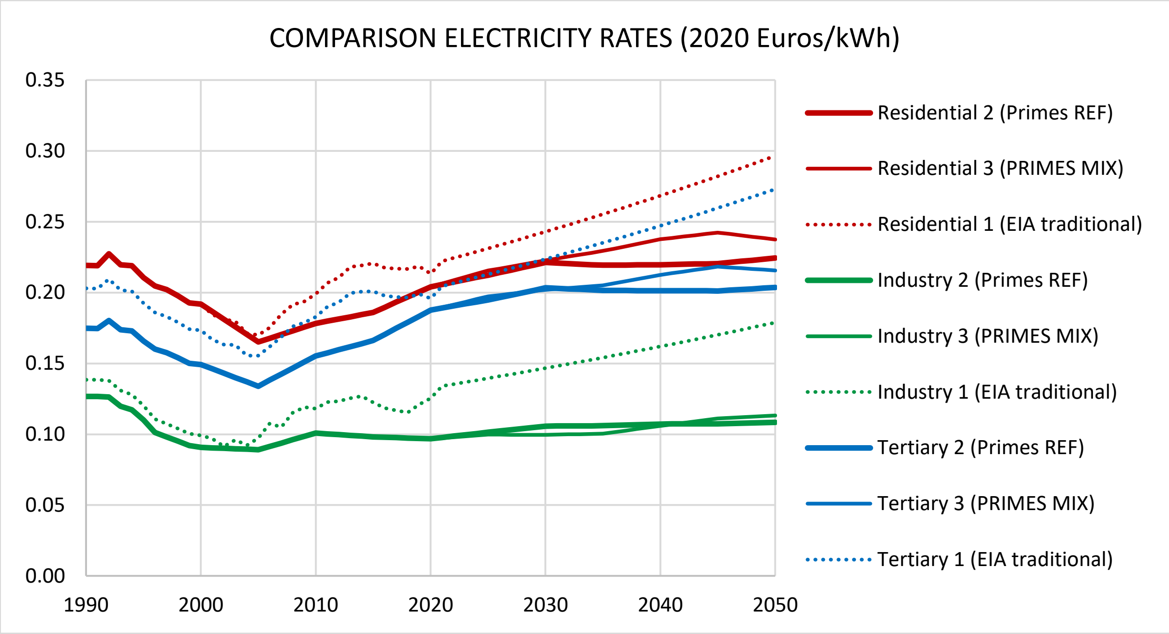

Figure 29: Comparison of rates for electricity (2020 € / kWh electric) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references.

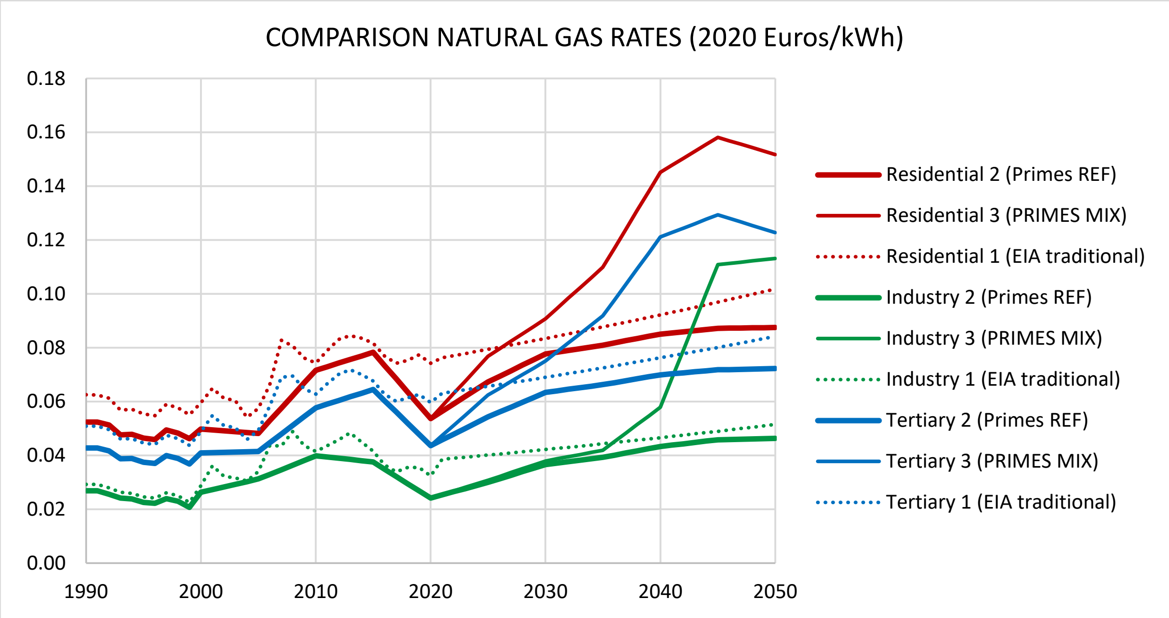

Figure 30: Comparison of rates for natural gas (2020 € / kWh NCV) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references.

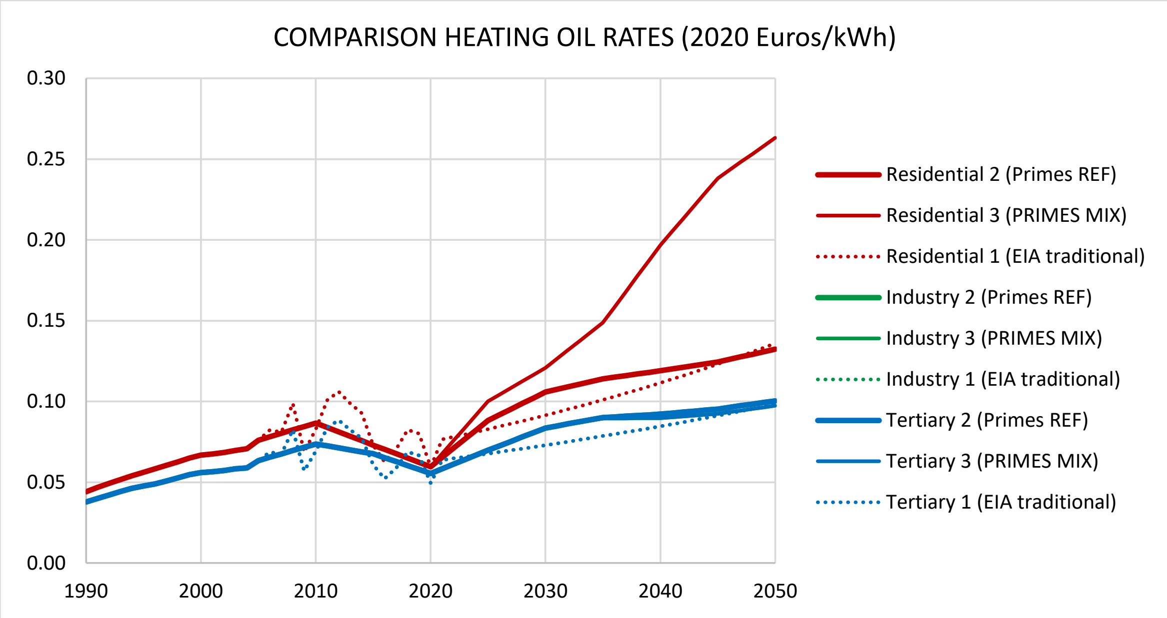

Figure 31: Comparison of rates for heating oil (2020 € / kWh NCV) for EIA traditional approach, PRIMES 2020 reference scenario and PRIMES 2020 MIX scenario, for residential, industry and tertiary/services sectors (incl. VAT for residential). See sheets General_1 and _2 in Annex A for details and references. (curves for industry and tertiary sectors overlap)

In the sensitivity analysis, the rates for electricity, natural gas, heating oil and LPG have been changed together. For automotive fuels, coal and wood, only the traditional EIA set of rates is available, so that these rates were not changed during the analysis [114].

As shown in Annex A on the EXPENS- and HOUSEHOLD-sheets and reported in sections 3.4.5 and 3.5, when using the energy rates of the PRIMES 2020 reference scenario, the EU27 total user expense savings due to Ecodesign and Energy Labelling measures are 57 bn euros/a in 2020 and 110 bn euros/a in 2030. Direct annual savings per household are 198 euros in 2020 and 312 euros in 2030.

Table 11 and Figure 32 show how these values (and the energy costs [115]) vary when using other sets of energy rates.

Using the rates of the PRIMES 2020 MIX scenario leads to expense savings of 114 bn euros instead of 110 bn euros in 2030. After 2030, the difference between the two PRIMES scenarios increases (Figure 32).

The EIA traditional set of rates generally leads to higher user expense savings: 63 bn euros instead of 57 bn euros in 2020, and 125 bn euros instead of 110 bn euros in 2030. In the period 2040-2050 the results for EIA traditional energy rates are close to the results for the PRIMES 2020 MIX scenario (Figure 32).

The direct annual savings per household in 2030 are 312 euros for the rates of the PRIMES REF scenario, 329 euros for the PRIMES MIX scenario, and 342 euros for the traditional EIA rates.

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[114] No information was available on PRIMES rates for automotive fuels. The rates have been updated in EIA2021 following Oil bulletin data, but only the traditional EIA approach is available. Automotive fuels are responsible for 11-14% of energy costs in EIA.

Wood rates are not so important in EIA, covering around 2% of all energy costs. PRIMES has a single aggregated rate for biomass, probably including also non-woody biomass and waste, but does not provide the split between logs, pellets and chips that is used in EIA. The wood rates have been updated in EIA2021 based on various sources (see notes on sheet General_2 in Annex A), but only the traditional EIA approach is available.

Coal rates are responsible for 0.2% of all energy costs in EIA. PRIMES has a single aggregated rate for solids, and it is not clear if this rate is representative also for coal rates in EIA. It has not been considered worthwhile to offer a choice of rates for coal, so only the traditional EIA approach is available.

[115] The difference between energy cost savings and user expense savings are the additional acquisition costs, cost savings on consumables, and variations in maintenance costs. The latter three are the same for all sets of energy rates.

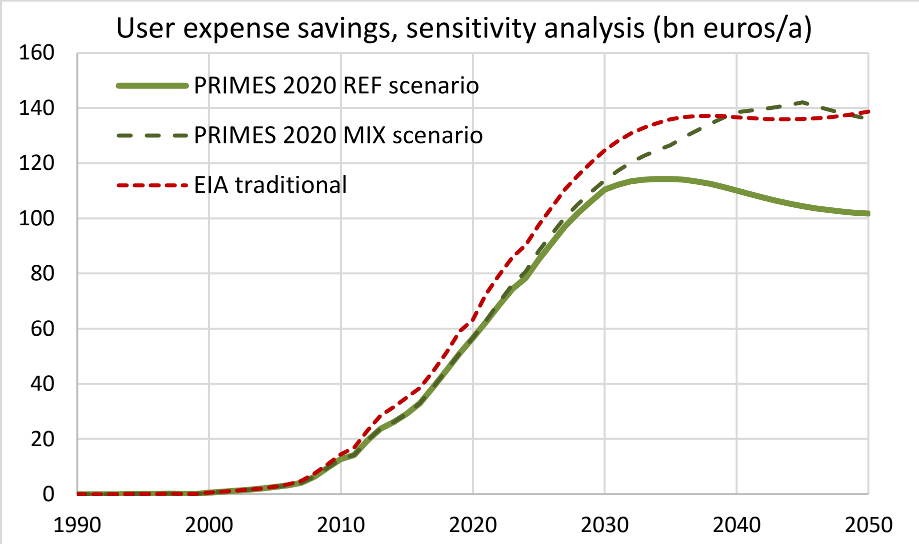

Figure 32: EU27 total user expense savings due to ecodesign and energy labelling measures for three different sets of rates for electricity, natural gas, heating oil and LPG (in bn euros/a). EIA2021 reporting uses the rates of the PRIMES 2020 REF scenario.

Table 11 Comparison of total EU27 energy costs and user expenses (in bn euros/a) and expense savings per household (in euros/a/hh) for EIA products for three different sets of rates for electricity, natural gas, heating oil and LPG.

		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Energy costs, EU27 total, bn euros 2020											
PRIMES 2020 Reference scenario	**BAU**	500	630	650	641	699	743	749	763	780	806
	ECO	500	615	608	567	589	607	608	625	646	674
	SAVE	***0***	***15***	***42***	***74***	***110***	***136***	***141***	***138***	***134***	***133***
PRIMES 2020 MIX scenario	**BAU**	500	630	650	641	717	754	792	861	909	915
	ECO	500	615	608	567	604	615	639	695	737	748
	SAVE	***0***	***15***	***42***	***74***	***113***	***139***	***153***	***166***	***172***	***167***
EIA traditional approach	**BAU**	535	689	739	709	784	827	869	916	973	1038
	ECO	535	672	691	628	662	677	707	751	807	869
	SAVE	***0***	***17***	***48***	***81***	***123***	***150***	***162***	***165***	***166***	***170***
User expense, EU27 total, bn euros 2020											
PRIMES 2020 Reference scenario	**BAU**	730	1110	1138	1160	1260	1353	1388	1423	1459	1503
	ECO	730	1097	1109	1103	1175	1242	1274	1313	1355	1401
	SAVE	***0***	***13***	***29***	***57***	***85***	***110***	***114***	***110***	***104***	***102***
PRIMES 2020 MIX scenario	**BAU**	730	1110	1138	1160	1277	1364	1431	1522	1588	1611
	ECO	730	1097	1109	1103	1189	1250	1305	1383	1446	1475
	SAVE	***0***	***13***	***29***	***57***	***88***	***114***	***127***	***138***	***142***	***136***
EIA traditional approach	**BAU**	764	1168	1227	1227	1345	1437	1508	1577	1652	1735
	ECO	764	1154	1192	1164	1247	1312	1373	1440	1516	1596
	SAVE	***0***	***14***	***35***	***63***	***98***	***125***	***136***	***137***	***136***	***139***
Direct user expense saving per household (2020 euros/a/hh)											
PRIMES 2020 Reference scenario	***SAVE***	***0***	***57***	***125***	***198***	***266***	***312***	***312***	***301***	***292***	***289***
PRIMES 2020 MIX scenario	***SAVE***	***0***	***57***	***125***	***198***	***278***	***329***	***362***	***408***	***427***	***414***
EIA traditional approach	***SAVE***	***0***	***64***	***147***	***218***	***297***	***342***	***359***	***359***	***363***	***375***

3.6.2. Effects of energy rate increase in 2021-2022.

In the last months of 2021 and the first months of 2022, a strong increase in energy rates occurred. This increase is not yet reflected in the EIA traditional rates (based on Eurostat data) or in the PRIMES 2020 scenarios, and thus not captured by the analysis in the previous paragraph.

The effect of the increase in electricity rates and natural gas rates on energy cost savings and user expense savings in EIA was therefore modelled separately. This analysis was performed prior to finalizing the EIA2021 updates and consequently uses EIA2020 product data, is based on EIA2020 traditional energy rates, and still expresses monetary amounts in 2015 euros [116].

Figure 33 shows the reference prices for electricity and natural gas as used by the European Commission, respectively from the European Power Benchmark (EPB7) (EC-AAENM00) and from the NL TTF Day Ahead (GTFUX00).

For electricity, the annual average is 35.4 for 2020 and 104.8 for 2021, with a factor 2.96 increase. The price of 254.2 in January 2022 represents a factor 7.18 increase compared to the 2020 annual average.

For natural gas, the annual average is 9.4 for 2020 and 45.4 for 2021, with a factor 4.84 increase. The price of 85.6 in January 2022 represents a factor 9.13 increase compared to the 2020 annual average.

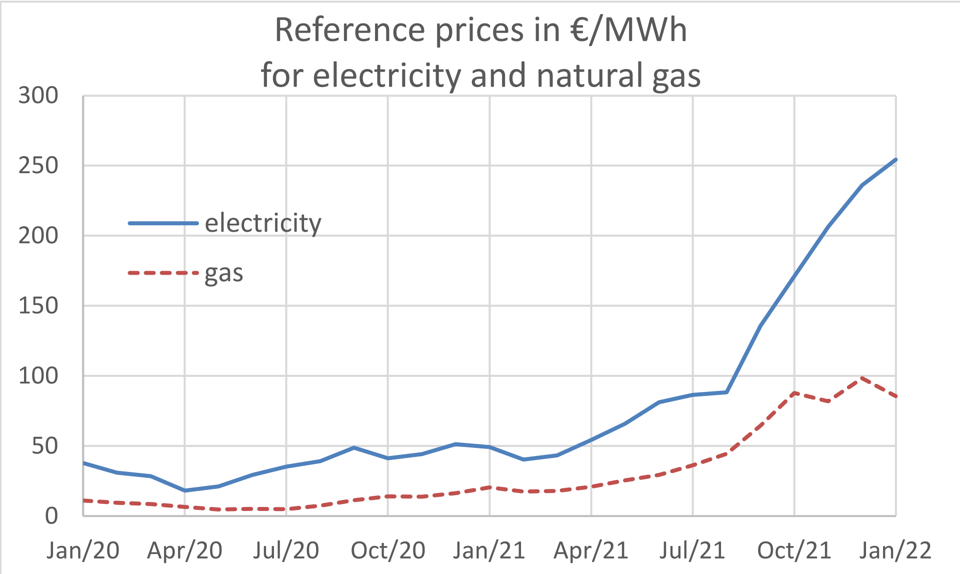

Figure 33: Reference prices in €/MWh for electricity (source: European Power Benchmark (EPB7) (EC-AAENM00)) and for natural gas (source: NL TTF Day Ahead (GTFUX00)

The above reference market prices are without taxes, levies, network and distribution costs, etc. and thus cannot be used directly in EIA as final consumer rates. The rates for 2021 and 2022 (Table 12) have been derived from the EIA rates for 2020 applying the increase factors reported above to the full rate (option A, full increase) or only to the energy-part of the rate (excluding taxes, levies and network/distribution costs)(option B, partial increase) [117].

[116] The analysis has not been updated for EIA2021, for compatibility with figures published elsewhere by the Commission.

[117] According to data received from the Commission services, the energy-part (X%) of the rates is 32% for electricity in households, 46% for electricity in industry, 45% for gas in households, 67% for gas in industry. In option B, new rates are computed as: [X%*increase factor + (1-X%)]*rate in 2020. In option A, new rates are computed as increase factor * rate in 2020. For 2022 it is assumed that the increase factor for January 2022 is representative for the average over the entire year.

Table 12 Effect of the increase in rates for electricity and natural gas in 2021 and 2022 on energy cost savings and user expense savings in EIA. See text for further explanation.

	2020 REF, EIA traditional	2021 REF, EIA traditional	2021 B, Partial increase	2021 A, Full increase	2022 REF, EIA traditional	2022 B, Partial increase	2022 A, Full increase
Electricity rates (2015 euros / kWh)							
households	0.201	0.203	0.328	0.596	0.205	0.600	1.446
index	*1.00*	*1.01*	*1.63*	*2.96*	*1.02*	*2.98*	*7.18*
industry	0.118	0.119	0.225	0.350	0.121	0.454	0.849
index	*1.00*	*1.01*	*1.90*	*2.96*	*1.02*	*3.84*	*7.18*
tertiary/services	0.172	0.174	0.292	0.510	0.176	0.549	1.237
index	*1.00*	*1.01*	*1.69*	*2.96*	*1.02*	*3.19*	*7.18*
Natural gas rates (2015 euros / kWh NCV)							
households	0.069	0.070	0.187	0.332	0.071	0.320	0.626
index	*1.00*	*1.015*	*2.73*	*4.84*	*1.03*	*4.66*	*9.13*
industry	0.033	0.033	0.118	0.159	0.034	0.212	0.301
index	*1.00*	*1.015*	*3.57*	*4.84*	*1.03*	*6.45*	*9.13*
tertiary/services	0.054	0.054	0.158	0.260	0.055	0.275	0.490
index	*1.00*	*1.015*	*2.95*	*4.84*	*1.03*	*5.12*	*9.13*
energy cost savings							
bn euros 2015	**75**	**83**	**143**	**248**	**90**	**277**	**607**
index	*1.00*	*1.11*	*1.73*	*3.0*	*1.20*	*3.69*	*8.09*
total user expense savings							
bn euros 2015	**60**	**65**	**126**	**230**	**72**	**259**	**588**
index	*1.00*	*1.08*	*1.93*	*3.53*	*1.20*	*4.32*	*9.8*

Compared to the published estimate for 2020 (€60 bn), the **reduction in consumer expenditure is estimated to have roughly doubled in 2021 (reaching almost €126 bn)**[118] (based on an increase applied to the commodity price, while taxes and network costs were not reviewed, option B).

For 2022, a first estimate shows that **savings could again double in 2022 compared to 2021**, reaching 259 billion euro if prices in 2022 will stay at January 2020 levels, and not taking into account the effect of potential government intervention on components of the energy price (taxes and network costs) or of changes in consumer behaviours (e.g. advanced or delayed appliance purchases, or more careful behavioural patterns triggered by higher prices).

3.6.3. Potential additional savings due to stock measures.

To counteract the effects of the high energy rates and the scarcity of energy supply, some immediate interventions on the 2022 stock of products were hypotized by the Commission services and the EIA was used to analyze the additional impacts (on top of the existing ecodesign measures). The results of this ad hoc analysis are summarized in Table 13 and presented without further comments. The analysis was performed using 0.60 €/kWh for electricity and 0.32 €/kWh for natural gas.

[118] Savings cover households, industry and tertiary sector. They were €60 bn in 2020 and estimated to raise to 65 bn in 2021. With the increase in electricity and gas rates, the value in 2021 changes to €126 bn.

Table 13 Additional impacts (on top of existing ecodesign measures) due to some hypothetical immediate interventions on the 2022 stock.

Hypothetical measure	Variation in energy use compared to existing ECO measures (TWh)			Energy cost variation (bn euros)	Acquisition costs (bn euros)
	2023	**2030**	**Cumulative 2023-2030**	**Cumulative 2023-2030**	**2022**
Substitution of the entire 2022 non-LED stock of 4.8 billion light sources by LED	-53 elec	-17 elec	-270 elec	-162	+110 [a)]
Substitution of 2022 stock of incande-scents and CFLi of 2.3 billion light sources by LED.	-7.5 elec	-0.6 elec	-22 elec	-13	+15 [b)]
Substitution of household fridges older than 10 years in the 2022 stock by class C products [c)].	-11 elec	-0 elec [d)]	-34 elec	-21	+71 [e)]
Substitution of the entire 2022 stock of 118 million electric dedicated water heaters by dedicated heat pumps	-64 elec	-62 elec	-501 elec	-300	+157 [f)]
Substitution of the entire 2022 stock of 16 million gas-fired dedicated water heaters by dedicated heat pumps	-20 gas +4.6 elec -10 prim [g)]	-15 gas +4.0 elec -7 prim	-135 gas +34 elec -64 prim	-23	+33 [h)]
Substitution of the entire 2022 stock of 78 million gas hobs by induction hobs	-23 gas +9.0 elec -4.0 prim [g)]	-21 gas +8.4 elec -3.5 prim	-176 gas +69 elec -30 prim	-15	+42 [i)]

a) Except for HID replacement, after 2023 users would anyway have to buy LEDs because CR 2019/2020 no longer allows incandescents, CFLi and most LFL T8 to be sold, while RoHS measures block the sales of LFL T5 and CFLni, so this is mainly an anticipation of expenses. Without enforced stock replacement, acquisition would be spread over more years (when light sources fail) and LED prices might still drop (and efficacy increase) after 2022.

b) users would anyway have to buy LEDs because CR 2019/2020 no longer allows incandescents and CFLi to be sold, so this is mainly an anticipation of expenses. Without enforced stock replacement, acquisition would be spread over several years (when light sources fail) and LED prices might still drop (and efficacy increase) after 2022

c) The 2022 stock of household refrigerators and freezers is 260 mln units. Of these, 95 mln are older than 10 years (sold in the period 2007-2012; average lifetime in modelling is 16 years). Substituting the models older than 10 years with class C products (according to CDR 2019/2016).

d) products older than 10 years in the 2022 stock would anyway have been substituted before 2030, and on average by a product similar to class C, so the additional savings in 2030 due to the substitution in 2022 are approximately zero.

e) in EIA the average household RF substitution price is 622 euros over the period 2023-2028, compared to a price of 740 euros for a class C product in 2022. Hence, acquisition of class C in 2022 is approximately 20% higher than what would otherwise be spent over the years

f) in EIA the cumulative acquisition costs for electric DWH over the period 2022-2030 are 20 bn euros, but this does not substitute the entire 2022 stock. If the entire 2022 stock of electric DWH would be replaced by electric DWH, acquisition costs would be 31 bn euros, so far less than the 157 bn euros for heat pumps. Heat pump unit price is assumed to be 5 times the electric DWH price.

g) PEF 2.1 used to convert electricity to primary energy.

h) in EIA the cumulative acquisition costs for gas DWH over the period 2022-2030 are 3.3 bn euros, but this does not substitute the entire 2022 stock. If the entire 2022 stock of gas DWH would be replaced by gas DWH, acquisition costs would be 6.6 bn euros, so far less than the 33 bn euros for heat pumps. Heat pump unit price is assumed to be 5 times the gas DWH price.

i) in EIA the cumulative acquisition costs for gas hobs over the period 2022-2030 are 12 bn euros, but this does not substitute the entire 2022 stock. If the entire 2022 stock of gas hobs would be replaced by gas hobs, acquisition costs would be around 23 bn euros, so far less than the 42 bn euros for induction hobs. In EIA, unit price for gas hobs is 294 euros. Unit price for induction hobs is 535 euros from the 2021 JRC review study.

3.7. Other sensitivity analyses

3.7.1. Sensitivity of GHG-emissions to changes in GWP factors.

As anticipated in sections 1.2.1.5 and 3.4.3, for reporting EIA2021 uses the GWP-factors for electricity generation and distribution of the PRIMES 2020 reference scenario.

A user-option in the EIA Masterfile on sheet General_1 (see Annex A) allows quick selection of the traditional EIA set of GWP factors for electricity, the PRIMES 2020 reference or 2020 mix scenario set, or a fourth set definable by the user, now with data from the EEA 2020 [119]. Figure 34 compares the GWP-factors for the four sets. The user-option has been used by the EIA team to present the sensitivity data reported below.

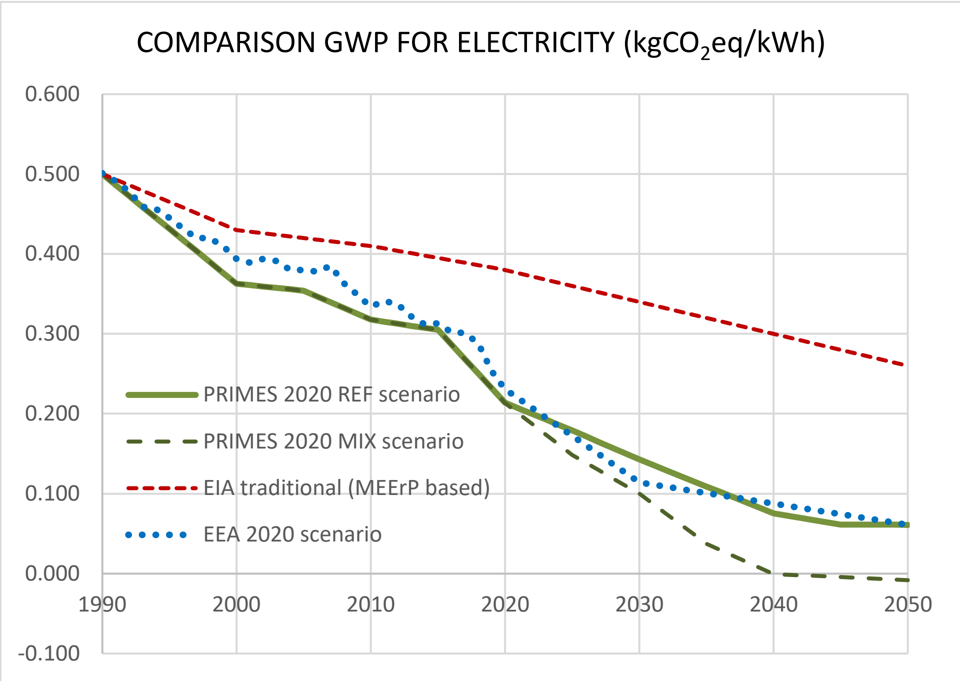

Figure 34: Comparison of GWP-100 factors for electricity generation and distribution (kgCO2eq/kWh electric) for EIA traditional (MEErP), PRIMES 2020 reference scenario (=EIA2021 baseline), PRIMES 2020 MIX scenario, and EEA 2020.

As shown in Annex A on the EMISS-sheets and reported in section 3.4.3, when using the GWP factors for electricity of the PRIMES 2020 reference scenario, the reduction of GHG-emissions due to Ecodesign and Energy Labelling measures is 114 $MtCO_2eq/a$ in 2020 and 160 $MtCO_2eq/a$ in 2030. Table 14 and Figure 35 show how these values vary when

[119] Global Warming Potential (GWP-100) for electricity generation and distribution for EIA traditional (set 1) taken from MEErP Part 1 table 30, http://ec.europa.eu/growth/industry/sustainability/ecodesign_en (section on 'support tools for experts'). For years following 2030, extrapolation with same downward trend. These data have been used in EIA2020 and earlier editions but are now obsolete.

Values for GWP electricity sets 2 and 3 for years 2000-2050 (in 5-year steps) are from the PRIMES 2020 reference scenario (set 2) and 2020 mix scenario (set 3), as supplied by the EC services for use in impact assessments. Value for 1990 assumed identical to set 1. Values in intermediate years interpolated linearly. Note that in the PRIMES 2020 Mix scenario from 2040 the GWP factors become negative, implying that electricity savings lead to additional emissions.

Values for GWP electricity set 4 can be freely defined by the user. Currently displayed values are from the European Environment Agency, https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-9/#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111, 'European level — Greenhouse gas emission intensity of electricity generation'. Annual values defined until 2020 (0.231) with projection between 0.110 and 0.118 for year 2030 (average used). Value for 2050 assumed identical to set 2. Linear interpolation 2020-2030 and 2030-2050.

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using other sets of GWP-factors for electricity. Using GWP-factors of the traditional EIA set (based on the MEErP 2011), the reduction of emissions is much larger (263 MtCO2eq in 2030), but by now these GWP-factors are considered obsolete. The GWP factors of the EEA 2020 scenario lead to emission reductions that are similar to those for the PRIMES 2020 REF scenario. The GWP factors of the PRIMES 2020 MIX scenario lead to lower emission reductions after year 2020, saving 137 MtCO2eq in 2030 compared to the 160 MtCO2eq for the PRIMES 2020 REF scenario.

The difference between using GWP-factors for electricity from the PRIMES 2020 REF scenario or the PRIMES 2020 MIX scenario is further illustrated in Figure 36 and Figure 37. Due to the negative GWP factors in the PRIMES 2020 MIX scenario, after 2040 the reduction of emissions due to savings on electricity becomes negative. This is clear especially in Figure 37, which excludes the functional groups that use fuel input.

Table 14 Comparison of total EU27 GHG-emissions (in MtCO2eq/a) due to energy use by EIA products for four different sets of GWP-factors for electricity generation and distribution.

EU27 total GHG-emissions in Mt CO2 eq/a		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
GWP Set 2 (PRIMES 2020 REF)	**BAU**	1769	1531	1483	1209	1067	926	801	682	625	610
(EIA2021 baseline)	**ECO**	1769	1502	1402	1095	918	766	649	545	493	476
	SAVE	***0***	***30***	***81***	***114***	***149***	***160***	***152***	***137***	***132***	***134***
GWP Set 3 (PRIMES 2020 MIX)	**BAU**	1769	1531	1483	1208	979	802	591	456	427	396
	ECO	1769	1502	1402	1094	844	665	477	357	325	293
	SAVE	***0***	***30***	***81***	***114***	***135***	***137***	***114***	***99***	***102***	***103***
GWP Set 4 (EEA 2020)	**BAU**	1771	1573	1505	1257	1047	843	777	718	664	610
	ECO	1771	1542	1423	1137	901	698	629	575	526	476
	SAVE	***0***	***31***	***82***	***120***	***146***	***145***	***148***	***143***	***138***	***134***
GWP Set 1 (MEErP, EIA traditional)	**BAU**	1769	1764	1726	1676	1585	1499	1419	1347	1284	1224
	ECO	1769	1728	1630	1506	1354	1237	1156	1099	1052	1003
	SAVE	***0***	***37***	***96***	***170***	***231***	***263***	***263***	***248***	***233***	***221***

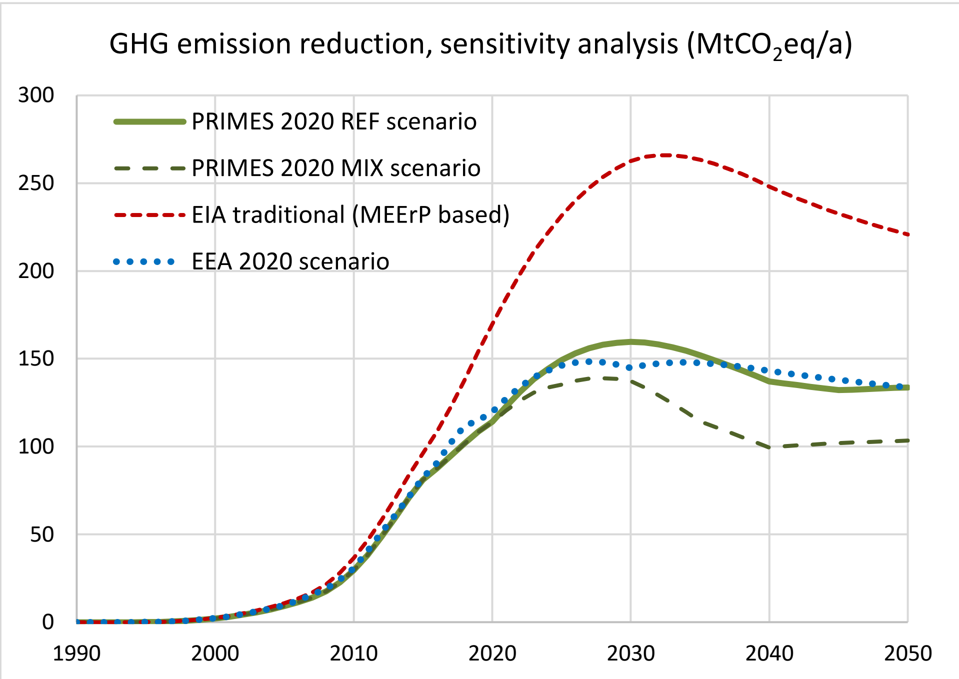
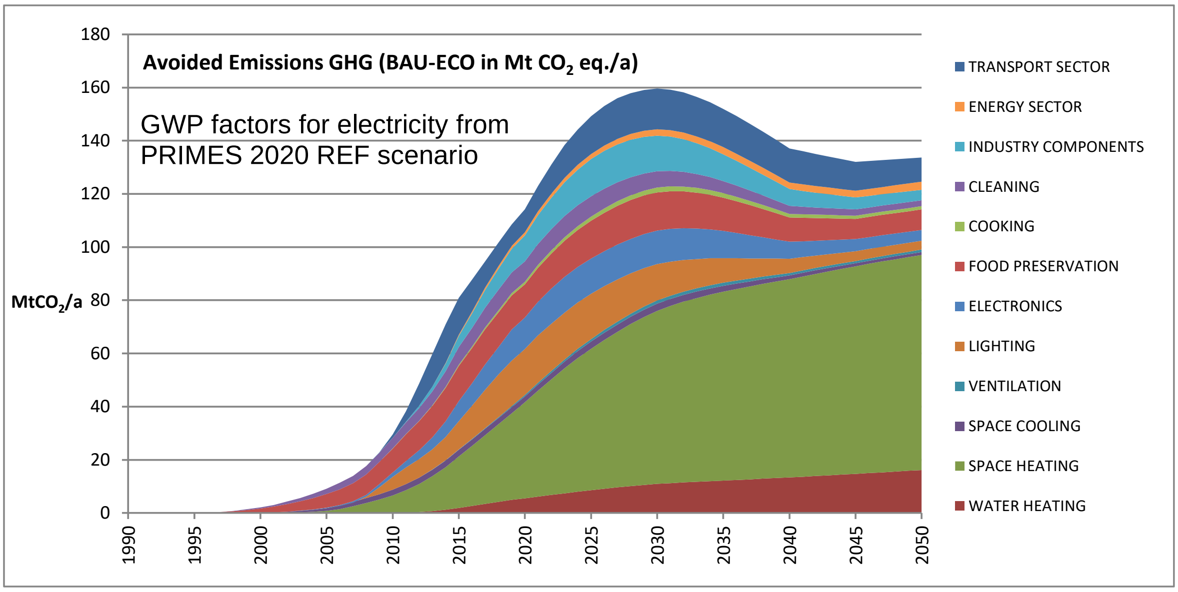


Figure 35: EU27 total reduction of GHG emission due to ecodesign and energy labelling measures for four different sets of GWP-factors for electricity (in MtCO2eq/a). EIA2021 reporting uses the GWP-factors of the PRIMES 2020 REF scenario.



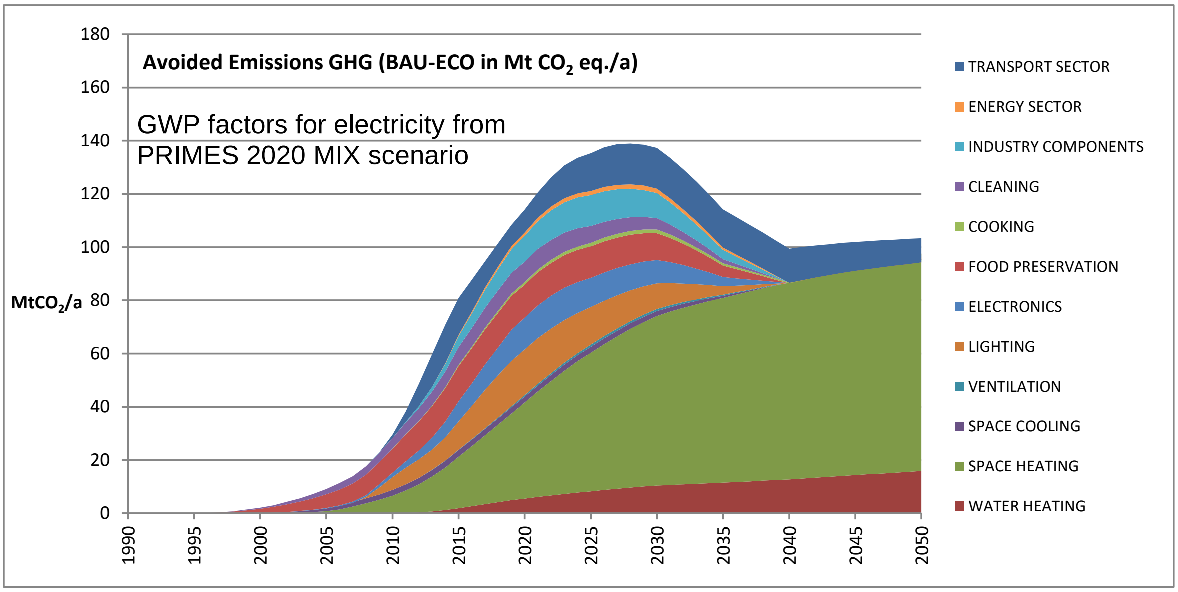
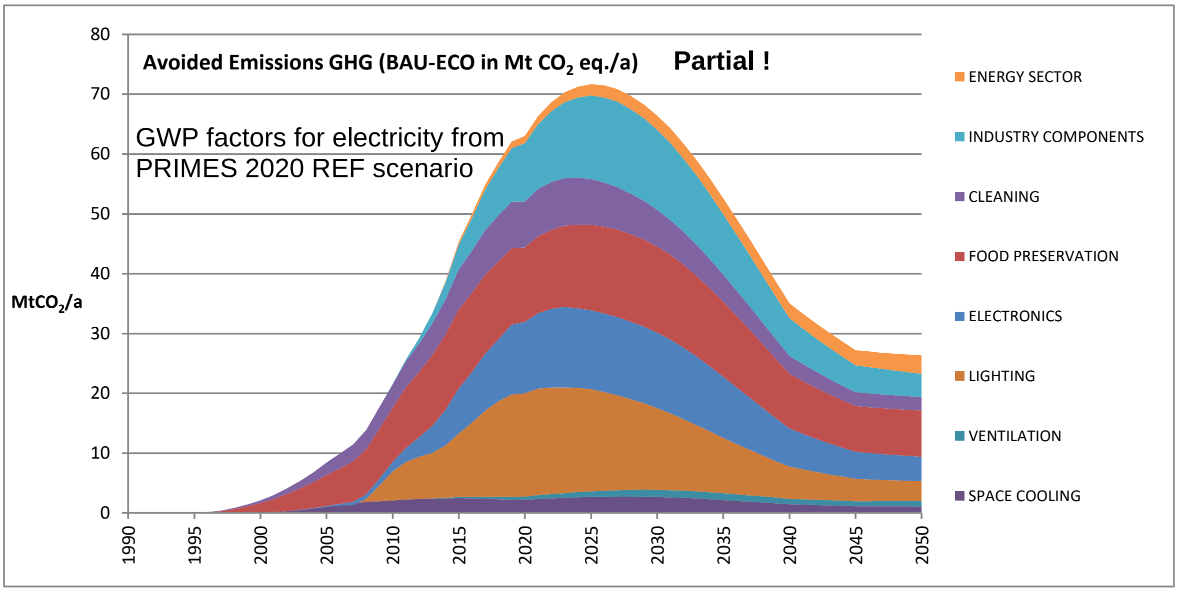


Figure 36: EU27 total reduction of GHG emission per functional group due to ecodesign and energy labelling measures for the GWP-factors for electricity of the PRIMES 2020 reference scenario (top) and of the PRIMES 2020 MIX scenario (bottom) (in MtCO2eq/a).



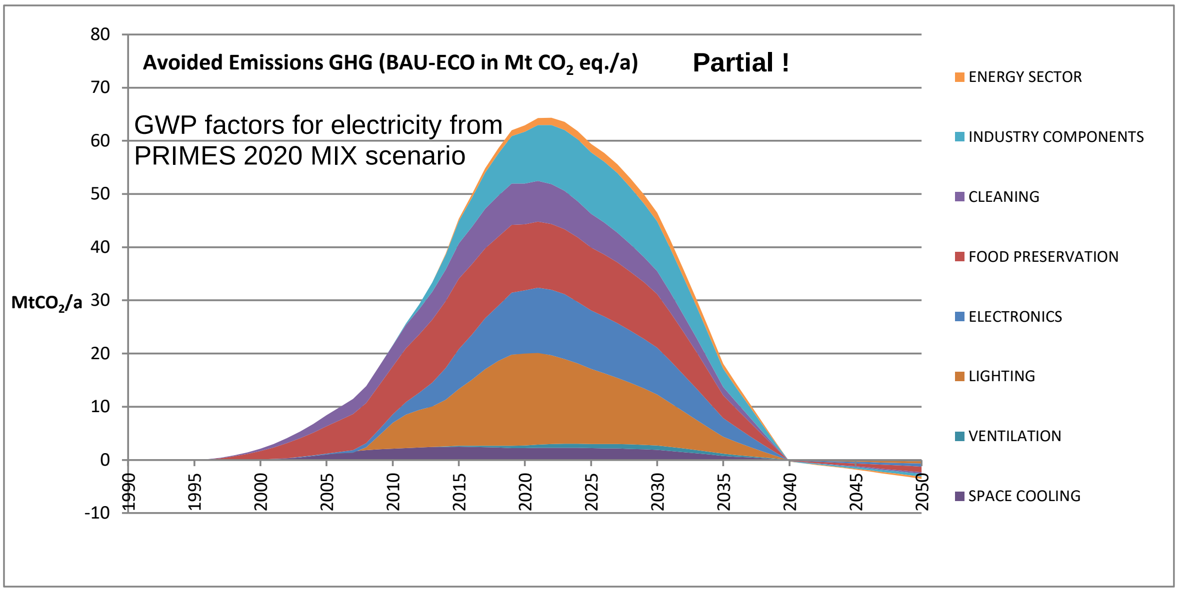


Figure 37: Same as Figure 36, but functional groups using fuel (space heating, water heating, transport-tyres, and cooking) have been excluded. The graph shows that using GWP-factors for electricity of the PRIMES 2020 MIX scenario, after 2040 electricity savings lead to negative emission reductions (i.e. higher emissions)

3.7.2. Sensitivity of Primary energy to PEF for electricity

Sensitivity to PEF for electricity:

- Using PEF 1.8 for electricity in 2030 instead of PEF 2.1, the primary energy savings accounted in EIA would decrease by 10%.

Primary energy (NRG) is calculated in EIA as NRG=ELEC/CC + FUEL (section 2.6.4), where CC=1/PEF the conversion coefficient for electricity (ELEC) and PEF the primary energy factor for electricity (sections 1.2.1.6 and 2.3.7) [120].

The share of electricity in the final energy (FNRG=ELEC+FUEL) consumed by EIA-products increases over time (Figure 38) [121] [122].

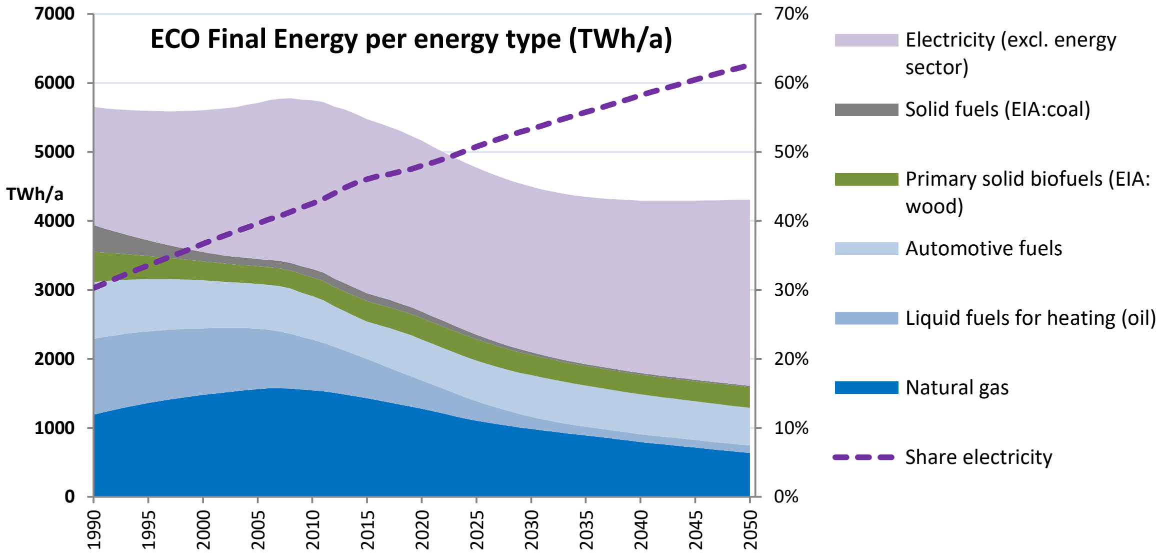


Figure 38: EU27 total final energy per energy type consumed by products in the accounting in the ECO scenario (stacked areas, lefthand scale, in TWh/a). The share of electricity (dotted line, righthand scale) increases over time.

Primary energy reporting in EIA2021 uses PEF 2.5 (CC=40%) until 2020 and PEF 2.1 (CC=47.6%) from 2021 onwards. This reflects default values mentioned in the energy efficiency directive (EED).

As explained in section 1.2.1.6, the EIA Master Excel file on sheet General_1 offers a user-option to choose from four sets of CC/PEF values:

---

[120] Following the approach in the EU Energy efficiency directive, EIA does not consider a PEF for (non-electric) fuels. The direct fuel input to products in the accounting is identical to their primary energy equivalent.

[121] In 1990 the share of electricity in final energy was 30% and in 2030 it is projected 53% (for products accounted in EIA). For water heating the share increases from 27% in 1990 to 37% in 2030, for space heating from 9% to 17%, and for cooking from 54% to 73%.

The change in share is mainly due to a strong decrease in fuel consumption (-1840 TWh in 2030 compared to 1990). The main contributor is space heating (-1580 TWh, due to efficiency improvements, shifts between technologies, heat load reduction due to building insulation, climate effects, heat recovery by ventilation units). Second contributor are tyres (-224 TWh, reduction of fuel losses due to rolling resistance). Smaller contributions to lower fuel consumption from water heating (-22 TWh) and cooking (-16 TWh).

In parallel, electricity consumption in 2030 is projected to increase compared to 1990 by 688 TWh, of which +444 TWh for industrial components, +123 TWh for electronics, +85 TWh for space cooling, +41 TWh for lighting, +32 TWh for water heating, +21 for cooking, +19 for ventilation, -7 TWh for space heating, -11 TWh for cleaning and -59 TWh for food preservation.

[122] For automotive fuels, EIA considers only the fuel losses due to the rolling resistance of tyres, not the entire fuel consumption by vehicles.

- PEF constant 2.5 (CC=40%);
- PEF constant 2.1 (CC=47.6%);
- PEF switch from 2.5 to 2.1 in 2020 (EIA2021 reporting baseline);
- Eurostat Shares time-series for efficiency of electricity generation [123].

The EIA2021 reporting also addresses the impact of changes to PEF 2.0, 1.9 and 1.8, as this insight could be relevant for the 2024 review of the default PEF for electricity in the EED.

As reported in Annex A on the NRG-sheets and in section 3.4.2, the primary energy savings due to ecodesign and energy labelling measures are 1039 TWh/a in 2020 (with PEF 2.5) and 1513 TWh/a in 2030 (with PEF 2.1). This uses the switch in PEF for electricity from 2.5 (in 2020 and before) to 2.1 (in 2021 and later).

Figure 39 and Table 15 show how the primary energy consumption in the ECO-scenario and the primary energy savings versus BAU vary when other primary energy factors for electricity are assumed. The graphs also indicate the direct fuel [124] consumption and savings, which are not affected by changes in the PEF for electricity. In addition the graphs indicate the final energy consumption and savings, which correspond to using PEF=1.0 for electricity. The changes in PEF examined in this sensitivity analysis act on electricity only, i.e. on the part of the graphs between the long-dashed blue line (fuel) and the short-dashed blue line (final energy).

In year 2030, the EIA ECO fuel consumption is 2099 TWh and the electricity consumption 2399 TWh for a final energy total of 4498 TWh [125]. Multiplying the electricity by a PEF of 2.1 (which is the EIA reporting baseline in 2030) the primary energy equivalent for electricity is 5003 TWh [126], and summing this with the fuel gives a total primary energy of 7102 TWh. Applying a PEF of 2.5 this would increase to 8055 TWh (+13%). Applying a PEF of 1.8 it would decrease to 6387 TWh (-10%).

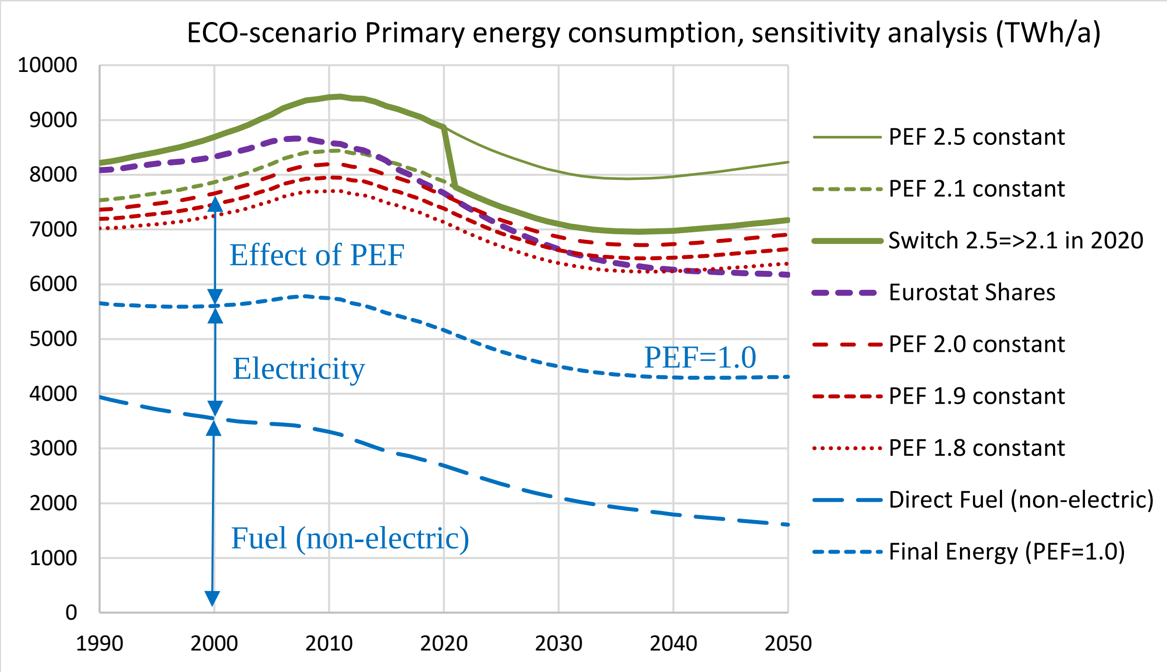
In the same year, the savings on fuel consumption are 417 TWh and the electricity savings 505 TWh for final energy savings of 922 TWh. Multiplying the electricity by a PEF of 2.1 the primary energy equivalent for electricity savings is 1096 TWh, and summing this with the fuel savings gives total primary energy savings of 1513 TWh. Applying a PEF of 2.5 this would increase to 1722 TWh (+13%). Applying a PEF of 1.8 it would decrease to 1357 TWh (-10%).

[123] CCset3 takes the 1990-2019 values from Eurostat Shares (https://ec.europa.eu/eurostat/web/energy/data/shares, η (eta) time series (1990-2019), accessed 25.04.2022). For 2020 and later years the 2010-2019 trend is extrapolated.

[124] Direct fuel indicates the non-electric fuel input directly into EIA products. Fuel used for electricity generation excluded.

[125] This does not count the 17 TWh savings on Distribution transformers (not considered for final energy)

[126] This does count the 17 TWh savings on Distribution transformers (considered for primary energy.



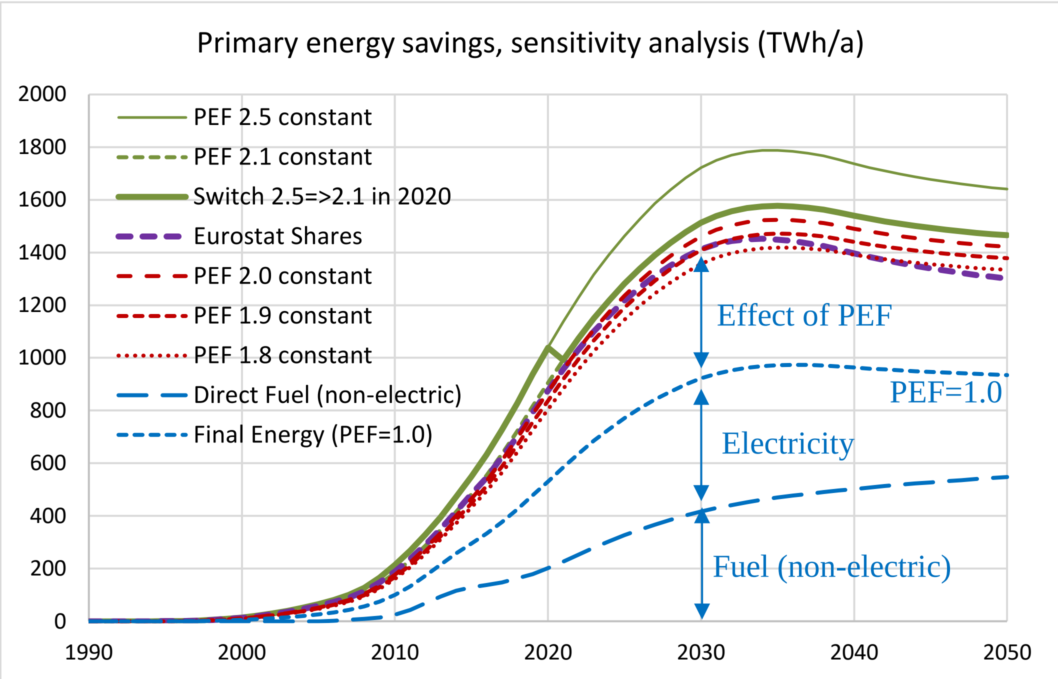


Figure 39: EU27 total primary energy consumption in the ECO-scenario (top) and primary energy savings versus BAU (bottom) in TWh/a, for 7 different sets of primary energy factors (PEF) for electricity generation and distribution. The graphs also indicate the direct (non-electric) fuel consumption and savings, which is a constant part of the total primary energy, not affected by the changes in PEF for electricity. The graphs also indicate the final energy consumption and savings, which correspond to using PEF=1.0 for electricity

Table 15 Comparison of total EU27 primary energy consumption and savings (in TWh/a) for EIA products for seven different sets of primary energy factors (PEF) for electricity generation and distribution.

EU27 total Primary Energy in TWh/a		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PEF 2.5 constant	**BAU**	8219	9629	9807	9908	9841	9777	9718	9701	9764	9873
	ECO	8219	9415	9257	8869	8378	8055	7930	7965	8087	8232
	SAVE	***0***	***214***	***550***	***1039***	***1463***	***1722***	***1788***	***1737***	***1677***	***1641***
PEF 2.1 constant	**BAU**	7534	8621	8731	8785	8695	8616	8546	8517	8558	8638
	ECO	7534	8437	8248	7880	7414	7102	6969	6978	7065	7173
	SAVE	***0***	***184***	***482***	***905***	***1281***	***1513***	***1577***	***1539***	***1493***	***1466***
Switch 2.5=>2.1 in 2020	**BAU**	8219	9629	9807	9908	8695	8616	8546	8517	8558	8638
(EIA2021 baseline)	**ECO**	8219	9415	9257	8869	7414	7102	6969	6978	7065	7173
	SAVE	***0***	***214***	***550***	***1039***	***1281***	***1513***	***1577***	***1539***	***1493***	***1466***
Eurostat Shares	**BAU**	8081	8770	8740	8543	8290	8055	7836	7660	7551	7477
	ECO	8081	8582	8257	7667	7073	6642	6387	6263	6211	6176
	SAVE	***0***	***188***	***483***	***876***	***1217***	***1413***	***1449***	***1396***	***1340***	***1301***
PEF 2.0 constant	**BAU**	7363	8369	8462	8504	8408	8325	8253	8221	8256	8330
	ECO	7363	8193	7996	7632	7173	6864	6729	6731	6809	6908
	SAVE	***0***	***176***	***466***	***872***	***1236***	***1461***	***1524***	***1490***	***1447***	***1422***
PEF 1.9 constant	**BAU**	7192	8117	8193	8223	8122	8035	7960	7924	7955	8021
	ECO	7192	7948	7744	7385	6931	6626	6489	6484	6554	6643
	SAVE	***0***	***169***	***449***	***838***	***1190***	***1409***	***1472***	***1440***	***1401***	***1378***
PEF 1.8 constant	**BAU**	7021	7865	7924	7942	7835	7744	7667	7628	7653	7713
	ECO	7021	7704	7492	7138	6690	6387	6249	6237	6298	6378
	SAVE	***0***	***161***	***432***	***805***	***1145***	***1357***	***1419***	***1391***	***1355***	***1335***

3.7.3. Sensitivity of EIA results to product non-compliance

The results presented in sections 3.4.2 through 3.4.7 do not consider possible effects of non-compliance. As explained in section 2.11, EIA provides an estimate for the reduction of reported savings due to a share of non-compliant products entering the market. By lack of further data, this reduction is assumed to be 10% for all years and all product groups and applied on the separate sheet 'NONCOMPLIANCE' (see Annex A) to the EIA totals for ELEC, FUEL, FNRG, NRG, EMISS and NRGCOST. Variations in total user expense (EXPENS) are the same as variations in energy costs.

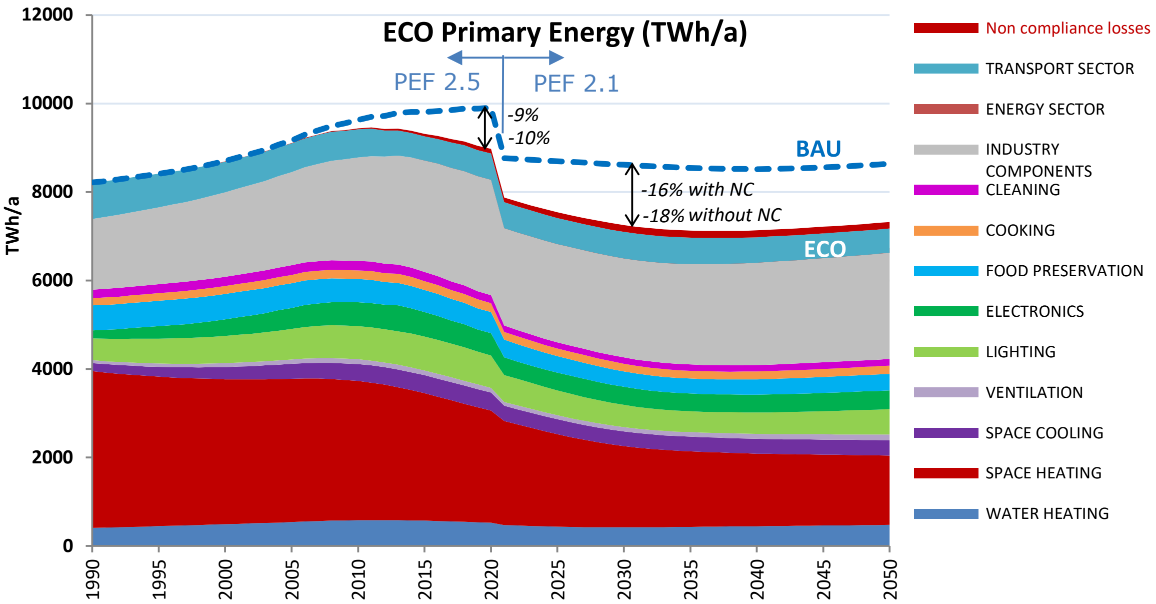


Figure 40. Primary energy consumption of products included in ecodesign impact accounting, status 31 December 2021 (energy sector impact not shown). The graph also indicates the possible reduction of the savings by 10% due to a share of non-compliant (NC) products.

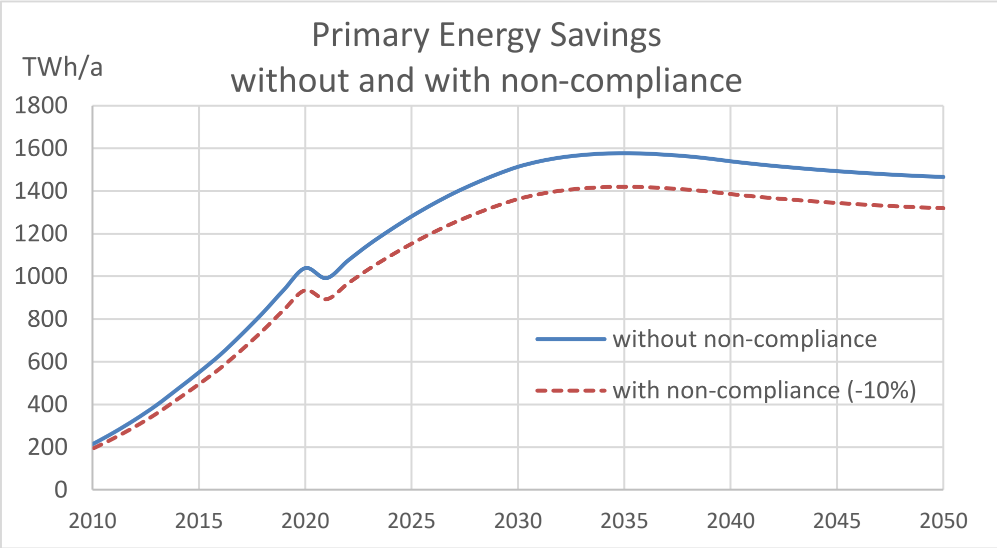


Figure 41. Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

Table 16: Reduction by 10% of energy-, emission- and cost-savings in 2020 and 2030 due to a share of products entering the market being non-compliant (NC) with Ecodesign and Energy Labelling regulations.

	2020					
	BAU	ECO no NC	ECO with NC	SAVE no NC	SAVE with NC	loss due to NC
Electricity (TWh/a)	2808	2473	2507	335	301	33
Final Fuel (TWh/a)	2888	2686	2706	202	182	20
Final Energy (TWh/a)	5696	5165	5218	531	478	53
Primary Energy (TWh/a)	9908	8869	8973	1039	935	104
GHG-emissions (MtCO2eq/a)	1209	1095	1106	114	103	11
Energy costs (bn euros/a)	641	567	574	74	67	7
User expense (bn euros/a)	1160	1103	1110	57	49	7
	2030					
	BAU	ECO no NC	ECO with NC	SAVE no NC	SAVE with NC	loss due to NC
Electricity (TWh/a)	2905	2383	2435	522	470	52
Final Fuel (TWh/a)	2516	2099	2141	417	375	42
Final Energy (TWh/a)	5420	4498	4590	922	830	92
Primary Energy (TWh/a)	8616	7102	7253	1513	1362	151
GHG-emissions (MtCO2eq/a)	926	766	782	160	144	16
Energy costs (bn euros/a)	743	607	621	136	122	14
User expense (bn euros/a)	1353	1242	1256	110	97	14

Final Energy does not count savings for Distribution Transformers.
Primary Energy: PEF 2.5 in 2020; PEF 2.1 in 2030
User Expense: assumes that NC does not change acquisition costs.

3.8. Differences in results with previous EIA editions

3.8.1. Differences between EIA2020 and EIA2021

Energy differences between EIA2021 and EIA2020 are small:

- After the extensive product updates in EIA2020, with large changes in energy consumption and savings compared to EIA2019, EIA2021 required only few updates, resulting in minor changes in energy consumption and savings compared to EIA2020, maximum around 1%.

Table 17 provides an overview of the changes in energy impact due to product updates implemented in EIA2021 (status December 2021) compared to EIA2020 (status December 2020). The changes are based on new information from review studies and some error corrections have been made, see section 1.2.2 for details. The table presents data for the primary energy consumption in year 2010 and for the primary energy savings in years 2020 (using PEF 2.5) and 2030 (using PEF 2.1). The EIA2021 data are reported as '*is*' values, the EIA2020 data as '*was*' values.

The total EU27 primary energy consumption in 2010 is 21 TWh (0.2%) higher than previously accounted. Table 17 provides the breakdown. The increase is mainly due to changing the double counting factor for stand-alone circulators. The removal of compressors from EIA (-132 TWh in 2010) [127] is compensated by the update for water pumps (+132 TWh in 2010) [128].

The primary energy savings in EIA2021 for year 2020 are 2 TWh (0.2%) higher than in EIA2020. In year 2030 they are 20 TWh (1.3%) lower. These differences are mainly due to changes in the double counting factor for stand-alone circulators and to the update for vacuum cleaners. For the latter, the 2030 decrease in savings of 18 TWh (37%) derives inter alia from a lower stock for mains-operated regulated products, while battery-operated products, which show an increasing stock, are not covered by current regulation and thus have no accounted savings.

[127] Compressors have been removed because there is no ecodesign regulation, and none is expected soon.

[128] The increase results from a more detailed accounting based on the review study. The new stock is lower, but average load is higher and average efficiencies are lower. In the new extended product approach, motor losses and VSD losses are included, while in previous versions the bare pump was considered. Data are preliminary, awaiting the final impact assessment for new proposed measures.

Table 17 List of energy impact changes in EIA2021 compared to EIA2020. BAU primary energy for year 2010, and primary energy savings for 2020 and 2030.

Product Group updated in EIA2021	BAU Primary Energy in TWh/a **year 2010**	Primary Energy Savings in TWh/a (PEF=2.5) **year 2020**	Primary Energy Savings in TWh/a (PEF=2.1) **year 2030**	Main reason for change
Dedicated Water Heaters (DWH)	was: 317 is: 305 **Variation: -12**	was: 24 is: 21 **Variation: -3**	was: 41 is: 36 **Variation: -5**	Update of Brexit factors for electric DWH (section 1.2.2.6)
Circulators (CIRC)	was: 0 is: 31 **Variation: +31**	was: 0 is: 10 **Variation: +10**	was: 0 is: 7 **Variation: +7**	Change in double counting factor for stand-alone CIRCs (section 1.2.2.5)
Vacuum Cleaners (VC)	was: 45 is: 47 **Variation: +2**	was: 33 is: 29 **Variation: -4**	was: 49 is: 31 **Variation: -18**	Update for existing measures, following review study (section 1.2.2.2)
Water Pumps (WP)	was: 264 is: 396 **Variation: +132**	was: 7 is: 8 **Variation: +1**	was: 9 is: 8 **Variation: -1**	Update for existing measures, following review study (section 1.2.2.3)
Standard Air Compressors (SAC)	was: 132 is: 0 **Variation: -132**	was: 2 is: 0 **Variation: -2**	was: 3 is: 0 **Variation: -3**	Product group removed from EIA (no regulation) (section 1.2.2.4)
Sum all products	was: 9608 is: 9629 **Variation: +21**	was: 1037 is: 1039 **Variation: +2**	was: 1533 is: 1513 **Variation: -20**	Total for all EIA products Variation sum of those above

3.8.2. Differences between the last six EIA editions

Table 18 provides the differences between the last six EIA issues, for primary energy savings, user expense savings and business revenues, for years 2020 and 2030.

The differences between EIA2016 and EIA2017 mainly resulted from updates for light sources and electric motors. The difference in 2020 primary energy savings (-130 TWh) derives from -35 TWh for light sources, -97 TWh for electric motors, and +3 TWh for changes in EIA methodology for Space Heating - Ventilation interaction.

The differences between EIA2017 and EIA2018 (-40 TWh in 2020) resulted for a large part from the update for Tyres (21 TWh less savings in 2020). See details in the 2018 EIA Status report.

The large decrease in user expense savings between EIA2017 and EIA2018 resulted from a combination of several factors:

- introduction of new electricity and gas rates for the tertiary sector,
- update of energy rates up to 2018 from Eurostat and Oil Bulletin,
- lower annual escalation rates for future prices of energy and resources,
- update of product data following review studies and impact assessments.

The increase in primary energy savings in EIA2019 compared to EIA2018 (at parity of PEF for electricity (2.5)), mainly resulted from the update for standby, partly compensated by the removal of UPS from EIA. See details in the 2019 EIA Status report.

The large decrease in savings in EIA2020 compared to EIA2019 derived from many product updates following review studies, e.g. for space heating by central heating boilers, water heating and ventilation units. The decrease is inter alia related to the 2008 economic crisis resulting in a collapse of the building market, and new data on water consumption in EU27. See details in the 2020 EIA Status report.

For the energy differences between EIA2021 and EIA2020, see Table 17 and text above. Monetary differences result from using 2020 euros instead of 2015 euros, new energy rates, and some product updates and corrections.

Table 18 Main recent changes in EIA results						
	Primary Energy Savings (TWh, mtoe)		User Expense Savings (bn euros)		Extra Business Revenues (bn euros)	
	2020 [129]	2030 [130]	2020	2030	2020	2030
EIA2016 for EU28 bn euros 2015	1918 TWh 165 mtoe	3206 TWh 276 mtoe	121	365	62	80
EIA2017 for EU28 bn euros 2015	1788 TWh 154 mtoe	3064 TWh 264 mtoe	112	349	63	81
EIA2018 for EU28 bn euros 2015	1748 TWh 150 mtoe	2988 TWh 257 mtoe	63	152	66	91
EIA2019 **for EU28** bn euros 2015	1777 TWh 153 mtoe	3005 TWh 258 mtoe **(PEF 2.5)** 2718 TWh 234 mtoe **(PEF 2.1)**	64	150	64	91
EIA2019 **for EU27** [131] bn euros 2015	1523 TWh 131 mtoe	2339 TWh 201 mtoe (PEF 2.1)	55	130	55	77
EIA2020 for EU27 bn euros 2015	1037 TWh 89 mtoe	1533 TWh 132 mtoe	60	118	21	29
EIA2021 for EU27 **bn euros 2020**	1039 TWh 89 mtoe	1513 TWh 130 mtoe	63 [132]	125 [132]	22	31

[129] For year 2020, PEF for electricity is 2.5 for all EIA editions

[130] In the EIA 2016, 2017, 2018 editions, the primary energy factor for electricity (PEF) was 2.5 for all years. Starting from the EIA 2019 edition, the PEF has been set to 2.1 for years 2021 and later. For comparison with earlier years, the 2030 primary energy savings for EIA2019 are reported both for PEF 2.5 and PEF 2.1.

[131] These data were saved in the EIA Masterfile after applying the Brexit factors, but before performing any product updates.

[132] For compatibility with the earlier EIA editions, which all used the EIA traditional approach to energy rates, the expense savings for EIA2021 in this table are also for the EIA traditional rates. When applying the energy rates from the PRIMES 2020 Reference scenario (which is the EIA2021 baseline for reporting), user expense savings would be 57 bn euros in 2020 and 110 bn euros in 2030 (both in 2020 euros), see section 3.6.1 for details.

3.9. Comparison between EIA and Eurostat

The comparison between EIA and Eurostat results presented below is based on data from the EIA ECO scenario and on data from the April 2022 edition of the Eurostat Energy Balance [133], which provides information up to year 2020.

The comparison is presented for:

- Primary energy, total over all usage sectors (3.9.1),
- Final energy, total over all usage sectors, and split per sector (3.9.2)
- Electricity, total over all usage sectors, and split per sector (3.9.3)
- Fuel, total over all usage sectors, split per sector, and split per fuel type for the residential and services sector (3.9.4)
- Split per final energy type and per end-use application for the residential sector in year 2019 [134] (3.9.5)

3.9.1. EIA – Eurostat comparison for primary energy

Figure 42 compares the total EU27 primary energy data of the EIA ECO scenario (for all usage sectors together, using PEF 2.5 for electricity) with the primary energy consumption (PEC - Europe 2020-2030) reported in Eurostat Energy Balance sheets.

In 2019, the primary energy consumed by EIA products represents 57% of the total EU primary energy consumption. In 2020 this is 62%, but this is mainly due to the effects of the Covid pandemic, which are included in Eurostat data, but not in the EIA.

The difference between Eurostat and the EIA is due to scope limitations: the EIA includes only products regulated in Ecodesign, Energy Labelling, legacy Energy Star or Tyre Labelling. In particular, the EIA does not cover large parts of industrial and transport energy consumption. District heating (distributed heat), ambient heat used by e.g. heat pumps, and solar heat is not accounted in the EIA, while coverage of renewables/biomass is partial.

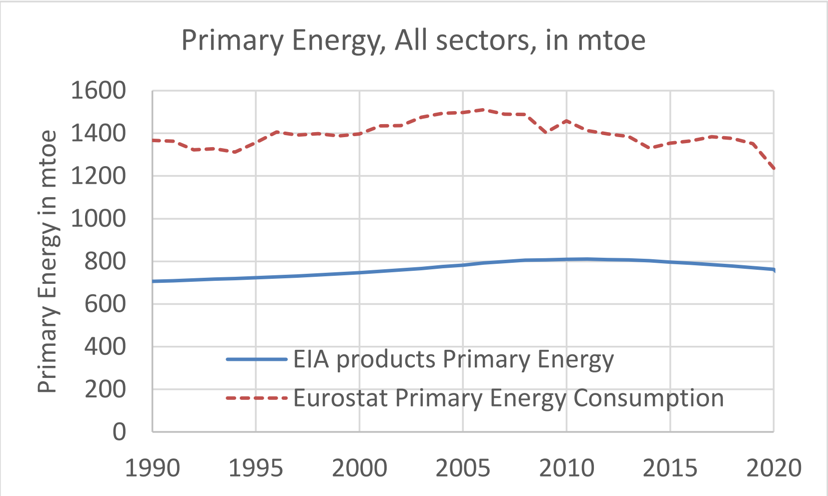


Figure 42 Comparison of total EU27 primary energy in the EIA ECO scenario with primary energy consumption (PEC Europe 2020-2030) as reported in Eurostat Energy Balance sheets. Eurostat data available until 2020. EIA data use PEF 2.5 for electricity for the period 1990-2020.

[133] Eurostat Energy Balance nrg_bal_c, ed. April 2022
[134] Eurostat data from online data code nrg_d_hhq, accessed April 2022

3.9.2. EIA – Eurostat comparison for final energy

Figure 43 compares the total EU27 final energy data of the EIA ECO scenario (for all usage sectors together) with the final energy consumption reported in Eurostat Energy Balance sheets.

In 2019, the final energy consumed by EIA products represents 48% of the total EU final energy consumption. In 2020 this is 50%, but this is mainly due to the effects of the Covid pandemic, which are included in Eurostat data, but not in the EIA.

The difference between Eurostat and the EIA is due to EIA scope limitations (see previous paragraph). As shown in the breakdown per sector in Figure 44, the EIA coverage is high for the residential and services sectors, and much lower for the industry, (road) transport, and 'other' sectors [135].

The EIA final energy for the residential sector is slightly lower than in Eurostat, which is reasonable considering the differences in scope [136]. The trend in residential final energy consumption in Eurostat over the 1990-2020 period is almost constant at 240-260 mtoe while in EIA there is a clear reduction in final energy consumption from 242 mtoe in 1990 to 181 mtoe in 2020.

For the services sector, the EIA final energy matches the Eurostat data, but there could be scope differences also here and EIA data could be on the high side [137].

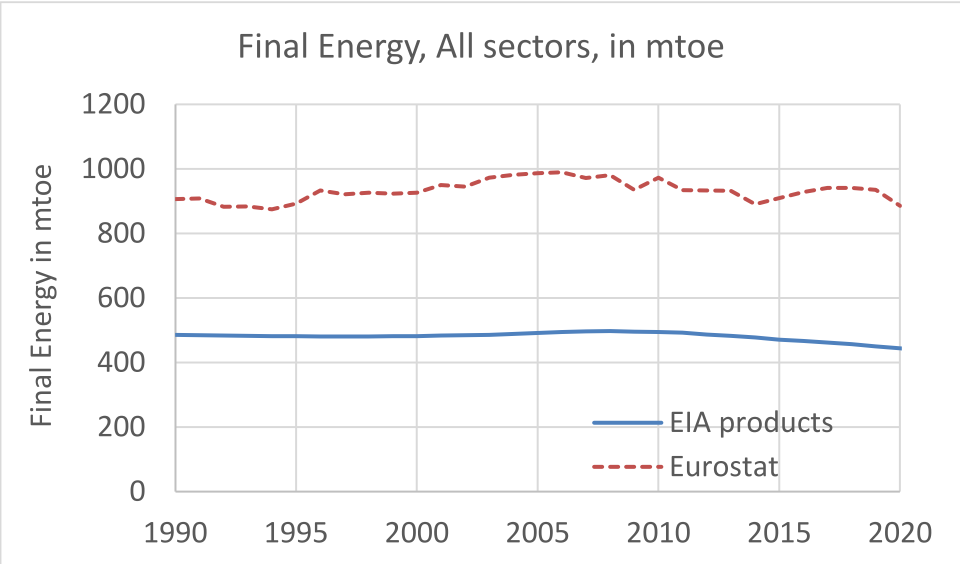


Figure 43 Comparison of total EU27 final energy in the EIA ECO scenario with final energy consumption reported in Eurostat Energy Balance sheets. Eurostat data available until 2020.

[135] The 'other' sector in the EIA covers e.g. agriculture, forestry and fishing.

[136] E.g. ironing, small appliances (except standby), and a part of ICT-products are not accounted in the EIA. It is estimated that these products represent around 81 TWh (7 mtoe) of additional final energy consumption.

[137] For the services / tertiary sector it needs to be further clarified exactly which energy consumption is included in Eurostat data. At the moment the differences in scope have a margin of uncertainty that makes it difficult to draw conclusions. EIA could reconsider and further diversify the sector usage shares in the next edition (see section 2.4 and sheet SHARES in Annex A).

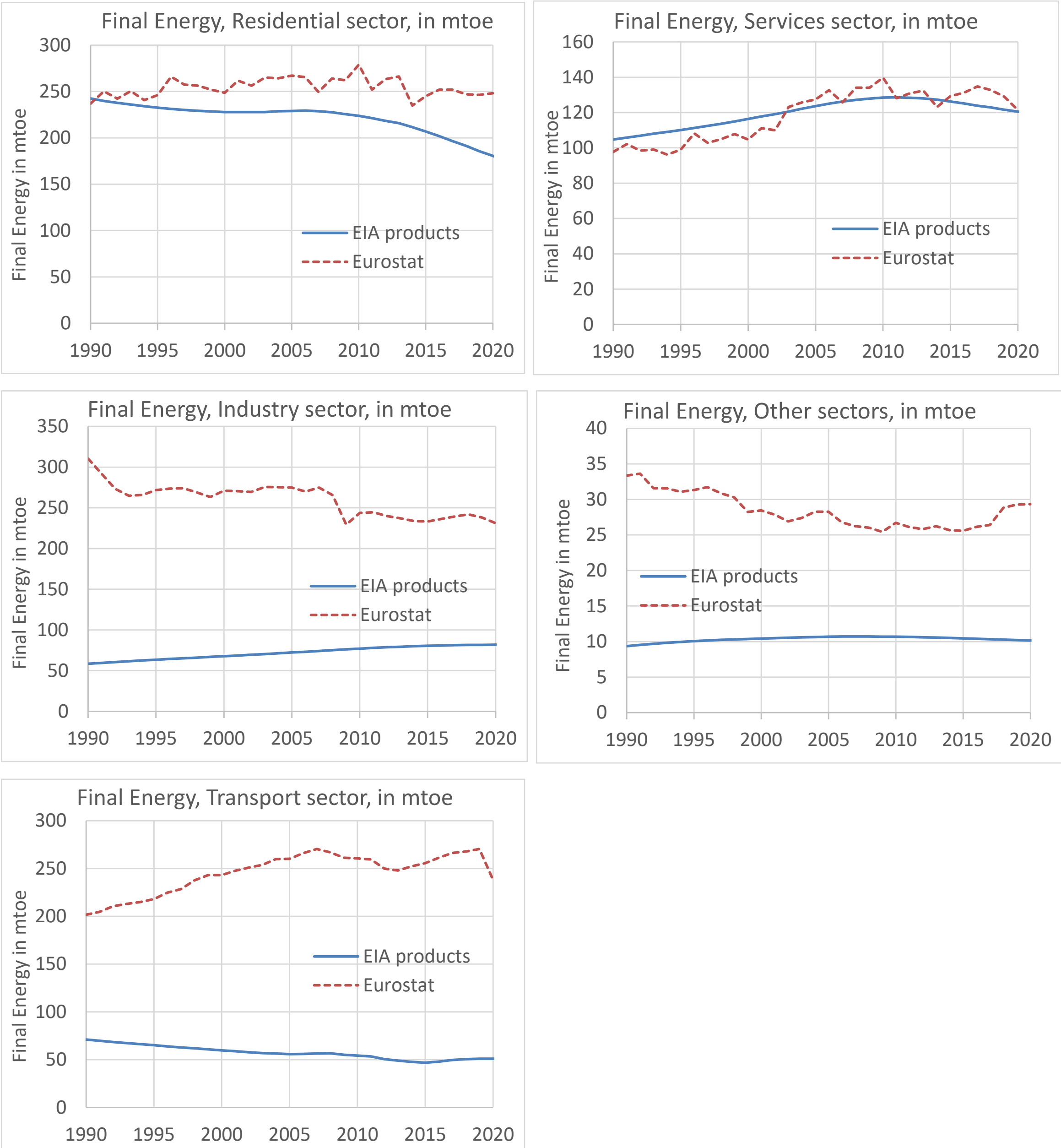


Figure 44 Comparison per usage sector of total EU27 final energy in the EIA ECO scenario with final energy consumption reported in Eurostat Energy Balance sheets (Eurostat data for transport are for road transport only).

3.9.3. EIA – Eurostat comparison for electricity consumption

Figure 45 compares the total EU27 electricity of the EIA ECO scenario (for all usage sectors together) with the electricity consumption reported in Eurostat Energy Balance sheets.

The electricity consumption of EIA products matches the total EU electricity consumption over the entire 1990-2020 period, with differences well within 10%. The period 2009-2020 shows an excellent match. As shown in the breakdown per sector in Figure 46, the EIA is high for electricity consumption in the services and 'other' sectors, and low for the industry sector, while there is a good match for the residential sector.

For the services sector the same remarks apply as made for final energy: scope differences need to be clarified and the EIA could reconsider the usage sector shares [137].

The 'other' sector in the EIA covers e.g. agriculture, forestry and fishing. The share of this sector in the overall energy consumption of a product group is small and difficult to estimate. E.g. changing a usage sector share for a product group in EIA from 0.5% to 0.4% would change the electricity consumption in this sector by 20%. Also here: EIA could reconsider the usage sector shares.

The lower EIA values for the industry sector are due to the partial EIA coverage in this sector.

As regards the residential sector, in the period 1990-2008, the EIA electricity consumption is around 10% higher than in Eurostat, while trends are the same. This can be considered a good match, even if it would have been preferable, considering scope differences, to have EIA values slightly below the Eurostat level (or Eurostat values slightly above EIA).

The downward trend in residential electricity consumption in EIA over the 2013-2020 period is not confirmed by Eurostat. Considering that trends for the total electricity consumption over all sectors match, this could be a matter of distribution of the consumption over the sectors.

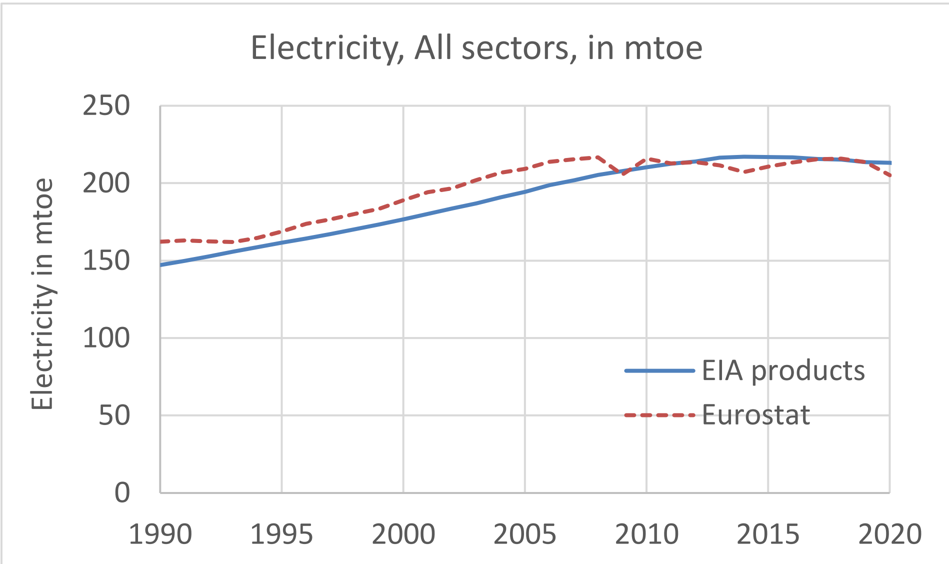


Figure 45 Comparison of total EU27 electricity consumption in the EIA ECO scenario with electricity consumption reported in Eurostat Energy Balance sheets. Eurostat data available until 2020.

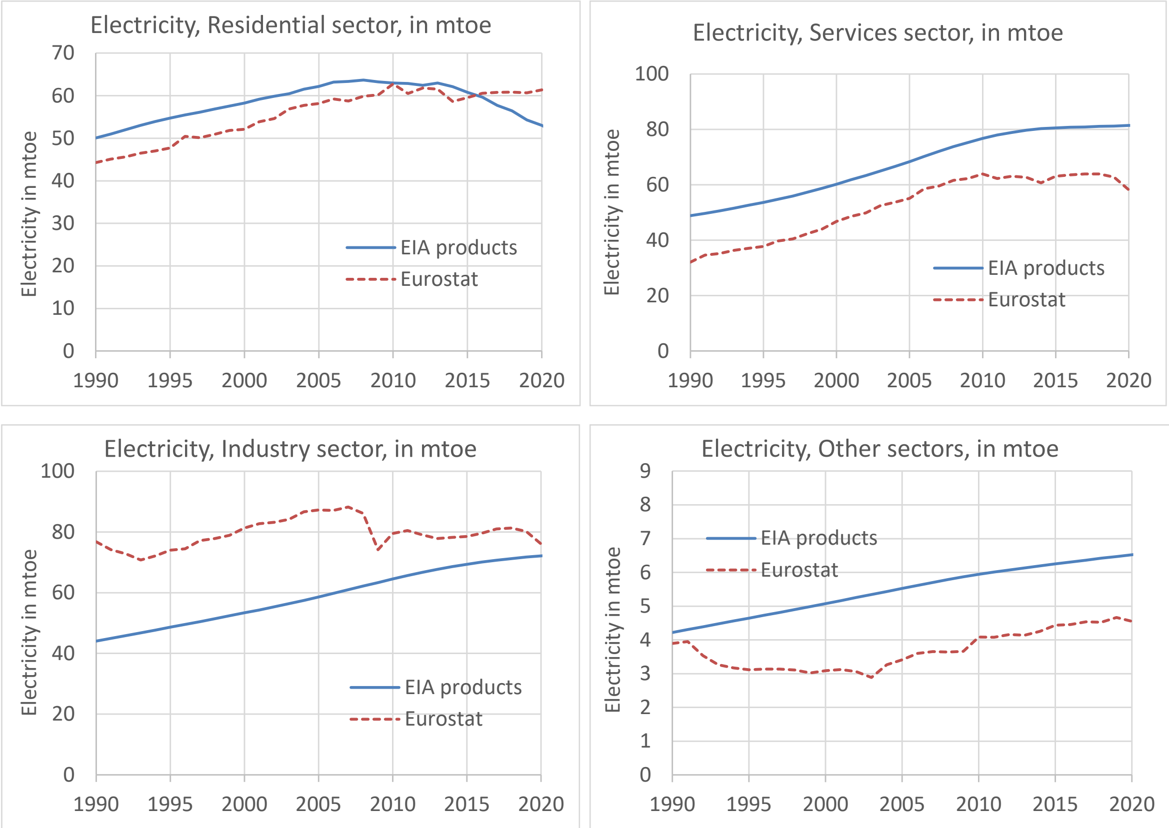


Figure 46 Comparison per usage sector of total EU27 electricity in the EIA ECO scenario with electricity consumption reported in Eurostat Energy Balance sheets.

3.9.4. EIA – Eurostat comparison for fuel consumption

Fuel in the EIA indicates all final energy input to products that is not electricity. Figure 47 compares the total EU27 fuel consumption of the EIA ECO scenario (for all usage sectors together) with the non-electric final energy consumption reported in Eurostat Energy Balance sheets (incl. solid fuels, oil and petroleum products, gas, renewables, wastes, derived heat).

In 2020, the final fuel consumed by EIA products represents 34% of the total EU non-electric final energy consumption. As shown in the breakdown per sector in Figure 48, the EIA coverage is low for the industry, (road) transport, and ‘other’ sectors. This is due to the partial EIA-coverage of products used in these sectors. For instance, for the transport sector EIA covers only the energy losses due to the rolling resistance of tyres, which is only a small part of the overall fuel consumption for road transport.

As regards the residential and services sectors the EIA coverage is much higher. For the sum of these two sectors, a further breakdown per fuel type in Figure 49 shows a match between EIA consumption and Eurostat consumption for solid fuels (EIA: coal), natural gas, and liquid fuels. The difference is mainly in renewables/biomass (EIA: wood) where the EIA scope is partial. In addition (not shown in the figures) EIA does not account distributed heat (district heating), ambient heat for heat pumps and solar heat, while these contributions are present in the Eurostat totals of Figure 47 and Figure 48.

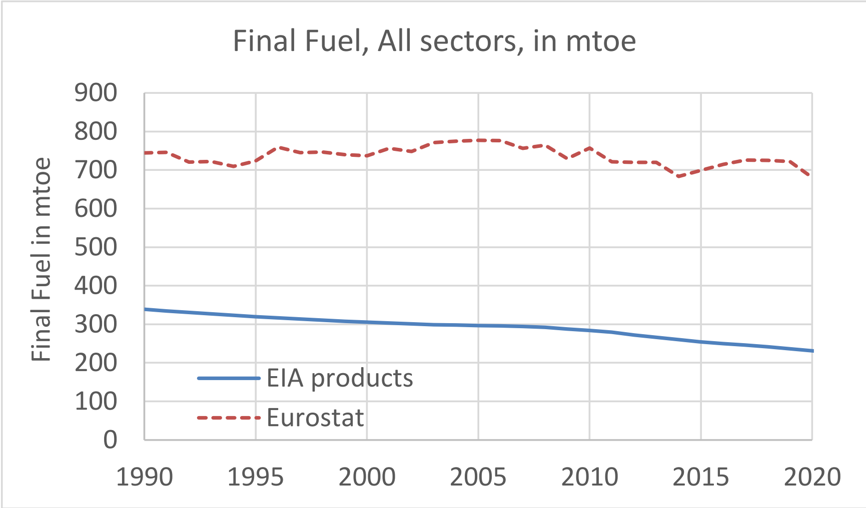


Figure 47 Comparison of total EU27 fuel consumption in the EIA ECO scenario with non-electric final energy consumption reported in Eurostat Energy Balance sheets.

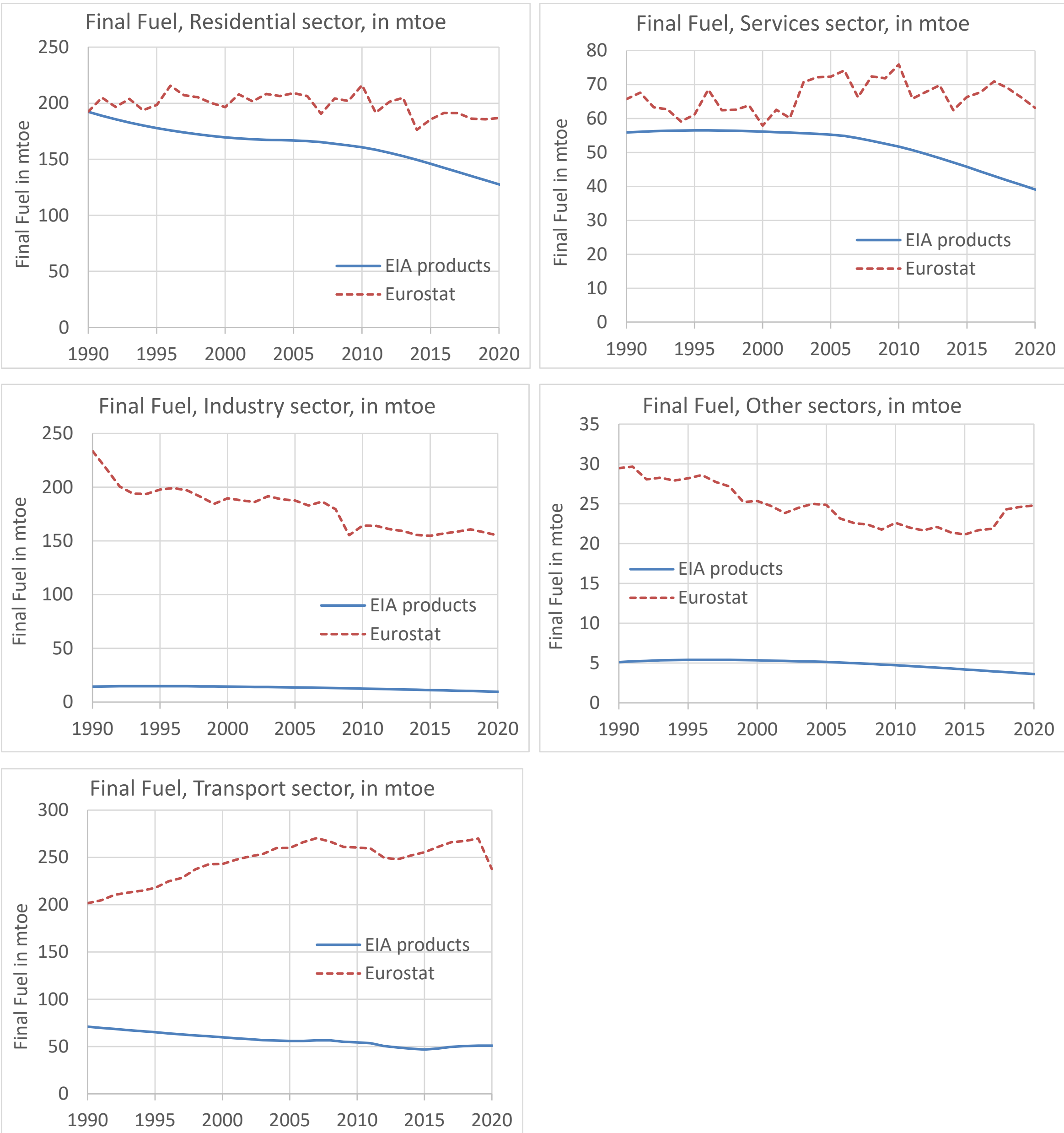


Figure 48 Comparison per usage sector of total EU27 fuel in the EIA ECO scenario with non-electric final energy consumption reported in Eurostat Energy Balance sheets (Eurostat data for transport are for road transport only)

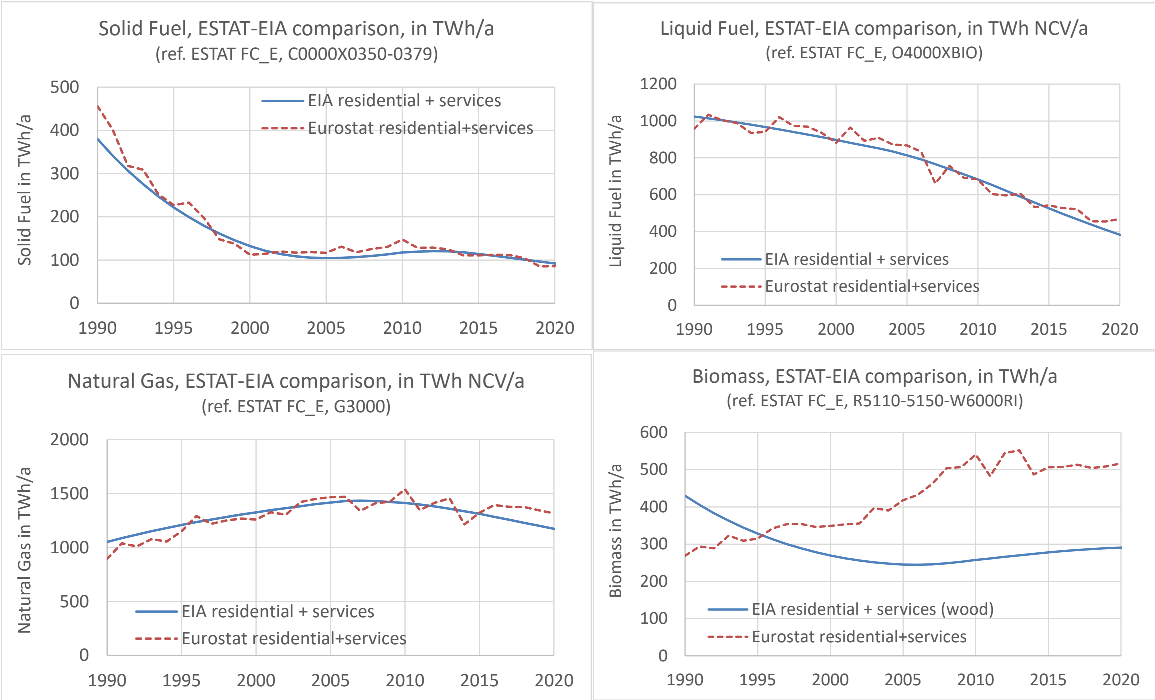


Figure 49 Comparison for the sum of residential and services sectors of EU27 fuel consumption per fuel type in the EIA ECO scenario with the comparable consumption reported in Eurostat Energy Balance sheets (ESTAT reference codes in graph titles).

3.9.5. EIA – Eurostat comparison for households in 2019

In addition to the overall data for the residential sector from the Eurostat Energy Balance sheets presented above, data on the final energy consumption of households broken down by end-use have been collected and published by Eurostat since 2017. This allows a more detailed analysis of the differences between Eurostat and the the EIA. Table 19 shows these details for year 2019 [138]. The Eurostat value without derived heat, solar heat, ambient heat and biogas is used as reference because that value comes closest to what is accounted in the EIA.

Remarks on Table 19 (applies to residential sector, year 2019, EU27 totals):

- Final energy consumption in the EIA is 363 TWh (14%) lower than the comparable value in Eurostat. This difference derives for 100 TWh (28%) from space heating, 85 TWh (23%) from lighting and appliances, 84 TWh (23%) from cooking, 64 TWh (18%) from water heating, 3 TWh (1%) from space cooling and 27 TWh (7%) from other end-uses.
- Electricity consumption in the EIA is 76 TWh (11%) lower than in Eurostat. However, electricity consumption in the EIA is higher than Eurostat for space heating (+70 TWh), and lower for lighting and appliances (-85 TWh), cooking (-24 TWh), water heating (-11 TWh), space cooling (-3 TWh) and other end-uses (-23 TWh).
- Fuel consumption in the EIA is 287 TWh (16%) lower than in Eurostat. This difference derives for 170 TWh (59%) from space heating, 60 TWh (21%) from cooking, 53 TWh (18%) from water heating, and 4 TWh (1%) from other end-uses.

[138] Source for Eurostat data is online data code nrg_d_hhq, accessed in April 2022. EU totals are provided only for 2019, which was the latest year available. In other years contributions for some countries are missing in Eurostat. Data converted from TJ to TWh NCV by VHK.

- For space heating, the final energy consumption in the EIA is 100 TWh (6%) lower than in Eurostat. The electricity consumption in the EIA is 70 TWh (73%) higher; the fuel consumption 170 TWh (12%) lower.
- The electricity consumption for space heating in the EIA of 166 TWh derives for 101 TWh (61%) from local heaters, mainly from electric convectors. This product group has recently been reviewed and was updated in EIA2020. Estimated electricity savings on local heaters in 2019 are around 4 TWh, so if there is any overestimation of savings or any non-compliance, the effect of this on EIA totals will be negligible [139].
- Another 48 TWh (29%) of electricity consumption in the EIA comes from central heating boilers. This includes electric Joule-effect boilers and electric heat pumps, but almost half of the electricity is consumed by circulators, controls, fans, valves, pumps, etc. of gas/oil boilers. It is not clear if Eurostat data capture this latter contribution.
- The difference in fuel consumption for space heating between the EIA and Eurostat of 170 TWh derives almost entirely from heaters using solid fuels and renewables. Central heating boilers operating on gas or oil have the same consumption as in Eurostat.
- As regards solid fuels and renewables, the Ecodesign regulation on solid fuel boilers (CR 2015/1189) excludes boilers > 500 kW, co-generation devices > 50 kW, and heaters using non-woody biomass. The regulation on local space heaters using solid fuels (CR 2015/1185) also excludes LSHs specified for the combustion of non-woody biomass only. The 170 TWh missing in the EIA compared to Eurostat are mainly due to products being out-of-scope for Ecodesign and Energy labelling.
- For water heating, the final energy consumption in the EIA is 64 TWh (19%) lower than in Eurostat, of which 53 TWh are due to a lower fuel consumption. Of these, 35 TWh come from solid fuels and renewables, which are not being accounted in the EIA because out-of-scope of the regulations. For water heating by gas/oil, the EIA is 18 TWh lower, and for electricity 11 TWh lower.
- For cooking, the final energy consumption in the EIA is 84 TWh (49%) lower than in Eurostat. The electricity consumption is 24 TWh (28%) lower, while the fuel consumption 60 TWh (70%) lower [140].
- As regards electricity for cooking, the EIA considers electric hobs, ovens and range hoods, including their consumption in standby. The EIA does not include e.g. microwaves, small ovens, portable ovens, coffeemakers (except standby), electric kettles, toasters, because not covered by Ecodesign regulations. This scope difference could explain a part of the 24 TWh difference with Eurostat, although Eurostat might have accounted some of these devices under lighting and appliances rather than under cooking.
- As regards fuel for cooking, the EIA considers only devices using gas (others excluded from Ecodesign). Hence, the corresponding 31 TWh of Eurostat for other fuels (incl. LPG) are not accounted in the EIA.
- For gas cooking, EIA consumption is 29 TWh (53%) lower than Eurostat. This difference is not due to overestimating savings in EIA (less than 1 TWh), so it must be due to the scope or due to assumptions on the stock of appliances, on the loads (average power, usage times) and on the efficiencies. As regards the scope,

[139] The review study considered that 30% of the fixed electric heaters and 90% of the underfloor heaters is sold without controls, as slave-heaters, and thus not subject to CR 1188/2015, resulting in lower average ECO efficiency than assumed in previous studies.

[140] EIA2021 does not consider the 2021 review study on cooking appliances, which would lead to even larger differences with Eurostat data. See also section 1.2.2.8

Ecodesign regulation does not cover e.g. cookers designed only for 3rd family gases (propane, butane [141]); covered gas burners; gas burners < 1.16 kW.

- For lighting and appliances, the electricity consumption in the EIA is 85 TWh (21%) lower than in Eurostat. This difference is mainly due to a difference in scope. EIA does not account e.g. ironing, small appliances (except standby) and a part of the information-, communication and entertainment products. It has been estimated that these products represent a consumption of 81 TWh.
- For space cooling, the final energy consumption in the EIA is 3 TWh (26%) lower than in Eurostat.

Table 19 Comparison of final energy between Eurostat and the EIA for the residential sector in year 2019, divided per end-use and type of energy input. EIA values are indicated for the ECO scenario (without and with 10% non-compliance) and for the BAU scenario. Values for EU27 in TWh NCV/a.

Residential sector, year 2019 Values for EU27 in TWh NCV/a		Eurostat total (0)	Eurostat scope (1)	EIA ECO (2)	EIA ECO-NC (3)	EIA BAU (4)	difference (2) - (1) (5)	ratio (2) / (1) (6)
Residential sector, all uses	**Final Energy**	**2861**	**2522**	**2159**	**2188**	**2448**	**-363**	**86%**
Space Heating	FNRG	1819	1564	1464	1475	1569	-100	94%
Space Cooling	FNRG	12	12	9	10	14	-3	74%
Water Heating	FNRG	424	342	278	280	296	-64	81%
Cooking	FNRG	175	172	88	89	92	-84	51%
Lighting and Appliances	FNRG	404	404	319	335	478	-85	79%
Other End uses	FNRG	27	27	0	0	0	-27	0%
Residential sector, all uses	**Electricity**	**708**	**708**	**632**	**650**	**817**	**-76**	**89%**
Space Heating	ELEC	96	96	166	168	182	70	173%
Space Cooling	ELEC	12	12	9	10	14	-3	74%
Water Heating	ELEC	86	86	74	75	78	-11	87%
Cooking	ELEC	87	87	63	63	66	-24	72%
Lighting and Appliances	ELEC	404	404	319	335	478	-85	79%
Other End uses	ELEC	23	23	0	0	0	-23	0%
Residential sector, all uses	**(Final) Fuel**	**2153**	**1814**	**1527**	**1537**	**1631**	**-287**	**84%**
Space Heating	FUEL	1722	1468	1298	1307	1387	-170	88%
Space Cooling	FUEL	0	0	0	0	0	0	
Water Heating	FUEL	338	256	204	205	218	-53	79%
Cooking	FUEL	88	85	25	25	26	-60	30%
Lighting and Appliances	FUEL	0	0	0	0	0	0	
Other End uses	FUEL	5	4	0	0	0	-4	0%
Space Heating	**FNRG**	**1819**	**1564**	**1464**	**1475**	**1569**	**-100**	**94%**
Space Heating	**ELEC**	**96**	**96**	**166**	**168**	**182**	**70**	**173%**
Central Heating Boilers	ELEC			48	48	54		
Air Heaters	ELEC			1	1	1		
Local Heaters	ELEC			101	102	105		
reversible RAC	ELEC			15	16	22		
Space Heating	**FUEL**	**1722**	**1468**	**1298**	**1307**	**1387**	**-170**	**88%**
Space Heating	***GAS/OIL***	**955**	**955**	**954**	**962**	**1038**	**-1**	**100%**
Central Heating Boilers	GAS/OIL			946	955	1031		
Air Heaters	GAS/OIL			2	2	2		
Local Heaters	GAS/OIL			5	5	5		
Space Heating	***SOLID&RNW***	**583**	**513**	**344**	**345**	**349**	**-169**	**67%**

[141] LPG is covered in Eurostat under oil and petroleum products, not under natural gas.

Residential sector, year 2019 Values for EU27 in TWh NCV/a		Eurostat total (0)	Eurostat scope (1)	EIA ECO (2)	EIA ECO-NC (3)	EIA BAU (4)	difference (2) - (1) (5)	ratio (2) / (1) (6)
Solid Fuel Boilers	SOLID&RNW			192	193	195		
Local Heaters (stoves)	SOLID&RNW			152	152	154		
Space Heating	***Derived Heat***	**184**	**0**	**0**	**0**	**0**	**0**	
Water Heating	**FNRG**	**424**	**342**	**278**	**280**	**296**	**-64**	**81%**
Water Heating	**ELEC**	**86**	**86**	**74**	**75**	**78**	**-11**	**87%**
Water Heating	**FUEL**	**338**	**256**	**204**	**205**	**218**	**-53**	**79%**
Water Heating	GAS/OIL	222	222	204	205	218	-18	92%
Water Heating	SOLID&RNW	62	35	0	0	0	-35	0%
Water Heating	Derived Heat	54	0	0	0	0	0	
Cooking	**FNRG**	**175**	**172**	**88**	**89**	**92**	**-84**	**51%**
Cooking	**ELEC**	**87**	**87**	**63**	**63**	**66**	**-24**	**72%**
Cooking	**FUEL**	**88**	**85**	**25**	**25**	**26**	**-60**	**30%**
Cooking	GAS	54	54	25	25	26	-29	47%
Cooking	Other Fuel	34	31	0	0	0	-31	0%
Lighting and Appliances	**ELEC**	**404**	**404**	**319**	**335**	**478**	**-85**	**79%**
Light sources	ELEC			49	54	93		
Electronics	ELEC			108	112	145		
Food preservation	ELEC			58	63	106		
Cleaning	ELEC			66	69	95		
Ventilation (electricity use)	ELEC			8	8	8		
Water pumps	ELEC			30	30	30		

Column (0): Eurostat data from online data code nrg_d_hhq for year 2019 (accessed April 2022).
Column (1): Eurostat excluding derived heat, solar heat, ambient heat, biogas (closest match to EIA scope)
Column (2): EIA data for ECO-scenario without non-compliance
Column (3): EIA data for ECO-scenario with non-compliance (10% lower savings)
Column (4): EIA data for BAU-scenario
Column (5): Difference in TWh computed as EIA ECO (2) minus Eurostat scope (1)
Column (6): Ratio in % computed as EIA ECO (2) divided by Eurostat scope (1)
FNRG= final energy; ELEC=electricity; NC=non-compliance; RNW=renewables and waste.

Annexes of the EIA2021 Status Report

ANNEX A: Ecodesign Impact Accounting by Parameter

CONTENTS

Revenue of market actors

REV_IND_BAU	Revenue industry (including OEM, services), in m euros/a, BAU scenario
REV_IND_ECO	Revenue industry (including OEM, services), in m euros/a, ECO scenario
REV_WHOLE_BAU	Revenue wholesale (including agents, importers), in m euros/s, BAU scenario
REV_WHOLE_ECO	Revenue wholesale (including agents, importers), in m euros/s, ECO scenario
REV_RETAIL_BAU	Revenue retail, in m euros/a, BAU scenario
REV_RETAIL_ECO	Revenue retail, in m euros/a, ECO scenario
REV_INST_BAU	Revenue from installation, in m euros/a, BAU scenario
REV_INST_ECO	Revenue from installation, in m euros/a, ECO scenario
REV_MAINT_BAU	Revenue from maintenance EXCL VAT, in m euros (for BAU scenario))
REV_MAINT_ECO	Revenue from maintenance EXCL VAT, in m euros (for ECO scenario))

Other sheets

HOUSEHOLDS	Sales, Stock, Energy, Emission and User Expense data per average EU household
NONCOMPLIANCE	Estimated effect of Non-Compliance with regulations on Energy, Emissions and Costs

GENERAL Data used in EIA (part 1)

This sheet groups some general data used in EIA, i.e. data that are not product-specific
For some data the user can choose an option; input fields have cyan coloured backgrounc
See notes [x] at the end of the sheet for further information. See also sheet 'General_2'

Efficiency of Electricity Generation and Distribution (CC=1/PEF) (PEF=Primary Energy Factor) [1]

Choose set to use:	CCset4	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
CCset1: constant 40%, EIA traditional	CCset1	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
CCset2: constant 48%, EED 2018	CCset2	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%
CCset3: variable, Eurostat Shares	CCset3	41.3%	46.3%	47.5%	49.7%	51.0%	52.4%	53.8%	55.2%	56.6%	58.0%
CCset4: variable, 2020 PEF switch	CCset4	40.0%	40.0%	40.0%	40.0%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%
CCactive, now in use:	**CCact**	**40.0%**	**40.0%**	**40.0%**	**40.0%**	**47.6%**	**47.6%**	**47.6%**	**47.6%**	**47.6%**	**47.6%**

Global Warming Potential (GWP-100) for electricity generation and distribution, in kg CO2 eq/kWh [2]

Choose set to use:	GWPel2	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
GWPel1: EIA traditional, MEErP based [2a]	GWPel1	0.500	0.410	0.395	0.380	0.360	0.340	0.320	0.300	0.280	0.260
GWPel2: PRIMES 2020_v6 REF scenario[2b]	GWPel2	0.500	0.318	0.305	0.214	0.179	0.143	0.109	0.075	0.061	0.061
GWPel3: PRIMES 2020 MIX scenario [2b]	GWPel3	0.500	0.318	0.305	0.213	0.149	0.100	0.037	-0.001	-0.004	-0.008
GWPel4: EEA 2020 [2c]	GWPel4	0.501	0.334	0.313	0.231	0.172	0.114	0.101	0.088	0.074	0.061
GWP electricity active, now in use:	**GWPact**	**0.500**	**0.318**	**0.305**	**0.214**	**0.179**	**0.143**	**0.109**	**0.075**	**0.061**	**0.061**
(for GWP-values for fuels, see sheet EMISRATES)											

Energy Rates

All rates presented on this sheet are in 2020-euros (inflation corrected).
For electricity-, gas-, heating oil- and LPG-rates, the user can choose the dataset to apply: EIA-traditional set, PRIMES 2020 reference or mix scenario, or 2022 Peak set of rates.
The EIA traditional rates are derived from the nominal rates (not inflation corrected) presented on sheet 'General_2', see also source information and possible user-settings there. The inflation indexes applied are the HICP for all items, from Eurostat (see sheet 'General_2'). For years following the last year for which nominal rates are available, an x%/a annual price increase is assumed (on top of the inflation). This percentage (escalation rate) can be set by the user below, for each entry separately. Until the 2017 edition, EIA used 4%/a, which is the value recommended in the MEErP. Following the PRIMES 2016 and 2020 reference scenarios, later EIA editions used lower escalation rates
The PRIMES rates have been taken directly from the 2020 reference scenario and 2020 mix scenario, but converting from prices per toe to prices per kWh and from 2015 euros to 2020 euros.

The rates for the 2022 peak scenario are a preliminary attempt to model the impact of the peak in energy rates that occurred in the last months of 2021 and the first months of 2022. This is a placeholder for a more official EC/PRIMES scenario that was not available in time for implementation in EIA 2021.
Residential rates include taxes and levies (20% VAT assumed where not already included in reference data
Non-residential rates (industry, services, other sector) exclude VAT and other recoverable taxes and levie
See sheet 'General_2' for user-settings regarding the tertiary/services sector rates.
The rates for the tertiary/services sector are also applied to the 'other sector' (agriculture, fishing, forestry)

Choose Electricity Rate to use:	PRIMES 2020 Reference scenario (v6)

EIA traditional inflation corrected, 2020 euros

Electricity Rates 1 (€/kWh)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1.0%	0.219	0.199	0.221	0.213	0.231	0.243	0.255	0.268	0.282	0.296
Industry sector	1.0%	0.138	0.118	0.122	0.125	0.140	0.147	0.154	0.162	0.170	0.179
Tertiary/Services & Other sector	1.0%	0.203	0.183	0.201	0.196	0.213	0.224	0.235	0.247	0.260	0.273

PRIMES 2020 Reference scenario (v6) inflation corrected, 2020 euros

Electricity Rates 2 (€/kWh) [3]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.219	0.178	0.186	0.204	0.212	0.221	0.219	0.220	0.221	0.224
Industry sector	0.127	0.101	0.098	0.097	0.101	0.106	0.106	0.107	0.107	0.108
Tertiary/Services & Other sector	0.175	0.155	0.166	0.188	0.195	0.203	0.202	0.201	0.201	0.204

PRIMES 2020 Mix scenario inflation corrected, 2020 euros

Electricity Rates 3 (€/kWh) [4]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.219	0.178	0.186	0.204	0.216	0.223	0.229	0.238	0.242	0.238
Industry sector	0.127	0.101	0.098	0.097	0.100	0.100	0.100	0.106	0.111	0.113
Tertiary/Services & Other sector	0.175	0.155	0.166	0.188	0.197	0.202	0.205	0.212	0.218	0.216

User-defined scenario inflation corrected, 2020 euros

Electricity Rates 4 (€/kWh) [5]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.219	0.178	0.186	0.204	0.262	0.270	0.279	0.288	0.288	0.288
Industry sector	0.127	0.101	0.098	0.097	0.125	0.129	0.135	0.139	0.139	0.139
Tertiary/Services & Other sector	0.175	0.155	0.166	0.188	0.240	0.249	0.257	0.265	0.265	0.265

(Active, now used in EIA) (these data are copied to sheet Rates)

Electricity Rates Active (€/kWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.219	0.178	0.186	0.204	0.212	0.221	0.219	0.220	0.221	0.224
Industry sector	0.127	0.101	0.098	0.097	0.101	0.106	0.106	0.107	0.107	0.108
Tertiary/Services & Other sector	0.175	0.155	0.166	0.188	0.195	0.203	0.202	0.201	0.201	0.204

Choose Natural Gas Rate to use:	PRIMES 2020 Reference scenario (v6)

EIA traditional inflation corrected, 2020 euros

Natural Gas Rates 1 (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1.0%	0.063	0.074	0.082	0.074	0.079	0.083	0.088	0.092	0.097	0.102
Industry sector	1.0%	0.029	0.041	0.042	0.032	0.040	0.042	0.044	0.047	0.049	0.051
Tertiary/Services sector	1.0%	0.051	0.063	0.068	0.060	0.066	0.069	0.073	0.076	0.080	0.084
Agriculture/Other sector	1.0%	0.051	0.063	0.068	0.060	0.066	0.069	0.073	0.076	0.080	0.084

PRIMES 2020 Reference scenario (v6) inflation corrected, 2020 euros

Natural Gas Rates 2 (€/kWh) [3]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.052	0.072	0.078	0.054	0.067	0.078	0.081	0.085	0.087	0.088
Industry sector	0.027	0.040	0.038	0.024	0.030	0.037	0.039	0.043	0.046	0.046
Tertiary/Services sector	0.043	0.058	0.065	0.044	0.054	0.063	0.066	0.070	0.072	0.072
Agriculture/Other sector	0.040	0.055	0.056	0.045	0.053	0.062	0.065	0.069	0.071	0.072

PRIMES 2020 Mix scenario inflation corrected, 2020 euros

Natural Gas Rates 3 (€/kWh) [4]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.052	0.072	0.078	0.054	0.077	0.091	0.110	0.145	0.158	0.152
Industry sector	0.027	0.040	0.038	0.024	0.031	0.038	0.042	0.058	0.111	0.113
Tertiary/Services sector	0.043	0.058	0.065	0.044	0.062	0.075	0.092	0.121	0.129	0.123
Agriculture/Other sector	0.040	0.055	0.056	0.045	0.054	0.063	0.066	0.081	0.127	0.127

User-defined scenario inflation corrected, 2020 euros

Natural Gas Rates 4 (€/kWh) [5]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.052	0.072	0.078	0.054	0.101	0.119	0.141	0.159	0.159	0.159
Industry sector	0.027	0.040	0.038	0.024	0.045	0.056	0.068	0.079	0.079	0.079
Tertiary/Services sector	0.043	0.058	0.065	0.044	0.082	0.097	0.115	0.131	0.131	0.131
Agriculture/Other sector	0.040	0.055	0.056	0.045	0.082	0.097	0.115	0.131	0.131	0.131

(Active, now used in EIA) (these data are copied to sheet Rates)

Natural Gas Rates Active (€/kWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.052	0.072	0.078	0.054	0.067	0.078	0.081	0.085	0.087	0.088
Industry sector	0.027	0.040	0.038	0.024	0.030	0.037	0.039	0.043	0.046	0.046
Tertiary/Services sector	0.043	0.058	0.065	0.044	0.054	0.063	0.066	0.070	0.072	0.072
Agriculture/Other sector	0.040	0.055	0.056	0.045	0.053	0.062	0.065	0.069	0.071	0.072

Choose Heating Oil Rate to use:	PRIMES 2020 Reference scenario (v6)

EIA traditional inflation corrected, 2020-euros

Heating Oil Rates 1 (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	2.0%	0.044	0.083	0.073	0.059	0.083	0.092	0.101	0.112	0.123	0.136
Industry sector	1.5%	0.038	0.069	0.061	0.050	0.068	0.073	0.079	0.085	0.091	0.098
Tertiary/Services & Other sector	1.5%	0.038	0.069	0.061	0.050	0.068	0.073	0.079	0.085	0.091	0.098

PRIMES 2020 Reference scenario (v6) inflation corrected, 2020 euros

Heating Oil Rates 2 (€/kWh) [3]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.044	0.087	0.073	0.060	0.088	0.106	0.114	0.119	0.124	0.132
Industry sector	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100
Tertiary/Services & Other sector	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100

PRIMES 2020 Mix scenario inflation corrected, 2020 euros

Heating Oil Rates 3 (€/kWh) [4]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.044	0.087	0.073	0.060	0.100	0.121	0.149	0.197	0.238	0.263
Industry sector	0.038	0.074	0.068	0.056	0.070	0.084	0.089	0.090	0.092	0.097
Tertiary/Services & Other sector	0.038	0.074	0.068	0.056	0.070	0.084	0.089	0.090	0.092	0.097

User-defined scenario inflation corrected, 2020 euros

Heating Oil Rates 4 (€/kWh) [5]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.044	0.087	0.073	0.060	0.133	0.163	0.192	0.217	0.217	0.217
Industry sector	0.038	0.074	0.068	0.056	0.105	0.128	0.156	0.181	0.181	0.181
Tertiary/Services & Other sector	0.038	0.074	0.068	0.056	0.105	0.128	0.156	0.181	0.181	0.181

(Active, now used in EIA) (these data are copied to sheet Rates)

Heating Oil Rates Active (€/kWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.044	0.087	0.073	0.060	0.088	0.106	0.114	0.119	0.124	0.132
Industry sector	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100
Tertiary/Services & Other sector	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100

Choose LPG Rate to use:	PRIMES 2020 Reference scenario (v6)

EIA traditional inflation corrected, 2020-euros

LPG Rates (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1.0%	0.064	0.105	0.090	0.081	0.100	0.105	0.110	0.116	0.122	0.128
Industry sector	1.0%	0.055	0.087	0.075	0.067	0.083	0.088	0.092	0.097	0.102	0.107
Tertiary/Services & Other sector	1.0%	0.055	0.087	0.075	0.067	0.083	0.088	0.092	0.097	0.102	0.107

PRIMES 2020 Reference scenario (v6) inflation corrected, 2020 euros

LPG Rates 2 (€/kWh) [3]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.055	0.091	0.081	0.076	0.090	0.101	0.109	0.119	0.131	0.131
Industry sector	0.055	0.089	0.075	0.076	0.095	0.106	0.109	0.110	0.110	0.108
Tertiary/Services & Other sector	0.048	0.077	0.066	0.064	0.082	0.094	0.097	0.098	0.110	0.109

PRIMES 2020 Mix scenario inflation corrected, 2020 euros

LPG Rates 3 (€/kWh) [4]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.055	0.091	0.081	0.076	0.100	0.113	0.144	0.191	0.223	0.236
Industry sector	0.055	0.089	0.075	0.076	0.095	0.106	0.109	0.110	0.110	0.108
Tertiary/Services & Other sector	0.048	0.077	0.066	0.064	0.090	0.104	0.122	0.146	0.162	0.171

User-defined scenario inflation corrected, 2020 euros

LPG Rates 4 (€/kWh) [5]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.055	0.091	0.081	0.076	0.134	0.155	0.183	0.207	0.207	0.207
Industry sector	0.055	0.089	0.075	0.076	0.123	0.144	0.171	0.194	0.194	0.194
Tertiary/Services & Other sector	0.048	0.077	0.066	0.064	0.123	0.144	0.171	0.194	0.194	0.194

(Active, now used in EIA) (these data are copied to sheet Rates)

LPG Rates Active (€/kWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.055	0.091	0.081	0.076	0.090	0.101	0.109	0.119	0.131	0.131
Industry sector	0.055	0.089	0.075	0.076	0.095	0.106	0.109	0.110	0.110	0.108
Tertiary/Services & Other sector	0.048	0.077	0.066	0.064	0.082	0.094	0.097	0.098	0.110	0.109

(inflation corrected, 2020-euros)

Petrol (auto) Rates (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	2%	0.126	0.165	0.159	0.140	0.175	0.193	0.213	0.235	0.259	0.287
Industry sector	2%	0.107	0.138	0.132	0.117	0.146	0.161	0.177	0.196	0.216	0.239
Tertiary/Services & Other sector	2%	0.107	0.138	0.132	0.117	0.146	0.161	0.177	0.196	0.216	0.239

(inflation corrected, 2015-euros)

Diesel (auto) Rates (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	2%	0.082	0.133	0.129	0.118	0.146	0.162	0.178	0.197	0.217	0.240
Industry sector	2%	0.070	0.111	0.108	0.099	0.122	0.135	0.149	0.164	0.181	0.200
Tertiary/Services & Other sector	2%	0.070	0.111	0.108	0.099	0.122	0.135	0.149	0.164	0.181	0.200

(inflation corrected, 2020-euros)

Wood logs Rates (€/kWh NCV) [6]	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1%	0.030	0.034	0.052	0.040	0.040	0.042	0.044	0.046	0.048	0.050
Industry sector	1%	0.025	0.029	0.043	0.033	0.034	0.035	0.037	0.038	0.040	0.042
Tertiary/Services & Other sector	1%	0.025	0.029	0.043	0.033	0.034	0.035	0.037	0.038	0.040	0.042

(inflation corrected, 2020-euros)

Wood pellets Rates (€/kWh NCV) [6]	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1%	0.046	0.053	0.057	0.053	0.053	0.055	0.058	0.061	0.063	0.066
Industry sector	1%	0.039	0.044	0.047	0.045	0.044	0.046	0.048	0.051	0.053	0.055
Tertiary/Services & Other sector	1%	0.039	0.044	0.047	0.045	0.044	0.046	0.048	0.051	0.053	0.055

(inflation corrected, 2020-euros)

Wood chips Rates (€/kWh NCV) [6]	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1%	0.022	0.032	0.036	0.029	0.028	0.029	0.031	0.032	0.034	0.035
Industry sector	1%	0.019	0.027	0.030	0.024	0.024	0.025	0.026	0.027	0.028	0.029
Tertiary/Services & Other sector	1%	0.019	0.027	0.030	0.024	0.024	0.025	0.026	0.027	0.028	0.029

(inflation corrected, 2020-euros)

Coal Rates (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1%	0.024	0.033	0.019	0.016	0.016	0.017	0.018	0.019	0.020	0.021
Industry sector	1%	0.020	0.027	0.016	0.013	0.014	0.014	0.015	0.016	0.017	0.018
Tertiary/Services & Other sector	1%	0.020	0.027	0.016	0.013	0.014	0.014	0.015	0.016	0.017	0.018

(inflation corrected, 2020-euros)

Fossil Fuel Rates (€/kWh NCV) [7]		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	share	0.051	0.075	0.077	0.055	0.072	0.083	0.088	0.092	0.095	0.096
Industry sector	gas:	0.029	0.047	0.044	0.030	0.038	0.046	0.049	0.053	0.056	0.057
Tertiary/Services sector	80%	0.042	0.061	0.065	0.046	0.057	0.067	0.071	0.074	0.077	0.078
Agriculture/Other sector		0.040	0.059	0.058	0.047	0.057	0.067	0.070	0.074	0.076	0.078

Non-Energy Rates (for consumables)

All rates presented on this sheet are in 2020-euros (inflation corrected).

They are derived from the nominal rates (not inflation corrected) presented on sheet 'General_2', see also source information and possible user-settings there. The inflation indexes applied are the HICP, all items, from Eurostat (see sheet 'General_2').

For years following the last year for which nominal rates are available, an x%/a annual price increase is assumed (on top of the inflation). This percentage (escalation rate) can be set by the user below, for each item separately. Until the 2020 edition, EIA used 3%/a for water and 0% for other consumables. Considering 2015-2021 trend for water now reduced to 1%.

(inflation corrected, 2020-euros)

Non-Energy Rates (2020 €)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
water & sewage, residential, €/m3	1%	3.19	3.96	4.33	4.37	4.53	4.76	5.00	5.25	5.52	5.80
ink/toner for copier/printer, all sectors	0%	see sheet Resources; prices per cartridge/container									
paper for copier/printer, €/page	0%	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014	0.014
detergent dishwasher, €/cycle	0%	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102	0.102
detergent washing machine, €/cycle	0%	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171	0.171
bags for vacuum cleaner, €/year	0%	see sheet RATES; prices for vacuum cleaner bags and filters									
shielding gas for welding, €/kg Argon	0%	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
filler wire / electrodes for welding, €/kg	0%	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

Employment parameters (million 2020-euros of sector revenue per employee) [8]		
Manufacturer's 'wages'	[9]	0.057
Wholesale 'wages'	[10]	0.286
Retail 'wages'	[10]	0.069
Installation 'wages'	[10]	0.114
Maintenance 'wages'	[10]	0.114

EU population and households [11]		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EU27 population (in millions)	[12]	418	441	444	448	449	449	448	447	444	441
EU27 households (in millions)	[13]	152	182	191	196	200	201	201	202	201	200

EU dwellings and buildings [14]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EU27 dwellings (mln)	174	215	223	229	234	235	235	235	234	233
EU27 dwellings total size (Mm2)	14257	18877	20034	20607	21005	21161	21169	21177	21087	20998
EU27 average dwelling size (m2)	82.2	87.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9	89.9
EU27 perm.occup.dwellings (mln)	147	181	187	193	196	198	198	198	197	196
EU27 perm.occup.dwellings size (Mm2)	12562	16627	17510	18027	18378	18519	18525	18531	18453	18375
EU27 avg. perm.occup.dwelling size (m2)	85.2	91.9	93.6	93.6	93.6	93.6	93.6	93.6	93.6	93.6
EU27 non-residential buildings (mln)	12.4	14.2	14.5	14.9	15.2	15.6	16.0	16.3	16.7	17.1
EU27 non-res. buildings total size (Mm2)	7822	9685	10016	10264	10513	10761	11010	11258	11507	11756
EU27 avg. non-res building size (m2)	629	682	689	689	689	689	689	689	689	689

Notes:

[1] **Efficiency of Electricity Generation and Distribution**: The calculation method uses a correction coefficient CC (with reverse also known as primary energy factor PEF) to convert electricity to primary energy. The CC value approximately represents the efficiency of electricity generation & distribution. The user of the Excel file can choose a set of CC-values to apply throughout the entire file (cyan input field; use dropdown menu).

In all EIA reports until 2018 a constant value of 40% was used (CCset1; corresponding to PEF=2.5), meaning that 1 kWh of electricity corresponds to 2.5 kWh of primary energy. The 40% was a consensual value, first introduced in Ecodesign accounting following the Energy Services Directive (later replaced by the Energy Efficiency Directive, EED) where for the first time Member States had to come to an agreement on a harmonized value. The 40% (factor 2.5) is mentioned as default value in Directive 2012/27/EU, footnote 3 of Annex IV
DIRECTIVE (EU) 2018/2002 of 11 December 2018 amending Directive 2012/27/EU (EED amendment) changes the default value in Annex IV footnote 3 from 2.5 to 2.1. The values for CCset2 are by default set to 47.6% efficiency (PEF=2.1).

CCsets 1 and 2 use values constant over the years, This ensures that the computation of impacts of Ecodesign and Energy Labelling measures (the aim of this Excel file) is not disturbed by impacts due to changes in the efficiency of electricity generation. CCsets 3 and 4 use efficiency values that vary over the years.
CCset3 takes the 1990-2019 values from Eurostat Shares (https://ec.europa.eu/eurostat/web/energy/data/shares, η (eta) time series (1990-2019), accessed 25.04.2022). For 2020 and later years the 2010-2019 trend is extrapolated.
CCset4 is the baseline in EIA2020 and EIA2021 and uses PEF=2.5 until 2020 (inclusive) and PEF 2.1 from 2021 onwards, as agreed with the EC policy officer for EIA. As a consequence, EIA graphs for primary energy (see NRG sheets) show a discontinuity between years 2020 and 2021
For products where the efficiency (EFN) is expressed in terms of primary energy (e.g. space- and water-heating products), the CC/PEF used for the definition of these efficiencies (indicated on the EFN sheets) may differ from the ones in the active CCset. EIA automatically handles such differences in CC/PEF. Note that a change in CCset will change only the electricity-related part of the primary energy, not the electricity, not the fuel, and not the efficiencies.
Currently, the accounting does not consider a PEF for fuels, i.e. final fuel consumption and associated primary energy are the same.

[2a] **Global Warming Potential (GWP-100) for electricity** generation and distribution for set 1 taken from MEErP Part 1 table 30, http://ec.europa.eu/growth/industry/sustainability/ecodesign_en (section on ‘support tools for experts’). For years following 2030, extrapolation with same downward trend. These data have been used in EIA2019 and earlier editions but are now obsolete.

[2b] Values for GWP electricity sets 2 and 3 for years 2000-2050 (in 5-year steps) are from the PRIMES 2020 reference scenario (set 2) and 2020 mix scenario (set 3), as supplied by the EC services for use in impact assessments. Value for 1990 assumed identical to set 1. Values in intermediate years interpolated linearly. Note that in the PRIMES 2020 Mix scenario from 2040 the GWP factors become negative, implying that electricity savings lead to additional emissions.

[2c] Values for GWP electricity set 4 can be freely defined by the user. Currently displayed values are from the European Environment Agency, https://www.eea.europa.eu/data-and-maps/daviz/co2-emission-intensity-9/#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111, 'European level — Greenhouse gas emission intensity of electricity generation'. Annual values defined until 2020 (0.231) with projection between 0.110 and 0.118 for year 2030 (average used). Value for 2050 assumed identical to set 2. Linear interpolation 2020-2030 and 2030-2050.

[3] **PRIMES 2020 REF rates** for electricity, natural gas, heating oil and LPG come from a dedicated Excel file 'PRIMES 2022 01 12 VEUREF2020_detinfo.xlsx', supplied to the EIA team by the EC policy officer. Original values in €/toe have been converted to €/kWh using 11630 kWh/toe. Original 2015 euros have been converted to 2020 euros using Eurostat HICP ratio 1.058. PRIMES data are available from 2010 to 2050 in 5-year steps. In 2005, PRIMES values from the 2016f scenario were used where available, converted to 2020 euros, or otherwise set identical to EIA traditional rates. Linear interpolation has been applied in intermediate years. Before 2005, the same trend has been used as in the EIA traditional data. It is assumed that PRIMES rates for gas, oil and LPG are per kWh NCV (net calorific value). PRIMES has an underlying calculation model for energy rates, leading to differences with the Eurostat rates for a specific usage band as applied in EIA traditional rates

[4] **PRIMES 2020 MIX rates** for electricity, natural gas, heating oil and LPG come from a dedicated Excel file 'PRIMES 20220419_Energy price MIX scenario disaggregated.xlsx', supplied by the EC services. Original values in €/toe have been converted to €/kWh using 11630 kWh/toe. Original 2015 euros have been converted to 2020 euros using Eurostat HICP ratio 1.058. PRIMES data are available from 2010 to 2050 in 5-year steps. Linear interpolation has been applied in intermediate years. Until 2020 inclusive, rates in the MIX scenario are identical to those in the REF scenario. (PRIMES MIX scenario rates are stated to include effects from Green Deal 55% carbon taxation COVID scenario)

[5] The **user-defined scenario** is intended for free use. When redefining the values please remember that columns for many years are hidden and that values in these columns might not update automatically.
Current values in this scenario represent a preliminary 2022 Peak scenario that has not been used for EIA reporting. In the last months of 2021 and the first months of 2022, a peak in energy rates occurred. In April 2022, when this version of EIA was finalized, it was not yet clear which impact these peak rates would have on future energy price development, and a new EC/PRIMES scenario to update the PRIMES 2020 reference scenario was not yet available. As a placeholder, the EIA team developed a preliminary '2022 Peak scenario' for energy rates, covering electricity, gas, heating oil and LPG. Until 2020 the rates in this scenario are identical to the PRIMES rates. For years 2021-2022, peak rates were derived from information for Germany, France, Italy, Netherlands and Belgium. For years 2023-2024, a decrease in rates is projected, based on preliminary indications of the EC services. From 2025 onwards, the same annual variation has been taken as in the PRIMES Mix scenario.

[6] The annual increase of 1% per year is based on PRIMES Reference scenario 2020 for biomass rates, and on Heat Roadmap Europe projections for wood-pellets and -chips rates in 2030 and 2050.
The peak in pellet price in the first four months of 2022 has been ignored for the moment.

[7] Fossil fuel rates are taken as z% natural gas rate plus (100-z)% heating gas oil rate. The value of 'z' can be set by the user. No nominal rates are defined for fossil fuel. This special rate is still used for some fuel-fired air conditioners and air heaters. Traditionally, EIA uses 80% gas and 20% oil (z=80%).

[8] The direct employment impact of the measures - i.e. the increase of employees in the value-adding chain - is derived from the business revenues in the various sectors (manufacturing, retail, wholesale, installation, maintenance), using the 'Wages' constants shown. The same constants are used for all products. The constants are not actual 'Wages' but total company revenue divided by staff. The number of jobs is calculated as sector revenue (in million euros) divided by 'sector wage' (in million euros / employee). (see sheet Gjob

[9] Manufacturer’s ‘wages’: 0.15 m euro/employee ±10% (in 2010 euros, now updated to 2020 euros). It is assumed that associated OEM jobs and Service jobs are each of the same order of magnitude. Including also these jobs the ‘wage’ reduces to 0.057 m euro/employee (in 2020 euros), which is the quantity used in EIA. Currently no distinction is made if these jobs are inside or outside EU.

[10] Wholesale, Retail, Installation and Maintenance ‘wages’: m euro/employee ±20%.

[11] These data are mainly provided as background information. They do not change EU-totals, but have influence where data per person or per household are presented as additional information, see e.g. sheet Households. Normally there would be no need to change them.

[12] Population for years 1990-2019 from Eurostat 'Population on 1 January by age and sex [demo_pjan]' for 'EU27 (from 2020)'
Population for years 2020-2050 in 5-year steps from Eurostat 'Population on 1st January by age, sex and type of projection [proj_19np]' for 'EU27 (from 2020)'; interpolated in intermediate years

[13] Source for 2005 to 2018: Eurostat, Number of private households by household composition, number of children and age of youngest child (1 000) [lfst_hhnhtych]
Households for years 2019-2050 computed as population divided by estimate for number of persons per household (varying from 2.28 in 2020 to 2.23 in 2050; extrapolation from Eurostat [lfst_hhanwhtc]).
Source for 1991 and 2001: Eurostat, Households by size (number of persons) [cens_hndwsize]; interpolation in intermediate years

[14] Based on data for 2000 - 2014 from the 'EU Buildings Observatory, https://ec.europa.eu/energy/en/eu-buildings-database, date of export: 2019-08-16, Copyright European Commission 2016', and on data from 'Average EU building heat load for HVAC equipment, final report, René Kemna, VHK, Prepared for the European Commission DG ENER C.3, August 2014', as further elaborated by VHK in 'Preparatory study on lighting systems , 'Lot 37', VITO / VHK / Kreios / P.Waide for the European Commission DG ENER C3, December 2016', and in 'Ventilation Units, Ecodesign and Energy Labelling, Review Study, Phase 1.1 and phase 1.2, Technical Analysis and update Preparatory Studies, Final Reports Tasks 1-7, VHK, Delft (NL), for the European Commission DG GROW, August 2020'.

GENERAL Data used in EIA (part 2)

This sheet groups some general data used in EIA, i.e. data that are not product-specific
For some data the user can choose an option; input fields have cyan coloured backgrounc
See notes [x] at the end of the sheet for further informatior

Harmonized Index of Consumer Prices (Inflation) [1]

	1990	1995	2000	2005	2010	*2015*	2016	2017	2018	2019	2020	2021
Eurostat HICP (2015=100)	**61.0**	**67.5**	**73.1**	**83.5**	**93.03**	***100***	**100.2**	**101.7**	**103.6**	**105.0**	**105.8**	**108.8**
corresponding % inflation per year		2.0%	1.9%	2.3%	1.8%	*0.1%*	0.2%	1.6%	1.8%	1.4%	0.7%	2.9%

Nominal Energy Rates (not inflation corrected)

All rates presented on this sheet are Nominal Rates (not inflation corrected). See sheet 'General_1' or sheet 'Rates' for rates in 2020-euros (inflation corrected) and for the future projection
Residential rates include taxes and levies (20% VAT assumed where not already included in reference data
Non-residential rates (industry, services, other sector) exclude VAT and other recoverable taxes and levie
For the tertiary/services sector the rates are interpolated between residential rate and industry rate using a user-supplied factor (settable
The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate
The rates for the tertiary/services sector are also applied to the 'other sector' (agriculture, fishing, forestry)

(nominal (not inflation corrected)

Electricity Rates (€/kWh)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**80%**												
Residential sector	[2]	0.126	0.134	0.133	0.134	0.175	0.209	0.206	0.209	0.212	0.217	0.213	0.229
Industry sector	[3]	0.080	0.077	0.069	0.077	0.104	0.116	0.112	0.112	0.113	0.120	0.125	0.138
Tertiary/Services & Other sector	[4]	0.117	0.123	0.120	0.123	0.161	0.190	0.187	0.189	0.192	0.198	0.196	0.210

(nominal (not inflation corrected)

Natural Gas Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**65%**												
Residential sector	[5]	0.036	0.035	0.041	0.045	0.065	0.077	0.073	0.071	0.074	0.077	0.074	0.079
Industry sector	[6]	0.017	0.016	0.020	0.027	0.036	0.039	0.035	0.033	0.035	0.035	0.032	0.040
Tertiary/Services & Other sector	[7]	0.029	0.028	0.034	0.039	0.055	0.064	0.059	0.058	0.060	0.062	0.060	0.065

(nominal (not inflation corrected)

Gas Oil for Heating Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[8]	0.025	0.036	0.046	0.060	0.073	0.069	0.059	0.068	0.081	0.080	0.059	0.079
Industry sector	[9]	0.022	0.030	0.039	0.050	0.061	0.057	0.050	0.057	0.067	0.066	0.050	0.066
Tertiary/Services & Other sector	[10]	0.022	0.030	0.039	0.050	0.061	0.057	0.050	0.057	0.067	0.066	0.050	0.066

(nominal (not inflation corrected)

LPG Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[11]	0.037	0.051	0.064	0.078	0.092	0.085	0.076	0.085	0.091	0.086	0.081	0.099
Industry sector	[12]	0.031	0.043	0.054	0.065	0.077	0.071	0.063	0.071	0.076	0.072	0.067	0.082
Tertiary/Services & Other sector	[13]	0.031	0.043	0.054	0.065	0.077	0.071	0.063	0.071	0.076	0.072	0.067	0.082

(nominal (not inflation corrected)

Petrol (automotive) Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[14]	0.072	0.091	0.109	0.126	0.145	0.150	0.141	0.149	0.157	0.155	0.140	0.166
Industry sector	[15]	0.062	0.077	0.091	0.105	0.121	0.125	0.117	0.124	0.131	0.129	0.117	0.138
Tertiary/Services & Other sector	[16]	0.062	0.077	0.091	0.105	0.121	0.125	0.117	0.124	0.131	0.129	0.117	0.138

(nominal (not inflation corrected)

Diesel (automotive) Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[14]	0.047	0.067	0.086	0.103	0.117	0.122	0.112	0.122	0.135	0.134	0.118	0.139
Industry sector	[15]	0.040	0.056	0.072	0.085	0.098	0.102	0.093	0.102	0.112	0.112	0.099	0.116
Tertiary/Services & Other sector	[16]	0.040	0.056	0.072	0.085	0.098	0.102	0.093	0.102	0.112	0.112	0.099	0.116

(nominal (not inflation corrected)

Firewood (logs) Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[17]	0.017	0.019	0.021	0.023	0.030	0.049	0.048	0.048	0.048	0.048	0.040	0.040
Industry sector	[18]	0.014	0.016	0.018	0.020	0.025	0.041	0.040	0.040	0.040	0.040	0.033	0.033
Tertiary/Services & Other sector	[19]	0.014	0.016	0.018	0.020	0.025	0.041	0.040	0.040	0.040	0.040	0.033	0.033

(nominal (not inflation corrected)

Wood pellets Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[17]	0.027	0.030	0.033	0.036	0.047	0.053	0.052	0.052	0.052	0.054	0.053	0.053
Industry sector	[18]	0.022	0.025	0.027	0.030	0.039	0.045	0.043	0.043	0.044	0.045	0.045	0.044
Tertiary/Services & Other sector	[19]	0.022	0.025	0.027	0.030	0.039	0.045	0.043	0.043	0.044	0.045	0.045	0.044

(nominal (not inflation corrected)

Wood chips Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
Choose factor for Tertiary sector:	**0%**												
Residential sector	[17]	0.013	0.014	0.016	0.017	0.028	0.034	0.032	0.031	0.031	0.031	0.029	0.028
Industry sector	[18]	0.011	0.012	0.013	0.014	0.023	0.028	0.027	0.025	0.026	0.026	0.024	0.023
Tertiary/Services & Other sector	[19]	0.011	0.012	0.013	0.014	0.023	0.028	0.027	0.025	0.026	0.026	0.024	0.023

(nominal (not inflation corrected)

Coal Rates (€/kWh NCV)		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**
Choose factor for Tertiary sector:	**0%**											
Residential sector	[20]	0.014	0.014	0.011	0.019	0.029	0.018	0.019	0.026	0.029	0.019	0.016
Industry sector	[21]	0.011	0.012	0.009	0.016	0.024	0.015	0.016	0.022	0.024	0.016	0.013
Tertiary/Services & Other sector	[22]	0.011	0.012	0.009	0.016	0.024	0.015	0.016	0.022	0.024	0.016	0.013

Nominal Rates for Non-energy Consumables (not inflation corrected)

All rates on this sheet are Nominal Rates (not inflation corrected). See sheet 'General_1' or sheet 'Rates' for rates in 2020-euros (inflation corrected) and for the future projection.

(nominal (not inflation corrected)

Non-energy Rates		**1990**	**1995**	**2000**	**2005**	**2010**	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**2021**
water & sewage, residential, €/m3	[23]	1.84	2.13	2.47	2.85	3.48	4.10	4.13	4.19	4.25	4.32	4.37	4.48
paper for copier/printer, all sectors, €/page	[24]	0.008	0.009	0.009	0.011	0.012							
detergent dishwasher, residential, €/cycle	[25]	0.059	0.065	0.071	0.081	0.090							
detergent wash.machine, residential, €/cycle	[25]	0.098	0.109	0.118	0.135	0.150							
bags for vacuum cleaner, residential, €/year		see sheet RATES; prices for vacuum cleaner bags and filters											
shielding gas for welding, €/kg Argon	[26]	1.33	1.47	1.59	1.81	2.02	2.17	2.18	2.21				
filler wire and electrodes for welding, €/kg	[27]	0.26	0.28	0.31	0.35	0.39	0.42	0.42	0.43				

Notes:

[1] Source for years 1996-2021: Eurostat HICP (2015 = 100) - annual average index [prc_hicp_aind], over all items, for EU27 (2020). Data extracted 11/04/2022. For years < 1996, rate of change set to 2%/a.

[2] Residential electricity rate. Eurostat data extracted 19/04/22. Data for year taken as average of 1st and 2nd semester. All taxes and levies included.
Before 2007: Electricity prices for domestic consumers - bi-annual data (until 2007) [nrg_pc_204_h]; Households - Dc (Annual consumption: 3 500 kWh of which night 1 300 KWh); EU27 data where available, otherwise EU25, EU15.
After 2007: Electricity prices for household consumers - bi-annual data (from 2007 onwards) [nrg_pc_204]; Band DC : 2 500 kWh < Consumption < 5 000 kWh; data for EU27 (excl. UK).

[3] Industry electricity rate. Eurostat data extracted 19/04/22. Data for year taken as average of 1st and 2nd semester. Excluding VAT and other recoverable taxes and levies.
Before 2007: Electricity prices for industrial consumers - bi-annual data (until 2007) [nrg_pc_205_h]; Industry - Ie (Annual consumption: 2 000 MWh; maximum demand: 500 kW; annual load: 4 000 hours); EU27 data where available, otherwise EU25, EU15.
After 2007: Electricity prices for non-household consumers - bi-annual data (from 2007 onwards) [nrg_pc_205]; Band IC : 500 MWh < Consumption < 2 000 MWh; EU27 (excl. UK).

[4] Tertiary electricity rate. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. User can choose the value for 'x'. For reference: In PRIMES scenario REF2020_v6, the factor x is around 70% in earlier years and 82-85% in later years).

[5] Residential natural gas rate. Eurostat data extracted 19/04/22. Data for year taken as average of 1st and 2nd semester. All taxes and levies included. Where original Eurostat data in euros per GJ GCV, converted to euros per kWh NCV dividing by 277.7 (kWh/GJ) and multiplying by 1.106 (GCV/NCV). Where Eurostat data in euros per kWh (after 2007) multiplied by 1.106 (GCV/NCV).
Before 2007: Gas prices for domestic consumers - bi-annual data (until 2007) [nrg_pc_202_h]; Households - D3 (Annual consumption: 83.70 GJ); EU27 data where available, otherwise EU25, EU15.
After 2007: Gas prices for household consumers - bi-annual data (from 2007 onwards) [nrg_pc_202]; Band D2 : 20 GJ < Consumption < 200 GJ; data for EU27.

[6] Industry natural gas rate. Eurostat data extracted 19/04/22. Data for year taken as average of 1st and 2nd semester. Excluding VAT and other recoverable taxes and levies. Original Eurostat data in euros per GJ GCV, converted to euros per kWh NCV dividing by 277.7 (kWh/GJ) and multiplying by 1.106 (GCV/NCV). After 2007 original values in euros per kWh multiplied by 1.106 (GCV/NCV).
Before 2007: Gas prices for industrial consumers - bi-annual data (until 2007) [nrg_pc_203_h]; Industry - I3-1 (Annual consumption: 41 860 GJ; load factor: 200 days, 1 600 hours); EU27 data where available, otherwise EU25, EU15.
After 2007: Gas prices for non-household consumers - bi-annual data (from 2007 onwards) [nrg_pc_203]; Band I3 : 10 000 GJ < Consumption < 100 000 GJ; EU27.

[7] Tertiary natural gas rate. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. User can choose the value for 'x'. For reference: In PRIMES scenario REF2020_v6, the factor x is around 65%).

[8] Residential rate for gas oil for heating. Oil Bulletin data (https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en) extracted 19/04/22. Data for year taken as average over all available weekly prices. Inclusive of duties and taxes. Original Oil Bulletin data in euros per 1000 litres, converted to euros per kWh NCV using 42.9 MJ/kg, 0.85 kg/litre, 277.7 kWh/GJ => 10.11 kWh/litre.
For 2005-2019 the rates derived from Oil Bulletin have been used. For year 2004 and before, Oil Bulletin provides rates per country but no weighted EU27 average. For these years, the rates already present in EIA2020 have been maintained.

[9] Industry rate for gas oil for heating. Same basic rate used as for residential above, but subtracting 20% VAT.

[10] Tertiary rates for gas oil for heating. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. User can choose the value for 'x'. For reference: In PRIMES scenario REF2015f, tertiary/services rates are 82-99% of the industry rates. This comes close to using x=0%. In PRIMES REF2020_v6 scenario tertiary/services rate not separately specified.

[11] Residential rate for LPG. Oil Bulletin data (https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en) extracted 19/04/22. Data for year taken as average over all available weekly prices. Inclusive of duties and taxes. Original Oil Bulletin data in euros per 1000 litres, converted to euros per kWh NCV using 46 MJ/kg, 0.508 kg/litre, 277.7 kWh/GJ => 6.49 kWh/litre.
For 2005-2019 the rates derived from Oil Bulletin have been used. For year 2004 and before, Oil Bulletin provides rates per country but no weighted EU27 average. For these years, the rates already present in EIA2020 have been maintained.

[12] Industry rate for LPG. Same basic rate used as for residential above, but subtracting 20% VAT.

[13] Tertiary rates for LPG. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. User can choose the value for 'x'. For reference: In PRIMES scenario REF2015f, tertiary/services rates are around 91% of the industry rates. This comes close to using x=0%. In PRIMES REF2020_v6 scenario there is no fixed relation; in several cases tertiary rates are even smaller than industry rate.

[14] Residential rate automotive Petrol (Euro Super 95) and Diesel. Oil Bulletin data (https://energy.ec.europa.eu/data-and-analysis/weekly-oil-bulletin_en) extracted 19/04/22. Data for year taken as average over all available weekly prices. Inclusive of duties and taxes. Original Oil Bulletin data in euros per 1000 litres, converted to euros per kWh NCV using 44 MJ/kg, 0.745 kg/litre, 277.7 kWh/GJ => 9.10 kWh/litre (for Petrol), and 42.3 MJ/kg, 0.832 kg/litre, 277.7 kWh/GJ => 9.77 kWh/litre (for Diesel) .
For 2005-2019 rates derived from Oil Bulletin have been used. For years < 2004, Oil Bulletin provides rates per country but no EU average. For these years, the rates already present in EIA2020 have been maintained.

[15] Industry rate for automotive Petrol (Euro Super 95) and Diesel. Same basic rate used as for residential above, but subtracting 20% VAT.

[16] Tertiary rates for automotive Petrol and Diesel. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. Rate for tertiary determined as (100-x%)*Industry rate + x%*Residential rate.

[17] Residential rate for Firewood logs, Wood pellets and chips. Main references are 2005 rate reported in prep. study on Solid Fuel Boilers, Task 2, table 2-25, and 2010 rate reported in Impact Assessment on Solid Fuel Boilers, Part 1/3, SWD(2015)92 final, 28.4.2015, table 20. For other years in period 2005-2016, data sources included: https://www.forestfuels.co.uk/wood-fuel-price-comparison/, MONITORING OF WOOD FUEL PRICES IN SLOVENIA, AUSTRIA, ITALY, CROATIA, ROMANIA, GERMANY, SPAIN AND IRELAND, Report No. 6, March 2014; EUbionet3, Solutions for biomass fuel market barriers and raw material availability - IEE/07/777/SI2.499477, WP3 - Wood fuel price statistics in Europe - D 3.3, Univ. of Uppsala, August 2011; Global Wood Pellet Industry and Trade Study 2017, IEA Bioenergy: Task 40: June 2017. For data conversion: 277.7 kWh/GJ and 4800 kWh/ton (@30% moisture content). Before year 2005 a 2%/a decrease in prices has been assumed.
For the EIA 2021 update: https://heatroadmap.eu/wp-content/uploads/2020/01/HRE4_D6.1-Future-fuel-price-review.pdf, https://www.propellets.at/aktuelle-pelletpreise, https://depi.de/pelletpreis, https://www.pelletpreis.ch/de/preise/preisentwicklung, https://www.researchgate.net/figure/Italian-pellet-price-evolution, https://www.carmen-ev.de/service/marktueberblick/marktpreise-energieholz, https://www.propellet.fr/page-chauffage-au-granule-indice-de-prix-du-granule-156.html, and PRIMES 2020 REF and MIX scenarios for generic biomass rates. The EIA 2020 nominal wood-rates until 2016 have been maintained in EIA 2021. For years 2017-2021 new rates have been added to EIA based on the reference documents. In the first 4 months of 2022, wood prices increased, in particular for pellets

[18] Industry rate for Firewood logs, Wood pellets and Wood chips: derived from residential rate (see above) subtracting 20% VAT.

[19] Tertiary rates for Firewood logs, Wood pellets and Wood chips. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT), but then considered to be excl. VAT and other recoverable taxes and levies. The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. User can choose the value for 'x'. In PRIMES scenario REF2020_v6 for biomass, tertiary/services rates are around 88% of the residential rates. This comes close to using x=0%.

[20] Residential rate for Coal. Main reference is 2010 rate reported in IA on Solid Fuel Boilers, Part 1/3, SWD(2015)92 final, 28.4.2015, table 20. Consumer rates are assumed to vary over the years according to the Northwest Europe marker price for coal reported in 'https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy.html, bp-stats-review-2021-all-data.xlsx, sheet 'coal prices'.

[21] Industry rate for Coal. Derived from the residential rate by subtracting 20% VAT. For coal the non-residential rates are of minor importance.

[22] Tertiary rates for Coal. Interpolated between residential rate (incl. VAT) and industry rate (excl. VAT). The rate for tertiary is determined as (100-x%)*Industry rate + x%*Residential rate. For reference: In PRIMES scenario REF2020 for solid fuels, tertiary/services rates are around 80% of the residential rates. This comes close to using x=0%.

[23] Residential rates for Water. The 2000, 2011 and 2013 rates are based on 'MEErP Preparatory Study on Taps and Showers, Task 2 report: Market (version 2), JRC 2014, par. 2.4.4.2'. For other years in the period 2001-2017, the annual variation of rates has been based on Eurostat, HICP (2015 = 100) - annual data (average index and rate of change) [prc_hicp_aind], for items: water supply, data extracted 12.04.2022.
For years before 2000, an average annual price decrease of 3%/a has been applied.

[24] Average paper cost 0.012 €/page in 2010; variation with inflation. This paper cost was still considered adequate in 2019 when updating EIA for the review study on Imaging Equipment.

[25] Detergent (inc. salt, rinsing agent, etc.) costs/cycle in 2010; variation with inflation.
Household dishwasher €0.09 per cycle (in 2010)
Household washing machine €0.15 per cycle (in 2010)

[26] Shielding gas (assumed to be Argon) is used for TIG and MIG-MAG welding processes. Table 15 of the Impact Assessment for welding equipment (SWD(2019) 340 final, 1.10.2019) provides the lifetime shielding gas costs per unit welding equipment (WE). Dividing these costs by the 7 years lifetime for inverter-based WE or 9 years for transformer-based WE, the annual cost per unit is 956 euros. The annual operating hours are 2000 h (Prep.study Lot 5, task 4, Fraunhofer 2012) of which on average 22% in arc-on mode (IA table A4.4), i.e. 440 h/a. The prep. study (p.62) indicates an Argon consumption of around 1 kg per hour arc-on time so annual consumption is 440 kg Ar. Resulting average price: 956 euros / 440 kg = 2.17 euros/kg Ar, assumed to be valid for year 2015, and assumed to be constant over the years when expressed in 2020 euros. From quick on-line research in 2019, a typical Argon price is $2-3/kg, so the calculated 2.17 euros is reasonable

[27] Filler wires and electrodes are used for all considered welding processes, except plasma welding. Table 15 of the Impact Assessment for welding equipment (SWD(2019) 340 final, 1.10.2019) provides the lifetime wire/electrode costs per unit welding equipment (WE). Dividing these costs by the 7 years lifetime for inverter-based WE or 9 years for transformer-based WE, the sales-weighted average annual cost per unit is 232 euros. It can be derived from IA Table 12 that the assumed annual filler wire and electrode consumption is around 552 kg/a/unit. This implies an average cost for filler wire and electrodes of 0.42 euros/kg. From 2019 online research, this could be a reasonable price for steel (which is used in IA as reference material for filler wire and electrodes), but it seems rather low for finished filler wire and electrodes. For compatibility with the IA, the price of 0.42 euros/kg has been used anyway and assumed to be valid for 2015, and assumed to be constant over the years when expressed in

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
2	EIWH Electric Instant. < 12 kW (secondary)	65%	31%	3%	1%	1.00					
2	EIWH Electric Instant. ≥ 12 kW (primary)	65%	31%	3%	1%	1.00					
2	EIWHS Electric Instant. Shower (secondary)	65%	31%	3%	1%	1.00					
2	ESWH Electric Storage ≤ 30 L (secondary)	65%	31%	3%	1%	1.00					
2	ESWH Electric Storage > 30 L (primary)	65%	31%	3%	1%	1.00					
2	GIWH Gas Instant. < 13 L/min (secondary)	65%	31%	3%	1%	0.003	0.997				
2	GIWH Gas Instant. ≥ 13 L/min (primary)	65%	31%	3%	1%	0.008	0.992				
2	GSWH Gas Storage, Condensing	65%	31%	3%	1%	0.01	0.99				
2	GSWH Gas Storage, Non-condensing	65%	31%	3%	1%	0.008	0.992				
2	Dedicated WH Heat Pump	65%	31%	3%	1%	1.00					
2	Dedicated WH Solar (3.5 m2)	65%	31%	3%	1%	0.80	0.20				
1	CHB Gas Combi Instant. WH	82%	14%	3%	1%	0.04	0.96				
1	CHB Gas + Cyl. WH	82%	14%	3%	1%	0.04	0.96				
1	CHB Jet Burner Gas + Cyl. WH	82%	14%	3%	1%	0.04	0.96				
1	CHB Jet Burner Oil + Cyl. WH	82%	14%	3%	1%	0.04		0.96			
1	CHB Electric (Joule) + Cyl. WH	82%	14%	3%	1%	1.00					
1	CHB Hybrid Gas/Electric WH	82%	14%	3%	1%	0.10	0.90				
1	CHB Electric HP + Cyl. WH	82%	14%	3%	1%	1.00					
1	CHB Gas HP + Cyl. WH	82%	14%	3%	1%	0.02	0.98				
1	CHB Gas mCHP + Cyl. WH	82%	14%	3%	1%	0.02	0.98				
1	CHB Solar Combi (16 m2)	82%	14%	3%	1%	0.04	0.96				
1	CHB Gas non-condensing	70%	25%	4%	1%	0.04	0.96				
1	CHB Gas condensing	70%	25%	4%	1%	0.04	0.96				
1	CHB Gas Jet burner non-condensing	70%	25%	4%	1%	0.04	0.96				
1	CHB Gas Jet burner condensing	70%	25%	4%	1%	0.04	0.96				
1	CHB Oil Jet burner non-condensing	70%	25%	4%	1%	0.04		0.96			
1	CHB Oil Jet burner condensing	70%	25%	4%	1%	0.04		0.96			
1	CHB Electric Joule-effect	70%	25%	4%	1%	1.00					
1	CHB Hybrid (gas-electric)	70%	25%	4%	1%	0.60	0.40				
1	CHB Electric Heat Pump	70%	25%	4%	1%	1.00					
1	CHB Gas Heat Pump	70%	25%	4%	1%	0.04	0.96				
1	CHB micro CHP	70%	25%	4%	1%	0.04	0.96				
1	CHB Solar combi (16 m2)	70%	25%	4%	1%	0.10					
15	SFB Wood Manual	90%	8%	2%	0%	0.00				1.00	
15	SFB Wood Direct Draft	90%	8%	2%	0%	0.00				1.00	
15	SFB Coal	90%	8%	2%	0%	0.00			1.00		
15	SFB Pellets	70%	24%	5%	1%	0.00				1.00	
15	SFB Wood chips	0%	30%	50%	20%	0.00				1.00	
15	**SFB Solid Fuel Boilers**										
21 /E6	CHAE-S (≤ 400 kW)	5%	94%	0%	1%	1.00					
21 /E6	CHAE-L (> 400 kW)	0%	71%	29%	0%	1.00					
21 /E6	CHWE-S (≤ 400 kW)	5%	95%	0%	0%	1.00					
21 /E6	CHWE-M (> 400 kW; ≤ 1500 kW)	0%	71%	29%	0%	1.00					
21 /E6	CHWE-L (> 1500 kW)	0%	71%	29%	0%	1.00					
21 /E6	CHF	5%	95%	0%	0%	0.05	0.76	0.19			
21 /E6	HT PCH-AE-S	0%	60%	30%	10%	1.00					
21 /E6	HT PCH-AE-L	0%	60%	30%	10%	1.00					
21 /E6	HT PCH-WE-S	0%	60%	30%	10%	1.00					
21 /E6	HT PCH-WE-M	0%	60%	30%	10%	1.00					
21 /E6	HT PCH-WE-L	0%	60%	30%	10%	1.00					
21 /E6	AC rooftop	0%	81%	17%	2%	1.00					
21 /E6	AC splits	5%	84%	9%	2%	1.00					
21 /E6	AC VRF	1%	95%	4%	0%	1.00					
21 /E6	ACF	3%	82%	13%	2%	0.05	0.76	0.19			
21 /E6	**AHC central Air Cooling**										
21 /E6	AC rooftop (rev)	0%	81%	17%	2%	1.00					
21 /E6	AC splits (rev)	5%	84%	9%	2%	1.00					
21 /E6	AC VRF (rev)	1%	95%	4%	0%	1.00					
21 /E6	ACF (rev)	3%	82%	13%	2%	0.05	0.76	0.19			
21 /E6	AHF	2%	42%	42%	14%	0.05	0.76	0.19			
21 /E6	AHE	2%	42%	42%	14%	1.00					
21 /E6	**AHC central Air Heating** (rev double)										

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
20	LH open fireplace	90%	9%	1%	0%	0.00				1.00	
20	LH closed fireplace/inset	90%	9%	1%	0%	0.00				1.00	
20	LH wood stove	90%	9%	1%	0%	0.00				1.00	
20	LH coal stove	90%	9%	1%	0%	0.00			1.00		
20	LH cooker	90%	9%	1%	0%	0.00				1.00	
20	LH SHR stove	90%	9%	1%	0%	0.00				1.00	
20	LH pellet stove	90%	9%	1%	0%	0.00				1.00	
20	LH Electric portable	66%	30%	4%	0%	1.00					
20	LH Electric fixed > 250W	66%	30%	4%	0%	1.00					
20	LH Electric fixed ≤ 250W	66%	30%	4%	0%	1.00					
20	LH Electric storage	66%	30%	4%	0%	1.00					
20	LH Electric underfloor	66%	30%	4%	0%	1.00					
20	LH Electric visibly glowing > 1.2 kW	50%	45%	4%	1%	1.00					
20	LH Electric visibly glowing ≤ 1.2 kW	66%	30%	4%	0%	1.00					
20	LH Electric towel heaters	98%	2%	0%	0%	1.00					
20	LH Gas luminous (commercial)	0%	2%	18%	80%	0.00	1.00				
20	LH Gaseous Tube (commercial < 120 kW)	0%	2%	18%	80%	0.00	1.00				
20	LH Gas open front	90%	9%	1%	0%	0.00	1.00				
20	LH Gas closed front	90%	9%	1%	0%	0.00	1.00				
20	LH Gas balanced flue	90%	9%	1%	0%	0.00	1.00				
20	LH Gas flueless	90%	9%	1%	0%	0.00	1.00				
20	LH Liquid tube (commercial < 120 kW)	0%	2%	18%	80%	0.00		1.00			
20	LH Liquid open front	90%	9%	1%	0%	0.00		1.00			
20	LH Liquid closed front	90%	9%	1%	0%	0.00		1.00			
20	LH Liquid balanced flue	90%	9%	1%	0%	0.00		1.00			
20	LH Liquid flueless	90%	9%	1%	0%	0.00		1.00			
20	**LH Local Space Heaters**										
10	RAC fixed < 6 kW, cooling	71%	23%	5%	1%	1.00					
10	RAC fixed 6-12 kW, cooling	46%	48%	5%	1%	1.00					
10	RAC portable < 12 kW, cooling	79%	15%	5%	1%	1.00					
10	**RAC < 12 kW total, cooling mode**										
10	RAC fixed < 6 kW, reversible, heating	71%	23%	5%	1%	1.00					
10	RAC fixed 6-12 kW, reversible, heating	46%	48%	5%	1%	1.00					
10	RAC portable < 12 kW, reversible, heating	79%	15%	5%	1%	1.00					
10	**RAC < 12 kW total, heating mode**										
11	CIRC Integrated circulators	70%	24%	5%	1%	1.00					
11	CIRC Large standalone circulators	47%	47%	5%	1%	1.00					
11	CIRC Small standalone circulators	70%	24%	5%	1%	1.00					
11	**CIRC Circulator pumps <2.5 kW**										
E6 /10	R-UVU ≤ 100 m3/h for Extract Spaces	100%	0%	0%	0%	1.00					
E6 /10	R-UVU ≤ 100 m3/h for Habitable Spaces	100%	0%	0%	0%	1.00					
E6 /10	R-BVU ≤ 100 m3/h for Habitable Spaces	100%	0%	0%	0%	1.00					
E6 /10	R-UVU 100-250 m3/h	100%	0%	0%	0%	1.00					
E6 /10	R-BVU 100-250 m3/h	100%	0%	0%	0%	1.00					
E6 /10	R-UVU 250-1000 m3/h	100%	0%	0%	0%	1.00					
E6 /10	R-BVU 250-1000 m3/h	100%	0%	0%	0%	1.00					
E6 /10	R-UVU > 1000 m3/h	100%	0%	0%	0%	1.00					
E6 /10	R-BVU 1000-2500 m3/h	100%	0%	0%	0%	1.00					
E6 /10	NR-UVU 250-1000 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-BVU 250-1000 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-UVU > 1000 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-BVU 1000-2500 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-AHU-S 2500-5500 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-AHU-M 5500-14500 m3/h	0%	86%	13%	1%	1.00					
E6 /10	NR-AHU-L > 14500 m3/h	0%	86%	13%	1%	1.00					
E6 /10	**VU Ventilation Units** (res & nonres)										

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
	LS, indicative shares, not constant over years										
8 /9 /19	LFL (T12,T8h,T8t,T5,other)	5%	72%	22%	1%	1.00					
8 /9 /19	HID (HPM, HPS, MH)	0%	92%	7%	1%	1.00					
8 /9 /19	CFLni (all shapes)	30%	65%	4%	1%	1.00					
8 /9 /19	CFLi (retrofit for GLS, HL)	60%	30%	10%	0%	1.00					
8 /9 /19	GLS (DLS & NDLS)	80%	14%	5%	1%	1.00					
8 /9 /19	HL (DLS & NDLS, LV & MV)	65%	25%	8%	2%	1.00					
8 /9 /19	LED replacing LFL (retrofit & luminaire)	5%	72%	22%	1%	1.00					
8 /9 /19	LED replacing HID (retrofit & luminaire)	0%	92%	7%	1%	1.00					
8 /9 /19	LED replacing CFLni (retrofit & luminaire)	20%	74%	5%	1%	1.00					
8 /9 /19	LED replacing DLS (retrofit & luminaire)	65%	25%	8%	2%	1.00					
8 /9 /19	LED replacing NDLS (retrofit & luminaire)	75%	18%	6%	1%	1.00					
8 /9 /19	*Standby*	*11%*	*71%*	*17%*	*1%*	1.00					
8 /9 /19	**LS Light Sources**										
5	**DP TV total**	90%	10%	0%	0%	1.00					
5	**DP Monitor total**	49%	44%	6%	1%	1.00					
5	**DP Signage total**	0%	90%	10%	0%	1.00					
18	SSTB Simple STB	90%	10%	0%	0%	1.00					
18	CSTB Complex STB	90%	10%	0%	0%	1.00					
E3	Game consoles > 20 W	100%	0%	0%	0%	1.00					
E3	Game consoles < 20 W	100%	0%	0%	0%	1.00					
E9	ES tower 1-socket traditional	0%	86%	13%	1%	1.00					
E9	ES rack 1-socket traditional	0%	86%	13%	1%	1.00					
E9	ES rack 2-socket traditional	0%	86%	13%	1%	1.00					
E9	ES rack 2-socket cloud	0%	86%	13%	1%	1.00					
E9	ES rack 4-socket traditional	0%	86%	13%	1%	1.00					
E9	ES rack 4-socket cloud	0%	86%	13%	1%	1.00					
E9	ES rack 2-socket resilient trad.	0%	86%	13%	1%	1.00					
E9	ES rack 2-socket resilient cloud	0%	86%	13%	1%	1.00					
E9	ES rack 4-socket resilient trad.	0%	86%	13%	1%	1.00					
E9	ES rack 4-socket resilient cloud	0%	86%	13%	1%	1.00					
E9	ES blade 1-socket traditional	0%	86%	13%	1%	1.00					
E9	ES blade 2-socket traditional	0%	86%	13%	1%	1.00					
E9	ES blade 2-socket cloud	0%	86%	13%	1%	1.00					
E9	ES blade 4-socket traditional	0%	86%	13%	1%	1.00					
E9	ES blade 4-socket cloud	0%	86%	13%	1%	1.00					
E9	**ES Enterprise Servers total**										
E9	DS Online 2	0%	86%	13%	1%	1.00					
E9	DS Online 3	0%	86%	13%	1%	1.00					
E9	DS Online 4	0%	86%	13%	1%	1.00					
E9	**DS Data Storage products total**										
3	PC Desktop	66%	29%	4%	1%	1.00					
3	PC Integrated Desktop	66%	29%	4%	1%	1.00					
3	PC Notebook	66%	29%	4%	1%	1.00					
3	PC Tablet/slate	90%	9%	1%	0%	1.00					
3	PC Thin client	0%	86%	13%	1%	1.00					
3	PC Integrated Thin Client	0%	86%	13%	1%	1.00					
3	PC Small-scale Server	0%	86%	13%	1%	1.00					
3	PC Workstation	0%	86%	13%	1%	1.00					
3	**PC Personal Computers**										
4	Inkjet Printer	50%	50%	0%	0%	1.00					
4	Inkjet MFD	50%	50%	0%	0%	1.00					
4	EP / Laser Printer mono	10%	90%	0%	0%	1.00					
4	EP / Laser Printer colour	10%	90%	0%	0%	1.00					
4	EP / Laser Copier mono	10%	90%	0%	0%	1.00					
4	EP / Laser Copier colour	10%	90%	0%	0%	1.00					
4	EP / Laser MFD mono	10%	90%	0%	0%	1.00					
4	EP / Laser MFD colour	5%	95%	0%	0%	1.00					
4	**EP & IJ imaging equipment**										

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
	Regulated only for (networked) standby ((n)sb,										
6 /26	SB Radios (sb & off modes)	95%	4%	1%	0%	1.00					
6 /26	SB Electric toothbrushes (off mode)	100%	0%	0%	0%	1.00					
6 /26	SB Audio speakers (wired) (sb & off modes)	95%	4%	1%	0%	1.00					
6 /26	SB Audio speakers (wireless) (nsb & off modes)	95%	4%	1%	0%	1.00					
6 /26	SB Small appliances (sb & off modes)	95%	4%	1%	0%	1.00					
6 /26	SB Media boxes /sticks (sb mode)	95%	4%	1%	0%	1.00					
6 /26	SB Media players and recorders (sb mode)	90%	9%	1%	0%	1.00					
6 /26	SB Projectors (sb & off modes)	3%	93%	3%	1%	1.00					
6 /26	SB Home phones (nsb mode)	100%	0%	0%	0%	1.00					
6 /26	SB Office phones (nsb mode)	0%	87%	12%	1%	1.00					
6 /26	SB Home NAS (nsb mode)	100%	0%	0%	0%	1.00					
6 /26	SB Home Network Equipment (nsb mode)	100%	0%	0%	0%	1.00					
6 /26	SB Office Network Equipment (nsb mode)	0%	87%	12%	1%	1.00					
6 /26	SB Coffee makers (off mode)	95%	5%	0%	0%	1.00					
	Regulated also for (networked) standby ((n)sb,										
6 /26 /14	SB Washing Machines (sb & off modes)	97%	3%	0%	0%	1.00					
6 /26 /14	SB Dishwashers (sb & off modes)	93%	7%	0%	0%	1.00					
6 /26 /16	SB Laundry Dryers (sb & off modes)	95%	5%	0%	0%	1.00					
6/26/22/23	SB Electric Ovens (sb mode)	80%	20%	0%	0%	1.00					
6/26/22/23	SB Electric Hobs (sb mode)	100%	0%	0%	0%	1.00					
6 /26 /18	SB Complex Set-Top Boxes (low-power modes)	90%	10%	0%	0%	1.00					
6/26 /E3	SB Game consoles (sb mode)	100%	0%	0%	0%	1.00					
6 /26 /4	SB IE Inkjet Printers (nsb mode)	50%	50%	0%	0%	1.00					
6 /26 /4	SB IE Inkjet MFDs (nsb mode)	50%	50%	0%	0%	1.00					
6 /26 /4	SB IE Laser Printers (nsb mode)	10%	90%	0%	0%	1.00					
6 /26 /4	SB IE Laser Copiers (nsb mode)	10%	90%	0%	0%	1.00					
6 /26 /4	SB IE Laser MFDs (nsb mode)	8%	93%	0%	0%	1.00					
7	EPS ≤ 6W, low-V	75%	25%	0%	0%	1.00					
7	EPS 6–10 W	75%	25%	0%	0%	1.00					
7	EPS 10–12 W	75%	25%	0%	0%	1.00					
7	EPS 15–20 W	75%	25%	0%	0%	1.00					
7	EPS 20–30 W	75%	25%	0%	0%	1.00					
7	EPS 30–65 W, multiple-V	75%	25%	0%	0%	1.00					
7	EPS 30-65 W	75%	25%	0%	0%	1.00					
7	EPS 65–120 W	75%	25%	0%	0%	1.00					
7	EPS 65–120 W, multiple-V	75%	25%	0%	0%	1.00					
7	EPS 12–15 W	75%	25%	0%	0%	1.00					
7	**EPS, total**										
13	**RF Household Refrigeration**	92%	6%	1%	1%	1.00					
12	CF open vertical chilled multi deck (RVC2)	0%	100%	0%	0%	1.00					
12	CF open horizontal frozen island (RHF4)	0%	100%	0%	0%	1.00					
12	CF other supermarket display (non-base cases)	0%	100%	0%	0%	1.00					
12	CF Plug in one door beverage cooler	0%	100%	0%	0%	1.00					
12	CF Plug in horizontal ice cream freezer	0%	100%	0%	0%	1.00					
12	CF Spiral vending machine	0%	76%	23%	1%	1.00					
	CF Commercial Refrigeration										
E1	**PF Storage cabinets All types**	0%	100%	0%	0%	1.00					
E1	**PF Process Chiller All MT&LT**	0%	2%	92%	6%	1.00					
E1	**PF Condensing Unit, All MT&LT**	0%	85%	10%	5%	1.00					
E1	**PF Professional Refrigeration, Total**										
22 /23	CA Electric Hobs	100%	0%	0%	0%	1.00					
22 /23	CA Electric Ovens	80%	20%	0%	0%	1.00					
22 /23	CA Gas Hobs	80%	20%	0%	0%	0.00	1.00				
22 /23	CA Gas Ovens	90%	10%	0%	0%	0.00	1.00				
22 /23	CA Range Hoods	80%	20%	0%	0%	1.00					
22 /23	**CA Cooking Appliances**										
14	**WM-WD Household Washing Machines**	97%	3%	0%	0%	1.00					
14	**DW Household Dishwashers**	93%	7%	0%	0%	1.00					

Lot	Shares per sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
16	LD condensing heat pump	95%	5%	0%	0%	1.00					
16	LD condensing electric heat element	95%	5%	0%	0%	1.00					
16	LD vented electric	95%	5%	0%	0%	1.00					
16	LD vented gas	95%	5%	0%	0%	0.00	1.00				
16	**LD Household Laundry Dryers**	95%	5%	0%	0%						
17	VC Cylinder Domestic mains	100%	0%	0%	0%						
17	VC Upright Domestic mains	100%	0%	0%	0%						
17	VC Handstick Domestic mains	100%	0%	0%	0%						
17	VC Cylinder Commercial mains	0%	86%	12%	2%						
17	VC Upright Commercial mains	0%	86%	12%	2%						
17	VC Cordless - domestic	100%	0%	0%	0%						
17	VC Cordless - commercial	0%	86%	12%	2%						
17	VC Robot - domestic	100%	0%	0%	0%						
17	VC Robot - commercial	0%	86%	12%	2%						
17	**VC Vacuum Cleaners**										
11	FAN Axial<300Pa (all FAN types >125W)	0%	75%	24%	1%	1.00					
11	FAN Axial>300Pa	0%	75%	24%	1%	1.00					
11	FAN Centr.FC	0%	75%	24%	1%	1.00					
11	FAN Centr.BC-free	0%	75%	24%	1%	1.00					
11	FAN Centr.BC	0%	75%	24%	1%	1.00					
11	FAN Cross-flow	0%	75%	24%	1%	1.00					
11	**FAN Industrial Fans >125W**										
11/30	Medium (S) 3-phase 0.75-7.5 kW no VSD	0%	20%	79%	1%	1.00					
11/30	Medium (M) 3-phase 7.5-75 kW no VSD	0%	20%	79%	1%	1.00					
11/30	Medium (L) 3-phase 75-375 kW no VSD	0%	20%	79%	1%	1.00					
11/30	**Total 3-phase 0.75-375 kW without VSD**										
11/30	Medium (S) 3-phase 0.75-7.5 kW with VSD	0%	20%	79%	1%	1.00					
11/30	Medium (M) 3-phase 7.5-75 kW with VSD	0%	20%	79%	1%	1.00					
11/30	Medium (L) 3-phase 75-375 kW with VSD	0%	20%	79%	1%	1.00					
11/30	**Total 3-phase 0.75-375 kW with VSD**										
11/30	Small 1 phase 0.12-0.75 kW no VSD	0%	20%	79%	1%	1.00					
11/30	Small 1 phase 0.12-0.75 kW with VSD	0%	20%	79%	1%	1.00					
11/30	**Total Small 1-phase 0.12-0.75 kW**										
11/30	Small 3 phase 0.12-0.75 kW no VSD	0%	20%	79%	1%	1.00					
11/30	Small 3 phase 0.12-0.75 kW with VSD	0%	20%	79%	1%	1.00					
11/30	**Total Small 3-phase 0.12-0.75 kW**										
11/30	Large 3-phase LV 375-1000 kW no VSD	0%	20%	79%	1%	1.00					
11/30	Large 3-phase LV 375-1000kW with VSD	0%	20%	79%	1%	1.00					
11/30	**Total Large 3-phase LV 375-1000 kW**										
11/30	Explosion motors (S) 3-phase 0.75-7.5 kW	0%	20%	79%	1%	1.00					
11/30	Explosion motors (M) 3-phase 7.5-75 kW	0%	20%	79%	1%	1.00					
11/30	Explosion motors (L) 3-phase 75-375 kW	0%	20%	79%	1%	1.00					
11/30	**Total Explosion 0.75-375 kW (no VSD)**										
11/30	Brake motors (S) 3-phase 0.75-7.5 kW	0%	20%	79%	1%	1.00					
11/30	Brake motors (M) 3-phase 7.5-75 kW	0%	20%	79%	1%	1.00					
11/30	Brake motors (L) 3-phase 75-375 kW	0%	20%	79%	1%	1.00					
11/30	**Total Brake motors 0.75-375 kW (no VSD)**										
11/30	8-pole motors (S) 3-phase 0.75-7.5 kW	0%	20%	79%	1%	1.00					
11/30	8-pole motors (M) 3-phase 7.5-75 kW	0%	20%	79%	1%	1.00					
11/30	8-pole motors (L) 3-phase 75-375 kW	0%	20%	79%	1%	1.00					
11/30	**Total 8-pole motors 0.75-375 kW (no VSD)**										
11/30	**Single phase motors > 0.75 kW (no VSD)**	0%	20%	79%	1%	1.00					
11/30	**MT Electric Motors LV 0.12-1000 kW**										
11/28/29	ESOB < 45 kW	17%	24%	34%	25%	1.00					
11/28/29	ESOB 45-150 kW	17%	24%	34%	25%	1.00					
11/28/29	ESCC < 45 kW	17%	24%	34%	25%	1.00					
11/28/29	ESCC 45-150 kW	17%	24%	34%	25%	1.00					
11/28/29	ESCCi < 45 kW	17%	24%	34%	25%	1.00					
11/28/29	ESCCi 45-150 kW	17%	24%	34%	25%	1.00					
11/28/29	MSSB < 6" diameter	17%	24%	34%	25%	1.00					
11/28/29	MS_V <25 bar	17%	24%	34%	25%	1.00					
11/28/29	**WP Water pumps**										

Lot	Shares per sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood	other
E5	**WE Welding Equipment**	0%	0%	100%	0%	0.00					
E2	TRAFO Distribution	0%	0%	0%	0%	1.00					
E2	TRAFO Industry oil	0%	0%	0%	0%	1.00					
E2	TRAFO Industry dry	0%	0%	0%	0%	1.00					
E2	TRAFO Power	0%	0%	0%	0%	1.00					
E2	TRAFO DER oil	0%	0%	0%	0%	1.00					
E2	TRAFO DER dry	0%	0%	0%	0%	1.00					
E2	TRAFO Small	0%	0%	0%	0%	1.00					
E2	**TRAFO Utility Transformers**										
T	Tyres C1, replacement for cars	80%	15%	4%	1%	0.00		1.00			
T	Tyres C1, OEM for cars	80%	15%	4%	1%	0.00		1.00			
T	**Tyres C1, total**										
T	Tyres C2, replacement for vans	0%	60%	35%	5%	0.00		1.00			
T	Tyres C2, OEM for vans	0%	60%	35%	5%	0.00		1.00			
T	**Tyres C2, total**										
T	Tyres C3, replacement for trucks/busses	0%	60%	35%	5%	0.00		1.00			
T	Tyres C3, OEM for trucks/busses	0%	60%	35%	5%	0.00		1.00			
T	**Tyres C3, total**										
T	**Tyres, total C1+C2+C3**										

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EU28 value - EU27 value) / EU28 value										
EIWH Electric Instant. < 12 kW (secondary)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
EIWH Electric Instant. ≥ 12 kW (primary)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
EIWHS Electric Instant. Shower (secondary)	90%	90%	90%	90%	90%	90%	90%	90%	90%	90%
ESWH Electric Storage ≤ 30 L (secondary)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ESWH Electric Storage > 30 L (primary)	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
GIWH Gas Instant. < 13 L/min (secondary)	26%	23%	22%	22%	22%	22%	22%	22%	22%	22%
GIWH Gas Instant. ≥ 13 L/min (primary)	26%	23%	22%	22%	22%	22%	22%	22%	22%	22%
GSWH Gas Storage, Condensing	26%	23%	22%	22%	22%	22%	22%	22%	22%	22%
GSWH Gas Storage, Non-condensing	26%	23%	22%	22%	22%	22%	22%	22%	22%	22%
Dedicated WH Heat Pump	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
Dedicated WH Solar (3.5 m2)	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
CHB Gas Combi Instant. WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Gas + Cyl. WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Jet Burner Gas + Cyl. WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Jet Burner Oil + Cyl. WH	6%	9%	9%	11%	11%	11%	11%	11%	11%	11%
CHB Electric (Joule) + Cyl. WH	8%	7%	6%	6%	6%	6%	6%	6%	6%	6%
CHB Hybrid Gas/Electric WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Electric HP + Cyl. WH	8%	7%	6%	6%	6%	6%	6%	6%	6%	6%
CHB Gas HP + Cyl. WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Gas mCHP + Cyl. WH	30%	25%	24%	24%	24%	24%	24%	24%	24%	24%
CHB Solar Combi (16 m2)	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
CHB Gas non-condensing	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB Gas condensing	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB Gas Jet burner non-condensing	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB Gas Jet burner condensing	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB Oil Jet burner non-condensing	6%	7%	7%	10%	10%	10%	10%	10%	10%	10%
CHB Oil Jet burner condensing	6%	7%	7%	10%	10%	10%	10%	10%	10%	10%
CHB Electric Joule-effect	18%	16%	15%	14%	14%	14%	14%	14%	14%	14%
CHB Hybrid (gas-electric)	20%	18%	17%	17%	17%	17%	17%	17%	17%	17%
CHB Electric Heat Pump	0%	2%	14%	6%	6%	6%	6%	6%	6%	6%
CHB Gas Heat Pump	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB micro CHP	24%	21%	20%	20%	20%	20%	20%	20%	20%	20%
CHB Solar combi (16 m2)	0%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SFB Wood Manual	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
SFB Wood Direct Draft	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
SFB Coal	11%	6%	6%	6%	6%	6%	6%	6%	6%	6%
SFB Pellets	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
SFB Wood chips	2%	3%	4%	5%	5%	5%	5%	5%	5%	5%
CHAE-S (≤ 400 kW)	16%	12%	12%	11%	11%	11%	11%	11%	11%	11%
CHAE-L (> 400 kW)	14%	11%	11%	10%	10%	10%	10%	10%	10%	10%
CHWE-S (≤ 400 kW)	16%	12%	12%	11%	11%	11%	11%	11%	11%	11%
CHWE-M (> 400 kW; ≤ 1500 kW)	14%	11%	11%	10%	10%	10%	10%	10%	10%	10%
CHWE-L (> 1500 kW)	14%	11%	11%	10%	10%	10%	10%	10%	10%	10%
CHF	11%	13%	13%	15%	15%	15%	15%	15%	15%	15%
HT PCH-AE-S	13%	11%	10%	10%	10%	10%	10%	10%	10%	10%
HT PCH-AE-L	13%	11%	10%	10%	10%	10%	10%	10%	10%	10%
HT PCH-WE-S	13%	11%	10%	10%	10%	10%	10%	10%	10%	10%
HT PCH-WE-M	13%	11%	10%	10%	10%	10%	10%	10%	10%	10%
HT PCH-WE-L	13%	11%	10%	10%	10%	10%	10%	10%	10%	10%
AC rooftop	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
AC splits	15%	12%	11%	11%	11%	11%	11%	11%	11%	11%
AC VRF	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
ACF	11%	12%	12%	14%	14%	14%	14%	14%	14%	14%
AC rooftop (rev)	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
AC splits (rev)	15%	12%	11%	11%	11%	11%	11%	11%	11%	11%
AC VRF (rev)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
ACF (rev)	11%	12%	12%	14%	14%	14%	14%	14%	14%	14%
AHF	10%	11%	10%	11%	11%	11%	11%	11%	11%	11%
AHE	12%	11%	10%	10%	10%	10%	10%	10%	10%	10%
LH open fireplace	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
LH closed fireplace/inset	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
LH wood stove	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
LH coal stove	11%	6%	6%	6%	6%	6%	6%	6%	6%	6%
LH cooker	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
LH SHR stove	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%
LH pellet stove	1%	2%	4%	5%	5%	5%	5%	5%	5%	5%

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric fixed > 250W	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric fixed ≤ 250W	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric storage	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric underfloor	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric visibly glowing > 1.2 kW	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric visibly glowing ≤ 1.2 kW	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Electric Towel Heaters	7%	7%	6%	6%	6%	6%	6%	6%	6%	6%
LH Gas luminous (commercial)	89%	85%	83%	80%	80%	80%	80%	80%	80%	80%
LH Gaseous Tube (commercial < 120 kW)	89%	85%	83%	80%	80%	80%	80%	80%	80%	80%
LH Gas open front	94%	90%	87%	84%	84%	84%	84%	84%	84%	84%
LH Gas closed front	89%	87%	86%	84%	84%	84%	84%	84%	84%	84%
LH Gas balanced flue	42%	41%	42%	42%	42%	42%	42%	42%	42%	42%
LH Gas flueless	28%	24%	22%	22%	22%	22%	22%	22%	22%	22%
LH Liquid tube (commercial < 120 kW)	89%	85%	83%	80%	80%	80%	80%	80%	80%	80%
LH Liquid open front	94%	90%	87%	84%	84%	84%	84%	84%	84%	84%
LH Liquid closed front	89%	87%	86%	84%	84%	84%	84%	84%	84%	84%
LH Liquid balanced flue	42%	42%	42%	42%	42%	42%	42%	42%	42%	42%
LH Liquid flueless	5%	7%	7%	8%	8%	8%	8%	8%	8%	8%
RAC fixed < 6 kW, cooling	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
RAC fixed 6-12 kW, cooling	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
RAC portable < 12 kW, cooling	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
RAC fixed < 6 kW, reversible, heating	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
RAC fixed 6-12 kW, reversible, heating	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
RAC portable < 12 kW, reversible, heating	6%	6%	5%	5%	5%	5%	4%	4%	3%	3%
CIRC Integrated circulators	15%	13%	12%	12%	12%	12%	12%	12%	12%	12%
CIRC Large standalone circulators	15%	13%	12%	12%	12%	12%	12%	12%	12%	12%
CIRC Small standalone circulators	15%	13%	12%	12%	12%	12%	12%	12%	12%	12%
R-UVU ≤ 100 m3/h for Extract Spaces	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-UVU ≤ 100 m3/h for Habitable Spaces	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-BVU ≤ 100 m3/h for Habitable Spaces	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-UVU 100-250 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-BVU 100-250 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-UVU 250-1000 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-BVU 250-1000 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-UVU > 1000 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
R-BVU 1000-2500 m3/h	15%	14%	13%	13%	13%	13%	13%	13%	13%	13%
NR-UVU 250-1000 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-BVU 250-1000 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-UVU > 1000 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-BVU 1000-2500 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-AHU-S 2500-5500 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-AHU-M 5500-14500 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
NR-AHU-L > 14500 m3/h	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
LS: BAU, million units										
LFL (T12,T8h,T8t,T5,other)	15%	12%	11%	11%	11%	11%	11%	11%	11%	11%
HID (HPM, HPS, MH)	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
CFLni (all shapes)	17%	13%	13%	12%	12%	12%	12%	12%	12%	12%
CFLi (retrofit for GLS, HL)	17%	15%	14%	14%	14%	14%	14%	14%	14%	14%
GLS (DLS & NDLS)	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
GLS from storage	*18%*	*16%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
HL (DLS & NDLS, LV & MV)	17%	15%	15%	14%	14%	14%	14%	14%	14%	14%
HL from storage	*17%*	*15%*	*15%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*	*14%*
LED replacing LFL (retrofit & luminaire)	15%	12%	11%	11%	11%	11%	11%	11%	11%	11%
LED replacing HID (retrofit & luminaire)	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
LED replacing CFLni (retrofit & luminaire)	16%	13%	12%	12%	12%	12%	12%	12%	12%	12%
LED replacing DLS (retrofit & luminaire)	17%	15%	15%	14%	14%	14%	14%	14%	14%	14%
LED replacing NDLS (retrofit & luminaire)	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
Special Purpose Lamps (exempt)										
Lighting controls and standby	*17%*	*14%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*	*13%*
DP TV total	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
DP Monitor total	17%	14%	14%	13%	13%	13%	13%	13%	13%	13%
DP Signage total	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
SSTB Simple STB	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
CSTB Complex STB	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
Game consoles > 20 W	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
Game consoles < 20 W	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ES tower 1-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 1-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 2-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 2-socket cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 4-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 4-socket cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 2-socket resilient trad.	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 2-socket resilient cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 4-socket resilient trad.	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES rack 4-socket resilient cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES blade 1-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES blade 2-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES blade 2-socket cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES blade 4-socket traditional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
ES blade 4-socket cloud	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
DS Online 2	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
DS Online 3	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
DS Online 4	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PC Desktop	18%	15%	15%	14%	14%	14%	14%	14%	14%	14%
PC Integrated Desktop	18%	15%	15%	14%	14%	14%	14%	14%	14%	14%
PC Notebook	18%	15%	15%	14%	14%	14%	14%	14%	14%	14%
PC Tablet/slate	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
PC Thin client	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PC Integrated Thin Client	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PC Small-scale Server	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PC Workstation	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
Inkjet Printer	17%	14%	14%	14%	14%	14%	14%	14%	14%	14%
Inkjet MFD	17%	14%	14%	14%	14%	14%	14%	14%	14%	14%
EP / Laser Printer mono	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
EP / Laser Printer colour	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
EP / Laser Copier mono	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
EP / Laser Copier colour	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
EP / Laser MFD mono	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
EP / Laser MFD colour	16%	12%	12%	11%	11%	11%	11%	11%	11%	11%
Regulated only for (networked) standby ((n)sb)										
SB Radios (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Electric toothbrushes (off mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB Audio speakers (wired) (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Audio speakers (wireless) (nsb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Small appliances (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Media boxes /sticks (sb mode)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Media players and recorders (sb mode)	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
SB Projectors (sb & off modes)	16%	12%	12%	11%	11%	11%	11%	11%	11%	11%
SB Home phones (nsb mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB Office phones (nsb mode)	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
SB Home NAS (nsb mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB Home Network Equipment (nsb mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB Office Network Equipment (nsb mode)	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
SB Coffee makers (off mode)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
Regulated also for (networked) standby ((n)sb)										
(already accounted elsewhere; here for info only)										
SB Washing Machines (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Dishwashers (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Laundry Dryers (sb & off modes)	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
SB Electric Ovens (sb mode)	18%	16%	16%	15%	15%	15%	15%	15%	15%	15%
SB Electric Hobs (sb mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB Complex Set-Top Boxes (low-power modes)	19%	17%	16%	15%	15%	15%	15%	15%	15%	15%
SB Game consoles (sb mode)	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
SB IE Inkjet Printers (nsb mode)	17%	14%	14%	14%	14%	14%	14%	14%	14%	14%
SB IE Inkjet MFDs (nsb mode)	17%	14%	14%	14%	14%	14%	14%	14%	14%	14%
SB IE Laser Printers (nsb mode)	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
SB IE Laser Copiers (nsb mode)	16%	12%	12%	12%	12%	12%	12%	12%	12%	12%
SB IE Laser MFDs (nsb mode)	16%	12%	12%	11%	11%	11%	11%	11%	11%	11%
EPS Active mode (for electricity losses)										
EPS ≤ 6W, low-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 6–10 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 10–12 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 15–20 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 20–30 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 30–65 W, multiple-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 30-65 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 65–120 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 65–120 W, multiple-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 12–15 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EPS No-load mode										
EPS ≤ 6W, low-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 6–10 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 10–12 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 15–20 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 20–30 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 30–65 W, multiple-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 30-65 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 65–120 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 65–120 W, multiple-V	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
EPS 12–15 W	18%	16%	15%	15%	15%	15%	15%	15%	15%	15%
RF Household Refrigeration	**19%**	**17%**	**16%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**
CF open vertical chilled multi deck (RVC2)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CF open horizontal frozen island (RHF4)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CF other supermarket display (non-base cases)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CF Plug in one door beverage cooler	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CF Plug in horizontal ice cream freezer	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CF Spiral vending machine	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Storage cabinet Chilled Vertical (CV)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
PF Storage cabinet Frozen Vertical (FV)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
PF Storage cabinet Chilled Horizontal (CH)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
PF Storage cabinet Frozen Horizontal (FH)	16%	12%	11%	11%	11%	11%	11%	11%	11%	11%
PF Storage cabinets All types	**16%**	**12%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**
PF Process Chiller AC MT S ≤ 300 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller AC MT L > 300 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller AC LT S ≤ 200 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller AC LT L > 200 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller WC MT S ≤ 300 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller WC MT L > 300 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller WC LT S ≤ 200 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller WC LT L > 200 kW	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
PF Process Chiller All MT&LT	**10%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
PF Condensing Unit MT S 0.2-1 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit MT M 1-5 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit MT L 5-20 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit MT XL 20-50 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit LT S 0.1-0.4 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit LT M 0.4-2 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit LT L 2-8 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit LT XL 8-20 kW	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
PF Condensing Unit, All MT&LT	**15%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**	**11%**
CA Electric Hobs	7%	7%	7%	6%	6%	6%	6%	6%	6%	6%
CA Electric Ovens	9%	8%	8%	7%	7%	7%	7%	7%	7%	7%
CA Gas Hobs	13%	12%	12%	12%	12%	12%	12%	12%	12%	12%
CA Gas Ovens	14%	12%	11%	11%	11%	11%	11%	11%	11%	11%
CA Range Hoods	9%	8%	8%	7%	7%	7%	7%	7%	7%	7%
WM Washing Machines	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
WD Washer-Dryers	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
WM-WD Total household Washing	**19%**	**17%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**
DW Household Dishwashers	**19%**	**17%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**	**16%**
LD condensing heat pump	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
LD condensing electric heat element	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
LD vented electric	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
LD vented gas	29%	24%	23%	23%	23%	23%	23%	23%	23%	23%
LD Laundry Dryers, low-power modes	19%	17%	16%	16%	16%	16%	16%	16%	16%	16%
VC Cylinder Domestic mains	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VC Upright Domestic mains	95%	95%	95%	95%	95%	95%	95%	95%	95%	95%
VC Handstick Domestic mains	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VC Cylinder Commercial mains	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
VC Upright Commercial mains	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
VC Cordless - domestic	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VC Cordless - commercial	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
VC Robot - domestic	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
VC Robot - commercial	20%	20%	15%	15%	15%	15%	15%	15%	15%	15%
FAN Axial<300Pa (all FAN types >125W)	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%
FAN Axial>300Pa	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%
FAN Centr.FC	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%
FAN Centr.BC-free	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%
FAN Centr.BC	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%
FAN Cross-flow	14%	11%	11%	11%	11%	11%	11%	11%	11%	11%

BREXIT factors	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Medium (S) 3-phase 0.75-7.5 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Medium (M) 3-phase 7.5-75 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Medium (L) 3-phase 75-375 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total 3-phase 0.75-375 kW without VSD										
Medium (S) 3-phase 0.75-7.5 kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Medium (M) 3-phase 7.5-75 kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Medium (L) 3-phase 75-375 kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total 3-phase 0.75-375 kW with VSD										
Total 3-phase 0.75-375 kW w/wo VSD										
Small 1 phase 0.12-0.75 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Small 1 phase 0.12-0.75 kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total Small 1-phase 0.12-0.75 kW										
Small 3 phase 0.12-0.75 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Small 3 phase 0.12-0.75 kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total Small 3-phase 0.12-0.75 kW										
Large 3-phase LV 375-1000 kW no VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Large 3-phase LV 375-1000kW with VSD	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total Large 3-phase LV 375-1000 kW										
Explosion motors (S) 3-phase 0.75-7.5 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Explosion motors (M) 3-phase 7.5-75 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Explosion motors (L) 3-phase 75-375 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total Explosion 0.75-375 kW (no VSD)										
Brake motors (S) 3-phase 0.75-7.5 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Brake motors (M) 3-phase 7.5-75 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Brake motors (L) 3-phase 75-375 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total Brake motors 0.75-375 kW (no VSD)										
8-pole motors (S) 3-phase 0.75-7.5 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
8-pole motors (M) 3-phase 7.5-75 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
8-pole motors (L) 3-phase 75-375 kW	11%	10%	9%	9%	9%	9%	9%	9%	9%	9%
Total 8-pole motors 0.75-375 kW (no VSD)										
Single phase motors > 0.75 kW (no VSD)	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MT Electric Motors LV 0.12-1000 kW										
ESOB<45_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB<45_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB<45_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB<45_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB_45-150_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB_45-150_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB_45-150_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESOB_45-150_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC<45_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC<45_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC<45_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC<45_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC_45-150_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC_45-150_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC_45-150_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCC_45-150_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi<45_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi<45_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi<45_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi<45_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi_45-150_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi_45-150_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi_45-150_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
ESCCi_45-150_VSD-CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MSSB<6"_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MSSB<6"_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MSSB<6"_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MS-V<25bar_VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MS-V<25bar_CF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
MS-V<25bar_VSD-VF	**11%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**
WP Water pumps										
WE Welding Equipment	**10%**	**10%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**	**9%**

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO Industry oil	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO Industry dry	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO Power	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO DER oil	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO DER dry	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO Small	13%	12%	11%	11%	11%	11%	11%	11%	11%	11%
TRAFO Utility Transformers										
Tyres in m units										
Tyres C1, replacement for cars	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C1, OEM for cars	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C1, total										
Tyres C2, replacement for vans	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C2, OEM for vans	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C2, total										
Tyres C3, replacement for trucks/busses	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C3, OEM for trucks/busses	15%	13%	13%	13%	13%	13%	13%	13%	13%	13%
Tyres C3, total										
Tyres, total C1+C2+C3										

Lot	**SALESBAU, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
2	EIWH Electric Instant. < 12 kW (secondary)	245	357	393	434	434	434	434	434	434	434
2	EIWH Electric Instant. ≥ 12 kW (primary)	708	599	591	616	681	746	811	877	942	1007
2	EIWHS Electric Instant. Shower (secondary)	104	134	132	130	138	146	154	162	170	178
2	ESWH Electric Storage ≤ 30 L (secondary)	1586	1761	1772	1850	1978	2105	2232	2360	2487	2615
2	ESWH Electric Storage > 30 L (primary)	3478	4056	3724	3887	4155	4423	4691	4958	5226	5494
2	GIWH Gas Instant. < 13 L/min (secondary)	1252	869	714	726	716	706	696	685	675	665
2	GIWH Gas Instant. ≥ 13 L/min (primary)	203	192	163	166	163	161	159	156	154	152
2	GSWH Gas Storage, Condensing	0	5	8	9	11	13	15	17	19	20
2	GSWH Gas Storage, Non-condensing	211	125	91	57	51	44	38	31	25	19
2	Dedicated WH Heat Pump	0	43	119	172	261	350	440	529	618	707
2	Dedicated WH Solar (3.5 m2)	159	569	576	469	486	504	521	539	556	574
2	**WH dedicated Water Heater**	**7947**	**8710**	**8284**	**8515**	**9074**	**9632**	**10190**	**10749**	**11307**	**11866**
1	CHB Gas Combi Instant. WH	1824	3066	3183	3412	3451	3481	3490	3485	3456	3399
1	CHB Gas + Cyl. WH	643	876	909	975	986	994	997	995	987	971
1	CHB Jet Burner Gas + Cyl. WH	95	42	29	29	30	30	31	32	33	33
1	CHB Jet Burner Oil + Cyl. WH	722	290	195	191	196	201	207	213	217	222
1	CHB Electric (Joule) + Cyl. WH	39	63	60	66	61	57	52	47	42	38
1	CHB Hybrid Gas/Electric WH	1	2	4	6	11	17	28	46	76	124
1	CHB Electric HP + Cyl. WH	19	267	302	369	426	492	566	652	749	861
1	CHB Gas HP + Cyl. WH	1	2	3	5	7	10	14	20	29	41
1	CHB Gas mCHP + Cyl. WH	1	2	3	5	7	10	14	20	29	41
1	CHB Solar Combi (16 m2)	19	33	33	35	36	37	38	38	39	40
1	**CHC Central Heating combi, water heating**	**3362**	**4643**	**4722**	**5092**	**5210**	**5329**	**5437**	**5549**	**5658**	**5771**
1	CHB Gas non-condensing	2918	1569	1454	1423	1312	1207	1102	1001	903	806
1	CHB Gas condensing	97	2726	2949	3344	3552	3741	3896	4022	4109	4147
1	CHB Gas Jet burner non-condensing	128	41	19	16	15	14	13	12	11	10
1	CHB Gas Jet burner condensing	0	14	19	21	23	26	28	30	32	33
1	CHB Oil Jet burner non-condensing	901	278	123	109	101	94	87	81	75	69
1	CHB Oil Jet burner condensing	0	93	124	132	146	160	173	187	199	211
1	CHB Electric Joule-effect	35	57	55	60	56	52	47	43	39	34
1	CHB Hybrid (gas-electric)	1	2	4	7	12	19	32	53	87	144
1	CHB Electric Heat Pump	20	281	318	391	457	533	620	720	836	970
1	CHB Gas Heat Pump	1	2	3	5	7	11	15	22	32	46
1	CHB micro CHP	1	2	3	5	7	11	15	22	32	46
1	CHB Solar combi (16 m2)	19	33	33	36	37	38	39	40	41	42
1	**CHB Central Heating boiler < 400 kW, space heating**	**4121**	**5098**	**5104**	**5548**	**5726**	**5904**	**6068**	**6232**	**6395**	**6558**
15	SFB Wood Manual	224	133	84	47	27	24	22	20	18	16
15	SFB Wood Direct Draft	5	218	218	221	196	239	290	353	430	523
15	SFB Coal	45	209	46	59	64	58	52	47	43	39
15	SFB Pellets	0	45	69	68	68	75	83	91	101	111
15	SFB Wood chips	0	5	5	6	7	7	8	9	10	11
15	**SFB Solid Fuel Boilers**	**274**	**610**	**422**	**400**	**362**	**403**	**455**	**521**	**601**	**700**
21 /E6	CHAE-S (≤ 400 kW)	18	78	86	95	105	115	125	135	145	153
21 /E6	CHAE-L (> 400 kW)	2	6	6	6	6	6	7	7	7	7
21 /E6	CHWE-S (≤ 400 kW)	2	8	9	10	11	12	13	14	14	15
21 /E6	CHWE-M (> 400 kW; ≤ 1500 kW)	0	2	2	2	2	2	2	2	2	2
21 /E6	CHWE-L (> 1500 kW)	0	1	1	1	1	1	1	1	1	1
21 /E6	CHF	0	0	0	1	1	1	1	1	1	1
21 /E6	HT PCH-AE-S	8	14	15	16	16	17	18	18	19	19
21 /E6	HT PCH-AE-L	3	4	5	5	5	5	6	6	6	6
21 /E6	HT PCH-WE-S	2	4	4	4	4	4	5	5	5	5
21 /E6	HT PCH-WE-M	2	3	3	3	3	3	3	4	4	4
21 /E6	HT PCH-WE-L	0	0	0	0	0	0	0	0	0	0
21 /E6	AC rooftop	9	32	32	25	14	4	4	4	4	4
21 /E6	AC splits	78	296	310	300	290	278	268	257	247	236
21 /E6	AC VRF	0	80	105	153	194	234	273	308	337	359
21 /E6	ACF	0	0	0	1	1	1	1	1	1	1
21 /E6	**AHC central Air Cooling**	**124**	**526**	**576**	**620**	**653**	**684**	**724**	**761**	**793**	**815**
21 /E6	AC rooftop (rev)	6	20	19	15	8	2	0	0	0	0
21 /E6	AC splits (rev)	56	204	214	208	201	193	185	178	171	164
21 /E6	AC VRF (rev)	0	71	88	135	164	189	209	224	234	236
21 /E6	ACF (rev)	0	1	1	1	1	1	2	2	2	2
21 /E6	AHF	121	78	74	69	65	62	58	54	51	47
21 /E6	AHE	2	4	5	5	5	5	5	5	5	5
21 /E6	**AHC central Air Heating** (rev double)	**185**	**378**	**400**	**432**	**444**	**451**	**458**	**463**	**462**	**454**
21 /E6	**AHC total Heating & Cooling**	**247**	**609**	**654**	**694**	**723**	**750**	**787**	**820**	**848**	**867**

Lot	**SALESBAU, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
20	LH open fireplace	513	737	729	727	722	718	717	717	717	717
20	LH closed fireplace/inset	313	835	916	1002	1015	1028	1030	1030	1030	1030
20	LH wood stove	339	393	428	466	472	478	480	480	480	480
20	LH coal stove	138	113	104	95	71	47	43	43	43	43
20	LH cooker	248	491	583	677	695	712	715	715	715	715
20	LH SHR stove	214	295	360	426	476	526	536	536	536	536
20	LH pellet stove	0	226	280	335	359	383	388	388	388	388
	LH Solid fuel sum	**1766**	**3089**	**3401**	**3728**	**3810**	**3892**	**3909**	**3909**	**3909**	**3909**
20	LH Electric portable	5562	6787	7084	7144	7144	7144	7144	7144	7144	7144
20	LH Electric fixed > 250W	5981	6894	5331	5018	5018	5018	5018	5018	5018	5018
20	LH Electric fixed ≤ 250W	1495	1724	1333	1254	1254	1254	1254	1254	1254	1254
20	LH Electric storage	255	311	276	269	269	269	269	269	269	269
20	LH Electric underfloor	1004	1225	1264	1272	1272	1272	1272	1272	1272	1272
20	LH Electric visibly glowing > 1.2 kW	118	144	150	151	151	151	151	151	151	151
20	LH Electric visibly glowing ≤ 1.2 kW	50	62	64	65	65	65	65	65	65	65
20	LH Electric Towel Heaters	1131	1885	1885	1885	1885	1885	1885	1885	1885	1885
	LH Electric sum	**15598**	**19033**	**17387**	**17058**	**17058**	**17058**	**17058**	**17058**	**17058**	**17058**
20	LH Gas luminous (commercial)	4	5	5	4	4	3	3	3	3	3
20	LH Gaseous Tube (commercial < 120 kW)	4	5	5	4	4	3	3	3	3	3
20	LH Gas open front	10	10	11	10	9	7	7	7	7	7
20	LH Gas closed front	52	28	22	19	17	15	15	15	15	15
20	LH Gas balanced flue	122	51	34	28	25	21	21	21	21	21
20	LH Gas flueless	18	6	3	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**210**	**105**	**79**	**66**	**58**	**50**	**50**	**50**	**50**	**50**
20	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
20	LH Liquid open front	1	1	1	1	1	1	1	1	1	1
20	LH Liquid closed front	5	3	2	2	2	1	1	1	1	1
20	LH Liquid balanced flue	12	5	3	3	2	2	2	2	2	2
20	LH Liquid flueless	214	71	36	0	0	0	0	0	0	0
	LH Liquid fuel sum	**233**	**81**	**43**	**6**	**5**	**5**	**5**	**5**	**5**	**5**
20	**LH Local Space Heaters**	**17807**	**22308**	**20911**	**20857**	**20931**	**21005**	**21022**	**21022**	**21022**	**21022**
10	RAC fixed < 6 kW, cooling	268	2930	2459	3102	3735	4327	5004	5889	6748	7810
10	RAC fixed 6-12 kW, cooling	58	724	782	853	973	1099	1228	1371	1519	1681
10	RAC portable < 12 kW, cooling	47	551	527	423	437	453	468	485	501	518
10	**RAC < 12 kW total, cooling mode**	**373**	**4205**	**3767**	**4377**	**5145**	**5878**	**6701**	**7745**	**8768**	**10009**
	RAC Share reversible	*28%*	*83%*	*96%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*	*100%*
	RAC Share of reversible used for heating	*30%*	*46%*	*50%*	*60%*	*70%*	*80%*	*90%*	*100%*	*100%*	*100%*
10	RAC fixed < 6 kW, reversible, heating	23	1119	1180	1861	2615	3461	4504	5889	6748	7810
10	RAC fixed 6-12 kW, reversible, heating	5	277	375	512	681	879	1106	1371	1519	1681
10	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
10	**RAC < 12 kW total, heating mode**	**27**	**1395**	**1556**	**2373**	**3296**	**4340**	**5609**	**7261**	**8267**	**9491**
10	**RAC Room Air Conditioner**	**373**	**4205**	**3767**	**4377**	**5145**	**5878**	**6701**	**7745**	**8768**	**10009**
11	CIRC Integrated circulators	4674	7421	8174	8898	9594	10149	10149	10149	10149	10149
11	CIRC Large standalone circulators	623	863	816	784	731	652	652	652	652	652
11	CIRC Small standalone circulators	3429	4787	4639	4502	4220	3850	3850	3850	3850	3850
11	**CIRC Circulator pumps <2.5 kW**	**8726**	**13071**	**13629**	**14184**	**14545**	**14651**	**14651**	**14651**	**14651**	**14651**
E6 /10	R-UVU ≤ 100 m3/h for Extract Spaces	32	82	85	99	101	105	111	122	117	120
E6 /10	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	5	10	14	18	20	24
E6 /10	R-BVU ≤ 100 m3/h for Habitable Spaces	8	102	160	359	1775	1953	2172	3189	3930	4268
E6 /10	R-UVU 100-250 m3/h	140	331	359	427	424	405	433	465	412	416
E6 /10	R-BVU 100-250 m3/h	4	27	31	48	208	225	242	354	433	466
E6 /10	R-UVU 250-1000 m3/h	183	434	470	559	556	530	567	609	540	545
E6 /10	R-BVU 250-1000 m3/h	5	35	41	62	273	294	317	464	568	610
E6 /10	R-UVU > 1000 m3/h	5	8	8	9	8	8	9	8	8	7
E6 /10	R-BVU 1000-2500 m3/h	0	3	4	4	5	6	7	8	9	9
	RVU, Total residential	**377**	**1023**	**1158**	**1567**	**3356**	**3536**	**3871**	**5236**	**6037**	**6464**
E6 /10	NR-UVU 250-1000 m3/h	96	166	169	178	174	176	177	170	162	156
E6 /10	NR-BVU 250-1000 m3/h	0	68	74	91	109	127	142	158	181	194
E6 /10	NR-UVU > 1000 m3/h	43	73	75	79	77	78	79	76	72	69
E6 /10	NR-BVU 1000-2500 m3/h	0	30	33	40	48	56	63	70	80	86
E6 /10	NR-AHU-S 2500-5500 m3/h	3	46	61	70	75	91	104	109	119	133
E6 /10	NR-AHU-M 5500-14500 m3/h	45	77	84	86	88	96	101	101	107	113
E6 /10	NR-AHU-L > 14500 m3/h	4	7	7	8	8	8	9	9	9	10
	NRVU, Total non-residential	**190**	**467**	**504**	**552**	**580**	**633**	**674**	**692**	**730**	**761**
	VU Ventilation Units, res + non-res	**568**	**1490**	**1662**	**2119**	**3936**	**4169**	**4544**	**5928**	**6767**	**7225**

Lot	**SALESBAU, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
8 /9 /19	*LS: BAU, million units*										
8 /9 /19	LFL (T12,T8h,T8t,T5,other)	230	345	312	238	164	120	100	79	61	46
8 /9 /19	HID (HPM, HPS, MH)	14	36	31	21	17	9	5	2	1	1
8 /9 /19	CFLni (all shapes)	19	75	66	64	52	26	14	8	3	2
8 /9 /19	CFLi (retrofit for GLS, HL)	23	298	195	234	140	104	56	39	24	15
8 /9 /19	GLS (DLS & NDLS)	1384	1151	973	678	399	234	137	80	47	27
8 /9 /19	HL (DLS & NDLS, LV & MV)	73	475	633	684	422	217	114	62	34	20
8 /9 /19	LED replacing LFL (retrofit & luminaire)	0	0	5	34	88	151	167	193	231	270
8 /9 /19	LED replacing HID (retrofit & luminaire)	0	0	0	4	8	14	16	19	22	25
8 /9 /19	LED replacing CFLni (retrofit & luminaire)	0	0	1	10	30	49	57	63	66	72
8 /9 /19	LED replacing DLS (retrofit & luminaire)	0	0	6	55	101	78	57	46	42	41
8 /9 /19	LED replacing NDLS (retrofit & luminaire)	0	1	12	288	392	363	295	239	205	192
8 /9 /19	SUBTOTAL non-LED	1743	2381	2210	1920	1193	710	425	269	170	112
8 /9 /19	SUBTOTAL LED	0	1	25	391	620	655	592	561	565	600
8 /9 /19	**LS Lighting, mln units**	**1743**	**2383**	**2236**	**2310**	**1813**	**1364**	**1017**	**829**	**735**	**712**
5	DP TV, standard (NoNA)	21154	46885	352	0	0	0	0	0	0	0
5	DP TV, LoNA	0	7403	17624	10992	0	0	0	0	0	0
5	DP TV, HiNA ('Smart')	0	7403	17272	32975	50731	58341	59187	59187	59187	59187
5	**DP TV total**	**21154**	**61690**	**35249**	**43967**	**50731**	**58341**	**59187**	**59187**	**59187**	**59187**
5	DP Monitor	8302	21444	12069	12137	12137	12137	12137	12137	12137	12137
5	DP Signage	0	354	1553	3564	2673	2673	2673	2673	2673	2673
5	**DP Electronic Displays, total**	**29455**	**83489**	**48871**	**59668**	**65541**	**73151**	**73996**	**73996**	**73996**	**73996**
18	SSTB Simple STB	0	22202	5061	0	0	0	0	0	0	0
18	CSTB Complex STB	0	27858	34362	34666	34666	34666	34666	34666	34666	34666
18	**STB Set Top Boxes**	**0**	**50060**	**39423**	**34666**	**34666**	**34666**	**34666**	**34666**	**34666**	**34666**
E3	Game consoles > 20 W	100	7800	7800	7800	7800	7800	7800	7800	7800	7800
E3	Game consoles < 20 W	500	2800	2800	2800	2800	2800	2800	2800	2800	2800
E3	**Total Game consoles, all modes**	**600**	**10600**	**10600**	**10600**	**10600**	**10600**	**10600**	**10600**	**10600**	**10600**
E9	ES tower 1-socket traditional	7	197	206	177	152	131	131	131	131	131
E9	ES rack 1-socket traditional	18	496	483	509	535	562	562	562	562	562
E9	ES rack 2-socket traditional	59	951	433	528	643	782	782	782	782	782
E9	ES rack 2-socket cloud	0	677	1019	1244	1514	1842	1842	1842	1842	1842
E9	ES rack 4-socket traditional	3	53	23	28	34	41	41	41	41	41
E9	ES rack 4-socket cloud	0	38	54	65	80	97	97	97	97	97
E9	ES rack 2-socket resilient trad.	1	16	7	9	11	13	13	13	13	13
E9	ES rack 2-socket resilient cloud	0	11	17	21	26	31	31	31	31	31
E9	ES rack 4-socket resilient trad.	0	1	0	0	1	1	1	1	1	1
E9	ES rack 4-socket resilient cloud	0	1	1	1	1	2	2	2	2	2
E9	ES blade 1-socket traditional	14	159	151	159	167	176	176	176	176	176
E9	ES blade 2-socket traditional	45	308	136	166	201	245	245	245	245	245
E9	ES blade 2-socket cloud	0	220	319	390	474	577	577	577	577	577
E9	ES blade 4-socket traditional	3	17	7	9	11	13	13	13	13	13
E9	ES blade 4-socket cloud	0	12	17	21	25	31	31	31	31	31
E9	**ES total traditional**	**150**	**2199**	**1445**	**1586**	**1755**	**1964**	**1964**	**1964**	**1964**	**1964**
E9	**ES total cloud**	**0**	**959**	**1427**	**1743**	**2120**	**2580**	**2580**	**2580**	**2580**	**2580**
E9	**ES Enterprise Servers total**	**150**	**3157**	**2873**	**3328**	**3875**	**4544**	**4544**	**4544**	**4544**	**4544**
E9	DS Online 2	11	271	251	276	304	336	336	336	336	336
E9	DS Online 3	8	169	121	132	146	161	161	161	161	161
E9	DS Online 4	2	35	31	35	38	42	42	42	42	42
E9	**DS Data Storage products total**	**21**	**474**	**403**	**443**	**489**	**540**	**540**	**540**	**540**	**540**
E9	**ES + DS total**	**171**	**3631**	**3276**	**3771**	**4364**	**5084**	**5084**	**5084**	**5084**	**5084**
3	PC Desktop	15510	24091	12744	14255	19669	20969	21725	21979	22063	22091
3	PC Integrated Desktop	620	964	510	570	787	960	1079	1121	1136	1140
3	PC Notebook	0	48278	42570	42464	56033	70666	81151	84953	86242	86669
3	PC Tablet/slate	0	3560	40790	39328	42752	46339	48467	49188	49427	49505
3	PC Thin client	0	1347	1308	1381	1394	1403	1408	1409	1410	1410
3	PC Integrated Thin Client	0	135	131	138	139	140	141	141	141	141
3	PC Small-scale Server	68	133	168	170	171	172	173	173	173	173
3	PC Workstation	363	646	795	908	1087	1301	1445	1495	1512	1518
3	**PC Personal Computers**	**16561**	**79154**	**99016**	**99214**	**122032**	**141950**	**155587**	**160460**	**162104**	**162648**
4	Inkjet Printer	5035	8306	822	786	748	711	674	640	605	571
4	Inkjet MFD	4127	10669	12740	12186	11588	11021	10481	9970	9460	8950
4	EP / Laser Printer mono	2975	2954	2034	1545	1217	978	768	587	406	226
4	EP / Laser Printer colour	0	1142	1332	1669	1840	1929	1999	2038	2078	2117
4	EP / Laser Copier mono	1967	828	204	0	0	0	0	0	0	0
4	EP / Laser Copier colour	0	166	298	0	0	0	0	0	0	0
4	EP / Laser MFD mono	0	1379	1843	1760	1674	1592	1512	1436	1361	1286
4	EP / Laser MFD colour	0	1380	1844	1761	1675	1593	1516	1440	1365	1290
4	**EP & IJ imaging equipment**	**14104**	**26825**	**21117**	**19707**	**18741**	**17823**	**16949**	**16112**	**15276**	**14439**

Lot	**SALESBAU, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Regulated only for (networked) standby ((n)sb)										
6 /26	SB Radios (sb & off modes)	62230	50472	40605	35745	32630	29527	26423	23319	20216	17112
6 /26	SB Electric toothbrushes (off mode)	5833	9404	10321	11627	12983	14355	15727	17099	18471	19843
6 /26	SB Audio speakers (wired) (sb & off modes)	29889	15388	10871	3888	0	0	0	0	0	0
6 /26	SB Audio speakers (wireless) (nsb & off modes)	0	188	12266	32598	36953	37140	37174	37207	37241	37275
6 /26	SB Small appliances (sb & off modes)	112082	181136	185803	190734	192852	194981	197111	199240	201369	203498
6 /26	SB Media boxes /sticks (sb mode)	0	9	6088	7457	7481	7481	7481	7481	7481	7481
6 /26	SB Media players and recorders (sb mode)	32	29517	25604	3383	0	0	0	0	0	0
6 /26	SB Projectors (sb & off modes)	25	1854	1576	644	278	0	0	0	0	0
6 /26	SB Home phones (nsb mode)	3747	17326	18006	17112	16065	15484	15168	14852	14536	14220
6 /26	SB Office phones (nsb mode)	4969	9026	8283	7792	7731	7852	7692	7531	7371	7211
6 /26	SB Home NAS (nsb mode)	0	5083	8026	10959	13789	16619	19084	20869	21722	21767
6 /26	SB Home Network Equipment (nsb mode)	0	23309	26462	28231	29792	31352	33861	33861	33861	33861
6 /26	SB Office Network Equipment (nsb mode)	0	2450	7228	13576	19897	26219	29529	29529	29529	29529
6 /26	SB Coffee makers (off mode)	17978	21820	22435	23072	23765	24489	25191	25893	26595	27297
	Regulated also for (networked) standby ((n)sb)										
	(already accounted elsewhere; here for info only)										
6 /26 /14	SB Washing Machines (sb & off modes)	7707	11441	11533	12464	11990	11993	11996	11999	12001	12004
6 /26 /14	SB Dishwashers (sb & off modes)	2614	5852	6833	7833	8780	9727	10674	11621	12568	13515
6 /26 /16	SB Laundry Dryers (sb & off modes)	2259	3175	3970	4489	4665	4700	4700	4700	4700	4700
6/26/22/23	SB Electric Ovens (sb mode)	8778	9707	10162	11579	11724	11872	12021	12172	12325	12479
6/26/22/23	SB Electric Hobs (sb mode)	6087	9699	10570	11465	12145	12796	13447	14098	14749	15400
6 /26 /18	SB Complex Set-Top Boxes (low-power modes)	0	27858	34362	34666	34666	34666	34666	34666	34666	34666
6/26 /E3	SB Game consoles (non-active modes)	600	10600	10600	10600	10600	10600	10600	10600	10600	10600
6 /26 /4	SB IE Inkjet Printers (nsb mode)	5035	8306	822	786	748	711	674	640	605	571
6 /26 /4	SB IE Inkjet MFDs (nsb mode)	4127	10669	12740	12186	11588	11021	10481	9970	9460	8950
6 /26 /4	SB IE Laser Printers (nsb mode)	2975	4096	3366	3215	3057	2907	2767	2625	2484	2342
6 /26 /4	SB IE Laser Copiers (nsb mode)	1967	994	502	0	0	0	0	0	0	0
6 /26 /4	SB IE Laser MFDs (nsb mode)	0	2759	3687	3521	3348	3184	3027	2877	2726	2576
6 /26	Total (networked) SB (incl. double)	278935	472139	492722	499622	507531	519675	529493	532850	535277	536898
6 /26	**Total (networked) SB (excl. double)**	**236786**	**366982**	**383575**	**386818**	**394218**	**405498**	**414440**	**416883**	**418393**	**419095**
7	EPS ≤ 6W, low-V	4945	64709	45970	31390	22628	11840	5253	2331	1034	459
7	EPS 6–10 W	13195	185600	200639	214358	224632	236049	242010	248121	254386	260810
7	EPS 10–12 W	0	102872	122894	132503	133725	134558	135394	136235	137082	137933
7	EPS 15–20 W	0	648	3911	7530	8354	9317	9792	10292	10817	11368
7	EPS 20–30 W	247	12549	13003	12027	11516	10838	9985	9132	8279	7427
7	EPS 30–65 W, multiple-V	0	0	0	1313	1947	2709	3562	4415	5268	6120
7	EPS 30-65 W	0	0	0	1054	2599	4470	4470	4470	4470	4470
7	EPS 65–120 W	91	4558	4442	3393	1888	45	0	0	0	0
7	EPS 65–120 W, multiple-V	0	20330	7374	2174	2194	2208	2208	2208	2208	2208
7	EPS 12–15 W	234	9672	19621	23911	24132	24282	24282	24282	24282	24282
7	**EPS, total**	**18712**	**400937**	**417854**	**429653**	**433615**	**436316**	**436956**	**441486**	**447826**	**455078**
13	**RF Household Refrigeration**	**14323**	**15991**	**16355**	**16732**	**16987**	**17242**	**17497**	**17751**	**18006**	**18261**
12	CF open vertical chilled multi deck (RVC2)	68	79	78	80	81	82	83	85	86	87
12	CF open horizontal frozen island (RHF4)	7	8	8	8	8	9	9	9	9	9
12	CF other supermarket display (non-base cases)	264	329	348	363	376	389	403	417	432	447
12	CF Plug in one door beverage cooler	568	727	725	754	780	806	832	860	888	918
12	CF Plug in horizontal ice cream freezer	243	312	311	323	334	345	357	369	381	393
12	CF Spiral vending machine	90	71	58	60	63	65	68	70	73	76
	CF Commercial Refrigeration	**1241**	**1525**	**1527**	**1587**	**1642**	**1696**	**1752**	**1809**	**1869**	**1930**
E1	PF Storage cabinet Chilled Vertical (CV)	121	165	173	180	189	197	206	215	223	232
E1	PF Storage cabinet Frozen Vertical (FV)	54	73	77	80	84	87	91	95	99	103
E1	PF Storage cabinet Chilled Horizontal (CH)	52	71	74	77	81	85	88	92	96	99
E1	PF Storage cabinet Frozen Horizontal (FH)	23	31	33	34	36	37	39	41	42	44
E1	**PF Storage cabinets All types**	**250**	**341**	**357**	**371**	**389**	**407**	**425**	**443**	**461**	**478**
E1	PF Process Chiller AC MT S ≤ 300 kW	1.0	2.0	2.2	2.4	2.7	2.9	3.2	3.4	3.7	3.9
E1	PF Process Chiller AC MT L > 300 kW	0.3	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2
E1	PF Process Chiller AC LT S ≤ 200 kW	0.7	1.4	1.6	1.8	1.9	2.1	2.3	2.5	2.7	2.9
E1	PF Process Chiller AC LT L > 200 kW	0.2	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9
E1	PF Process Chiller WC MT S ≤ 300 kW	0.3	0.6	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2
E1	PF Process Chiller WC MT L > 300 kW	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5
E1	PF Process Chiller WC LT S ≤ 200 kW	0.3	0.5	0.6	0.6	0.7	0.8	0.8	0.9	1.0	1.0
E1	PF Process Chiller WC LT L > 200 kW	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4
E1	**PF Process Chiller All MT&LT**	**3**	**6**	**7**	**7**	**8**	**9**	**10**	**10**	**11**	**12**
E1	PF Condensing Unit MT S 0.2-1 kW	277	230	236	255	275	296	319	343	370	398
E1	PF Condensing Unit MT M 1-5 kW	166	138	141	153	165	177	191	206	222	239
E1	PF Condensing Unit MT L 5-20 kW	83	69	71	76	82	89	96	103	111	120
E1	PF Condensing Unit MT XL 20-50 kW	28	23	24	25	27	30	32	34	37	40
E1	PF Condensing Unit LT S 0.1-0.4 kW	40	33	34	37	40	43	46	49	53	57
E1	PF Condensing Unit LT M 0.4-2 kW	53	44	45	49	53	57	61	66	71	76
E1	PF Condensing Unit LT L 2-8 kW	27	22	23	24	26	28	31	33	35	38
E1	PF Condensing Unit LT XL 8-20 kW	13	11	11	12	13	14	15	16	18	19
E1	**PF Condensing Unit, All MT&LT**	**686**	**570**	**585**	**632**	**681**	**733**	**790**	**851**	**917**	**988**
E1	**PF Professional Refrigeration, Total**	**939**	**917**	**948**	**1011**	**1078**	**1149**	**1225**	**1304**	**1389**	**1478**

Lot	**SALESBAU, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
22 /23	CA Electric Hobs, active modes	6087	9699	10570	11465	12145	12796	13447	14098	14749	15400
22 /23	CA Electric Ovens, low-power modes	8778	9707	10162	11579	11724	11872	12021	12172	12325	12479
22 /23	CA Gas Hobs	6404	5459	5234	4978	4739	4512	4284	4057	3829	3602
22 /23	CA Gas Ovens	2315	1864	1767	1760	1738	1717	1695	1674	1653	1633
22 /23	CA Range Hoods	5252	6522	6872	7244	7614	8002	8390	8779	9167	9555
22 /23	**CA Cooking Appliances**	**28835**	**33252**	**34606**	**37026**	**37960**	**38898**	**39837**	**40779**	**41723**	**42669**
	WM Washing Machines	7340	10923	11001	11918	11441	11441	11441	11441	11441	11441
	WD Washer-Dryers	367	519	532	546	549	552	555	557	560	563
14	**WM-WD Total household Washing**	**7707**	**11441**	**11533**	**12464**	**11990**	**11993**	**11996**	**11999**	**12001**	**12004**
14	**DW Household Dishwashers**	**2614**	**5852**	**6833**	**7833**	**8780**	**9727**	**10674**	**11621**	**12568**	**13515**
16	LD condensing heat pump	0	64	107	193	303	456	606	757	907	1057
16	LD condensing electric heat element	678	1842	2474	2949	2962	2834	2683	2533	2383	2232
16	LD vented electric	1574	1261	1386	1346	1399	1410	1410	1410	1410	1410
16	LD vented gas	7	8	4	0	0	0	0	0	0	0
16	**LD Household Laundry Dryers**	**2259**	**3175**	**3970**	**4489**	**4665**	**4700**	**4700**	**4700**	**4700**	**4700**
17	VC Cylinder Domestic mains	13024	24017	23819	20960	16986	12038	8949	8234	8234	8234
17	VC Upright Domestic mains	121	172	146	128	119	106	95	92	92	92
17	VC Handstick Domestic mains	261	860	1189	1778	2265	3210	3979	4234	4234	4234
17	**VC Total Domestic mains**	**13406**	**25050**	**25153**	**22866**	**19370**	**15354**	**13023**	**12561**	**12561**	**12561**
17	VC Cylinder Commercial mains	1386	2427	2557	2507	2507	2507	2507	2507	2507	2507
17	VC Upright Commercial mains	245	331	297	268	268	268	268	268	268	268
17	**VC Total Commercial mains**	**1631**	**2758**	**2855**	**2775**	**2775**	**2775**	**2775**	**2775**	**2775**	**2775**
17	**VC Total in scope of CR 666/2013**	**15037**	**27807**	**28008**	**25641**	**22145**	**18129**	**15798**	**15336**	**15336**	**15336**
17	VC Cordless - domestic	275	1258	3410	7335	10871	14568	17636	19306	19991	20192
17	VC Cordless - commercial	4	16	46	100	148	198	240	263	272	275
17	VC Robot - domestic	0	723	1321	2231	3261	4402	5352	5866	6074	6135
17	VC Robot - commercial	0	25	49	83	122	164	200	219	226	229
17	**VC Total Domestic mains+cordless+robots**	**13681**	**27031**	**29884**	**32432**	**33502**	**34324**	**36010**	**37733**	**38626**	**38888**
17	**VC Total Commercial mains+cordless+robots**	**1635**	**2799**	**2950**	**2958**	**3045**	**3138**	**3215**	**3257**	**3274**	**3279**
17	**VC Vacuum Cleaners**	**15316**	**29830**	**32835**	**35390**	**36547**	**37461**	**39225**	**40990**	**41900**	**42167**
11	FAN Axial<300Pa (all FAN types >125W)	1373	4670	5383	6098	6098	6098	6098	6098	6098	6098
11	FAN Axial>300Pa	1420	5099	5401	5702	5702	5702	5702	5702	5702	5702
11	FAN Centr.FC	705	1860	2155	2451	2451	2451	2451	2451	2451	2451
11	FAN Centr.BC-free	216	547	624	701	776	791	806	822	837	852
11	FAN Centr.BC	220	608	700	791	881	898	988	1077	1166	1256
11	FAN Cross-flow	203	471	539	606	672	686	752	818	884	950
11	**FAN Industrial Fans >125W**	**4138**	**13256**	**14801**	**16349**	**16580**	**16626**	**16796**	**16967**	**17137**	**17307**
11/30	Medium (S) 3-phase 0.75-7.5 kW no VSD	4597	6315	6612	6693	6585	6427	6207	5915	5538	5060
11/30	Medium (M) 3-phase 7.5-75 kW no VSD	615	822	851	850	822	785	737	677	600	548
11/30	Medium (L) 3-phase 75-375 kW no VSD	48	60	61	59	54	49	42	33	33	34
11/30	**Total 3-phase 0.75-375 kW without VSD**	**5260**	**7197**	**7523**	**7602**	**7462**	**7261**	**6986**	**6625**	**6172**	**5642**
11/30	Medium (S) 3-phase 0.75-7.5 kW with VSD	490	1255	1549	1860	2183	2564	3010	3535	4151	4874
11/30	Medium (M) 3-phase 7.5-75 kW with VSD	87	223	275	330	387	455	534	627	736	822
11/30	Medium (L) 3-phase 75-375 kW with VSD	10	27	33	40	47	55	64	75	78	80
11/30	**Total 3-phase 0.75-375 kW with VSD**	**588**	**1504**	**1857**	**2229**	**2617**	**3073**	**3609**	**4237**	**4965**	**5776**
11/30	**Total 3-phase 0.75-375 kW w/wo VSD**	**5847**	**8701**	**9381**	**9831**	**10079**	**10334**	**10595**	**10862**	**11137**	**11418**
11/30	Small 1 phase 0.12-0.75 kW no VSD	10344	14136	14594	14719	14795	14864	14927	14982	15030	15069
11/30	Small 1 phase 0.12-0.75 kW with VSD	211	1571	1953	2120	2256	2401	2555	2719	2893	3079
11/30	**Total Small 1-phase 0.12-0.75 kW**	**10556**	**15707**	**16547**	**16839**	**17050**	**17265**	**17481**	**17701**	**17923**	**18149**
11/30	Small 3 phase 0.12-0.75 kW no VSD	2901	3905	4092	4207	4255	4298	4335	4366	4389	4404
11/30	Small 3 phase 0.12-0.75 kW with VSD	69	516	653	737	814	899	993	1097	1211	1338
11/30	**Total Small 3-phase 0.12-0.75 kW**	**2971**	**4421**	**4745**	**4944**	**5069**	**5197**	**5328**	**5463**	**5600**	**5742**
11/30	Large 3-phase LV 375-1000 kW no VSD	5.3	5.5	4.8	4.7	4.7	4.6	4.6	4.6	4.5	4.5
11/30	Large 3-phase LV 375-1000kW with VSD	0.6	3.2	4.6	5.1	5.3	5.6	5.9	6.2	6.5	6.9
11/30	**Total Large 3-phase LV 375-1000 kW**	**6**	**9**	**9**	**10**	**10**	**10**	**11**	**11**	**11**	**11**
11/30	Explosion motors (S) 3-phase 0.75-7.5 kW	193	287	309	324	333	341	350	358	367	377
11/30	Explosion motors (M) 3-phase 7.5-75 kW	39	58	62	65	67	69	70	72	74	76
11/30	Explosion motors (L) 3-phase 75-375 kW	3	4	5	5	5	5	5	5	6	6
11/30	**Total Explosion 0.75-375 kW (no VSD)**	**235**	**349**	**376**	**394**	**404**	**415**	**425**	**436**	**447**	**458**
11/30	Brake motors (S) 3-phase 0.75-7.5 kW	241	359	387	405	416	426	437	448	459	471
11/30	Brake motors (M) 3-phase 7.5-75 kW	49	72	78	82	84	86	88	90	92	95
11/30	Brake motors (L) 3-phase 75-375 kW	4	5	6	6	6	6	7	7	7	7
11/30	**Total Brake motors 0.75-375 kW (no VSD)**	**293**	**436**	**470**	**493**	**506**	**518**	**531**	**545**	**559**	**573**
11/30	8-pole motors (S) 3-phase 0.75-7.5 kW	10	14	15	16	17	17	17	18	18	19
11/30	8-pole motors (M) 3-phase 7.5-75 kW	2	3	3	3	3	3	4	4	4	4
11/30	8-pole motors (L) 3-phase 75-375 kW	0	0	0	0	0	0	0	0	0	0
11/30	**Total 8-pole motors 0.75-375 kW (no VSD)**	**12**	**17**	**19**	**20**	**20**	**21**	**21**	**22**	**22**	**23**
11/30	**Single phase motors > 0.75 kW (no VSD)**	**5899**	**8779**	**9464**	**9918**	**10169**	**10426**	**10689**	**10959**	**11235**	**11519**
11/30	**MT Electric Motors LV 0.12-1000 kW**	**25819**	**38419**	**41011**	**42449**	**43307**	**44185**	**45081**	**45998**	**46935**	**47892**

Lot	SALESBAU, 000 units (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
11/28/29	ESOB<45_VF	67	88	95	100	101	108	115	122	130	137
11/28/29	ESOB<45_CF	71	95	104	113	117	126	134	143	151	160
11/28/29	ESOB<45_VSD-VF	4	7	9	13	17	18	19	20	22	23
11/28/29	ESOB<45_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESOB < 45 Total**	**141**	**191**	**208**	**226**	**235**	**252**	**269**	**286**	**302**	**319**
11/28/29	ESOB_45-150_VF	3	3	4	4	4	4	4	4	5	5
11/28/29	ESOB_45-150_CF	7	9	10	11	11	12	13	13	14	15
11/28/29	ESOB_45-150_VSD-VF	0	0	1	1	1	1	1	1	1	2
11/28/29	ESOB_45-150_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESOB 45-150 Total**	**9**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
11/28/29	**ESOB < 150 Total**	**151**	**203**	**222**	**241**	**251**	**269**	**287**	**305**	**323**	**341**
11/28/29	ESCC<45_VF	68	89	96	100	99	107	114	121	128	135
11/28/29	ESCC<45_CF	73	98	107	116	121	130	138	147	156	165
11/28/29	ESCC<45_VSD-VF	5	9	11	17	22	23	25	26	28	29
11/28/29	ESCC<45_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESCC < 45 Total**	**146**	**196**	**214**	**233**	**242**	**260**	**277**	**294**	**312**	**329**
11/28/29	ESCC_45-150_VF	2	3	3	3	3	4	4	4	4	5
11/28/29	ESCC_45-150_CF	3	3	4	4	4	5	5	5	5	6
11/28/29	ESCC_45-150_VSD-VF	0	0	0	1	1	1	1	1	1	1
11/28/29	ESCC_45-150_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESCC 45-150 Total**	**5**	**7**	**8**	**8**	**8**	**9**	**10**	**10**	**11**	**12**
11/28/29	**ESCC < 150 Total**	**151**	**203**	**222**	**241**	**251**	**269**	**287**	**305**	**323**	**341**
11/28/29	ESCCi<45_VF	42	49	51	45	36	38	41	44	46	49
11/28/29	ESCCi<45_CF	6	8	9	9	10	11	11	12	13	13
11/28/29	ESCCi<45_VSD-VF	11	23	28	41	53	57	61	64	68	72
11/28/29	ESCCi<45_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESCCi < 45 Total**	**59**	**80**	**87**	**95**	**99**	**106**	**113**	**120**	**127**	**134**
11/28/29	ESCCi_45-150_VF	1	1	1	1	1	1	1	1	1	1
11/28/29	ESCCi_45-150_CF	0	0	0	0	0	0	0	0	0	0
11/28/29	ESCCi_45-150_VSD-VF	0	0	0	1	1	1	1	1	1	1
11/28/29	ESCCi_45-150_VSD-CF	0	0	0	0	0	0	0	0	0	0
11/28/29	**ESCCi 45-150 Total**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**	**2**	**2**
11/28/29	**ESCCi < 150 Total**	**60**	**81**	**89**	**96**	**100**	**107**	**115**	**122**	**129**	**136**
11/28/29	MSSB<6"_VF	67	79	82	82	73	78	83	88	94	99
11/28/29	MSSB<6"_CF	338	456	496	540	561	602	642	682	723	763
11/28/29	MSSB<6"_VSD-VF	17	35	42	53	68	73	77	82	87	92
11/28/29	**MSSB <6" Total**	**422**	**569**	**620**	**674**	**702**	**752**	**803**	**853**	**903**	**954**
11/28/29	MS-V<25bar_VF	68	86	92	93	89	96	102	109	115	122
11/28/29	MS-V<25bar_CF	75	102	111	120	125	134	143	152	161	170
11/28/29	MS-V<25bar_VSD-VF	8	15	19	28	36	38	41	44	46	49
11/28/29	**MS_V <25 bar Total**	**151**	**203**	**222**	**241**	**251**	**269**	**287**	**305**	**323**	**341**
11/28/29	**WP Water pumps**	**935**	**1261**	**1374**	**1494**	**1554**	**1665**	**1778**	**1889**	**2000**	**2112**
E5	**WE Welding Equipment**	**422**	**479**	**483**	**486**	**491**	**497**	**500**	**504**	**508**	**512**
E2	TRAFO Distribution	53	85	91	99	106	114	122	130	138	146
E2	TRAFO Industry oil	16	26	28	30	33	35	38	40	43	45
E2	TRAFO Industry dry	3	5	5	6	6	7	7	7	8	8
E2	TRAFO Power	2	3	3	3	4	4	4	5	5	5
E2	TRAFO DER oil	0	1	1	2	4	6	9	13	16	19
E2	TRAFO DER dry	0	3	6	9	16	26	38	50	62	75
E2	TRAFO Small	33	33	34	34	34	34	34	34	34	34
E2	**TRAFO Utility Transformers**	**107**	**156**	**169**	**184**	**201**	**225**	**252**	**278**	**305**	**331**
	Tyres in m units										
T	Tyres C1, replacement for cars	174	217	210	234	260	289	289	289	289	289
T	Tyres C1, OEM for cars	53	65	67	71	78	87	87	87	87	87
T	**Tyres C1, total**	**227**	**282**	**278**	**305**	**338**	**375**	**375**	**375**	**375**	**375**
T	Tyres C2, replacement for vans	19	24	23	26	29	32	32	32	32	32
T	Tyres C2, OEM for vans	4	4	5	5	6	7	7	7	7	7
T	**Tyres C2, total**	**23**	**28**	**29**	**32**	**35**	**39**	**39**	**39**	**39**	**39**
T	Tyres C3, replacement for trucks/busses	10	10	11	13	14	15	15	15	15	15
T	Tyres C3, OEM for trucks/busses	3	2	3	4	4	4	4	4	4	4
T	**Tyres C3, total**	**13**	**12**	**14**	**16**	**18**	**20**	**20**	**20**	**20**	**20**
T	**Tyres, total C1+C2+C3**	**263**	**323**	**321**	**353**	**391**	**434**	**434**	**434**	**434**	**434**

Lot	**SALESECO, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Note for printed version: for products not listed below, ECO-sales are identical to BAU-sales										
1	CHB Gas Combi Instant. WH	1824	3066	3174	3270	3055	2840	2608	2376	2108	1840
1	CHB Gas + Cyl. WH	643	876	774	848	793	737	677	616	547	477
1	CHB Jet Burner Gas + Cyl. WH	95	42	29	29	30	30	31	32	33	33
1	CHB Jet Burner Oil + Cyl. WH	722	290	195	191	196	201	207	213	217	222
1	CHB Electric (Joule) + Cyl. WH	39	63	60	66	61	57	52	47	42	38
1	CHB Hybrid Gas/Electric WH	1	2	7	17	60	103	156	209	283	357
1	CHB Electric HP + Cyl. WH	19	267	324	553	962	1372	1779	2187	2621	3055
1	CHB Gas HP + Cyl. WH	1	2	6	13	25	36	48	60	74	87
1	CHB Gas mCHP + Cyl. WH	1	2	6	12	18	24	31	37	43	49
1	CHB Solar Combi (16 m2)	19	33	39	37	38	39	40	41	42	43
1	**CHC Central Heating combi, water heating**	**3362**	**4643**	**4614**	**5036**	**5238**	**5440**	**5629**	**5818**	**6010**	**6202**
1	CHB Gas non-condensing	2918	1569	1181	361	221	81	64	47	38	28
1	CHB Gas condensing	97	2726	3228	4215	4054	3894	3585	3277	2912	2547
1	CHB Gas Jet burner non-condensing	128	41	14	5	4	3	2	2	2	1
1	CHB Gas Jet burner condensing	0	14	23	33	35	37	38	40	41	43
1	CHB Oil Jet burner non-condensing	901	278	93	30	25	20	16	12	10	8
1	CHB Oil Jet burner condensing	0	93	155	210	222	234	245	255	263	272
1	CHB Electric Joule-effect	35	57	55	60	56	52	47	43	39	34
1	CHB Hybrid (gas-electric)	1	2	8	18	66	113	171	229	310	390
1	CHB Electric Heat Pump	20	281	296	552	961	1369	1776	2183	2617	3050
1	CHB Gas Heat Pump	1	2	6	14	26	37	50	63	77	92
1	CHB micro CHP	1	2	6	12	19	26	32	39	45	51
1	CHB Solar combi (16 m2)	19	33	39	37	38	39	40	41	42	43
1	**CHB Central Heating boiler < 400 kW, space heating**	**4121**	**5098**	**5104**	**5548**	**5726**	**5904**	**6068**	**6232**	**6395**	**6558**
8 /9 /19	*LS: ECO, million units*										
8 /9 /19	LFL (T12,T8h,T8t,T5,other)	230	345	253	211	67	34	19	12	7	4
8 /9 /19	HID (HPM, HPS, MH)	14	36	25	15	9	4	1	0	0	0
8 /9 /19	CFLni (all shapes)	19	75	57	41	25	7	2	1	0	0
8 /9 /19	CFLi (retrofit for GLS, HL)	23	409	132	72	0	0	0	0	0	0
8 /9 /19	GLS (DLS & NDLS)	1384	586	49	0	0	0	0	0	0	0
8 /9 /19	*GLS from storage*	*0*	*94*	*158*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
8 /9 /19	HL (DLS & NDLS, LV & MV)	73	552	631	152	1	0	0	0	0	0
8 /9 /19	*HL from storage*	*0*	*76*	*106*	*9*	*0*	*0*	*0*	*0*	*0*	*0*
8 /9 /19	LED replacing LFL (retrofit & luminaire)	0	0	11	47	176	210	199	212	248	287
8 /9 /19	LED replacing HID (retrofit & luminaire)	0	0	5	6	12	15	17	20	22	25
8 /9 /19	LED replacing CFLni (retrofit & luminaire)	0	0	10	30	43	54	58	61	67	76
8 /9 /19	LED replacing DLS (retrofit & luminaire)	0	5	77	114	75	23	25	28	31	34
8 /9 /19	LED replacing NDLS (retrofit & luminaire)	0	2	214	813	361	234	120	126	138	152
8 /9 /19	SUBTOTAL non-LED (excl. SPL, ctrl, sb)	1743	2174	1412	500	102	45	22	14	8	4
8 /9 /19	SUBTOTAL LED	0	7	318	1009	667	537	419	446	507	574
8 /9 /19	**LS Lighting mln units**	**1743**	**2181**	**1730**	**1509**	**769**	**582**	**441**	**460**	**514**	**578**
16	LD condensing heat pump	0	283	1859	2573	3033	3759	3759	3759	3759	3759
16	LD condensing electric heat element	678	1788	1488	1421	1306	940	940	940	940	940
16	LD vented electric	1574	1096	623	495	326	0	0	0	0	0
16	LD vented gas	7	8	4	0	0	0	0	0	0	0
16	LD Laundry Dryers, low-power modes	2259	3175	3974	4489	4665	4700	4700	4700	4700	4700
16	**LD Household Laundry Dryers**	**2259**	**3175**	**3974**	**4489**	**4665**	**4700**	**4700**	**4700**	**4700**	**4700**
11/30	Medium (S) 3-phase 0.75-7.5 kW no VSD	4597	6303	6204	5255	5219	5203	5177	5139	5089	5026
11/30	Medium (M) 3-phase 7.5-75 kW no VSD	615	818	706	607	598	587	575	560	544	548
11/30	Medium (L) 3-phase 75-375 kW no VSD	48	60	47	41	39	37	35	33	33	34
11/30	**Total 3-phase 0.75-375 kW without VSD**	**5260**	**7181**	**6957**	**5904**	**5856**	**5828**	**5787**	**5733**	**5666**	**5608**
11/30	Medium (S) 3-phase 0.75-7.5 kW with VSD	490	1267	1958	3298	3550	3787	4041	4311	4600	4908
11/30	Medium (M) 3-phase 7.5-75 kW with VSD	87	226	419	572	612	653	696	743	793	822
11/30	Medium (L) 3-phase 75-375 kW with VSD	10	27	47	58	62	66	71	76	78	80
11/30	**Total 3-phase 0.75-375 kW with VSD**	**588**	**1520**	**2424**	**3928**	**4223**	**4506**	**4808**	**5130**	**5470**	**5810**
11/30	**Total 3-phase 0.75-375 kW w/wo VSD**	**5847**	**8701**	**9381**	**9831**	**10079**	**10334**	**10595**	**10862**	**11137**	**11418**
11/30	Small 1 phase 0.12-0.75 kW no VSD	10344	14136	14594	14719	14795	14864	14927	14982	15030	15069
11/30	Small 1 phase 0.12-0.75 kW with VSD	211	1571	1953	2120	2256	2401	2555	2719	2893	3079
11/30	**Total Small 1-phase 0.12-0.75 kW**	**10556**	**15707**	**16547**	**16839**	**17050**	**17265**	**17481**	**17701**	**17923**	**18149**
11/30	Small 3 phase 0.12-0.75 kW no VSD	2901	3905	4092	4207	4255	4298	4335	4366	4389	4404
11/30	Small 3 phase 0.12-0.75 kW with VSD	69	516	653	737	814	899	993	1097	1211	1338
11/30	**Total Small 3-phase 0.12-0.75 kW**	**2971**	**4421**	**4745**	**4944**	**5069**	**5197**	**5328**	**5463**	**5600**	**5742**

Lot	**SALESECO, 000 units** (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
11/30	Large 3-phase LV 375-1000 kW no VSD	5.3	5.5	4.8	4.7	4.7	4.6	4.6	4.6	4.5	4.5
11/30	Large 3-phase LV 375-1000kW with VSD	0.6	3.2	4.6	5.1	5.3	5.6	5.9	6.2	6.5	6.9
11/30	**Total Large 3-phase LV 375-1000 kW**	**6**	**9**	**9**	**10**	**10**	**10**	**11**	**11**	**11**	**11**
11/30	Explosion motors (S) 3-phase 0.75-7.5 kW	193	287	309	324	333	341	350	358	367	377
11/30	Explosion motors (M) 3-phase 7.5-75 kW	39	58	62	65	67	69	70	72	74	76
11/30	Explosion motors (L) 3-phase 75-375 kW	3	4	5	5	5	5	5	5	6	6
11/30	**Total Explosion 0.75-375 kW (no VSD)**	**235**	**349**	**376**	**394**	**404**	**415**	**425**	**436**	**447**	**458**
11/30	Brake motors (S) 3-phase 0.75-7.5 kW	241	359	387	405	416	426	437	448	459	471
11/30	Brake motors (M) 3-phase 7.5-75 kW	49	72	78	82	84	86	88	90	92	95
11/30	Brake motors (L) 3-phase 75-375 kW	4	5	6	6	6	6	7	7	7	7
11/30	**Total Brake motors 0.75-375 kW (no VSD)**	**293**	**436**	**470**	**493**	**506**	**518**	**531**	**545**	**559**	**573**
11/30	8-pole motors (S) 3-phase 0.75-7.5 kW	10	14	15	16	17	17	17	18	18	19
11/30	8-pole motors (M) 3-phase 7.5-75 kW	2	3	3	3	3	3	4	4	4	4
11/30	8-pole motors (L) 3-phase 75-375 kW	0	0	0	0	0	0	0	0	0	0
11/30	**Total 8-pole motors 0.75-375 kW (no VSD)**	**12**	**17**	**19**	**20**	**20**	**21**	**21**	**22**	**22**	**23**
11/30	**Single phase motors > 0.75 kW (no VSD)**	**5899**	**8779**	**9464**	**9918**	**10169**	**10426**	**10689**	**10959**	**11235**	**11519**
11/30	**MT Electric Motors LV 0.12-1000 kW**	**25819**	**38419**	**41011**	**42449**	**43307**	**44185**	**45081**	**45998**	**46935**	**47892**

STOCKBAU (000 units, LS & Tyre m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
EIWH Electric Instant. < 12 kW (secondary)	15.4	3 446	4 408	4 946	5 683	6 297	6 588	6 686	6 686	6 686	6 686
EIWH Electric Instant. ≥ 12 kW (primary)	18.0	11 709	13 193	12 465	11 653	11 252	11 692	12 638	13 783	14 959	16 135
EIWHS Electric Instant. Shower (secondary)	15.0	1 424	1 978	2 056	2 002	1 977	2 036	2 141	2 262	2 383	2 504
ESWH Electric Storage ≤ 30 L (secondary)	15.4	22 267	27 720	27 736	27 631	28 238	29 734	31 550	33 512	35 475	37 438
ESWH Electric Storage > 30 L (primary)	15.0	47 683	61 883	61 693	60 442	58 530	60 986	64 735	68 751	72 768	76 784
GIWH Gas Instant. < 13 L/min (secondary)	15.4	17 579	17 761	15 212	12 787	11 351	11 094	10 936	10 780	10 625	10 469
GIWH Gas Instant. ≥ 13 L/min (primary)	15.4	2 848	3 306	3 095	2 881	2 542	2 531	2 495	2 459	2 424	2 389
GSWH Gas Storage, Condensing	15.4	-	25	59	103	136	164	189	217	245	273
GSWH Gas Storage, Non-condensing	15.4	2 966	2 808	2 262	1 680	1 197	901	724	626	527	428
Dedicated WH Heat Pump	15.4	-	245	657	1 342	2 321	3 489	4 789	6 163	7 538	8 912
Dedicated WH Solar (3.5 m2)	18.0	873	6 484	8 385	9 142	9 456	9 083	8 860	9 165	9 480	9 796
WH dedicated Water Heater		**110 795**	**139 810**	**138 565**	**135 345**	**133 297**	**138 297**	**145 741**	**154 404**	**163 108**	**171 813**
CHB Gas Combi Instant. WH	18.0	20 416	50 142	54 077	57 018	57 917	60 055	62 025	62 553	62 649	62 378
CHB Gas + Cyl. WH	18.0	9 408	15 467	16 076	16 474	16 626	17 157	17 719	17 870	17 898	17 820
CHB Jet Burner Gas + Cyl. WH	24.0	2 170	1 950	1 627	1 310	1 019	781	705	723	741	760
CHB Jet Burner Oil + Cyl. WH	24.0	16 510	14 295	11 734	9 282	7 071	5 290	4 711	4 806	4 926	5 051
CHB Electric (Joule) + Cyl. WH	18.0	674	871	952	1 079	1 126	1 103	1 075	994	909	824
CHB Hybrid Gas/Electric WH	18.0	12	18	30	52	90	150	250	410	672	1 100
CHB Electric HP + Cyl. WH	18.0	323	2 326	3 474	4 763	5 982	6 862	8 072	9 325	10 740	12 357
CHB Gas HP + Cyl. WH	18.0	4	18	28	45	70	103	149	213	304	433
CHB Gas mCHP + Cyl. WH	18.0	7	29	35	48	71	103	149	213	304	433
CHB Solar Combi (16 m2)	18.0	270	435	491	550	601	627	654	668	680	692
CHC Central Heating combi, water heating		**49 793**	**85 552**	**88 525**	**90 621**	**90 572**	**92 230**	**95 510**	**97 775**	**99 823**	**101 849**
CHB Gas non-condensing	18	35 778	52 508	44 939	36 199	27 841	25 476	23 544	21 167	19 313	17 505
CHB Gas condensing	18	487	21 288	33 382	45 801	56 359	61 842	65 771	67 923	70 555	72 542
CHB Gas Jet burner non-condensing	24	2 936	2 546	2 055	1 558	1 088	637	399	349	323	299
CHB Gas Jet burner condensing	24	0	61	146	247	359	478	550	599	650	698
CHB Oil Jet burner non-condensing	24	20 624	17 676	14 191	10 705	7 404	4 260	2 644	2 314	2 144	1 989
CHB Oil Jet burner condensing	24	0	416	977	1 610	2 304	3 037	3 458	3 735	4 056	4 370
CHB Electric Joule-effect	18	600	781	865	993	1 067	1 041	1 002	905	828	751
CHB Hybrid (gas-electric)	18	13	20	33	57	100	168	280	461	763	1 262
CHB Electric Heat Pump	18	349	2 497	3 720	5 110	6 540	7 542	8 828	10 151	11 806	13 714
CHB Gas Heat Pump	18	4	19	30	48	75	110	160	229	330	475
CHB micro CHP	18	8	30	37	51	75	110	160	229	330	475
CHB Solar combi (16 m2)	18	270	437	497	561	624	656	678	687	706	725
CHB Central Heating boiler < 400 kW, space heating		**61 069**	**98 280**	**100 871**	**102 939**	**103 835**	**105 357**	**107 474**	**108 750**	**111 804**	**114 805**
SFB Wood Manual	**18**	6 609	2 908	2 469	1 969	1 414	896	582	439	387	350
SFB Wood Direct Draft	**18**	71	1 026	2 044	3 017	3 765	3 887	4 138	4 688	5 659	6 885
SFB Coal	**20**	7 058	3 360	3 559	3 066	2 351	1 545	1 153	1 128	1 040	940
SFB Pellets	**20**	-	325	605	897	1 152	1 337	1 437	1 536	1 681	1 856
SFB Wood chips	**20**	-	79	100	119	117	118	133	149	166	183
SFB Solid Fuel Boilers		**13 738**	**7 699**	**8 778**	**9 068**	**8 800**	**7 783**	**7 443**	**7 941**	**8 933**	**10 214**
CHAE-S (≤ 400 kW)	**20**	242	1 044	1 327	1 570	1 752	1 931	2 125	2 323	2 522	2 716
CHAE-L (> 400 kW)	**25**	25	90	111	129	142	148	153	159	165	171
CHWE-S (≤ 400 kW)	**20**	24	105	134	158	176	193	213	232	252	272
CHWE-M (> 400 kW; ≤ 1500 kW)	**25**	7	26	32	37	41	43	45	47	48	50
CHWE-L (> 1500 kW)	**25**	2	9	11	12	14	14	15	16	16	17
CHF	**15**	0	2	4	6	7	9	10	12	13	15
HT PCH-AE-S	**15**	94	168	191	211	227	238	249	259	269	279
HT PCH-AE-L	**15**	30	53	60	67	72	75	79	82	85	88
HT PCH-WE-S	**15**	24	43	49	54	58	62	64	67	69	72
HT PCH-WE-M	**15**	18	33	38	42	45	47	49	51	53	55
HT PCH-WE-L	**20**	2	3	4	4	5	5	5	5	6	6
AC rooftop	**15**	107	438	485	477	404	274	150	77	57	57
AC splits	**15**	896	3 906	4 321	4 494	4 521	4 408	4 239	4 081	3 923	3 766
AC VRF	**15**	0	618	1 004	1 525	2 025	2 657	3 282	3 850	4 387	4 854
ACF	**15**	0	2	4	6	7	9	10	12	14	15
AHC central Air Cooling		**1 471**	**6 539**	**7 774**	**8 793**	**9 494**	**10 113**	**10 688**	**11 274**	**11 879**	**12 430**
AC rooftop (rev)	**15**	66	271	298	287	241	162	81	25	2	0
AC splits (rev)	**15**	649	2 695	2 981	3 102	3 123	3 049	2 934	2 825	2 716	2 607
AC VRF (rev)	**15**	0	543	871	1 297	1 721	2 224	2 679	2 993	3 248	3 423
ACF (rev)	**15**	0	4	8	12	14	17	21	24	27	30
AHF	**16**	1 435	1 382	1 278	1 201	1 128	1 061	1 001	943	886	829
AHE	**10**	21	76	66	45	45	45	45	45	45	45
AHC central Air Heating (rev double)		**2 172**	**4 972**	**5 502**	**5 945**	**6 273**	**6 559**	**6 761**	**6 856**	**6 924**	**6 934**
AHC total Heating & Cooling		**2 927**	**7 997**	**9 118**	**10 039**	**10 667**	**11 219**	**11 734**	**12 262**	**12 810**	**13 305**
LH open fireplace	**25**	10 331	15 075	16 272	17 183	17 809	18 110	18 108	18 022	17 969	17 931
LH closed fireplace/inset	**25**	4 627	12 641	15 640	18 603	21 271	23 300	24 574	25 295	25 613	25 717
LH wood stove	**25**	7 697	9 056	9 464	9 979	10 516	11 006	11 455	11 777	11 923	11 973
LH coal stove	**25**	4 686	3 087	2 899	2 752	2 572	2 290	1 931	1 609	1 332	1 145
LH cooker	**15**	2 959	5 971	7 053	8 265	9 375	10 160	10 540	10 678	10 730	10 730
LH SHR stove	**25**	4 422	6 174	6 810	7 675	8 726	9 919	11 161	12 170	12 858	13 261
LH pellet stove	**15**	-	1 934	2 910	3 849	4 606	5 175	5 550	5 742	5 814	5 814
LH Solid fuel sum		**34722**	**53938**	**61049**	**68306**	**74875**	**79960**	**83319**	**85293**	**86239**	**86570**

STOCKBAU (000 units, LS & Tyre m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH Electric portable	**9**	50 386	61 752	64 725	66 985	67 721	67 721	67 721	67 721	67 721	67 721
LH Electric fixed > 250W	**15**	86 891	101 748	99 755	91 932	83 062	77 666	77 526	77 526	77 526	77 526
LH Electric fixed ≤ 250W	**15**	21 723	25 437	24 939	22 983	20 765	19 417	19 381	19 381	19 381	19 381
LH Electric storage	**15**	3 645	4 486	4 560	4 458	4 282	4 160	4 156	4 156	4 156	4 156
LH Electric underfloor	**35**	28 900	36 316	38 168	39 875	41 319	42 500	43 419	44 058	44 407	44 524
LH Electric visibly glowing > 1.2 kW	**10**	1 133	1 389	1 456	1 508	1 528	1 528	1 528	1 528	1 528	1 528
LH Electric visibly glowing ≤ 1.2 kW	**10**	486	595	624	646	655	655	655	655	655	655
LH Electric Towel Heaters	**15**	13 999	23 294	25 933	27 724	28 280	28 280	28 280	28 280	28 280	28 280
LH Electric sum		**207162**	**255016**	**260161**	**256111**	**247612**	**241927**	**242666**	**243305**	**243654**	**243771**
LH Gas luminous (commercial)	**15**	59	65	68	69	66	61	55	51	50	50
LH Gaseous Tube (commercial < 120 kW)	**20**	78	85	88	90	89	84	78	71	68	67
LH Gas open front	**20**	209	212	213	212	205	192	176	162	154	151
LH Gas closed front	**20**	1 069	816	694	578	482	404	352	324	307	302
LH Gas balanced flue	**20**	2 434	1 697	1 346	1 023	772	593	494	455	432	426
LH Gas flueless	**7**	115	54	33	13	1	-	-	-	-	-
LH Gaseous fuel sum		**3964**	**2929**	**2442**	**1985**	**1615**	**1334**	**1155**	**1064**	**1011**	**996**
LH Liquid tube (commercial < 120 kW)	**20**	8	9	9	9	9	8	8	7	7	7
LH Liquid open front	**20**	20	21	21	21	20	19	17	16	15	15
LH Liquid closed front	**20**	107	82	69	58	48	40	35	32	31	30
LH Liquid balanced flue	**20**	243	170	135	102	77	59	49	46	43	43
LH Liquid flueless	**7**	1 407	650	400	150	7	-	-	-	-	-
LH Liquid fuel sum		**1786**	**931**	**634**	**340**	**162**	**127**	**110**	**101**	**96**	**94**
LH Local Heaters		**247 633**	**312 814**	**324 286**	**326 743**	**324 264**	**323 348**	**327 250**	**329 763**	**331 001**	**331 431**
RAC fixed < 6 kW, cooling	**12**	3 215	37 363	37 466	32 795	36 636	43 714	51 327	59 952	69 639	80 395
RAC fixed 6-12 kW, cooling	**12**	694	8 677	9 890	9 252	10 228	11 540	13 040	14 622	16 294	18 077
RAC portable < 12 kW, cooling	**10**	468	4 252	4 194	4 042	4 244	4 387	4 542	4 701	4 862	5 026
RAC < 12 kW total, cooling mode		**4 376**	**50 293**	**51 551**	**46 089**	**51 108**	**59 641**	**68 908**	**79 275**	**90 796**	**103 498**
RAC fixed < 6 kW, reversible, heating	**12**	271	10 429	13 553	15 682	21 719	30 503	40 915	53 804	67 478	80 281
RAC fixed 6-12 kW, reversible, heating	**12**	58	2 464	3 661	4 438	6 023	8 029	10 375	13 091	15 770	18 050
RAC portable < 12 kW, reversible, heating	**10**	-	-	-	-	-	-	-	-	-	-
RAC < 12 kW total, heating mode		**329**	**12 893**	**17 214**	**20 120**	**27 742**	**38 531**	**51 290**	**66 896**	**83 248**	**98 331**
RAC Room Air Conditioner		**4 376**	**50 293**	**51 551**	**46 089**	**51 108**	**59 641**	**68 908**	**79 275**	**90 796**	**103 498**
CIRC Integrated circulators	**10**	42 673	66 074	74 464	82 456	89 676	96 214	100 381	101 491	101 491	101 491
CIRC Large standalone circulators	**10**	5 685	8 432	8 478	8 163	7 751	7 180	6 678	6 519	6 519	6 519
CIRC Small standalone circulators	**10**	31 304	46 502	47 282	46 310	44 480	41 654	39 240	38 500	38 500	38 500
CIRC Circulator pumps <2.5 kW		**79 661**	**121 008**	**130 224**	**136 929**	**141 907**	**145 048**	**146 299**	**146 510**	**146 510**	**146 510**
R-UVU ≤ 100 m3/h for Extract Spaces	**17**	387	989	1 208	1 432	1 586	1 685	1 781	1 854	1 927	1 993
R-UVU ≤ 100 m3/h for Habitable Spaces	**17**	-	-	-	-	16	57	119	196	262	319
R-BVU ≤ 100 m3/h for Habitable Spaces	**17**	31	1 008	1 581	2 711	8 226	16 956	26 219	36 106	46 197	57 030
R-UVU 100-250 m3/h	**17**	1 897	4 792	5 480	6 112	6 566	6 907	7 157	7 265	7 332	7 360
R-BVU 100-250 m3/h	**17**	17	275	392	534	1 124	2 051	3 032	4 081	5 145	6 292
R-UVU 250-1000 m3/h	**17**	2 485	6 279	7 181	8 009	8 603	9 050	9 379	9 519	9 607	9 644
R-BVU 250-1000 m3/h	**17**	22	361	513	700	1 473	2 688	3 973	5 348	6 742	8 245
R-UVU > 1000 m3/h	**17**	52	116	127	135	141	143	144	143	141	136
R-BVU 1000-2500 m3/h	**17**	-	28	41	55	68	81	95	108	122	136
RVU, Total residential (000 units)		**4891**	**13847**	**16524**	**19688**	**27803**	**39619**	**51898**	**64621**	**77476**	**91156**
RVU, Total residential (Mm2 covered)		**1252**	**3361**	**3916**	**4468**	**5330**	**6435**	**7535**	**8608**	**9670**	**10783**
Area share perm. occup. dwellings with RVU		***10%***	***20%***	***22%***	***25%***	***29%***	***35%***	***41%***	***46%***	***52%***	***59%***
NR-UVU 250-1000 m3/h	**17**	1 069	2 420	2 654	2 829	2 933	2 983	3 002	2 982	2 928	2 837
NR-BVU 250-1000 m3/h	**17**	-	590	867	1 148	1 419	1 685	1 967	2 254	2 542	2 836
NR-UVU > 1000 m3/h	**17**	474	1 073	1 176	1 254	1 300	1 322	1 331	1 322	1 298	1 258
NR-BVU 1000-2500 m3/h	**17**	-	261	384	509	629	747	872	999	1 127	1 257
NR-AHU-S 2500-5500 m3/h	**17**	26	399	632	874	1 071	1 247	1 424	1 600	1 775	1 945
NR-AHU-M 5500-14500 m3/h	**17**	705	1 090	1 214	1 336	1 427	1 498	1 568	1 639	1 709	1 777
NR-AHU-L > 14500 m3/h	**17**	61	95	106	116	124	130	136	142	149	154
NRVU, Total non-residential (000 units)		**2335**	**5928**	**7032**	**8066**	**8904**	**9612**	**10300**	**10938**	**11527**	**12064**
NRVU, Total non-residential (Mm2 covered)		**2836**	**5571**	**6509**	**7417**	**8136**	**8736**	**9326**	**9897**	**10446**	**10966**
Area share non-res. buildings with NRVU		***36%***	***58%***	***65%***	***72%***	***77%***	***81%***	***85%***	***88%***	***91%***	***93%***
VU Ventilation Units, res + non-res (000 units)		**7226**	**19775**	**23557**	**27754**	**36707**	**49232**	**62198**	**75559**	**89003**	**103220**
LS: BAU, million units											
LFL (T12,T8h,T8t,T5,other)	9	1051	1783	1986	2102	2038	1751	1385	1091	862	688
HID (HPM, HPS, MH)	4	34	84	93	94	79	52	27	14	7	4
CFLni (all shapes)	8	107	499	564	575	523	385	231	129	79	52
CFLi (retrofit for GLS, HL)	12	163	2150	2789	2824	2373	1919	1248	806	501	325
GLS (DLS & NDLS) incl. from storage	2	3030	2590	2197	1603	943	554	324	189	110	65
HL (DLS & NDLS, LV & MV) incl. storage	4	235	1550	2137	2423	1792	941	502	273	153	89
LED replacing LFL (retrofit & luminaire)	21	0	0	10	121	449	1034	1734	2408	3065	3720
LED replacing HID (retrofit & luminaire)	10	0	0	0	12	42	85	127	160	190	219
LED replacing CFLni (retrofit & luminaire)	16	0	0	2	32	141	342	566	747	883	1006
LED replacing DLS (retrofit & luminaire)	43	0	0	8	175	588	1056	1379	1628	1843	2046
LED replacing NDLS (retrofit & luminaire)	43	0	2	47	805	2683	4524	6212	7506	8607	9581
SUBTOTAL non-LED		4620	8656	9766	9622	7747	5601	3717	2503	1712	1223
SUBTOTAL LED		0	2	66	1145	3902	7040	10019	12449	14587	16573
LS Lighting mln units		**4 620**	**8 659**	**9 832**	**10 767**	**11 650**	**12 641**	**13 736**	**14 952**	**16 299**	**17 797**

STOCKBAU (000 units, LS & Tyre m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
DP TV, standard (NoNA)		174925	268816	192136	77169	0	0	0	0	0	0
DP TV, LoNA		0	15293	81729	138292	92123	22829	0	0	0	0
DP TV, HiNA ('Smart')		0	15646	81842	202560	347366	491250	573265	591867	591867	591867
DP TV total		174925	299756	355708	418021	439489	514079	573265	591867	591867	591867
DP Monitor	7	10792	145949	111549	84734	84957	84957	84957	84957	84957	84957
DP Signage		0	557	6062	18893	27171	27176	26730	26730	26730	26730
DP Electronic Displays, total		**185717**	**446262**	**473319**	**521649**	**551617**	**626211**	**684953**	**703554**	**703554**	**703554**
SSTB	**5**	0	81543	65125	1691	0	0	0	0	0	0
CSTB	**5**	0	66307	162826	173137	173332	173332	173332	173332	173332	173332
STB set top boxes (Complex & Simple)		**-**	**147 850**	**227 951**	**174 828**	**173 332**	**173 332**	**173 332**	**173 332**	**173 332**	**173 332**
Game consoles > 20 W	**7**	100	53072	54600	54600	54600	54600	54600	54600	54600	54600
Game consoles < 20 W	**7**	500	19600	19600	19600	19600	19600	19600	19600	19600	19600
Total Game consoles, all modes		**600**	**72672**	**74200**	**74200**	**74200**	**74200**	**74200**	**74200**	**74200**	**74200**
ES tower 1-socket traditional	**5.5**	29	996	1157	1044	898	771	718	718	718	718
ES rack 1-socket traditional	**5.5**	74	2509	2717	2736	2877	3024	3093	3093	3093	3093
ES rack 2-socket traditional	**5.5**	243	5546	3564	2661	3240	3942	4301	4301	4301	4301
ES rack 2-socket cloud	**5.5**	0	2691	4787	6268	7631	9285	10130	10130	10130	10130
ES rack 4-socket traditional	**5.5**	14	311	193	140	170	207	226	226	226	226
ES rack 4-socket cloud	**5.5**	0	151	257	329	401	488	532	532	532	532
ES rack 2-socket resilient trad.	**5.5**	4	92	60	45	55	66	72	72	72	72
ES rack 2-socket resilient cloud	**5.5**	0	45	80	106	129	156	171	171	171	171
ES rack 4-socket resilient trad.	**5.5**	0	5	3	2	3	4	4	4	4	4
ES rack 4-socket resilient cloud	**5.5**	0	2	4	6	7	9	9	9	9	9
ES blade 1-socket traditional	**5.5**	47	856	855	855	899	945	967	967	967	967
ES blade 2-socket traditional	**5.5**	155	1915	1127	834	1015	1235	1348	1348	1348	1348
ES blade 2-socket cloud	**5.5**	0	921	1509	1964	2391	2909	3174	3174	3174	3174
ES blade 4-socket traditional	**5.5**	9	106	61	45	54	66	72	72	72	72
ES blade 4-socket cloud	**5.5**	0	51	82	105	128	156	170	170	170	170
ES total traditional		**575**	**12338**	**9736**	**8362**	**9212**	**10261**	**10802**	**10802**	**10802**	**10802**
ES total cloud		**0**	**3861**	**6719**	**8777**	**10687**	**13002**	**14186**	**14186**	**14186**	**14186**
ES Enterprise Servers total		**575**	**16199**	**16455**	**17139**	**19899**	**23263**	**24988**	**24988**	**24988**	**24988**
DS Online 2	**7.5**	72	1364	1792	1941	2131	2353	2494	2507	2507	2507
DS Online 3	**7.5**	50	863	1022	938	1024	1130	1198	1204	1204	1204
DS Online 4	**7.5**	11	178	230	245	267	295	313	314	314	314
DS Data Storage products total		**132**	**2405**	**3044**	**3123**	**3422**	**3778**	**4005**	**4025**	**4025**	**4025**
ES + DS total		**707**	**18605**	**19499**	**20263**	**23321**	**27041**	**28993**	**29013**	**29013**	**29013**
PC Desktop	**6**	52506	156355	110524	81096	101772	121914	128400	131222	132163	132473
PC Integrated Desktop	**6**	1466	6255	4423	3244	4071	5241	6163	6618	6777	6830
PC Notebook	**5**	0	184321	224187	212868	253027	324064	388748	418749	429189	432678
PC Tablet/slate	**3**	0	8505	99855	119044	126202	136865	144543	147277	148186	148485
PC Thin client	**5**	0	6750	6607	6765	6944	6997	7032	7045	7049	7051
PC Integrated Thin Client	**5**	0	677	662	677	693	698	702	703	704	704
PC Small-scale Server	**7**	333	813	1029	1178	1195	1202	1207	1209	1210	1210
PC Workstation	**7**	1191	4358	4956	5876	6871	8215	9551	10267	10520	10604
PC Personal Computers		**55 495**	**368 033**	**452 243**	**430 748**	**500 775**	**605 196**	**686 346**	**723 091**	**735 797**	**740 036**
Inkjet Printer		18343	36002	15619	4008	3815	3628	3445	3269	3096	2923
Inkjet MFD		15036	40004	53944	62117	59125	56227	53483	50873	48322	45771
EP / Laser Printer mono		11849	12115	10585	8645	6790	5396	4260	3297	2393	1489
EP / Laser Printer colour		0	3981	6253	9077	10476	11277	11784	12111	12347	12583
EP / Laser Copier mono		8210	3761	2243	490	0	0	0	0	0	0
EP / Laser Copier colour		0	592	1567	1018	0	0	0	0	0	0
EP / Laser MFD mono		0	6843	9648	10816	10299	9794	9309	8844	8393	7942
EP / Laser MFD colour		0	6852	9656	10823	10305	9800	9325	8868	8416	7964
EP & IJ imaging equipment		**53 437**	**110 149**	**109 515**	**106 994**	**100 809**	**96 121**	**91 606**	**87 262**	**82 967**	**78 672**
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	**9.3**	575 625	501 994	440 260	372 848	326 904	296 866	268 155	239 446	210 738	182 029
SB Electric toothbrushes (off mode)	**4.5**	24 017	41 000	44 836	50 194	56 229	62 403	68 576	74 750	80 924	87 098
SB Audio speakers (wired) (sb & off modes)	**5.6**	165 886	105 136	75 736	37 991	6 385	-	-	-	-	-
SB Audio speakers (wireless) (nsb & off modes)	**5.4**	-	558	26 732	124 552	193 648	200 315	200 656	200 839	201 022	201 205
SB Small appliances (sb & off modes)	**8.5**	791 665	1 484 846	1 539 703	1 590 683	1 625 068	1 643 715	1 661 813	1 679 911	1 698 010	1 716 108
SB Media boxes /sticks (sb mode)	**5.5**	-	43	12 716	38 085	41 122	41 145	41 145	41 145	41 145	41 145
SB Media players and recorders (sb mode)	**4.0**	56	112 076	138 949	34 581	2 537	-	-	-	-	-
SB Projectors (sb & off modes)	**5.0**	51	9 361	8 121	4 796	2 029	375	-	-	-	-
SB Home phones (nsb mode)	**7.0**	11 312	110 616	124 270	124 080	116 460	110 824	107 556	105 292	103 080	100 868
SB Office phones (nsb mode)	**7.0**	13 153	63 496	61 498	56 209	54 202	54 461	54 460	53 393	52 271	51 149
SB Home NAS (nsb mode)	**4.5**	-	18 122	31 353	44 735	57 525	70 259	82 126	91 353	96 755	97 951
SB Home Network Equipment (nsb mode)	**4.5**	-	95 740	115 776	124 456	131 567	138 588	147 208	152 375	152 375	152 375
SB Office Network Equipment (nsb mode)	**4.5**	-	7 044	22 940	50 962	79 423	107 870	130 807	132 882	132 882	132 882
SB Coffee makers (off mode)	**6.0**	103 497	128 417	132 837	136 674	140 452	144 772	149 038	153 251	157 463	161 676

STOCKBAU (000 units, LS&tyre m units**)**	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Regulated also for (networked) standby ((n)sb)											
(already accounted elsewhere; here for info only)											
SB Washing Machines (sb & off modes)		103135	158318	169089	174734	177909	180352	179737	178820	178856	178892
SB Dishwashers (sb & off modes)	**15**	29921	67976	81550	96528	111431	125977	140227	154431	168634	182836
SB Laundry Dryers (sb & off modes)	**12**	18164	40216	40651	45587	52446	55430	56278	56395	56395	56395
SB Electric Ovens (sb mode)	**19**	159480	176004	183710	194026	205012	216162	222920	226144	228985	231861
SB Electric Hobs (sb mode)	**15**	77855	124577	139309	153464	166050	177619	187979	197800	207563	217326
SB Complex Set-Top Boxes (low-power modes)		0	66307	162826	173137	173332	173332	173332	173332	173332	173332
SB Game consoles (non-active modes)		600	72672	74200	74200	74200	74200	74200	74200	74200	74200
SB IE Inkjet Printers (nsb mode)		18343	36002	15619	4008	3815	3628	3445	3269	3096	2923
SB IE Inkjet MFDs (nsb mode)		15036	40004	53944	62117	59125	56227	53483	50873	48322	45771
SB IE Laser Printers (nsb mode)		11849	16095	16838	17723	17267	16673	16044	15408	14741	14073
SB IE Laser Copiers (nsb mode)		8210	4352	3810	1508	0	0	0	0	0	0
SB IE Laser MFDs (nsb mode)		0	13696	19304	21639	20603	19593	18634	17712	16809	15906
Total (networked) SB (incl. double)		2127855	3494670	3736575	3809515	3894740	3970784	4037821	4073021	4097596	4118001
Total (networked) SB (excl. double)		**1685263**	**2678450**	**2775725**	**2790846**	**2833550**	**2871592**	**2911540**	**2924638**	**2926665**	**2924486**
EPS ≤ 6W, low-V	**3.5**	13 479	235 087	178 209	117 988	87 406	54 283	23 068	10 235	4 541	2 015
EPS 6–10 W	**3.5**	35 779	634 870	684 136	736 692	772 556	808 628	836 863	857 995	879 660	901 873
EPS 10–12 W	**4.5**	-	312 161	518 409	589 029	597 153	601 501	605 240	609 000	612 784	616 591
EPS 15–20 W	**3.4**	-	648	10 576	24 700	27 866	30 803	33 079	34 766	36 539	38 403
EPS 20–30 W	**5.5**	676	57 227	69 723	67 896	64 018	60 980	56 507	51 859	47 212	42 564
EPS 30–65 W, multiple-V	**5.5**	-	-	-	4 225	9 120	12 742	17 460	22 150	26 840	31 530
EPS 30-65 W	**5.5**	-	-	-	2 464	10 421	19 284	24 588	24 588	24 588	24 588
EPS 65–120 W	**5.5**	249	21 117	24 710	21 901	14 159	5 482	23	-	-	-
EPS 65–120 W, multiple-V	**5.5**	-	89 886	72 990	17 120	12 017	12 108	12 142	12 142	12 142	12 142
EPS 12–15 W	**5.5**	888	35 152	82 953	126 747	132 172	133 174	133 550	133 550	133 550	133 550
EPS, total		**51071**	**1386147**	**1641707**	**1708761**	**1726889**	**1738987**	**1742518**	**1756285**	**1777856**	**1803256**
RF Household Refrigerators & freezers	**16**	**219 351**	**244 578**	**251 180**	**258 072**	**264 525**	**269 539**	**273 831**	**277 908**	**281 985**	**286 062**
CF open vertical chilled multi deck (RVC2)	**10**	675	753	781	791	797	810	823	836	849	862
CF open horizontal frozen island (RHF4)	**10**	70	78	81	82	83	84	86	87	88	90
CF other supermarket display (non-BCs)	**10**	2 605	3 007	3 289	3 488	3 638	3 773	3 908	4 045	4 188	4 335
CF Plug in one door beverage cooler	**9**	4 953	6 200	6 476	6 572	6 828	7 064	7 300	7 542	7 791	8 049
CF Plug in horizontal ice cream freezer	**9**	2 123	2 657	2 776	2 817	2 926	3 027	3 129	3 232	3 339	3 449
CF Spiral vending machine	**11**	991	1 017	810	663	663	689	716	743	772	801
CF Commercial Refrigeration		**11 416**	**13 713**	**14 213**	**14 413**	**14 936**	**15 448**	**15 961**	**16 485**	**17 026**	**17 586**
PF Storage cabinet Chilled Vertical (CV)	9	986	1 409	1 498	1 570	1 640	1 715	1 793	1 871	1 949	2 027
PF Storage cabinet Frozen Vertical (FV)	9	437	624	664	696	726	760	794	829	863	898
PF Storage cabinet Chilled Horizontal (CH)	9	422	604	642	673	703	735	768	802	835	869
PF Storage cabinet Frozen Horizontal (FH)	9	187	268	284	298	311	326	340	355	370	385
PF Storage cabinets All types	**9**	**2 032**	**2 905**	**3 088**	**3 237**	**3 380**	**3 535**	**3 696**	**3 857**	**4 017**	**4 178**
PF Process Chiller AC MT S ≤ 300 kW	15	10	23	27	31	35	38	42	46	50	53
PF Process Chiller AC MT L > 300 kW	15	3	7	8	9	10	11	12	14	15	16
PF Process Chiller AC LT S ≤ 200 kW	15	8	17	20	23	25	28	31	34	36	39
PF Process Chiller AC LT L > 200 kW	15	2	5	6	7	8	9	10	10	11	12
PF Process Chiller WC MT S ≤ 300 kW	15	3	7	8	9	10	11	13	14	15	16
PF Process Chiller WC MT L > 300 kW	15	1	3	4	4	5	5	6	6	7	7
PF Process Chiller WC LT S ≤ 200 kW	15	3	6	7	8	9	10	11	12	13	14
PF Process Chiller WC LT L > 200 kW	15	1	2	3	3	4	4	5	5	5	6
PF Process Chiller All MT&LT	**15**	**32**	**70**	**82**	**95**	**106**	**117**	**129**	**140**	**152**	**163**
PF Condensing Unit MT S 0.2-1 kW	8	2 304	1 897	1 843	1 932	2 086	2 247	2 421	2 608	2 810	3 027
PF Condensing Unit MT M 1-5 kW	8	1 383	1 138	1 106	1 159	1 252	1 348	1 453	1 565	1 686	1 816
PF Condensing Unit MT L 5-20 kW	8	691	569	553	580	626	674	726	782	843	908
PF Condensing Unit MT XL 20-50 kW	8	230	190	184	193	209	225	242	261	281	303
PF Condensing Unit LT S 0.1-0.4 kW	8	332	273	265	278	300	323	348	375	404	436
PF Condensing Unit LT M 0.4-2 kW	8	442	364	354	371	400	431	465	501	539	581
PF Condensing Unit LT L 2-8 kW	8	221	182	177	185	200	216	232	250	270	290
PF Condensing Unit LT XL 8-20 kW	8	111	91	88	93	100	108	116	125	135	145
PF Condensing Unit, All MT&LT	**8**	**5 714**	**4 705**	**4 571**	**4 790**	**5 173**	**5 573**	**6 004**	**6 468**	**6 967**	**7 506**
PF Professional Refrigeration, Total		**7 778**	**7 680**	**7 741**	**8 122**	**8 659**	**9 225**	**9 828**	**10 464**	**11 136**	**11 847**
CA Electric Hobs	**15**	77 855	124 577	139 309	153 464	166 050	177 619	187 979	197 800	207 563	217 326
CA Electric Ovens	**19**	159 480	176 004	183 710	194 026	205 012	216 162	222 920	226 144	228 985	231 861
CA Gas Hobs	**15**	101 316	85 307	82 399	79 529	76 265	72 633	69 061	65 626	62 214	58 802
CA Gas Ovens	**19**	49 068	39 246	37 406	35 741	34 499	33 585	32 950	32 536	32 131	31 731
CA Range Hoods	**14**	68 479	84 897	89 709	94 776	99 883	105 115	110 419	115 834	121 271	126 708
CA Cooking Appliances		**456 198**	**510 031**	**532 535**	**557 536**	**581 709**	**605 113**	**623 329**	**637 939**	**652 163**	**666 428**
WM Washing Machines	**15**	98 684	152 072	162 498	167 857	170 872	173 224	172 569	171 616	171 616	171 616
WD Washer-Dryers	**13**	4 450	6 246	6 591	6 877	7 037	7 128	7 168	7 204	7 240	7 276
WM-WD Total household Washing		**103 135**	**158 318**	**169 089**	**174 734**	**177 909**	**180 352**	**179 737**	**178 820**	**178 856**	**178 892**
DW Household Dishwashers	**15**	**29 921**	**67 976**	**81 550**	**96 528**	**111 431**	**125 977**	**140 227**	**154 431**	**168 634**	**182 836**

STOCKBAU (000 units, LS&tyre m units)	**Life**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LD condensing heat pump	**12**	-	296	697	1 344	2 297	3 642	5 292	7 094	8 899	10 704
LD condensing electric heat element	**12**	2 836	21 558	23 536	28 275	33 572	35 114	34 103	32 382	30 577	28 773
LD vented electric	**12**	15 267	18 232	16 317	15 917	16 563	16 671	16 883	16 918	16 918	16 918
LD vented gas	**12**	62	130	101	50	15	2	0	-	-	-
LD Household Laundry Dryers	**12**	**18 164**	**40 216**	**40 651**	**45 587**	**52 446**	**55 430**	**56 278**	**56 395**	**56 395**	**56 395**
VC Cylinder Domestic mains	**8.5**	107 407	203 358	206 836	196 532	169 521	133 817	96 538	75 170	70 162	69 991
VC Upright Domestic mains	**8.5**	998	1 737	1 412	1 165	1 068	984	877	806	787	786
VC Handstick Domestic mains	**8.5**	2 156	5 213	8 088	11 842	16 139	21 649	28 890	34 248	35 927	35 993
VC Total Domestic mains		**110 560**	**210 307**	**216 336**	**209 539**	**186 727**	**156 450**	**126 305**	**110 224**	**106 876**	**106 769**
VC Cylinder Commercial mains	**5.5**	7 924	13 396	14 318	13 816	13 791	13 791	13 791	13 791	13 791	13 791
VC Upright Commercial mains	**5.5**	1 398	2 072	1 710	1 487	1 472	1 472	1 472	1 472	1 472	1 472
VC Total Commercial mains		**9 322**	**15 468**	**16 027**	**15 303**	**15 263**	**15 263**	**15 263**	**15 263**	**15 263**	**15 263**
VC Total in scope of CR 666/2013		**119 883**	**225 775**	**232 364**	**224 842**	**201 991**	**171 714**	**141 569**	**125 487**	**122 139**	**122 032**
VC Cordless - domestic	**6.5**	1 294	6 246	11 847	34 240	57 933	81 521	103 946	120 074	127 635	130 695
VC Cordless - commercial	**6.5**	17	80	160	467	789	1 111	1 416	1 636	1 739	1 781
VC Robot - domestic	**6.5**	-	2 166	6 683	11 079	17 490	24 555	31 480	36 464	38 779	39 708
VC Robot - commercial	**6.5**	-	76	247	413	652	915	1 174	1 359	1 446	1 480
VC Total Domestic mains+cordless+robots		**111 854**	**218 720**	**234 866**	**254 858**	**262 151**	**262 527**	**261 731**	**266 762**	**273 289**	**277 172**
VC Total Commercial mains+cordless+robots		**9 340**	**15 624**	**16 434**	**16 183**	**16 705**	**17 290**	**17 853**	**18 259**	**18 448**	**18 524**
VC Total All mains+cordless+robots		**121 194**	**234 343**	**251 301**	**271 040**	**278 855**	**279 816**	**279 584**	**285 021**	**291 738**	**295 697**
VC domestic units/dwelling (penetration rate)											
domestic mains		*0.75*	*1.16*	*1.16*	*1.09*	*0.95*	*0.79*	*0.64*	*0.56*	*0.54*	*0.54*
domestic mains+cordless		*0.76*	*1.20*	*1.22*	*1.27*	*1.25*	*1.20*	*1.16*	*1.16*	*1.19*	*1.21*
domestic mains+cordless+robots		*0.76*	*1.21*	*1.26*	*1.32*	*1.34*	*1.33*	*1.32*	*1.35*	*1.39*	*1.41*
VC commercial units/1000m2 tertiary area											
commercial mains		*1.51*	*2.02*	*2.03*	*1.89*	*1.84*	*1.80*	*1.75*	*1.72*	*1.68*	*1.64*
commercial mains+cordless		*1.51*	*2.03*	*2.05*	*1.94*	*1.93*	*1.93*	*1.92*	*1.90*	*1.87*	*1.84*
commercial mains+cordless+robots		*1.51*	*2.04*	*2.08*	*2.00*	*2.01*	*2.03*	*2.05*	*2.05*	*2.03*	*1.99*
FAN Axial<300Pa (all FAN types >125W)	**15**	20 590	57 774	68 451	77 019	85 021	90 057	91 463	91 463	91 463	91 463
FAN Axial>300Pa	**15**	21 306	64 129	74 224	79 126	82 804	84 950	85 528	85 528	85 528	85 528
FAN Centr.FC	**15**	10 573	22 766	27 918	31 379	34 096	36 181	36 763	36 763	36 763	36 763
FAN Centr.BC-free	**15**	3 243	6 881	8 251	9 123	10 048	10 992	11 640	11 985	12 232	12 458
FAN Centr.BC	**15**	3 305	7 621	9 224	10 225	11 311	12 421	13 406	14 388	15 621	16 961
FAN Cross-flow	**15**	3 049	5 527	6 437	7 535	8 683	9 504	10 232	10 958	11 869	12 859
FAN Industrial Fans >125W *(excl. box/ roof)*		**62 067**	**164 698**	**194 505**	**214 407**	**231 963**	**244 105**	**249 031**	**251 086**	**253 476**	**256 031**
Medium (S) 3-ph 0.75-7.5 kW no VSD	**9**	38 596	53 278	57 255	59 601	59 976	58 959	57 415	55 304	52 519	48 935
Medium (M) 3-ph 7.5-75 kW no VSD	**11**	6 216	8 384	8 974	9 303	9 295	9 025	8 615	8 084	7 409	6 625
Medium (L) 3-ph 75-375 kW no VSD	**16**	682	885	930	956	943	895	816	715	620	560
Total 3ph 0.75-375 kW no VSD		**45 494**	**62 547**	**67 160**	**69 860**	**70 214**	**68 879**	**66 847**	**64 103**	**60 548**	**56 120**
Medium (S) 3-ph 0.75-7.5 kW with VSD	**9**	3 677	9 378	11 831	14 524	17 329	20 363	23 910	28 075	32 965	38 707
Medium (M) 3-ph 7.5-75 kW with VSD	**11**	762	1 940	2 457	3 032	3 634	4 281	5 027	5 903	6 931	8 077
Medium (L) 3-ph 75-375 kW with VSD	**16**	119	305	386	481	584	694	817	959	1 096	1 200
Total 3-ph 0.75-375 kW with VSD		**4 558**	**11 623**	**14 674**	**18 038**	**21 547**	**25 338**	**29 754**	**34 937**	**40 993**	**47 985**
Total 3-ph 0.75-375 kW w/wo VSD		**50 052**	**74 170**	**81 834**	**87 898**	**91 761**	**94 217**	**96 601**	**99 040**	**101 541**	**104 105**
Small 1 ph 0.12-0.75 kW no VSD	**8**	78 158	106 800	114 230	117 062	117 935	118 523	119 062	119 547	119 973	120 335
Small 1 ph 0.12-0.75 kW with VSD	**8**	617	10 107	13 527	15 996	17 284	18 394	19 575	20 832	22 170	23 593
Total Small 1-ph 0.12-0.75 kW		**78 776**	**116 908**	**127 756**	**133 059**	**135 219**	**136 917**	**138 637**	**140 379**	**142 143**	**143 928**
Small 3 ph 0.12-0.75 kW no VSD	**8**	21 968	29 584	31 667	33 050	33 769	34 142	34 472	34 755	34 983	35 150
Small 3 ph 0.12-0.75 kW with VSD	**8**	203	3 319	4 465	5 420	6 080	6 715	7 417	8 192	9 048	9 993
Total Small 3-ph 0.12-0.75 kW		**22 171**	**32 903**	**36 132**	**38 469**	**39 849**	**40 857**	**41 889**	**42 947**	**44 031**	**45 143**
Large 3-ph LV 375-1000 kW no VSD	**18**	83	101	99	94	89	85	84	83	83	82
Large 3-ph LV 375-1000kW with VSD	**18**	6	31	46	64	80	91	98	103	108	114
Total Large 3-ph LV 375-1000 kW		**88**	**132**	**146**	**159**	**169**	**176**	**182**	**186**	**191**	**196**
Explosion motors (S) 3-ph 0.75-7.5 kW	**9**	1 603	2 376	2 620	2 811	2 931	3 008	3 084	3 162	3 241	3 323
Explosion motors (M) 3-ph 7.5-75 kW	**11**	386	571	632	682	715	736	755	774	793	813
Explosion motors (L) 3-ph 75-375 kW	**16**	40	59	65	71	76	79	81	83	85	87
Total Expl. 0.75-375 kW (no VSD)		**2 029**	**3 006**	**3 317**	**3 564**	**3 722**	**3 823**	**3 919**	**4 018**	**4 120**	**4 224**
Brake motors (S) 3-ph 0.75-7.5 kW	**9**	2 004	2 970	3 275	3 513	3 664	3 760	3 855	3 952	4 052	4 154
Brake motors (M) 3-ph 7.5-75 kW	**11**	482	714	790	853	894	920	943	967	991	1 017
Brake motors (L) 3-ph 75-375 kW	**16**	50	74	82	89	95	98	101	104	106	109
Total Brake 0.75-375 kW (no VSD)		**2 536**	**3 757**	**4 147**	**4 455**	**4 653**	**4 778**	**4 899**	**5 023**	**5 150**	**5 280**
8-pole motors (S) 3-ph 0.75-7.5 kW	**9**	80	119	131	141	147	150	154	158	162	166
8-pole motors (M) 3-ph 7.5-75 kW	**11**	19	29	32	34	36	37	38	39	40	41
8-pole motors (L) 3-ph 75-375 kW	**16**	2	3	3	4	4	4	4	4	4	4
Total 8-pole 0.75-375 kW (no VSD)		**101**	**150**	**166**	**178**	**186**	**191**	**196**	**201**	**206**	**211**
1-phase motors >0.75 kW (no VSD)	**12**	**63 325**	**93 676**	**103 832**	**112 301**	**118 039**	**121 740**	**124 814**	**127 966**	**131 197**	**134 510**
MT Elec. Motors LV 0.12-1000 kW		**219 077**	**324 702**	**357 330**	**380 084**	**393 597**	**402 700**	**411 137**	**419 760**	**428 578**	**437 596**

STOCKBAU (000 units, LS&tyre m units)	Life	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	**10.5**	653	876	932	998	1 042	1 076	1 136	1 212	1 288	1 364
ESOB<45_CF	**10.5**	685	941	1 009	1 098	1 180	1 248	1 326	1 415	1 503	1 592
ESOB<45_VSD-VF	**10.5**	32	65	77	100	138	172	190	203	215	228
ESOB<45_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESOB < 45 Total		**1369**	**1882**	**2018**	**2196**	**2361**	**2496**	**2652**	**2829**	**3006**	**3183**
ESOB_45-150_VF	**10.5**	25	33	35	37	38	39	40	43	46	49
ESOB_45-150_CF	**10.5**	64	88	94	103	110	117	124	132	141	149
ESOB_45-150_VSD-VF	**10.5**	2	4	5	7	9	11	13	14	14	15
ESOB_45-150_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESOB 45-150 Total		**91**	**126**	**135**	**147**	**158**	**167**	**177**	**189**	**201**	**213**
ESOB < 150 Total		**1461**	**2008**	**2153**	**2343**	**2519**	**2663**	**2829**	**3018**	**3207**	**3396**
ESCC<45_VF	**10.5**	664	886	941	1 003	1 038	1 065	1 122	1 197	1 272	1 347
ESCC<45_CF	**10.5**	706	970	1 040	1 132	1 217	1 286	1 366	1 458	1 549	1 640
ESCC<45_VSD-VF	**10.5**	41	84	99	129	178	222	245	261	277	294
ESCC<45_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESCC < 45 Total		**1411**	**1940**	**2080**	**2264**	**2433**	**2573**	**2733**	**2916**	**3099**	**3281**
ESCC_45-150_VF	**10.5**	23	31	33	35	36	37	39	42	45	47
ESCC_45-150_CF	**10.5**	25	34	36	40	43	45	48	51	54	57
ESCC_45-150_VSD-VF	**10.5**	1	3	3	5	6	8	9	9	10	10
ESCC_45-150_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESCC 45-150 Total		**49**	**68**	**73**	**79**	**85**	**90**	**96**	**102**	**109**	**115**
ESCC < 150 Total		**1461**	**2008**	**2153**	**2343**	**2519**	**2663**	**2829**	**3018**	**3207**	**3396**
ESCCi<45_VF	**10.5**	417	508	521	516	457	403	404	431	459	485
ESCCi<45_CF	**10.5**	58	79	85	92	99	105	111	119	126	134
ESCCi<45_VSD-VF	**10.5**	101	204	242	315	436	542	599	639	679	719
ESCCi<45_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESCCi < 45 Total		**576**	**791**	**848**	**923**	**993**	**1049**	**1115**	**1189**	**1264**	**1338**
ESCCi_45-150_VF	**10.5**	6	8	8	8	7	6	6	6	7	7
ESCCi_45-150_CF	**10.5**	1	1	1	1	1	2	2	2	2	2
ESCCi_45-150_VSD-VF	**10.5**	2	3	4	5	7	8	9	10	10	11
ESCCi_45-150_VSD-CF	**10.5**	-	-	-	-	-	-	-	-	-	-
ESCCi 45-150 Total		**9**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
ESCCi < 150 Total		**584**	**803**	**861**	**937**	**1007**	**1065**	**1132**	**1207**	**1283**	**1358**
MSSB<6"_VF	**10.5**	665	814	838	855	829	800	821	875	930	985
MSSB<6"_CF	**10.5**	3 272	4 497	4 822	5 248	5 642	5 965	6 336	6 761	7 184	7 607
MSSB<6"_VSD-VF	**10.5**	153	310	368	457	581	692	764	815	866	917
MSSB <6" Total		**4091**	**5621**	**6028**	**6560**	**7052**	**7456**	**7921**	**8451**	**8980**	**9508**
MS-V<25bar_VF	**10.5**	662	865	912	958	964	965	1 009	1 077	1 144	1 211
MS-V<25bar_CF	**10.5**	730	1 004	1 076	1 171	1 259	1 332	1 414	1 509	1 604	1 698
MS-V<25bar_VSD-VF	**10.5**	68	138	164	213	295	367	405	432	459	486
MS_V <25 bar Total		**1461**	**2008**	**2153**	**2343**	**2519**	**2663**	**2829**	**3018**	**3207**	**3396**
WP Water pumps		**9058**	**12447**	**13347**	**14526**	**15615**	**16511**	**17538**	**18712**	**19884**	**21054**
WE Welding Equipment	**6.3**	**2 611**	**2 969**	**3 047**	**3 049**	**3 079**	**3 111**	**3 140**	**3 163**	**3 187**	**3 210**
TRAFO Distribution	**40**	1 336	2 230	2 501	2 784	3 076	3 376	3 683	3 992	4 294	4 598
TRAFO Industry oil	**25**	289	502	563	625	685	742	798	857	917	979
TRAFO Industry dry	**30**	63	107	120	134	147	160	173	185	198	212
TRAFO Power	**30**	42	64	72	80	88	97	105	112	121	129
TRAFO DER oil	**25**	-	7	13	22	37	62	99	150	212	283
TRAFO DER dry	**25**	-	28	51	89	149	246	397	600	848	1 132
TRAFO Small	**20**	658	658	662	666	670	672	673	673	673	673
TRAFO Utility Transformers		**2 387**	**3 597**	**3 983**	**4 401**	**4 852**	**5 355**	**5 928**	**6 570**	**7 264**	**8 006**
Tyres in m units											
Tyres C1, replacement for cars	**4.7**	818	951	966	1 057	1 174	1 302	1 353	1 353	1 353	1 353
Tyres C1, OEM for cars	**4.7**	246	278	300	324	353	392	407	407	407	407
Tyres C1, total		**1 065**	**1 229**	**1 266**	**1 381**	**1 527**	**1 694**	**1 761**	**1 761**	**1 761**	**1 761**
Tyres C2, replacement for vans	**3.9**	75	88	88	98	109	121	125	125	125	125
Tyres C2, OEM for vans	**3.9**	16	18	18	21	23	26	26	26	26	26
Tyres C2, total		**91**	**106**	**106**	**120**	**132**	**147**	**151**	**151**	**151**	**151**
Tyres C3, replacement for trucks/busses	**4.0**	39	41	39	49	54	59	61	61	61	61
Tyres C3, OEM for trucks/busses	**4.0**	11	11	12	14	15	17	17	17	17	17
Tyres C3, total		**50**	**52**	**51**	**63**	**69**	**76**	**78**	**78**	**78**	**78**
Tyres, total C1+C2+C3		**1 207**	**1 387**	**1 422**	**1 564**	**1 728**	**1 917**	**1 990**	**1 990**	**1 990**	**1 990**

Non-standard LIFE values	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TVLIFE	10.0	7.3	7.8	10.0	10.0	10.0	10.0	10.0	10.0	10.0
IJLIFE - Inkjet devices and Laser Printer mono	4.0	4.0	4.5	5.0	5.0	5.0	5.0	5.0	5.0	5.0
EPLIFE1 - EP/Laser Printer colour and all Copiers	4.0	4.0	5.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
EPLIFE2 - EP/Laser MFD	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0	6.0
Lifetime multiplier for CHB (LifeCor)	1.00	1.00	1.02	1.03	1.04	1.04	1.02	1.00	1.00	1.00

STOCKECO (000 units, LS&tyre m units)	Life	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Note for printed version: for products not listed below, ECO-stock is identical to BAU-stock											
CHB Gas Combi Instant. WH	18.0	20 416	50 142	53 947	56 396	55 821	55 286	53 548	49 772	45 570	41 113
CHB Gas + Cyl. WH	18.0	9 408	15 467	15 762	15 606	14 925	14 315	13 894	12 914	11 824	10 667
CHB Jet Burner Gas + Cyl. WH	24.0	2 170	1 950	1 627	1 310	1 019	781	705	723	741	760
CHB Jet Burner Oil + Cyl. WH	24.0	16 510	14 295	11 734	9 282	7 071	5 290	4 711	4 806	4 926	5 051
CHB Electric (Joule) + Cyl. WH	18.0	674	871	952	1 079	1 126	1 103	1 075	994	909	824
CHB Hybrid Gas/Electric WH	18.0	12	18	39	101	309	725	1 363	2 199	3 167	4 282
CHB Electric HP + Cyl. WH	18.0	323	2 326	3 559	5 440	8 640	13 207	19 623	26 883	34 309	41 860
CHB Gas HP + Cyl. WH	18.0	4	18	36	85	180	324	507	713	932	1 162
CHB Gas mCHP + Cyl. WH	18.0	7	29	44	85	154	251	361	473	584	694
CHB Solar Combi (16 m2)	18.0	270	435	519	599	660	688	695	712	731	749
CHC Central Heating combi, water heating		**49 793**	**85 552**	**88 219**	**89 981**	**89 905**	**91 970**	**96 481**	**100 189**	**103 692**	**107 163**
CHB Gas non-condensing	18	35 778	52 508	44 198	30 236	16 483	8 595	3 649	2 059	1 160	839
CHB Gas condensing	18	487	21 288	34 061	51 117	64 917	71 835	72 916	67 595	62 614	56 697
CHB Gas Jet burner non-condensing	24	2 936	2 546	2 046	1 507	979	472	181	93	67	53
CHB Gas Jet burner condensing	24	0	61	154	299	468	642	768	855	905	944
CHB Oil Jet burner non-condensing	24	20 624	17 676	14 134	10 357	6 673	3 156	1 179	596	426	339
CHB Oil Jet burner condensing	24	0	416	1 034	1 957	3 035	4 141	4 923	5 453	5 774	6 019
CHB Electric Joule-effect	18	600	781	865	993	1 067	1 041	1 002	905	828	751
CHB Hybrid (gas-electric)	18	13	20	43	110	339	796	1 495	2 405	3 464	4 684
CHB Electric Heat Pump	18	349	2 497	3 728	5 577	8 844	13 359	19 740	26 836	34 249	41 786
CHB Gas Heat Pump	18	4	19	38	89	190	342	535	748	977	1 219
CHB micro CHP	18	8	30	47	90	163	266	382	496	613	728
CHB Solar combi (16 m2)	18	270	437	524	607	676	710	704	707	726	744
CHB Central Heating boiler, space heating		**61 069**	**98 280**	**100 871**	**102 939**	**103 835**	**105 357**	**107 474**	**108 750**	**111 804**	**114 805**
LS: ECO, million units											
LFL (T12,T8h,T8t,T5,other)		1051	1777	1963	2019	1675	1024	520	262	152	98
HID (HPM, HPS, MH)		34	84	81	70	51	26	9	3	1	0
CFLni (all shapes)		107	499	549	481	340	195	98	38	16	8
CFLi (retrofit for GLS, HL)		163	2648	3381	2604	914	246	0	0	0	0
GLS (DLS & NDLS) incl. from storage		3030	1773	562	6	0	0	0	0	0	0
HL (DLS & NDLS, LV & MV) incl. storage		235	1812	2627	1145	72	0	0	0	0	0
LED replacing LFL (retrofit & luminaire)		0	0	21	192	796	1744	2582	3218	3753	4285
LED replacing HID (retrofit & luminaire)		0	0	13	37	70	111	146	172	197	224
LED replacing CFLni (retrofit & luminaire)		0	0	17	127	325	533	701	838	947	1051
LED replacing DLS (retrofit & luminaire)		0	8	205	850	1373	1522	1643	1777	1924	2086
LED replacing NDLS (retrofit & luminaire)		0	4	380	3263	6054	7256	8055	8661	9327	10058
SUBTOTAL non-LED (excl. SPL, ctrl, sb)		4620	8594	9164	6325	3053	1491	628	303	169	107
SUBTOTAL LED		0	12	636	4469	8619	11167	13127	14667	16147	17704
LS Lighting (excl. SPL, ctrl) mln units		**4 620**	**8 606**	**9 800**	**10 793**	**11 671**	**12 658**	**13 755**	**14 969**	**16 316**	**17 811**
LD condensing heat pump	**12**	-	515	6 192	17 908	29 480	36 688	42 149	44 973	45 114	45 114
LD condensing electric heat element	**12**	2 836	21 504	21 077	18 978	16 996	15 083	12 785	11 356	11 281	11 281
LD vented electric	**12**	15 267	18 066	13 300	8 674	5 967	3 656	1 345	66	-	-
LD vented gas	**12**	62	130	101	50	15	2	0	-	-	-
LD Laundry Dryers, low-power modes	**12**	18 164	40 216	40 670	45 609	52 457	55 430	56 278	56 395	56 395	56 395
LD Household Laundry Dryers	**12**	**18 164**	**40 216**	**40 670**	**45 609**	**52 457**	**55 430**	**56 278**	**56 395**	**56 395**	**56 395**
Medium (S) 3-ph 0.75-7.5 kW no VSD	**9**	38 596	53 263	56 373	52 769	47 608	46 940	46 775	46 517	46 155	45 682
Medium (M) 3-ph 7.5-75 kW no VSD	**11**	6 216	8 380	8 691	7 887	6 853	6 572	6 456	6 320	6 160	6 035
Medium (L) 3-ph 75-375 kW no VSD	**16**	682	885	900	836	741	644	607	575	549	538
Total 3ph 0.75-375 kW no VSD		**45 494**	**62 527**	**65 965**	**61 492**	**55 202**	**54 156**	**53 839**	**53 412**	**52 865**	**52 255**
Medium (S) 3-ph 0.75-7.5 kW with VSD	**9**	3 677	9 393	12 713	21 356	29 697	32 382	34 550	36 862	39 329	41 961
Medium (M) 3-ph 7.5-75 kW with VSD	**11**	762	1 944	2 740	4 448	6 076	6 734	7 186	7 667	8 180	8 667
Medium (L) 3-ph 75-375 kW with VSD	**16**	119	306	417	601	786	945	1 026	1 100	1 168	1 223
Total 3-ph 0.75-375 kW with VSD		**4 558**	**11 643**	**15 869**	**26 406**	**36 559**	**40 062**	**42 762**	**45 628**	**48 676**	**51 850**
Total 3-ph 0.75-375 kW w/wo VSD		**50 052**	**74 170**	**81 834**	**87 898**	**91 761**	**94 217**	**96 601**	**99 040**	**101 541**	**104 105**
Small 1 ph 0.12-0.75 kW no VSD	**8**	78 158	106 800	114 230	117 062	117 935	118 523	119 062	119 547	119 973	120 335
Small 1 ph 0.12-0.75 kW with VSD	**8**	617	10 107	13 527	15 996	17 284	18 394	19 575	20 832	22 170	23 593
Total Small 1-ph 0.12-0.75 kW		**78 776**	**116 908**	**127 756**	**133 059**	**135 219**	**136 917**	**138 637**	**140 379**	**142 143**	**143 928**
Small 3 ph 0.12-0.75 kW no VSD	**8**	21 968	29 584	31 667	33 050	33 769	34 142	34 472	34 755	34 983	35 150
Small 3 ph 0.12-0.75 kW with VSD	**8**	203	3 319	4 465	5 420	6 080	6 715	7 417	8 192	9 048	9 993
Total Small 3-ph 0.12-0.75 kW		**22 171**	**32 903**	**36 132**	**38 469**	**39 849**	**40 857**	**41 889**	**42 947**	**44 031**	**45 143**
Large 3-ph LV 375-1000 kW no VSD	**18**	83	101	99	94	89	85	84	83	83	82
Large 3-ph LV 375-1000kW with VSD	**18**	6	31	46	64	80	91	98	103	108	114
Total Large 3-ph LV 375-1000 kW		**88**	**132**	**146**	**159**	**169**	**176**	**182**	**186**	**191**	**196**
Explosion motors (S) 3-ph 0.75-7.5 kW	**9**	1 603	2 376	2 620	2 811	2 931	3 008	3 084	3 162	3 241	3 323
Explosion motors (M) 3-ph 7.5-75 kW	**11**	386	571	632	682	715	736	755	774	793	813
Explosion motors (L) 3-ph 75-375 kW	**16**	40	59	65	71	76	79	81	83	85	87
Total Expl. 0.75-375 kW (no VSD)		**2 029**	**3 006**	**3 317**	**3 564**	**3 722**	**3 823**	**3 919**	**4 018**	**4 120**	**4 224**
Brake motors (S) 3-ph 0.75-7.5 kW	**9**	2 004	2 970	3 275	3 513	3 664	3 760	3 855	3 952	4 052	4 154
Brake motors (M) 3-ph 7.5-75 kW	**11**	482	714	790	853	894	920	943	967	991	1 017
Brake motors (L) 3-ph 75-375 kW	**16**	50	74	82	89	95	98	101	104	106	109
Total Brake 0.75-375 kW (no VSD)		**2 536**	**3 757**	**4 147**	**4 455**	**4 653**	**4 778**	**4 899**	**5 023**	**5 150**	**5 280**
8-pole motors (S) 3-ph 0.75-7.5 kW	**9**	80	119	131	141	147	150	154	158	162	166
8-pole motors (M) 3-ph 7.5-75 kW	**11**	19	29	32	34	36	37	38	39	40	41
8-pole motors (L) 3-ph 75-375 kW	**16**	2	3	3	4	4	4	4	4	4	4
Total 8-pole 0.75-375 kW (no VSD)		**101**	**150**	**166**	**178**	**186**	**191**	**196**	**201**	**206**	**211**
1-phase motors >0.75 kW (no VSD)	**12**	**63 325**	**93 676**	**103 832**	**112 301**	**118 039**	**121 740**	**124 814**	**127 966**	**131 197**	**134 510**
MT Elec. Motors LV 0.12-1000 kW		**219 077**	**324 702**	**357 330**	**380 084**	**393 597**	**402 700**	**411 137**	**419 760**	**428 578**	**437 596**

LOAD & TEST	unit	EXPLANATORY NOTES
Introduction		Explanations of the main test- and calculation methods are given below. The explanation is incomplete and aims only to give the reader an idea of the main principles involved. For a full overview it is indispensable to consult the original documents. The description below also provides some specific guidance as to how and where the values used in the model are different from what is mentioned in the regulations and/or in the impact assessments.
WH dedicated Water Heater	kWh heat/a	Measurement unit for performance is the energy content of the useful hot water delivered, expressed in kWh heat.
		Energy efficiency of WHs is tested with a designated 24h tapping pattern, following manufacturer's instructions for intended use, and expressed as the ratio of the energy content of the useful hot water delivered and the measured energy input of the WH. The energy content of a draw-off relates to the volume of useful water ('useful' meaning that the water is above a minimum temperature threshold, depending on the type of draw-off), the average temperature difference with cold water (10 °C) over the draw-off period and the specific heat capacity of the water. Depending on the type of draw-off, minimum average or peak temperatures that need to be reached are defined. The measured energy input relates to primary energy, e.g. for electric WHs using conversion factor CC of 2.5.
		There are additional test- and calculation methods for solar-assisted WHs as well as for the assessment of whether or not a 'smart control' bonus applies for an electric WH. Additional guidelines from the Commission are expected in the spring of 2014.
		The EIA2020 update is based on the 2019 review study [1]. The update uses a breakdown in base cases, providing a more detailed insight in the development of the various types of DWHs. The BAU scenario in EIA reflects the situation without any measures. The ECO scenario includes the impacts of past and current regulations (CR 814/2013 and CDR 812/2013). New measures proposed in the review study have not been considered for EIA because not finalized yet (in Dec. 2020). [1] Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review Study Final reports Tasks 1-7, VHK for the European Commission, July 2019.
		In the regulations, energy input of fossil-fuel fired WHs is expressed in GCV (Gross Calorific Value). Review study efficiencies are also based on primary energy input in GCV, for electricity using a PEF 2.1. For ease of comparison the same is done in EIA: primary energy efficiencies on EFN and EFS sheets are in %GCV with PEF 2.1. However, as usual in EIA, and for ease of comparison with Eurostat and PRIMES, fuel consumption (FUEL, FNRG, NRG sheets) is expressed in NCV (Net Calorific Value). For natural gas GCV=1.11 NCV, for heating oil 1.065. Note that in NCV the efficiency values would be higher than in GCV. Electricity consumption (ELEC sheets) takes into account that the efficiencies include a PEF 2.1. For the primary energy calculations (NRG sheets) the electricity is multiplied by the agreed PEF values (2.5 until 2020; 2.1 from 2021 onwards).
		Values used in the model are based on weighted average efficiency of tapping patterns for dedicated WHs (source: 2019 review study). Note that, following the EL metric, the annual energy consumption of the WH is calculated at 60% of the 24h daily tapping pattern for 365 days (the tapping pattern represents peak performance, e.g. at certain times in the weekends)
CHC Central Heating combi, water heat	kWh heat/a	Same remarks apply as above for dedicated WHs. The 2019 review study cited there also addressed water heating by Central Heating Combis. Extra: for the interaction between the space heating and water heating functions special test- and calculation methods apply. Efficiencies on the EFN and EFS sheets are in % primary energy in GCV, using PEF 2.1 for electricity. Reported fuel consumption is in NCV. See explanations for DWHs above.
CH Central Heating boiler, space heat	kWh heat/a	Measurement unit for performance is the annual space heating demand in a designated heating season, calculated in the regulation as the multiplication of the rated boiler heat output (in kW) and a fixed number of full load equivalent operating hours (h). The seasonal space heating efficiency, i.e. the main regulated parameter, is the ratio of the above space heating demand and the actual energy consumption of the boiler. The actual energy consumption of the boiler is determined through testing and calculation. The testing entails measurements at the following test points: (a) 100% and 30% load heating efficiency (η100 and η30 conventional fossil fuel fired boiler and heat production of micro-CHP) or (b) 100% load efficiency (electric resistance boiler) or (c) the efficiency at 4 or 5 sink/source temperature pairs (heat pump boiler) and/or (d) electricity production at 100% heat load/30% heat load (micro-cogeneration) Also minimum and maximum auxiliary electricity is measured. The solar collector efficiency, which is an input the calculation of a possible solar contribution, is derived from testing (4 different water inlet temperatures over the operating range, 4 test samples). The basic seasonal efficiency (ηs) equation for conventional gas- and oil-boilers as well as micro-cogeneration boilers is $\eta s=0.85*\eta 30 + 0.15*\eta 100 - \sum F$

∑F is the sum of:
F1 temperature control correction -3%,
F2 auxiliary electricity from combustion fan and CPU (conv.boiler) or source fan/pump (heat pump boiler) or solar loop circulator (solar assisted boiler) but without CH circulators (is in separate regulation Lot 11),
F3 standby heat loss,
F4 possible pilot flame loss,
F5 for CHP: positive contribution of electricity production to seasonal efficiency.

For heat pump boilers the seasonal coefficient of performance SCOP is calculated with a climate-specific 'bin-method' (comparable to the 'heating degree hours' concept) for Average, Warm and Cold climate. These 3 climate zones are also used in calculating the solar contribution to space heating. The climate zones are defined using meteorological data from Strasbourg (FR), Athens (GR) and Helsinki (FIN) respectively.

The seasonal efficiency in the regulation mainly takes into account product-related losses and assumes optimal sizing of the boiler capacity. Only through the temperature control term (F1) also some part of the comfort losses (temperature fluctuation, stratification) are taken into account. In the preparatory and IA studies, and in the EIA2019 model, the space heating demand is assessed on the basis of the estimated real average heat demand of the buildings in which the boilers are used. This means that all system-losses, i.e. the full fluctuation, stratification losses, distribution, buffer and timer losses at real-life boiler sizing are taken into account. For the strict boiler efficiency a more realistic, but more complex, assessment method was used to also calculate the effect of cycling below 30% of rated output.

Note that the IA study scenarios, which were used in the EIA2019 model, assumed an exemption for B1.1 boilers up to 10 kW; not the (unconditional) exemption for B1 (combi) boilers up to 30 kW rated output which is in the current legislation.

The EIA2020 update is based on the 2019 review study [1], taking into account modifications from the new impact assessment study (ongoing in December 2020). The update uses a breakdown in base cases, providing a more detailed insight in the development of the market and usage of central heating boilers for space heating. The update regards the BAU-scenario (without any measures) and the ECO-scenario (including effects of CR 813/2013 and CDR 811/2013). New proposed measures in the review study (and ongoing follow-up study) have not been considered for EIA because not finalized yet (in December 2020). This will be addressed in a subsequent future update of EIA.
[1] 'Space and Combination Heaters, Ecodesign and Energy Labelling, Review study final report, VHK 2019', mainly Task 7 Scenarios

In EIA2020, the average heat demand per unit has been slightly reduced compared to EIA2019 to fit the total expected EU load for buildings and dwellings. In addition the heat demand has been diversified per base case. The annual variation is now 0.85%/a, taking into account e.g. the decrease in heating-degree-days due to climate changes and urbanization, the decrease due to building thermal insulation improvements, the increase in heat demand due to the decrease in internal heat gains (more energy efficient lighting and appliances), the increase in average dwelling area, the increase in comfort, etc.
In addition to this variation in heat demand, in the ECO scenario an additional decrease in heat demand is applied to reflect the reduction of heat losses by improvements in Ventilation Units due to Ecodesign measures (see sheet EULOADVAR for details).

For convenience of comparison with the regulation, the review study and the ongoing impact assessment study, efficiencies for central heating boilers in EIA2020 are expressed in primary energy GCV, using a PEF = 2.1 for electricity for all years. The FUEL, FNRG and NRG sheets continue to be in NCV, applying a GCV-NCV conversion factor of 1.11 for gas and 1.065 for liquid fuel. The ELEC sheets take into account that the primary efficiencies use a PEF of 2.1. The primary energy (NRG) sheets apply the final agreed PEF of 2.5 until 2020 and 2.1 from 2021 onwards.

SFB Solid Fuel Boilers

The performance in kWh annual heat output is a multiplication of operating hours (h) and the seasonal average heat output (P, in kW) as given in the table below.

The model assumes an autonomous annual decrease (HeatDec) of the heating load after year 2010 .

Testpoints are at full (ηn, 100%) and partial (ηp, 50%) load heating efficiency. If it is a cogeneration device the electricity production at full and part load is established (factor F3). Auxiliary electricity (elmax and elmin, pef 2.5) is taken into account in factor F2. Generic temperature control loss F1 is 3%.

For biomass boilers, to take into account the renewable character, a biomass label factor (BLF=1.15; for fossil fuel BLF=1) is taken into account to determine the EEI.
Basic seasonal efficiency equation conventional boilers and micro-CHP-boiler :
$\eta s = BLF*(0.85*\eta p + 0.15*\eta n) - F1 - F2 + F3$

In the first version of EIA the nominal (rated) heat output and the nominal efficiencies were used. This has been changed in the second version that uses average seasonal heat output and seasonal space heating efficiencies. The use of the latter improves the link with the regulation, that expresses minimum requirements as seasonal efficiencies. Seasonal efficiencies have been taken 15 percentage points lower than the nominal efficiencies. The seasonal average loads have been taken 81% of the nominal (rated) loads. This means that BAU energy remains approximately the same as in the first EIA version.

In EIA2020, following a comparison with data from Eurostat and PRIMES, the sales and stock for coal-fired boilers have been increased to obtain a better match of energy consumption. The need for the increase in EIA was confirmed by the 'EHI Heating Market report 2020' and by 'Mapping and analyses of the current and future (2020 - 2030) heating/cooling fuel deployment (fossil/renewables), Work package 2: Assessment of the technologies for the year 2012, Final report, September 2016, Prepared for: European Commission by Fraunhofer et al. (Table 12)'.

		P nominal, rated	P seasonal	h	Load up to year 2010	HeatDec after 2010
SFB Wood Manual	kWh heat/a	18	14.6	1000	14580	1%
SFB Wood Direct Draft	kWh heat/a	20	16.2	1000	16200	1%
SFB Coal	kWh heat/a	25	20.3	1000	20250	1%
SFB Pellets	kWh heat/a	25	20.3	1000	20250	1%
SFB Wood chips	kWh heat/a	160	129.6	1000	129600	1%

Air Heating and Cooling

The data in EIA are based on a draft Impact Assessment of June 2014 and a draft Working Document of September 2015 containing a proposal for regulation. The WD is accompanied by Transitional methods for test and calculation.

The requirements in the proposed regulation are expressed in terms of minimum seasonal space heating energy efficiency and useful efficiencies for air heating and air cooling products (refer to primary energy), and in terms of seasonal energy performance ratio (SEPR) for high temperature process chillers (refers to electricity). The same efficiencies are now applied in EIA (SEER and SCOP of previous release no longer used). The detailed definition of these efficiencies is rather complex and cannot be reported here: see the draft regulation and the transitional methods:

The seasonal efficiency for cooling or heating of all comfort chillers and electric heat pumps and air conditioners is based on the approach by EN 14511 and EN 14825:2012, which requires (as for hydronic heat pumps) measurement of capacity and efficiency at 4 to 5 anchor points. Using a bin-method, describing the cooling or heating seasons, the seasonal efficiency is then calculated through inter- and extrapolation. Two corrections factors apply: 3% for control losses and 5% for pump losses (brine/water equipment only). The seasonal efficiency thus does not include distribution losses or emitter losses.

For gas-engine driven heat pumps and/or air conditioners the standards are still being developed. It is expected that the EN14825 part load approach is integrated in standards such as prEN 12309. There are no specific requirements for sorption heat pumps or air conditioners.

For high-temperature process chillers a similar approach as for the electric comfort chillers and air conditioners/heat pumps is developed, but with the following differences: 1) the cooling season is extended as process chillers operate all year long. 2) the standard rating conditions are at slightly different operating temperatures, to better reflect the performance at lower outdoor temperatures. 3) this is also reflected in the bins that describe the cooling season. The methodology for doing measurements is intended to be the same as applied in EN 14825 and related standards.

The seasonal efficiency of fuel-fired warm air heaters is based on establishing the useful (thermal) efficiency at nominal load and part load, on the basis of the GCV of the fuel, and includes the following corrections: envelope losses (as in some parts of Europe some equipment is not allowed to be installed inside the heated space), emission efficiency (which deals with the temperature and the volume flow of the heated air), type of control over heat output (modulation etc.), losses due to auxiliary electricity consumption, draught losses of gravity vented systems and a pilot flame. For electric warm air heaters the useful thermal efficiency is by default 40% on primary energy basis.

Most aspects for establishing the seasonal efficiency of warm air heaters are covered by prEn1020:2007, EN 1319:2009, EN 1196:2011, EN 621:2009 and EN 778:2009. Establishment of envelope losses requires testing according EN 1886:2007 and measurement of auxiliary power requires testing according EN 15456. The seasonal efficiencies do not include distribution losses.

In the model, an aggregate GCV to NCV conversion factor of 1.09 for AHF is used between published values in IA study and the model. This conversion factor is NOT present in the reported efficiencies for AHF but applied directly in the NRG calculations.

Cooling		P (kW)	hours/a	HeatDec
CHAE-S (≤ 400 kW)	kWh cool/a	44	600	1%
CHAE-L (> 400 kW)	kWh cool/a	714	600	1%
CHWE-S (≤ 400 kW)	kWh cool/a	61	600	1%
CHWE-M (< 400 ≤ 1500 kW)	kWh cool/a	834	600	1%
CHWE-L (≥ 1500 kW)	kWh cool/a	1600	600	1%
CHF	kWh cool/a	20	600	1%
HT PCH-AE-S	kWh cool/a	145	5964	0%
HT PCH-AE-L	kWh cool/a	1000	2825	0%
HT PCH-WE-S	kWh cool/a	250	4418	0%
HT PCH-WE-M	kWh cool/a	750	4375	0%
HT PCH-WE-L	kWh cool/a	1600	3984	0%
AC rooftop	kWh cool/a	70	600	1%
AC splits	kWh cool/a	17	600	1%
AC VRF	kWh cool/a	28	600	1%
ACF	kWh cool/a	20	600	1%

Output Load = P * Hours * ((1+HeatDec)^(2010-yr))
Annual dec/increase of HeatDec% with respect to 2010

HeatDec represents decreased output demand due to improved building isolation and reduced ventilation loss
NOT applied to High-temperature Process Chillers

Heating		P (kW)	hours/a	HeatDec
AC rooftop (rev)	kWh heat/a	70	1400	1%
AC splits (rev)	kWh heat/a	17	1400	1%
AC VRF (rev)	kWh heat/a	28	1400	1%
ACF (rev)	kWh heat/a	40	1400	1%
AHF	kWh heat/a	59	1200	1%
AHE	kWh heat/a	20	1200	1%

LH Local Space Heaters

Applicable regulations are CR (EU) 2015/1185 (ecodesign solid fuel LSH), CR (EU) 2015/1188 (ecodesign electric, gas, and liquid fuel LSH) and CDR (EU) 2015/1186 (energy labelling for LSH).

Ecodesign minimum efficiency requirements are expressed in terms of seasonal space heating efficiency, that is defined in the regulations as the ratio between the space heating demand and the annual energy consumption required to meet this demand, expressed in %. This efficiency is derived from the efficiency at nominal heat output, applying corrections factors for e.g. suboptimal operation in real life (-10%), controls, auxiliary electricity consumption, permanent pilot flames, heat storage. See also Annex E 'Key facts' and details in the regulation.

The applicable standard for solid fuel fired local space heaters (open and closed fireplaces, wood stoves, coal stoves and pellet stoves) is EN 14785:2006 for pellet heaters, EN 15250:2007 for slow heat release stoves and EN 16510-1:2013 for the other solid fuel heaters. For gas-fired heaters there are several standards such as prEN 613:2000, EN 1266:2002 and EN 13278:2013. For oil-fired heaters there is EN 1:1998 and EN 13842. For electric heaters the thermal efficiency doesn't need to be established as it is default 40% on primary energy basis.

This efficiency is reduced by 10% to account for suboptimal operation in real life, which can be recuperated (in part or full) depending on the options the product incorporates regarding: type of heat storage options (electric storage heaters only), type of control over heat output (thermostats etc., timers, detection devices), auxiliary electricity consumption and losses from a pilot flame.

For luminous and tube heaters the approach is more elaborate. The useful efficiency is established on basis of the GCV of the fuel, for both nominal and part load operation and is then weighted according 0.85/0.15. For luminous heaters a default efficiency is assumed. Then follows a correction for envelope losses as some products may have the burners (heat generators) installed outside the heated space due to local building regulations. A correction for the emission efficiency is applied, based on the radiant factor of the products.

The efficiency is then further reduced by a loss factor related to the possibility of modulation of the heat output and the modulation range, the auxiliary electricity consumption and pilot flame losses.

Relevant standards for luminous and tube heaters are EN 416-1/-2 EN 419-1/-2. As these (currently) do not contain a method for establishing the useful efficiency, the chimney loss method as described in EN 1319 is suggested. Establishment of envelope losses requires testing according EN 1886:2007 and measurement of auxiliary power requires testing according to EN 15456.

The EIA Load for each type of LSH is expressed in kWh heat per year and obtained as the product of average nominal power (P in kW), average annual operating hours (h/a) and a load factor. The load factor expresses that during the hours the LSH on average works on a lower power than the nominal one. From a different point of view, but with the same effect, the load factor transforms the annual operating hours to full-load equivalent hours.

The thus obtained basic kWh heat/a value is assumed valid for year 2010 for solid fuel LSHs (not updated in EIA2020) and for year 2018 for the other LSHs (updated in EIA2020 based on the 2019 review study). For earlier years, an increase in heat load is applied and for later years a decrease, applying an annual HeatDec rate as specified below. For solid fuel LSH the HeatDec values have been taken identical to those used in the 2015 Impact Assessment. For the other LSHs, for consistency, the same value has been applied as for Central Heating boilers and Room Air-Conditioners.

In addition to the HeatDec, in the EIA ECO scenario an additional heat load reduction is applied to account for the additional heat savings in ECO versus BAU by improved Ventilation Units (see explanations for VUs and on sheet EULOADVAR).

The EIA2020 update for electric-, gas- and liquid fuel-LSHs essentially uses the efficiencies presented in the 2019 review study for the ECO-scenario starting from 2010. For the BAU-scenario, the update uses efficiencies similar to those in EIA2019. Where necessary, data were adapted to create consistent sets of data.
In the regulations, minimum efficiency requirements for luminous and tube LSH are expressed in GCV. For application in EIA these efficiencies have been multiplied by 1.1 (gas) or 1.065 (liquid fuel) to convert to NCV. For other types of gaseous or liquid fuel LSH the requirements are expressed in NCV and EIA does the same.
In the regulations, minimum efficiency requirements for electric LSH are expressed in primary energy using a primary energy factor of 2.5. In EIA the electric energy efficiency is used.
The 2019 review study reduced the efficiencies for fixed electric heaters and for underfloor electric heaters to account for a non-compliance of 30% of the fixed heaters and 90% of the underfloor heaters (LSHs being sold without controls, as slave heaters, and thus exempt from the regulation and with lower efficiency). These lower efficiencies have been copied in the EIA data.

	P (kW)	hours/a	kWh heat /a in 2010	HeatDec
LH open fireplace	8	42	336	0%
LH closed fireplace/inset	8	266	2128	0.5%
LH wood stove	8	337	2696	0.5%
LH coal stove	8	337	2696	0.5%
LH cooker	10	112	1120	0.5%
LH SHR stove	8	337	2696	0.5%
LH pellet stove	8	403	3224	0.5%

	P (kW)	hours/a	load factor	kWh heat /a in 2018	Annual HeatDec
LH Electric portable	1	475	0.50	237	0.85%
LH Electric fixed > 250W	1	1534	0.50	767	0.85%
LH Electric fixed ≤ 250W	0.25	1534	0.50	192	0.85%
LH Electric storage	2.75	480	0.75	990	0.85%
LH Electric underfloor	0.8	912	0.50	365	0.85%
LH Electric visibly glowing > 1.2 kW	2	912	0.50	912	0.85%
LH Electric visibly glowing ≤ 1.2 kW	1	912	0.50	456	0.85%
LH Electric towel heater	0.6	836	0.50	251	0.85%
LH Gas luminous (commercial)	20	1200	0.50	12000	0.85%
LH Gas Tube (comm. < 120 kW)	30	1200	0.50	18000	0.85%
LH Gas open front	4.2	800	0.50	1680	0.85%
LH Gas closed front	4.2	800	0.50	1680	0.85%
LH Gas balanced flue	4.2	800	0.50	1680	0.85%
LH Gas flueless	1.5	200	0.50	150	0.85%
LH Liquid tube (comm. < 120 kW)	30	1200	0.50	18000	0.85%
LH Liquid open front	2.0	800	0.50	800	0.85%
LH Liquid closed front	4.0	800	0.50	1600	0.85%
LH Liquid balanced flue	4.0	800	0.50	1600	0.85%
LH Liquid flueless	1.5	200	0.50	150	0.85%

Room Air Conditioners (RAC)

Room air conditioners, i.e. small air-to-air heat pumps with rated output up to 12 kW, follow the same testing and calculation principles as the air/water/ground-to-water heat pumps (see CH boilers) and as the air/water/ground-to-air heat pumps (see central air heating and cooling products): Test at 4 or 5 source/sink temperature pairs, calculation on the basis of the 'bin method' for average, warmer and colder climate zones. The performance, i.e. the annual heat/cooling output, is calculated on the basis of the rated output and a fixed number of full load equivalent operating hours.

EIA2020 implements new data from the 2018 review study [1], integrated with additional information from Viegand Maagøe. Following the review study, EIA base cases are now split in fixed RAC < 6 kW, fixed RAC 6-12 kW, and portable RAC < 12 kW. For fixed RACs, the space cooling and heating functions are separately considered; for portable RACs only the cooling function is included.
The BAU scenario in EIA reflects the situation without any regulation (also without the effects of Directive 2002/31/EC [2]). The ECO scenario in EIA reflects the impacts of all current and past regulations (CR 206/2012, CDR 626/2011 and Directive 2002/31). New measures proposed in the review study are not yet taken into account because not finalized yet (in December 2020).
[1] Review of Regulation 206/2012 and 626/2011, Air conditioners and comfort fans, Task 1 - Task 7 reports, Final version, Viegand Maagøe and ARMINES, May 2018
[2] COMMISSION DIRECTIVE 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air-conditioners.

The average annual cooling demand per unit is based on the average design power (kW) and the equivalent full-load usage hours per year (h/a), see table below. This load applies to the entire stock of RACs. Following the review study, the cooling load is assumed to be constant over the years, and the same for the BAU and ECO scenarios.

The average annual heating demand per unit is based on the average design power for heating (kW) and the equivalent full-load usage hours for heating per year (h/a), see table below. In EIA, this heating load applies only to reversible RACs that are actually being used for heating purposes by the users. This is a variable share of the stock, that increases with the years, see details on the SALES sheets. Similar to other space heating appliances, EIA applies an annual heat load decrease of 0.85%/a for e.g. improved thermal insulation of buildings and dwellings, climate effects, reduced internal gains, and other effects. For the ECO scenario, an additional heat load decrease due to improvements in Ventilation Units is taken into account (sheet EULOADVAR).

Following the approach in the review study, EIA now uses the SEER as efficiency metric for cooling and the SCOP for heating. The same metric is used in the regulations. Annual heating and cooling demands per unit are reported on the LOAD sheets; totals for the EU stock on the EULOAD sheets. Sales average efficiencies are on the EFN sheets; stock average values on the EFS sheets.

For cooling EIA considers all RAC sales and the entire stock. For heating, EIA considers only the part of sales/stock that is reversible and that is actually being used for heating (as stated in the 2018 review study). The SALES sheets report the share reversible and the share of those used for heating.
Acquisition costs, maintenance costs and business revenues are partitioned over the cooling and heating functions based on the number of units used for cooling and for heating. The shares for cooling and heating are respectively Ncool / (Ncool+Nheat) and Nheat / (Ncool+Nheat), where N the sales or the stock.

		Pdesign kW	Full load h/a	usage share	kWh/a (2015)	efficiency unit	
RAC fixed < 6 kW, cooling	kWh cool	3.5	350		1225	SEER	applies to entire stock
RAC fixed 6-12 kW, cooling	kWh cool	7.1	350		2485	SEER	cooling demand constant over years
RAC portable < 12 kW, cooling	kWh cool	2.6	549	0.256	365	SEER	
RAC fixed < 6 kW rev., heating	kWh heat	3.0	1400	see text	4200	SCOP	applies to a share of the stock
RAC fixed 6-12 kW rev., heating	kWh heat	5.6	1400	see text	7840	SCOP	annual heat load variation compared to
RAC portable < 12 kW rev., heating	kWh heat	heating function not considered				n/a	2015:
							0.85%

CIRC Circulator pumps <2.5 kW kWh flow/a Test=weighted avg. of 4 part load tests= 40%*¼+30%*½+20%*¾ +10%*full load.

The EIA2020 update is based on 'Review study on Circulators, Final report, Viegand Maagøe A/S, April 2018'.
The kWh flow per year is calculated as the product of the average hydraulic power Phyd (below) and 5000 operating hours per year. This basic value is assumed valid in year 2010 and reported on the LOAD sheets. The % annual variation of this value is set as shown below. The load in terms of kWh flow/a is the same for the BAU and ECO scenarios.
The reference power Pref and the weighted average power PLavg at EEI=1 can be calculated from (see regulation):

$$EEI = \frac{P_{L,avg}}{P_{ref}} \cdot C_{20\%}, \text{ where } C_{20\%} = 0.49$$

$$P_{ref} = 1.7 \cdot P_{hyd} + 17 \cdot \left(1 - e^{-0.3 \cdot P_{hyd}}\right)$$

The EEI values are reported on the EFN sheets, based on the distribution of sales over the energy label classes, as reported in the review study. For the BAU scenario an improvement of the EEI by 1% per year after 2010 is assumed. In the ECO scenario, due to the regulation, a strong improvement occurs between 2010 and 2015.
The average power PLavg at these EEI values is directly proportional to the PLavg value at EEI=1 shown in the table below. The annual electricity consumption per unit (kWh elec/a) is calculated as EEI * PLavg(@EEI=1) * hours per year / 1000. For years before and after 2010 the annual variation of the load is considered. The sales-average kWh elec/a are reported on the EFN sheets. Stock-average values are on the EFS sheets. The ELEC sheets multiply the unit values by the installed stock.

	Phyd [W]	year 2010 Hours [h/a]	year 2010 kWh flow	Pref [W]	at EEI=1 PL,avg [W]	annual variation
Integrated circulators	25.5	5000	128	60.3	123	0%
Large standalone circulators	195	5000	975	348.5	711	0%
Small standalone circulators	10.2	5000	51	33.5	68	0%

The electricity consumed by circulators is already counted in the auxiliary electricity of central heating boilers (excluding solid fuel boilers). By comparing the stocks of central heating boilers and circulators in year 2020, it can be estimated that the energy of all integrated circulators and 38% of the stand-alone circulators is already counted under central heating boilers. In 1990 the share of stand-alone would be 60% and in 2050 20%, but the 38% has been applied as double counting factor for stand-alones in all years.
For integrated circulators the double counting factor is 1 (all double counted).
When computing totals over all products, only the non-double counted share is considered. This is 62% of the stand-alone circulators.

VU Ventilation Units

EIA2020 update

The EIA2020 update for VUs is based on the 2020 Review study: 'Ventilation Units, Ecodesign and Energy Labelling, Review Study, Phase 1.1 and phase 1.2, Technical Analysis and update Preparatory Studies, Final Reports Tasks 1-7, VHK, Delft (NL), for the European Commission DG GROW, August 2020'.
The scenario analyses in the review study are detailed and complex, and not all details can be addressed in EIA. Refer to the study for more information.

The BAU scenario in EIA represents the situation without any regulation. The ECO scenario in EIA considers the impacts of current regulations (CR 1253/2014 and CDR 1254/2014). These regulations apply from 2016/2018, but studies and discussions started already in 2008. Manufacturers anticipated the measures, leading to first effects from 2012. From 2012, the BAU scenario is a freeze (same approach as in EIA2019 and in the 2013 IA). The EIA2020 update does not yet take into account new measures proposed in the review study, because these were not finalized yet (in December 2020).

Abbreviations

R	Residential
NR	Non-Residential
UVU	Unidirectional VU (exhaust only or supply only)
BVU	Bidirectional VU (exhaust and supply, balanced, typically with heat recovery)
ES	Extract Spaces (e.g. toilets, bathrooms, kitchens)
HS	Habitable Spaces (e.g. living rooms, bedrooms)
AHU	Air-Handling Unit
MVU	Mechanical Ventilation Unit (UVU, BVU or AHU)

Parameters

Aref	reference building/dwelling area covered by one MVU, see tables below
Qnom	nominal mechanical air-flow rate (m3/h), see tables below
Qavg	Qavg is the real-life average mechanical air-flow rate. Qavg values per VU in m3/h on the EIA LOAD sheets have been copied from the review study as stock average values. Qavg is typically smaller than Qnom and depends on e.g. motor control options (2-speed, multi-speed, variable speed), user control options (manual, clock, relative humidity (RH) sensors, CO2 sensors, presence detection (PIR), sensors central, per zone or local), and ventilation performance index (VPI) or other indoor air-quality metric. Due to additional controls Qavg typically goes down with the years, but it may also be necessary to increase Qavg to improve indoor air quality.
Qinf	remaining infiltration air-flow (in presence of MVU)

value depending on n50 air-tightness value of buildings and dwellings using MVU

	1990	2000	2010	2020	2030	
n50	6	4	3	2	2	[-] approximate
Qinf rate	1.30	0.85	0.65	0.45	0.45	m3/h/m2

Qinf per VU in m3/h on LOAD sheets computed as Aref (m2) * Qinf rate in m3/h/m2
Infiltration air flows are the same for BAU and ECO scenarios. These additional air-flows assist the ventilation needs but they are uncontrolled (not the desired quantity in the desired zone; no heat recovery). Values for Qinf are reported for information only (not used in EIA calculations).

Qnat — reference natural air-flow (in absence of MVU) 2.48 m3/h/m2 for all years

A value of 2.48 m3/h/m2 (for all base cases and all years) is used as reference for VUs sold for new-built and renovated dwellings/buildings. For VUs sold as replacements for existing VUs, the Qinf rate is used as reference.
Qnat per VU in m3/h on LOAD sheets computed as Aref (m2) * 2.48 m3/h/m2 * share sales for new-built and renovation + Aref (m2) * Qinf rate (m3/h/m2) * share replacement sales.
Qnat is the same for the BAU and ECO scenarios. Values for Qnat are reported for information only (not used in EIA calculations).

Hours — Qavg, Qinf and Qnat per unit in m3/h are reported on the LOAD sheets. Multiplied by the stock, the same parameters are shown in Mm3/h on the EULOAD sheets. The totals per sector on the EULOAD sheets are in Tm3/a, using 8760 h/a (VUtime) for total vented airflow, and 4910 h/a in 2020 (SHtime) for venting during the heating season. The hours per year during the heating season decrease by 0.85%/a (SHtimevar), see variables below.

VUtime	8760	hours per year ventilation time
SHtime	4910	hours per year ventilation time during heating season (valid in 2020)
SHtimevar	0.85%	decrease of SHtime per year

Efficiencies — The EFN sheets provide the sales-average annual electricity consumption per unit (kWh elec/a/unit) and the heat recovery efficiency for each base case. These data have been derived in the VU review study, but in EIA they are fixed input values. The EFS sheets provide the stock-averages for the same parameters. In addition the EFS sheets report the stock-average amount of heat recovered per unit per year (kWh heat/a/unit), calculated as the mechanical flow Qavg (from LOAD sheet) * Heat Capacity for air (below)* Delta temperature for space heating (below) * Space heating hours per year (above) * Heat recovery efficiency (EFS).

HCair	0.000344	kWh/m3/K, heat capacity of air
DeltaT	10.94	K, average temperature increase for space heating

EULOADVAR — The kWh heat/a/unit values of the EFS sheets are used on the EULOADVAR sheet to compute the heat recovered by the stock of VUs, in the BAU scenario and in the ECO scenario. The difference in heat recovery (ECO-BAU) is used as basis for the space heating load reduction, see details on the EULOADVAR sheet. The space heating load reduction is independent from infiltration air flows or reference natural air flows, as these are the same in BAU and ECO.
No credit is given in the model for savings on space cooling (although a non-insignificant credit in a Warm climate is plausible)

STOCK — The stock sheets report the VU stock per base case in thousands of units. The total stock per sector is specified both in thousands of units and in million of m2 of building/dwelling area covered by VUs. The latter values are derived using the Aref values of the table below.
The total EU dwelling and building sizes are reported on sheet General_1, and used on the STOCK sheets to show the share of building/dwelling area covered by VUs.

RVU Residential Ventilation Units	Qnom m3/h	Aref m2
R-UVU ≤ 100 m3/h, ES	60	33
R-UVU ≤ 100 m3/h, HS	60	33
R-BVU ≤ 100 m3/h, HS	60	33
R-UVU 100-250 m3/h	180	100
R-BVU 100-250 m3/h	180	100
R-UVU 250-1000 m3/h	720	400
R-BVU 250-1000 m3/h	720	400
R-UVU > 1000 m3/h	1500	833
R-BVU 1000-2500 m3/h	2250	1250

NRVU Non-Residential Ventilation Units	Qnom m3/h	Aref m2
NR-UVU 250-1000 m3/h	720	400
NR-BVU 250-1000 m3/h	720	400
NR-UVU > 1000 m3/h	1440	400
NR-BVU 1000-2500 m3/h	1800	500
NR-AHU-S 2500-5500 m3/h	3780	1050
NR-AHU-M 5500-14500 m3/h	9000	2500
NR-AHU-L > 14500 m3/h	25200	7000

Backgrounds on the modelling of Ventilation Units
(details not shown in EIA, see the 2020 VU Review study, the regulations, and the 2013 Impact Assessment)

NRVU, Non-Residential Ventilation Units

Modelling of Annual Electricity Consumption *AEC* of non-residential VUs in kWh/a:

$AEC = 8.76 * NrFans * (\Delta P_{int} + \Delta P_{ext}) * (q_{nom}/3600) * \eta_{fan} * MISC * (0.05+0.95*(CTRL_{on} + CTRL_{var}^3))$

where 8.76=8760 operating hours x 0.001 kWh/Wh, *NrFans* =1 fan for UVU/2 for BVU, $\Delta P_{int} + \Delta P_{ext}$ = internal and external pressure difference per fan, q_{nom} =nominal flow rate in m³/h, 3600= s per h (for conversion m³/h to m³/s), η_{fan} = fan efficiency at design point (usually best efficiency point *bep*), *MISC* =factor for ventilation effectiveness, duct leakage etc., $CTRL_{on}$ = factor for on-off control, $CTRL_{var}$ = factor for (variable) demand-control of flow rate.

For Annual Heating Saving *AHS* (with respect of qref=natural ventilation) of non-residential VUs per m³ ventilation:

$q_{refcorr} = 1.36 * q_{effective}$ (includes $CTRL_{on}$ =0.8), q_{net} =1.3 m³/h

$q_{effective} = Q_{nom} / MISC,$

specific heating energy *SHE* in kWh per m³/a = 5112 heat h/a*9.5 K difference indoor/outdoor for average climate * 0.000344 kWh/m³.K * 1/75% η_h boiler efficiency = 22.21 kWh/m³.a . For Warm climate 10.05; for Cold 43.47.

$AHS = SHE * (q_{nom} / MISC) * [1.36 - MISC * CTRL_{on} * CTRL_{var} * (1-\eta_t)] - Q_{defrost}$

with $Q_{defrost} = HR_{pen} * 0.35 * q_{nom} * CTRL_{on} * CTRL_{var}$, where HR_{pen} is the market penetration of heat recovery (for an individual model 0 or 1, in a larger population can be any value between 0 and 1)

RVU Residential Ventilation Units

For residential VUs (RVU) the regulated parameter is the SEC

$$SEC= t_a \cdot pef \cdot q_{net} \cdot MISC \cdot CTRL^x \cdot SPI - t_h \cdot \Delta T_h \cdot \eta_h^{-1} \cdot c_{air} \cdot (q_{ref} - q_{net} \cdot CTRL \cdot MISC \cdot (1-\eta_t)) + Q_{defr}$$

where SEC = Specific Energy Consumption per unit floor area (kWh primary/a)/m²;
t_a =8760 operating h/a; *pef* =primary energy factor 2.5; q_{net} =minimum ventilation demand per floor area 1.3 (m³/h)/m²; *MISC* is correction factor ventilation effectiveness, duct leakage, etc.; *CTRL* =control factor; *x* =exponent motor & drive;
SPI =Specific Power Input in W/(m³/h) of the VU at ca. 70% rated flow and 50 Pa;
t_h =5112 h/a heating season; ΔT_h = 9.5 K; η_h = boiler efficiency 75%; c_{air}=0.000344 kWh/m³.K;
q_{ref} = natural ventilation per floor area 2.2 (m³/h)/m²; η_t =efficiency heat recovery;
Q_{defr} = defrost energy 0.45 kWh prim/a in Average climate.

The Average climate is used for the energy label (figures above apply to BAU)

LS Light Sources

EIA data for light sources are based on the Model for European Light Sources Analysis (MELISA) that was developed during the Lot 8/9/19 preparatory study (2014-2016) and last updated in 2019 for regulations CR 2019/2020 and CDR 2019/2015. This model is rather complex, involving variable lifetimes, lifetime distributions, detailed base cases and a split between residential and non-residential data. This makes it difficult to reproduce MELISA results accurately in EIA using the standard EIA formulas applied to the aggregated EIA base cases. It has therefore been preferred to insert MELISA data directly in EIA as fixed values, i.e. data are not computed from basic input data as is done for other products. The basic input data for the aggregated base cases are reported in EIA anyway, but they are averages over the detailed base cases and over the residential and non-residential sector. These input data averages (in particular for loads, efficiencies and prices) are indicative only, not used for computations in EIA, and sometimes difficult to interpret. For a better understanding of the underlying input data and assumptions, see the MELISA model.

The BAU-scenario in EIA represents the situation if no Ecodesign and Energy Labelling measures would have been taken in 2009-2012. This scenario is different from the BAU-scenario that was presented in EIA versions of December 2016 and earlier, due to using new information that was collected during the 2014-2016 preparatory / review study on light sources.
The **ECO scenario** in EIA represents the combined effects of existing regulations (244/2009, 245/2009, 1194/2012, 874/2012) and the new 2019 regulations. The scenario **reflects the final regulation, including last-minute changes introduced in the Regulatory Committee** (in particular: phase-out LFL T8 2-4-5 feet in 2023; HL capsules allowed on market until 2023).

The quantity of light emitted by a lamp is measured in lumen (lm). A lamp emits a spectrum of electro-magnetic radiation, consisting of different wavelengths (colours), of which a large part cannot be perceived by the human eye. The other part (called light) still consists of different colours, and the sensitivity of the human eye depends on the colour. The lumen-measure takes these different sensitivities into account and consequently can be conceived as the useful amount of emitted light, as perceived by humans (although lately there have been discussions on this). The instantaneous amount of electrical input to a lamp is called the input power, expressed in Watt (W). The efficacy (efficiency) of a lamp is the ratio of the light output (in lumen) and the power input (in Watt) and consequently expressed in lm/W.

As regards the average annual hours (h/a) a lamp is operated by the user (burning hours), the MELISA model uses full-power equivalent (fpe) hours, and EIA copies this approach. If e.g. a lamp burns 2000 h/a at full power and 1000 h/a dimmed at half power, the fpe-hours are 2000 +1000/2 = 2500 h/a.

The unit lamp load, i.e. the annual demand for light output, is the product of the (full, non-dimmed) light output in lumens and the fpe-hours, expressed in lm.h/a. The LOAD sheet reports the capacity (lm) and the fpe-hours (h/a) separately.

LOAD: Average unit capacity (lm): computed as EU total installed lumen from MELISA divided by EU total installed stock from MELISA. Consequently, for light sources these are stock-weighted averages. For directional lamps, reported lumens are those in a 90 or 120 degree cone as defined in CR 1194/2012 (they are not total lumens). DLS efficacy also refers to lumens in a cone.

LOAD: Average unit annual fpe operating hours (h/a): computed from MELISA data as EU electricity/EU stock/unit lumen * EFS, i.e. reported unit hours have been determined in such a way that when applying standard EIA formulas the EIA electricity matches exactly the MELISA electricity (but anyway EIA electricity data are not calculated but fixed values from MELISA).

EFN: Average efficiency of light sources sold in a given year (EFN, in lm/W) for the aggregated EIA base case: computed as sales-weighted average over the detailed MELISA base cases, and over residential and non-residential. This is a sales-weighted average efficiency (not energy-weighted) that includes both light source efficiency and control gear efficiency. For indicative reference only : the EFN data are NOT used to compute EFS data, and EFN-data (sales-weighted) and EFS-data (energy-weighted) should not be compared.

EFS: Average efficiency of light sources installed in a given year (EFS, in lm/W) for the aggregated EIA base case: computed as EU total load from MELISA in Tlm.h/a divided by EU total electricity consumption incl. control gear from MELISA in TWh/a. This is an energy-weighted average efficiency that includes both light source efficiency and control gear efficiency. Note that these are fixed values in EIA, NOT computed from EFN as done for other products.

In some cases the averaging procedures for lumens, hours and efficiencies lead to 'strange' values for the aggregated base cases in EIA. This is due to the shares of the detailed MELISA base cases inside an aggregated EIA base case changing over the years. E.g. inside the aggregated EIA LFL base case the ratio between T8 and T5 changes because the rate at which they are replaced by LED is not the same for the two types and also different for residential and non-residential sector. E.g. the EIA aggregated HL base case (halogen lamps) contains a mix of directional (DLS) and non-directional light sources (NDLS), a mix of low-voltage (LV) and mains-voltage (MV), and also includes the linear (R7s) halogen lamps; these different types are substituted by LEDs at different speeds, causing variations in capacity, fpe-hours and efficiencies that are not always easy to understand. See MELISA for more detailed information.

The MELISA curves used for LED efficiency development with time are reported below. High-End LEDs include LEDs replacing LFL, HID and CFLni in the non-residential sector. Low-End LEDs include LEDs replacing DLS or NDLS in all sectors and LEDs replacing LFL, HID and CFLni in the residential sector. For corresponding price curves, see sheets PRICEBAU and PRICEECO. For the ECO-scenario the original MELISA curves are used, including the effects of energy labelling improvements (ECO+LBL scenario). For the BAU2008 scenario the curves have been shifted forward by 2 years (delay in LED development) and are without the effects of label improvement.

	2010	2015	2020	2025	2030	2040	2050	
BAU SCENARIO, LED development curves (from MELISA BAU2008 scenario of November 2017)								
High-End, LS efficiency (lm/W)	21	68	115	139	164	174	174	incl. CG efficiency
High-End, CG efficiency (%)	85.0%	85.0%	89.0%	91.6%	92.6%	93.0%	93.0%	
Low-End, NDLS efficiency (lm/W)	21	68	99	109	118	122	122	incl. CG efficiency
Low-End, DLS efficiency (lm/W)	17	54	76	88	97	101	101	incl. CG eff.; for flux in cone
Low-End, CG efficiency (%)	85.0%	85.0%	86.5%	89.0%	90.0%	90.0%	90.0%	

	2010	2015	2020	2025	2030	2040	2050	
ECO SCENARIO, LED development curves (from MELISA ECO+LBL 2021 scenario of April/May 2018)								
High-End, LS efficiency (lm/W)	26	90	125	166	190	190	190	incl. CG efficiency
High-End, CG efficiency (%)	85.0%	87.0%	92.0%	93.0%	94.0%	94.0%	94.0%	
Low-End, NDLS efficiency (lm/W)	26	85	103	142	160	160	160	incl. CG efficiency
Low-End, DLS efficiency (lm/W)	20	67	81	114	130	130	130	incl. CG eff.; for flux in cone
Low-End, CG efficiency (%)	85.0%	86.0%	90.0%	91.0%	92.0%	92.0%	92.0%	

MELISA distinguishes 'normal' sales for GLS and HL and additional **GLS and HL 'from storage'**. The latter are non-directional light sources that are installed by residential users from the spares they had in house. These are not real sales in the considered year (they have been bought in preceding years) but they are relevant for the stock of installed light sources. In EIA, GLS and HL 'from storage' are reported separately only on the sheet SALES (but not counted in total sales). On other EIA sheets the data for 'normal' and 'from storage' light sources are summed and reported on a single line .

Starting from EIA 2019, data on **Special purpose lamps** (SPL) and **lighting controls** (ctrl) are no longer reported, because SPL and ctrl are not regulated. Data for SPL can still be found in http://ecodesign-lightsources.eu/sites/ecodesign-lightsources.eu/files/attachments/LightSources%20Task1_Annexes%20Final%2020151031.pdf in Annex D (from 2014-2016 Lot 8/9/19 preparatory / review study).

Standby (sb) is included in EIA as regards energy consumption and related emissions and energy costs. Data for sb have not been estimated in the MELISA model, nor in the 2018 IA on light sources. Data for sb have been maintained from earlier EIA versions (fixed values) and are rough estimates. No savings on sb accounted.

DP Electronic Displays

Commission Regulation (EC) No 642/2009 , OJ L 191/42, 23.7.2009, sets Ecodesign requirements for televisions (TV sets and TV monitors). Starting from 2010/2012, requirements regard the on-mode power, off-mode power and standby power. The limits for the on-mode power are defined as the sum of a fixed basic power (16 W for sets; 12 W for monitors, in tier 2 from 2012) and a variable power depending on the viewable area (Area in dm2 * 3.4579 W/dm2). From 2012, the power limit for off-mode is 0.3 W (in some conditions 0.5 W) and for standby mode 0.5 W (in some conditions 1 W). From August 2012, after 4 hours inactivity TVs have to switch to off-mode / standby-mode or similar (auto power down)

Commission Delegated Regulation (EU) No 1062/2010, OJ L 314/64, 30.11.2010, defines energy classes and energy labels for televisions. Classes are defined on a G to A+++ scale using an Energy Efficiency Index (EEI), being the ratio between the measured power and a reference power (fixed part depending on the type of product and variable part depending on viewable area).

The new regulations (CR 2019/2021, CDR 2019/2013) extend the scope of Ecodesign to all Electronic Displays (DP), including also computer monitors and signage displays. Exempted are: DP with area ≤ 100 cm2; digital photo frames; projectors; all-in-one video conference systems; medical displays; DP where main function is status display or control or function activation; DP integrated or to be integrated exclusively into products whose main function is not displaying images. In addition energy efficiency and some functional requirements do not apply to: broadcast displays; professional displays; security displays; digital interactive whiteboards; digital signage displays (so only off-mode, standby and information requirements for these DP).

The new ecodesign regulation sets energy efficiency requirements in terms of EEI, defined as:

$$EEI = \frac{(P_{measured} + 1)}{\left(3 \times \left[90 \times \tanh\left(0{,}02 + 0{,}004 \times (A - 11)\right) + 4\right] + 3\right) + corr_{l}}$$

(where A is the viewable area). Maximum allowed EEI=0.90 from 2021, 0.75 from 2023 and 0.60 from 2025, for HD resolution (1980x1080 pixels). For higher resolution, the allowed power is around 20-25% higher. For UHD-4k and higher resolution, requirements start from 2023.
For off-mode the maximum allowed power is 0.3 W. For standby 0.5 W is allowed, but depending on the product this can increase to 2.2 W. For networked standby 2 W is allowed, but depending on the product this can increase to 7.7 W (for High Network Availability, HiNA).

The new labeling regulation defines new energy efficiency classes for DPs based on EEI (same as above), on a G-A scale, conform to framework Regulation (EU).2017/1369.

For on-mode, the reference for modelling of W/dm2 efficiency is 2D HD picture quality. The additional power for UHD, 3D or HDR is assumed as follows:

Additional on-mode power for UHD / 3D / HDR	BAU	**50%**
Additional on-mode power for UHD / 3D / HDR	ECO	**20%** (applied from 2023; transition 2020-2023)

The load parameters for on-mode are the viewable area in dm2 (for TV, Monitor, Signage), the share of products with UHD/3D/HDR (TV, Monitor) and the viewing or display time (on-mode-time) in hours per day. These parameters are presented on the LOAD sheet. They are combined with the on-mode efficiency in W/dm2 (see EF-sheets) for energy calculations.

The load parameters for standby are the standby times (for TV, Monitor, Signage). They are combined with the standby power in W (see EF-sheets) for energy calculations. Standby hours include both simple standby hours for remote control (esp. before 2010) and networked standby (for LoNA and Smart TVs)

Viewing and standby hours are constant over the years. The viewable area and the share UHD/3D/HDR increase with the years. The load parameters are the same for all scenarios. The on-mode efficiency shows a strong power decrease with the years, in all scenarios, but faster in the ECO scenario due to the measures taken.

For TVs, test with dynamic video content according to EN IEC 620B7:2012 (estimate from available data) at 65% of peak luminance. Older test standards use static test image. For monitors, according to Energy Star before July 2013, test luminance is at a fixed 200 cd/m². After July 2013 the US Energy Star (not yet updated in EU) tests with dynamic video content according to EN IEC 620B7:2012 (estimate from available data) at 65% of peak luminance.

The BAU scenario in the Ecodesign Impact Accounting (EIA) represents the situation without any regulation (so without CR 642/2009, CDR 1062/2010, CR 1275/2008). This is different from the BAU scenario in the 2018 Impact Assessment (IA) that considers the situation with the existing regulations in force. Consequently, BAU data and BAU-ECO savings data cannot be directly compared for EIA and IA.
The ECO scenario in EIA reflects the impacts of the 2019 regulations.

STB Set-Top Boxes

SSTB	TEC	Operating hours (24h) as CSTB, i.e. 4.5h on, 4.5h sb from APD and 15h sb
CSTB	TEC	CSTB are regulated by a Voluntary Agreement (VA) since 2011. Currently (2019), active version is VA 6 Tier 4 (www.cstb.eu). Active modes, standby, and standby after AutoPowerDown (APD) are distinguished, but combined in a single Total Energy Consumption (TEC) value in kWh/a. Maximum limits are set for the TEC, depending on base functionality type (cable, satellite, IP, terrestial, thin-client/remote) and many additional functionalities. TEC for a product with APD capability (now required for all) is calculated as 0.365 x (Ton x Pon + Tstandby x Pstandby + Tapd x Papd), where Ton=4.5 h/d, Tstandby=15 h/d and Tapd=4.5 h/d. In earlier VA versions for products without APD capability Ton= 9h/d and Tstandby=15 h/d. (Note that other sources e.g. Intertek and US DoE suggest on-modes up to 10h)
		CSTB data have been updated in EIA 2019 using TEC data from the VA independent inspector report 2018. TEC values reported for service providers have been used as a reference. These values are higher, but probably closer to reality, than values reported for equipment manufacturers (see also April 2020 ICT interim report). There are contradicting indications as regards CSTB sales. In the EIA 2019 update, sales have been kept constant from 2016 on 41 mln units per year (stock 205 mln), removing the further increase that was present in previous EIA issues.
		CSTB are also regulated by the standby regulation (CR 1275/2008 as amended). The 2019 draft IA on Standby calculated standby electricity consumption of CSTBs separately from the TEC for the VA, but values are not always compatible. In EIA it has been assumed that 65% of the TEC value is covered by CR 1275/2008. This share is based on information in the 2018 VA Independent inspector report.

VIDEO (Game Consoles)

Games Consoles (GCs) are regulated in Ecodesign by means of a Voluntary Agreement (Self-Regulatory Initiative, SRI) since 2014/2015, last updated in March 2020 (version 3.0, see https://efficientgaming.eu/). The SRI applies to mains-powered consoles (not battery-operated, usually handheld, devices).
For GCs with a power of more than 20 W in gaming mode, the SRI sets power caps for the media playback and navigation modes (not for the gaming mode). The maximum allowed powers have gradually decreased over the period 2014-2019 from 90 W to 50/60 W. UHD gaming capable consoles have a higher power allowance.
For the same GCs > 20 W, the SRI sets Auto-PowerDown (APD) requirements. After 4 hours of inactivity in media playback, or after 1 hour of inactivity in other modes, the consoles shall automatically enter a low-power state, in principle standby or networked standby, not exceeding the power limits set by Ecodesign standby regulation CR 1275/2008. The APD function has to be activated by default, but users can disable it or change the APD trigger times.
As many users tended to disable APD, manufacturers introduced a 'rest mode' (or instant-on or hold-mode) in the most recent consoles, in which the state of the game is saved in memory (suspend-to-RAM) and in which some console functions can remain active (e.g. charging enabled, peripheral charging, low-power download). The power consumption in this 'rest mode' is currently not regulated, and for a part of the time can be higher than the limits set in CR 1275/2008.
The SRI also provides test and verification procedures (for the power of the active modes and for the APD).

In addition, Games Consoles are subject to the Ecodesign standby regulation CR 1275/2008, as amended for e.g. networked standby by CR 801/2013. This regulation applies to mains-powered products. There is no power limit, but devices using a Low-Voltage external power supply are exempt. This means that GCs with a power less than 20 W in gaming mode can be subject to the standby regulation, but not to the power requirements of the SRI.
CR 1275/2008 sets maximum powers for standby and off-mode (1 W in 2009, 0.5 W in 2013, allowance for information or status display), while amendment 801/2013 adds maximum powers for networked standby mode (6 W in 2015, 3 W in 2017, 2 W in 2019, values for non-HiNA equipment).
Similar to the APD-requirements in the SRI, CR 1275/2008 (as amended) also requires a power management function to be implemented and to be activated by default. This function should switch the device to a low-power state, not exceeding the power limits of CR 1275/2008, within 20 minutes of inactivity.

Considering the regulatory status described above, Games Consoles in EIA have been split in those with power > 20 W in active gaming mode and those with power < 20 W. In addition, active modes (gaming, media playback, navigation/other) and non-active modes (standby, networked standby, off-mode) are addressed separately. For the moment, the 'rest mode' is considered part of the non-active modes.
EIA data on sales, lifetime, usage times and powers per mode are mainly based on the following references:
'Review Study of the Ecodesign Voluntary Agreement for the Product Group “Videogames Consoles”' (CSES et al, 2019)
'Report on the 2017 review of the Game Console Self-Regulatory Initiative', Final report: July 5th, 2017, Microsoft, Nintendo, Sony
'Evaluating Games Console Electricity Use: Technologies and Policy Options to Improve Energy Efficiency', Amanda Webb, Doctoral thesis June 2014
and for additional sales data: https://www.vgchartz.com/tools/hw_date.php?reg=Europe&ending=Yearly

The review studies focus on the period 2013-2018 and on Playstation 4 and Xbox One. The thesis by Webb covers a longer period but focuses on the Playstation model series. The references do not provide a full 1990-2050 scenario as required in EIA. VHK therefore elaborated the data from the reference documents and integrated with data from other sources and own estimates, especially for earlier years. After 2018/2019, all data were kept constant. The Games Consoles models considered were: Sony Playstation-1, Playstation-2, Playstation-3, Playstation-4, Microsoft Xbox One, Xbox 360, Nintendo Switch, Wii, Wii U, 64, Gamecube, and Sega Saturn.
Games consoles sales show peaks in the first years after the launch of a new model and a gradual decrease in later years. This gives variable sales over the years. In addition, new GC models intially tend to have higher power consumption than their predecessor, due to additional features and functionality, higher computing performance, higher display resolution, etc. In subsequent years the average power consumption decreases due to optimization, power management improvements and diversification of model variants. In addition, active usage times tend to increase over the years, but are then slightly reduced by the APD and power management functions of the regulations. This leads to irregular time-series for sales, usage times and powers, especially when combined with the standard EIA stock calculation (with constant average lifetime). It was therefore preferred to apply a data smoothening to provide a more comprehensible, and probably more realistic scenario, but without significantly altering the end results of the analysis.

The development of the characteristics of Games Consoles over the years, as described above, makes it complex to define a BAU-scenario, i.e. what would have happened without any regulation. The 2019 CSES review study and the 2017 Industry review study both used a baseline reference scenario from the 2014 thesis by Amanda Webb. The same reference is used in EIA, but instead of using a freeze BAU scenario at 200 kWh/a/unit (for Playstation-4 and Xbox One), an improvement is assumed also in BAU, decreasing to 137 kWh/a/unit in 2020 and later years. This BAU scenario, and thus the computed savings, remain disputable.
Another factor affecting the computed savings is the assumed decrease in active usage time due to the APD requirements of the SRI and the power management requirements of CR 1275/2008 (as amended). Following the reference documents, EIA assumes that active usage times in BAU would have been 20% higher than in ECO. The decrease in active usage time in the ECO scenario leads to an identical increase in the time for non-active modes. The 20% time-shift is uncertain. Sensitivity analysis showed that 1/3 of the 2020 savings for active modes is due to this time-shift assumption (and 2/3 to the power caps set by the SRI). Savings in 2020 for non-active modes are negligibly affected by this time-shift.
Usage times in hours per day for active and non-active modes are presented on the LOAD sheets. Powers per mode (in Watt) are presented on the EFN sheets. The same EFN sheets also present the sales-weighted average unit annual electricity consumptions, computed as hours-per-day * 365 days/year * power / 1000 (kWh/a/unit). EIA computes stock-average kWh/a/unit from the sales-average values (on the EFS sheets) and these stock-averages are multiplied by the stock of games consoles in a given year to compute the overall electricity consumption.

ES & DS: Enterprise Servers and Data Storage products

Regulation CR 2019/424 applies to servers and online data storage products, where:

'**server**' means a computing product that provides services and manages networked resources for client devices, such as desktop computers, notebook computers, desktop thin clients, internet protocol telephones, smartphones, tablets, telecommunication, automated systems or other servers, primarily accessed via network connections, and not through direct user input devices, such as a keyboard or a mouse and with the following characteristics:
(a) it is designed to support server operating systems (OS) and/or hypervisors, and targeted to run user-installed enterprise applications;
(b) it supports error-correcting code and/or buffered memory (including both buffered dual in-line memory modules and buffered on board configurations);
(c) all processors have access to shared system memory and are independently visible to a single OS or hypervisor;

'**data storage product**' means a fully-functional storage system that supplies data storage services to clients and devices attached directly or through a network. Components and subsystems that are an integral part of the data storage product architecture (e.g., to provide internal communications between controllers and disks) are considered to be part of the data storage product. In contrast, components that are normally associated with a storage environment at the data centre level (e.g. devices required for operation of an external storage area network) are not considered to be part of the data storage product. A data storage product may be composed of integrated storage controllers, data storage devices, embedded network elements, software, and other devices;

The regulation does not apply to: (a) servers intended for embedded applications; (b) servers classified as small scale servers in terms of Regulation (EU) No 617/2013; (c) servers with more than four processor sockets; (d) server appliances; (e) large servers (> 32 dedicated input/output slots); (f) fully fault tolerant servers; (g) network servers; (h) small data storage products(≤ 4 data storage devices) ; (i) large data storage products (> 400 data storage devices). See detailed definitions in the CR.

The regulation sets minimum requirements for the efficiency and power factor of (internal) Power Supply Units (PSUs) for ES and DS, in 3 tiers (2020, 2023, 2026). The proposal also limits the power consumption in idle state for ES with 1 or 2 processor sockets. In addition, material efficiency requirements (disassembly) and information requirements are set.

The EIA ECO scenario represents the situation with CR 2019/424 in force (This closely corresponds to policy option PO 3.2 of the IA).
The EIA BAU scenario represents the situation without the new 2019 regulation. This is essentially the same BAU scenario considered in the IA.

Servers (ES) were previously regulated in CR 617/2013 on computers and computer servers, but that regulation has been ineffective in practice (no energy savings; see also remarks elsewhere for computers). In addition, there is an Energy Star specification for ES, but only 28% of servers on the EU market is labelled Energy Star. ES and DS are also involved in the 'EU Code of Conduct (CoC) on Data Centre Energy Efficiency' (CoC), but effects of that code are beyond the scope of EIA. Moreover, the available studies do not provide data for a BAU scenario without the effects of CR 617/2013, Energy Star and CoC. Hence, the BAU scenario in EIA already includes the effects of CR 617/2013, Energy Star and CoC, and the difference BAU - ECO thus provides only the effects of the new proposed regulation.

To avoid regulation conflicts, the new CR amends CR 617/2013 such that ES in the scope of the new proposed regulation are removed from CR 617/2013. Small-scale servers, that are excluded from the new regulation, remain in the scope of CR 617/2013.

A higher energy efficiency of ES and DS implies that these devices generate less heat, meaning that less cooling is required for the spaces in data centers where the equipment is installed. In addition the proposed regulation sets an information requirement on the operating conditions for ES and DS, in an attempt to stimulate manufacturers to increase the maximum operating temperature for the equipment (which would allow additional energy savings on space cooling).
In the IA, the energy savings are therefore reported for the equipment itself, and for the entire data center infrastructure (incl. e.g. space cooling).**EIA considers only the energy consumption and related emissions due to ES and DS**, **NOT those of the entire data centers**. The reasons for this are:
- Savings on infrastructure in the IA assume an Ecodesign requirement on operating conditions, but the final regulation has 'only' information requirements.
- It is not usual in EIA to consider the indirect effects of energy efficiency improvements on space heating and cooling: for other products such as lighting and electronic displays these effects are also not taken into account.
- Avoid double-counting issues: most cooling and air conditioning equipment is already taken into account in ENER Lot 21/ GROW Lot 6 (airco and HT chillers), UPS are already in ENER Lot 27 (but no ecodesign measures) and distribution transformers are already in GROW Lot 2 (regulation in place). Possibly there would also be an overlap with specific cooling solutions (e.g. water-cooled CPUs) in GROW Lot 1 on professional refrigeration.

Base Cases (BCs):
For ES, EIA maintains the 15 base cases distinguished in the Excel files underlying the IA. These BCs differ on construction (tower, rack or blade), on number of sockets/CPUs (1, 2 or 4), on reliability (resilient or not), and on the type of use (traditional or cloud).
For DS, there are 3 BCs: Online 2, Online 3 and Online 4, according to a taxonomy of the Storage Networking Industry Association (SNIA).

The LOAD sheets provide the stock-average annual electric energy **output** in kWh/a per PSU for all ES and DS base cases. The values are calculated as the stock-average output power (in kW) multiplied by 8760 h/a. For ES, the average power is a time-weighted average of idle power and maximum output power, but these details are not reported in EIA. For ES ECO scenario, the average power also includes a reduction for the expected effect of the information requirement on the SERT metrics (increasing power per server; decreasing amount of servers; overall decrease in power consumption). Consequently, for ES, LOADBAU and LOADECO are slightly different from 2019 onwards.

The EFN sheets provide the PSU efficiencies (output / input in %) for products sold in the year. These efficiencies are a weighted average considering the market share distributions over the PSU 80PLUS efficiency classes (non certified, 80 plus, bronze, silver, gold, platinum, titanium), but these details are not reported in EIA. Starting from 2019, the EFNECO take into account the expected effect of the information requirement on PSU efficiency, both for ES and for DS.

The EFS sheets provide the stock-average efficiency, applying the standard EIA calculation, and considering the lifetimes reported on sheet STOCK. As the underlying study uses complex lifetime distributions that cannot be applied in EIA, EIA lifetimes are 'artificial' and set such to approximately match the stock from the underlying study.

The ELEC sheets provide the EU total electricity input to the PSUs, calculated as LOAD * STOCK / EFS.

PC Personal Computers

The ED regulation 617/2013 applies to computers that can be powered directly from the mains alternating current (AC) including via an external or internal power supply, which includes desktop computers, integrated desktop computers (AIO, ‘All-in-One’), notebook computers (including tablet computers, slate computers and mobile thin clients), desktop thin clients, workstations, mobile workstations, and small-scale servers. Since 2019, (Enterprise) Servers and Data Storage Products have their own ED regulation 2019/424, which removes servers (except small-scale servers) from the scope of CR 617/2013.
The regulation does not apply to blade system and components, servers, game consoles (addressed in ENTR Lot 3) and docking stations. Notebook computers with power less than 6W in idle state and/or viewable diagonal screen size less than 22,86 cm (9 inches) are also exempted from CR 617/2013, but the standby regulation CR 1275/2008 would apply, unless these notebooks use a low-voltage external power supply.
Computers were also covered by EU ENERGY STAR measures, until February 2018, with the same scope as above.

CR 617/2013 sets limits on the annual total energy consumption (ETEC in kWh/year) for (integrated) desktops and notebooks. The formula used to calculate ETEC includes only power usage in off-mode, sleep-mode and idle-mode. There are ETEC allowances for e.g. additional GB of RAM, extra internal storage, discrete TV tuner, discrete audio card, discrete graphics cards.
Electricity consumption in active usage mode is not regulated and therefore not included in the energy consumption reported in EIA.
CR 617/2013 further sets limits on the power in sleep-mode, off-mode and in the lowest-power-state (for desktops and notebooks), and on the efficiency of internal power supplies (for all computer types except notebooks). It also requires a power management function to be enabled (for desktops and notebooks), switching the computer to a state with power consumption lower than sleep mode, after a certain period of inactivity.

The ETEC formulas (in kWh/a/unit) used in the regulation (based on Energy Star v6.1) are:
Desktop and integrated desktop (Categories A, B, C, D): $E_{tec} = 8.76 \times (0.55P_{off} + 0.05P_{sleep} + 0.4P_{idle})$ If no sleep-mode and $P_{idle}<10$ W then $P_{sleep}=P_{idle}$ (P in W).
Notebook PC (including tablet computers, slate computers, mobile thin clients; Categories A, B, C): $E_{tec}=8.76 \times (0.60P_{off}+0.10P_{sleep}+0.30P_{idle})$

The EIA2020 update uses data from the 'ICT Impact study (Draft Final Report, VHK and Viegand Maagøe, June 2020)' and from the 'Preparatory study on the Review of Regulation 617/2013 (Task 1-7 reports, Final version, VITO and Viegand Maagøe, July 2018). These documents use a different formula for ETEC, based on Energy Star v7.1: $E_{TEC} = 8.76\ (T_{off}\ P_{off} + T_{sleep}\ P_{sleep} + T_{long\_idle}\ P_{long\_idle} + T_{short\_idle}\ P_{short\_idle})$ in kWh/a, with T time per hour in the mode and P power in W for the mode, for 8760 hours/year.

time per mode per hour	T off	T sleep	T long_idle	T short_idle
Desktop Base network capability:	0.4	0.15	0.12	0.33
Notebook Base network capability:	0.25	0.39	0.08	0.28
Workstations:	0.35	0.1	0.15	0.4

Resulting average ETEC values in kWh/a/unit for the period 2005-2030 have been copied from the ICT 2020 study. After 2030, the EIA team assumed that, without further measures, 33% of sales in 2050 would have the BAT kWh values reported in the ICT study by 2050, and the remaining 67% the 2030 kWh values. Before 2005, the EIA team estimated kWh values based on the existing EIA2019 data.

The ETEC value covers only non-active computer usage (off, sleep, idle). This implies that energy values reported in EIA do not include active usage. The 2018 review study estimated that including also active usage, the 2020 energy consumption would increase by 80% for desktops, 30% for integrated desktops and 175% for notebooks. This estimate was based on the assumption that 20% of the on-time is spent in active mode, and using tests to relate the active power to the short_idle power.

As noted in the ICT 2020 study: The personal IT category is probably the category with the largest uncertainty as regards energy consumption. On one hand there are anecdotal reports of energy increasing trends, such as extreme gaming, bitcoin mining through blockchains and individual binge-watching of series and movies on notebooks and tablets. On the other hand, mid-market notebooks and PCs can be found with energy consumption that is only a fraction of Energy Star limits. And there is the continuing trend of consumers looking for smaller, lighter and mobile devices (PC→notebook→tablet→smartphone) lowering personal IT energy use.

For PCs (Lot 3) the minimum requirements of CR 617/2013 were based on the 2007 preparatory study, and for this fast-moving sector were not effective when introduced in 2013. Consequently ECO scenario data in EIA have been taken identical to BAU scenario data, and no savings are reported. EIA does not yet take into account the new ecodesign measures proposed in the 2017 review study on CR 617/2013, because these have not been formally adopted yet (December 2020).

Imaging Equipment IE)

Imaging Equipment (IE) is regulated in Ecodesign context by a Voluntary Agreement (VA, see www.eurovaprint.eu). The VA requires that a certain % of IE-models of VA-signatories meets (US) Energy Star (ES) requirements for IE. The current version 5.2 of the VA (active since 2015) refers to ES v2.0; the initial version 4.0 of the VA (active 2011-2015) referred to ES v1.0. A revision of the VA referring to ES v3.0 is ongoing (Autumn 2019).
According to the 2019 Independent Inspector report over year 2018, the 11 VA signatories covered 97% of the EU Sales of IE in scope of the VA, while 98.74% of TEC models and 99.96% of OM models were compliant with the VA primary design requirements (and 100% compliant with resource and information requirements).

The VA covers Copiers, Printers, Fax-machines and Multi-functional devices (MFDs) that use Electrophotography (EP), Inkjet (IJ, including high performance IJ) or Solid Ink (SI) marking technology. The VA is limited to household and office equipment: Standard black & white (BW) format products with maximum speed < 66 A4 images per minute (ipm) and Standard Colour format products with maximum speed <51 A4 ipm, thus excluding products for professional use. It also addresses OEM-cartridges.

The VA Primary requirements regard energy consumption, default delay times for OM products, and duplex availability (front/rear printing) for TEC products. In addition there are Resource efficiency requirements (e.g. on N-printing: printing N images per face of paper) and Information requirements. EIA data focus on energy consumption but also consider impacts on paper and toner use.

TEC products are Standard-size (not large, not small) Copiers, Printers, MFDs, etc. using high-temperature marking technologies such as EP (Laser), SI, and High Performance IJ. TEC stands for Typical Electricity Consumption, referring to the corresponding test method in ES V2.0. The TEC method measures energy consumption (kWh) in normal operation over a specified period of time. This includes the active mode (e.g. printing, copying, scanning) as well as recovery-, ready-, sleep-, off-modes. The method involves combining energy measurements for the various modes in a complex formula to obtain a single weekly TEC value. Energy consumption in active mode depends e.g. on the number of images printed, which in the test method relates to the maximum printing speed (ipm). The allowable limit TEC value in ES v2.0 also depends on the device speed, and on monochrome or colour, and multi- or single-functionality. The TEC method is not intended for low-temperature technologies such as conventional Ink Jet (IJ) or Impact, nor for Large-format or Small-format products.

OM products cover the non-TEC products, i.e. devices that use (non-high performance) Ink Jet, Dot Matrix or Impact technologies, as well as scanners and all large-format and small-format devices. OM stands for Operational Mode, referring to the test method in ES v2.0 that is used to determine power values for Ready, Sleep, and Off modes. This test does not include the active mode (e.g. printing, copying, scanning), but only off-, auto-off-, ready-, sleep-modes, etc. It measures powers, not energy. There are power limits for the sleep mode (depending on device type and size, interface configuration, special features) and for the standby mode (minimum of all non-active modes).

As the OM method measures powers, not energy, an assumption on the times spent in the various modes is necessary to compute an energy consumption. These times have been derived in the 2008 Lot 4 preparatory study, and the same times are used in the annual VA Inspector reports (in hours per day per mode):

type / mode	active h/d	ready h/d	sleep h/d	off h/d	total h/d
home IJ printer	0.07	0.5	3.43	16	20
workgroup IJ printer	0.25	1.25	10.5	8	20

A Digital Front End (DFE) is a functionally-integrated server that hosts other computers and applications and acts as an interface to the IE. Functions performed include: Network connectivity, Mailbox functionality; Job queue management; Machine management (e.g. waking IE from reduced power state); Advanced graphic user-interface; communication with other host servers and client computers (e.g. scanning to email, polling remote mailboxes for jobs); Ability to post-process pages (e.g. reformatting pages prior to printing). The ES v2.0 procedure foresees separate energy or power measurement for these DFEs, which must meet separate limits, but if they are of Type 2 (DFE that draws its dc power from the same power supply as the IE) their energy or power is subtracted from the overall IE energy or power, before comparing with the allowable TEC or OM limits for the IE. Considering the example calculations provided in ES v2.0, this DFE energy or power can be a large part of the overall IE energy or power, which is probably not being considered in the unit annual energy values for IE presented in the scenario analyses and the VA reports.

The data in EIA 2019 for years up to 2010 are mainly based on the IA 2013 (SWD(2013) 15 final) and thus similar to those in EIA 2018. For later years, EIA data have been updated to reflect new information from the October 2019 Review study (Revision of Voluntary Agreement on Imaging Equipment Task 1-7 Final Report, Viegand Maagøe A/S) and from the 2019 Independent Inspector report for the VA.
The EIA ECO scenario provides the impacts of past and existing measures (VA 4.0/ES 1.0, VA 5.2/ES 2.0). New measures proposed in the Review study and drafts for the new VA referring to ES v3.0 have not been considered yet, because they were not finalized by December 2019.

IE are also regulated by the standby regulation (CR 1275/2008 as amended). The 2019 draft IA on Standby calculated standby electricity consumption of IEs separately from the TEC/OM for the VA, but values are not always compatible. In EIA it has been assumed that 75% of the VA-TEC values is covered by CR 1275/2008, and 90% of the VA-OM values. These shares are rough estimates.

Images printed / processed per year

The function of IE is to print/process images. The number of images printed/processed per year (ipy) is the user-demand for IE output, or the LOAD (per unit) or EULOAD (for entire stock) in EIA terminology, and should play a central role. Calculations of paper and ink/toner consumption, should start from these ipy. For TEC-products, the annual unit electricity consumption also (partly) depends on the ipy.
In EIA 2018 the ipy are indeed used in this way (and this is continued in EIA 2019). In the Review study, data on ipy are reported, and maybe used in LCC calculations and EcoReports, but they are not used in the scenario analyses.

Data on the number of images printed/processed per year (ipy) per device differ considerably per source (table below). The high ipy used in IA 2013 derive from the (US) Energy Star test procedures, and their link with the EU reality is not clear. The 2008 preparatory study (figures 14 and 15) reported ipy derived from InfoTrend data, which are much lower than the IA 2013 data. EIA 2018 believed the prep. study data to be closer to reality than the ipy presented in the 2013 IA and consequently used the lower ipy for estimates of paper and toner consumption. To reflect the lower ipy, EIA 2018 also reduced the unit annual energy for TEC products of IA 2013 by 15% (factor 0.85; the difference in ipy is much larger, but only around 20-25% of the TEC depends on ipy). For IJ (OM) equipment there was no difference in energy consumption.
The 2019 Review study report in table 33 provides images printed over the lifetime. Dividing these by the assumed average lifetimes, the ipy result as shown in the table (4th column). These ipy are stated to derive from considerations on the sales of ink/toner - cartridges/containers, and the declared page yield of these consumables. Compared to the other sources, the Review ipy are intermediate for Inkjets and laser MFD/Copiers, and low for Laser printers. The derivation of these ipy in the Review study is non-transparent and not convincing (sales and masses of ink/toner are not compatible with the reported ipy).
By lack of new reliable information, EIA 2019 chose to continue to use the same (low) ipy as in EIA 2018, deriving from the 2008 prep. study. Note that this mainly influences calculations on paper and ink/toner; the impact on energy calculations is small.

	Pages printed in lifetime (Review)	Lifetime in years (Review)	Pages per year (ipy) (Review)	Ipy in IA 2013	ipy in EIA2018 and PS2008	
BC 1 Mono Laser MFD	350000	6	58333	133120	28000	EIA 2019 uses the same, low, ipy as in EIA 2018
BC 2 Colour Laser MFD	576000	6	96000	133120	28000	
BC 3 Mono Laser printer	53000	5	10600	87880	28000	
BC 4 Colour Laser Printer	120000	6	20000	87880	28000	
BC 5 Colour Inkjet MFD	6500	5	1300	3900	1000	
BC 6 Colour Inkjet Printer	10500	5	2100	1040	1000	

Another issue is for which year the above ipy would be valid and if they remain constant. EIA 2018, following IA 2013, used the same ipy values for all years 1990-2050, but noted that the resulting continuing increase in paper use contradicted the decrease in sales of graphic paper. The Review study also observes a strong decrease in number of prints and reports strongly decreasing sales of graphic paper, from 40.5 Mt/a in 2007 to 26.5 Mt/a in 2017. This cannot be explained from a reduction in the IE sales and stock alone. For EIA 2019 the ipy has therefore been reduced starting from 2008, in such a way to maintain approximately the 13% paper weight share of the IE stock also in 2017. The ipy decrease is 7%/a in 2008, reducing to 6% in 2020, 1% in 2030 and 0% in 2050.

SB (networked) Standby, ENER lots 6 and 26

Energy consumption of electrical and electronic household and office equipment in standby-mode (SB) and in off-mode is regulated by CR 1275/2008, which is a so called horizontal regulation, applying to a large number of products, listed in its Annex I. The regulation has been amended by CR 801/2013, which inter alia adds networked standby mode (NSB), and by various product-specific (vertical) Ecodesign regulations, which provide product-specific low-power mode requirements themselves and therefore remove the product from the scope of CR 1275/2008. In this way, Televisions were removed from the scope of CR 1275/2008 in 2010, Computers (desktop PCs, notebooks) in 2013, and washing machines and dishwashers will be removed from 2021. E.g. lighting products have never been in the scope. The scope of CR 1275/2008 is further limited to products that are dependent on energy input from the mains power source in order to work as intended. The connection to the mains power can also be through an external power supply (EPS), but products using a low-voltage EPS are excluded (output voltage < 6V and output current >= 550 mA; this exempts e.g. many smart phones, classic cell phones, tablets).

CR 1275/2008 was reviewed in 2017, and an impact assessment (IA) report followed in 2019. For the current measures (excluding new proposed measures) the IA provides data that differ from those visible in EIA 2018 and the EC policy officer asked to study the difference and update EIA as necessary.

The EIA 2019 update reflects the data from the IA and also makes low-power mode data that were hidden in aggregate EIA values more explicit.

In addition, on request of the policy officer (and following comments of the European Court of Auditors) for products regulated only for standby-mode, and not for on-mode, data on the on-mode have been removed from EIA. This applies to e.g. coffee makers, home/office phones, home gateways and home NAS.

EIA now splits standby data in two groups:
- products for which only low-power modes are regulated, by CR 1275/2008, are reported and accounted directly under the SB heading (Ecodesign lots 6 / 26).
- products for which both on-mode and low-power modes are regulated, by a product specific regulation, are reported and accounted primarily under the specific product heading, distinguishing on-mode data and low-power mode data. A copy of the low-power mode data is reported also under the SB heading, but for information only, and signalled as being fully double counted.
Under the SB heading, two totals are presented, one including double counted low-power mode data, and one excluding the double counted data.

The LOAD sheets report the hours per day (h/d) spent in low-power mode. The source for these data is the IA, where h/d are constant over the years and the same for BAU and ECO. Where the IA considered more than one low-power mode (e.g. standby and off), the sum of hours is reported in EIA.

The EFN sheets report the corresponding low-power mode power. Also here, source for the data is the IA, where the BAU is a freeze scenario (same power for all years), while the ECO values typically decrease, in the period 2010-2019, to the limit power values set in CR 1275/2008 (as amended). Where the IA considered more than one low-power mode (e.g. standby and off), the hours-weighted average power is reported in EIA.

For products that were already present in EIA with low-power mode data, the IA data for h/d and power were sometimes adapted, especially in earlier years, to make the two data sets compatible. These changes were agreed with the EC policy officer.

In earlier years (before 2005), the share of products without standby functionality, and/or with zero power in off-mode, would be expected to be higher. These years are not covered by the IA, but EIA has to take them into account, and the expected changes in shares were implemented in EIA (for some products) as a decrease (from 2005 back to 1990) in average low-power mode power.
In later years (from 2020 onwards), the share of products with networked standby functionality would be expected to increase (smart appliances, IoT). This should then be expressed either in the average nsb-hours or in the average nsb-power, but EIA followed the IA, which did not consider such an increase.

EPS External Power Supplies

External Power Supplies (EPS) are covered by Commission Regulation (EC) No 278/2009 (OJ L 93/3, 7.4.2009). From April 2011, this CR sets minimum ecodesign requirements for power consumption in no-load condition and for the active efficiency of EPSs. Requirements depend on the type of EPS (AC-AC, AC-DC, low-voltage) and on the declared output power. The CR does not apply to: voltage converters; uninterruptible power supplies; battery chargers; halogen lighting converters; EPS for medical devices; EPS used as spare parts (under certain conditions).

In CR 278/2009, 'external power supply' means a device which meets all of the following criteria:
(a) it is designed to convert alternating current (AC) power input from the mains power source input into lower voltage direct current (DC) or AC output;
(b) it is able to convert to only one DC or AC output voltage at a time;
(c) it is intended to be used with a separate device that constitutes the primary load;
(d) it is contained in a physical enclosure separate from the device that constitutes the primary load;
(e) it is connected to the device that constitutes the primary load via a removable or hard-wired male/female electrical connection, cable, cord or other wiring;
(f) it has nameplate output power not exceeding 250 Watts;
(g) it is intended for use with electrical and electronic household and office equipment as referred to in Article 2(1) of Regulation (EC) No 1275/2008;

The new proposed regulation (based on 2018 Impact Assessment and October 2018 Commission Working Documents) essentially has the same scope, except that active power over ethernet injectors is excluded, while multi-voltage EPSs (able to convert to more than one DC or AC output at a time) are now included.
Starting from April 2020, in a single tier, the new regulation sets lower limits for the no-load power and higher limits for the minimum average active efficiency. These limits align the EU requirements with the latest USA requirements. The active efficiency remains based on the arithmetic average of the efficiencies at 25, 50, 75 and 100% of rated output current, but the proposed regulation adds an information requirement for the active efficiency at 10% of rated output current.

Harmonised standard EN 50563:2011/A1:2013 describes the determination of no-load power and average active efficiency of AC-DC and AC-AC EPSs within the scope of CR 278/2009. Additions to this standard would be necessary for the new regulation, to address multi-voltage EPSs and to address the information requirement at 10% of load. An update is also recommended for testing of 'agile' chargers (i.e. the ones that are able to scale their output voltage depending on the needs of the primary load product).

The 2018 IA study distinguishes 10 EPS base cases (BCs) that are listed below. Load parameters and efficiency parameters differ per BC.
Load parameters represent the user-demand for output of the EPSs: the average annual active power and active hours, and the no-load hours, as listed below.
These load parameters are assumed to remain constant over the years and are the same for all scenarios (BAU and ECO).
Efficiency parameters are the average active efficiency and the average no-load power. These vary with the years, are different for BAU and ECO, and reported on the EFN (average of sales) and EFS (average of stock) sheets.
The ECO scenario in EIA is the (preferred) PO2 policy option of IA 2018. The BAU scenario in EIA represents the situation without any regulation, which is different from the BAU in IA 2018 which includes the effects of current regulations.

Load parameters per EPS base case (for all years, all scenarios)	Name plate power (W)	Active power (output) (W)	Active hours (hours /day)	No-load (hours /day)	Unplugged (hours /day)	Lifetime (years)
a. EPS ≤ 6W, low-V (e.g. mobile phone; grooming products)	3.50	1.10	5.20	9.80	9.00	3.0
b. EPS 6–10 W (e.g. tablets, smart phones etc.)	10.00	2.00	5.20	9.80	9.00	3.0
c. EPS 10–12 W (e.g. small network equipment, set-top boxes)	12.00	7.70	21.40	2.60	0.00	4.0
d. EPS 15–20 W (e.g. portable devices, portable game consoles)	18.00	3.10	7.00	10.00	7.00	3.0
e. EPS 20–30 W (e.g. notebook computer)	30.00	7.60	20.72	0.00	3.28	5.0
f. EPS 30–65 W, multiple-V (e.g. multi-device univ. chargers)	36.00	9.70	20.72	0.00	3.28	5.0
g. EPS 30-65 W (e.g. high-end notebooks computers)	65.00	7.80	20.72	0.00	3.28	5.0
h. EPS 65–120 W (e.g. high-end notebook computers)	120.00	7.60	20.72	0.00	3.28	5.0
i. EPS 65–120 W, multiple-V (e.g. stationary game consoles)	120.00	9.70	24.00	0.00	0.00	5.0
j. EPS 12–15 W (e.g. loudspeakers, sound systems)	9.50	2.30	24.00	0.00	0.00	5.0

‘no-load condition’ means the condition in which the input of an EPS is connected to the mains power source, but the output is not connected to any primary load. This means that all power input to the EPS in 'no-load' is actually 'consumed' by the EPS itself.
No-load energy = No-load power * No-load hours

During 'active-use', the EPS passes on a large part of its input power to the primary load. Only the difference between input and output (the EPS losses) are actually being consumed by the EPS itself.
Therefore, for the 'active' part, the energy consumption for EPSs reported in EIA refers only to the losses (input minus output). This is the same approach as used in EIA for UPS, but differs from the approach in IA 2018, where the entire input energy is considered as EPS energy consumption.
Active energy = Input - Output = active power * active hours / active efficiency - active power * active hours

The assumed lifetimes are reported in the table above. For the computations of Stock and Stock-efficiency, EIA uses slightly higher lifetimes (see sheet Stock), to closely match the stock values used in IA 2018 (where a more complex lifetime distribution was used for stock computations)

Many of the primary loads for which the EPS are being used, are also themselves accounted in EIA because they are subject to other ecodesign regulations. This includes e.g. notebook computers, tablets, game consoles, set-top boxes, gateways and NAS. For these products, the EPS losses (active and/or no-load) may already have been taken into account in the energy consumption of the primary product. Hence, there is a possible double counting issue. Following the general EIA philosophy, EPS losses are first reported entirely on BC- and product-level (for transparency) and then double counting factors (db) are considered when computing functional group totals (when combining EPS data with those for other products). The db-factors can be found on e.g. sheet ELEC in the first column. At the moment these factors are rough preliminary estimates. The main products not involved in this double counting are mobile phones, smart phones, rechargeable grooming products such as razors, lady-shaves, electric toothbrushes, etc., and loudspeakers / sound systems. Double counting mainly regards the active mode of EPS, not the no-load mode.

UPS Uninterrupted Power Supplies

Data for this product group have been removed from EIA in the 2019 issue. Data were inserted in the past based on preparatory study data, expecting an Ecodesign regulation to follow, but no Ecodesign or Energy Labelling measures have been taken. Also following comments from the European Court of Auditors, it was agreed with the EIA policy officer to remove UPS from EIA. Data can still be found in previous EIA versions, if needed.

RF Household Refrigerators

Energy labels for Household Refrigerators were first introduced in 1994 by COMMISSION DIRECTIVE 94/2/EC of 21 January 1994 implementing Council Directive 92/75/EEC with regard to energy labelling of household electric refrigerators , freezers and their combinations, OJ L45/1, 17.2.94.
The first limits on allowable electricity consumption in kWh/24h were set in 1996 by DIRECTIVE 96/57/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 3 September 1996 on energy efficiency requirements for household electric refrigerators , freezers, and combinations thereof, OJ L236/36, 18.9.96.

The 1994/1996 Directives were replaced in 2009/2010 by COMMISSION REGULATION (EC) No 643/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for household refrigerating appliances, OJ L 191/53, 23.7.2009, and COMMISSION DELEGATED REGULATION (EU) No 1060/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of household refrigerating appliances, OJ L 314/17, 30.11.2010

In December 2019, revised regulations were published: CR (EU) 2019/2019 for Ecodesign and CDR (EU) 2019/2016 for Energy Labelling. These regulations repeal the 2009/2010 regulations and apply to electric mains-operated RF with volume > 10 litres and≤ 1500 litres. Not applicable to: (a) products covered by CR (EU) 2015/1095 (professional refrigeration, PF), (b) refrigerating appliances with a direct sales function (now covered by separate regulations CR 2019/2024 and CDR 2019/2018); (c) mobile refrigerating appliances. More ambitious ecodesign requirements are set, and more extensive requirements are set for wine storage appliances, RF with transparent doors, low-noise RF.
The definition of the Standard Annual Energy consumption (SAEc) is changed w.r.t. CR 643/2009, changing also the values for the Energy Efficiency Index (EEI). The scale for the energy efficiency / label classes is revised.

Explanations of the main test- and calculation methods are given below. The explanation is incomplete and aims only to give the reader an idea of the main principles involved. For a full overview it is indispensable to consult the original documents.

The description below also provides some specific guidance as to how and where the values used in the model are different from what is mentioned in the regulations. Note in particular that in EIA, the SAEc and the EEI are as defined in CR 643/2009, and not as defined in the 2018 proposal.

RF Net volume Vnet (CECED 2013)	ltr	average from CECED database
RF Estimated equivalent volume Veq	ltr	Veq=∑Vc x (25-Tc)/20 x FFc] x CC x BI ≈ (Vfreeze_net*2.15+Vfridge_net) x 1.1 , with
		Vfreeze_net (-18 °C)=22% x Vnet, rest is Vfridge_net (Tc=+5 °C). So Veq= 1.353 * Vnet
		Note that 1.1 is the estimated average effect of correction factors FF (Frost Free=1.2), CC (Climate Correction for Tropical=1.2 and SubTropical=1.1) and Built-In (<58 cm width--> 1.2) for average product sold
RF SAEc (EEI=100)	kWh/a	EEI=AEc/ SAEc , with AEc = E24h x 365, where E24h is 24h energy consumption tested according to EN 62552: 2013.
		SAEc=Veq x M + N + CH, with M=0.63, N=290, CH=5-25 (according to CR 643/2009).
		CH=presence of chiller compartment (max=100%=50 kWh), runs from 5 to 25 kWh over period 1990-2030. Calculation of M and N based on 2005 CECED database.
		Note that --although test ambient temperature of 25 °C (to compensate for missing door openings) is high-- it is assumed that the Standard (test) and Real-life (used here) consumption data are identical.

The ECO scenario in EIA is the preferred policy option of IA 2018 (i.e. the LLCC scenario), which closely corresponds to the new 2019 regulations.
The BAU scenario in EIA represents the situation without any regulation (not even the 1994/1996 Directives), which is different from the BAU in IA 2018 which includes the effects of current regulations.

CF Commercial Refrigeration (Refrigerating appliances with a direct sales function)

Data on 'refrigerating appliances with a direct sales function' (formerly referred to as 'commercial refrigeration', CF) have been updated in EIA 2019 to reflect the final voted CR 2019/2024 (ecodesign) and CDR 2019/2018 (energy labelling).
The ecodesign requirements apply to electric mains-operated refrigerating appliances with a direct sales function, including appliances sold for refrigeration of items other than foodstuffs. This includes e.g. horizontal or vertical refrigerators and freezers with a display function in supermarkets, beverage coolers, ice-cream freezers, gelato-scooping cabinets, refrigerated vending machines.
Excluded from the scope are: only powered by energy sources other than electricity; remote components, such as the condensing unit, compressors or water condensed unit; food processing; storage of medicines or scientific samples; functioning by ducting chilled air that is produced by an external air chiller unit; professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers as defined in Regulation (EU) 2015/1095; wine storage appliances and minibars (covered by the revised CR 2019/2019 on 'household' refrigerators).
The following appliances have only information and resource-efficiency requirements (i.e. no energy efficiency requirements and no label): not using a vapour compression refrigeration cycle; sale and display of live foodstuffs, such as living fish and shellfish, refrigerated aquaria and water tanks; saladettes; horizontal serve-over counters with integrated storage designed to work at chilled operating temperatures; corner cabinets; vending machines designed to work at frozen operating temperatures; serve-over fish counters with flaked ice.

Energy efficiency requirements and label classes are defined in terms of an Energy Efficiency Index: EEI = (AE/SAE) (expressed in %). AE=365 x Edaily (Annual Energy consumption in kWh/year). Edaily in kWh/24h is the daily energy consumption measured in specific test conditions (e.g. EN ISO 23953 and as specified in the regulation). The AE includes remote energy where applicable. SAE= 365 x P x (M + N × Y) × C, Standard Annual Energy consumption in kWh/year (summed over compartments with different temperature classes where applicable) . The regulation specifies values for M, N, P (1.1 only for integral supermarket models, otherwise 1) and C (depends on temperature class). Y is the equivalent volume in litres for beverage coolers, small ice-cream freezers and vending machines; for all other refrigerated cabinets Y is the total display area (TDA) in m^2.
EIA uses the EEI on all efficiency sheets. The LOAD sheet is used to present the SAE values, computed as shown below (although SAE is not really an output load), and assumed constant over the years. The EU-LOAD shows the total EU-28 refrigerated or frozen Volume or Display Area, depending on the base case. Electricity consumption per unit is computed as SAE*EEI* real-life factor. The latter factor reflects the difference between the electricity consumption in test conditions (higher) and the real-life consumption (lower). The factor is specified in the Impact Assessment report.

Underlying studies only considered 5 base cases: Beverage Coolers (BC), Ice-Cream freezers (ICF), Vending Machines (VM), and the supermarket remote base cases RVC2 (chilled vertical) and RHF4 (frozen horizontal). However the proposed regulation applies to many other supermarket models as well. The Impact Assessment report presents tables for 'base cases only' and tables 'including non-base cases', showing a significant impact for the non-base cases. Consequently, it was agreed to include the non-base cases in the accounting, but this required estimating some of the missing basic input data: the TDA of 2.5 m2 and the SAE=8500 kWh/year. The non-base cases are a mix of integrated and remote models, a mix of chillers and freezers, vertical and horizontal, without precise values for M, N, P and C.

The Impact Assessment (IA) assumed introduction of tier 1 requirements in 2017 and tier 2 in 2020. In the final regulation these dates were changed to 2021 and 2023 respectively. In addition, compared to the IA, the final regulation changed the EEI limit value for tier 1, added specific EEI limits for ice-cream freezers, and changed some of the values for M, N, P and C. EIA data reflect the final regulation and consequently can differ from IA data.

	M	N	P	C	TDA (m2) or eq. volume (dm3)	**SAE kWh/year**	**real-life vs. test factor**	temperature range
remote, supermarket, open vertical chilled multideck (RVC2)	9.1	9.1	1	1	4.37	**17836**	**0.70**	m^2 @ -1 /+7°C
remote, supermarket, open horizontal frozen island (RHF4)	4.0	10.3	1	1	2.93	**12475**	**0.85**	m^2 @ -18 /-15°C
other supermarket (non-base cases)	-	-	-	-	2.54	**8500**	**0.80**	m^2 @ -18 /+7 °C
Plug in one door beverage cooler	2.1	0.006	1	1	538	**1944**	**0.80**	litres @ 1 /10°C
Plug in horizontal ice cream freezer	2.0	0.009	1	1	291	**1686**	**0.89**	litres @ -18 /-15°C
refrigerated Vending Machine	4.1	0.004	1	1.36	750	**3524**	**1.00**	litres @ 1 /7°C

PF Professional Refrigeraton

CR 2015/1095 (ecodesign) applies to professional refrigerated storage cabinets, blast cabinets, low- and medium temperature process chillers and low- and medium temperature condensing units. CR 2015/1094 (energy labelling) applies only to professional refrigerated storage cabinets. **Walk-in cold rooms** are not covered by the regulations and consequenly have been removed from EIA. For **blast cabinets** the regulation only specifies information requirements that are assumed not to lead to quantifiable changes in energy efficiency and consequently blast cabinets have also been removed from EIA. Storage cabinets, process chillers and condensing units each have specific load- and efficiency definitions and are therefore described separately below.

PF (1): professional refrigerated storage cabinets

CR 2015/1095 expresses efficiency requirements in terms of Energy Efficiency Index, EEI = (AEC/SAEC) × 100. AEC=E24h × af x 365, Annual Energy Consumption of the cabinet in kWh/year (correction factor 'af' for light-duty cabinets. E24h in kWh/24h (Test standard to be developed with ECFEM). SAEC= (N + M × Vn) × 365, Standard Annual Energy Consumption of the cabinet in kWh/year. The proposed regulation specifies M and N for four cabinet types, see table below. EIA uses the EEI on all efficiency sheets. The LOAD sheet is used to present the SAEC values, computed as shown below (although SAEC is not really an output load). The EU-LOAD shows the total EU-28 refrigerated Volume.

	N	M	Net Volume Vn (litres)	SAEC (kWh/year)
Chilled, Vertical storage cabinet	609	1.643	600	1595
Chilled, Horizontal (counter) storage cabinet	1790	2.555	300	2557
Frozen, Vertical storage cabinet	1472	4.928	600	4429
Frozen, Horizontal (counter) storage cabinet	2380	5.84	200	3548

PF (2):low- and medium-temperature process chillers

CR 2015/1095 expresses efficiency requirements in terms of 'seasonal energy performance ratio' (SEPR), which is the efficiency ratio of a process chiller for providing cooling at standard rating conditions, representative of variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption. SEPR values depend on the type of cooling (air-cooled, AC or water-cooled, WC), on the operating temperature (low, LT or medium, MT) and on the cooling capacity (small, S or large, L). For reasons of transparency, EIA also uses SEPR on the efficiency sheets. The LOAD sheet shows the annual unit cooling demand (MWhcool/a), and the EU-LOAD sheet shows corresponding EU-28 total cooling demand (TWhcool/a). The calculation of the unit cooling load is based on data from the preparatory study, that have been aggregated to the base cases used in EIA, see table below.

	average cooling capacity (kWcool)	Annual energy consumpt., AEC in MWh/a	SEPR 2011 market average	Annual cooling demand = SEPR*AEC (MWh/a)
Process Chiller AC MT S ≤ 300 kW	167	275	2.70	743
Process Chiller AC MT L > 300 kW	589	896	3.00	2688
Process Chiller AC LT S ≤ 200 kW	164	377	1.59	599
Process Chiller AC LT L > 200 kW	588	1254	1.70	2132
Process Chiller WC MT S ≤ 300 kW	180	257	3.60	925
Process Chiller WC MT L > 300 kW	622	818	3.90	3190
Process Chiller WC LT S ≤ 200 kW	189	376	2.00	752
Process Chiller WC LT L > 200 kW	629	1156	2.25	2601

PF (3):low- and medium-temperature condensing units

CR 2015/1095 expresses efficiency requirements in terms of COP for lower capacity models and in terms of SEPR for higher capacity models. 'rated coefficient of performance' (COP) means the rated cooling capacity, expressed in kW, divided by the rated power input, expressed in kW. 'seasonal energy performance ratio' (SEPR) is the efficiency ratio of a condensing unit for providing cooling at standard rating conditions, representative of variations in load and ambient temperature throughout the year, and calculated as the ratio between annual cooling demand and annual electricity consumption. For reasons of transparency, EIA also uses COP or SEPR on the efficiency sheets. The LOAD sheet shows the annual unit cooling demand (MWhcool/a), and the EU-LOAD sheet shows the corresponding EU-28 total cooling demand (TWhcool/a). The calculation of the unit cooling load is based on data from the preparatory study and from Excel files underlying the impact assessment, see table below.

	efficiency parameter	COP/SEPR Market average in 2011	Average cooling capacity of the range (kW)	Assumed operating hours per year (h/a)	Annual cooling demand in MWhcool/a (per unit)	Base case AEC in MWh/a per unit, before Tier 1
Condensing Unit MT S 0.2-1 kW	COP	1.42	0.56	5840	3.27	2.30
Condensing Unit MT M 1-5 kW	COP	1.64	2.73	5840	16.0	9.73
Condensing Unit MT L 5-20 kW	SEPR	2.64	10.8	5840	63.2	23.9
Condensing Unit MT XL 20-50 kW	SEPR	2.71	33.1	5840	193.4	71.4
Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.28	5840	1.65	2.06
Condensing Unit LT M 0.4-2 kW	COP	0.95	0.93	5840	5.43	5.72
Condensing Unit LT L 2-8 kW	SEPR	1.46	4.64	5840	27.1	18.6
Condensing Unit LT XL 8-20 kW	SEPR	1.61	31.9	5840	186.3	115.7

COOK Cooking Appliances

COOK El. Hobs — ltr/a

New test standard prEN 60350-2:2012 measures energy per cooking zone to heat water by 75 K (pot size and water volume depending on cooking zone size) and also the energy required to keep the heated water at the final temperature for 20 minutes after heating up. The average energy consumption of the hob, in Wh/kg water heated, is the straight average of all cooking zones of the hob.
Annual energy consumption in the model is based on 1229 ltr/a. Regulation is in GCV.

COOK El. Ovens — TEC

Energy Efficiency Index ovens EEI= EC (test)/SEC (average model 2012), with EC, SEC in kWh elec/cycle for electric and MJ/cycle (primary) for gas, determined per oven cavity. For electric ovens SEC= 0.0042*V+0.55. For gas ovens SEC=0.044*V+3.53. EC is based on EN 60350:2009 (electric oven) or EN 15181:2008 (gas oven). Annual energy consumption based on 110 cycles/a.

COOK Gas Hobs — kWh/a

Energy efficiency (EE) of the burner (in %) is calculated by dividing the theoretical energy needed for heating a pot with an amount of water (in MJ) by the measured energy consumption on the gas burner when heating water by 75 K in a standardised pot (pot size and water volume depending on burner) and standard conditions, expressed in MJ Net Calorific Value (NCV) of the amount of gas used. Current standard EN 30-2-1, new standard similar to the one for electric hobs is being developed (status 2013).

EEburner=EEtheoretical/EEtest.
In the modelling, in order to be compatible with electric hobs, it is assumed that the load=the minimum theoretical annual energy consumption to heat 1229 ltr/a by 75 K and keep it warm during 20 minutes is 181 kWh/a =651.6 MJ/a (based on 438 cooking periods/a).
Regulation is in GCV. Conversion factor GCV to NCV is 1.1

COOK Gas Ovens	TEC	Energy Efficiency Index ovens EEI= EC (test)/SEC (average model 2012), with EC, SEC in kWh elec/cycle for electric and MJ/cycle (primary) for gas, determined per oven cavity. For electric ovens SEC= 0.0042*V+0.55. For gas ovens SEC=0.044*V+3.53. EC is based on EN 60350:2009 (electric oven) or EN 15181:2008 (gas oven). Annual energy consumption based on 110 cycles/a. Conversion factor GCV to NCV is 1.1 .
COOK Range Hoods	TEC	The annual energy consumption AEC (in kWh) is calculated on the basis of 1 h extraction operation daily at best efficiency point bep , and 2 h lighting operation daily, during 365 days per year. The electric power consumption (in W) of the extraction fan Pbep and the lighting system PL are measured according to test standard EN 61591:1997. The power consumption of the extraction fan is corrected with a so-called 'time increase factor' f, which relates to the fluid dynamic efficiency FDE of the fan . Where appropriate, i.e. in the case of a fully automatic hood, the power consumption in off-mode Po and standby mode Psb is taken into account. The standard energy annual energy consumption SAEC (in kWh) is derived from the average of the 2011 CECED database through a regression analysis. EEI= AEC/ SAEC, with SAEC=0.55*(WBEP+WL)+15.3 (in kWh/a, with Wbep and WL is electric power input in W for fans and light respectively).
COOK Standby	h/d W	Low-power modes of Electric ovens and Electric hobs are covered by the standby regulation CR 1275/2008, as amended. The 2019 draft IA on Standby estimated the electricity consumption in standby mode. These standby data have been added in EIA 2019. Hours per day (sheets LOAD) and standby power (sheets EFN) have been taken from the IA, but EIA uses the same stock as for on-mode calculations. The standby electricity is additional to the on-mode electricity that was already present in EIA. It is accounted primarily under Cooking Appliances, but a copy of the data is provided under standby heading for information, signalled there as being double counted. CR 66/2014 already covers low-power modes for range hoods, included in the presented EIA totals, so no separate data are provided in EIA for standby of range hoods.

CM Coffee Makers

On-mode data for this product group have been removed in EIA 2019 because they are not regulated by ecodesign or energy labelling.
Standby data (excl. keep-warm) are covered by CR 1275/2008, as amended, and included under the standby heading, using data from the 2019 draft IA on Standby.

WM Household Washing Machines and WD Washer-Dryers

Household washing machines (WM) and washer-dryers (WD) have had an energy labelling since 1995/1996 (CD 95/12/EC; CD 96/60/EC).
Subsequently, WM were regulated by CR 1015/2010 (Ecodesign) and CDR 1061/2010 (Labelling), which repealed CD 95/12/EC for WM, but CD 96/60/EC for labelling of WD remained active.
In 2019, new regulations CR 2019/2023 and CDR 2019/2014 were adopted, with requirements applicable from 2021 to WM and WD. These regulations repeal the 2010-regulations and CD 96/60/EC.

The EIA BAU scenario for WM and WD represents the projection of what would have happened if no measures would have been taken, starting from 1996.
The updated (2019) EIA ECO scenario aims to take into account the impacts of all combined measures, including the 2019 regulations.

The 2019 regulations apply to placing on the market or putting into service of electric mains-operated household WM and WD (excluding those covered by the machinery directive 2006/42/EC), including built-in, and including if also operable from batteries. There is no limit on WM/WD capacity, but products below 2 kg have less requirements.
The 2019 regulations require WM/WD to have a washing cycle called 'eco 40-60', able to clean normally soiled cotton declared washable at 40°C or 60°C, together in the same cycle, and a washing cycle called '20 °C', which is able to clean lightly soiled cotton laundry, at a nominal temperature of 20°C. Efficiency-, functional-, duration- and wateruse-requirements apply to the 'eco 40-60' program.

In the 1995/1996 directives, the metric for labelling was the energy consumption 'C' in kWh per kg washed for standard 60 °C cotton cycle.

In the 2010 regulations, an Energy Efficiency Index derived from annual energy consumption (including standby) was used:
SAEc=47c +51.7 (SAEc= Standard Annual Energy Consumption, calculated from c=capacity, in kg)
EEI=AEc/SAEc (EEI=Energy Efficiency Index)
AEc=220*[(3*E60 + 2*E60½ + 2*E40½)/7] + Esb, AEC is Annual Energy Consumption (measured); Esb is standby energy (small, see regulation)
E60, E60½ and E40½ are full resp. half-rated load test cycles at 60 resp. 40°C, according to EN 60456:2011.
Note that there is, for various possibly valid reasons (e.g. repeatability and accuracy of tests), a significant difference between the Standard (as in regulations) and Real-life (used here) conditions.

In the 2019 regulations, the definitions changed again (based on cycle energy, and treating low-power modes separately):

<u>Energy Efficiency Index (EEIw) for 'eco 40-60' washing cycle:</u>	
EEIw = (Ew / SCEw) x 100	c rated capacity in kg for 'eco 40-60'
SCEw = -0,0025 * c2 + 0,0846 * c + 0,3920	SCEw standard cycle energy consumption (computed) in kWh
Ew= A * Ew(full) + B * Ew(1/2) + C * Ew(1/4)	Ew weighted cycle energy consumption (measured) at full, half or quarter of capacity
A= -0,0391 * c + 0,6918; B= -0,0109 * c + 0,3582; C= 1-(A+B)	A, B, C weighting coefficients; if c <= 3kg only full load considered: A=1, B=C=0
<u>Energy Efficiency Index (EEIwd) for 'wash and dry' cycle</u>	
EEIwd = (Ewd / SCEwd) * 100	d rated capacity in kg for 'wash and dry'
SCEwd = –0,0502 * d^2 + 1,1742 * d – 0,644	SCEwd is the standard cycle energy consumption (computed) in kWh
Ewd=(3 * Ed(full) + 2 * Ed(1/2)) / 5	Ewd is the weighted cycle energy consumption (measured) at full or half capacity
	If d <= 3 kg, only full-load considered

As regards the 2019 EIA update, the EIA BAU scenario for WM remained unchanged, while the new EIA ECO scenario is a mix of existing EIA data and new data from the 2019 IA. Based on the IA, the EIA curve for average washing temperature has been flattened compared to earlier versions, now decreasing from the current 41°C to 35°C in 2050. The EIA ECO efficiencies for WM have been adjusted accordingly (higher kWh/cycle). Average user loading of WMs and average number of washing cycles per year were maintained from previous EIA versions (as a compromise between the 220 cyc/a used in IA and regulations, and the 180 (2008) to 160 cyc/a (2017) resulting from AISE consumer surveys, see https://www.aise.eu/our-activities/information-to-end-users/consumer-research.aspx). As a result, the total ECO electricity consumption for WM in EIA is close to the value in the IA.

Based on the 2019 IA, washer-dryers were newly inserted in EIA. These data are not completely consistent with WM data, and should be viewed as preliminary. The EIA 1996 BAU scenario for WD (not reported in the IA) was developed in analogy with the BAU scenario for WM.

Standby data for WM (hours per day, standby powers) were taken from the 2019 draft IA on Standby. Standby data for WD have been taken identical to those for WM. Electricity data for WM are primarily computed for all modes together. Standby electricity is subtracted from the overall total to obtain the electricity consumption for active modes. A copy of the standby data is reported for information also under the standby heading, but signalled there as being double counted.

DW Household Dishwashers

Household dishwashers (DW) have had an energy labelling since 1997 (CD 97/17/EC).
Subsequently, DW were regulated by CR 1016/2010 (Ecodesign) and CDR 1059/2010 (Labelling), which repealed CD 97/17/EC.
In 2019, new regulations CR 2019/2022 and CDR 2019/2017 were adopted, with requirements applicable from 2021. These regulations repeal the 2010-regulations.

The EIA BAU scenario for DW represents the projection of what would have happened if no measures would have been taken, starting from 1997.
The EIA ECO scenario aims to take into account the impacts of all combined measures, including the 2019 regulations.

The 2019 regulations apply to placing on the market or putting into service of electric mains-operated household DW (excluding those covered by the machinery directive 2006/42/EC), including built-in, and including if also operable from batteries. There is no limit on DW capacity (expressed in number of place settings (ps)).
The 2019 regulations require DW to have an 'eco programme'. Efficiency- and functional-requirements apply to this program. In addition there are requirements for low-power-mode, resource efficiency, and information requirements.

In the 1997 directive, the metric for labelling was an energy efficiency index (EEI=C/CR), comparing the measured kWh per cycle (C; using standard dishwasher cycle) with a reference consumption CR calculated as:
CR = 1,35 + 0,025 x ps when ps >= 10, or CR = 0,45 + 0,09 x ps when ps =< 9.

In the 2010 regulations, an Energy Efficiency Index derived from annual energy consumption (including standby) was used:
SAEc=7*ps+378 (normal size) or 25.2*ps+126 (compact)
EEI=AEc/SAEc
AEc=280*Ecyc + Esb, Esb is standby energy (small, see regulation), Ecyc is test cycle according to EN 50242:2008,
normal/compact = ca. 15% at 9 ps / 85% at 12.5 ps (in 2005 ca. 12 ps) --> SAEc=22.5*ps +164 kWh/a (value previously displayed on EIA LOAD sheet until EIA 2018)

In the 2019 regulations, the approach changes back to energy per cycle, considering low-power mode energy separately. The EEI is defined as:
EEI = (EPEC/SPEC) × 100
EPEC = eco programme energy consumption of the DW measured in kWh/cycle
SPEC = standard programme energy consumption of the DW, computed in kWh/cycle:
SPEC = 0,025 × ps + 1,350 for DW with rated capacity ps≥ 10 and width > 50 cm
SPEC = 0,090 × ps + 0,450 for DW with rated capacity ps≤ 9 or width ≤ 50 cm, where ps is the number of place settings.
On average, assuming 14% <=9 ps and 86% >= 10 ps (source: IA 2019), approx. SPEC = 0,034 × ps + 1,224 kWh/cyc (new value displayed on EIA sheet LOAD)

AISE consumer surveys (https://www.aise.eu/our-activities/information-to-end-users/consumer-research.aspx) indicate an average of 4.2 DW cycles/week in 2011 and 4.3 cycles/week in 2014 and 2017. This means 218-224 cycles per year. EIA 2018 used 210 cyc/a, which was an estimate, and has been raised to 220 cyc/a in the EIA 2019 update. This is considerably lower than the 280 cyc/a used in the IA for DW and in the 2010 regulations. As a consequence, electricity consumption in EIA is lower than in the IA.

Standby data for DW (hours per day, standby powers) were taken from the 2019 draft IA on Standby. Electricity data for DW are primarily computed for all modes together. Standby electricity is subtracted from the overall total to obtain the electricity consumption for active modes. A copy of the standby data is reported for information also under the standby heading, but signalled there as being double counted.

LD Laundry Driers

The EIA2020 update is based on the 'Review study on household tumble driers, Final report, June 2019, Viegand Maagøe A/S'.
The BAU scenario in EIA reflects the situation without any measures. The ECO scenario considers the impacts of current regulations (CR 932/2012 and CDR 392/2012). Effects of new measures proposed in the review study are not taken into account in EIA yet because not finalized (in December 2020).
The data of the review study have been converted from EU28 (incl. UK) to EU27 (excl. UK) using Brexit factors, see sheet BREXIT.

The EU28 ECO total LD sales after 1995 are from the review study. Before 1995 they are from IA 2012/EIA2019. From 2018 onwards the distribution of ECO sales over the base cases is also according to the review study. Before 2010 the distribution is identical to the one in BAU, which continues to follow IA 2012 and EIA2019. After 2030 sales totals are kept constant.
The EU28 BAU total LD sales are identical to the ECO total sales, but the distribution over the base cases is different. For BAU, EIA2020 continues to follow the projections of IA 2012 / EIA2019, which imply less heat pump LDs and more condensing electric and vented electric. Consequently, sales subdivisions in BAU and ECO are different.

Compared to EIA2019, which was based on the 2012 Impact Assessment, the following data have been more or less confirmed in the review study and thus have been maintained in EIA2020 (see LOAD sheets):
- spin speed of the stock of washing machines (rpm)
- real initial moisture of load to be dried (%)
- standard moisture (%)
- correction factor for initial moisture (-)
- rated capacity (kg/cycle)

According to the review study, the average real user loading of laundry dryers (LDs) is 4.4 kg in 2018 and expected to remain constant. This is the same level as in 2008. Earlier studies assumed a gradual increase of this loading, following the increase in rated capacity. The LOAD-sheets have been adapted for the new data. In 2018, with an average rated capacity of 7.1 kg, the 4.4 kg implies an average 62% user-loading, lower than the 71% assumed previously.

The review study concludes that the average annual number of drying cycles is 107 in year 2018: much lower than the 160 cycles assumed in earlier studies (for year 2008) and used in the regulations. For compatibility with past and present studies, EIA2020 continues to use 160 cycles per year until 2008 and applies 107 cycles per year from 2018 onwards, with linear interpolation in intermediate years. The number of cycles per year seems uncertain. The reduction of the cycles combined with a constant user loading implies that the total amount of washing being dried in an LD decreases with the years, which seems doubtful. The efficiencies (in terms of kWh/a, see EFN sheets), have been adapted for the change in number of cycles. The change in number of cycles is assumed to occur in the same way in the BAU - and ECO-scenarios.

The standard annual energy consumption (in kWh electric) is reported on the LOAD sheets and calculated according to the regulations:

LD SAEc non-vented (EEI=100)	SAEc=140 x capacity^0.8
LD SAEc vented (EEI=100)	SAEc=140 x capacity^0.8 -30*(programme time/60), reported for programme-time 130 minutes (note that for gas-vented LDs this is in kWh/a electric equivalent (gas consumption divided by 2.5)

Efficiencies for the ECO scenario, in terms of kWh energy consumption per year (electric or gas), have been taken from the review study. Before year 2018 the efficiencies have been scaled in function of the number of cycles per year (see remarks above). Until 2012, BAU efficiencies are the same as ECO efficiencies. After 2012, BAU efficiencies essentially remain the same (freeze scenario), but they are scaled according to the changes in annual number of cycles.

Standby data for LD (hours per day, standby powers) were taken from the 2019 draft IA on Standby. Electricity data for LD are primarily computed for all modes together. Standby electricity is subtracted from the overall total to obtain the electricity consumption for active modes. A copy of the standby data is reported for information also under the standby heading, but signalled there as being double counted.

VC Vacuum Cleaners

EIA 2021 for VCs has been updated based on the "Review study on Vacuum cleaners, Final report, June 2019, Viegand Maagoe and VHK" and on the preliminary scenario analysis for the impact assessment (IA) study (ongoing, to be finalized in 2022). The EIA update is limited to the impacts of the current regulation (CR 666/2013). New measures proposed in the review study and the draft IA are not (yet) taken into account in EIA because not finally approved. IA data are preliminary and might still change. Hence, also EIA data could further change in future.

CR 666/2013 (ecodesign for VCs) applies to electric mains-operated vacuum cleaners, including hybrid vacuum cleaners (can be powered by both electric mains and batteries). The regulation does not apply to wet, wet and dry, battery operated, robot, industrial, or central vacuum cleaners, floor polishers and outdoor vacuums. CDR 665/2013 (labelling for VCs) has been annulled, and the impact of this has been modelled in the underlying studies.

Although cordless and robot VCs are not in scope of the current regulation, they are increasingly being used to (partially) substitute mains-operated VCs. Representing only the latter in EIA would give a wrong impression of trends in energy consumption for vacuum cleaning over the years. Therefore, cordless and robot VCs are also included in EIA, but with the same data for the BAU and ECO scenarios (because they are not subject to existing ecodesign measures), and clearly separated from the regulated mains-operated VCs.

Ecodesign regulation CR 666/2013 (for mains-operated VCs) calculates the annual energy consumption in kWh/y/unit as:
AE= 4 x 87 x 50 x ASE x (1-0.2/dpu-0.2), established specifically for carpets and/or hard floors (suffixes 'c' or 'hf' for AE, ASE, dpu). For general purpose VCs, the average AE of carpet and hardfloor values is taken.
The average specific energy (ASE) in Wh/m2/stroke is determined using 5 double strokes according to test standard IEC 60312-1 ed.1: 2010, to establish average power P (W), including possible battery power for active nozzles NP, from the energy consumption during the test (set against the cleaned surface A and the cleaning time t, at speed of 0.5 m/s). The same tests establish dust pick-up (dpu) for carpets and hard floors of the model.
The annual electricity consumption (AE) is calculated with 2 double strokes per surface area, which explains the multiplication factor 4 for the ASE. The conventional cleaned surface area is 87 m2 (average m2/dwelling), cleaned in 50 one-hour tasks per year. For the regulation, this is the same for domestic and commercial VCs.

Calculation of annual energy consumption (AE in kWh/a) per unit for VC Cordless (from 2019 review study):
AE cleaning = 4*(87/4)*200*0.001*ASE*(1-0.2)/(dpu-0.2)
- instead of 50 cycles cleaning 87 m2 for mains VCs, for cordless 200 cycles cleaning 87/4 m2 are used (shorter cycles due to battery decharging)
- same factor 4 as for VC mains, for 2 double strokes
- ASE: annual specific energy in Wh/m2 per stroke from test, average of values for carpet (c) and hardfloor (hf) used. ASE_c=0.54, ASE_hf=0.48, but both increasing after 2016 to 0.90 in 2030 (larger motor sizes).
- dpu: dust pick up from test, average of values for carpet (c) and hardfloor (hf) used. dpu_c=0.63, dpu_hf=0.46, for all years.

Standby kWh/a for cordless calculated as power (W) when charged and docked multiplied by VCtime_cordless_docked plus power (W) for empty dock multiplied by VCtime_cordless (when cleaning). For standby powers see EFN/EFS sheets. For times see table on this sheet.

Calculation of annual energy consumption (AE in kWh/a) per unit for VC Robot (from 2019 review study):
AE cleaning = (Emeasured/(RCF*20))*(87/4)*200*0.001*(avgdpu/(dpu)
- instead of 50 cycles cleaning 87 m2 for mains VCs, for robots 200 cycles cleaning 87/4 m2 are used (shorter cycles due to battery decharging)
- Emeasured is 42.5 Wh/cycle, assumed constant over the years and the same for carpet and hardfloor. Dividing by 20 (approx m2 cleaned per cycle) converts to Wh/m2.
- RCF (room coverage factor) is 0.83, constant over the years
- dpu: dust pick up from test, review study uses only values for carpet (c). avgdpu=dpu=0.13, for all years.

Standby kWh/a for robots calculated as power (W) when charged and docked multiplied by VCtime_robot_docked plus power (W) for empty dock multiplied by VCtime_robot (when cleaning). For standby powers see EFN/EFS sheets. For times see table on this sheet.

Unit Load and EULOAD:
The load (demand for product output) is reported in terms of hours of cleaning (h/a/unit or Mh/a) and in terms of surface area cleaned (m2/a/unit or 1000km2/a). The load is the same for the BAU and ECO scenarios.

Real-life cleaning hours differ from the standard conditions (50 h/a/unit) used in the regulation. For commercial VCs the real annual usage time is 300 h/a (6 hours per cleaning cycle) and assumed constant over the years. For domestic VCs, for years after 2005, the penetration rate is higher than 1 (STOCK sheets), i.e. on average there is more than 1 VC per dwelling. It is assumed that this does not imply that the dwelling will be cleaned more often: the cleaning task is assumed to remain the same, but the task is divided over the available VCs, leading to less than the standard 50 h/a/unit (1 hour per cleaning cycle) (LOAD sheets).
For Cordless and Robot VCs, battery decharging limits the time per cleaning tasks, and the cleaning performance differs. This requires a larger number of shorter tasks to keep the same dwelling clean. For domestic cordless, 63 h/a is used as a basis; for robots 104 h/a. Similar to the mains VCs, these hours are assumed to vary with the years depending on the overall penetration rate. In addition, Cordless and Robot VCs have standby losses, when docked and not charging, and when the dock is empty. The table further below gives a survey of the basic operating times assumed.

Areas cleaned by dry VCs are initially calculated as EU total (EULOAD sheets), separately for domestic and commercial. For domestic, the total area of permanently occupied dwellings (sheet GENERAL_1) is multiplied by 50 cleaning tasks per year and by the VC penetration rate (STOCK sheet), if smaller than 1. For commercial, the total non-residential building area (sheet GENERAL_1) is multiplied by 0.79 (assumed share of tertiary area), by 50 cleaning tasks per year, and by a factor reflecting the change over the years in the number of commercial VCs per 1000m2 building area (STOCK sheet). The EU totals are subdivided over the various VC types in proportion of their stock (EULOAD sheet). Dividing the EU totals by the stock provides the m2/a/unit (LOAD sheet). The reported area data are indicative estimates only, to give an idea of the order of magnitude. They are not further being used in the EIA calculations.

Efficiencies (EFN and EFS sheets):
These sheets report the real-life efficiency, the standard efficiency (as used in CR 666/2013) and corresponding power. The EFN sheet gives the average of products sold in a given year; the EFS sheet the average of products in stock in a given year.
The standard efficiencies, expressed in kWh/a/unit, are inputs to EIA, based on the underlying studies. Dividing these values by the standard 50 hours per year provides the nominal power of the VC (in Watt). These values can be compared with limits in CR 666/2013 (Tier 1 in 2014: 62 kWh/a and 1600 W; Tier 2 in 2017: 43 kWh/a and 900 W).
The real-life efficiencies (also in kWh/a/unit) are derived from the standard efficiencies considering the difference between the standard 50 h/a and the real operating hours (see above). In addition a load factor (between 0.8 and 1.0) is applied for years where the VC power is very high.

For the standby of cordless- and robot-VCs, the EFN and EFS sheets report the standby power in Watts for two situations: VC charged and docked (see times below), and empty dock (when using the VC for cleaning).

Basic parameter values used for VCs:

cleaning cycles per year	cyc/a/unit	50	VCcycles
domestic mains cleaning time	h/a/unit	50	VCtime_domestic
commercial mains cleaning time	h/a/unit	300	VCtime_commercial
cordless cleaning time	h/a/unit	63	VCtime_cordless
robot cleaning time	h/a/unit	104	VCtime_robot
cordless charged and docked time	h/a/unit	8030	VCtime_cordless_docked
cordless charging time	h/a/unit	667	
robot charged and docked time	h/a/unit	8445	VCtime_robot_docked
robot charging time	h/a/unit	211	

FAN Industrial (>125W)

FMEG (Fan Motor Efficiency Grade) is the fan efficiency at best efficiency point (bep), following draft ISO 12759 standard (status 2009). Depending on type, total or static pressure is used in the equation to determine fluid power output (in Pa * m^3/s = W).
The draft standard (by TC 117) gives generic equations per fan-type and per rated power category (0.125-10 kW and 10-500 kW):
For axial and centrifugal forward curved (FC) fans: 2.74*ln(Pe)-6.33+N (Pe:0.125-10kW); 0.78*ln(Pe)-1.88+N (Pe:10-500kW).
Centrifugal backwards curved (BC): 4.56ln(Pe)-10.5+N (Pe:0.125-10kW); 1.1*ln(Pe)-2.6+N (Pe:10-500kW).
Cross-flow: 1.14*ln(Pe)-2.6+N (Pe:0.125-10kW).
Where N is the FMEG-value.

The table below gives the output power and annual operating hours per basecase.

		P flow(kW)	h/a
FAN Axial<300Pa (all FAN types >125W)	kWh flow/ a	0.123	2000
FAN Axial>300Pa	kWh flow/ a	0.245	2000
FAN Centr.FC	kWh flow/ a	0.071	3000
FAN Centr.BC-free	kWh flow/ a	1.060	3000
FAN Centr.BC	kWh flow/ a	1.026	3000
FAN Cross-flow	kWh flow/ a	0.015	1865

Note that P flow is Pnominal * load factor, where load factor is 50%

MT Industrial motors, net unit load	net annual load (=demand for output) kWh output/a	average nominal output power kW	average annual operating hours h/a	average load factor -
Med. (S) 3-ph 0.75-7.5 kW no VSD	1756	1.1	2800	0.57
Med. (M) 3-ph 7.5-75 kW no VSD	20020	11	3500	0.52
Med. (L) 3-ph 75-375 kW no VSD	400400	110	7000	0.52
Med. (S) 3-ph 0.75-7.5 kW with VSD	1053	1.1	2800	0.34
Med. (M) 3-ph 7.5-75 kW with VSD	12012	11	3500	0.31
Med. (L) 3-ph 75-375 kW with VSD	240240	110	7000	0.31
Small 1 ph 0.12-0.75 kW no VSD	59	0.37	400	0.40
Small 1 ph 0.12-0.75 kW with VSD	36	0.37	400	0.24
Small 3 ph 0.12-0.75 kW no VSD	296	0.37	2000	0.40
Small 3 ph 0.12-0.75 kW with VSD	178	0.37	2000	0.24
Large 3-ph LV 375-1000 kW no VSD	1716000	550	6000	0.52
Large 3-ph LV 375-1000kW with VSD	1188000	550	6000	0.36
Explosion motors (S) 3-ph 0.75-7.5 kW	1411	1.1	2250	0.57
Explosion motors (M) 3-ph 7.5-75 kW	17160	11	3000	0.52
Explosion motors (L) 3-ph 75-375 kW	343200	110	6000	0.52
Brake motors (S) 3-ph 0.75-7.5 kW	784	1.1	1250	0.57
Brake motors (M) 3-ph 7.5-75 kW	9152	11	1600	0.52
Brake motors (L) 3-ph 75-375 kW	137280	110	2400	0.52
8-pole motors (S) 3-ph 0.75-7.5 kW	1411	1.1	2250	0.57
8-pole motors (M) 3-ph 7.5-75 kW	17160	11	3000	0.52
8-pole motors (L) 3-ph 75-375 kW	343200	110	6000	0.52
1-phase motors >0.75 kW (no VSD)	440	1.1	800	0.50

net load = nominal power * annual hours * load factor

load factor indicates the part of the nominal power at which motor operates on average during hours

unit load is assumed constant: same value for all years it is also the same in BAU and in ECO (but in ECO share using VSD may be higher than in BAU)

use of VSD is assumed to reduce load by 40%

Source for data: IA Motors of October 2017

Motor efficiency is measured according to IEC60032-30. Efficiencies on EFNBAU/ECO are copied from IA motors, but ECO efficiencies updated for final voted regulation. Motor efficiencies for different IE-classes based on minimum values for 4-pole 50 Hz from EN 60034-30-1 for the ref. nominal output power of each base case (except for 8-pole motors where 8-pole data are used) For each scenario/year a distribution of sales over the IE-classes is assumed and MT efficiency calculated as weighted average over the IE-class efficiencies.

VSD losses (90% max speed; 100% torque) for IE1-class based on max loss values from regulation Annex. For IE0, losses 25% higher; IE2 25% lower; IE3 50% lower. For each scenario/year a distribution of sales over the IE-classes assumed and VSD losses calculated as weighted average over the IE-class losses.

Efficiency of motor+VSD considers motor losses, VSD losses, and losses induced by VSD in motor (=15% of motor loss for < 100 kW; 25% for > 100 kW).

The EIA ECO scenario reflects the final CR 2019/1781.

WP Water Pumps

EIA 2021 for WPs has been updated based on the "Ecodesign Pump Review, Study of Commission Regulation (EU) No. 547/2012, Extended report (final version), Viegand Maagøe and Van Holsteijn en Kemna B.V., December 2018" and on the draft impact assessment (IA) study (ongoing, to be finalized in 2022). The EIA update is limited to the impacts of the current regulation (CR 547/2012). New measures and scope extension proposed in the review study and the draft IA are not (yet) taken into account in EIA because not finally approved. IA data are preliminary and might still change. Hence, also EIA data could further change in future.

CR 547/2012 (ecodesign for WPs) applies to rotodynamic water pumps for pumping clean water, including where integrated in other products. The CR does not apply to pumps designed specifically for pumping clean water at temperatures below – 10 °C or above 120 °C (except some information requirements), water pumps designed only for fire-fighting applications, displacement water pumps, self-priming water pumps.
According to the definitions in the CR: 'water pump' is the hydraulic part of a device that moves clean water by physical or mechanical action and is of one of the following designs:
— End suction own bearing (ESOB),
— End suction close coupled (ESCC),
— End suction close coupled inline (ESCCi),
— Vertical multistage (MS-V),
— Submersible multistage (MSS).
Scope limitations: ESOB, ESCC and ESCCi with maximum shaft power 150 kW, MS-V for pressures up to 25 bar, MSS with nominal outer diameter of 4′ (10,16 cm) or 6" (15,24 cm) designed to be operated in a borehole (additional conditions in the definitions of the CR).

For ESOB, ESCC and ESCCi, the IA distinguishes between pump sizes < 45 kW and between 45 and 150 kW. For MSS there is one category≤ 6" diameter. For MS-V there is one category ≤ 25 bar. The IA further subdivides in pumps for variable flow (VF, with or without the use of a Variable Speed Drive (VSD)), and for constant flow (CF, always without VSD). The IA subdivision in base cases has been maintained in EIA.
The IA also contains data for pumps not in scope of CR 547/2012, for assessment of scope extension, but these have not been included in EIA (yet).

The EIA 2021 update thus has a large number of WP base cases that replace the single aggregated base case of EIA 2020, providing a more detailed insight and increased transparency. The new modelling results in a higher sales-weighted average unit load (demand for product output): approximately 5900 kWh flow/a in 2014 compared to the previous 4600 kWh flow/a. The new sales-weighted average efficiency for year 2014 is lower: approximately 51% compared to the previous 67%. The main reason for this is that the IA uses an Extended Product Approach, considering the system of pump+motor+VSD+controls (as far as present), while CR 547/2012 and previous EIA considered the bare pump.

The average pump output powers, annual operating hours and reference electric input powers (P1) in EIA 2021 have been taken from the IA study (table below). They derive from industry input collected during the 2019 review study. The product of output power and operating hours is the unit load (demand for product output). The unit load is assumed to be constant over the years and the same for the BAU and ECO scenario.
For variable flow, the load with VSD is approximately 32% lower than the load without VSD. (This is a modelling choice; alternative would have been to express the entire effect of VSDs in the efficiency). This does not mean that the user demand for pump output changes when using a VSD; it only indicates that the installed pumps with VSD better match the real needs of the user.

	Output Power kW flow	Operating hours h/a	Unit Load kWhflow/a		Ref. Input Power (P1) kW elec
ESOB<45_VF	2.3	5000	11628		6.7
ESOB<45_CF	4.3	2250	9626		6.7
ESOB<45_VSD-VF	1.6	5000	7911	0.68	6.7
ESOB_45-150_VF	23.0	5000	114997		62.7
ESOB_45-150_CF	42.9	2250	96518		62.7
ESOB_45-150_VSD-VF	15.9	5000	79421	0.69	62.7
ESCC<45_VF	1.9	5000	9384		5.5
ESCC<45_CF	3.4	2250	7751		5.5
ESCC<45_VSD-VF	1.3	5000	6368	0.68	5.5
ESCC_45-150_VF	22.1	5000	110332		60.1
ESCC_45-150_CF	41.2	2250	92602		60.1
ESCC_45-150_VSD-VF	15.2	5000	76199	0.69	60.1
ESCCi<45_VF	1.5	5000	7377		4.4
ESCCi<45_CF	2.7	2250	6076		4.4
ESCCi<45_VSD-VF	1.0	5000	4991	0.68	4.4
ESCCi_45-150_VF	21.0	5000	105136		57.3
ESCCi_45-150_CF	39.2	2250	88241		57.3
ESCCi_45-150_VSD-VF	14.5	5000	72610	0.69	57.3
MSSB<6"_VF	0.5	2250	1199		1.4
MSSB<6"_CF	0.8	2250	1854		1.4
MSSB<6"_VSD-VF	0.3	2250	684	0.57	1.4
MS-V<25bar_VF	1.3	5000	6635		4.4
MS-V<25bar_CF	2.3	2250	5265		4.4
MS-V<25bar_VSD-VF	0.9	5000	4325	0.65	4.4

Pump-system efficiencies for the ECO scenario have been taken directly from the 2022 draft IA. In year 2014 for ESOB, ESCC and ESCCi in constant flow, the efficiencies are computed in the IA as output power divided by reference input power. For variable flow without VSD, efficiencies are taken 22%-24% (relative, not %points) smaller than those for CF; for variable flow with VSD around 15.5% smaller (so VF+VSD has lower unit load and higher efficiency than VF without VSD). The 2014 efficiencies are based on motor IE3 or motor IE2 + VSD IE1. The variation of efficiencies with time takes into account the requirements of the motor regulation (IE2=>IE3 or IE2+VSD=>IE3) and a general improvement of 0.1% relative per year over the period 1990-2011. After 2017, efficiencies in the ECO scenario in general remain constant (see EFNECO sheet for details).

The draft IA does not provide details for the scenario without CR 547/2012 (the EIA BAU scenario; would be BAU0 for the IA). The efficiencies of the existing EIA 2020 BAU scenario can no longer be used because the entire approach has been changed (introduction of Extended Product Approach). Considering that the first tier in CR 547/2012 is in 2013, and that suppliers tend to anticipate the requirements, BAU efficiencies have been set identical to ECO efficiencies until 2012. In later years, an efficiency increase of 0.06% (relative) per year has been applied in BAU until the ECO-efficiency is reached. This approximately matches the electricity savings that were present in EIA 2020.

CP Standard Air Compressors

Data for this product group have been removed from EIA in the 2021 issue, on request of the EC policy officer for EIA. Data were inserted in the past based on preparatory study data, expecting an Ecodesign regulation to follow, but no Ecodesign or Energy Labelling measures have been taken, nor are they expected soon. Data can still be found in previous EIA versions, if needed.

WE Welding Equipment

From 1 January 2023, CR (EU) 2019/1784 sets a minimum efficiency for power sources for welding, and a maximum power consumption in idle state. In addition there are resource requirements and information requirements. Where the equipment has a display it shall provide indication of the use of welding wire or filler material. This is expected to reduce the consumption of wires and electrodes. A similar info requirement for the consumption of shielding gas is not present in the final CR. Development of harmonised standards for measurement of the parameters regulated in the CR is ongoing (December 2019) in CEN/CENELEC, following mandate M/559, C(2018) 3309 of 4.6.2018.

Information on WE in EIA is based on the 2019 Impact Assessment SWD(2019) 340, taking into account the differences between this IA and the final CR.

The preferred option in the IA differs from the final CR (second efficiency tier in 2028 not present; no info requirement for shielding gas use). In addition EIA had to estimate some parameters not reported in IA, while some other parameters were slightly adapted for consistency. For these reasons, EIA data can deviate from IA data. EIA data were checked with EC policy officer and no comments were received.

The unit load data (user demand for WE output) is based on a daily use of 8 hours for 250 days per year, total 2000 h/a (prep. study). According to the IA, the average arc-on-time is 22% or 440 h/a, leaving the equipment in idle state for 1560 h/a. An average arc-on power of 3.4 kW has been derived from the IA data, see Load sheets.

TRAFO Distribution	TEC	only annual losses are counted. On average 3.3% of final demand electricity (2.6% of produced electricity)
TRAFO Industry oil	TEC	
TRAFO Industry dry	TEC	CR 2019/1783 amends regulation CR 548/2014, but effects on electricity losses are negligible.
TRAFO Power	TEC	EIA 2019 data are therefore identical to data that were already present in EIA.
TRAFO DER oil	TEC	
TRAFO DER dry	TEC	
TRAFO Small	TEC	

TYRES
The EU adopted in 2009 two sets of rules relating to tyres:

1. The Tyre Labelling Regulation (TLR, Regulation (EC) No 1222/2009, OJ L 342 of 22.12.2009, p.46) harmonising the information on tyre parameters to be provided to end-users allowing them to make informed purchasing choices.

2. The Regulation on type-approval requirements for the general safety of motor vehicles ("General Safety Regulation" or GSR, Regulation (EC) No 661/2009, OJ L 200 of 31.7.2009, p.1) putting in place harmonised technical requirements that tyres must satisfy before they can be placed on the Union market.
The GSR puts in place minimum requirements for, amongst others, (i) the rolling resistance, (ii) external rolling noise and (iii) wet grip performance of tyres. These minimum requirements became applicable for all three parameters from 1 November 2012, with a second tier of more stringent requirements for the rolling resistance starting to apply on 1 November 2016 (with further requirements coming into application in 2018 and 2020).

International UNECE test methods form the basis of the tests in both TLR and the GSR.

The TLR relates to C1, C2 and C3 tyre types, as defined in article 8 of the GSR. The definition of tyre types is based on the vehicles they are primarily designed for, including the weight and passenger capacity, and on the tyre load and speed indexes. C1 tyres are used typically for passenger cars, C2 tyres for light commercial vehicles (LCVs, vans) and C3 tyres for heavy commercial vehicles (HCVs, trucks, busses).

In addition to the division between C1, C2 and C3 type tyres, the 2018 Impact Assessment (IA) makes a distinction between OEM tyres (mounted on new vehicles sold; often not selected by the vehicle buyer) and replacement tyres (selected by the vehicle user/owner). The reason for this additional distinction is that the existing TLR seems to have been less effective for OEM tyres, leading to a difference in average RRC values for OEM and replacement tyres. For ease of traceability, EIA has maintained this distinction made in the IA.

The fuel efficiency of tyres is regulated using the Rolling Resistance Coefficient (RRC) expressed in kg/ton. Values for RRC are reported further below. A lower RRC value indicates higher efficiency. In the official "fuel savings calculator" model (https://ec.europa.eu/energy/en/topics/energy-efficiency/energy-efficient-products/tyres), the relation between changes in RRC and changes in vehicle fuel consumption is given by the formula:

$$Fuel\ consumption\ change\ (\%) = K * \frac{RRC_{old} - RRC_{new}}{RRC_{old}} * 100\%$$

K is a factor calculated by IDIADA (see background document for fuel savings calculator) based on actual measurements of cars driven on a test lane with different tyres. It depends on the type of tyre (and thus vehicle), the share of urban and non-urban driving and whether the rolling resistance is increasing or decreasing. K-factors used in the IA and EIA analyses are shown below, assuming a 50/50 share of urban and non-urban driving.

K-factors	C1	C2	C3
Increasing rolling resistance	0.131	0.108	0.1035
Decreasing rolling resistance	0.164	0.117	0.112

Total EU fuel consumption by vehicles due to RRC (in TWh) is calculated in EIA using:

(Litres/100km/vehicle due to RRC) * (annual km driven / 100) * (EU vehicle stock in mln) * (kWh/litre) * 1E-3

(Litres/100km/vehicle due to RRC) is the efficiency parameter, reported on sheets EFNBAU and EFNECO. In the 2018 IA, the total (Litres/100km/vehicle) values (complete fuel consumption, not only due to RRC) have been fixed for the current situation (BAU1 scenario; including the existing TLR), while values for BAU0 (excluding existing TLR) and ECO (including new proposed TLR) are derived based on the variation in fuel consumption due to the variation in RRC as explained above. This derivation is not shown in EIA (L/100km are fixed input values) because EIA does not report the BAU1 scenario. The BAU scenario in EIA is without the existing TLR (but with the GSR). The ECO scenario in EIA is the PO4 policy option from the Impact Assessment SWD(2018)189 final of 17.5.2018.

Considering that the TLR only regards the part of the fuel consumption that is caused by the rolling resistance, EIA does not use the complete fuel consumption (L/100km/vehicle), but only the part that is due to rolling resistance (L/100km/vehicle due to RRC). The shares of total fuel consumption that are caused by rolling resistance are reported below. These shares are rough estimates based on data from the 2018 IA, data from the previous EIA version, and additional data from literature. These shares have influence on the BAU and ECO totals for FUEL, FNRG and NRG for tyres, but the difference between BAU and ECO (the energy saving) is independent from these shares.

Share of total vehicle fuel consumption assumed due to rolling resistance of the tyres:

C1:	16%	C2:	16%	C3:	20%

(Annual km driven / 100) is the load parameter, reported on sheets LOADBAU and LOADECO. It represent the expected 'output' from the tyres / vehicles. The load is assumed to be constant over the years and independent from the scenario:

vehicles with C1 tyres	13500	km /a
vehicles with C2 tyres	21000	km /a
vehicles with C3 tyres	57500	km /a

In the 2018 IA, the Tyre stock is computed using a lifetime distribution model using lifetimes of 4.2 years for C1, 3.4 yrs for C2 and 3.5 yrs for C3, with standard deviation 1. In EIA, to obtain approximately the same Tyre stock with the standard EIA stock calculation (see sheets STOCKBAU and STOCKECO), slightly longer 'artificial' lifetimes have been applied: 4.69 yrs for C1, 3.89 yrs for C2, 3.97 yrs for C3.
(Vehicle stock) is derived from the Tyre stock, dividing by the average number of tyres per vehicle:

Average number of (non-retreaded) tyres per vehicle:

vehicles with C1 replacement	5.9
vehicles with C1 OEM	5.9
vehicles with C2 replacement	4.1
vehicles with C2 OEM	4.1
vehicles with C3 replacement	10.5
vehicles with C3 OEM	13.1

The value for C3 replacement is lower than for C3 OEM because retreaded tyres (not considered here) have been excluded.

(kWh/litre) converts the litres of fuel to kWh NCV, which is the main energy measure used in EIA. It is different for diesel and petrol. As the assumed share for diesel and petrol is different for C1, C2, C3, the conversion factor differs per tyre type. The conversion factors have been taken from 2018 IA:

Diesel	38.7	MJ/litre	10.8	kWh/litre
Petrol	35.0	MJ/litre	9.7	kWh/litre

	share diesel	share petrol	average	
vehicles using C1 tyres	41%	59%	10.1	kWh/litre
vehicles using C2 tyres	88%	12%	10.6	kWh/litre
vehicles using C3 tyres	96%	4%	10.7	kWh/litre

Rolling Resistance Coefficient (RRC) values in kg/t (source: Impact Assessment SWD(2018)189 final of 17.5.2018 and underlying Excel files)
BAU0 is without any tyre labelling regulation (but includes the General Safety Regulation, Regulation (EC) No 661/2009, OJ L 200, 31.7.2009, p.1)
BAU1 is with existing tyre labelling regulation (Regulation (EC) No 1222/2009, OJ L 342, 22.12.2009, p.46)
ECO is with PO4 policy option from 2018 Impact Assessment SWD(2018)189 final of 17.5.2018.

RRC in kg/t for C1 tyres		BAU0		BAU1		ECO	
		replacement tyres	OEM tyres	replacement tyres	OEM tyres	replacement tyres	OEM tyres
	1990	13.2	13.2	13.2	13.2	13.2	13.2
	2000	12.6	12.6	12.6	12.6	12.6	12.6
	2005	12.2	12.2	12.2	12.2	12.2	12.2
	2010	11.9	11.9	11.4	11.9	11.4	11.9
	2015	10.8	10.8	9.9	10.8	9.9	10.8
	2020	9.9	9.9	9.7	9.9	9.2	9.6
	2025	9.7	9.7	9.4	9.7	8.8	8.8
	2030	9.4	9.4	9.3	9.4	8.7	8.7
	2040	8.9	8.9	8.9	8.9	8.4	8.4
	2050	8.5	8.5	8.5	8.5	8.0	8.0

RRC in kg/t for C2 tyres		BAU0		BAU1		ECO	
		replacement tyres	OEM tyres	replacement tyres	OEM tyres	replacement tyres	OEM tyres
	1990	11.3	11.3	11.3	11.3	11.3	11.3
	2000	10.8	10.8	10.8	10.8	10.8	10.8
	2005	10.6	10.6	10.6	10.6	10.6	10.6
	2010	10.4	10.4	10.0	10.4	10.0	10.4
	2015	9.6	9.6	9.1	9.6	9.1	9.6
	2020	8.8	8.8	8.8	8.8	8.5	8.6
	2025	8.7	8.7	8.7	8.7	8.1	8.2
	2030	8.7	8.7	8.6	8.7	8.1	8.1
	2040	8.5	8.5	8.5	8.5	8.1	8.1
	2050	8.3	8.3	8.3	8.3	8.0	8.0

RRC in kg/t for C3 tyres		BAU0		BAU1		ECO	
		replacement tyres	OEM tyres	replacement tyres	OEM tyres	replacement tyres	OEM tyres
	1990	7.8	7.8	7.8	7.8	7.8	7.8
	2000	7.6	7.6	7.6	7.6	7.6	7.6
	2005	7.6	7.6	7.6	7.6	7.6	7.6
	2010	7.5	7.5	7.2	7.5	7.2	7.5
	2015	7.2	7.2	6.6	7.2	6.6	7.2
	2020	6.6	6.6	6.6	6.6	6.3	6.4
	2025	6.5	6.5	6.5	6.5	6.1	6.1
	2030	6.5	6.5	6.5	6.5	6.1	6.1
	2040	6.4	6.4	6.4	6.4	6.0	6.0
	2050	6.3	6.3	6.3	6.3	5.8	5.8

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	kWh heat/a	69	76	78	78	78	78	78	78	78	78
EIWH Electric Instant. ≥ 12 kW (primary)	kWh heat/a	398	436	451	451	451	451	451	451	451	451
EIWHS Electric Instant. Shower (secondary)	kWh heat/a	421	461	477	477	477	477	477	477	477	477
ESWH Electric Storage ≤ 30 L (secondary)	kWh heat/a	210	230	238	238	238	238	238	238	238	238
ESWH Electric Storage > 30 L (primary)	kWh heat/a	909	995	1029	1029	1029	1029	1029	1029	1029	1029
GIWH Gas Instant. < 13 L/min (secondary)	kWh heat/a	274	300	310	310	310	310	310	310	310	310
GIWH Gas Instant. ≥ 13 L/min (primary)	kWh heat/a	1256	1375	1422	1422	1422	1422	1422	1422	1422	1422
GSWH Gas Storage, Condensing	kWh heat/a	3130	3426	3543	3543	3543	3543	3543	3543	3543	3543
GSWH Gas Storage, Non-condensing	kWh heat/a	3130	3426	3543	3543	3543	3543	3543	3543	3543	3543
Dedicated WH Heat Pump	kWh heat/a	2338	2559	2647	2647	2647	2647	2647	2647	2647	2647
Dedicated WH Solar (3.5 m2)	kWh heat/a	1326	1448	1492	1492	1492	1492	1492	1492	1492	1492
CHB Gas Combi Instant. WH	kWh heat/a	1750	1900	1917	1917	1917	1917	1917	1917	1917	1917
CHB Gas + Cyl. WH	kWh heat/a	2361	2564	2587	2587	2587	2587	2587	2587	2587	2587
CHB Jet Burner Gas + Cyl. WH	kWh heat/a	2361	2564	2587	2587	2587	2587	2587	2587	2587	2587
CHB Jet Burner Oil + Cyl. WH	kWh heat/a	2361	2564	2587	2587	2587	2587	2587	2587	2587	2587
CHB Electric (Joule) + Cyl. WH	kWh heat/a	1253	1360	1372	1372	1372	1372	1372	1372	1372	1372
CHB Hybrid Gas/Electric WH	kWh heat/a	1917	2082	2101	2101	2101	2101	2101	2101	2101	2101
CHB Electric HP + Cyl. WH	kWh heat/a	1917	2082	2101	2101	2101	2101	2101	2101	2101	2101
CHB Gas HP + Cyl. WH	kWh heat/a	4961	5387	5436	5436	5436	5436	5436	5436	5436	5436
CHB Gas mCHP + Cyl. WH	kWh heat/a	2395	2600	2624	2624	2624	2624	2624	2624	2624	2624
CHB Solar Combi (16 m2)	kWh heat/a	4715	5120	5167	5167	5167	5167	5167	5167	5167	5167
CHB Gas non-condensing	kWh heat/a	10705	9038	8660	8298	7952	7619	7301	6996	6704	6424
CHB Gas condensing	kWh heat/a	10705	9038	8660	8298	7952	7619	7301	6996	6704	6424
CHB Gas Jet burner non-condensing	kWh heat/a	12846	10845	10392	9958	9542	9143	8761	8395	8044	7708
CHB Gas Jet burner condensing	kWh heat/a	12846	10845	10392	9958	9542	9143	8761	8395	8044	7708
CHB Oil Jet burner non-condensing	kWh heat/a	21838	18437	17667	16929	16221	15544	14894	14272	13675	13104
CHB Oil Jet burner condensing	kWh heat/a	17984	15184	14549	13941	13359	12801	12266	11753	11262	10792
CHB Electric Joule-effect	kWh heat/a	12846	10845	10392	9958	9542	9143	8761	8395	8044	7708
CHB Hybrid (gas-electric)	kWh heat/a	10705	9038	8660	8298	7952	7619	7301	6996	6704	6424
CHB Electric Heat Pump	kWh heat/a	10705	9038	8660	8298	7952	7619	7301	6996	6704	6424
CHB Gas Heat Pump	kWh heat/a	10705	9038	8660	8298	7952	7619	7301	6996	6704	6424
CHB micro CHP	kWh heat/a	12846	10845	10392	9958	9542	9143	8761	8395	8044	7708
CHB Solar combi (16 m2)	kWh heat/a	12846	10845	10392	9958	9542	9143	8761	8395	8044	7708
SFB Wood Manual	kWh heat/a	14580	14580	13872	13199	12558	11949	11369	10817	10292	9793
SFB Wood Direct Draft	kWh heat/a	16200	16200	15414	14666	13954	13277	12632	12019	11436	10881
SFB Coal	kWh heat/a	20250	20250	19267	18332	17442	16596	15790	15024	14295	13601
SFB Pellets	kWh heat/a	20250	20250	19267	18332	17442	16596	15790	15024	14295	13601
SFB Wood chips	kWh heat/a	129600	129600	123310	117325	111631	106213	101058	96153	91486	87046
CHAE-S (≤ 400 kW)	kWh cool/a	32213	26400	25119	23900	22740	21636	20586	19587	18636	17732
CHAE-L (> 400 kW)	kWh cool/a	522729	428400	407608	387825	369002	351093	334053	317840	302414	287736
CHWE-S (≤ 400 kW)	kWh cool/a	44659	36600	34824	33134	31525	29995	28540	27154	25836	24583
CHWE-M (> 400 kW; ≤ 1500 kW)	kWh cool/a	610583	500400	476113	453006	431019	410100	390196	371258	353239	336095
CHWE-L (> 1500 kW)	kWh cool/a	1171382	960000	913407	869075	826895	786763	748578	712246	677678	644787
CHF	kWh cool/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
HT PCH-AE-S	kWh cool/a	864800	864800	864800	864800	864800	864800	864800	864800	864800	864800
HT PCH-AE-L	kWh cool/a	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400	2825400
HT PCH-WE-S	kWh cool/a	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556	1104556
HT PCH-WE-M	kWh cool/a	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289	3281289
HT PCH-WE-L	kWh cool/a	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000	6375000
AC rooftop	kWh cool/a	51248	42000	39962	38022	36177	34421	32750	31161	29648	28209
AC splits	kWh cool/a	12226	10020	9534	9071	8631	8212	7813	7434	7073	6730
AC VRF	kWh cool/a	20499	16800	15985	15209	14471	13768	13100	12464	11859	11284
ACF	kWh cool/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
AC rooftop (rev)	kWh heat/a	119579	98000	93244	88718	84412	80315	76417	72708	69180	65822
AC splits (rev)	kWh heat/a	28528	23380	22245	21166	20138	19161	18231	17346	16504	15703
AC VRF (rev)	kWh heat/a	47831	39200	37297	35487	33765	32126	30567	29083	27672	26329
ACF (rev)	kWh heat/a	68331	56000	53282	50696	48236	45894	43667	41548	39531	37613
AHF	kWh heat/a	86730	71079	67629	64347	61224	58252	55425	52735	50176	47740
AHE	kWh heat/a	29285	24000	22835	21727	20672	19669	18714	17806	16942	16120
LH open fireplace	kWh heat/a	336	336	336	336	336	336	336	336	336	336
LH closed fireplace/inset	kWh heat/a	2351	2128	2076	2024	1975	1926	1879	1832	1787	1743
LH wood stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH coal stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH cooker	kWh heat/a	1237	1120	1092	1066	1039	1014	989	964	941	917
LH SHR stove	kWh heat/a	2979	2696	2630	2565	2502	2440	2380	2321	2264	2208
LH pellet stove	kWh heat/a	3562	3224	3145	3067	2992	2918	2846	2776	2708	2641

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	kWh heat/a	301	254	243	233	224	214	205	197	188	181
LH Electric fixed > 250W	kWh heat/a	974	821	787	754	723	692	663	636	609	584
LH Electric fixed ≤ 250W	kWh heat/a	244	205	197	189	181	173	166	159	152	146
LH Electric storage	kWh heat/a	1257	1060	1016	973	933	894	856	820	786	753
LH Electric underfloor	kWh heat/a	464	391	374	359	344	329	316	302	290	278
LH Electric visibly glowing > 1.2 kW	kWh heat/a	1159	977	936	897	860	824	789	756	725	694
LH Electric visibly glowing ≤ 1.2 kW	kWh heat/a	579	488	468	449	430	412	395	378	362	347
LH Electric Towel Heaters	kWh heat/a	319	269	257	247	236	226	217	208	199	191
LH Gas luminous (commercial)	kWh heat/a	15240	12848	12311	11797	11304	10832	10379	9945	9530	9132
LH Gaseous Tube (commercial < 120 kW)	kWh heat/a	22860	19272	18467	17695	16956	16247	15569	14918	14295	13697
LH Gas open front	kWh heat/a	2134	1799	1724	1652	1583	1516	1453	1392	1334	1278
LH Gas closed front	kWh heat/a	2134	1799	1724	1652	1583	1516	1453	1392	1334	1278
LH Gas balanced flue	kWh heat/a	2134	1799	1724	1652	1583	1516	1453	1392	1334	1278
LH Gas flueless	kWh heat/a	191	161	154	147	141	135	130	124	119	114
LH Liquid tube (commercial < 120 kW)	kWh heat/a	22860	19272	18467	17695	16956	16247	15569	14918	14295	13697
LH Liquid open front	kWh heat/a	1016	857	821	786	754	722	692	663	635	609
LH Liquid closed front	kWh heat/a	2032	1713	1642	1573	1507	1444	1384	1326	1271	1218
LH Liquid balanced flue	kWh heat/a	2032	1713	1642	1573	1507	1444	1384	1326	1271	1218
LH Liquid flueless	kWh heat/a	191	161	154	147	141	135	130	124	119	114
RAC fixed < 6 kW, cooling	kWh cool/a	1225	1225	1225	1225	1225	1225	1225	1225	1225	1225
RAC fixed 6-12 kW, cooling	kWh cool/a	2485	2485	2485	2485	2485	2485	2485	2485	2485	2485
RAC portable < 12 kW, cooling	kWh cool/a	365	365	365	365	365	365	365	365	365	365
RAC fixed < 6 kW, reversible, heating	kWh heat/a	5199	4383	4200	4025	3856	3695	3541	3393	3251	3115
RAC fixed 6-12 kW, reversible, heating	kWh heat/a	9705	8182	7840	7512	7199	6898	6610	6333	6069	5815
RAC portable < 12 kW, reversible, heating	kWh heat/a	0	0	0	0	0	0	0	0	0	0
CIRC Integrated circulators	kWh flow/a	128	128	128	128	128	128	128	128	128	128
CIRC Large standalone circulators	kWh flow/a	975	975	975	975	975	975	975	975	975	975
CIRC Small standalone circulators	kWh flow/a	51	51	51	51	51	51	51	51	51	51
R-UVU ≤ 100 m3/h for Extract Spaces											
Avg. mechanical flow per VU	m3/h	22	22	22	22	21	21	21	21	21	21
Remaining infiltration flow (with MVU)	m3/h	17	11	9	8	7	6	6	6	6	6
Ref. natural airflow (without MVU)	m3/h	27	24	23	22	19	17	16	16	17	18
R-UVU ≤ 100 m3/h for Habitable Spaces											
Avg. mechanical flow per VU	m3/h	0	0	0	0	19	19	19	19	19	19
Remaining infiltration flow (with MVU)	m3/h	0	0	0	0	9	9	9	9	9	9
Ref. natural airflow (without MVU)	m3/h	0	0	0	0	49	49	49	48	44	38
R-BVU ≤ 100 m3/h for Habitable Spaces											
Avg. mechanical flow per VU	m3/h	20	20	20	21	21	21	21	21	21	21
Remaining infiltration flow (with MVU)	m3/h	26	15	13	11	9	9	9	9	9	9
Ref. natural airflow (without MVU)	m3/h	49	47	46	45	46	46	46	44	39	35
R-UVU 100-250 m3/h											
Avg. mechanical flow per VU	m3/h	54	56	58	60	62	62	62	62	62	62
Remaining infiltration flow (with MVU)	m3/h	130	81	70	61	52	47	45	45	45	45
Ref. natural airflow (without MVU)	m3/h	181	178	166	150	126	114	109	109	111	115
R-BVU 100-250 m3/h											
Avg. mechanical flow per VU	m3/h	54	54	55	56	57	57	57	57	57	57
Remaining infiltration flow (with MVU)	m3/h	130	78	68	59	49	46	45	45	45	45
Ref. natural airflow (without MVU)	m3/h	248	228	216	206	208	215	218	211	187	169
R-UVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	294	327	356	371	372	372	372	372	372
Remaining infiltration flow (with MVU)	m3/h	520	325	281	242	208	189	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	725	711	664	600	502	458	437	434	446	461
R-BVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	244	249	252	256	257	257	257	257	257
Remaining infiltration flow (with MVU)	m3/h	520	311	271	237	194	183	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	992	911	863	823	832	862	873	843	747	678
R-UVU > 1000 m3/h											
Avg. mechanical flow per VU	m3/h	508	508	517	524	532	535	535	535	535	535
Remaining infiltration flow (with MVU)	m3/h	1083	689	588	505	438	395	376	375	375	375
Ref. natural airflow (without MVU)	m3/h	1808	1310	1129	962	815	709	641	604	585	564
R-BVU 1000-2500 m3/h											
Avg. mechanical flow per VU	m3/h	0	763	779	790	799	803	803	803	803	803
Remaining infiltration flow (with MVU)	m3/h	0	975	846	735	646	587	564	563	563	563
Ref. natural airflow (without MVU)	m3/h	0	3027	2818	2588	2300	2048	1884	1768	1686	1607

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-UVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	289	326	357	371	372	372	372	372	372
Remaining infiltration flow (with MVU)	m3/h	520	331	282	242	210	190	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	868	629	542	462	391	340	308	290	281	271
NR-BVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	0	244	249	253	256	257	257	257	257	257
Remaining infiltration flow (with MVU)	m3/h	0	312	271	235	207	188	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	0	969	902	828	736	655	603	566	539	514
NR-UVU > 1000 m3/h											
Avg. mechanical flow per VU	m3/h	691	691	691	691	691	691	691	691	691	691
Remaining infiltration flow (with MVU)	m3/h	520	331	282	242	210	190	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	868	629	542	462	391	340	308	290	281	271
NR-BVU 1000-2500 m3/h											
Avg. mechanical flow per VU	m3/h	0	864	864	864	864	864	864	864	864	864
Remaining infiltration flow (with MVU)	m3/h	0	390	338	294	258	235	225	225	225	225
Ref. natural airflow (without MVU)	m3/h	0	1211	1127	1035	920	819	754	707	674	643
NR-AHU-S 2500-5500 m3/h											
Avg. mechanical flow per VU	m3/h	1814	1814	1814	1814	1814	1814	1814	1814	1814	1814
Remaining infiltration flow (with MVU)	m3/h	1365	809	707	613	541	495	474	473	473	473
Ref. natural airflow (without MVU)	m3/h	2418	2433	2370	2226	2004	1762	1540	1407	1335	1269
NR-AHU-M 5500-14500 m3/h											
Avg. mechanical flow per VU	m3/h	4320	4320	4320	4320	4320	4320	4320	4320	4320	4320
Remaining infiltration flow (with MVU)	m3/h	3250	2072	1753	1504	1311	1185	1128	1125	1125	1125
Ref. natural airflow (without MVU)	m3/h	4069	3345	3128	2950	2721	2530	2365	2290	2269	2240
NR-AHU-L > 14500 m3/h											
Avg. mechanical flow per VU	m3/h	12096	12096	12096	12096	12096	12096	12096	12096	12096	12096
Remaining infiltration flow (with MVU)	m3/h	9100	5803	4909	4212	3672	3317	3158	3150	3150	3150
Ref. natural airflow (without MVU)	m3/h	11398	9367	8758	8261	7619	7085	6623	6413	6354	6271
LS, stock average unit capacities in lm											
LFL (T12,T8h,T8t,T5,other)	lm	2281	2295	2557	2787	2869	2885	2889	2891	2889	2878
HID (HPM, HPS, MH)	lm	12044	13032	13343	14121	14475	14975	15701	16395	17034	17603
CFLni (all shapes)	lm	690	690	690	690	690	690	690	690	690	690
CFLi (retrofit for GLS, HL)	lm	523	561	582	599	605	605	605	605	605	605
GLS (DLS & NDLS)	lm	494	496	482	482	483	483	483	483	483	483
HL (DLS & NDLS, LV & MV)	lm	746	593	561	597	580	564	555	550	548	546
LED replacing LFL (retrofit & luminaire)	lm			3103	3172	3124	3096	3090	3089	3093	3100
LED replacing HID (retrofit & luminaire)	lm			12672	13826	13863	14038	14285	14484	14618	14699
LED replacing CFLni (retrofit & luminaire)	lm			731	731	731	731	731	730	730	730
LED replacing DLS (retrofit & luminaire)	lm			472	511	516	523	528	532	535	537
LED replacing NDLS (retrofit & luminaire)	lm		550	584	679	670	664	660	658	657	657
LS, unit fpe-hours in h/a (see LoadNotes)											
LFL (T12,T8h,T8t,T5,other)	h/a	1949	1975	2004	2028	2033	2020	1999	1985	1972	1949
HID (HPM, HPS, MH)	h/a	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
CFLni (all shapes)	h/a	1251	1213	1190	1184	1174	1114	1003	929	856	797
CFLi (retrofit for GLS, HL)	h/a	500	500	500	500	500	500	500	500	500	500
GLS (DLS & NDLS)	h/a	450	450	450	450	450	450	450	450	450	450
HL (DLS & NDLS, LV & MV)	h/a	450	450	450	450	450	450	450	450	450	450
LED replacing LFL (retrofit & luminaire)	h/a			1696	2044	2102	2119	2122	2118	2118	2121
LED replacing HID (retrofit & luminaire)	h/a			4000	4000	4000	4000	4000	4000	4000	4000
LED replacing CFLni (retrofit & luminaire)	h/a			1374	1377	1353	1359	1347	1323	1320	1324
LED replacing DLS (retrofit & luminaire)	h/a			461	461	461	461	461	461	461	461
LED replacing NDLS (retrofit & luminaire)	h/a		461	462	484	477	486	493	495	497	497
DP TV viewable area (avg. all types)	dm²	10	28	43	51	59	68	79	92	106	123
DP TV share of UHD / 3D / HDR	%	0%	2%	10%	25%	38%	50%	50%	50%	50%	50%
DP TV viewing time (on-mode)	h on / d	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
DP TV standby time	h sb / d	6.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
DP Monitor viewable area	dm²	5.0	11.4	13.5	15.9	17.9	20.1	22.3	24.5	26.8	29.0
DP Monitor share of UHD / 3D / HDR	%	0%	2%	10%	25%	38%	50%	50%	50%	50%	50%
DP Monitor viewing time (on-mode)	h on / d	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
DP Monitor standby time	h sb / d	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
DP Signage viewable area	dm²	16	46	71	84	97	113	130	151	175	202
DP Signage display time (on-mode)	h on / d	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
DP Signage standby time	h sb / d	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8
SSTB	TEC	1	1	1	1	1	1	1	1	1	1
CSTB (low-power modes)	TECshare	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
CSTB (all covered modes)	TEC	1	1	1	1	1	1	1	1	1	1
Game consoles > 20 W Active modes (SRI)	h/d	1.5	1.7	3.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Game consoles > 20 W Non-Active (CR)	h/d	22.5	22.3	21.0	20.9	20.9	20.9	20.9	20.9	20.9	20.9
Game consoles < 20 W Non-Active (CR)	h/d	22.5	22.4	22.2	22.2	22.2	22.2	22.2	22.2	22.2	22.2
Game consoles < 20 W Active (no reg.)	h/d	1.5	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8	1.8

LOAD, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Stock average PSU output for ES&DS (8760 h/a)											
ES tower 1-socket traditional	kWh/a	723	674	498	408	376	375	375	375	375	375
ES rack 1-socket traditional	kWh/a	920	838	591	531	524	554	554	554	554	554
ES rack 2-socket traditional	kWh/a	1905	1835	1565	1309	1277	1276	1276	1276	1276	1276
ES rack 2-socket cloud	kWh/a		2123	1893	1661	1642	1642	1642	1642	1642	1642
ES rack 4-socket traditional	kWh/a	3854	3397	3047	3491	3482	3482	3482	3482	3482	3482
ES rack 4-socket cloud	kWh/a		4211	4425	4841	4862	4862	4862	4862	4862	4862
ES rack 2-socket resilient trad.	kWh/a	5694	5562	4981	3860	3331	3323	3323	3323	3323	3323
ES rack 2-socket resilient cloud	kWh/a		5514	4878	3852	3331	3323	3323	3323	3323	3323
ES rack 4-socket resilient trad.	kWh/a	5606	5485	5123	4762	4607	4605	4605	4605	4605	4605
ES rack 4-socket resilient cloud	kWh/a		6150	6027	5812	5708	5706	5706	5706	5706	5706
ES blade 1-socket traditional	kWh/a	753	733	662	593	576	602	602	602	602	602
ES blade 2-socket traditional	kWh/a	2488	2426	2156	1940	1915	1914	1914	1914	1914	1914
ES blade 2-socket cloud	kWh/a		2820	2670	2576	2567	2567	2567	2567	2567	2567
ES blade 4-socket traditional	kWh/a	5606	5504	5241	4955	4810	4808	4808	4808	4808	4808
ES blade 4-socket cloud	kWh/a		6197	6264	6137	6043	6042	6042	6042	6042	6042
DS Online 2	kWh/a	3504	3504	3677	4737	5595	6184	6184	6184	6184	6184
DS Online 3	kWh/a	845	815	932	1381	1642	1815	1815	1815	1815	1815
DS Online 4	kWh/a	15330	15330	16068	20688	24477	27054	27054	27054	27054	27054
DS Data Storage products total											
PC Desktop	TEC	1	1	1	1	1	1	1	1	1	1
PC Integrated Desktop	TEC	1	1	1	1	1	1	1	1	1	1
PC Notebook	TEC	1	1	1	1	1	1	1	1	1	1
PC Tablet/slate	TEC	1	1	1	1	1	1	1	1	1	1
PC Thin client	TEC	1	1	1	1	1	1	1	1	1	1
PC Integrated Thin Client	TEC	1	1	1	1	1	1	1	1	1	1
PC Small-scale Server	TEC	1	1	1	1	1	1	1	1	1	1
PC Workstation	TEC	1	1	1	1	1	1	1	1	1	1
images printed per year per device											
Inkjet Printer	ipy	1000	807	574	417	331	300	287	279	274	272
Inkjet MFD	ipy	1000	807	574	417	331	300	287	279	274	272
EP / Laser Printer mono	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
EP / Laser Printer colour	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
EP / Laser Copier mono	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
EP / Laser Copier colour	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
EP / Laser MFD mono	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
EP / Laser MFD colour	ipy	28000	22583	16065	11686	9282	8389	8038	7800	7665	7626
(further details on sheet RESOURCES)											
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	h/d	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
SB Electric toothbrushes (off mode)	h/d	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9	21.9
SB Audio speakers (wired) (sb & off modes)	h/d	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3
SB Audio speakers (wireless) (nsb & off modes)	h/d	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3	21.3
SB Small appliances (sb & off modes)	h/d	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0	12.0
SB Media boxes /sticks (sb mode)	h/d	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
SB Media players and recorders (sb mode)	h/d	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0	21.0
SB Projectors (sb & off modes)	h/d	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6	21.6
SB Home phones (nsb mode)	h/d	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0	22.0
SB Office phones (nsb mode)	h/d	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
SB Home NAS (nsb mode)	h/d	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0	17.0
SB Home Network Equipment (nsb mode)	h/d	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SB Office Network Equipment (nsb mode)	h/d	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5	8.5
SB Coffee makers (off mode)	h/d	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3	22.3
Regulated also for (networked) standby ((n)sb)											
(already accounted elsewhere; here for info only)											
SB Washing Machines (sb & off modes)	h/d	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
SB Dishwashers (sb & off modes)	h/d	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
SB Laundry Dryers (sb & off modes)	h/d	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
SB Electric Ovens (sb mode)	h/d	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7
SB Electric Hobs (sb mode)	h/d	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7
SB Complex Set-Top Boxes (low-power modes)	TECshare	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65	0.65
SB Game consoles (non-active modes)	h/d	see game consoles above									
SB IE Inkjet Printers (nsb mode)	TECshare	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
SB IE Inkjet MFDs (nsb mode)	TECshare	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90	0.90
SB IE Laser Printers (nsb mode)	TECshare	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
SB IE Laser Copiers (nsb mode)	TECshare	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75
SB IE Laser MFDs (nsb mode)	TECshare	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75	0.75

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EPS Active output energy per unit per year											
EPS ≤ 6W, low-V	W.h / a	2088	2088	2088	2088	2088	2088	2088	2088	2088	2088
EPS 6–10 W	W.h / a	3796	3796	3796	3796	3796	3796	3796	3796	3796	3796
EPS 10–12 W	W.h / a	60145	60145	60145	60145	60145	60145	60145	60145	60145	60145
EPS 15–20 W	W.h / a	7921	7921	7921	7921	7921	7921	7921	7921	7921	7921
EPS 20–30 W	W.h / a	57477	57477	57477	57477	57477	57477	57477	57477	57477	57477
EPS 30–65 W, multiple-V	W.h / a	73359	73359	73359	73359	73359	73359	73359	73359	73359	73359
EPS 30-65 W	W.h / a	58990	58990	58990	58990	58990	58990	58990	58990	58990	58990
EPS 65–120 W	W.h / a	57477	57477	57477	57477	57477	57477	57477	57477	57477	57477
EPS 65–120 W, multiple-V	W.h / a	84972	84972	84972	84972	84972	84972	84972	84972	84972	84972
EPS 12–15 W	W.h / a	20148	20148	20148	20148	20148	20148	20148	20148	20148	20148
EPS No-load hours per unit per year											
EPS ≤ 6W, low-V	h / a	3577	3577	3577	3577	3577	3577	3577	3577	3577	3577
EPS 6–10 W	h / a	3577	3577	3577	3577	3577	3577	3577	3577	3577	3577
EPS 10–12 W	h / a	949	949	949	949	949	949	949	949	949	949
EPS 15–20 W	h / a	3650	3650	3650	3650	3650	3650	3650	3650	3650	3650
EPS 20–30 W	h / a	0	0	0	0	0	0	0	0	0	0
EPS 30–65 W, multiple-V	h / a	0	0	0	0	0	0	0	0	0	0
EPS 30-65 W	h / a	0	0	0	0	0	0	0	0	0	0
EPS 65–120 W	h / a	0	0	0	0	0	0	0	0	0	0
EPS 65–120 W, multiple-V	h / a	0	0	0	0	0	0	0	0	0	0
EPS 12–15 W	h / a	0	0	0	0	0	0	0	0	0	0
RF Net volume Vnet (CECED 2013)	ltr	203	259	278	297	316	337	358	380	401	422
RF Estimated equivalent volume Veq	ltr	274	350	377	401	428	456	485	514	542	571
RF SAEc (EEI=100)	kWh/a	468	526	545	563	582	602	623	644	664	685
CF open vertical chilled multi deck (RVC2)	SAE,kWh/a	17836	17836	17836	17836	17836	17836	17836	17836	17836	17836
CF open horizontal frozen island (RHF4)	SAE,kWh/a	12475	12475	12475	12475	12475	12475	12475	12475	12475	12475
CF other supermarket display (non-BCs)	SAE,kWh/a	8500	8500	8500	8500	8500	8500	8500	8500	8500	8500
CF Plug in one door beverage cooler	SAE,kWh/a	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
CF Plug in horizontal ice cream freezer	SAE,kWh/a	1686	1686	1686	1686	1686	1686	1686	1686	1686	1686
CF Spiral vending machine	SAE,kWh/a	3524	3524	3524	3524	3524	3524	3524	3524	3524	3524
PF Storage cabinet Chilled Vertical (CV)	SAEC,kWh/a	1595	1595	1595	1595	1595	1595	1595	1595	1595	1595
PF Storage cabinet Frozen Vertical (FV)	SAEC,kWh/a	4429	4429	4429	4429	4429	4429	4429	4429	4429	4429
PF Storage cabinet Chilled Horizontal (CH)	SAEC,kWh/a	2557	2557	2557	2557	2557	2557	2557	2557	2557	2557
PF Storage cabinet Frozen Horizontal (FH)	SAEC,kWh/a	3548	3548	3548	3548	3548	3548	3548	3548	3548	3548
PF Storage cabinets All types	**SAEC,kWh/a**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**	**2584**
PF Process Chiller AC MT S ≤ 300 kW	Mwhcool/a	741	741	741	741	741	741	741	741	741	741
PF Process Chiller AC MT L > 300 kW	Mwhcool/a	2689	2689	2689	2689	2689	2689	2689	2689	2689	2689
PF Process Chiller AC LT S ≤ 200 kW	Mwhcool/a	599	599	599	599	599	599	599	599	599	599
PF Process Chiller AC LT L > 200 kW	Mwhcool/a	2131	2131	2131	2131	2131	2131	2131	2131	2131	2131
PF Process Chiller WC MT S ≤ 300 kW	Mwhcool/a	923	923	923	923	923	923	923	923	923	923
PF Process Chiller WC MT L > 300 kW	Mwhcool/a	3192	3192	3192	3192	3192	3192	3192	3192	3192	3192
PF Process Chiller WC LT S ≤ 200 kW	Mwhcool/a	752	752	752	752	752	752	752	752	752	752
PF Process Chiller WC LT L > 200 kW	Mwhcool/a	2601	2601	2601	2601	2601	2601	2601	2601	2601	2601
PF Process Chiller All MT&LT	**Mwhcool/a**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**	**1194**
PF Condensing Unit MT S 0.2-1 kW	Mwhcool/a	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
PF Condensing Unit MT M 1-5 kW	Mwhcool/a	17	17	17	17	17	17	17	17	17	17
PF Condensing Unit MT L 5-20 kW	Mwhcool/a	66	66	66	66	66	66	66	66	66	66
PF Condensing Unit MT XL 20-50 kW	Mwhcool/a	203	203	203	203	203	203	203	203	203	203
PF Condensing Unit LT S 0.1-0.4 kW	Mwhcool/a	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT M 0.4-2 kW	Mwhcool/a	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7	5.7
PF Condensing Unit LT L 2-8 kW	Mwhcool/a	28	28	28	28	28	28	28	28	28	28
PF Condensing Unit LT XL 8-20 kW	Mwhcool/a	196	196	196	196	196	196	196	196	196	196
PF Condensing Unit, All MT&LT	**Mwhcool/a**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**	**27**
CA Elec. Hobs (heat + keep warm 20 min. 1229 ltr water by 75 K)	ltr/a	1229	1229	1229	1229	1229	1229	1229	1229	1229	1229
CA Elec. Hobs, low-power modes	h/d	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7
CA Electric Ovens (110 cycles/a)	TEC	1	1	1	1	1	1	1	1	1	1
CA Electric Ovens , low-power modes	h/d	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7	23.7
CA Gas Hobs (heating 1229 ltr water by 75 K)	kWh/a	181	181	181	181	181	181	181	181	181	181
CA Gas Ovens (110 cycles/a)	TEC	1	1	1	1	1	1	1	1	1	1
CA Range Hoods (365 h/a extraction)	TEC	1	1	1	1	1	1	1	1	1	1
WM Programme temperature, in °C	°C	56.0	43.0	40.7	40.0	39.2	38.3	37.5	36.7	35.8	35.0
WM Rated capacity ***c*** , in kg	kg/cycle	4.1	6.9	7.3	7.6	7.6	7.6	7.6	7.6	7.6	7.6
WM Real user load, in kg	kg/cycle	2.9	3.8	3.9	4.0	4.0	4.0	4.0	4.0	4.0	4.0
WM Cycles/yr per unit	cyc/a	237	187	180	174	174	174	174	174	174	174
WM Washing Machines, low-power modes	h/d	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
WM SCEw (EEIw=100; CR 2019/2023)	kWh/cyc	0.70	0.86	0.88	0.89	0.89	0.89	0.89	0.89	0.89	0.89

LOAD, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WD Rated capacity wash-only, in kg	kg/cycle	4.7	6.7	7.8	8.0	8.0	8.0	8.0	8.0	8.0	8.0
WD Rated capacity wash+dry, in kg	kg/cycle	2.4	4.4	5.2	6.0	6.0	6.0	6.0	6.0	6.0	6.0
WD Real user load wash-only, in kg	kg/cycle	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
WD Real user load wash+dry, in kg	kg/cycle	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
WD Cycles/yr/unit, wash-only	cyc/a	81	81	81	81	81	81	81	81	81	81
WD Cycles/yr/unit, wash+dry	cyc/a	139	139	139	139	139	139	139	139	139	139
WD Washer-Dryers, low-power modes	h/d	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0	23.0
WD SCEwd (EEIwd=100; CR 2019/2023)	kWh/cyc	1.86	3.53	4.08	4.59	4.59	4.59	4.59	4.59	4.59	4.59
DW Real average programme temperature, in	°C	61.6	57.6	56.6	55.6	54.6	53.6	52.6	51.6	50.6	49.6
DW Rated capacity, ***ps,*** in place settings	ps/cycl	11.9	12.6	12.7	12.8	12.8	12.8	12.8	12.8	12.8	12.8
DW Real load, in place settings	ps/cycl	6.7	8.8	9.1	9.3	9.3	9.3	9.3	9.3	9.3	9.3
DW Cycles/yr per unit	cyc/a	220	220	220	220	220	220	220	220	220	220
DW Dishwashers, low-power modes	h/d	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
DW SPEC (EEI=100; CR 2019/2022)	kWh/cyc	1.63	1.65	1.66	1.66	1.66	1.66	1.66	1.66	1.66	1.66
LD Spin speeds of stock WM	rpm	800	950	1000	1050	1100	1200	1300	1400	1500	1600
LD Real inital moisture of drying load	%	70%	60%	58%	56%	55%	55%	56%	56%	57%	57%
LD Standard moisture	%	60%	60%	60%	60%	60%	60%	60%	60%	60%	60%
LD correction factor for initial moisture	-	*1.14*	*1.00*	*0.97*	*0.95*	*0.94*	*0.93*	*0.94*	*0.94*	*0.95*	*0.96*
LD Rated Capacity	kg/cycle	4.81	6.6	7.1	7.3	7.3	7.3	7.3	7.3	7.3	7.3
LD Real Capacity (71% => 62% of rated)	kg/cycle	3.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4	4.4
LD Cycles real per year	cyc/a	160	149	123	107	107	107	107	107	107	107
LD condensing heat pump SAEc (EEI=100)	kWh elec/a	492	631	670	684	688	689	689	689	689	689
LD condensing heat element SAEc (EEI=100)	kWh elec/a	492	631	670	684	688	689	689	689	689	689
LD vented electric SAEc (EEI=100, 130 min)	kWh elec/a	427	566	605	619	623	624	624	624	624	624
LD vented gas (EEI=100, 130 min)	kWh elec/a	427	566	605	619	623	624	624	624	624	624
LD Laundry Dryers, low-power modes	h/d	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
VC Cylinder Domestic mains	h/a	50	41	40	38	37	38	38	37	36	35
VC Upright Domestic mains	h/a	50	41	40	38	37	38	38	37	36	35
VC Handstick Domestic mains	h/a	50	41	40	38	37	38	38	37	36	35
VC Cylinder Commercial mains	h/a	300	300	300	300	300	300	300	300	300	300
VC Upright Commercial mains	h/a	300	300	300	300	300	300	300	300	300	300
VC Cordless - domestic - cleaning	h/a	63	52	50	48	47	47	48	47	45	45
VC Cordless - commercial - cleaning	h/a	300	300	300	300	300	300	300	300	300	300
VC Robot - domestic - cleaning	h/a	104	86	83	79	78	78	79	77	75	74
VC Robot - commercial - cleaning	h/a	300	300	300	300	300	300	300	300	300	300
VC Cylinder Domestic mains	m2/a/unit	4261	3801	3728	3537	3505	3527	3539	3473	3376	3315
VC Upright Domestic mains	m2/a/unit	4261	3801	3728	3537	3505	3527	3539	3473	3376	3315
VC Handstick Domestic mains	m2/a/unit	4261	3801	3728	3537	3505	3527	3539	3473	3376	3315
VC Cylinder Commercial mains	m2/a/unit	24073	24073	24073	24073	24073	24073	24073	24073	24073	24073
VC Upright Commercial mains	m2/a/unit	24073	24073	24073	24073	24073	24073	24073	24073	24073	24073
VC Cordless - domestic - cleaning	m2/a/unit	4261	3801	3728	3537	3505	3527	3539	3473	3376	3315
VC Cordless - commercial - cleaning	m2/a/unit	24073	24073	24073	24073	24073	24073	24073	24073	24073	24073
VC Robot - domestic - cleaning	m2/a/unit	0	3801	3728	3537	3505	3527	3539	3473	3376	3315
VC Robot - commercial - cleaning	m2/a/unit	0	24073	24073	24073	24073	24073	24073	24073	24073	24073
FAN Axial<300Pa (all FAN types >125W)	kWh flow/ a	247	247	247	247	247	247	247	247	247	247
FAN Axial>300Pa	kWh flow/ a	489	489	489	489	489	489	489	489	489	489
FAN Centr.FC	kWh flow/ a	212	212	212	212	212	212	212	212	212	212
FAN Centr.BC-free	kWh flow/ a	3180	3180	3180	3180	3180	3180	3180	3180	3180	3180
FAN Centr.BC	kWh flow/ a	3078	3078	3078	3078	3078	3078	3078	3078	3078	3078
FAN Cross-flow	kWh flow/ a	28	28	28	28	28	28	28	28	28	28
MT motors											
Medium (S) 3-ph 0.75-7.5 kW no VSD	kWh out/a	1756	1756	1756	1756	1756	1756	1756	1756	1756	1756
Medium (M) 3-ph 7.5-75 kW no VSD	kWh out/a	20020	20020	20020	20020	20020	20020	20020	20020	20020	20020
Medium (L) 3-ph 75-375 kW no VSD	kWh out/a	400400	400400	400400	400400	400400	400400	400400	400400	400400	400400
Medium (S) 3-ph 0.75-7.5 kW with VSD	kWh out/a	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
Medium (M) 3-ph 7.5-75 kW with VSD	kWh out/a	12012	12012	12012	12012	12012	12012	12012	12012	12012	12012
Medium (L) 3-ph 75-375 kW with VSD	kWh out/a	240240	240240	240240	240240	240240	240240	240240	240240	240240	240240
Small 1 ph 0.12-0.75 kW no VSD	kWh out/a	59	59	59	59	59	59	59	59	59	59
Small 1 ph 0.12-0.75 kW with VSD	kWh out/a	36	36	36	36	36	36	36	36	36	36
Small 3 ph 0.12-0.75 kW no VSD	kWh out/a	296	296	296	296	296	296	296	296	296	296
Small 3 ph 0.12-0.75 kW with VSD	kWh out/a	178	178	178	178	178	178	178	178	178	178
Large 3-ph LV 375-1000 kW no VSD	kWh out/a	1716000	1716000	1716000	1716000	1716000	1716000	1716000	1716000	1716000	1716000
Large 3-ph LV 375-1000kW with VSD	kWh out/a	1188000	1188000	1188000	1188000	1188000	1188000	1188000	1188000	1188000	1188000
Explosion motors (S) 3-ph 0.75-7.5 kW	kWh out/a	1411	1411	1411	1411	1411	1411	1411	1411	1411	1411
Explosion motors (M) 3-ph 7.5-75 kW	kWh out/a	17160	17160	17160	17160	17160	17160	17160	17160	17160	17160
Explosion motors (L) 3-ph 75-375 kW	kWh out/a	343200	343200	343200	343200	343200	343200	343200	343200	343200	343200

LOAD, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Brake motors (S) 3-ph 0.75-7.5 kW	kWh out/a	784	784	784	784	784	784	784	784	784	784
Brake motors (M) 3-ph 7.5-75 kW	kWh out/a	9152	9152	9152	9152	9152	9152	9152	9152	9152	9152
Brake motors (L) 3-ph 75-375 kW	kWh out/a	137280	137280	137280	137280	137280	137280	137280	137280	137280	137280
8-pole motors (S) 3-ph 0.75-7.5 kW	kWh out/a	1411	1411	1411	1411	1411	1411	1411	1411	1411	1411
8-pole motors (M) 3-ph 7.5-75 kW	kWh out/a	17160	17160	17160	17160	17160	17160	17160	17160	17160	17160
8-pole motors (L) 3-ph 75-375 kW	kWh out/a	343200	343200	343200	343200	343200	343200	343200	343200	343200	343200
1-phase motors >0.75 kW (no VSD)	kWh out/a	440	440	440	440	440	440	440	440	440	440
ESOB<45_VF	kWh flow/a	11628	11628	11628	11628	11628	11628	11628	11628	11628	11628
ESOB<45_CF	kWh flow/a	9626	9626	9626	9626	9626	9626	9626	9626	9626	9626
ESOB<45_VSD-VF	kWh flow/a	7911	7911	7911	7911	7911	7911	7911	7911	7911	7911
ESOB_45-150_VF	kWh flow/a	114997	114997	114997	114997	114997	114997	114997	114997	114997	114997
ESOB_45-150_CF	kWh flow/a	96518	96518	96518	96518	96518	96518	96518	96518	96518	96518
ESOB_45-150_VSD-VF	kWh flow/a	79421	79421	79421	79421	79421	79421	79421	79421	79421	79421
ESCC<45_VF	kWh flow/a	9384	9384	9384	9384	9384	9384	9384	9384	9384	9384
ESCC<45_CF	kWh flow/a	7751	7751	7751	7751	7751	7751	7751	7751	7751	7751
ESCC<45_VSD-VF	kWh flow/a	6368	6368	6368	6368	6368	6368	6368	6368	6368	6368
ESCC_45-150_VF	kWh flow/a	110332	110332	110332	110332	110332	110332	110332	110332	110332	110332
ESCC_45-150_CF	kWh flow/a	92602	92602	92602	92602	92602	92602	92602	92602	92602	92602
ESCC_45-150_VSD-VF	kWh flow/a	76199	76199	76199	76199	76199	76199	76199	76199	76199	76199
ESCCi<45_VF	kWh flow/a	7377	7377	7377	7377	7377	7377	7377	7377	7377	7377
ESCCi<45_CF	kWh flow/a	6076	6076	6076	6076	6076	6076	6076	6076	6076	6076
ESCCi<45_VSD-VF	kWh flow/a	4991	4991	4991	4991	4991	4991	4991	4991	4991	4991
ESCCi_45-150_VF	kWh flow/a	105136	105136	105136	105136	105136	105136	105136	105136	105136	105136
ESCCi_45-150_CF	kWh flow/a	88241	88241	88241	88241	88241	88241	88241	88241	88241	88241
ESCCi_45-150_VSD-VF	kWh flow/a	72610	72610	72610	72610	72610	72610	72610	72610	72610	72610
MSSB<6"_VF	kWh flow/a	1199	1199	1199	1199	1199	1199	1199	1199	1199	1199
MSSB<6"_CF	kWh flow/a	1854	1854	1854	1854	1854	1854	1854	1854	1854	1854
MSSB<6"_VSD-VF	kWh flow/a	684	684	684	684	684	684	684	684	684	684
MS-V<25bar_VF	kWh flow/a	6635	6635	6635	6635	6635	6635	6635	6635	6635	6635
MS-V<25bar_CF	kWh flow/a	5265	5265	5265	5265	5265	5265	5265	5265	5265	5265
MS-V<25bar_VSD-VF	kWh flow/a	4325	4325	4325	4325	4325	4325	4325	4325	4325	4325
WE arc-on time	h/a/unit	440	440	440	440	440	440	440	440	440	440
WE idle time	h/a/unit	1560	1560	1560	1560	1560	1560	1560	1560	1560	1560
WE arc-on output power	kW	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
WE Welding Equipment (arc-on output)	kWh/a/unit	1506	1506	1506	1506	1506	1506	1506	1506	1506	1506
TRAFO Distribution	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Industry dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Power	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER oil	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO DER dry	TEC	1	1	1	1	1	1	1	1	1	1
TRAFO Small	TEC	1	1	1	1	1	1	1	1	1	1
(annual km driven per vehicle / 100)											
Tyres C1, replacement for cars	100 km/a	135	135	135	135	135	135	135	135	135	135
Tyres C1, OEM for cars	100 km/a	135	135	135	135	135	135	135	135	135	135
Tyres C2, replacement for vans	100 km/a	210	210	210	210	210	210	210	210	210	210
Tyres C2, OEM for vans	100 km/a	210	210	210	210	210	210	210	210	210	210
Tyres C3, replacement for trucks/busses	100 km/a	575	575	575	575	575	575	575	575	575	575
Tyres C3, OEM for trucks/busses	100 km/a	575	575	575	575	575	575	575	575	575	575

LOAD, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Note for printed version: for products not listed below, ECO-load is identical to BAU-load											
CHB Gas non-condensing	kWh heat/a	10705	9038	8647	8238	7822	7420	7062	6745	6448	6165
CHB Gas condensing	kWh heat/a	10705	9038	8647	8238	7822	7420	7062	6745	6448	6165
CHB Gas Jet burner non-condensing	kWh heat/a	12846	10845	10376	9886	9387	8904	8475	8094	7738	7397
CHB Gas Jet burner condensing	kWh heat/a	12846	10845	10376	9886	9387	8904	8475	8094	7738	7397
CHB Oil Jet burner non-condensing	kWh heat/a	21838	18437	17640	16806	15958	15136	14407	13760	13154	12576
CHB Oil Jet burner condensing	kWh heat/a	17984	15184	14527	13840	13142	12465	11865	11332	10833	10356
CHB Electric Joule-effect	kWh heat/a	12846	10845	10376	9886	9387	8904	8475	8094	7738	7397
CHB Hybrid (gas-electric)	kWh heat/a	10705	9038	8647	8238	7822	7420	7062	6745	6448	6165
CHB Electric Heat Pump	kWh heat/a	10705	9038	8647	8238	7822	7420	7062	6745	6448	6165
CHB Gas Heat Pump	kWh heat/a	10705	9038	8647	8238	7822	7420	7062	6745	6448	6165
CHB micro CHP	kWh heat/a	12846	10845	10376	9886	9387	8904	8475	8094	7738	7397
CHB Solar combi (16 m2)	kWh heat/a	12846	10845	10376	9886	9387	8904	8475	8094	7738	7397
SFB Wood Manual	kWh heat/a	14580	14580	13864	13160	12456	11774	11146	10568	10028	9515
SFB Wood Direct Draft	kWh heat/a	16200	16200	15404	14622	13840	13082	12384	11742	11142	10573
SFB Coal	kWh heat/a	20250	20250	19255	18277	17300	16352	15480	14678	13927	13216
SFB Pellets	kWh heat/a	20250	20250	19238	18199	17159	16161	15274	14485	13750	13053
SFB Wood chips	kWh heat/a	129600	129600	122725	114731	106660	99139	93127	88387	84027	79877
AC rooftop (rev)	kWh heat/a	119579	98000	92801	86756	80653	74966	70420	66836	63539	60400
AC splits (rev)	kWh heat/a	28528	23380	22145	20720	19282	17940	16860	16001	15210	14457
AC VRF (rev)	kWh heat/a	47831	39200	37122	34710	32275	30005	28188	26753	25433	24176
ACF (rev)	kWh heat/a	68331	56000	53037	49607	46146	42917	40326	38272	36381	34582
AHF	kWh heat/a	86730	71079	67315	62951	58547	54440	51148	48544	46147	43866
AHE	kWh heat/a	29285	24000	22729	21256	19769	18382	17270	16391	15582	14811
LH open fireplace	kWh heat/a	336	336	336	335	333	331	329	328	327	326
LH closed fireplace/inset	kWh heat/a	2351	2128	2074	2018	1958	1898	1842	1790	1741	1694
LH wood stove	kWh heat/a	2979	2696	2628	2557	2481	2404	2333	2268	2206	2146
LH coal stove	kWh heat/a	2979	2696	2628	2557	2481	2404	2333	2268	2206	2146
LH cooker	kWh heat/a	1237	1120	1092	1062	1031	999	969	942	916	891
LH SHR stove	kWh heat/a	2979	2696	2628	2557	2481	2404	2333	2268	2206	2146
LH pellet stove	kWh heat/a	3562	3224	3143	3058	2967	2875	2790	2712	2638	2566
LH Electric portable	kWh heat/a	301	254	243	231	220	208	198	189	181	173
LH Electric fixed > 250W	kWh heat/a	974	821	786	748	710	673	640	611	584	559
LH Electric fixed ≤ 250W	kWh heat/a	244	205	196	187	177	168	160	153	146	140
LH Electric storage	kWh heat/a	1257	1060	1014	965	916	868	826	789	754	721
LH Electric underfloor	kWh heat/a	464	391	374	356	338	320	305	291	278	266
LH Electric visibly glowing > 1.2 kW	kWh heat/a	1159	977	934	887	839	793	753	719	688	658
LH Electric visibly glowing ≤ 1.2 kW	kWh heat/a	579	488	467	445	422	400	381	364	348	332
LH Electric Towel Heaters	kWh heat/a	319	269	257	246	235	224	214	204	195	186
LH Gas luminous (commercial)	kWh heat/a	15240	12848	12253	11536	10801	10110	9565	9142	8753	8379
LH Gaseous Tube (commercial < 120 kW)	kWh heat/a	22860	19272	18379	17304	16201	15165	14347	13713	13129	12569
LH Gas open front	kWh heat/a	2134	1799	1723	1647	1570	1494	1425	1360	1300	1242
LH Gas closed front	kWh heat/a	2134	1799	1723	1647	1570	1494	1425	1360	1300	1242
LH Gas balanced flue	kWh heat/a	2134	1799	1723	1647	1570	1494	1425	1360	1300	1242
LH Gas flueless	kWh heat/a	191	161	154	147	140	135	130	124	119	114
LH Liquid tube (commercial < 120 kW)	kWh heat/a	22860	19272	18379	17304	16201	15165	14347	13713	13129	12569
LH Liquid open front	kWh heat/a	1016	857	820	784	747	712	678	648	619	592
LH Liquid closed front	kWh heat/a	2032	1713	1641	1568	1495	1423	1357	1296	1238	1183
LH Liquid balanced flue	kWh heat/a	2032	1713	1641	1568	1495	1423	1357	1296	1238	1183
LH Liquid flueless	kWh heat/a	191	161	154	147	140	135	130	124	119	114
RAC fixed < 6 kW, reversible, heating	kWh heat/a	5199	4383	4194	3996	3795	3601	3427	3273	3129	2992
RAC fixed 6-12 kW, reversible, heating	kWh heat/a	9705	8182	7819	7420	7012	6621	6290	6009	5747	5497
RAC portable < 12 kW, reversible, heating	kWh heat/a	0	0	0	0	0	0	0	0	0	0

LOAD, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
R-UVU ≤ 100 m3/h for Extract Spaces											
Avg. mechanical flow per VU	m3/h	22	22	21	20	18	16	16	16	16	16
Remaining infiltration flow (with MVU)	m3/h	17	11	9	8	7	6	6	6	6	6
Ref. natural airflow (without MVU)	m3/h	27	24	23	22	19	17	16	16	17	18
R-UVU ≤ 100 m3/h for Habitable Spaces											
Avg. mechanical flow per VU	m3/h	0	0	0	0	29	29	28	28	28	28
Remaining infiltration flow (with MVU)	m3/h	0	0	0	0	9	9	9	9	9	9
Ref. natural airflow (without MVU)	m3/h	0	0	0	0	49	49	49	48	44	38
R-BVU ≤ 100 m3/h for Habitable Spaces											
Avg. mechanical flow per VU	m3/h	20	20	21	24	28	29	29	29	28	28
Remaining infiltration flow (with MVU)	m3/h	26	15	13	11	9	9	9	9	9	9
Ref. natural airflow (without MVU)	m3/h	49	47	46	45	46	46	46	44	39	35
R-UVU 100-250 m3/h											
Avg. mechanical flow per VU	m3/h	54	56	61	72	86	96	100	101	101	102
Remaining infiltration flow (with MVU)	m3/h	130	81	70	61	52	47	45	45	45	45
Ref. natural airflow (without MVU)	m3/h	181	178	166	150	126	114	109	109	111	115
R-BVU 100-250 m3/h											
Avg. mechanical flow per VU	m3/h	54	54	58	67	81	85	86	86	86	86
Remaining infiltration flow (with MVU)	m3/h	130	78	68	59	49	46	45	45	45	45
Ref. natural airflow (without MVU)	m3/h	248	228	216	206	208	215	218	211	187	169
R-UVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	294	327	356	371	372	372	372	372	372
Remaining infiltration flow (with MVU)	m3/h	520	325	281	242	208	189	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	725	711	664	600	502	458	437	434	446	461
R-BVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	244	259	294	349	367	371	371	371	370
Remaining infiltration flow (with MVU)	m3/h	520	311	271	237	194	183	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	992	911	863	823	832	862	873	843	747	678
R-UVU > 1000 m3/h											
Avg. mechanical flow per VU	m3/h	508	508	533	598	675	743	773	775	775	775
Remaining infiltration flow (with MVU)	m3/h	1083	689	588	505	438	395	376	375	375	375
Ref. natural airflow (without MVU)	m3/h	1808	1310	1129	962	815	709	641	604	585	564
R-BVU 1000-2500 m3/h											
Avg. mechanical flow per VU	m3/h	0	763	813	919	1031	1123	1159	1160	1159	1157
Remaining infiltration flow (with MVU)	m3/h	0	975	846	735	646	587	564	563	563	563
Ref. natural airflow (without MVU)	m3/h	0	3027	2818	2588	2300	2048	1884	1768	1686	1607
NR-UVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	244	289	326	357	371	372	372	372	372	372
Remaining infiltration flow (with MVU)	m3/h	520	331	282	242	210	190	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	868	629	542	462	391	340	308	290	281	271
NR-BVU 250-1000 m3/h											
Avg. mechanical flow per VU	m3/h	0	244	260	294	330	359	371	371	371	370
Remaining infiltration flow (with MVU)	m3/h	0	312	271	235	207	188	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	0	969	902	828	736	655	603	566	539	514
NR-UVU > 1000 m3/h											
Avg. mechanical flow per VU	m3/h	691	691	691	691	691	691	690	688	687	685
Remaining infiltration flow (with MVU)	m3/h	520	331	282	242	210	190	180	180	180	180
Ref. natural airflow (without MVU)	m3/h	868	629	542	462	391	340	308	290	281	271
NR-BVU 1000-2500 m3/h											
Avg. mechanical flow per VU	m3/h	0	864	864	864	864	863	862	860	858	856
Remaining infiltration flow (with MVU)	m3/h	0	390	338	294	258	235	225	225	225	225
Ref. natural airflow (without MVU)	m3/h	0	1211	1127	1035	920	819	754	707	674	643
NR-AHU-S 2500-5500 m3/h											
Avg. mechanical flow per VU	m3/h	1814	1814	1814	1814	1814	1813	1810	1806	1802	1797
Remaining infiltration flow (with MVU)	m3/h	1365	809	707	613	541	495	474	473	473	473
Ref. natural airflow (without MVU)	m3/h	2418	2433	2370	2226	2004	1762	1540	1407	1335	1269
NR-AHU-M 5500-14500 m3/h											
Avg. mechanical flow per VU	m3/h	4320	4320	4320	4320	4319	4316	4310	4302	4292	4280
Remaining infiltration flow (with MVU)	m3/h	3250	2072	1753	1504	1311	1185	1128	1125	1125	1125
Ref. natural airflow (without MVU)	m3/h	4069	3345	3128	2950	2721	2530	2365	2290	2269	2240
NR-AHU-L > 14500 m3/h											
Avg. mechanical flow per VU	m3/h	12096	12096	12096	12096	12093	12085	12069	12045	12016	11983
Remaining infiltration flow (with MVU)	m3/h	9100	5803	4909	4212	3672	3317	3158	3150	3150	3150
Ref. natural airflow (without MVU)	m3/h	11398	9367	8758	8261	7619	7085	6623	6413	6354	6271

LOAD, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS, stock average unit capacities in lm											
LFL (T12,T8h,T8t,T5,other)	lm	2281	2303	2611	2808	2830	2731	2590	2519	2491	2461
HID (HPM, HPS, MH)	lm	12044	13032	13490	14730	15280	16042	17041	17955	18641	19121
CFLni (all shapes)	lm	690	690	690	690	690	690	690	690	690	690
CFLi (retrofit for GLS, HL)	lm	523	564	581	595	605	605	605	605	605	605
GLS (DLS & NDLS)	lm	494	495	485	495	495	495	495	495	495	495
HL (DLS & NDLS, LV & MV)	lm	746	568	561	618	655	1679	3800	3800	3800	3772
LED replacing LFL (retrofit & luminaire)	lm			3221	3305	3268	3228	3181	3142	3124	3115
LED replacing HID (retrofit & luminaire)	lm			12115	12605	13569	14216	14605	14815	14903	14934
LED replacing CFLni (retrofit & luminaire)	lm			731	731	731	731	731	731	731	731
LED replacing DLS (retrofit & luminaire)	lm		432	447	470	529	534	536	537	539	541
LED replacing NDLS (retrofit & luminaire)	lm		639	647	647	660	661	661	662	662	662
LS, unit fpe-hours in h/a (see LoadNotes)											
LFL (T12,T8h,T8t,T5,other)	h/a	1949	1975	2007	2026	2009	1945	1873	1912	1924	1863
HID (HPM, HPS, MH)	h/a	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
CFLni (all shapes)	h/a	1251	1213	1185	1146	1092	985	840	761	726	709
CFLi (retrofit for GLS, HL)	h/a	500	500	500	500	500	500	500	500	500	500
GLS (DLS & NDLS)	h/a	450	450	450	450	450	450	450	450	450	450
HL (DLS & NDLS, LV & MV)	h/a	450	450	450	450	450	450	450	450	450	450
LED replacing LFL (retrofit & luminaire)	h/a			1921	2073	2119	2117	2102	2089	2091	2099
LED replacing HID (retrofit & luminaire)	h/a			4000	4000	4000	4000	4000	4000	4000	4000
LED replacing CFLni (retrofit & luminaire)	h/a			1370	1375	1337	1319	1304	1287	1291	1302
LED replacing DLS (retrofit & luminaire)	h/a		461	461	461	461	461	461	461	461	461
LED replacing NDLS (retrofit & luminaire)	h/a		475	472	485	506	512	512	512	512	512
Game consoles > 20 W Active modes (SRI)	h/d	1.5	1.6	2.2	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Game consoles > 20 W Non-Active (CR)	h/d	22.5	22.4	21.8	21.5	21.5	21.5	21.5	21.5	21.5	21.5
Game consoles < 20 W Non-Active (CR)	h/d	22.5	22.4	22.5	22.5	22.5	22.5	22.5	22.5	22.5	22.5
Game consoles < 20 W Active (no reg.)	h/d	1.5	1.6	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
Stock average PSU output for ES&DS (8760 h/a)											
ES tower 1-socket traditional	kWh/a	723	674	498	376	364	368	368	368	368	368
ES rack 1-socket traditional	kWh/a	920	838	591	508	533	569	569	569	569	569
ES rack 2-socket traditional	kWh/a	1905	1835	1565	1234	1236	1246	1246	1246	1246	1246
ES rack 2-socket cloud	kWh/a		2123	1893	1591	1620	1632	1632	1632	1632	1632
ES rack 4-socket traditional	kWh/a	3854	3397	3047	3306	3322	3343	3343	3343	3343	3343
ES rack 4-socket cloud	kWh/a		4211	4425	4606	4694	4725	4725	4725	4725	4725
ES rack 2-socket resilient trad.	kWh/a	5694	5562	4981	3743	3288	3295	3295	3295	3295	3295
ES rack 2-socket resilient cloud	kWh/a		5514	4878	3735	3288	3295	3295	3295	3295	3295
ES rack 4-socket resilient trad.	kWh/a	5606	5485	5123	4574	4427	4444	4444	4444	4444	4444
ES rack 4-socket resilient cloud	kWh/a		6150	6027	5627	5604	5627	5627	5627	5627	5627
ES blade 1-socket traditional	kWh/a	753	733	662	573	563	592	592	592	592	592
ES blade 2-socket traditional	kWh/a	2488	2426	2156	1888	1900	1908	1908	1908	1908	1908
ES blade 2-socket cloud	kWh/a		2820	2670	2505	2548	2559	2559	2559	2559	2559
ES blade 4-socket traditional	kWh/a	5606	5504	5241	4662	4367	4383	4383	4383	4383	4383
ES blade 4-socket cloud	kWh/a		6197	6264	5777	5505	5526	5526	5526	5526	5526
DS Online 2	kWh/a	3504	3504	3677	4737	5595	6184	6184	6184	6184	6184
DS Online 3	kWh/a	845	815	932	1381	1642	1815	1815	1815	1815	1815
DS Online 4	kWh/a	15330	15330	16068	20688	24477	27054	27054	27054	27054	27054
DS Data Storage products total											

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	TWh heat/a	0	0	0	0	0	1	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	TWh heat/a	5	6	6	5.3	5	5	6	6	7	7
EIWHS Electric Instant. Shower (secondary)	TWh heat/a	1	1	1	1.0	1	1	1	1	1	1
ESWH Electric Storage ≤ 30 L (secondary)	TWh heat/a	5	6	7	7	7	7	8	8	8	9
ESWH Electric Storage > 30 L (primary)	TWh heat/a	43	62	63	62	60	63	67	71	75	79
GIWH Gas Instant. < 13 L/min (secondary)	TWh heat/a	5	5	5	4	4	3	3	3	3	3
GIWH Gas Instant. ≥ 13 L/min (primary)	TWh heat/a	4	5	4	4	4	4	4	3	3	3
GSWH Gas Storage, Condensing	TWh heat/a	0	0	0	0	0	1	1	1	1	1
GSWH Gas Storage, Non-condensing	TWh heat/a	9	10	8	6	4	3	3	2	2	2
Dedicated WH Heat Pump	TWh heat/a	0	1	2	4	6	9	13	16	20	24
Dedicated WH Solar (3.5 m2)	TWh heat/a	1	9	13	14	14	14	13	14	14	15
WH dedicated Water Heater	**TWh heat/a**	**72**	**105**	**109**	**107**	**106**	**110**	**117**	**126**	**135**	**144**
CHB Gas Combi Instant. WH	TWh heat/a	36	95	104	109	111	115	119	120	120	120
CHB Gas + Cyl. WH	TWh heat/a	22	40	42	43	43	44	46	46	46	46
CHB Jet Burner Gas + Cyl. WH	TWh heat/a	5	5	4	3	3	2	2	2	2	2
CHB Jet Burner Oil + Cyl. WH	TWh heat/a	39	37	30	24	18	14	12	12	13	13
CHB Electric (Joule) + Cyl. WH	TWh heat/a	1	1	1	1	2	2	1	1	1	1
CHB Hybrid Gas/Electric WH	TWh heat/a	0	0	0	0	0	0	1	1	1	2
CHB Electric HP + Cyl. WH	TWh heat/a	1	5	7	10	13	14	17	20	23	26
CHB Gas HP + Cyl. WH	TWh heat/a	0	0	0	0	0	1	1	1	2	2
CHB Gas mCHP + Cyl. WH	TWh heat/a	0	0	0	0	0	0	0	1	1	1
CHB Solar Combi (16 m2)	TWh heat/a	1	2	3	3	3	3	3	3	4	4
CHC Central Heating combi, water heating	**TWh heat/a**	**105**	**185**	**191**	**194**	**193**	**196**	**202**	**207**	**212**	**217**
CHB Gas non-condensing	TWh heat/a	383	475	389	300	221	194	172	148	129	112
CHB Gas condensing	TWh heat/a	5	192	289	380	448	471	480	475	473	466
CHB Gas Jet burner non-condensing	TWh heat/a	38	28	21	16	10	6	3	3	3	2
CHB Gas Jet burner condensing	TWh heat/a	0	1	2	2	3	4	5	5	5	5
CHB Oil Jet burner non-condensing	TWh heat/a	450	326	251	181	120	66	39	33	29	26
CHB Oil Jet burner condensing	TWh heat/a	0	6	14	22	31	39	42	44	46	47
CHB Electric Joule-effect	TWh heat/a	8	8	9	10	10	10	9	8	7	6
CHB Hybrid (gas-electric)	TWh heat/a	0	0	0	0	1	1	2	3	5	8
CHB Electric Heat Pump	TWh heat/a	4	23	32	42	52	57	64	71	79	88
CHB Gas Heat Pump	TWh heat/a	0	0	0	0	1	1	1	2	2	3
CHB micro CHP	TWh heat/a	0	0	0	1	1	1	1	2	3	4
CHB Solar combi (16 m2)	TWh heat/a	3	5	5	6	6	6	6	6	6	6
CHB Central Heating boiler < 400 kW, space heating	**TWh heat/a**	**892**	**1064**	**1013**	**961**	**904**	**857**	**826**	**799**	**787**	**774**
SFB Wood Manual	TWh heat/a	96	42	34	26	18	11	7	5	4	3
SFB Wood Direct Draft	TWh heat/a	1	17	32	44	53	52	52	56	65	75
SFB Coal	TWh heat/a	143	68	69	56	41	26	18	17	15	13
SFB Pellets	TWh heat/a	0	7	12	16	20	22	23	23	24	25
SFB Wood chips	TWh heat/a	0	10	12	14	13	13	13	14	15	16
SFB total net heat demand	**TWh heat/a**	**240**	**144**	**158**	**157**	**144**	**123**	**113**	**115**	**123**	**132**
CHAE-S (≤ 400 kW)	TWh cool/a	8	28	33	38	40	42	44	46	47	48
CHAE-L (> 400 kW)	TWh cool/a	13	39	45	50	52	52	51	50	50	49
CHWE-S (≤ 400 kW)	TWh cool/a	1	4	5	5	6	6	6	6	7	7
CHWE-M (> 400 kW; ≤ 1500 kW)	TWh cool/a	4	13	15	17	18	18	17	17	17	17
CHWE-L (> 1500 kW)	TWh cool/a	3	8	10	11	11	11	11	11	11	11
CHF	TWh cool/a	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	TWh cool/a	81	145	165	183	196	206	215	224	232	241
HT PCH-AE-L	TWh cool/a	84	150	170	189	202	213	222	231	240	249
HT PCH-WE-S	TWh cool/a	27	48	54	60	65	68	71	74	77	79
HT PCH-WE-M	TWh cool/a	60	108	123	136	146	154	161	167	174	180
HT PCH-WE-L	TWh cool/a	11	21	24	27	30	32	33	34	36	37
AC rooftop	TWh cool/a	5	18	19	18	15	9	5	2	2	2
AC splits	TWh cool/a	11	39	41	41	39	36	33	30	28	25
AC VRF	TWh cool/a	0	10	16	23	29	37	43	48	52	55
ACF	TWh cool/a	0	0	0	0	0	0	0	0	0	0
AHC central Air Cooling	**TWh cool/a**	**308**	**632**	**722**	**798**	**849**	**884**	**913**	**942**	**972**	**1000**
AC rooftop (rev)	TWh heat/a	8	27	28	25	20	13	6	2	0	0
AC splits (rev)	TWh heat/a	19	63	66	66	63	58	53	49	45	41
AC VRF (rev)	TWh heat/a	0	21	32	46	58	71	82	87	90	90
ACF (rev)	TWh heat/a	0	0	0	1	1	1	1	1	1	1
AHF	TWh heat/a	124	98	86	77	69	62	55	50	44	40
AHE	TWh heat/a	1	2	1	1	1	1	1	1	1	1
AHC central Air Heating	**TWh heat/a**	**152**	**211**	**215**	**216**	**212**	**206**	**199**	**189**	**181**	**173**
AHC total Heating & Cooling	**TWh heat/a**	**459**	**843**	**937**	**1014**	**1061**	**1090**	**1112**	**1132**	**1153**	**1173**

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	TWh heat/a	3	5	5	6	6	6	6	6	6	6
LH closed fireplace/inset	TWh heat/a	11	27	32	38	42	45	46	46	46	45
LH wood stove	TWh heat/a	23	24	25	26	26	27	27	27	27	26
LH coal stove	TWh heat/a	14	8	8	7	6	6	5	4	3	3
LH cooker	TWh heat/a	4	7	8	9	10	10	10	10	10	10
LH SHR stove	TWh heat/a	13	17	18	20	22	24	27	28	29	29
LH pellet stove	TWh heat/a	0	6	9	12	14	15	16	16	16	15
LH Solid fuel sum	**TWh heat/a**	**68**	**94**	**105**	**116**	**126**	**133**	**137**	**138**	**137**	**134**
LH Electric portable	TWh heat/a	15	16	16	16	15	15	14	13	13	12
LH Electric fixed > 250W	TWh heat/a	85	84	78	69	60	54	51	49	47	45
LH Electric fixed ≤ 250W	TWh heat/a	5	5	5	4	4	3	3	3	3	3
LH Electric storage	TWh heat/a	5	5	5	4	4	4	4	3	3	3
LH Electric underfloor	TWh heat/a	13	14	14	14	14	14	14	13	13	12
LH Electric visibly glowing > 1.2 kW	TWh heat/a	1	1	1	1	1	1	1	1	1	1
LH Electric visibly glowing ≤ 1.2 kW	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Electric Towel Heaters	TWh heat/a	4	6	7	7	7	6	6	6	6	5
LH Electric sum	**TWh heat/a**	**129**	**131**	**126**	**116**	**105**	**97**	**93**	**90**	**86**	**82**
LH Gas luminous (commercial)	TWh heat/a	1	1	1	1	1	1	1	1	0	0
LH Gaseous Tube (commercial < 120 kW)	TWh heat/a	2	2	2	2	2	1	1	1	1	1
LH Gas open front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Gas closed front	TWh heat/a	2	1	1	1	1	1	1	0	0	0
LH Gas balanced flue	TWh heat/a	5	3	2	2	1	1	1	1	1	1
LH Gas flueless	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	**TWh heat/a**	**11**	**7**	**6**	**5**	**5**	**4**	**3**	**3**	**3**	**2**
LH Liquid tube (commercial < 120 kW)	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid open front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid closed front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid flueless	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid fuel sum	**TWh heat/a**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LH Local Heaters total		**209**	**234**	**239**	**239**	**236**	**234**	**234**	**231**	**226**	**219**
RAC fixed < 6 kW, cooling	TWh cool/a	4	46	46	40	45	54	63	73	85	98
RAC fixed 6-12 kW, cooling	TWh cool/a	2	22	25	23	25	29	32	36	40	45
RAC portable < 12 kW, cooling	TWh cool/a	0	2	2	1	2	2	2	2	2	2
RAC < 12 kW total, cooling mode	**TWh cool/a**	**6**	**69**	**72**	**65**	**72**	**84**	**97**	**111**	**128**	**145**
RAC fixed < 6 kW, reversible, heating	TWh heat/a	1	46	57	63	84	113	145	183	219	250
RAC fixed 6-12 kW, reversible, heating	TWh heat/a	1	20	29	33	43	55	69	83	96	105
RAC portable < 12 kW, reversible, heating	TWh heat/a	0	0	0	0	0	0	0	0	0	0
RAC < 12 kW total, heating mode	**TWh heat/a**	**2**	**66**	**86**	**96**	**127**	**168**	**213**	**265**	**315**	**355**
CIRC Integrated circulators	TWh flow/a	5	8	9	11	11	12	13	13	13	13
CIRC Large standalone circulators	TWh flow/a	6	8	8	8	8	7	7	6	6	6
CIRC Small standalone circulators	TWh flow/a	2	2	2	2	2	2	2	2	2	2
CIRC Circulator pumps <2.5 kW	**TWh flow/a**	**13**	**19**	**20**	**21**	**21**	**21**	**21**	**21**	**21**	**21**
TOTAL SPACE HEATING load	**TWh heat/a**	**1494**	**1719**	**1711**	**1669**	**1624**	**1588**	**1585**	**1600**	**1631**	**1653**
TOTAL SPACE COOLING load	**TWh cool/a**	**314**	**701**	**794**	**863**	**921**	**967**	**1010**	**1054**	**1099**	**1146**
R-UVU ≤ 100 m3/h for Extract Spaces											
Mechanical flow from MVU	Mm3/h	9	22	26	31	34	36	38	40	41	43
Remaining infiltration flow (with MVU)	Mm3/h	7	11	11	12	11	11	11	11	12	12
Ref. natural airflow (without MVU)	Mm3/h	10	23	28	31	30	29	29	29	32	36
R-UVU ≤ 100 m3/h for Habitable Spaces											
Mechanical flow from MVU	Mm3/h	0	0	0	0	0	1	2	4	5	6
Remaining infiltration flow (with MVU)	Mm3/h	0	0	0	0	0	1	1	2	2	3
Ref. natural airflow (without MVU)	Mm3/h	0	0	0	0	1	3	6	9	11	12
R-BVU ≤ 100 m3/h for Habitable Spaces											
Mechanical flow from MVU	Mm3/h	1	20	32	56	172	354	548	755	966	1192
Remaining infiltration flow (with MVU)	Mm3/h	1	15	21	31	77	154	235	324	415	512
Ref. natural airflow (without MVU)	Mm3/h	2	48	72	121	376	788	1214	1589	1781	1978
R-UVU 100-250 m3/h											
Mechanical flow from MVU	Mm3/h	102	266	317	367	405	430	445	452	456	458
Remaining infiltration flow (with MVU)	Mm3/h	247	389	385	370	341	326	323	327	330	331
Ref. natural airflow (without MVU)	Mm3/h	344	852	910	916	825	791	783	788	817	849
R-BVU 100-250 m3/h											
Mechanical flow from MVU	Mm3/h	1	15	22	30	64	117	174	234	295	360
Remaining infiltration flow (with MVU)	Mm3/h	2	21	27	32	55	94	137	184	232	283
Ref. natural airflow (without MVU)	Mm3/h	4	63	85	110	234	442	661	860	961	1066
R-UVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	606	1844	2350	2853	3195	3367	3489	3541	3574	3588
Remaining infiltration flow (with MVU)	Mm3/h	1292	2038	2020	1942	1787	1710	1692	1713	1729	1736
Ref. natural airflow (without MVU)	Mm3/h	1801	4467	4772	4802	4323	4144	4103	4132	4281	4449

LOAD EU Total, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
R-BVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	5	88	128	177	377	690	1020	1373	1731	2117
Remaining infiltration flow (with MVU)	Mm3/h	11	112	139	166	286	491	716	963	1214	1484
Ref. natural airflow (without MVU)	Mm3/h	22	329	443	576	1226	2316	3466	4506	5036	5588
R-UVU > 1000 m3/h											
Mechanical flow from MVU	Mm3/h	27	59	66	71	75	77	77	77	75	73
Remaining infiltration flow (with MVU)	Mm3/h	57	80	75	68	62	57	54	54	53	51
Ref. natural airflow (without MVU)	Mm3/h	95	152	143	130	115	102	92	87	82	77
R-BVU 1000-2500 m3/h											
Mechanical flow from MVU	Mm3/h	0	22	32	43	54	65	76	87	98	109
Remaining infiltration flow (with MVU)	Mm3/h	0	28	35	40	44	47	53	61	69	77
Ref. natural airflow (without MVU)	Mm3/h	0	86	117	142	157	166	178	191	206	219
RVU, Total residential (for venting hours per year:)	venting h/a	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760
Mechanical flow from MVU	**Tm3/a**	**7**	**20**	**26**	**32**	**38**	**45**	**51**	**57**	**63**	**70**
Remaining infiltration flow (with MVU)	**Tm3/a**	**14**	**24**	**24**	**23**	**23**	**25**	**28**	**32**	**36**	**39**
Ref. natural airflow (without MVU)	**Tm3/a**	**20**	**53**	**58**	**60**	**64**	**77**	**92**	**107**	**116**	**125**
RVU, Total residential (for heating season hours:)	heating h/a	6343	5348	5124	4910	4705	4508	4320	4139	3966	3801
Mechanical flow from MVU	**Tm3/a**	**5**	**12**	**15**	**18**	**21**	**23**	**25**	**27**	**29**	**30**
Remaining infiltration flow (with MVU)	**Tm3/a**	**10**	**14**	**14**	**13**	**13**	**13**	**14**	**15**	**16**	**17**
Ref. natural airflow (without MVU)	**Tm3/a**	**14**	**32**	**34**	**34**	**34**	**40**	**45**	**50**	**52**	**54**
NR-UVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	261	700	865	1010	1089	1110	1117	1109	1089	1055
Remaining infiltration flow (with MVU)	Mm3/h	556	800	749	686	617	566	542	537	527	511
Ref. natural airflow (without MVU)	Mm3/h	927	1522	1438	1307	1147	1014	924	864	822	768
NR-BVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	0	144	216	290	363	433	505	579	653	728
Remaining infiltration flow (with MVU)	Mm3/h	0	184	235	270	293	316	355	406	458	510
Ref. natural airflow (without MVU)	Mm3/h	0	571	781	951	1045	1104	1186	1275	1372	1458
NR-UVU > 1000 m3/h											
Mechanical flow from MVU	Mm3/h	328	742	813	867	899	914	920	914	897	869
Remaining infiltration flow (with MVU)	Mm3/h	246	355	332	304	273	251	240	238	234	226
Ref. natural airflow (without MVU)	Mm3/h	411	675	638	579	508	450	409	383	364	341
NR-BVU 1000-2500 m3/h											
Mechanical flow from MVU	Mm3/h	0	226	332	440	544	645	753	863	974	1086
Remaining infiltration flow (with MVU)	Mm3/h	0	102	130	150	162	175	197	225	254	283
Ref. natural airflow (without MVU)	Mm3/h	0	317	433	527	579	612	657	707	760	808
NR-AHU-S 2500-5500 m3/h											
Mechanical flow from MVU	Mm3/h	48	724	1147	1585	1944	2262	2583	2903	3221	3529
Remaining infiltration flow (with MVU)	Mm3/h	36	323	447	536	580	617	674	756	839	919
Ref. natural airflow (without MVU)	Mm3/h	64	971	1498	1945	2147	2196	2193	2250	2369	2469
NR-AHU-M 5500-14500 m3/h											
Mechanical flow from MVU	Mm3/h	3044	4708	5245	5771	6163	6472	6775	7079	7382	7675
Remaining infiltration flow (with MVU)	Mm3/h	2290	2258	2129	2009	1871	1775	1769	1844	1922	1999
Ref. natural airflow (without MVU)	Mm3/h	2867	3646	3797	3941	3882	3791	3709	3753	3878	3979
NR-AHU-L > 14500 m3/h											
Mechanical flow from MVU	Mm3/h	741	1146	1277	1405	1501	1576	1649	1724	1797	1869
Remaining infiltration flow (with MVU)	Mm3/h	558	550	518	489	456	432	431	449	468	487
Ref. natural airflow (without MVU)	Mm3/h	699	888	925	960	945	923	903	914	944	969
NRVU, Total non-residential (venting hours/year:)	venting h/a	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760
Mechanical flow from MVU	**Tm3/a**	**39**	**73**	**87**	**100**	**110**	**117**	**125**	**133**	**140**	**147**
Remaining infiltration flow (with MVU)	**Tm3/a**	**32**	**40**	**40**	**39**	**37**	**36**	**37**	**39**	**41**	**43**
Ref. natural airflow (without MVU)	**Tm3/a**	**44**	**75**	**83**	**89**	**90**	**88**	**87**	**89**	**92**	**95**
NRVU, Total non-residential (heating season hours:)	heating h/a	6343	5348	5124	4910	4705	4508	4320	4139	3966	3801
Mechanical flow from MVU	**Tm3/a**	**28**	**45**	**51**	**56**	**59**	**60**	**62**	**63**	**64**	**64**
Remaining infiltration flow (with MVU)	**Tm3/a**	**23**	**24**	**23**	**22**	**20**	**19**	**18**	**18**	**19**	**19**
Ref. natural airflow (without MVU)	**Tm3/a**	**32**	**46**	**49**	**50**	**48**	**45**	**43**	**42**	**42**	**41**
VU Ventilation Units, res + non-res	venting h/a			43			57				71
Mechanical flow from MVU	**Tm3/a**	**45**	**94**	**113**	**131**	**148**	**162**	**177**	**190**	**204**	**217**
Remaining infiltration flow (with MVU)	**Tm3/a**	**46**	**64**	**64**	**62**	**61**	**62**	**65**	**71**	**77**	**83**
Ref. natural airflow (without MVU)	**Tm3/a**	**63**	**128**	**141**	**149**	**154**	**165**	**180**	**196**	**208**	**220**

LOAD EU Total, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LS, total EU capacity in Tlm											
LFL (T12,T8h,T8t,T5,other)	Tlm	2.4	4.1	5.1	5.9	5.8	5.1	4.0	3.2	2.5	2.0
HID (HPM, HPS, MH)	Tlm	0.4	1.1	1.2	1.3	1.1	0.8	0.4	0.2	0.1	0.1
CFLni (all shapes)	Tlm	0.1	0.3	0.4	0.4	0.4	0.3	0.2	0.1	0.1	0.0
CFLi (retrofit for GLS, HL)	Tlm	0.1	1.2	1.6	1.7	1.4	1.2	0.8	0.5	0.3	0.2
GLS (DLS & NDLS)	Tlm	1.5	1.3	1.1	0.8	0.5	0.3	0.2	0.1	0.1	0.0
HL (DLS & NDLS, LV & MV)	Tlm	0.2	0.9	1.2	1.4	1.0	0.5	0.3	0.2	0.1	0.0
LED replacing LFL (retrofit & luminaire)	Tlm			0.0	0.4	1.4	3.2	5.4	7.4	9.5	11.5
LED replacing HID (retrofit & luminaire)	Tlm			0.0	0.2	0.6	1.2	1.8	2.3	2.8	3.2
LED replacing CFLni (retrofit & luminaire)	Tlm			0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.7
LED replacing DLS (retrofit & luminaire)	Tlm			0.0	0.1	0.3	0.6	0.7	0.9	1.0	1.1
LED replacing NDLS (retrofit & luminaire)	Tlm		0.0	0.0	0.5	1.8	3.0	4.1	4.9	5.7	6.3
LS Lighting	**Tlm**	**4.6**	**8.9**	**10.7**	**12.7**	**14.5**	**16.2**	**18.2**	**20.3**	**22.6**	**25.2**
LS, total EU fpe-hours in Th/a											
LFL (T12,T8h,T8t,T5,other)	Th/a	2.0	3.5	4.0	4.3	4.1	3.5	2.8	2.2	1.7	1.3
HID (HPM, HPS, MH)	Th/a	0.1	0.3	0.4	0.4	0.3	0.2	0.1	0.1	0.0	0.0
CFLni (all shapes)	Th/a	0.1	0.6	0.7	0.7	0.6	0.4	0.2	0.1	0.1	0.0
CFLi (retrofit for GLS, HL)	Th/a	0.1	1.1	1.4	1.4	1.2	1.0	0.6	0.4	0.3	0.2
GLS (DLS & NDLS)	Th/a	1.4	1.2	1.0	0.7	0.4	0.2	0.1	0.1	0.0	0.0
HL (DLS & NDLS, LV & MV)	Th/a	0.1	0.7	1.0	1.1	0.8	0.4	0.2	0.1	0.1	0.0
LED replacing LFL (retrofit & luminaire)	Th/a			0.0	0.2	0.9	2.2	3.7	5.1	6.5	7.9
LED replacing HID (retrofit & luminaire)	Th/a			0.0	0.0	0.2	0.3	0.5	0.6	0.8	0.9
LED replacing CFLni (retrofit & luminaire)	Th/a			0.0	0.0	0.2	0.5	0.8	1.0	1.2	1.3
LED replacing DLS (retrofit & luminaire)	Th/a		0.0	0.0	0.1	0.3	0.5	0.6	0.8	0.8	0.9
LED replacing NDLS (retrofit & luminaire)	Th/a		0.0	0.0	0.4	1.3	2.2	3.1	3.7	4.3	4.8
LS Lighting	**Th/a**	**3.9**	**7.4**	**8.4**	**9.4**	**10.3**	**11.5**	**12.8**	**14.1**	**15.7**	**17.4**
DP TV viewable area (avg. all types)	km²	17	84	154	213	259	351	453	542	629	725
DP TV viewing time (on-mode)	M years / a	29	50	59	70	73	86	96	99	99	99
DP TV standby time	M years / a	44	125	148	174	183	214	239	247	247	247
DP Monitor viewable area	km²	1	17	15	13	15	17	19	21	23	25
DP Monitor viewing time (on-mode)	M years / a	2	24	19	14	14	14	14	14	14	14
DP Monitor standby time	M years / a	2	24	19	14	14	14	14	14	14	14
DP Signage viewable area	km²	0	0	4	16	26	31	35	40	47	54
DP Signage display time (on-mode)	M years / a	0	0	3	9	14	14	13	13	13	13
DP Signage standby time	M years / a	0	0	0	1	2	2	2	2	2	2
DP Elec.Displays, total viewable area	**km²**	**18**	**101**	**173**	**242**	**300**	**398**	**507**	**604**	**698**	**804**
DP Elec.Displays, total on-mode time	**M years / a**	**31**	**75**	**81**	**93**	**101**	**113**	**123**	**126**	**126**	**126**
DP Elec.Displays, total standby time	**M years / a**	**46**	**149**	**167**	**190**	**199**	**230**	**255**	**263**	**263**	**263**
SSTB (4.5h on/d)	Th on/a	0.00	0.13	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CSTB (4.5 h on/d)	Th on/a	0.00	0.11	0.27	0.28	0.28	0.28	0.28	0.28	0.28	0.28
Game consoles > 20 W Active modes (SRI)	bn h/a	0	33	60	62	62	62	62	62	62	62
Game consoles > 20 W Non-Active (CR)	bn h/a	1	432	419	417	417	417	417	417	417	417
Game consoles < 20 W Non-Active (CR)	bn h/a	4	160	159	159	159	159	159	159	159	159
Game consoles < 20 W Active (no reg.)	bn h/a	0	12	13	13	13	13	13	13	13	13
Total Game consoles, active modes	bn h/a	0	44	72	75	75	75	75	75	75	75
Total Game consoles, non-active modes	bn h/a	5	592	578	575	575	575	575	575	575	575
Total Game consoles > 20 W, all modes	bn h/a	1	465	478	478	478	478	478	478	478	478
Total Game consoles < 20 W, all modes	bn h/a	4	172	172	172	172	172	172	172	172	172
Total Game consoles, all modes	bn h/a	**5**	**637**	**650**	**650**	**650**	**650**	**650**	**650**	**650**	**650**
ES tower 1-socket traditional	GWh	21	672	576	426	337	289	270	270	270	270
ES rack 1-socket traditional	GWh	68	2102	1607	1453	1508	1675	1713	1713	1713	1713
ES rack 2-socket traditional	GWh	464	10179	5577	3484	4137	5032	5490	5490	5490	5490
ES rack 2-socket cloud	GWh	0	5712	9063	10411	12530	15242	16630	16630	16630	16630
ES rack 4-socket traditional	GWh	53	1058	587	488	593	721	787	787	787	787
ES rack 4-socket cloud	GWh	0	636	1135	1593	1948	2370	2586	2586	2586	2586
ES rack 2-socket resilient trad.	GWh	23	512	298	173	182	221	241	241	241	241
ES rack 2-socket resilient cloud	GWh	0	246	392	407	428	520	567	567	567	567
ES rack 4-socket resilient trad.	GWh	1	28	17	12	14	17	18	18	18	18
ES rack 4-socket resilient cloud	GWh	0	15	27	34	40	49	53	53	53	53
ES blade 1-socket traditional	GWh	35	628	566	507	518	569	582	582	582	582
ES blade 2-socket traditional	GWh	385	4645	2429	1618	1944	2365	2580	2580	2580	2580
ES blade 2-socket cloud	GWh	0	2598	4028	5058	6139	7468	8148	8148	8148	8148
ES blade 4-socket traditional	GWh	48	585	321	221	262	318	347	347	347	347
ES blade 4-socket cloud	GWh	0	317	512	646	774	942	1027	1027	1027	1027
ES total traditional	**GWh**	**1099**	**20409**	**11978**	**8382**	**9494**	**11206**	**12027**	**12027**	**12027**	**12027**
ES total cloud	**GWh**	**0**	**9525**	**15156**	**18149**	**21859**	**26590**	**29012**	**29012**	**29012**	**29012**
ES Enterprise Servers total	**GWh**	**1099**	**29934**	**27134**	**26531**	**31353**	**37796**	**41039**	**41039**	**41039**	**41039**

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DS Online 2	GWh	251	4779	6588	9194	11921	14548	15422	15499	15499	15499
DS Online 3	GWh	42	703	952	1295	1681	2051	2174	2185	2185	2185
DS Online 4	GWh	165	2734	3703	5062	6537	7977	8456	8499	8499	8499
DS Data Storage products total	**GWh**	**458**	**8216**	**11244**	**15551**	**20139**	**24576**	**26052**	**26184**	**26184**	**26184**
ES + DS total	**GWh**	**1556**	**38150**	**38378**	**42082**	**51492**	**62372**	**67091**	**67223**	**67223**	**67223**
images printed per year by EU stock											
Inkjet Printer	bn ipy	18	29	9	2	1	1	1	1	1	1
Inkjet MFD	bn ipy	15	32	31	26	20	17	15	14	13	12
EP / Laser Printer mono	bn ipy	332	274	170	101	63	45	34	26	18	11
EP / Laser Printer colour	bn ipy	0	90	100	106	97	95	95	94	95	96
EP / Laser Copier mono	bn ipy	230	85	36	6	0	0	0	0	0	0
EP / Laser Copier colour	bn ipy	0	13	25	12	0	0	0	0	0	0
EP / Laser MFD mono	bn ipy	0	155	155	126	96	82	75	69	64	61
EP / Laser MFD colour	bn ipy	0	155	155	126	96	82	75	69	65	61
Total images printed/processed per year	**bn ipy**	**595**	**832**	**682**	**505**	**372**	**322**	**295**	**273**	**256**	**242**
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	Th sb/a	4.69	4.09	3.58	3.03	2.66	2.42	2.18	1.95	1.72	1.48
SB Electric toothbrushes (off mode)	Th sb/a	0.19	0.33	0.36	0.40	0.45	0.50	0.55	0.60	0.65	0.70
SB Audio speakers (wired) (sb & off modes)	Th sb/a	1.29	0.82	0.59	0.30	0.05	0.00	0.00	0.00	0.00	0.00
SB Audio speakers (wireless) (nsb & off modes)	Th sb/a	0.00	0.00	0.21	0.97	1.51	1.56	1.56	1.56	1.56	1.56
SB Small appliances (sb & off modes)	Th sb/a	3.47	6.50	6.74	6.97	7.12	7.20	7.28	7.36	7.44	7.52
SB Media boxes /sticks (sb mode)	Th sb/a	0.00	0.00	0.10	0.29	0.32	0.32	0.32	0.32	0.32	0.32
SB Media players and recorders (sb mode)	Th sb/a	0.00	0.86	1.07	0.27	0.02	0.00	0.00	0.00	0.00	0.00
SB Projectors (sb & off modes)	Th sb/a	0.00	0.07	0.06	0.04	0.02	0.00	0.00	0.00	0.00	0.00
SB Home phones (nsb mode)	Th sb/a	0.09	0.89	1.00	1.00	0.94	0.89	0.86	0.85	0.83	0.81
SB Office phones (nsb mode)	Th sb/a	0.10	0.46	0.45	0.41	0.40	0.40	0.40	0.39	0.38	0.37
SB Home NAS (nsb mode)	Th sb/a	0.00	0.11	0.19	0.28	0.36	0.44	0.51	0.57	0.60	0.61
SB Home Network Equipment (nsb mode)	Th sb/a	0.00	0.30	0.36	0.39	0.41	0.43	0.46	0.47	0.47	0.47
SB Office Network Equipment (nsb mode)	Th sb/a	0.00	0.02	0.07	0.16	0.25	0.33	0.41	0.41	0.41	0.41
SB Coffee makers (off mode)	Th sb/a	0.84	1.05	1.08	1.11	1.14	1.18	1.21	1.25	1.28	1.32
Regulated also for (networked) standby ((n)sb)											
(already accounted elsewhere; here for info only)											
SB Washing Machines (sb & off modes)	Th sb/a	0.87	1.33	1.42	1.47	1.49	1.51	1.51	1.50	1.50	1.50
SB Dishwashers (sb & off modes)	Th sb/a	0.25	0.56	0.67	0.79	0.91	1.03	1.15	1.27	1.38	1.50
SB Laundry Dryers (sb & off modes)	Th sb/a	0.15	0.33	0.33	0.37	0.43	0.45	0.46	0.46	0.46	0.46
SB Electric Ovens (sb mode)	Th sb/a	1.38	1.52	1.59	1.68	1.77	1.87	1.93	1.96	1.98	2.01
SB Electric Hobs (sb mode)	Th sb/a	0.67	1.08	1.21	1.33	1.44	1.54	1.63	1.71	1.80	1.88
SB Game consoles (non-active modes)	Th sb/a	0.00	0.59	0.58	0.58	0.58	0.58	0.58	0.58	0.58	0.58
Total (networked) SB (incl. double)	Th sb/a	14	21	22	22	22	23	23	23	23	23
Total (networked) SB (excl. double)	**Th sb/a**	**11**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**	**16**
EU Active output energy per year											
EPS ≤ 6W, low-V	TW.h / a	0.0	0.5	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0
EPS 6–10 W	TW.h / a	0.1	2.4	2.6	2.8	2.9	3.1	3.2	3.3	3.3	3.4
EPS 10–12 W	TW.h / a	0.0	18.8	31.2	35.4	35.9	36.2	36.4	36.6	36.9	37.1
EPS 15–20 W	TW.h / a	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
EPS 20–30 W	TW.h / a	0.0	3.3	4.0	3.9	3.7	3.5	3.2	3.0	2.7	2.4
EPS 30–65 W, multiple-V	TW.h / a	0.0	0.0	0.0	0.3	0.7	0.9	1.3	1.6	2.0	2.3
EPS 30-65 W	TW.h / a	0.0	0.0	0.0	0.1	0.6	1.1	1.5	1.5	1.5	1.5
EPS 65–120 W	TW.h / a	0.0	1.2	1.4	1.3	0.8	0.3	0.0	0.0	0.0	0.0
EPS 65–120 W, multiple-V	TW.h / a	0.0	7.6	6.2	1.5	1.0	1.0	1.0	1.0	1.0	1.0
EPS 12–15 W	TW.h / a	0.0	0.7	1.7	2.6	2.7	2.7	2.7	2.7	2.7	2.7
EPS, total for active mode	**TW.h / a**	**0**	**35**	**48**	**48**	**49**	**49**	**50**	**50**	**50**	**51**
EU No-load hours per year											
EPS ≤ 6W, low-V	Th / a	0.0	0.8	0.6	0.4	0.3	0.2	0.1	0.0	0.0	0.0
EPS 6–10 W	Th / a	0.1	2.3	2.4	2.6	2.8	2.9	3.0	3.1	3.1	3.2
EPS 10–12 W	Th / a	0.0	0.3	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
EPS 15–20 W	Th / a	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EPS 20–30 W	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 30–65 W, multiple-V	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 30-65 W	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 65–120 W	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 65–120 W, multiple-V	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 12–15 W	Th / a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS, total for no-load mode	**Th / a**	**0.2**	**3.4**	**3.6**	**3.7**	**3.7**	**3.8**	**3.8**	**3.8**	**3.9**	**4.0**
RF freezer net volume	M m³ @ -18C°	9.8	13.9	15.4	16.8	18.4	20.0	21.6	23.2	24.9	26.6
RF refrigerator net volume	M m³ @ 5C°	34.7	49.4	54.5	59.7	65.2	70.8	76.5	82.3	88.2	94.2

LOAD EU Total, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
CF open vertical chilled multi deck (RVC2)	M m^2 @ -1/+7°C	3.0	3.3	3.4	3.5	3.5	3.5	3.6	3.7	3.7	3.8
CF open horizontal frozen island (RHF4)	M m^2 @ -18/-15°C	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
CF other supermarket display (non-base cases)	M m^2 @ -18/+7°C	6.6	7.6	8.3	8.8	9.2	9.6	9.9	10.3	10.6	11.0
CF Plug in one door beverage cooler	M m^3 @ 1/10C°	2.7	3.3	3.5	3.5	3.7	3.8	3.9	4.1	4.2	4.3
CF Plug in horizontal ice cream freezer	M m^3 @ -18/-15C°	0.6	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0
CF Spiral vending machine	M m^3 @ 1/7C°	0.7	0.8	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6
PF Storage cabinet Chilled Vertical (CV, 600 l)	M m^3 @ 5C°	0.6	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2
PF Storage cabinet Frozen Vertical (FV, 600 l)	M m^3 @ -18C°	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
PF Storage cabinet Chilled Horizontal (CH, 300 l)	M m^3 @ 5C°	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
PF Storage cabinet Frozen Horizontal (FH, 200 l)	M m^3 @ -18C°	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PF Storage cabinets All types	**M m^3**	**1.0**	**1.5**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**1.9**	**2.0**	**2.1**
PF Process Chiller AC MT S ≤ 300 kW	TWhcool/a	8	17	20	23	26	28	31	34	37	40
PF Process Chiller AC MT L > 300 kW	TWhcool/a	8	18	21	25	28	30	33	36	39	42
PF Process Chiller AC LT S ≤ 200 kW	TWhcool/a	5	10	12	14	15	17	18	20	22	23
PF Process Chiller AC LT L > 200 kW	TWhcool/a	5	11	13	15	17	19	20	22	24	26
PF Process Chiller WC MT S ≤ 300 kW	TWhcool/a	3	6	7	9	10	11	12	13	14	15
PF Process Chiller WC MT L > 300 kW	TWhcool/a	5	10	12	14	15	17	19	20	22	24
PF Process Chiller WC LT S ≤ 200 kW	TWhcool/a	2	4	5	6	7	8	8	9	10	10
PF Process Chiller WC LT L > 200 kW	TWhcool/a	3	6	8	9	10	11	12	13	14	15
PF Process Chiller All MT&LT	**TWhcool/a**	**38**	**83**	**98**	**113**	**127**	**140**	**154**	**167**	**181**	**195**
PF Condensing Unit MT S 0.2-1 kW	TWhcool/a	8	7	6	7	7	8	8	9	10	10
PF Condensing Unit MT M 1-5 kW	TWhcool/a	23	19	19	19	21	23	24	26	28	30
PF Condensing Unit MT L 5-20 kW	TWhcool/a	46	38	37	38	42	45	48	52	56	60
PF Condensing Unit MT XL 20-50 kW	TWhcool/a	47	39	37	39	42	46	49	53	57	61
PF Condensing Unit LT S 0.1-0.4 kW	TWhcool/a	1	0	0	0	1	1	1	1	1	1
PF Condensing Unit LT M 0.4-2 kW	TWhcool/a	3	2	2	2	2	2	3	3	3	3
PF Condensing Unit LT L 2-8 kW	TWhcool/a	6	5	5	5	6	6	7	7	8	8
PF Condensing Unit LT XL 8-20 kW	TWhcool/a	22	18	17	18	20	21	23	24	26	28
PF Condensing Unit, All MT&LT	TWhcool/a	**155**	**127**	**124**	**130**	**140**	**151**	**163**	**175**	**189**	**203**
CA Electric Hobs (heat + keep warm 20 min. 1229 ltr water by 75 K)	kt/a	96	1229	1229	1229	1229	1229	1229	1229	1229	1229
CA Electric Ovens (110 cycles/a)	bn cyc/a	18	19	20	21	23	24	25	25	25	26
CA Gas Hobs (heating 1229 ltr water by 75 K)	kt/a	125	105	101	98	94	89	85	81	76	72
CA Gas Ovens (110 cycles/a)	bn cyc/a	5.4	4.3	4.1	3.9	3.8	3.7	3.6	3.6	3.5	3.5
CA Range Hoods (365 h/a extraction)	Th/a	25.0	31.0	32.7	34.6	36.5	38.4	40.3	42.3	44.3	46.2
WM Laundry washed	Mt laundry/a	67	107	114	117	119	120	120	119	119	119
WD Laudry washed	Mt laundry/a	1.2	1.7	1.8	1.8	1.9	1.9	1.9	1.9	1.9	1.9
WD Laundry washed+dried	Mt laundry/a	1.3	1.8	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1
WM-WD laundry washed	**Mt laundry/a**	**70**	**111**	**117**	**121**	**123**	**124**	**124**	**123**	**123**	**123**
DW place settings washed	**bn ps/a**	**44**	**132**	**164**	**197**	**228**	**257**	**286**	**315**	**344**	**373**
LD condensing heat pump	Mt laundry/a	0.0	0.2	0.4	0.6	1.1	1.7	2.5	3.3	4.2	5.0
LD condensing electric heat element	Mt laundry/a	1.5	14.2	12.7	13.3	15.8	16.5	16.1	15.2	14.4	13.5
LD vented electric	Mt laundry/a	8.3	12.0	8.8	7.5	7.8	7.8	7.9	8.0	8.0	8.0
LD vented gas	Mt laundry/a	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LD total weight of laundry dried	**Mt laundry/a**	**10**	**27**	**22**	**21**	**25**	**26**	**26**	**27**	**27**	**27**
VC Cylinder Domestic mains	Mh/a	5370	8410	8238	7426	6349	5043	3650	2790	2531	2479
VC Upright Domestic mains	Mh/a	50	72	56	44	40	37	33	30	28	28
VC Handstick Domestic mains	Mh/a	108	216	322	447	604	816	1092	1271	1296	1275
VC Total Domestic mains	**Mh/a**	**5528**	**8698**	**8616**	**7918**	**6993**	**5896**	**4776**	**4091**	**3855**	**3781**
VC Cylinder Commercial mains	Mh/a	2377	4019	4295	4145	4137	4137	4137	4137	4137	4137
VC Upright Commercial mains	Mh/a	420	621	513	446	442	442	442	442	442	442
VC Total Commercial mains	**Mh/a**	**2797**	**4640**	**4808**	**4591**	**4579**	**4579**	**4579**	**4579**	**4579**	**4579**
VC Total in scope of CR 666/2013	**Mh/a**	**8325**	**13338**	**13425**	**12509**	**11572**	**10475**	**9355**	**8670**	**8434**	**8360**
VC Cordless - domestic - cleaning	Mh/a	82	325	595	1630	2734	3871	4952	5615	5801	5832
VC Cordless - commercial - cleaning	Mh/a	5	24	48	140	237	333	425	491	522	534
VC Robot - domestic - cleaning	Mh/a	0	186	554	871	1362	1925	2476	2815	2910	2925
VC Robot - commercial - cleaning	Mh/a	0	23	74	124	196	275	352	408	434	444
VC Total Domestic mains+cordless+robots	**Mh/a**	**5610**	**9210**	**9765**	**10419**	**11090**	**11692**	**12204**	**12520**	**12566**	**12539**
VC Total Commercial mains+cordless+robots	**Mh/a**	**2802**	**4687**	**4930**	**4855**	**5011**	**5187**	**5356**	**5478**	**5534**	**5557**
VC Total All mains+cordless+robots	**Mh/a**	**8411**	**13897**	**14695**	**15274**	**16101**	**16879**	**17560**	**17998**	**18101**	**18096**

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VC Cylinder Domestic mains	1000 km²/a	458	773	771	695	594	472	342	261	237	232
VC Upright Domestic mains	1000 km²/a	4	7	5	4	4	3	3	3	3	3
VC Handstick Domestic mains	1000 km²/a	9	20	30	42	57	76	102	119	121	119
VC Total Domestic mains	**1000 km²/a**	**471**	**799**	**806**	**741**	**655**	**552**	**447**	**383**	**361**	**354**
VC Cylinder Commercial mains	1000 km²/a	191	322	345	333	332	332	332	332	332	332
VC Upright Commercial mains	1000 km²/a	34	50	41	36	35	35	35	35	35	35
VC Total Commercial mains	**1000 km²/a**	**224**	**372**	**386**	**368**	**367**	**367**	**367**	**367**	**367**	**367**
VC Total in scope of CR 666/2013	**1000 km²/a**	**695**	**1172**	**1192**	**1109**	**1022**	**919**	**814**	**750**	**728**	**721**
VC Cordless - domestic - cleaning	1000 km²/a	6	24	44	121	203	288	368	417	431	433
VC Cordless - commercial - cleaning	1000 km²/a	0	2	4	11	19	27	34	39	42	43
VC Robot - domestic - cleaning	1000 km²/a	0	8	25	39	61	87	111	127	131	132
VC Robot - commercial - cleaning	1000 km²/a	0	2	6	10	16	22	28	33	35	36
VC Total Domestic mains+cordless+robots	**1000 km²/a**	**477**	**831**	**876**	**901**	**919**	**926**	**926**	**927**	**923**	**919**
VC Total Commercial mains+cordless+robots	**1000 km²/a**	**225**	**376**	**396**	**390**	**402**	**416**	**430**	**440**	**444**	**446**
VC Total All mains+cordless+robots	**1000 km²/a**	**701**	**1207**	**1271**	**1291**	**1321**	**1342**	**1356**	**1366**	**1367**	**1365**
FAN Axial<300Pa (all FAN types >125W)	TWh flow/ a	5	14	17	19	21	22	23	23	23	23
FAN Axial>300Pa	TWh flow/ a	10	31	36	39	40	42	42	42	42	42
FAN Centr.FC	TWh flow/ a	2	5	6	7	7	8	8	8	8	8
FAN Centr.BC-free	TWh flow/ a	10	22	26	29	32	35	37	38	39	40
FAN Centr.BC	TWh flow/ a	10	23	28	31	35	38	41	44	48	52
FAN Cross-flow	TWh flow/ a	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W	TWh flow/ a	**38**	**96**	**114**	**125**	**136**	**145**	**151**	**155**	**160**	**164**
Medium (S) 3-ph 0.75-7.5 kW no VSD	TWh output/a	68	94	101	105	105	104	101	97	92	86
Medium (M) 3-ph 7.5-75 kW no VSD	TWh output/a	124	168	180	186	186	181	172	162	148	133
Medium (L) 3-ph 75-375 kW no VSD	TWh output/a	273	354	373	383	378	358	327	286	248	224
Total 3ph 0.75-375 kW no VSD	**TWh output/a**	**465**	**616**	**653**	**674**	**669**	**642**	**600**	**545**	**489**	**443**
Medium (S) 3-ph 0.75-7.5 kW with VSD	TWh output/a	4	10	12	15	18	21	25	30	35	41
Medium (M) 3-ph 7.5-75 kW with VSD	TWh output/a	9	23	30	36	44	51	60	71	83	97
Medium (L) 3-ph 75-375 kW with VSD	TWh output/a	29	73	93	116	140	167	196	230	263	288
Total 3-ph 0.75-375 kW with VSD	**TWh output/a**	**42**	**106**	**135**	**167**	**202**	**240**	**282**	**331**	**381**	**426**
Total 3-ph 0.75-375 kW w/wo VSD	**TWh output/a**	**507**	**722**	**787**	**841**	**871**	**882**	**882**	**876**	**870**	**869**
Small 1 ph 0.12-0.75 kW no VSD	TWh output/a	5	6	7	7	7	7	7	7	7	7
Small 1 ph 0.12-0.75 kW with VSD	TWh output/a	0	0	0	1	1	1	1	1	1	1
Total Small 1-ph 0.12-0.75 kW	**TWh output/a**	**5**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**8**	**8**
Small 3 ph 0.12-0.75 kW no VSD	TWh output/a	7	9	9	10	10	10	10	10	10	10
Small 3 ph 0.12-0.75 kW with VSD	TWh output/a	0	1	1	1	1	1	1	1	2	2
Total Small 3-ph 0.12-0.75 kW	**TWh output/a**	**7**	**9**	**10**	**11**	**11**	**11**	**12**	**12**	**12**	**12**
Large 3-ph LV 375-1000 kW no VSD	TWh output/a	142	174	170	162	153	146	144	143	142	141
Large 3-ph LV 375-1000kW with VSD	TWh output/a	7	36	55	77	95	109	116	122	128	135
Total Large 3-ph LV 375-1000 kW	**TWh output/a**	**149**	**210**	**225**	**239**	**248**	**254**	**260**	**265**	**270**	**276**
Explosion motors (S) 3-ph 0.75-7.5 kW	TWh output/a	2	3	4	4	4	4	4	4	5	5
Explosion motors (M) 3-ph 7.5-75 kW	TWh output/a	7	10	11	12	12	13	13	13	14	14
Explosion motors (L) 3-ph 75-375 kW	TWh output/a	14	20	22	24	26	27	28	28	29	30
Total Expl. 0.75-375 kW (no VSD)	**TWh output/a**	**23**	**33**	**37**	**40**	**42**	**44**	**45**	**46**	**47**	**49**
Brake motors (S) 3-ph 0.75-7.5 kW	TWh output/a	2	2	3	3	3	3	3	3	3	3
Brake motors (M) 3-ph 7.5-75 kW	TWh output/a	4	7	7	8	8	8	9	9	9	9
Brake motors (L) 3-ph 75-375 kW	TWh output/a	7	10	11	12	13	14	14	14	15	15
Total Brake 0.75-375 kW (no VSD)	**TWh output/a**	**13**	**19**	**21**	**23**	**24**	**25**	**26**	**26**	**27**	**28**
8-pole motors (S) 3-ph 0.75-7.5 kW	TWh output/a	0	0	0	0	0	0	0	0	0	0
8-pole motors (M) 3-ph 7.5-75 kW	TWh output/a	0	0	1	1	1	1	1	1	1	1
8-pole motors (L) 3-ph 75-375 kW	TWh output/a	1	1	1	1	1	1	1	1	1	1
Total 8-pole 0.75-375 kW (no VSD)	**TWh output/a**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
1-phase motors >0.75 kW (no VSD)	**TWh output/a**	**28**	**41**	**46**	**49**	**52**	**54**	**55**	**56**	**58**	**59**
MT Elec. Motors LV 0.12-1000 kW	**TWh output/a**	**731**	**1044**	**1136**	**1212**	**1258**	**1280**	**1289**	**1292**	**1295**	**1302**

LOAD EU Total, BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
ESOB<45_VF	TWh flow/a	7.6	10.2	10.8	11.6	12.1	12.5	13.2	14.1	15.0	15.9
ESOB<45_CF	TWh flow/a	6.6	9.1	9.7	10.6	11.4	12.0	12.8	13.6	14.5	15.3
ESOB<45_VSD-VF	TWh flow/a	0.3	0.5	0.6	0.8	1.1	1.4	1.5	1.6	1.7	1.8
ESOB < 45 Total	TWh flow/a	**14**	**20**	**21**	**23**	**25**	**26**	**27**	**29**	**31**	**33**
ESOB_45-150_VF	TWh flow/a	2.9	3.8	4.1	4.3	4.4	4.4	4.6	5.0	5.3	5.6
ESOB_45-150_CF	TWh flow/a	6.2	8.5	9.1	9.9	10.6	11.3	12.0	12.8	13.6	14.4
ESOB_45-150_VSD-VF	TWh flow/a	0.2	0.3	0.4	0.5	0.7	0.9	1.0	1.1	1.1	1.2
ESOB 45-150 Total	TWh flow/a	**9**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**	**21**
ESOB < 150 Total	TWh flow/a	**24**	**32**	**35**	**38**	**40**	**42**	**45**	**48**	**51**	**54**
ESCC<45_VF	TWh flow/a	6.2	8.3	8.8	9.4	9.7	10.0	10.5	11.2	11.9	12.6
ESCC<45_CF	TWh flow/a	5.5	7.5	8.1	8.8	9.4	10.0	10.6	11.3	12.0	12.7
ESCC<45_VSD-VF	TWh flow/a	0.3	0.5	0.6	0.8	1.1	1.4	1.6	1.7	1.8	1.9
ESCC < 45 Total	TWh flow/a	**12**	**16**	**18**	**19**	**20**	**21**	**23**	**24**	**26**	**27**
ESCC_45-150_VF	TWh flow/a	2.6	3.4	3.6	3.9	4.0	4.1	4.3	4.6	4.9	5.2
ESCC_45-150_CF	TWh flow/a	2.3	3.1	3.4	3.7	3.9	4.2	4.4	4.7	5.0	5.3
ESCC_45-150_VSD-VF	TWh flow/a	0.1	0.2	0.3	0.3	0.5	0.6	0.7	0.7	0.7	0.8
ESCC 45-150 Total	TWh flow/a	**5**	**7**	**7**	**8**	**8**	**9**	**9**	**10**	**11**	**11**
ESCC < 150 Total	TWh flow/a	**17**	**23**	**25**	**27**	**29**	**30**	**32**	**34**	**36**	**39**
ESCCi<45_VF	TWh flow/a	3.1	3.7	3.8	3.8	3.4	3.0	3.0	3.2	3.4	3.6
ESCCi<45_CF	TWh flow/a	0.3	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8
ESCCi<45_VSD-VF	TWh flow/a	0.5	1.0	1.2	1.6	2.2	2.7	3.0	3.2	3.4	3.6
ESCCi < 45 Total	TWh flow/a	**4**	**5**	**6**	**6**	**6**	**6**	**7**	**7**	**8**	**8**
ESCCi_45-150_VF	TWh flow/a	0.7	0.8	0.8	0.8	0.7	0.6	0.6	0.7	0.7	0.8
ESCCi_45-150_CF	TWh flow/a	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
ESCCi_45-150_VSD-VF	TWh flow/a	0.1	0.2	0.3	0.3	0.5	0.6	0.7	0.7	0.7	0.8
ESCCi 45-150 Total	TWh flow/a	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
ESCCi < 150 Total	TWh flow/a	**5**	**6**	**7**	**7**	**7**	**8**	**8**	**9**	**9**	**10**
MSSB<6"_VF	TWh flow/a	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.2
MSSB<6"_CF	TWh flow/a	6.1	8.3	8.9	9.7	10.5	11.1	11.7	12.5	13.3	14.1
MSSB<6"_VSD-VF	TWh flow/a	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.6	0.6
MSSB <6" Total	TWh flow/a	**7**	**10**	**10**	**11**	**12**	**12**	**13**	**14**	**15**	**16**
MS-V<25bar_VF	TWh flow/a	4.4	5.7	6.1	6.4	6.4	6.4	6.7	7.1	7.6	8.0
MS-V<25bar_CF	TWh flow/a	3.8	5.3	5.7	6.2	6.6	7.0	7.4	7.9	8.4	8.9
MS-V<25bar_VSD-VF	TWh flow/a	0.3	0.6	0.7	0.9	1.3	1.6	1.8	1.9	2.0	2.1
MS_V <25 bar Total	TWh flow/a	**9**	**12**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
WP Water pumps	**TWh flow/a**	**61**	**83**	**89**	**96**	**103**	**108**	**114**	**122**	**130**	**137**
WE Welding Equipment (arc-on output)	**TWh/a**	**3.9**	**4.5**	**4.6**	**4.6**	**4.6**	**4.7**	**4.7**	**4.8**	**4.8**	**4.8**
TRAFO Distribution	m units/a	1.34	2.23	2.50	2.78	3.08	3.38	3.68	3.99	4.29	4.60
TRAFO Industry oil	m units/a	0.29	0.50	0.56	0.62	0.68	0.74	0.80	0.86	0.92	0.98
TRAFO Industry dry	m units/a	0.06	0.11	0.12	0.13	0.15	0.16	0.17	0.19	0.20	0.21
TRAFO Power	m units/a	0.04	0.06	0.07	0.08	0.09	0.10	0.10	0.11	0.12	0.13
TRAFO DER oil	m units/a	0.00	0.01	0.01	0.02	0.04	0.06	0.10	0.15	0.21	0.28
TRAFO DER dry	m units/a	0.00	0.03	0.05	0.09	0.15	0.25	0.40	0.60	0.85	1.13
TRAFO Small	m units/a	0.66	0.66	0.66	0.67	0.67	0.67	0.67	0.67	0.67	0.67
TRAFO Utility Transformers	m units/a	**2.39**	**3.60**	**3.98**	**4.40**	**4.85**	**5.35**	**5.93**	**6.57**	**7.26**	**8.01**
(annual km driven by all vehicles with tyre type)											
Tyres C1, replacement for cars	bn km/a	1876	2179	2213	2422	2690	2985	3101	3101	3101	3101
Tyres C1, OEM for cars	bn km/a	565	638	688	743	810	899	934	934	934	934
Tyres C1, total	**bn km/a**	**2440**	**2817**	**2901**	**3166**	**3500**	**3883**	**4035**	**4035**	**4035**	**4035**
Tyres C2, replacement for vans	bn km/a	385	448	447	501	557	618	636	636	636	636
Tyres C2, OEM for vans	bn km/a	81	93	92	109	117	130	134	134	134	134
Tyres C2, total	**bn km/a**	**466**	**541**	**538**	**610**	**674**	**748**	**771**	**771**	**771**	**771**
Tyres C3, replacement for trucks/busses	bn km/a	216	222	214	271	294	326	336	336	336	336
Tyres C3, OEM for trucks/busses	bn km/a	48	49	51	59	65	73	75	75	75	75
Tyres C3, total	**bn km/a**	**264**	**271**	**265**	**330**	**359**	**398**	**411**	**411**	**411**	**411**
Tyres, total C1+C2+C3	**bn km/a**	**3171**	**3629**	**3705**	**4106**	**4533**	**5029**	**5217**	**5217**	**5217**	**5217**

LOAD EU, Variation (BAU-ECO)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050

Note for printed version: for products not listed below, the load variation is zero (BAU-load and ECO-load identical)

The space heating load reduction is computed as Sres(i)*Qrestot +Snres(i)*Qnrestot, where:
Sres(i) is the share of appliance 'i' in the total EU residential heat load, computed as %res(i)*Load(i)/Lrestot
Snres(i) is the share of appliance 'i' in the total EU non-residential heat load, computed as (1-%res(i))*Load(i)/Lnrestot
Qrestot is the total heat saving due to residential ventilation units (RVU), reported further below
Qnrestot is the total heat saving due to non-residential ventilation units (NRVU), reported further below
%res is the residential share for appliance 'i' as defined on sheet SHARES
Load(i) is the EULOADBAU for appliance 'i'
Lrestot is the total residential EULOADBAU over all space heating appliances, reported further below
Lnrestot is the total non-residential EULOADBAU over all space heating appliances, reported further below

CHB Gas non-condensing	TWh heat/a	0	0	1	2	4	5	6	5	5	5
CHB Gas condensing	TWh heat/a	0	0	0	3	7	12	16	17	18	19
CHB Gas Jet burner non-condensing	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Gas Jet burner condensing	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Oil Jet burner non-condensing	TWh heat/a	0	0	0	1	2	2	1	1	1	1
CHB Oil Jet burner condensing	TWh heat/a	0	0	0	0	1	1	1	2	2	2
CHB Electric Joule-effect	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Hybrid (gas-electric)	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Electric Heat Pump	TWh heat/a	0	0	0	0	1	2	2	3	3	4
CHB Gas Heat Pump	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB micro CHP	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Solar combi (16 m2)	TWh heat/a	0	0	0	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating	**TWh heat/a**	**0**	**0**	**2**	**7**	**15**	**22**	**27**	**29**	**30**	**31**
SFB Wood Manual	TWh heat/a	0.0	0.0	0.0	0.1	0.1	0.2	0.1	0.1	0.1	0.1
SFB Wood Direct Draft	TWh heat/a	0.0	0.0	0.0	0.1	0.4	0.8	1.0	1.3	1.7	2.1
SFB Coal	TWh heat/a	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.4	0.4
SFB Pellets	TWh heat/a	0.0	0.0	0.0	0.1	0.3	0.6	0.7	0.8	0.9	1.0
SFB Wood chips	TWh heat/a	0.0	0.0	0.1	0.3	0.6	0.8	1.1	1.2	1.2	1.3
SFB total net heat demand	**TWh heat/a**	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**4**	**4**	**5**
AC rooftop (rev)	TWh heat/a	0.0	0.0	0.1	0.6	0.9	0.9	0.5	0.1	0.0	0.0
AC splits (rev)	TWh heat/a	0.0	0.0	0.3	1.4	2.7	3.7	4.0	3.8	3.5	3.2
AC VRF (rev)	TWh heat/a	0.0	0.0	0.2	1.0	2.6	4.7	6.4	7.0	7.3	7.4
ACF (rev)	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
AHF	TWh heat/a	0.0	0.0	0.4	1.7	3.0	4.0	4.3	4.0	3.6	3.2
AHE	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
AHC central Air Heating	**TWh heat/a**	**0**	**0**	**1**	**5**	**9**	**13**	**15**	**15**	**15**	**14**
LH open fireplace	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
LH closed fireplace/inset	TWh heat/a	0.0	0.0	0.0	0.1	0.3	0.7	0.9	1.1	1.2	1.3
LH wood stove	TWh heat/a	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.7	0.7
LH coal stove	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LH cooker	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3
LH SHR stove	TWh heat/a	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.7	0.7	0.8
LH pellet stove	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4
LH Solid fuel sum	**TWh heat/a**	**0**	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**4**	**4**
LH Electric portable	TWh heat/a	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.5	0.5
LH Electric fixed > 250W	TWh heat/a	0.0	0.0	0.1	0.6	1.1	1.5	1.8	1.9	1.9	1.9
LH Electric fixed ≤ 250W	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LH Electric storage	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LH Electric underfloor	TWh heat/a	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.5	0.5
LH Electric visibly glowing > 1.2 kW	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
LH Electric visibly glowing ≤ 1.2 kW	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Electric Towel Heaters	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
LH Electric sum	**TWh heat/a**	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
LH Gas luminous (commercial)	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gaseous Tube (commercial < 120 kW)	TWh heat/a	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LH Gas open front	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gas closed front	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gas balanced flue	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gas flueless	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gaseous fuel sum	**TWh heat/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LH Liquid tube (commercial < 120 kW)	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid open front	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid closed front	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	TWh heat/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid fuel sum	**TWh heat/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LH Local Space Heaters total		**0**	**0**	**0**	**1**	**3**	**5**	**6**	**7**	**7**	**7**

LOAD EU, Variation (BAU-ECO)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
RAC fixed < 6 kW, reversible, heating	TWh heat/a	0	0	0	0	1	3	5	6	8	10
RAC fixed 6-12 kW, reversible, heating	TWh heat/a	0	0	0	0	1	2	3	4	5	6
RAC portable < 12 kW, reversible, heating	TWh heat/a	0	0	0	0	0	0	0	0	0	0
RAC < 12 kW total, heating mode	**TWh heat/a**	**0**	**0**	**0**	**1**	**2**	**5**	**8**	**11**	**13**	**16**
Space Heating Load Total, Variation	**TWh heat/a**	**0**	**0**	**3**	**15**	**31**	**49**	**60**	**65**	**69**	**73**
R-BVU ≤ 100 m3/h for Habitable Spaces											
Heat recovered by MVU stock, BAU	TWh heat/a	0.0	0.3	0.4	0.7	2.0	3.9	5.8	7.7	9.4	11.2
Heat recovered by MVU stock, ECO	TWh heat/a	0.0	0.3	0.4	0.8	2.8	5.8	8.6	11.3	13.8	16.3
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.0	0.1	0.8	1.8	2.8	3.6	4.4	5.1
R-BVU 100-250 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.0	0.2	0.3	0.4	0.8	1.4	2.0	2.6	3.1	3.7
Heat recovered by MVU stock, ECO	TWh heat/a	0.0	0.2	0.3	0.5	1.3	2.4	3.5	4.5	5.5	6.4
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.0	0.1	0.5	1.0	1.5	2.0	2.4	2.7
R-BVU 250-1000 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.1	1.2	1.7	2.3	4.8	8.4	11.8	15.3	18.4	21.6
Heat recovered by MVU stock, ECO	TWh heat/a	0.1	1.2	1.8	2.8	7.4	13.8	19.9	25.7	31.1	36.4
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.1	0.5	2.6	5.5	8.1	10.5	12.6	14.8
R-BVU 1000-2500 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.0	0.3	0.4	0.6	0.7	0.8	0.9	1.0	1.0	1.1
Heat recovered by MVU stock, ECO	TWh heat/a	0.0	0.3	0.5	0.7	1.0	1.3	1.5	1.6	1.8	1.9
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.7	0.7	0.8
RVU, Total residential											
Heat recovered by RVU stock, BAU	**TWh heat/a**	**0**	**2**	**3**	**4**	**8**	**14**	**21**	**27**	**32**	**38**
Heat recovered by RVU stock, ECO	**TWh heat/a**	**0**	**2**	**3**	**5**	**12**	**23**	**34**	**43**	**52**	**61**
Additional heat recovered by RVU, ECO vs BAU	**TWh heat/a**	**0**	**0**	**0**	**1**	**4**	**9**	**13**	**17**	**20**	**23**
NR-BVU 250-1000 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.0	2.0	2.9	3.8	4.6	5.2	5.9	6.4	6.9	7.4
Heat recovered by MVU stock, ECO	TWh heat/a	0.0	2.0	3.1	4.7	6.5	8.4	9.9	10.8	11.7	12.5
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.2	0.9	2.0	3.2	4.0	4.4	4.8	5.1
NR-BVU 1000-2500 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.0	2.9	4.3	5.7	6.8	7.8	8.7	9.5	10.3	11.0
Heat recovered by MVU stock, ECO	TWh heat/a	0.0	2.9	4.4	5.9	7.4	8.7	9.8	10.8	11.6	12.4
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.1	0.3	0.6	0.9	1.1	1.2	1.3	1.4
NR-AHU-S 2500-5500 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	0.3	5.4	9.2	13.1	15.9	17.9	19.6	21.1	22.4	23.5
Heat recovered by MVU stock, ECO	TWh heat/a	0.3	5.4	9.8	15.7	21.2	25.8	29.3	31.6	33.6	35.2
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.5	2.6	5.2	7.9	9.8	10.5	11.2	11.7
NR-AHU-M 5500-14500 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	21.8	33.2	40.5	47.1	50.5	51.2	51.3	51.4	51.3	51.2
Heat recovered by MVU stock, ECO	TWh heat/a	21.8	33.2	42.3	55.1	65.9	73.5	76.9	77.1	77.0	76.6
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	1.8	8.0	15.4	22.3	25.6	25.7	25.6	25.4
NR-AHU-L > 14500 m3/h											
Heat recovered by MVU stock, BAU	TWh heat/a	5.3	8.1	9.9	11.5	12.3	12.5	12.5	12.5	12.5	12.5
Heat recovered by MVU stock, ECO	TWh heat/a	5.3	8.1	10.3	13.4	16.0	17.9	18.7	18.8	18.7	18.6
Additional heat recovered in ECO vs BAU	TWh heat/a	0.0	0.0	0.4	1.9	3.8	5.4	6.2	6.3	6.2	6.2
NRVU, Total non-residential											
Heat recovered by NRVU stock, BAU	**TWh heat/a**	**27**	**52**	**67**	**81**	**90**	**95**	**98**	**101**	**104**	**106**
Heat recovered by NRVU stock, ECO	**TWh heat/a**	**27**	**52**	**70**	**95**	**117**	**134**	**145**	**149**	**153**	**155**
Additional heat recovered by NRVU, ECO vs BAU	**TWh heat/a**	**0**	**0**	**3**	**14**	**27**	**40**	**47**	**48**	**49**	**50**
VU Ventilation Units, res + non-res											
Heat recovered by MVU stock, BAU	**TWh heat/a**	**28**	**54**	**70**	**85**	**98**	**109**	**118**	**127**	**136**	**143**
Heat recovered by MVU stock, ECO	**TWh heat/a**	**28**	**54**	**73**	**100**	**130**	**158**	**178**	**192**	**205**	**216**
Additional heat recovered by MVU, ECO vs BAU	**TWh heat/a**	**0**	**0**	**3**	**15**	**31**	**49**	**60**	**65**	**69**	**73**

LOAD EU, Variation (BAU-ECO)	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LS, total EU capacity variation (BAU-ECO) in Tlm											
LFL (T12,T8h,T8t,T5,other)	Tlm	0.0	0.0	0.0	0.2	1.1	2.3	2.7	2.5	2.1	1.7
HID (HPM, HPS, MH)	Tlm	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.1	0.1
CFLni (all shapes)	Tlm	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
CFLi (retrofit for GLS, HL)	Tlm	0.0	-0.3	-0.3	0.1	0.9	1.0	0.8	0.5	0.3	0.2
GLS (DLS & NDLS)	Tlm	0.0	0.4	0.8	0.8	0.5	0.3	0.2	0.1	0.1	0.0
HL (DLS & NDLS, LV & MV)	Tlm	0.0	-0.1	-0.3	0.7	1.0	0.5	0.3	0.2	0.1	0.0
LED replacing LFL (retrofit & luminaire)	Tlm	0.0	0.0	0.0	-0.2	-1.2	-2.4	-2.9	-2.7	-2.2	-1.8
LED replacing HID (retrofit & luminaire)	Tlm	0.0	0.0	-0.2	-0.3	-0.4	-0.4	-0.3	-0.2	-0.2	-0.1
LED replacing CFLni (retrofit & luminaire)	Tlm	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0
LED replacing DLS (retrofit & luminaire)	Tlm	0.0	0.0	-0.1	-0.3	-0.4	-0.3	-0.2	-0.1	-0.1	0.0
LED replacing NDLS (retrofit & luminaire)	Tlm	0.0	0.0	-0.2	-1.6	-2.2	-1.8	-1.2	-0.8	-0.5	-0.4
LS Lighting	**Tlm**	**0.0**	**0.0**	**-0.2**	**-0.3**	**-0.4**	**-0.5**	**-0.4**	**-0.4**	**-0.3**	**-0.3**
LS, total EU fpe-hours variation (BAU - ECO) in Th/a											
LFL (T12,T8h,T8t,T5,other)	Th/a	0.0	0.0	0.0	0.2	0.8	1.5	1.8	1.7	1.4	1.2
HID (HPM, HPS, MH)	Th/a	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
CFLni (all shapes)	Th/a	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.0
CFLi (retrofit for GLS, HL)	Th/a	0.0	-0.2	-0.3	0.1	0.7	0.8	0.6	0.4	0.3	0.2
GLS (DLS & NDLS)	Th/a	0.0	0.4	0.7	0.7	0.4	0.2	0.1	0.1	0.0	0.0
HL (DLS & NDLS, LV & MV)	Th/a	0.0	-0.1	-0.2	0.6	0.8	0.4	0.2	0.1	0.1	0.0
LED replacing LFL (retrofit & luminaire)	Th/a	0.0	0.0	0.0	-0.2	-0.7	-1.5	-1.7	-1.6	-1.4	-1.1
LED replacing HID (retrofit & luminaire)	Th/a	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0	0.0	0.0
LED replacing CFLni (retrofit & luminaire)	Th/a	0.0	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.1	-0.1	0.0
LED replacing DLS (retrofit & luminaire)	Th/a	0.0	0.0	-0.1	-0.3	-0.4	-0.2	-0.1	-0.1	0.0	0.0
LED replacing NDLS (retrofit & luminaire)	Th/a	0.0	0.0	-0.2	-1.2	-1.8	-1.5	-1.1	-0.7	-0.5	-0.4
LS Lighting	**Th/a**	**0.0**	**0.0**	**0.0**	**-0.1**	**-0.2**	**-0.2**	**-0.1**	**-0.1**	**-0.1**	**-0.1**
Game consoles > 20 W Active modes (SRI)	bn h/a	0	1	15	12	12	12	12	12	12	12
Game consoles > 20 W Non-Active (CR)	bn h/a	0	-1	-15	-12	-12	-12	-12	-12	-12	-12
Game consoles < 20 W Non-Active (CR)	bn h/a	0	0	-2	-3	-3	-3	-3	-3	-3	-3
Game consoles < 20 W Active (no reg.)	bn h/a	0	0	2	3	3	3	3	3	3	3
Total Game consoles, active modes	bn h/a	0	1	17	15	15	15	15	15	15	15
Total Game consoles, non-active modes	bn h/a	0	-1	-17	-15	-15	-15	-15	-15	-15	-15
Total Game consoles > 20 W, all modes	bn h/a	0	0	0	0	0	0	0	0	0	0
Total Game consoles < 20 W, all modes	bn h/a	0	0	0	0	0	0	0	0	0	0
Total Game consoles, all modes	**bn h/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ES tower 1-socket traditional	GWh	0	0	0	34	11	6	5	5	5	5
ES rack 1-socket traditional	GWh	0	0	0	62	-27	-45	-46	-46	-46	-46
ES rack 2-socket traditional	GWh	0	0	0	198	133	121	132	132	132	132
ES rack 2-socket cloud	GWh	0	0	0	440	165	93	101	101	101	101
ES rack 4-socket traditional	GWh	0	0	0	26	27	29	32	32	32	32
ES rack 4-socket cloud	GWh	0	0	0	78	67	67	73	73	73	73
ES rack 2-socket resilient trad.	GWh	0	0	0	5	2	2	2	2	2	2
ES rack 2-socket resilient cloud	GWh	0	0	0	12	6	4	5	5	5	5
ES rack 4-socket resilient trad.	GWh	0	0	0	0	1	1	1	1	1	1
ES rack 4-socket resilient cloud	GWh	0	0	0	1	1	1	1	1	1	1
ES blade 1-socket traditional	GWh	0	0	0	17	12	10	10	10	10	10
ES blade 2-socket traditional	GWh	0	0	0	44	15	8	8	8	8	8
ES blade 2-socket cloud	GWh	0	0	0	138	45	22	25	25	25	25
ES blade 4-socket traditional	GWh	0	0	0	13	24	28	31	31	31	31
ES blade 4-socket cloud	GWh	0	0	0	38	69	80	88	88	88	88
ES total traditional	**GWh**	**0**	**0**	**0**	**400**	**198**	**158**	**174**	**174**	**174**	**174**
ES total cloud	**GWh**	**0**	**0**	**0**	**707**	**353**	**268**	**292**	**292**	**292**	**292**
ES Enterprise Servers total	**GWh**	**0**	**0**	**0**	**1107**	**550**	**426**	**466**	**466**	**466**	**466**
DS Online 2	GWh	0	0	0	0	0	0	0	0	0	0
DS Online 3	GWh	0	0	0	0	0	0	0	0	0	0
DS Online 4	GWh	0	0	0	0	0	0	0	0	0	0
DS Data Storage products total	**GWh**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ES + DS total	**GWh**	**0**	**0**	**0**	**1107**	**550**	**426**	**466**	**466**	**466**	**466**
LD condensing heat pump	Mt laundry/a	0.0	-0.1	-3.0	-7.8	-12.8	-15.6	-17.4	-17.8	-17.0	-16.2
LD condensing electric heat element	Mt laundry/a	0.0	0.0	1.3	4.4	7.8	9.4	10.0	9.9	9.1	8.2
LD vented electric	Mt laundry/a	0.0	0.1	1.6	3.4	5.0	6.1	7.3	7.9	8.0	8.0
LD vented gas	Mt laundry/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LD total weight of laundry dried	**Mt laundry/a**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

LOAD EU, Variation (BAU-ECO)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
MT motors load variation (BAU-ECO) due to increased use of VSDs											
Medium (S) 3-ph 0.75-7.5 kW no VSD	TWh output/a	0.0	0.0	1.5	12.0	21.7	21.1	18.7	15.4	11.2	5.7
Medium (M) 3-ph 7.5-75 kW no VSD	TWh output/a	0.0	0.1	5.7	28.4	48.9	49.1	43.2	35.3	25.0	11.8
Medium (L) 3-ph 75-375 kW no VSD	TWh output/a	0.0	0.2	12.2	48.1	80.8	100.4	83.8	56.2	28.5	9.0
Total 3ph 0.75-375 kW no VSD	**TWh output/a**	**0**	**0**	**19**	**88**	**151**	**171**	**146**	**107**	**65**	**27**
Medium (S) 3-ph 0.75-7.5 kW with VSD	TWh output/a	0.0	0.0	-0.9	-7.2	-13.0	-12.7	-11.2	-9.3	-6.7	-3.4
Medium (M) 3-ph 7.5-75 kW with VSD	TWh output/a	0.0	0.0	-3.4	-17.0	-29.3	-29.5	-25.9	-21.2	-15.0	-7.1
Medium (L) 3-ph 75-375 kW with VSD	TWh output/a	0.0	-0.1	-7.3	-28.8	-48.5	-60.2	-50.3	-33.7	-17.1	-5.4
Total 3-ph 0.75-375 kW with VSD	**TWh output/a**	**0**	**0**	**-12**	**-53**	**-91**	**-102**	**-87**	**-64**	**-39**	**-16**
Total 3-ph 0.75-375 kW w/wo VSD	**TWh output/a**	**0**	**0**	**8**	**35**	**61**	**68**	**58**	**43**	**26**	**11**
Small 1 ph 0.12-0.75 kW no VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small 1 ph 0.12-0.75 kW with VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Small 1-ph 0.12-0.75 kW	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Small 3 ph 0.12-0.75 kW no VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Small 3 ph 0.12-0.75 kW with VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Small 3-ph 0.12-0.75 kW	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Large 3-ph LV 375-1000 kW no VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Large 3-ph LV 375-1000kW with VSD	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Large 3-ph LV 375-1000 kW	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Explosion motors (S) 3-ph 0.75-7.5 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Explosion motors (M) 3-ph 7.5-75 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Explosion motors (L) 3-ph 75-375 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Expl. 0.75-375 kW (no VSD)	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Brake motors (S) 3-ph 0.75-7.5 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brake motors (M) 3-ph 7.5-75 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Brake motors (L) 3-ph 75-375 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Brake 0.75-375 kW (no VSD)	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
8-pole motors (S) 3-ph 0.75-7.5 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-pole motors (M) 3-ph 7.5-75 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8-pole motors (L) 3-ph 75-375 kW	TWh output/a	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total 8-pole 0.75-375 kW (no VSD)	**TWh output/a**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1-phase motors >0.75 kW (no VSD)	**TWh output/a**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
MT Elec. Motors Total (BAU-ECO)	**TWh output/a**	**0**	**0**	**8**	**35**	**61**	**68**	**58**	**43**	**26**	**11**

Data for determination of Heat Load reduction for Space Heating due to Ventilation Units

The heat recovered by RVUs (residential) and NRVUs (non-residential) is reported per VU base case above. The totals per sector are repeated below. The heat recovered by VUs in the BAU scenario has already been taken into account in the space heating loads for the BAU scenario. The additional heat recovered by VUs in the ECO scenario is considered in EIA as a space heating load reduction in ECO vs BAU. The total EU heat load reduction is subdivided over the space heating base cases proportional to their share of the overall EU space heating load covered in BAU. The EU space heating load totals for BAU are reported below, separately for the residential and non-residential sectors.

NRVU BAU Heat recovered	TWh heat/a	27	52	67	81	90	95	98	101	104	106
NRVU ECO Heat recovered	TWh heat/a	27	52	70	95	117	134	145	149	153	155
NRVU ECO Heat savings vs. BAU	**TWh heat/a**	**0**	**0**	**3**	**14**	**27**	**40**	**47**	**48**	**49**	**50**
RVU BAU Heat recovered	TWh heat/a	0	2	3	4	8	14	21	27	32	38
RVU ECO Heat recovered	TWh heat/a	0	2	3	5	12	23	34	43	52	61
RVU ECO Heat savings vs. BAU	**TWh heat/a**	**0**	**0**	**0**	**1**	**4**	**9**	**13**	**17**	**20**	**23**

The Space Heating Load totals reported below are the sum of loads from EULOADBAU over all space heating products, taking into account the residential and non-residential shares from sheet SHARES.

EU Space Heating Load, BAU, Non-Residential	TWh heat/a	494	630	629	619	605	596	595	596	602	604
EU Space Heating Load, BAU, Residential	TWh heat/a	1001	1089	1081	1050	1019	992	991	1004	1029	1049
EU Space Heating Load, BAU, All sectors	TWh heat/a	1494	1719	1711	1669	1624	1588	1585	1600	1631	1653

LOAD EU Total, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050

Note for printed version: for products not listed below, ECO-load is identical to BAU-load

CHB Gas non-condensing	TWh heat/a	383	475	382	249	129	64	26	14	7	5
CHB Gas condensing	TWh heat/a	5	192	295	421	508	533	515	456	404	350
CHB Gas Jet burner non-condensing	TWh heat/a	38	28	21	15	9	4	2	1	1	0
CHB Gas Jet burner condensing	TWh heat/a	0	1	2	3	4	6	7	7	7	7
CHB Oil Jet burner non-condensing	TWh heat/a	450	326	249	174	106	48	17	8	6	4
CHB Oil Jet burner condensing	TWh heat/a	0	6	15	27	40	52	58	62	63	62
CHB Electric Joule-effect	TWh heat/a	8	8	9	10	10	9	8	7	6	6
CHB Hybrid (gas-electric)	TWh heat/a	0	0	0	1	3	6	11	16	22	29
CHB Electric Heat Pump	TWh heat/a	4	23	32	46	69	99	139	181	221	258
CHB Gas Heat Pump	TWh heat/a	0	0	0	1	1	3	4	5	6	8
CHB micro CHP	TWh heat/a	0	0	0	1	2	2	3	4	5	5
CHB Solar combi (16 m2)	TWh heat/a	3	5	5	6	6	6	6	6	6	6
CHB Central Heating boiler < 400 kW, space heating	**TWh heat/a**	**892**	**1064**	**1012**	**954**	**888**	**832**	**796**	**767**	**753**	**739**
SFB Wood Manual	TWh heat/a	96	42	34	26	18	11	6	5	4	3
SFB Wood Direct Draft	TWh heat/a	1	17	31	44	52	51	51	55	63	73
SFB Coal	TWh heat/a	143	68	69	56	41	25	18	17	14	12
SFB Pellets	TWh heat/a	0	7	12	16	20	22	22	22	23	24
SFB Wood chips	TWh heat/a	0	10	12	14	12	12	12	13	14	15
SFB total net heat demand	**TWh heat/a**	**240**	**144**	**158**	**156**	**143**	**120**	**110**	**112**	**118**	**127**
AC rooftop (rev)	TWh heat/a	8	27	28	25	19	12	6	2	0	0
AC splits (rev)	TWh heat/a	19	63	66	64	60	55	49	45	41	38
AC VRF (rev)	TWh heat/a	0	21	32	45	56	67	76	80	83	83
ACF (rev)	TWh heat/a	0	0	0	1	1	1	1	1	1	1
AHF	TWh heat/a	124	98	86	76	66	58	51	46	41	36
AHE	TWh heat/a	1	2	1	1	1	1	1	1	1	1
AHC central Air Heating	**TWh heat/a**	**152**	**211**	**214**	**211**	**203**	**193**	**183**	**174**	**167**	**159**
								0			
LH open fireplace	TWh heat/a	3	5	5	6	6	6	6	6	6	6
LH closed fireplace/inset	TWh heat/a	11	27	32	38	42	44	45	45	45	44
LH wood stove	TWh heat/a	23	24	25	26	26	26	27	27	26	26
LH coal stove	TWh heat/a	14	8	8	7	6	6	5	4	3	2
LH cooker	TWh heat/a	4	7	8	9	10	10	10	10	10	10
LH SHR stove	TWh heat/a	13	17	18	20	22	24	26	28	28	28
LH pellet stove	TWh heat/a	0	6	9	12	14	15	15	16	15	15
LH Solid fuel sum	**TWh heat/a**	**68**	**94**	**105**	**116**	**125**	**131**	**134**	**135**	**133**	**131**
LH Electric portable	TWh heat/a	15	16	16	15	15	14	13	13	12	12
LH Electric fixed > 250W	TWh heat/a	85	84	78	69	59	52	50	47	45	43
LH Electric fixed ≤ 250W	TWh heat/a	5	5	5	4	4	3	3	3	3	3
LH Electric storage	TWh heat/a	5	5	5	4	4	4	3	3	3	3
LH Electric underfloor	TWh heat/a	13	14	14	14	14	14	13	13	12	12
LH Electric visibly glowing > 1.2 kW	TWh heat/a	1	1	1	1	1	1	1	1	1	1
LH Electric visibly glowing ≤ 1.2 kW	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Electric Towel Heaters	TWh heat/a	4	6	7	7	7	6	6	6	6	5
LH Electric sum	**TWh heat/a**	**129**	**131**	**126**	**116**	**104**	**95**	**90**	**86**	**83**	**79**
LH Gas luminous (commercial)	TWh heat/a	1	1	1	1	1	1	1	0	0	0
LH Gaseous Tube (commercial < 120 kW)	TWh heat/a	2	2	2	2	1	1	1	1	1	1
LH Gas open front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Gas closed front	TWh heat/a	2	1	1	1	1	1	1	0	0	0
LH Gas balanced flue	TWh heat/a	5	3	2	2	1	1	1	1	1	1
LH Gas flueless	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	**TWh heat/a**	**11**	**7**	**6**	**5**	**4**	**4**	**3**	**3**	**2**	**2**
LH Liquid tube (commercial < 120 kW)	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid open front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid closed front	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid flueless	TWh heat/a	0	0	0	0	0	0	0	0	0	0
LH Liquid fuel sum	**TWh heat/a**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LH Local Space Heaters total		**209**	**234**	**238**	**237**	**233**	**230**	**228**	**224**	**219**	**212**
RAC fixed < 6 kW, reversible, heating	TWh heat/a	1	46	57	63	82	110	140	176	211	240
RAC fixed 6-12 kW, reversible, heating	TWh heat/a	1	20	29	33	42	53	65	79	91	99
RAC portable < 12 kW, reversible, heating	TWh heat/a	0	0	0	0	0	0	0	0	0	0
RAC < 12 kW total, heating mode	**TWh heat/a**	**2**	**66**	**85**	**96**	**125**	**163**	**205**	**255**	**302**	**339**
TOTAL SPACE HEATING load	**TWh heat/a**	**1494**	**1719**	**1708**	**1654**	**1591**	**1537**	**1522**	**1532**	**1559**	**1576**

LOAD EU Total, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
R-UVU ≤ 100 m3/h for Extract Spaces											
Mechanical flow from MVU	Mm3/h	9	22	26	28	28	27	28	29	30	31
Remaining infiltration flow (with MVU)	Mm3/h	7	11	11	12	11	11	11	11	12	12
Ref. natural airflow (without MVU)	Mm3/h	10	23	28	31	30	29	29	29	32	36
R-UVU ≤ 100 m3/h for Habitable Spaces											
Mechanical flow from MVU	Mm3/h	0	0	0	0	0	2	3	6	7	9
Remaining infiltration flow (with MVU)	Mm3/h	0	0	0	0	0	1	1	2	2	3
Ref. natural airflow (without MVU)	Mm3/h	0	0	0	0	1	3	6	9	11	12
R-BVU ≤ 100 m3/h for Habitable Spaces											
Mechanical flow from MVU	Mm3/h	1	20	34	66	230	485	752	1030	1307	1602
Remaining infiltration flow (with MVU)	Mm3/h	1	15	21	31	77	154	235	324	415	512
Ref. natural airflow (without MVU)	Mm3/h	2	48	72	121	376	788	1214	1589	1781	1978
R-UVU 100-250 m3/h											
Mechanical flow from MVU	Mm3/h	102	266	332	439	563	660	718	733	743	748
Remaining infiltration flow (with MVU)	Mm3/h	247	389	385	370	341	326	323	327	330	331
Ref. natural airflow (without MVU)	Mm3/h	344	852	910	916	825	791	783	788	817	849
R-BVU 100-250 m3/h											
Mechanical flow from MVU	Mm3/h	1	15	23	36	91	175	262	352	443	542
Remaining infiltration flow (with MVU)	Mm3/h	2	21	27	32	55	94	137	184	232	283
Ref. natural airflow (without MVU)	Mm3/h	4	63	85	110	234	442	661	860	961	1066
R-UVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	606	1844	2350	2853	3195	3367	3489	3541	3574	3588
Remaining infiltration flow (with MVU)	Mm3/h	1292	2038	2020	1942	1787	1710	1692	1713	1729	1736
Ref. natural airflow (without MVU)	Mm3/h	1801	4467	4772	4802	4323	4144	4103	4132	4281	4449
R-BVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	5	88	133	205	515	987	1475	1985	2500	3053
Remaining infiltration flow (with MVU)	Mm3/h	11	112	139	166	286	491	716	963	1214	1484
Ref. natural airflow (without MVU)	Mm3/h	22	329	443	576	1226	2316	3466	4506	5036	5588
R-UVU > 1000 m3/h											
Mechanical flow from MVU	Mm3/h	27	59	68	81	95	106	112	111	109	106
Remaining infiltration flow (with MVU)	Mm3/h	57	80	75	68	62	57	54	54	53	51
Ref. natural airflow (without MVU)	Mm3/h	95	152	143	130	115	102	92	87	82	77
R-BVU 1000-2500 m3/h											
Mechanical flow from MVU	Mm3/h	0	22	34	51	70	91	110	126	142	158
Remaining infiltration flow (with MVU)	Mm3/h	0	28	35	40	44	47	53	61	69	77
Ref. natural airflow (without MVU)	Mm3/h	0	86	117	142	157	166	178	191	206	219
RVU, Total residential (for venting hours per year:)	venting h/a	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760
Mechanical flow from MVU	**Tm3/a**	**7**	**20**	**26**	**33**	**42**	**52**	**61**	**69**	**78**	**86**
Remaining infiltration flow (with MVU)	**Tm3/a**	**14**	**24**	**24**	**23**	**23**	**25**	**28**	**32**	**36**	**39**
Ref. natural airflow (without MVU)	**Tm3/a**	**20**	**53**	**58**	**60**	**64**	**77**	**92**	**107**	**116**	**125**
RVU, Total residential (for heating season hours:)	heating h/a	6343	5348	5124	4910	4705	4508	4320	4139	3966	3801
Mechanical flow from MVU	**Tm3/a**	**5**	**12**	**15**	**18**	**23**	**27**	**30**	**33**	**35**	**37**
Remaining infiltration flow (with MVU)	**Tm3/a**	**10**	**14**	**14**	**13**	**13**	**13**	**14**	**15**	**16**	**17**
Ref. natural airflow (without MVU)	**Tm3/a**	**14**	**32**	**34**	**34**	**34**	**40**	**45**	**50**	**52**	**54**
NR-UVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	261	700	865	1010	1089	1110	1117	1109	1089	1055
Remaining infiltration flow (with MVU)	Mm3/h	556	800	749	686	617	566	542	537	527	511
Ref. natural airflow (without MVU)	Mm3/h	927	1522	1438	1307	1147	1014	924	864	822	768
NR-BVU 250-1000 m3/h											
Mechanical flow from MVU	Mm3/h	0	144	225	338	468	606	730	837	943	1050
Remaining infiltration flow (with MVU)	Mm3/h	0	184	235	270	293	316	355	406	458	510
Ref. natural airflow (without MVU)	Mm3/h	0	571	781	951	1045	1104	1186	1275	1372	1458
NR-UVU > 1000 m3/h											
Mechanical flow from MVU	Mm3/h	328	742	813	867	898	913	918	910	891	861
Remaining infiltration flow (with MVU)	Mm3/h	246	355	332	304	273	251	240	238	234	226
Ref. natural airflow (without MVU)	Mm3/h	411	675	638	579	508	450	409	383	364	341
NR-BVU 1000-2500 m3/h											
Mechanical flow from MVU	Mm3/h	0	226	332	440	543	645	752	859	967	1076
Remaining infiltration flow (with MVU)	Mm3/h	0	102	130	150	162	175	197	225	254	283
Ref. natural airflow (without MVU)	Mm3/h	0	317	433	527	579	612	657	707	760	808
NR-AHU-S 2500-5500 m3/h											
Mechanical flow from MVU	Mm3/h	48	724	1147	1585	1943	2260	2577	2890	3199	3496
Remaining infiltration flow (with MVU)	Mm3/h	36	323	447	536	580	617	674	756	839	919
Ref. natural airflow (without MVU)	Mm3/h	64	971	1498	1945	2147	2196	2193	2250	2369	2469
NR-AHU-M 5500-14500 m3/h											
Mechanical flow from MVU	Mm3/h	3044	4708	5245	5771	6162	6466	6759	7049	7333	7604
Remaining infiltration flow (with MVU)	Mm3/h	2290	2258	2129	2009	1871	1775	1769	1844	1922	1999
Ref. natural airflow (without MVU)	Mm3/h	2867	3646	3797	3941	3882	3791	3709	3753	3878	3979
NR-AHU-L > 14500 m3/h											
Mechanical flow from MVU	Mm3/h	741	1146	1277	1405	1500	1574	1646	1716	1785	1851
Remaining infiltration flow (with MVU)	Mm3/h	558	550	518	489	456	432	431	449	468	487
Ref. natural airflow (without MVU)	Mm3/h	699	888	925	960	945	923	903	914	944	969

LOAD EU Total, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NRVU, Total non-residential (venting hours/year:)	venting h/a	8760	8760	8760	8760	8760	8760	8760	8760	8760	8760
Mechanical flow from MVU	**Tm3/a**	**39**	**73**	**87**	**100**	**110**	**119**	**127**	**135**	**142**	**149**
Remaining infiltration flow (with MVU)	**Tm3/a**	**32**	**40**	**40**	**39**	**37**	**36**	**37**	**39**	**41**	**43**
Ref. natural airflow (without MVU)	**Tm3/a**	**44**	**75**	**83**	**89**	**90**	**88**	**87**	**89**	**92**	**95**
NRVU, Total non-residential (heating season hours:)	heating h/a	6343	5348	5124	4910	4705	4508	4320	4139	3966	3801
Mechanical flow from MVU	**Tm3/a**	**28**	**45**	**51**	**56**	**59**	**61**	**63**	**64**	**64**	**65**
Remaining infiltration flow (with MVU)	**Tm3/a**	**23**	**24**	**23**	**22**	**20**	**19**	**18**	**18**	**19**	**19**
Ref. natural airflow (without MVU)	**Tm3/a**	**32**	**46**	**49**	**50**	**48**	**45**	**43**	**42**	**42**	**41**
VU Ventilation Units, res + non-res	venting h/a						60				
Mechanical flow from MVU	**Tm3/a**	**45**	**94**	**113**	**133**	**152**	**171**	**188**	**204**	**220**	**235**
Remaining infiltration flow (with MVU)	**Tm3/a**	**46**	**64**	**64**	**62**	**61**	**62**	**65**	**71**	**77**	**83**
Ref. natural airflow (without MVU)	**Tm3/a**	**63**	**128**	**141**	**149**	**154**	**165**	**180**	**196**	**208**	**220**
LS, total EU capacity in Tlm											
LFL (T12,T8h,T8t,T5,other)	Tlm	2.4	4.1	5.1	5.7	4.7	2.8	1.3	0.7	0.4	0.2
HID (HPM, HPS, MH)	Tlm	0.4	1.1	1.1	1.0	0.8	0.4	0.2	0.1	0.0	0.0
CFLni (all shapes)	Tlm	0.1	0.3	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0
CFLi (retrofit for GLS, HL)	Tlm	0.1	1.5	2.0	1.5	0.6	0.1	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	Tlm	1.5	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	Tlm	0.2	1.0	1.5	0.7	0.0	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	Tlm			0.1	0.6	2.6	5.6	8.2	10.1	11.7	13.3
LED replacing HID (retrofit & luminaire)	Tlm			0.2	0.5	1.0	1.6	2.1	2.6	2.9	3.3
LED replacing CFLni (retrofit & luminaire)	Tlm			0.0	0.1	0.2	0.4	0.5	0.6	0.7	0.8
LED replacing DLS (retrofit & luminaire)	Tlm			0.1	0.4	0.7	0.8	0.9	1.0	1.0	1.1
LED replacing NDLS (retrofit & luminaire)	Tlm		0.0	0.2	2.1	4.0	4.8	5.3	5.7	6.2	6.7
LS Lighting	**Tlm**	**5**	**9**	**11**	**13**	**15**	**17**	**19**	**21**	**23**	**26**
LS, total EU fpe-hours in Th/a											
LFL (T12,T8h,T8t,T5,other)	Th/a	2.0	3.5	3.9	4.1	3.4	2.0	1.0	0.5	0.3	0.2
HID (HPM, HPS, MH)	Th/a	0.1	0.3	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0
CFLni (all shapes)	Th/a	0.1	0.6	0.7	0.6	0.4	0.2	0.1	0.0	0.0	0.0
CFLi (retrofit for GLS, HL)	Th/a	0.1	1.3	1.7	1.3	0.5	0.1	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	Th/a	1.4	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	Th/a	0.1	0.8	1.2	0.5	0.0	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	Th/a			0.0	0.4	1.7	3.7	5.4	6.7	7.8	9.0
LED replacing HID (retrofit & luminaire)	Th/a			0.1	0.1	0.3	0.4	0.6	0.7	0.8	0.9
LED replacing CFLni (retrofit & luminaire)	Th/a			0.0	0.2	0.4	0.7	0.9	1.1	1.2	1.4
LED replacing DLS (retrofit & luminaire)	Th/a		0.0	0.1	0.4	0.6	0.7	0.8	0.8	0.9	1.0
LED replacing NDLS (retrofit & luminaire)	Th/a		0.0	0.2	1.6	3.1	3.7	4.1	4.4	4.8	5.2
LS Lighting	**Th/a**	**4**	**7**	**8**	**9**	**11**	**12**	**13**	**14**	**16**	**18**
Game consoles > 20 W Active modes (SRI)	bn h/a	0	32	45	49	49	49	49	49	49	49
Game consoles > 20 W Non-Active (CR)	bn h/a	1	433	434	429	429	429	429	429	429	429
Game consoles < 20 W Non-Active (CR)	bn h/a	4	160	161	161	161	161	161	161	161	161
Game consoles < 20 W Active (no reg.)	bn h/a	0	11	11	11	11	11	11	11	11	11
Total Game consoles, active modes	bn h/a	0	43	55	60	60	60	60	60	60	60
Total Game consoles, non-active modes	bn h/a	5	593	595	590	590	590	590	590	590	590
Total Game consoles > 20 W, all modes	bn h/a	1	465	478	478	478	478	478	478	478	478
Total Game consoles < 20 W, all modes	bn h/a	4	172	172	172	172	172	172	172	172	172
Total Game consoles, all modes	bn h/a	**5**	**637**	**650**	**650**	**650**	**650**	**650**	**650**	**650**	**650**
ES tower 1-socket traditional	GWh	21	672	576	392	327	284	264	264	264	264
ES rack 1-socket traditional	GWh	68	2102	1607	1390	1535	1720	1759	1759	1759	1759
ES rack 2-socket traditional	GWh	464	10179	5577	3285	4004	4911	5358	5358	5358	5358
ES rack 2-socket cloud	GWh	0	5712	9063	9971	12365	15149	16528	16528	16528	16528
ES rack 4-socket traditional	GWh	53	1058	587	462	565	692	755	755	755	755
ES rack 4-socket cloud	GWh	0	636	1135	1516	1881	2304	2513	2513	2513	2513
ES rack 2-socket resilient trad.	GWh	23	512	298	168	179	219	239	239	239	239
ES rack 2-socket resilient cloud	GWh	0	246	392	394	423	515	562	562	562	562
ES rack 4-socket resilient trad.	GWh	1	28	17	11	13	16	18	18	18	18
ES rack 4-socket resilient cloud	GWh	0	15	27	33	40	48	53	53	53	53
ES blade 1-socket traditional	GWh	35	628	566	490	506	559	572	572	572	572
ES blade 2-socket traditional	GWh	385	4645	2429	1574	1929	2357	2572	2572	2572	2572
ES blade 2-socket cloud	GWh	0	2598	4028	4920	6093	7446	8124	8124	8124	8124
ES blade 4-socket traditional	GWh	48	585	321	208	238	290	316	316	316	316
ES blade 4-socket cloud	GWh	0	317	512	608	705	861	940	940	940	940
ES total traditional	**GWh**	**1099**	**20409**	**11978**	**7982**	**9297**	**11048**	**11853**	**11853**	**11853**	**11853**
ES total cloud	**GWh**	**0**	**9525**	**15156**	**17441**	**21506**	**26323**	**28720**	**28720**	**28720**	**28720**
ES Enterprise Servers total	**GWh**	**1099**	**29934**	**27134**	**25423**	**30803**	**37370**	**40573**	**40573**	**40573**	**40573**
DS Online 2	GWh	251	4779	6588	9194	11921	14548	15422	15499	15499	15499
DS Online 3	GWh	42	703	952	1295	1681	2051	2174	2185	2185	2185
DS Online 4	GWh	165	2734	3703	5062	6537	7977	8456	8499	8499	8499
DS Data Storage products total	**GWh**	**458**	**8216**	**11244**	**15551**	**20139**	**24576**	**26052**	**26184**	**26184**	**26184**
ES + DS total	**GWh**	**1556**	**38150**	**38378**	**40975**	**50942**	**61946**	**66625**	**66756**	**66756**	**66756**

LOAD EU Total, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LD condensing heat pump	Mt laundry/a	0.0	0.3	3.4	8.4	13.9	17.3	19.8	21.2	21.2	21.2
LD condensing electric heat element	Mt laundry/a	1.5	14.2	11.4	8.9	8.0	7.1	6.0	5.3	5.3	5.3
LD vented electric	Mt laundry/a	8.3	11.9	7.2	4.1	2.8	1.7	0.6	0.0	0.0	0.0
LD vented gas	Mt laundry/a	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LD total weight of laundry dried	**Mt laundry/a**	**10**	**27**	**22**	**21**	**25**	**26**	**26**	**27**	**27**	**27**
Medium (S) 3-ph 0.75-7.5 kW no VSD	TWh output/a	68	94	99	93	84	82	82	82	81	80
Medium (M) 3-ph 7.5-75 kW no VSD	TWh output/a	124	168	174	158	137	132	129	127	123	121
Medium (L) 3-ph 75-375 kW no VSD	TWh output/a	273	354	360	335	297	258	243	230	220	215
Total 3ph 0.75-375 kW no VSD	**TWh output/a**	**465**	**616**	**633**	**585**	**518**	**472**	**454**	**438**	**424**	**416**
Medium (S) 3-ph 0.75-7.5 kW with VSD	TWh output/a	4	10	13	22	31	34	36	39	41	44
Medium (M) 3-ph 7.5-75 kW with VSD	TWh output/a	9	23	33	53	73	81	86	92	98	104
Medium (L) 3-ph 75-375 kW with VSD	TWh output/a	29	73	100	144	189	227	247	264	281	294
Total 3-ph 0.75-375 kW with VSD	**TWh output/a**	**42**	**107**	**146**	**220**	**293**	**342**	**369**	**395**	**420**	**442**
Total 3-ph 0.75-375 kW w/wo VSD	**TWh output/a**	**507**	**722**	**780**	**806**	**811**	**814**	**824**	**834**	**844**	**858**
Small 1 ph 0.12-0.75 kW no VSD	TWh output/a	5	6	7	7	7	7	7	7	7	7
Small 1 ph 0.12-0.75 kW with VSD	TWh output/a	0	0	0	1	1	1	1	1	1	1
Total Small 1-ph 0.12-0.75 kW	**TWh output/a**	**5**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**8**	**8**
Small 3 ph 0.12-0.75 kW no VSD	TWh output/a	7	9	9	10	10	10	10	10	10	10
Small 3 ph 0.12-0.75 kW with VSD	TWh output/a	0	1	1	1	1	1	1	1	2	2
Total Small 3-ph 0.12-0.75 kW	**TWh output/a**	**7**	**9**	**10**	**11**	**11**	**11**	**12**	**12**	**12**	**12**
Large 3-ph LV 375-1000 kW no VSD	TWh output/a	142	174	170	162	153	146	144	143	142	141
Large 3-ph LV 375-1000kW with VSD	TWh output/a	7	36	55	77	95	109	116	122	128	135
Total Large 3-ph LV 375-1000 kW	**TWh output/a**	**149**	**210**	**225**	**239**	**248**	**254**	**260**	**265**	**270**	**276**
Explosion motors (S) 3-ph 0.75-7.5 kW	TWh output/a	2	3	4	4	4	4	4	4	5	5
Explosion motors (M) 3-ph 7.5-75 kW	TWh output/a	7	10	11	12	12	13	13	13	14	14
Explosion motors (L) 3-ph 75-375 kW	TWh output/a	14	20	22	24	26	27	28	28	29	30
Total Expl. 0.75-375 kW (no VSD)	**TWh output/a**	**23**	**33**	**37**	**40**	**42**	**44**	**45**	**46**	**47**	**49**
Brake motors (S) 3-ph 0.75-7.5 kW	TWh output/a	2	2	3	3	3	3	3	3	3	3
Brake motors (M) 3-ph 7.5-75 kW	TWh output/a	4	7	7	8	8	8	9	9	9	9
Brake motors (L) 3-ph 75-375 kW	TWh output/a	7	10	11	12	13	14	14	14	15	15
Total Brake 0.75-375 kW (no VSD)	**TWh output/a**	**13**	**19**	**21**	**23**	**24**	**25**	**26**	**26**	**27**	**28**
8-pole motors (S) 3-ph 0.75-7.5 kW	TWh output/a	0	0	0	0	0	0	0	0	0	0
8-pole motors (M) 3-ph 7.5-75 kW	TWh output/a	0	0	1	1	1	1	1	1	1	1
8-pole motors (L) 3-ph 75-375 kW	TWh output/a	1	1	1	1	1	1	1	1	1	1
Total 8-pole 0.75-375 kW (no VSD)	**TWh output/a**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
1-phase motors >0.75 kW (no VSD)	**TWh output/a**	**28**	**41**	**46**	**49**	**52**	**54**	**55**	**56**	**58**	**59**
MT Elec. Motors LV 0.12-1000 kW	**TWh output/a**	**731**	**1044**	**1128**	**1177**	**1198**	**1212**	**1231**	**1249**	**1269**	**1292**

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DWH Primary efficiency in GCV using PEF 2.1											
EIWH Electric Instant. < 12 kW (secondary)	%GCV,PEF2.1	33%	34%	34%	34%	34%	34%	35%	35%	35%	35%
EIWH Electric Instant. ≥ 12 kW (primary)	%GCV,PEF2.1	35%	36%	36%	36%	36%	36%	37%	37%	37%	37%
EIWHS Electric Instant. Shower (secondary)	%GCV,PEF2.1	33%	34%	34%	34%	34%	34%	35%	35%	35%	35%
ESWH Electric Storage ≤ 30 L (secondary)	%GCV,PEF2.1	32%	36%	37%	39%	40%	41%	41%	41%	41%	41%
ESWH Electric Storage > 30 L (primary)	%GCV,PEF2.1	36%	37%	37%	37%	37%	38%	38%	38%	38%	38%
GIWH Gas Instant. < 13 L/min (secondary)	%GCV,PEF2.1	30%	34%	35%	36%	37%	38%	39%	40%	41%	42%
GIWH Gas Instant. ≥ 13 L/min (primary)	%GCV,PEF2.1	45%	50%	52%	53%	55%	56%	58%	59%	61%	62%
GSWH Gas Storage, Condensing	%GCV,PEF2.1	43%	48%	50%	51%	53%	54%	55%	57%	58%	60%
GSWH Gas Storage, Non-condensing	%GCV,PEF2.1	37%	41%	42%	44%	45%	46%	47%	48%	50%	51%
Dedicated WH Heat Pump	%GCV,PEF2.1	72%	76%	77%	78%	79%	81%	82%	83%	84%	85%
Dedicated WH Solar (3.5 m2)	%GCV,PEF2.1	73%	80%	83%	85%	88%	91%	94%	96%	98%	101%
CHB Primary WH efficiency in GCV using PEF 2.1											
CHB Gas Combi Instant. WH	%GCV,PEF2.1	58%	69%	72%	75%	75%	76%	76%	76%	76%	77%
CHB Gas + Cyl. WH	%GCV,PEF2.1	57%	68%	71%	74%	74%	75%	75%	75%	75%	76%
CHB Jet Burner Gas + Cyl. WH	%GCV,PEF2.1	56%	61%	63%	64%	65%	67%	68%	69%	71%	72%
CHB Jet Burner Oil + Cyl. WH	%GCV,PEF2.1	56%	61%	63%	64%	65%	67%	68%	69%	71%	72%
CHB Electric (Joule) + Cyl. WH	%GCV,PEF2.1	35%	40%	41%	41%	42%	42%	42%	42%	42%	42%
CHB Hybrid Gas/Electric WH	%GCV,PEF2.1	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
CHB Electric HP + Cyl. WH	%GCV,PEF2.1	121%	124%	125%	126%	127%	127%	128%	129%	130%	130%
CHB Gas HP + Cyl. WH	%GCV,PEF2.1	107%	125%	130%	131%	132%	132%	133%	134%	135%	136%
CHB Gas mCHP + Cyl. WH	%GCV,PEF2.1	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
CHB Solar Combi (16 m2)	%GCV,PEF2.1	177%	224%	237%	250%	256%	263%	270%	277%	285%	293%
CHB Primary SH efficiency in GCV using PEF 2.1											
CHB Gas non-condensing	%GCV,PEF2.1	47%	51%	52%	53%	55%	56%	57%	58%	59%	60%
CHB Gas condensing	%GCV,PEF2.1	62%	63%	64%	64%	65%	65%	66%	66%	66%	67%
CHB Gas Jet burner non-condensing	%GCV,PEF2.1	44%	49%	51%	52%	53%	55%	56%	57%	59%	60%
CHB Gas Jet burner condensing	%GCV,PEF2.1	60%	61%	62%	62%	63%	63%	64%	64%	64%	65%
CHB Oil Jet burner non-condensing	%GCV,PEF2.1	44%	49%	51%	52%	53%	55%	56%	57%	59%	60%
CHB Oil Jet burner condensing	%GCV,PEF2.1	60%	61%	62%	62%	63%	63%	64%	64%	64%	65%
CHB Electric Joule-effect	%GCV,PEF2.1	29%	30%	31%	31%	31%	31%	32%	32%	32%	32%
CHB Hybrid (gas-electric)	%GCV,PEF2.1	84%	85%	86%	86%	86%	86%	87%	87%	87%	88%
CHB Electric Heat Pump	%GCV,PEF2.1	92%	93%	94%	94%	95%	95%	96%	96%	96%	97%
CHB Gas Heat Pump	%GCV,PEF2.1	91%	92%	93%	93%	94%	94%	95%	95%	95%	96%
CHB micro CHP	%GCV,PEF2.1	82%	83%	84%	84%	85%	85%	86%	86%	86%	87%
CHB Solar combi (16 m2)	%GCV,PEF2.1	55%	74%	77%	80%	83%	86%	89%	92%	95%	99%
SFB Wood Manual	%	39%	51%	52%	54%	55%	56%	58%	59%	61%	62%
SFB Wood Direct Draft	%	57%	73%	74%	75%	76%	77%	77%	77%	77%	77%
SFB Coal	%	53%	67%	68%	69%	70%	71%	71%	71%	71%	71%
SFB Pellets	%	57%	73%	74%	75%	76%	77%	77%	77%	77%	77%
SFB Wood chips	%	57%	73%	74%	74%	75%	76%	76%	76%	76%	76%
CHAE-S (≤ 400 kW)	%	104%	136%	143%	150%	156%	163%	167%	171%	176%	180%
CHAE-L (> 400 kW)	%	108%	140%	149%	159%	168%	177%	182%	186%	191%	196%
CHWE-S (≤ 400 kW)	%	134%	186%	196%	206%	216%	226%	232%	238%	244%	250%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	158%	217%	235%	253%	271%	289%	296%	304%	311%	319%
CHWE-L (> 1500 kW)	%	158%	217%	235%	253%	271%	289%	296%	304%	311%	319%
CHF	%	60%	103%	106%	108%	111%	113%	116%	119%	122%	125%
HT PCH-AE-S	SEPR	4.2	4.7	4.9	5.0	5.2	5.3	5.5	5.6	5.7	5.9
HT PCH-AE-L	SEPR	4.5	5.1	5.3	5.5	5.7	5.9	6.0	6.2	6.3	6.5
HT PCH-WE-S	SEPR	6.7	7.3	7.6	7.8	8.1	8.4	8.6	8.8	9.0	9.2
HT PCH-WE-M	SEPR	7.7	8.5	8.8	9.0	9.3	9.6	9.8	10.0	10.3	10.6
HT PCH-WE-L	SEPR	7.6	8.5	8.8	9.1	9.4	9.7	9.9	10.1	10.4	10.7
AC rooftop	%	88%	120%	128%	136%	144%	153%	156%	160%	164%	168%
AC splits	%	121%	156%	160%	164%	169%	173%	177%	182%	186%	191%
AC VRF	%	113%	165%	169%	173%	177%	181%	186%	190%	195%	200%
ACF	%	60%	103%	106%	108%	111%	113%	116%	119%	122%	125%
AC rooftop (rev)	%	86%	99%	101%	102%	104%	106%	109%	112%	114%	117%
AC splits (rev)	%	112%	117%	121%	124%	128%	132%	135%	138%	142%	146%
AC VRF (rev)	%	108%	130%	131%	133%	134%	135%	139%	142%	146%	150%
ACF (rev)	%	101%	129%	135%	142%	148%	155%	159%	163%	167%	171%
AHF	%	57%	63%	65%	66%	67%	68%	69%	69%	70%	71%
AHE	%	26%	30%	30%	30%	30%	30%	31%	32%	32%	33%
LH open fireplace	%	27%	30%	30%	30%	31%	31%	31%	31%	31%	31%
LH closed fireplace/inset	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH wood stove	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH coal stove	%	62%	69%	71%	72%	73%	75%	75%	75%	75%	75%
LH cooker	%	58%	64%	66%	67%	68%	69%	69%	69%	69%	69%
LH SHR stove	%	80%	80%	81%	83%	84%	86%	86%	86%	86%	86%
LH pellet stove	%	77%	85%	87%	89%	91%	93%	93%	93%	93%	93%

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	%elec	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH Electric fixed > 250W	%elec	71%	78%	80%	81%	82%	84%	84%	84%	84%	84%
LH Electric fixed ≤ 250W	%elec	65%	73%	74%	76%	77%	79%	79%	79%	79%	79%
LH Electric storage	%elec	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH Electric underfloor	%elec	67%	74%	76%	77%	79%	80%	80%	80%	80%	80%
LH Electric visibly glowing > 1.2 kW	%elec	69%	76%	78%	79%	81%	82%	82%	82%	82%	82%
LH Electric visibly glowing ≤ 1.2 kW	%elec	62%	69%	71%	72%	74%	75%	75%	75%	75%	75%
LH Electric Towel Heaters	%elec	68%	68%	75%	82%	82%	83%	83%	83%	83%	83%
LH Gas luminous (commercial)	%NCV	75%	83%	85%	87%	89%	90%	90%	90%	90%	90%
LH Gaseous Tube (commercial < 120 kW)	%NCV	66%	73%	75%	76%	77%	79%	79%	79%	79%	79%
LH Gas open front	%NCV	37%	42%	42%	43%	43%	44%	44%	44%	44%	44%
LH Gas closed front	%NCV	58%	64%	66%	67%	68%	69%	69%	69%	69%	69%
LH Gas balanced flue	%NCV	61%	68%	69%	70%	71%	72%	72%	72%	72%	72%
LH Gas flueless	%NCV	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH Liquid tube (commercial < 120 kW)	%NCV	64%	71%	72%	74%	75%	76%	76%	76%	76%	76%
LH Liquid open front	%NCV	37%	42%	42%	43%	43%	44%	44%	44%	44%	44%
LH Liquid closed front	%NCV	58%	64%	66%	67%	68%	69%	69%	69%	69%	69%
LH Liquid balanced flue	%NCV	61%	68%	69%	70%	71%	72%	72%	72%	72%	72%
LH Liquid flueless	%NCV	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RAC fixed < 6 kW, cooling	SEER	2.16	3.22	3.68	4.14	4.59	5.05	5.51	5.65	5.80	5.94
RAC fixed 6-12 kW, cooling	SEER	1.86	2.84	3.26	3.68	4.11	4.53	4.95	5.08	5.21	5.34
RAC portable < 12 kW, cooling	SEER	1.16	1.39	1.44	1.50	1.55	1.60	1.66	1.68	1.70	1.72
RAC fixed < 6 kW, reversible, heating	SCOP	1.84	2.48	2.76	3.03	3.31	3.58	3.86	3.96	4.06	4.16
RAC fixed 6-12 kW, reversible, heating	SCOP	1.58	2.18	2.44	2.70	2.95	3.21	3.47	3.56	3.65	3.74
RAC portable < 12 kW, reversible, heating	SCOP										
CIRC Integrated circulators	EEI	0.49	0.42	0.39	0.38	0.36	0.34	0.32	0.31	0.29	0.28
CIRC Large standalone circulators	EEI	0.41	0.36	0.34	0.32	0.31	0.29	0.28	0.26	0.25	0.24
CIRC Small standalone circulators	EEI	0.58	0.48	0.45	0.43	0.41	0.39	0.37	0.35	0.34	0.32
CIRC Integrated circulators	kWh elec/a	303	256	243	231	220	209	199	189	180	173
CIRC Large standalone circulators	kWh elec/a	1 452	1 265	1 203	1 144	1 088	1 035	984	936	890	855
CIRC Small standalone circulators	kWh elec/a	199	164	156	148	141	134	127	121	115	111
CIRC Circulator pumps <2.5 kW											
R-UVU ≤ 100 m3/h for Extract Spaces											
Unit annual electricity consumption	kWhe/a	64	36	34	34	34	34	34	34	34	34
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-UVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	57	30	29	29	29	29	29	29	29	29
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	115	84	83	83	83	83	83	83	83	83
Heat recovery efficiency	%	60%	65%	66%	66%	66%	66%	66%	66%	66%	66%
R-UVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	193	145	140	140	140	140	140	140	140	140
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	375	276	267	267	267	267	267	267	267	267
Heat recovery efficiency	%	70%	70%	71%	71%	71%	71%	71%	71%	71%	71%
R-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	722	698	698	698	698	698	698	698	698
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1230	1212	1212	1212	1212	1212	1212	1212	1212
Heat recovery efficiency	%	65%	70%	71%	71%	71%	71%	71%	71%	71%	71%
R-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1766	1261	1235	1235	1235	1235	1235	1235	1235	1235
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	4772	3825	3770	3770	3770	3770	3770	3770	3770	3770
Heat recovery efficiency	%	70%	70%	71%	71%	71%	71%	71%	71%	71%	71%
NR-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	722	698	698	698	698	698	698	698	698
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NR-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1230	1212	1212	1212	1212	1212	1212	1212	1212
Heat recovery efficiency	%	65%	70%	71%	71%	71%	71%	71%	71%	71%	71%

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1256	626	609	609	609	609	609	609	609	609
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NR-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	3248	2056	2016	2016	2016	2016	2016	2016	2016	2016
Heat recovery efficiency	%	60%	70%	71%	71%	71%	71%	71%	71%	71%	71%
NR-AHU-S 2500-5500 m3/h											
Unit annual electricity consumption	kWhe/a	7618	4891	4793	4793	4793	4793	4793	4793	4793	4793
Heat recovery efficiency	%	30%	44%	47%	47%	47%	47%	47%	47%	47%	47%
NR-AHU-M 5500-14500 m3/h											
Unit annual electricity consumption	kWhe/a	24456	14791	14583	14583	14583	14583	14583	14583	14583	14583
Heat recovery efficiency	%	30%	44%	47%	47%	47%	47%	47%	47%	47%	47%
NR-AHU-L > 14500 m3/h											
Unit annual electricity consumption	kWhe/a	79692	47968	47190	47190	47190	47190	47190	47190	47190	47190
Heat recovery efficiency	%	30%	44%	47%	47%	47%	47%	47%	47%	47%	47%
LS, sales average efficiency incl. control gear											
LFL (T12,T8h,T8t,T5,other)	lm/W	61	67	70	73	73	73	73	73	73	73
HID (HPM, HPS, MH)	lm/W	58	71	76	78	79	79	80	81	82	82
CFLni (all shapes)	lm/W	48	50	50	50	50	50	50	50	50	50
CFLi (retrofit for GLS, HL)	lm/W	55	55	55	55	55	55	55	55	55	55
GLS (DLS & NDLS)	lm/W	9	10	11	11	11	11	11	11	11	11
HL (DLS & NDLS, LV & MV)	lm/W	13	11	11	11	11	12	12	12	12	12
LED replacing LFL (retrofit & luminaire)	lm/W			68	114	137	161	171	171	171	172
LED replacing HID (retrofit & luminaire)	lm/W			68	115	139	164	174	174	174	174
LED replacing CFLni (retrofit & luminaire)	lm/W			68	111	130	153	160	163	167	166
LED replacing DLS (retrofit & luminaire)	lm/W			46	64	74	82	85	85	85	85
LED replacing NDLS (retrofit & luminaire)	lm/W		21	68	99	109	118	122	122	122	122
DP TV on-mode power (avg. all types)	W/dm2	8.8	3.7	1.9	1.6	1.2	0.9	0.7	0.6	0.5	0.5
DP TV standard (NoNA) standby power	W	8.0	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DP TV LoNA standby power	W	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV HiNA ('Smart') standby power	W	0.0	0.0	6.4	5.0	4.5	4.0	3.5	3.0	2.5	2.0
DP Monitor on-mode power	W/dm2	8.8	3.7	2.6	2.2	1.7	1.2	0.9	0.8	0.7	0.6
DP Monitor standby power	W	9.0	1.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
DP Signage on-mode power	W/dm2	17.7	7.4	2.5	1.9	1.6	1.3	1.1	0.9	0.7	0.7
DP Signage standby power	W/dm2	17.7	7.4	2.5	1.9	1.6	1.3	1.1	0.9	0.7	0.7
SSTB	kWh/a	43	25	19.2	19.2	19	19	19	19	19	19
CSTB (all covered modes)	kWh/a	117	117	110	103	95	88	88	88	88	88
Game consoles > 20 W Active modes (SRI)	W	22.1	114.3	98.2	85.6	85.6	85.6	85.6	85.6	85.6	85.6
Game consoles > 20 W Non-Active (CR)	W	1.0	3.7	6.1	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Game consoles < 20 W Non-Active (CR)	W	1.0	6.2	6.4	6.5	6.5	6.5	6.5	6.5	6.5	6.5
Game consoles < 20 W Active (no reg.)	W	13.3	13.3	13.3	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Game consoles > 20 W Active modes (SRI)	kWh/a	12	70	107	97	97	97	97	97	97	97
Game consoles > 20 W Non-Active (CR)	kWh/a	8	30	47	40	40	40	40	40	40	40
Game consoles < 20 W Non-Active (CR)	kWh/a	8	50	52	53	53	53	53	53	53	53
Game consoles < 20 W Active (no reg.)	kWh/a	7	8	9	6	6	6	6	6	6	6
Total Game consoles > 20 W, all modes	kWh/a	20	101	154	137	137	137	137	137	137	137
Total Game consoles < 20 W, all modes	kWh/a	16	58	60	59	59	59	59	59	59	59
PSU efficiency for ES&DS											
ES tower 1-socket traditional	%	67.4%	75.1%	77.0%	79.4%	82.6%	85.4%	85.4%	85.4%	85.4%	85.4%
ES rack 1-socket traditional	%	67.4%	75.1%	77.0%	79.4%	82.6%	85.4%	85.4%	85.4%	85.4%	85.4%
ES rack 2-socket traditional	%	71.6%	79.2%	81.1%	83.3%	86.0%	88.4%	88.4%	88.4%	88.4%	88.4%
ES rack 2-socket cloud	%	71.6%	79.2%	81.1%	83.3%	86.0%	88.4%	88.4%	88.4%	88.4%	88.4%
ES rack 4-socket traditional	%	70.7%	78.2%	80.1%	83.5%	86.3%	88.1%	88.1%	88.1%	88.1%	88.1%
ES rack 4-socket cloud	%	70.7%	78.2%	80.1%	83.5%	86.3%	88.1%	88.1%	88.1%	88.1%	88.1%
ES rack 2-socket resilient trad.	%	70.7%	78.2%	80.1%	82.4%	85.2%	87.7%	87.7%	87.7%	87.7%	87.7%
ES rack 2-socket resilient cloud	%	70.7%	78.2%	80.1%	82.4%	85.2%	87.7%	87.7%	87.7%	87.7%	87.7%
ES rack 4-socket resilient trad.	%	70.7%	78.2%	80.1%	83.5%	86.3%	88.1%	88.1%	88.1%	88.1%	88.1%
ES rack 4-socket resilient cloud	%	70.7%	78.2%	80.1%	83.5%	86.3%	88.1%	88.1%	88.1%	88.1%	88.1%
ES blade 1-socket traditional	%	71.6%	79.2%	81.1%	84.4%	87.0%	88.8%	88.8%	88.8%	88.8%	88.8%
ES blade 2-socket traditional	%	71.6%	79.2%	81.1%	84.4%	87.0%	88.8%	88.8%	88.8%	88.8%	88.8%
ES blade 2-socket cloud	%	71.6%	79.2%	81.1%	84.4%	87.0%	88.8%	88.8%	88.8%	88.8%	88.8%
ES blade 4-socket traditional	%	71.6%	79.2%	81.1%	84.4%	87.0%	88.8%	88.8%	88.8%	88.8%	88.8%
ES blade 4-socket cloud	%	71.6%	79.2%	81.1%	84.4%	87.0%	88.8%	88.8%	88.8%	88.8%	88.8%
DS Online 2	%	77.4%	84.6%	86.4%	88.6%	90.5%	92.3%	92.3%	92.3%	92.3%	92.3%
DS Online 3	%	77.4%	84.6%	86.4%	88.6%	90.5%	92.3%	92.3%	92.3%	92.3%	92.3%
DS Online 4	%	77.4%	84.6%	86.4%	88.6%	90.5%	92.3%	92.3%	92.3%	92.3%	92.3%

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	kWh/a	283	132	118	100	93	85	80	76	71	66
PC Integrated Desktop	kWh/a	319	141	126	128	130	132	127	121	116	110
PC Notebook	kWh/a	89	39	35	29	29	21	20	19	18	17
PC Tablet/slate	kWh/a		31	21	19	10	10	10	10	10	9
PC Thin client	kWh/a	89	75	48	41	40	38	37	36	34	33
PC Integrated Thin Client	kWh/a	200	169	108	92	89	86	83	80	77	74
PC Small-scale Server	kWh/a	283	132	118	100	93	85	80	76	71	66
PC Workstation	kWh/a	565	306	275	249	236	223	208	193	178	163
Inkjet Printer	kWh/a	51	15	12	12	12	12	12	12	12	12
Inkjet MFD	kWh/a	77	22	18	18	18	18	18	18	18	18
EP / Laser Printer mono	kWh/a	666	190	167	167	167	167	167	167	167	167
EP / Laser Printer colour	kWh/a	1040	297	260	260	260	260	260	260	260	260
EP / Laser Copier mono	kWh/a	1069	305	267	267	267	267	267	267	267	267
EP / Laser Copier colour	kWh/a	1261	360	315	315	315	315	315	315	315	315
EP / Laser MFD mono	kWh/a	1069	305	267	267	267	267	267	267	267	267
EP / Laser MFD colour	kWh/a	1261	360	315	315	315	315	315	315	315	315
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	W	0.7	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
SB Electric toothbrushes (off mode)	W	0.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Audio speakers (wired) (sb & off modes)	W	1.7	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
SB Audio speakers (wireless) (nsb & off modes)	W	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
SB Small appliances (sb & off modes)	W	0.5	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
SB Media boxes /sticks (sb mode)	W	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
SB Media players and recorders (sb mode)	W	0.0	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
SB Projectors (sb & off modes)	W	0.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
SB Home phones (nsb mode)	W	4.6	3.4	3.2	3.1	2.9	2.7	2.5	2.3	2.1	2.0
SB Office phones (nsb mode)	W	6.6	4.4	3.9	3.3	2.7	2.2	2.0	2.0	2.0	2.0
SB Home NAS (nsb mode)	W	9.9	8.0	7.6	7.2	6.9	6.5	6.1	5.8	5.4	5.0
SB Home Network Equipment (nsb mode)	W	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SB Office Network Equipment (nsb mode)	W	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
SB Coffee makers (off mode)	W	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Regulated also for (networked) standby ((n)sb)											
(already accounted elsewhere; here for info only)											
SB Washing Machines (sb & off modes)	W	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
SB Dishwashers (sb & off modes)	W	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Laundry Dryers (sb & off modes)	W	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Electric Ovens (sb mode)	W	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
SB Electric Hobs (sb mode)	W	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
EPS Average Active Efficiency											
EPS ≤ 6W, low-V	%	64.3%	66.3%	66.8%	67.3%	67.8%	68.4%	68.9%	69.4%	69.9%	70.4%
EPS 6–10 W	%	68.6%	72.1%	73.0%	73.9%	74.8%	75.6%	76.6%	77.5%	78.4%	78.5%
EPS 10–12 W	%	70.3%	73.6%	74.4%	75.3%	76.1%	77.0%	77.8%	78.7%	79.5%	79.7%
EPS 15–20 W	%	74.1%	76.9%	77.6%	78.3%	79.0%	79.7%	80.4%	81.2%	81.5%	81.6%
EPS 20–30 W	%	78.9%	81.0%	81.5%	82.0%	82.5%	83.1%	83.6%	84.1%	84.7%	85.2%
EPS 30–65 W, multiple-V	%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%
EPS 30-65 W	%	85.5%	85.5%	85.5%	85.6%	86.0%	86.3%	86.6%	87.0%	87.3%	87.7%
EPS 65–120 W	%	83.6%	85.0%	85.3%	85.6%	86.0%	86.3%	86.6%	87.0%	87.3%	87.7%
EPS 65–120 W, multiple-V	%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%
EPS 12–15 W	%	72.4%	75.4%	76.2%	76.9%	77.7%	78.5%	79.3%	80.1%	80.9%	80.9%
EPS Average No-load power											
EPS ≤ 6W, low-V	W	0.56	0.43	0.40	0.38	0.35	0.32	0.29	0.27	0.25	0.23
EPS 6–10 W	W	0.56	0.43	0.40	0.38	0.35	0.32	0.29	0.27	0.25	0.23
EPS 10–12 W	W	0.81	0.60	0.55	0.50	0.45	0.40	0.35	0.31	0.27	0.24
EPS 15–20 W	W	0.81	0.60	0.55	0.50	0.45	0.40	0.35	0.31	0.27	0.25
EPS 20–30 W	W	0.81	0.60	0.55	0.50	0.45	0.40	0.35	0.31	0.27	0.24
EPS 30–65 W, multiple-V	W	0.93	0.93	0.93	0.92	0.89	0.86	0.83	0.80	0.77	0.75
EPS 30-65 W	W	0.81	0.66	0.63	0.59	0.55	0.52	0.48	0.45	0.42	0.39
EPS 65–120 W	W	0.81	0.66	0.63	0.59	0.55	0.52	0.48	0.45	0.42	0.39
EPS 65–120 W, multiple-V	W	1.10	0.98	0.95	0.92	0.89	0.86	0.83	0.80	0.77	0.75
EPS 12–15 W	W	0.81	0.60	0.55	0.50	0.45	0.40	0.35	0.31	0.27	0.24
RF AEC	kWh/a	477	430	424	417	410	403	397	390	384	377
RF EEI	EEI	102	82	78	74	70	67	64	61	58	55
CF open vertical chilled multi deck (RVC2)	EEI	162	123	112	107	105	102	101	100	98	97
CF open horizontal frozen island (RHF4)	EEI	160	121	111	106	103	101	99	98	97	96
CF other supermarket display (non-BCs)	EEI	136	103	94	91	91	91	89	88	87	86
CF Plug in one door beverage cooler	EEI	198	150	137	130	126	123	121	120	118	117
CF Plug in horizontal ice cream freezer	EEI	109	82	75	72	70	68	68	67	66	65
CF Spiral vending machine	EEI	97	62	59	59	59	59	59	58	57	57

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	96	96	96	96	96	96	96
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	91	91	91	91	91	91	91
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	109	109	109	109	109	109	109
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	106	106	106	106	106	106	106
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit, All MT&LT	COP/SEPR	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**	**2.05**
CA Electric Hobs (active modes)	Wh/ltr	194	187	186	185	185	184	183	182	181	180
CA Electric Hobs (low-power modes)	W	0.0	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
CA Electric Ovens (active modes)	kWh/a	133	97	90	89	89	88	88	87	87	86
CA Electric Ovens (low-power modes)	W	0.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
CA Gas Hobs	%	60.2%	60.8%	60.9%	61.1%	61.2%	61.4%	61.6%	61.7%	61.9%	62.0%
CA Gas Ovens	kWh prim/a	237	202	194	191	187	183	179	175	171	168
CA Range Hoods	kWh/a	133	133	133	133	133	133	133	133	133	133
WM Washing Machines, active modes	kWh/a	350	195	176	159	148	138	127	116	106	95
WM Washing Machines, low-power modes	kWh/a	0.0	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
WM Washing Machines, all modes	kWh/a	350	205	186	169	159	148	137	127	116	105
WD Washer-Dryers, active modes	kWh/a	1600	1233	1143	1060	983	911	868	855	843	830
WD Washer-Dryers, low-power modes	kWh/a	0.0	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
WD Washer-Dryers, all modes	kWh/a	1600	1243	1153	1070	993	921	878	865	853	840
DW Dishwashers, active modes	kWh/a	310	261	253	246	239	231	224	216	209	202
DW Dishwashers, low-power modes	kWh/a	0.0	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
DW Dishwashers (all modes, annual)	kWh/a	310	269	262	254	247	239	232	225	217	210
DW Dishwashers (all modes, per cycle)	kWh/cycle	1.41	1.22	1.19	1.16	1.12	1.09	1.05	1.02	0.99	0.95
LD at current cycles and user loading											
LD condensing heat pump	kWh elec/a	241	212	161	141	141	141	141	141	141	141
LD condensing electric heat element	kWh elec/a	441	395	312	272	272	272	272	272	272	272
LD vented electric	kWh elec/a	402	381	306	266	266	266	266	266	266	266
LD vented gas	kWh gas /a	432	522	429	374	374	374	374	374	374	374
LD Laundry Dryers, low-power modes	kWh elec/a	0.0	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
kWh/a/unit, real-life											
VC Cylinder Domestic mains	kWh real/a	70	61	78	85	91	95	95	94	91	89
VC Upright Domestic mains	kWh real/a	65	55	69	74	79	83	84	82	80	78
VC Handstick Domestic mains	kWh real/a	35	29	36	40	43	47	50	49	47	46
VC Cylinder Commercial mains	kWh real/a	191	468	498	528	558	588	618	618	618	618
VC Upright Commercial mains	kWh real/a	191	468	498	528	558	588	618	618	618	618
VC Cordless - domestic - cleaning	kWh real/a	27	23	22	27	33	37	37	36	35	35
VC Cordless - commercial - cleaning	kWh real/a	131	131	131	168	207	233	233	233	233	233
VC Cordless - domestic - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh real/a	24	20	19	18	18	18	18	18	17	17
VC Robot - commercial - cleaning	kWh real/a	68	68	68	68	68	68	68	68	68	68
VC Robot - domestic -standby	kWh real/a	31	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh real/a	31	31	31	31	31	31	31	31	31	31
kWh/a/unit, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	kWh std/a	70	92	102	112	121	126	126	126	126	126
VC Upright Domestic mains	kWh std/a	65	83	91	99	106	111	111	111	111	111
VC Handstick Domestic mains	kWh std/a	35	44	48	53	58	63	66	66	66	66
VC Cylinder Commercial mains	kWh std/a	32	78	83	88	93	98	103	103	103	103
VC Upright Commercial mains	kWh std/a	32	78	83	88	93	98	103	103	103	103
VC Cordless - domestic - cleaning	kWh std/a	22	22	22	28	35	39	39	39	39	39
VC Cordless - commercial - cleaning	kWh std/a	22	22	22	28	35	39	39	39	39	39

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VC Cordless - domestic - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh std/a	11	11	11	11	11	11	11	11	11	11
VC Robot - commercial - cleaning	kWh std/a	11	11	11	11	11	11	11	11	11	11
VC Robot - domestic -standby	kWh std/a	31	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh std/a	31	31	31	31	31	31	31	31	31	31
Power, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	W std	1400	1840	2040	2240	2420	2520	2520	2520	2520	2520
VC Upright Domestic mains	W std	1300	1660	1820	1970	2110	2210	2210	2210	2210	2210
VC Handstick Domestic mains	W std	700	875	960	1060	1160	1260	1310	1310	1310	1310
VC Cylinder Commercial mains	W std	638	1560	1660	1760	1860	1960	2060	2060	2060	2060
VC Upright Commercial mains	W std	638	1560	1660	1760	1860	1960	2060	2060	2060	2060
VC Cordless - domestic - cleaning	W std	436	436	436	562	691	778	778	778	778	778
VC Cordless - commercial - cleaning	W std	436	436	436	562	691	778	778	778	778	778
VC Cordless Standby charged and docked [W]	W	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
VC Cordless Standby of empty dock [W]	W	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
VC Robot - domestic - cleaning	W std	227	227	227	227	227	227	227	227	227	227
VC Robot - commercial - cleaning	W std	227	227	227	227	227	227	227	227	227	227
VC Robot Standby charged and docked [W]	W	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
VC Robot Standby of empty dock [W]	W	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VC load factor domestic mains		1.00	0.80	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT motors											
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	70.1%	75.9%	76.5%	77.2%	77.9%	78.6%	79.3%	80.0%	80.7%	81.4%
Medium (M) 3-ph 7.5-75 kW no VSD	%	85.2%	87.9%	88.1%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%	90.1%
Medium (L) 3-ph 75-375 kW no VSD	%	92.0%	93.5%	93.6%	93.7%	93.9%	94.0%	94.2%	94.3%	94.5%	94.6%
Medium (S) 3-ph 0.75-7.5 kW with VSD	%	59.7%	66.6%	67.5%	68.3%	69.2%	70.0%	70.9%	71.7%	72.6%	73.4%
Medium (M) 3-ph 7.5-75 kW with VSD	%	77.6%	81.7%	82.2%	82.6%	83.0%	83.5%	83.9%	84.3%	84.7%	85.2%
Medium (L) 3-ph 75-375 kW with VSD	%	85.3%	88.2%	88.5%	88.8%	89.1%	89.4%	89.7%	90.0%	90.2%	90.5%
Small 1 ph 0.12-0.75 kW no VSD	%	62.4%	65.3%	66.0%	66.7%	67.5%	68.2%	69.0%	69.7%	70.5%	71.3%
Small 1 ph 0.12-0.75 kW with VSD	%	47.8%	51.1%	51.9%	52.8%	53.6%	54.5%	55.4%	56.4%	57.3%	58.1%
Small 3 ph 0.12-0.75 kW no VSD	%	62.4%	65.3%	66.0%	66.7%	67.5%	68.2%	69.0%	69.7%	70.5%	71.3%
Small 3 ph 0.12-0.75 kW with VSD	%	47.8%	51.1%	51.9%	52.8%	53.6%	54.5%	55.4%	56.4%	57.3%	58.1%
Large 3-ph LV 375-1000 kW no VSD	%	93.5%	94.4%	94.7%	95.0%	95.2%	95.5%	95.7%	95.8%	95.9%	96.0%
Large 3-ph LV 375-1000kW with VSD	%	86.9%	88.4%	88.9%	89.2%	89.6%	90.0%	90.2%	90.4%	90.5%	90.7%
Explosion motors (S) 3-ph 0.75-7.5 kW	%	70.1%	75.9%	76.5%	77.2%	77.9%	78.6%	79.3%	80.0%	80.7%	81.4%
Explosion motors (M) 3-ph 7.5-75 kW	%	85.2%	87.9%	88.1%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%	90.1%
Explosion motors (L) 3-ph 75-375 kW	%	92.0%	93.5%	93.6%	93.7%	93.9%	94.0%	94.2%	94.3%	94.5%	94.6%
Brake motors (S) 3-ph 0.75-7.5 kW	%	70.1%	75.9%	76.5%	77.2%	77.9%	78.6%	79.3%	80.0%	80.7%	81.4%
Brake motors (M) 3-ph 7.5-75 kW	%	85.2%	87.9%	88.1%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%	90.1%
Brake motors (L) 3-ph 75-375 kW	%	92.0%	93.5%	93.6%	93.7%	93.9%	94.0%	94.2%	94.3%	94.5%	94.6%
8-pole motors (S) 3-ph 0.75-7.5 kW	%	62.1%	67.9%	68.5%	69.2%	69.9%	70.6%	71.3%	72.0%	72.7%	73.4%
8-pole motors (M) 3-ph 7.5-75 kW	%	82.2%	84.9%	85.1%	85.4%	85.7%	86.0%	86.2%	86.5%	86.8%	87.1%
8-pole motors (L) 3-ph 75-375 kW	%	90.0%	91.5%	91.6%	91.7%	91.9%	92.0%	92.2%	92.3%	92.5%	92.6%
1-phase motors >0.75 kW (no VSD)	%	70.1%	75.9%	76.5%	77.2%	77.9%	78.6%	79.3%	80.0%	80.7%	81.4%
ESOB<45_VF	%	46.1%	47.0%	47.2%	47.3%	47.5%	47.6%	47.8%	47.9%	48.1%	48.2%
ESOB<45_CF	%	60.6%	61.9%	62.1%	62.3%	62.4%	62.6%	62.8%	63.0%	63.2%	63.4%
ESOB<45_VSD-VF	%	52.5%	53.6%	53.7%	53.8%	54.0%	54.1%	54.3%	54.5%	54.6%	54.8%
ESOB_45-150_VF	%	51.6%	52.6%	52.8%	53.0%	53.1%	53.3%	53.4%	53.5%	53.5%	53.5%
ESOB_45-150_CF	%	66.0%	67.4%	67.6%	67.8%	68.0%	68.2%	68.4%	68.5%	68.5%	68.5%
ESOB_45-150_VSD-VF	%	56.7%	57.9%	58.0%	58.1%	58.3%	58.5%	58.7%	58.8%	58.8%	58.8%
ESCC<45_VF	%	45.5%	46.4%	46.5%	46.7%	46.8%	47.0%	47.1%	47.2%	47.4%	47.5%
ESCC<45_CF	%	59.9%	61.1%	61.3%	61.5%	61.7%	61.8%	62.0%	62.2%	62.4%	62.6%
ESCC<45_VSD-VF	%	51.9%	53.0%	53.1%	53.2%	53.4%	53.6%	53.7%	53.9%	54.0%	54.2%
ESCC_45-150_VF	%	51.5%	52.5%	52.7%	52.9%	53.0%	53.2%	53.3%	53.4%	53.4%	53.4%
ESCC_45-150_CF	%	66.0%	67.3%	67.6%	67.8%	68.0%	68.2%	68.4%	68.4%	68.4%	68.4%
ESCC_45-150_VSD-VF	%	56.6%	57.8%	57.9%	58.0%	58.2%	58.4%	58.6%	58.7%	58.7%	58.7%

EFFICIENCY SALES BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
ESCCi<45_VF	%	44.5%	45.4%	45.6%	45.7%	45.9%	46.0%	46.1%	46.3%	46.4%	46.6%
ESCCi<45_CF	%	58.7%	59.9%	60.1%	60.3%	60.5%	60.6%	60.8%	61.0%	61.2%	61.4%
ESCCi<45_VSD-VF	%	51.1%	52.1%	52.2%	52.4%	52.5%	52.7%	52.9%	53.0%	53.2%	53.3%
ESCCi_45-150_VF	%	51.1%	52.2%	52.4%	52.5%	52.7%	52.8%	53.0%	53.0%	53.0%	53.0%
ESCCi_45-150_CF	%	66.0%	67.3%	67.5%	67.7%	67.9%	68.1%	68.4%	68.4%	68.4%	68.4%
ESCCi_45-150_VSD-VF	%	56.7%	57.8%	57.9%	58.1%	58.3%	58.4%	58.6%	58.8%	58.8%	58.8%
MSSB<6"_VF	%	34.0%	34.7%	34.8%	34.9%	35.1%	35.2%	35.3%	35.4%	35.5%	35.6%
MSSB<6"_CF	%	45.8%	46.7%	46.8%	47.0%	47.1%	47.3%	47.4%	47.6%	47.7%	47.8%
MSSB<6"_VSD-VF	%	35.5%	36.3%	36.3%	36.4%	36.5%	36.7%	36.8%	36.9%	37.0%	37.1%
MS-V<25bar_VF	%	43.4%	44.2%	44.4%	44.5%	44.7%	44.8%	44.9%	45.1%	45.2%	45.3%
MS-V<25bar_CF	%	60.2%	61.4%	61.6%	61.8%	62.0%	62.2%	62.4%	62.6%	62.7%	62.9%
MS-V<25bar_VSD-VF	%	43.8%	44.7%	44.9%	45.0%	45.2%	45.3%	45.4%	45.6%	45.7%	45.8%
WE arc-on-mode efficiency	%	65.0%	75.0%	76.3%	76.6%	76.8%	76.9%	76.9%	77.0%	77.0%	77.1%
WE idle mode power	W	90.4	80.4	79.9	79.5	79.1	79.0	79.0	78.9	78.9	78.8
TRAFO Distribution	kWh/a	7859	7859	7859	7859	7859	7859	7859	7859	7859	7859
TRAFO Industry oil	kWh/a	27168	27168	27168	27168	27168	27168	27168	27168	27168	27168
TRAFO Industry dry	kWh/a	39727	39727	39727	39727	39727	39727	39727	39727	39727	39727
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a	59094	59094	59094	59094	59094	59094	59094	59094	59094	59094
TRAFO DER dry	kWh/a	62415	62415	62415	62415	62415	62415	62415	62415	62415	62415
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
(Fuel losses due to RRC in L/100km/vehicle)											
Tyres C1, replacement for cars	L/100km	1.89	1.23	1.11	1.00	0.89	0.78	0.74	0.70	0.67	0.63
Tyres C1, OEM for cars	L/100km	1.89	1.23	1.11	1.00	0.89	0.78	0.74	0.70	0.67	0.63
Tyres C2, replacement for vans	L/100km	2.62	1.99	1.89	1.78	1.70	1.61	1.53	1.45	1.38	1.31
Tyres C2, OEM for vans	L/100km	2.62	1.99	1.89	1.78	1.70	1.61	1.53	1.45	1.38	1.31
Tyres C3, replacement for trucks/busses	L/100km	7.34	5.35	5.16	5.06	5.00	4.94	4.88	4.82	4.75	4.69
Tyres C3, OEM for trucks/busses	L/100km	7.34	5.35	5.16	5.06	5.00	4.94	4.88	4.82	4.75	4.69

VSD losses information for determination of VSD prices on PRICEBAU

VSD - Very Small 0.12 - 0.75 kW 1-phase	W loss	148	128	123	119	115	110	106	102	97	95
VSD - Very Small 0.12 - 0.75 kW 3-phase	W loss	148	128	123	119	115	110	106	102	97	95
VSD - Small 0.75 - 7.5 kW 3-phase	W loss	204	150	141	136	132	127	122	118	113	109
VSD - Medium 7.5 - 75kW 3-phase	W loss	980	724	677	655	633	611	589	567	545	523
VSD - Large 75 - 375kW 3-phase	W loss	6978	5153	4818	4662	4506	4350	4194	4038	3881	3726
VSD - Very Large 375 - 1,000kW 3-phase	W loss	34714	30992	30062	29735	29408	29080	28753	28426	28098	27771

Average Wet Grip coefficients for Tyres (BAU)

	2010	2015	2020	2025	2030
Tyres C1, replacement for cars	1.12	1.14	1.16	1.19	1.22
Tyres C1, OEM for cars	1.12	1.14	1.16	1.19	1.22
Tyres C2, replacement for vans	0.99	1.01	1.03	1.05	1.07
Tyres C2, OEM for vans	0.99	1.01	1.03	1.05	1.07
Tyres C3, replacement for trucks/busses	0.75	0.77	0.80	0.84	0.88
Tyres C3, OEM for trucks/busses	0.75	0.77	0.80	0.84	0.88

EFFICIENCY SALES ECO	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
DWH Primary efficiency in GCV using PEF 2.1											
EIWH Electric Instant. < 12 kW (secondary)	%GCV,PEF2.1	33%	34%	42%	44%	44%	44%	44%	44%	44%	44%
EIWH Electric Instant. ≥ 12 kW (primary)	%GCV,PEF2.1	35%	36%	44%	46%	46%	46%	46%	46%	46%	46%
EIWHS Electric Instant. Shower (secondary)	%GCV,PEF2.1	33%	34%	42%	44%	44%	44%	44%	44%	44%	44%
ESWH Electric Storage ≤ 30 L (secondary)	%GCV,PEF2.1	32%	36%	40%	41%	41%	41%	41%	41%	41%	41%
ESWH Electric Storage > 30 L (primary)	%GCV,PEF2.1	36%	37%	39%	42%	42%	42%	42%	42%	42%	42%
GIWH Gas Instant. < 13 L/min (secondary)	%GCV,PEF2.1	30%	34%	52%	55%	55%	55%	55%	55%	55%	55%
GIWH Gas Instant. ≥ 13 L/min (primary)	%GCV,PEF2.1	45%	50%	71%	75%	75%	75%	75%	75%	75%	75%
GSWH Gas Storage, Condensing	%GCV,PEF2.1	43%	48%	81%	87%	87%	87%	87%	87%	87%	87%
GSWH Gas Storage, Non-condensing	%GCV,PEF2.1	37%	41%	61%	65%	65%	65%	65%	65%	65%	65%
Dedicated WH Heat Pump	%GCV,PEF2.1	72%	76%	131%	142%	142%	142%	142%	142%	142%	142%
Dedicated WH Solar (3.5 m2)	%GCV,PEF2.1	73%	80%	97%	104%	107%	110%	113%	115%	118%	120%
CHB Primary WH efficiency in GCV using PEF 2.1											
CHB Gas Combi Instant. WH	%GCV,PEF2.1	58%	69%	79%	85%	85%	85%	85%	85%	85%	85%
CHB Gas + Cyl. WH	%GCV,PEF2.1	57%	68%	78%	84%	84%	84%	84%	84%	84%	84%
CHB Jet Burner Gas + Cyl. WH	%GCV,PEF2.1	56%	61%	74%	83%	83%	83%	83%	83%	83%	83%
CHB Jet Burner Oil + Cyl. WH	%GCV,PEF2.1	56%	61%	74%	83%	83%	83%	83%	83%	83%	83%
CHB Electric (Joule) + Cyl. WH	%GCV,PEF2.1	35%	40%	41%	42%	42%	42%	42%	42%	42%	42%
CHB Hybrid Gas/Electric WH	%GCV,PEF2.1	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
CHB Electric HP + Cyl. WH	%GCV,PEF2.1	121%	124%	125%	157%	160%	162%	165%	167%	170%	172%
CHB Gas HP + Cyl. WH	%GCV,PEF2.1	107%	125%	130%	145%	148%	150%	153%	155%	158%	160%
CHB Gas mCHP + Cyl. WH	%GCV,PEF2.1	110%	110%	110%	120%	125%	130%	135%	140%	145%	145%
CHB Solar Combi (16 m2)	%GCV,PEF2.1	177%	224%	259%	296%	317%	339%	362%	386%	411%	438%
CHB Primary SH efficiency in GCV using PEF 2.1											
CHB Gas non-condensing	%GCV,PEF2.1	47%	57%	64%	64%	64%	64%	64%	64%	64%	64%
CHB Gas condensing	%GCV,PEF2.1	62%	68%	74%	75%	75%	75%	75%	75%	75%	75%
CHB Gas Jet burner non-condensing	%GCV,PEF2.1	44%	53%	60%	60%	60%	60%	60%	60%	60%	60%
CHB Gas Jet burner condensing	%GCV,PEF2.1	60%	64%	70%	71%	71%	71%	71%	71%	71%	71%
CHB Oil Jet burner non-condensing	%GCV,PEF2.1	44%	53%	60%	60%	60%	60%	60%	60%	60%	60%
CHB Oil Jet burner condensing	%GCV,PEF2.1	60%	64%	70%	71%	71%	71%	71%	71%	71%	71%
CHB Electric Joule-effect	%GCV,PEF2.1	29%	32%	34%	34%	34%	34%	34%	34%	34%	34%
CHB Hybrid (gas-electric)	%GCV,PEF2.1	84%	88%	93%	98%	99%	100%	101%	102%	103%	104%
CHB Electric Heat Pump	%GCV,PEF2.1	92%	99%	113%	126%	128%	130%	132%	134%	136%	138%
CHB Gas Heat Pump	%GCV,PEF2.1	91%	100%	108%	116%	118%	120%	122%	124%	126%	128%
CHB micro CHP	%GCV,PEF2.1	82%	88%	92%	96%	100%	104%	108%	112%	116%	116%
CHB Solar combi (16 m2)	%GCV,PEF2.1	55%	80%	92%	100%	107%	115%	122%	130%	139%	149%
SFB Wood Manual	%	39%	51%	58%	75%	78%	78%	78%	78%	78%	78%
SFB Wood Direct Draft	%	57%	73%	74%	75%	78%	78%	78%	78%	78%	78%
SFB Coal	%	53%	67%	70%	75%	78%	78%	78%	78%	78%	78%
SFB Pellets	%	57%	73%	74%	75%	78%	78%	78%	78%	78%	78%
SFB Wood chips	%	57%	73%	74%	77%	77%	77%	77%	77%	77%	77%
CHAE-S (≤ 400 kW)	%	104%	136%	143%	157%	169%	179%	181%	183%	185%	187%
CHAE-L (> 400 kW)	%	108%	140%	151%	177%	189%	194%	196%	199%	201%	203%
CHWE-S (≤ 400 kW)	%	134%	186%	197%	208%	218%	229%	232%	238%	244%	250%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	158%	217%	236%	255%	275%	295%	299%	304%	311%	319%
CHWE-L (> 1500 kW)	%	158%	217%	236%	265%	282%	295%	299%	304%	311%	319%
CHF	%	60%	103%	118%	164%	169%	172%	173%	174%	176%	177%
HT PCH-AE-S	SEPR	4.2	4.7	4.9	5.5	5.7	5.9	5.9	6.0	6.1	6.1
HT PCH-AE-L	SEPR	4.5	5.1	5.4	6.1	6.6	6.9	7.0	7.1	7.2	7.2
HT PCH-WE-S	SEPR	6.7	7.3	7.6	8.2	8.5	8.7	8.8	8.9	9.0	9.2
HT PCH-WE-M	SEPR	7.7	8.5	8.8	9.4	9.6	9.7	9.8	10.0	10.3	10.6
HT PCH-WE-L	SEPR	7.6	8.5	8.9	9.7	10.1	10.3	10.4	10.6	10.7	10.8
AC rooftop	%	88%	120%	129%	139%	149%	159%	161%	163%	165%	168%
AC splits	%	121%	156%	165%	186%	192%	195%	197%	199%	202%	204%
AC VRF	%	113%	165%	171%	186%	196%	204%	206%	209%	211%	213%
ACF	%	60%	103%	118%	164%	171%	177%	178%	179%	181%	182%
AC rooftop (rev)	%	86%	99%	104%	122%	127%	130%	131%	132%	134%	135%
AC splits (rev)	%	112%	117%	123%	136%	139%	142%	144%	146%	147%	149%
AC VRF (rev)	%	108%	130%	131%	136%	140%	144%	146%	148%	149%	151%
ACF (rev)	%	101%	129%	136%	144%	153%	161%	163%	165%	167%	171%
AHF	%	57%	63%	66%	76%	80%	82%	82%	83%	83%	83%
AHE	%	26%	30%	30%	31%	32%	33%	33%	33%	34%	34%
LH open fireplace	%	27%	30%	30%	41%	47%	47%	47%	47%	47%	47%
LH closed fireplace/inset	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH wood stove	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH coal stove	%	62%	69%	71%	81%	86%	86%	86%	86%	86%	86%
LH cooker	%	58%	64%	66%	72%	75%	75%	75%	75%	75%	75%
LH SHR stove	%	80%	80%	81%	84%	86%	86%	86%	86%	86%	86%
LH pellet stove	%	77%	85%	87%	92%	94%	94%	94%	94%	94%	94%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	%elec	67%	74%	83%	91%	92%	92%	92%	92%	92%	92%
LH Electric fixed > 250W	%elec	71%	78%	83%	91%	92%	92%	92%	92%	92%	92%
LH Electric fixed ≤ 250W	%elec	65%	73%	78%	85%	85%	86%	86%	86%	86%	86%
LH Electric storage	%elec	67%	74%	86%	96%	97%	97%	97%	97%	97%	97%
LH Electric underfloor	%elec	67%	74%	77%	80%	80%	80%	80%	80%	80%	80%
LH Electric visibly glowing > 1.2 kW	%elec	69%	76%	81%	89%	89%	90%	90%	90%	90%	90%
LH Electric visibly glowing ≤ 1.2 kW	%elec	62%	69%	74%	81%	81%	82%	82%	82%	82%	82%
LH Electric Towel Heaters	%elec	68%	68%	75%	82%	82%	83%	83%	83%	83%	83%
LH Gas luminous (commercial)	%NCV	75%	83%	89%	97%	97%	97%	97%	97%	97%	97%
LH Gaseous Tube (commercial < 120 kW)	%NCV	66%	73%	79%	88%	88%	88%	88%	88%	88%	88%
LH Gas open front	%NCV	37%	42%	43%	45%	45%	46%	46%	46%	46%	46%
LH Gas closed front	%NCV	58%	64%	70%	78%	78%	78%	78%	78%	78%	78%
LH Gas balanced flue	%NCV	61%	68%	73%	82%	82%	82%	82%	82%	82%	82%
LH Gas flueless	%NCV	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
LH Liquid tube (commercial < 120 kW)	%NCV	64%	71%	77%	85%	85%	85%	85%	85%	85%	85%
LH Liquid open front	%NCV	37%	42%	43%	45%	45%	46%	46%	46%	46%	46%
LH Liquid closed front	%NCV	58%	64%	70%	78%	78%	78%	78%	78%	78%	78%
LH Liquid balanced flue	%NCV	61%	68%	73%	82%	82%	82%	82%	82%	82%	82%
LH Liquid flueless	%NCV	100%	100%	100%	100%	100%	100%	100%	100%	100%	100%
RAC fixed < 6 kW, cooling	SEER	2.16	4.81	6.00	6.36	6.71	7.07	7.43	7.79	8.14	8.50
RAC fixed 6-12 kW, cooling	SEER	1.86	4.58	5.80	6.01	6.23	6.44	6.66	6.87	7.09	7.30
RAC portable < 12 kW, cooling	SEER	1.16	1.65	1.83	1.87	1.91	1.96	2.00	2.05	2.09	2.14
RAC fixed < 6 kW, reversible, heating	SCOP	1.84	3.34	4.00	4.09	4.17	4.26	4.34	4.43	4.51	4.60
RAC fixed 6-12 kW, reversible, heating	SCOP	1.58	3.26	4.00	4.04	4.09	4.13	4.17	4.21	4.26	4.30
RAC portable < 12 kW, reversible, heating	SCOP										
CIRC Integrated circulators	EEI	0.49	0.42	0.26	0.22	0.21	0.21	0.21	0.21	0.21	0.21
CIRC Large standalone circulators	EEI	0.41	0.36	0.22	0.21	0.21	0.20	0.20	0.20	0.20	0.20
CIRC Small standalone circulators	EEI	0.58	0.48	0.22	0.21	0.21	0.20	0.20	0.20	0.20	0.20
CIRC Integrated circulators	kWh elec/a	303	256	159	135	129	128	128	128	128	128
CIRC Large standalone circulators	kWh elec/a	1 452	1 265	769	744	737	727	727	727	727	727
CIRC Small standalone circulators	kWh elec/a	199	164	76	72	71	70	70	70	70	70
CIRC Circulator pumps <2.5 kW											
R-UVU ≤ 100 m3/h for Extract Spaces											
Unit annual electricity consumption	kWhe/a	64	36	28	20	20	19	19	19	19	19
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-UVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	57	30	24	18	18	18	18	18	18	18
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	115	84	79	74	73	72	71	71	70	69
Heat recovery efficiency	%	60%	65%	68%	70%	70%	70%	71%	71%	71%	71%
R-UVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	193	145	121	98	98	98	98	98	98	98
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	375	276	231	186	185	185	184	184	183	182
Heat recovery efficiency	%	70%	70%	77%	83%	83%	83%	83%	83%	83%	83%
R-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	722	603	484	479	473	468	463	459	454
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1230	1142	1054	1043	1031	1020	1008	997	986
Heat recovery efficiency	%	65%	70%	77%	83%	83%	83%	83%	83%	83%	83%
R-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1766	1261	1130	999	988	977	966	956	946	935
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
R-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	4772	3825	3551	3276	3247	3217	3187	3156	3125	3094
Heat recovery efficiency	%	70%	70%	77%	83%	83%	83%	83%	83%	83%	83%
NR-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	722	603	484	479	473	468	463	459	454
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NR-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1230	1142	1054	1043	1031	1020	1008	997	986
Heat recovery efficiency	%	65%	70%	77%	83%	83%	83%	83%	83%	83%	83%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1256	626	537	447	444	440	436	431	427	422
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
NR-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	3248	2056	1856	1657	1645	1633	1618	1602	1587	1572
Heat recovery efficiency	%	60%	70%	75%	80%	80%	80%	80%	81%	81%	81%
NR-AHU-S 2500-5500 m3/h											
Unit annual electricity consumption	kWhe/a	7618	4891	4401	3910	3890	3869	3841	3812	3783	3755
Heat recovery efficiency	%	30%	44%	57%	70%	70%	70%	70%	70%	70%	71%
NR-AHU-M 5500-14500 m3/h											
Unit annual electricity consumption	kWhe/a	24456	14791	13751	12710	12648	12585	12496	12406	12317	12227
Heat recovery efficiency	%	30%	44%	57%	70%	70%	70%	70%	70%	70%	71%
NR-AHU-L > 14500 m3/h											
Unit annual electricity consumption	kWhe/a	79692	47968	44079	40190	40004	39818	39545	39273	39001	38728
Heat recovery efficiency	%	30%	44%	57%	70%	70%	70%	70%	70%	70%	71%
LS, sales average efficiency incl. control gear											
LFL (T12,T8h,T8t,T5,other)	lm/W	61	70	76	79	82	83	83	84	84	84
HID (HPM, HPS, MH)	lm/W	58	73	84	89	90	91	93	94	96	97
CFLni (all shapes)	lm/W	48	55	55	55	55	55	55	55	55	55
CFLi (retrofit for GLS, HL)	lm/W	55	55	55	55	55	55	55	55	55	55
GLS (DLS & NDLS)	lm/W	9	10	11	11	11	11	11	11	11	11
HL (DLS & NDLS, LV & MV)	lm/W	13	11	13	16	18	19	19	19	19	19
LED replacing LFL (retrofit & luminaire)	lm/W			89	123	165	188	187	188	189	189
LED replacing HID (retrofit & luminaire)	lm/W			90	125	166	190	190	190	190	190
LED replacing CFLni (retrofit & luminaire)	lm/W			89	119	158	183	183	185	186	184
LED replacing DLS (retrofit & luminaire)	lm/W		17	57	68	97	111	111	111	111	111
LED replacing NDLS (retrofit & luminaire)	lm/W		26	85	103	142	160	160	160	160	160
DP TV on-mode power (avg. all types)	W/dm2	8.8	3.7	1.3	1.0	0.6	0.4	0.4	0.4	0.4	0.4
DP TV standard (NoNA) standby power	W	8.0	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
DP TV LoNA standby power	W	0.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
DP TV HiNA ('Smart') standby power	W	0.0	0.0	6.4	5.0	4.5	4.0	3.5	3.0	2.5	2.0
DP Monitor on-mode power	W/dm2	8.8	3.7	1.3	1.2	0.7	0.4	0.4	0.3	0.3	0.3
DP Monitor standby power	W	9.0	1.3	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
DP Signage on-mode power	W/dm2	17.7	7.4	2.5	1.9	1.3	0.8	0.7	0.7	0.7	0.7
DP Signage standby power	W/dm2	17.7	7.4	2.5	1.9	1.3	0.8	0.7	0.7	0.7	0.7
SSTB	kWh/a	19.2	19.2	16.3	15.3	15.3	15.3	15	15	15	15
CSTB (all covered modes)	kWh/a	117	117	90	72	70	68	68	68	68	68
Game consoles > 20 W Active modes (SRI)	W	22.1	114.3	78.5	71.5	71.5	71.5	71.5	71.5	71.5	71.5
Game consoles > 20 W Non-Active (CR)	W	1.0	3.6	2.8	1.4	1.4	1.4	1.4	1.4	1.4	1.4
Game consoles < 20 W Non-Active (CR)	W	1.0	6.1	4.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
Game consoles < 20 W Active (no reg.)	W	13.3	13.3	13.3	9.4	9.4	9.4	9.4	9.4	9.4	9.4
Game consoles > 20 W Active modes (SRI)	kWh/a	12	69	64	65	65	65	65	65	65	65
Game consoles > 20 W Non-Active (CR)	kWh/a	8	29	22	11	11	11	11	11	11	11
Game consoles < 20 W Non-Active (CR)	kWh/a	8	50	33	16	16	16	16	16	16	16
Game consoles < 20 W Active (no reg.)	kWh/a	7	8	7	5	5	5	5	5	5	5
Total Game consoles > 20 W, all modes	kWh/a	20	98	86	76	76	76	76	76	76	76
Total Game consoles < 20 W, all modes	kWh/a	16	58	41	21	21	21	21	21	21	21
PSU efficiency for ES&DS											
ES tower 1-socket traditional	%	67.4%	75.1%	77.0%	82.9%	88.0%	89.8%	89.8%	89.8%	89.8%	89.8%
ES rack 1-socket traditional	%	67.4%	75.1%	77.0%	82.9%	88.0%	89.8%	89.8%	89.8%	89.8%	89.8%
ES rack 2-socket traditional	%	71.6%	79.2%	81.1%	86.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES rack 2-socket cloud	%	71.6%	79.2%	81.1%	86.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES rack 4-socket traditional	%	70.7%	78.2%	80.1%	86.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket cloud	%	70.7%	78.2%	80.1%	86.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES rack 2-socket resilient trad.	%	70.7%	78.2%	80.1%	85.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES rack 2-socket resilient cloud	%	70.7%	78.2%	80.1%	85.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket resilient trad.	%	70.7%	78.2%	80.1%	86.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket resilient cloud	%	70.7%	78.2%	80.1%	86.5%	90.0%	91.5%	91.5%	91.5%	91.5%	91.5%
ES blade 1-socket traditional	%	71.6%	79.2%	81.1%	87.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES blade 2-socket traditional	%	71.6%	79.2%	81.1%	87.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES blade 2-socket cloud	%	71.6%	79.2%	81.1%	87.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES blade 4-socket traditional	%	71.6%	79.2%	81.1%	87.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
ES blade 4-socket cloud	%	71.6%	79.2%	81.1%	87.3%	90.6%	92.1%	92.1%	92.1%	92.1%	92.1%
DS Online 2	%	77.4%	84.6%	86.4%	90.6%	92.6%	94.8%	94.8%	94.8%	94.8%	94.8%
DS Online 3	%	77.4%	84.6%	86.4%	90.6%	92.8%	94.9%	94.9%	94.9%	94.9%	94.9%
DS Online 4	%	77.4%	84.6%	86.4%	90.8%	92.8%	94.9%	94.9%	94.9%	94.9%	94.9%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	kWh/a	283	132	118	100	93	85	80	76	71	66
PC Integrated Desktop	kWh/a	319	141	126	128	130	132	127	121	116	110
PC Notebook	kWh/a	89	39	35	29	29	21	20	19	18	17
PC Tablet/slate	kWh/a		31	21	19	10	10	10	10	10	9
PC Thin client	kWh/a	89	75	48	41	40	38	37	36	34	33
PC Integrated Thin Client	kWh/a	200	169	108	92	89	86	83	80	77	74
PC Small-scale Server	kWh/a	283	132	118	100	93	85	80	76	71	66
PC Workstation	kWh/a	565	306	275	249	236	223	208	193	178	163
Inkjet Printer	kWh/a	51	8	4	2	2	2	2	2	2	2
Inkjet MFD	kWh/a	77	12	8	6	6	6	6	6	6	6
EP / Laser Printer mono	kWh/a	666	137	96	71	71	71	71	71	71	71
EP / Laser Printer colour	kWh/a	1040	247	161	110	110	110	110	110	110	110
EP / Laser Copier mono	kWh/a	1069	170	113	79	79	79	79	79	79	79
EP / Laser Copier colour	kWh/a	1261	255	153	92	92	92	92	92	92	92
EP / Laser MFD mono	kWh/a	1069	170	113	79	79	79	79	79	79	79
EP / Laser MFD colour	kWh/a	1261	255	153	92	92	92	92	92	92	92
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	W	0.7	1.5	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Electric toothbrushes (off mode)	W	0.5	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Audio speakers (wired) (sb & off modes)	W	1.7	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Audio speakers (wireless) (nsb & off modes)	W	3.4	2.5	2.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
SB Small appliances (sb & off modes)	W	0.5	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Media boxes /sticks (sb mode)	W	3.9	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Media players and recorders (sb mode)	W	0.0	2.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Projectors (sb & off modes)	W	0.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Home phones (nsb mode)	W	4.6	3.4	3.2	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SB Office phones (nsb mode)	W	6.6	4.4	3.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SB Home NAS (nsb mode)	W	9.9	8.0	6.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
SB Home Network Equipment (nsb mode)	W	9.0	9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
SB Office Network Equipment (nsb mode)	W	15.0	15.0	12.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
SB Coffee makers (off mode)	W	1.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Regulated also for (networked) standby ((n)sb)											
SB Washing Machines (sb & off modes)	W	0.0	1.1	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3
SB Dishwashers (sb & off modes)	W	0.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Laundry Dryers (sb & off modes)	W	0.0	1.0	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3
SB Electric Ovens (sb mode)	W	0.0	2.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Electric Hobs (sb mode)	W	0.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
EPS Average Active Efficiency											
EPS ≤ 6W, low-V	%	64.3%	66.8%	70.2%	73.6%	73.7%	73.7%	73.7%	73.7%	73.7%	73.7%
EPS 6–10 W	%	68.6%	72.8%	77.3%	81.9%	81.9%	82.0%	82.0%	82.0%	82.0%	82.0%
EPS 10–12 W	%	70.3%	74.2%	78.3%	83.0%	83.1%	83.1%	83.1%	83.1%	83.1%	83.1%
EPS 15–20 W	%	74.1%	77.3%	80.1%	84.9%	85.0%	85.1%	85.1%	85.1%	85.1%	85.1%
EPS 20–30 W	%	78.9%	81.6%	85.3%	87.3%	87.3%	87.3%	87.3%	87.3%	87.3%	87.3%
EPS 30–65 W, multiple-V	%	83.0%	83.1%	83.3%	83.3%	83.3%	83.3%	83.3%	83.3%	83.3%	83.3%
EPS 30-65 W	%	85.5%	86.0%	88.2%	88.5%	88.5%	88.5%	88.6%	88.6%	88.6%	88.6%
EPS 65–120 W	%	83.6%	85.4%	87.5%	88.5%	88.5%	88.5%	88.6%	88.6%	88.6%	88.6%
EPS 65–120 W, multiple-V	%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%
EPS 12–15 W	%	72.4%	76.0%	79.5%	84.0%	84.1%	84.2%	84.2%	84.2%	84.2%	84.2%
EPS Average No-load power											
EPS ≤ 6W, low-V	W	0.56	0.40	0.20	0.09	0.09	0.09	0.09	0.09	0.09	0.09
EPS 6–10 W	W	0.56	0.41	0.27	0.10	0.10	0.09	0.09	0.09	0.09	0.09
EPS 10–12 W	W	0.81	0.56	0.30	0.10	0.10	0.09	0.09	0.09	0.09	0.09
EPS 15–20 W	W	0.81	0.56	0.30	0.10	0.10	0.10	0.10	0.10	0.10	0.10
EPS 20–30 W	W	0.81	0.54	0.21	0.09	0.09	0.09	0.09	0.09	0.09	0.09
EPS 30–65 W, multiple-V	W	0.93	0.87	0.60	0.32	0.31	0.30	0.30	0.30	0.30	0.30
EPS 30-65 W	W	0.81	0.61	0.31	0.18	0.18	0.18	0.18	0.18	0.18	0.18
EPS 65–120 W	W	0.81	0.61	0.31	0.18	0.18	0.18	0.18	0.18	0.18	0.18
EPS 65–120 W, multiple-V	W	1.10	0.98	0.95	0.40	0.31	0.30	0.30	0.30	0.30	0.30
EPS 12–15 W	W	0.81	0.56	0.30	0.10	0.10	0.09	0.09	0.09	0.09	0.09
RF AEC	kWh/a	477	253	201	181	113	114	101	93	86	78
RF EEI	EEI	102	48	37	32	19	19	16	14	13	11
CF open vertical chilled multi deck (RVC2)	EEI	162	123	112	104	68	45	44	44	43	42
CF open horizontal frozen island (RHF4)	EEI	160	121	111	103	72	56	55	54	54	53
CF other supermarket display (non-BCs)	EEI	136	103	94	88	74	60	59	59	58	57
CF Plug in one door beverage cooler	EEI	198	150	137	116	74	60	59	59	58	57
CF Plug in horizontal ice cream freezer	EEI	109	82	75	67	49	47	46	45	45	44
CF Spiral vending machine	EEI	97	62	59	58	53	48	47	46	46	45

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	57	57	57	57	57	57	57
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	53	53	53	53	53	53	53
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	65	65	65	65	65	65	65
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	61	61	61	61	61	61	61
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**58**	**58**	**58**	**58**	**58**	**58**	**58**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.2	3.2	3.2	3.2	3.2	3.2	3.2
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	4.2	4.2	4.2	4.2	4.2	4.2	4.2
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.2	2.2	2.2	2.2	2.2	2.2	2.2
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4	2.4
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.9	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.8	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit, All MT&LT	COP/SEPR	**2.1**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
CA Electric Hobs (active modes)	Wh/ltr	194	187	186	185	184	183	182	181	180	179
CA Electric Hobs (low-power modes)	W	0.0	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CA Electric Ovens (active modes)	kWh/a	133	97	88	80	79	79	78	78	77	77
CA Electric Ovens (low-power modes)	W	0.0	2.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CA Gas Hobs	%	60.2%	61%	61%	62%	63%	63%	63%	63%	63%	63%
CA Gas Ovens	kWh prim/a	237	202	187	147	143	139	136	132	128	124
CA Range Hoods	kWh/a	133	133	128	110	96	95	94	94	93	92
WM Washing Machines, active modes	kWh/a	350	120	107	96	92	93	93	93	93	93
WM Washing Machines, low-power modes	kWh/a	0.0	8.8	3.8	3.8	3.4	2.7	2.7	2.7	2.7	2.7
WM Washing Machines, all modes	kWh/a	350	129	110	99	96	96	96	96	96	96
WD Washer-Dryers, active modes	kWh/a	1600	995	915	870	836	830	830	830	830	830
WD Washer-Dryers, low-power modes	kWh/a	0.0	8.8	3.8	3.8	3.4	2.7	2.7	2.7	2.7	2.7
WD Washer-Dryers, all modes	kWh/a	1600	1004	919	874	839	833	833	833	833	833
DW Dishwashers, active modes	kWh/a	310	190	179	170	163	155	148	141	133	126
DW Dishwashers, low-power modes	kWh/a	0.0	8.3	4.1	4.1	4.1	4.1	4.1	4.1	4.1	4.1
DW Dishwashers (all modes, annual)	kWh/a	310	198	183	174	167	159	152	145	137	130
DW Dishwashers (all modes, per cycle)	kWh/cycle	1.41	0.90	0.83	0.79	0.76	0.72	0.69	0.66	0.62	0.59
LD at current cycles and user loading											
LD condensing heat pump	kWh elec/a	241	212	132	104	102	101	101	101	101	101
LD condensing electric heat element	kWh elec/a	441	395	301	255	255	255	255	255	255	255
LD vented electric	kWh elec/a	402	381	298	251	251	251	251	251	251	251
LD vented gas	kWh gas /a	432	522	429	374	374	374	374	374	374	374
LD Laundry Dryers, low-power modes	kWh elec/a	0.0	8.3	4.1	4.1	3.3	2.5	2.5	2.5	2.5	2.5
kWh/a/unit, real-life											
VC Cylinder Domestic mains	kWh real/a	70	61	53	26	28	28	29	28	27	27
VC Upright Domestic mains	kWh real/a	65	55	47	23	25	26	26	25	25	24
VC Handstick Domestic mains	kWh real/a	35	29	30	22	26	26	26	25	25	24
VC Cylinder Commercial mains	kWh real/a	191	468	332	217	214	209	209	209	209	209
VC Upright Commercial mains	kWh real/a	191	468	332	217	214	209	209	209	209	209
VC Cordless - domestic - cleaning	kWh real/a	27	23	22	27	33	37	37	36	35	35
VC Cordless - commercial - cleaning	kWh real/a	131	131	131	168	207	233	233	233	233	233
VC Cordless - domestic - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh real/a	24	20	19	18	18	18	18	18	17	17
VC Robot - commercial - cleaning	kWh real/a	68	68	68	68	68	68	68	68	68	68
VC Robot - domestic -standby	kWh real/a	31	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh real/a	31	31	31	31	31	31	31	31	31	31
kWh/a/unit, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	kWh std/a	70	92	70	34	38	38	38	38	38	38
VC Upright Domestic mains	kWh std/a	65	83	62	30	34	34	34	34	34	34
VC Handstick Domestic mains	kWh std/a	35	44	40	29	34	34	34	34	34	34
VC Cylinder Commercial mains	kWh std/a	32	78	55	36	36	35	35	35	35	35
VC Upright Commercial mains	kWh std/a	32	78	55	36	36	35	35	35	35	35
VC Cordless - domestic - cleaning	kWh std/a	22	22	22	28	35	39	39	39	39	39
VC Cordless - commercial - cleaning	kWh std/a	22	22	22	28	35	39	39	39	39	39

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VC Cordless - domestic - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh std/a	11	11	11	11	11	11	11	11	11	11
VC Robot - commercial - cleaning	kWh std/a	11	11	11	11	11	11	11	11	11	11
VC Robot - domestic -standby	kWh std/a	31	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh std/a	31	31	31	31	31	31	31	31	31	31
Power, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	W std	1400	1840	1391	687	754	754	754	754	754	754
VC Upright Domestic mains	W std	1300	1660	1232	600	681	681	681	681	681	681
VC Handstick Domestic mains	W std	700	875	800	586	687	684	684	684	684	684
VC Cylinder Commercial mains	W std	638	1560	1107	723	712	695	695	695	695	695
VC Upright Commercial mains	W std	638	1560	1107	723	712	695	695	695	695	695
VC Cordless - domestic - cleaning	W std	436	436	436	562	691	778	778	778	778	778
VC Cordless - commercial - cleaning	W std	436	436	436	562	691	778	778	778	778	778
VC Cordless Standby charged and docked [W]	W	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
VC Cordless Standby of empty dock [W]	W	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
VC Robot - domestic - cleaning	W std	227	227	227	227	227	227	227	227	227	227
VC Robot - commercial - cleaning	W std	227	227	227	227	227	227	227	227	227	227
VC Robot Standby charged and docked [W]	W	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
VC Robot Standby of empty dock [W]	W	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VC load factor domestic mains		1.00	0.80	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FAN Axial<300Pa (all FAN types >125W)	%	31%	30.9%	35.6%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%	39.0%
FAN Axial>300Pa	%	37%	37.1%	39.2%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%	44.0%
FAN Centr.FC	%	32%	32.1%	38.5%	45.4%	45.4%	45.4%	45.4%	45.4%	45.4%	45.4%
FAN Centr.BC-free	%	56%	56.4%	65.1%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%
FAN Centr.BC	%	54%	53.7%	62.9%	64.8%	64.8%	64.8%	64.8%	64.8%	64.8%	64.8%
FAN Cross-flow	%	7%	7.3%	17.4%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%	21.0%
MT motors											
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	70.1%	76.3%	80.6%	83.2%	84.4%	84.7%	84.8%	85.0%	85.1%	85.3%
Medium (M) 3-ph 7.5-75 kW no VSD	%	85.2%	88.0%	89.6%	90.9%	91.6%	91.8%	91.8%	91.9%	92.0%	92.1%
Medium (L) 3-ph 75-375 kW no VSD	%	92.0%	93.5%	94.4%	95.1%	96.1%	96.2%	96.2%	96.2%	96.2%	96.2%
Medium (S) 3-ph 0.75-7.5 kW with VSD	%	59.7%	66.9%	71.2%	73.9%	75.8%	76.2%	76.5%	76.8%	77.1%	77.4%
Medium (M) 3-ph 7.5-75 kW with VSD	%	77.6%	81.8%	83.7%	85.2%	86.4%	86.7%	86.9%	87.1%	87.3%	87.5%
Medium (L) 3-ph 75-375 kW with VSD	%	85.3%	88.2%	89.5%	90.4%	92.0%	92.2%	92.2%	92.3%	92.4%	92.5%
Small 1 ph 0.12-0.75 kW no VSD	%	62.4%	65.3%	66.0%	66.7%	72.7%	73.1%	73.5%	73.9%	74.3%	74.7%
Small 1 ph 0.12-0.75 kW with VSD	%	47.8%	51.1%	51.9%	52.8%	57.4%	58.1%	58.8%	59.5%	60.2%	60.8%
Small 3 ph 0.12-0.75 kW no VSD	%	62.4%	65.3%	66.0%	67.8%	72.9%	73.3%	73.7%	74.1%	74.5%	74.9%
Small 3 ph 0.12-0.75 kW with VSD	%	47.8%	51.1%	51.9%	54.2%	60.2%	60.6%	61.0%	61.4%	61.9%	62.3%
Large 3-ph LV 375-1000 kW no VSD	%	93.5%	94.4%	94.7%	95.0%	96.0%	96.1%	96.1%	96.2%	96.2%	96.2%
Large 3-ph LV 375-1000kW with VSD	%	86.9%	88.4%	88.9%	89.7%	91.8%	91.8%	91.9%	91.9%	92.0%	92.0%
Explosion motors (S) 3-ph 0.75-7.5 kW	%	70.1%	75.9%	76.5%	78.2%	82.9%	83.1%	83.3%	83.5%	83.7%	83.9%
Explosion motors (M) 3-ph 7.5-75 kW	%	85.2%	87.9%	88.1%	88.8%	90.7%	90.8%	91.0%	91.1%	91.2%	91.3%
Explosion motors (L) 3-ph 75-375 kW	%	92.0%	93.5%	93.6%	94.0%	95.0%	95.1%	95.1%	95.2%	95.3%	95.3%
Brake motors (S) 3-ph 0.75-7.5 kW	%	70.1%	75.9%	76.5%	78.8%	84.3%	84.6%	84.8%	85.0%	85.1%	85.2%
Brake motors (M) 3-ph 7.5-75 kW	%	85.2%	87.9%	88.1%	89.1%	91.5%	91.7%	91.8%	91.9%	92.0%	92.1%
Brake motors (L) 3-ph 75-375 kW	%	92.0%	93.5%	93.6%	94.1%	95.5%	95.6%	95.6%	95.6%	95.7%	95.7%
8-pole motors (S) 3-ph 0.75-7.5 kW	%	62.1%	67.9%	68.5%	71.2%	77.9%	78.2%	78.6%	79.0%	79.4%	79.7%
8-pole motors (M) 3-ph 7.5-75 kW	%	82.2%	84.9%	85.1%	86.2%	88.7%	88.8%	88.9%	89.1%	89.2%	89.3%
8-pole motors (L) 3-ph 75-375 kW	%	90.0%	91.5%	91.6%	92.2%	93.7%	93.8%	93.9%	94.0%	94.1%	94.2%
1-phase motors >0.75 kW (no VSD)	%	70.1%	75.9%	76.5%	77.2%	81.4%	81.8%	82.2%	82.6%	83.0%	83.5%
ESOB<45_VF	%	46.1%	47.0%	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
ESOB<45_CF	%	60.6%	61.9%	63.6%	63.6%	63.6%	63.6%	63.6%	63.6%	63.6%	63.6%
ESOB<45_VSD-VF	%	52.5%	53.6%	54.1%	55.1%	55.1%	55.1%	55.1%	55.1%	55.1%	55.1%
ESOB_45-150_VF	%	51.6%	52.6%	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%
ESOB_45-150_CF	%	66.0%	67.4%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
ESOB_45-150_VSD-VF	%	56.7%	57.9%	58.2%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%
ESCC<45_VF	%	45.5%	46.4%	47.7%	47.7%	47.7%	47.7%	47.7%	47.7%	47.7%	47.7%
ESCC<45_CF	%	59.9%	61.1%	62.8%	62.8%	62.8%	62.8%	62.8%	62.8%	62.8%	62.8%
ESCC<45_VSD-VF	%	51.9%	53.0%	53.5%	54.5%	54.5%	54.5%	54.5%	54.5%	54.5%	54.5%
ESCC_45-150_VF	%	51.5%	52.5%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%
ESCC_45-150_CF	%	66.0%	67.3%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
ESCC_45-150_VSD-VF	%	56.6%	57.8%	58.1%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%

EFFICIENCY SALES ECO	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
ESCCi<45_VF	%	44.5%	45.4%	46.8%	46.8%	46.8%	46.8%	46.8%	46.8%	46.8%	46.8%
ESCCi<45_CF	%	58.7%	59.9%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%
ESCCi<45_VSD-VF	%	51.1%	52.1%	52.7%	53.7%	53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
ESCCi_45-150_VF	%	51.1%	52.2%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%
ESCCi_45-150_CF	%	66.0%	67.3%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
ESCCi_45-150_VSD-VF	%	56.7%	57.8%	58.2%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%
MSSB<6"_VF	%	34.0%	34.7%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
MSSB<6"_CF	%	45.8%	46.7%	48.4%	48.6%	48.9%	48.9%	48.9%	48.9%	48.9%	48.9%
MSSB<6"_VSD-VF	%	35.5%	36.3%	36.7%	37.6%	37.6%	37.6%	37.6%	37.6%	37.6%	37.6%
MS-V<25bar_VF	%	43.4%	44.2%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%
MS-V<25bar_CF	%	60.2%	61.4%	63.3%	63.5%	63.9%	63.9%	63.9%	63.9%	63.9%	63.9%
MS-V<25bar_VSD-VF	%	43.8%	44.7%	46.1%	46.1%	46.1%	46.1%	46.1%	46.1%	46.1%	46.1%
WE arc-on-mode efficiency	%	65.0%	75.0%	76.3%	76.6%	87.0%	87.5%	87.8%	88.0%	88.2%	88.5%
WE idle mode power	W	90.4	80.4	79.9	79.5	50.0	49.9	49.8	49.7	49.6	49.5
TRAFO Distribution	kWh/a	7859	7859	5056	5056	5056	5056	5056	5056	5056	5056
TRAFO Industry oil	kWh/a	27168	27168	15631	15631	15631	15631	15631	15631	15631	15631
TRAFO Industry dry	kWh/a	39727	39727	28629	28629	28629	28629	28629	28629	28629	28629
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a	59094	59094	35515	35515	35515	35515	35515	35515	35515	35515
TRAFO DER dry	kWh/a	62415	62415	47109	47109	47109	47109	47109	47109	47109	47109
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
(Fuel losses due to RRC in L/100km/vehicle)											
Tyres C1, replacement for cars	L/100km	1.89	1.19	0.99	0.90	0.78	0.68	0.65	0.63	0.61	0.59
Tyres C1, OEM for cars	L/100km	1.89	1.23	1.11	0.97	0.81	0.72	0.69	0.66	0.63	0.60
Tyres C2, replacement for vans	L/100km	2.62	1.93	1.77	1.70	1.55	1.48	1.42	1.35	1.30	1.25
Tyres C2, OEM for vans	L/100km	2.62	1.99	1.89	1.75	1.61	1.53	1.46	1.40	1.34	1.28
Tyres C3, replacement for trucks/busses	L/100km	7.34	5.21	4.78	4.85	4.71	4.63	4.57	4.52	4.46	4.41
Tyres C3, OEM for trucks/busses	L/100km	7.34	5.35	5.16	4.96	4.83	4.77	4.70	4.63	4.56	4.50

VSD losses information for determination of VSD prices on PRICEECO

VSD - Very Small 0.12 - 0.75 kW 1-phase	W loss	148	128	123	119	115	110	106	102	97	95
VSD - Very Small 0.12 - 0.75 kW 3-phase	W loss	148	128	123	110	87	85	84	83	82	81
VSD - Small 0.75 - 7.5 kW 3-phase	W loss	204	150	141	132	117	114	111	109	106	103
VSD - Medium 7.5 - 75kW 3-phase	W loss	980	724	677	635	563	549	536	522	508	495
VSD - Large 75 - 375kW 3-phase	W loss	6978	5153	4818	4519	4009	3912	3814	3716	3619	3521
VSD - Very Large 375 - 1,000kW 3-phase	W loss	34714	30992	30062	27077	20828	20828	20828	20828	20828	20828

Average Wet Grip coefficients for Tyres (ECO)

Tyres C1, replacement for cars	1.18	1.36	1.42	1.45	1.48
Tyres C1, OEM for cars	1.12	1.14	1.39	1.45	1.48
Tyres C2, replacement for vans	1.05	1.16	1.25	1.28	1.29
Tyres C2, OEM for vans	0.99	1.01	1.19	1.28	1.29
Tyres C3, replacement for trucks/busses	0.86	1.04	1.10	1.11	1.12
Tyres C3, OEM for trucks/busses	0.75	0.77	1.00	1.11	1.12

EFFICIENCY STOCK BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
DWH Primary efficiency in GCV using PEF 2.1											
EIWH Electric Instant. < 12 kW (secondary)	%GCV,PEF2.1	33%	34%	34%	34%	34%	34%	34%	35%	35%	35%
EIWH Electric Instant. ≥ 12 kW (primary)	%GCV,PEF2.1	35%	36%	36%	36%	36%	36%	36%	37%	37%	37%
EIWHS Electric Instant. Shower (secondary)	%GCV,PEF2.1	33%	34%	34%	34%	34%	34%	34%	35%	35%	35%
ESWH Electric Storage ≤ 30 L (secondary)	%GCV,PEF2.1	31%	35%	36%	37%	38%	39%	40%	41%	41%	41%
ESWH Electric Storage > 30 L (primary)	%GCV,PEF2.1	36%	37%	37%	37%	37%	37%	38%	38%	38%	38%
GIWH Gas Instant. < 13 L/min (secondary)	%GCV,PEF2.1	29%	33%	34%	35%	36%	37%	38%	39%	40%	41%
GIWH Gas Instant. ≥ 13 L/min (primary)	%GCV,PEF2.1	43%	48%	50%	51%	53%	54%	56%	57%	58%	60%
GSWH Gas Storage, Condensing	%GCV,PEF2.1	0%	48%	49%	50%	51%	52%	54%	55%	56%	58%
GSWH Gas Storage, Non-condensing	%GCV,PEF2.1	35%	39%	40%	42%	43%	44%	45%	47%	48%	49%
Dedicated WH Heat Pump	%GCV,PEF2.1	0%	75%	76%	77%	78%	79%	80%	81%	83%	84%
Dedicated WH Solar (3.5 m2)	%GCV,PEF2.1	72%	78%	80%	81%	83%	86%	89%	92%	95%	97%
CHB Primary WH efficiency in GCV using PEF 2.1											
CHB Gas Combi Instant. WH	%GCV,PEF2.1	56%	62%	65%	69%	72%	74%	75%	76%	76%	76%
CHB Gas + Cyl. WH	%GCV,PEF2.1	55%	61%	64%	68%	71%	73%	74%	75%	75%	75%
CHB Jet Burner Gas + Cyl. WH	%GCV,PEF2.1	53%	58%	59%	60%	62%	63%	65%	66%	68%	69%
CHB Jet Burner Oil + Cyl. WH	%GCV,PEF2.1	53%	58%	59%	60%	62%	63%	65%	66%	68%	69%
CHB Electric (Joule) + Cyl. WH	%GCV,PEF2.1	35%	38%	40%	40%	41%	42%	42%	42%	42%	42%
CHB Hybrid Gas/Electric WH	%GCV,PEF2.1	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
CHB Electric HP + Cyl. WH	%GCV,PEF2.1	120%	124%	124%	125%	125%	126%	127%	128%	128%	129%
CHB Gas HP + Cyl. WH	%GCV,PEF2.1	106%	119%	124%	128%	130%	131%	132%	133%	134%	134%
CHB Gas mCHP + Cyl. WH	%GCV,PEF2.1	110%	110%	110%	110%	110%	110%	110%	110%	110%	110%
CHB Solar Combi (16 m2)	%GCV,PEF2.1	171%	199%	213%	227%	240%	250%	258%	265%	272%	280%
CHB Primary efficiency in GCV using PEF 2.1											
CHB Gas non-condensing	%GCV,PEF2.1	45%	49%	50%	51%	53%	54%	55%	56%	57%	58%
CHB Gas condensing	%GCV,PEF2.1	61%	63%	63%	64%	64%	64%	65%	65%	66%	66%
CHB Gas Jet burner non-condensing	%GCV,PEF2.1	41%	46%	47%	48%	49%	51%	53%	54%	56%	57%
CHB Gas Jet burner condensing	%GCV,PEF2.1	59%	61%	61%	62%	62%	62%	63%	63%	64%	64%
CHB Oil Jet burner non-condensing	%GCV,PEF2.1	41%	46%	47%	48%	49%	51%	53%	54%	56%	57%
CHB Oil Jet burner condensing	%GCV,PEF2.1	59%	61%	61%	62%	62%	62%	63%	63%	64%	64%
CHB Electric Joule-effect	%GCV,PEF2.1	29%	30%	30%	30%	31%	31%	31%	31%	32%	32%
CHB Hybrid (gas-electric)	%GCV,PEF2.1	84%	85%	85%	86%	86%	86%	86%	87%	87%	87%
CHB Electric Heat Pump	%GCV,PEF2.1	91%	93%	93%	94%	94%	94%	95%	95%	96%	96%
CHB Gas Heat Pump	%GCV,PEF2.1	90%	92%	92%	93%	93%	94%	94%	94%	95%	95%
CHB micro CHP	%GCV,PEF2.1	81%	83%	83%	84%	84%	85%	85%	85%	86%	86%
CHB Solar combi (16 m2)	%GCV,PEF2.1	53%	65%	70%	75%	78%	81%	84%	87%	90%	93%
SFB Wood Manual	kWh/a	28%	47%	50%	51%	52%	53%	55%	57%	58%	60%
SFB Wood Direct Draft	kWh/a	49%	71%	73%	74%	74%	75%	76%	76%	77%	77%
SFB Coal	kWh/a	39%	64%	65%	66%	67%	69%	70%	71%	71%	71%
SFB Pellets	kWh/a		70%	72%	74%	74%	75%	76%	77%	77%	77%
SFB Wood chips	kWh/a		71%	72%	73%	74%	75%	75%	76%	76%	76%
CHAE-S (≤ 400 kW)	%	97%	122%	129%	136%	144%	151%	157%	163%	168%	172%
CHAE-L (> 400 kW)	%	99%	123%	130%	137%	146%	156%	164%	172%	179%	185%
CHWE-S (≤ 400 kW)	%	124%	159%	172%	184%	197%	208%	218%	226%	233%	239%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	144%	185%	198%	212%	229%	247%	264%	278%	290%	301%
CHWE-L (> 1500 kW)	%	144%	185%	198%	212%	229%	247%	264%	278%	290%	301%
CHF	%	46%	96%	100%	104%	107%	110%	112%	115%	118%	121%
HT PCH-AE-S	SEPR	4.0	4.5	4.7	4.8	5.0	5.1	5.3	5.4	5.5	5.7
HT PCH-AE-L	SEPR	4.3	4.9	5.1	5.2	5.4	5.6	5.8	6.0	6.1	6.3
HT PCH-WE-S	SEPR	6.5	7.1	7.3	7.5	7.7	8.0	8.2	8.5	8.7	8.9
HT PCH-WE-M	SEPR	7.5	8.2	8.5	8.7	8.9	9.2	9.4	9.7	9.9	10.2
HT PCH-WE-L	SEPR	7.3	8.1	8.3	8.6	8.8	9.1	9.4	9.7	9.9	10.2
AC rooftop	%	77%	109%	117%	124%	131%	138%	145%	152%	159%	163%
AC splits	%	116%	140%	149%	157%	163%	167%	171%	176%	180%	184%
AC VRF	%	111%	146%	158%	166%	172%	176%	180%	184%	189%	193%
ACF	%	46%	96%	100%	104%	107%	110%	112%	115%	118%	121%
AC rooftop (rev)	%	84%	93%	96%	99%	101%	103%	104%	105%	107%	109%
AC splits (rev)	%	109%	118%	120%	121%	123%	126%	130%	134%	137%	140%
AC VRF (rev)	%	108%	122%	127%	130%	132%	134%	135%	138%	141%	145%
ACF (rev)	%	93%	124%	128%	134%	140%	147%	152%	157%	162%	166%
AHF	%	56%	61%	62%	64%	65%	66%	67%	68%	69%	70%
AHE	%	25%	29%	30%	30%	30%	30%	30%	31%	32%	32%
LH open fireplace	%	26%	28%	29%	29%	30%	30%	30%	31%	31%	31%
LH closed fireplace/inset	%	60%	66%	68%	69%	70%	72%	73%	73%	74%	74%
LH wood stove	%	60%	65%	67%	69%	70%	72%	73%	73%	74%	74%
LH coal stove	%	59%	65%	67%	68%	70%	71%	72%	73%	74%	74%
LH cooker	%	56%	62%	64%	65%	66%	67%	68%	69%	69%	69%
LH SHR stove	%	80%	80%	80%	81%	81%	83%	84%	85%	85%	86%
LH pellet stove	%		83%	85%	87%	88%	90%	92%	93%	93%	93%

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	%elec	65%	73%	75%	76%	78%	79%	80%	80%	80%	80%
LH Electric fixed > 250W	%elec	68%	75%	77%	79%	80%	82%	83%	84%	84%	84%
LH Electric fixed ≤ 250W	%elec	63%	70%	72%	73%	75%	77%	78%	78%	79%	79%
LH Electric storage	%elec	64%	72%	73%	75%	77%	78%	79%	80%	80%	80%
LH Electric underfloor	%elec	64%	68%	70%	72%	74%	75%	77%	78%	79%	79%
LH Electric visibly glowing > 1.2 kW	%elec	67%	75%	76%	78%	79%	81%	82%	82%	82%	82%
LH Electric visibly glowing ≤ 1.2 kW	%elec	60%	67%	69%	71%	72%	74%	75%	75%	75%	75%
LH Electric Towel Heaters	%elec	68%	68%	69%	73%	78%	81%	82%	83%	83%	83%
LH Gas luminous (commercial)	%NCV	72%	80%	82%	84%	86%	88%	89%	90%	90%	90%
LH Gaseous Tube (commercial < 120 kW)	%NCV	63%	70%	72%	73%	75%	76%	77%	78%	79%	79%
LH Gas open front	%NCV	36%	40%	41%	41%	42%	43%	43%	43%	44%	44%
LH Gas closed front	%NCV	55%	61%	62%	64%	65%	67%	68%	68%	69%	69%
LH Gas balanced flue	%NCV	59%	64%	66%	67%	68%	70%	71%	72%	72%	72%
LH Gas flueless	%NCV	100%	100%	100%	100%	100%					
LH Liquid tube (commercial < 120 kW)	%NCV	61%	67%	69%	71%	72%	74%	75%	76%	76%	76%
LH Liquid open front	%NCV	36%	40%	41%	41%	42%	43%	43%	43%	44%	44%
LH Liquid closed front	%NCV	55%	61%	62%	64%	65%	67%	68%	68%	69%	69%
LH Liquid balanced flue	%NCV	59%	64%	66%	67%	68%	70%	71%	72%	72%	72%
LH Liquid flueless	%NCV	100%	100%	100%	100%	100%					
RAC fixed < 6 kW, cooling	SEER	2.14	2.75	3.11	3.64	4.13	4.59	5.04	5.41	5.65	5.79
RAC fixed 6-12 kW, cooling	SEER	1.84	2.43	2.78	3.24	3.66	4.09	4.51	4.85	5.07	5.20
RAC portable < 12 kW, cooling	SEER	1.11	1.35	1.40	1.45	1.50	1.56	1.61	1.65	1.68	1.70
RAC fixed < 6 kW, reversible, heating	SCOP	1.82	2.25	2.45	2.77	3.05	3.32	3.59	3.81	3.96	4.05
RAC fixed 6-12 kW, reversible, heating	SCOP	1.57	1.98	2.18	2.45	2.71	2.96	3.22	3.42	3.55	3.64
RAC portable < 12 kW, reversible, heating	SCOP										
CIRC Integrated circulators	EEI	0.49	0.46	0.42	0.39	0.37	0.36	0.34	0.32	0.31	0.29
CIRC Large standalone circulators	EEI	0.41	0.39	0.36	0.34	0.32	0.31	0.29	0.28	0.26	0.25
CIRC Small standalone circulators	EEI	0.58	0.54	0.49	0.45	0.43	0.41	0.39	0.37	0.35	0.34
CIRC Integrated circulators	kWh elec/a	303	284	259	242	230	219	208	198	188	179
CIRC Large standalone circulators	kWh elec/a	1452	1381	1280	1199	1140	1085	1031	980	932	887
CIRC Small standalone circulators	kWh elec/a	199	185	167	155	148	140	133	127	121	115
R-UVU ≤ 100 m3/h for Extract Spaces											
Unit annual electricity consumption	kWhe/a	64	52	44	38	34	34	34	34	34	34
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-UVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	0	0	0	0	29	29	29	29	29	29
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	115	99	91	85	83	83	83	83	83	83
Heat recovery efficiency	%	60%	63%	64%	65%	65%	66%	66%	66%	66%	66%
Heat recovered per unit per year	kWh heat/a	286	252	252	248	242	232	223	213	204	196
R-UVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	193	174	160	148	141	140	140	140	140	140
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	375	325	298	280	268	267	267	267	267	267
Heat recovery efficiency	%	70%	70%	71%	71%	71%	71%	71%	71%	71%	71%
Heat recovered per unit per year	kWh heat/a	902	761	752	735	720	692	663	636	609	584
R-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	801	760	723	701	698	698	698	698	698
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1442	1330	1259	1214	1212	1212	1212	1212	1212
Heat recovery efficiency	%	65%	68%	69%	70%	71%	71%	71%	71%	71%	71%
Heat recovered per unit per year	kWh heat/a	3786	3315	3325	3282	3231	3106	2977	2852	2733	2619
R-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1766	1586	1432	1303	1241	1235	1235	1235	1235	1235
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	0	4313	4040	3865	3779	3770	3770	3770	3770	3770
Heat recovery efficiency	%	0%	70%	71%	71%	71%	71%	71%	71%	71%	71%
Heat recovered per unit per year	kWh heat/a	0	10742	10599	10346	10068	9708	9302	8913	8541	8184

EFFICIENCY STOCK BAU	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
NR-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	805	761	722	702	698	698	698	698	698
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
NR-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	0	1447	1329	1253	1216	1212	1212	1212	1212	1212
Heat recovery efficiency	%	0%	67%	69%	70%	71%	71%	71%	71%	71%	71%
Heat recovered per unit per year	kWh heat/a	0	3311	3331	3291	3221	3106	2977	2852	2733	2619
NR-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1256	1030	845	688	614	609	609	609	609	609
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
NR-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	0	2667	2338	2126	2025	2016	2016	2016	2016	2016
Heat recovery efficiency	%	0%	65%	68%	70%	71%	71%	71%	71%	71%	71%
Heat recovered per unit per year	kWh heat/a	0	11280	11315	11154	10841	10408	9973	9556	9157	8774
NR-AHU-S 2500-5500 m3/h											
Unit annual electricity consumption	kWhe/a	7618	6241	5508	5037	4812	4793	4793	4793	4793	4793
Heat recovery efficiency	%	30%	37%	42%	45%	46%	47%	47%	47%	47%	47%
Heat recovered per unit per year	kWh heat/a	12994	13536	14610	14998	14884	14345	13746	13171	12621	12094
NR-AHU-M 5500-14500 m3/h											
Unit annual electricity consumption	kWhe/a	24456	20992	18028	15695	14656	14583	14583	14583	14583	14583
Heat recovery efficiency	%	30%	35%	40%	44%	46%	47%	47%	47%	47%	47%
Heat recovered per unit per year	kWh heat/a	30937	30444	33392	35233	35376	34155	32728	31360	30050	28794
NR-AHU-L > 14500 m3/h											
Unit annual electricity consumption	kWhe/a	79692	68321	58561	50873	47439	47190	47190	47190	47190	47190
Heat recovery efficiency	%	30%	35%	40%	44%	46%	47%	47%	47%	47%	47%
Heat recovered per unit per year	kWh heat/a	86624	85244	93498	98652	99054	95634	91638	87809	84140	80624
LS, stock average efficiency incl. control gear											
LFL (T12,T8h,T8t,T5,other)	lm/W	60	66	70	72	73	73	73	73	73	73
HID (HPM, HPS, MH)	lm/W	58	71	77	81	81	82	82	83	84	84
CFLni (all shapes)	lm/W	48	50	50	50	50	50	50	50	50	50
CFLi (retrofit for GLS, HL)	lm/W	55	55	55	55	55	55	55	55	55	55
GLS (DLS & NDLS)	lm/W	9	9	11	11	11	11	11	11	11	11
HL (DLS & NDLS, LV & MV)	lm/W	13	11	11	12	12	12	12	12	12	12
LED replacing LFL (retrofit & luminaire)	lm/W			57	98	120	139	154	162	168	171
LED replacing HID (retrofit & luminaire)	lm/W			62	102	124	145	163	171	173	173
LED replacing CFLni (retrofit & luminaire)	lm/W			64	98	119	137	151	159	161	162
LED replacing DLS (retrofit & luminaire)	lm/W			43	59	67	72	75	76	77	78
LED replacing NDLS (retrofit & luminaire)	lm/W		21	39	88	99	105	109	111	112	113
DP TV on-mode power (avg. all types)	W/dm2	9.2	5.0	3.0	2.1	1.5	1.2	0.9	0.7	0.6	0.5
DP TV standard (NoNA) standby power	W	8.0	2.0	0.8	0.5						
DP TV LoNA standby power	W		2.0	2.0	2.0	2.0	2.0				
DP TV HiNA ('Smart') standby power	W		0.0	5.1	5.6	5.0	4.4	3.9	3.4	2.9	2.4
DP Monitor on-mode power	W/dm2	9.2	5.1	3.3	2.4	2.0	1.5	1.1	0.8	0.7	0.7
DP Monitor standby power	W	9.0	2.4	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.2
DP Signage on-mode power	W/dm2		8.0	4.2	2.6	1.9	1.6	1.3	1.0	0.9	0.7
DP Signage standby power	W/dm2		8.0	4.2	2.6	1.9	1.6	1.3	1.0	0.9	0.7
SSTB	kWh/a		33	19	19						
CSTB (all covered modes)	kWh/a		117	113	105	98	91	88	88	88	88
Game consoles > 20 W Active modes (SRI)	kWh/a	12	46	82	102	97	97	97	97	97	97
Game consoles > 20 W Non-Active (CR)	kWh/a	8	24	36	45	41	40	40	40	40	40
Game consoles < 20 W Non-Active (CR)	kWh/a	8	47	51	52	53	53	53	53	53	53
Game consoles < 20 W Active (no reg.)	kWh/a	7	8	8	7	6	6	6	6	6	6
Total Game consoles > 20 W, all modes	kWh/a	20	70	118	147	138	137	137	137	137	137
Total Game consoles < 20 W, all modes	kWh/a	16	54	59	59	59	59	59	59	59	59
PSU efficiency for ES&DS											
ES tower 1-socket traditional	%	67.4%	74.4%	76.2%	78.4%	81.3%	84.2%	85.4%	85.4%	85.4%	85.4%
ES rack 1-socket traditional	%	67.4%	74.4%	76.2%	78.4%	81.3%	84.3%	85.4%	85.4%	85.4%	85.4%
ES rack 2-socket traditional	%	71.6%	78.4%	80.2%	82.5%	85.0%	87.5%	88.4%	88.4%	88.4%	88.4%
ES rack 2-socket cloud	%		78.6%	80.4%	82.5%	85.0%	87.5%	88.4%	88.4%	88.4%	88.4%
ES rack 4-socket traditional	%	70.7%	77.4%	79.2%	82.2%	85.2%	87.4%	88.1%	88.1%	88.1%	88.1%
ES rack 4-socket cloud	%		77.6%	79.4%	82.2%	85.2%	87.4%	88.1%	88.1%	88.1%	88.1%
ES rack 2-socket resilient trad.	%	70.7%	77.4%	79.2%	81.5%	84.1%	86.7%	87.7%	87.7%	87.7%	87.7%
ES rack 2-socket resilient cloud	%		77.6%	79.4%	81.5%	84.1%	86.7%	87.7%	87.7%	87.7%	87.7%
ES rack 4-socket resilient trad.	%	70.7%	77.4%	79.2%	82.2%	85.2%	87.4%	88.1%	88.1%	88.1%	88.1%
ES rack 4-socket resilient cloud	%		77.6%	79.4%	82.2%	85.2%	87.4%	88.1%	88.1%	88.1%	88.1%
ES blade 1-socket traditional	%	71.6%	78.4%	80.3%	83.1%	86.0%	88.1%	88.8%	88.8%	88.8%	88.8%

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ES blade 2-socket traditional	%	71.6%	78.4%	80.2%	83.1%	86.0%	88.1%	88.8%	88.8%	88.8%	88.8%
ES blade 2-socket cloud	%		78.5%	80.4%	83.1%	86.0%	88.1%	88.8%	88.8%	88.8%	88.8%
ES blade 4-socket traditional	%	71.6%	78.4%	80.2%	83.1%	86.0%	88.1%	88.8%	88.8%	88.8%	88.8%
ES blade 4-socket cloud	%		78.5%	80.4%	83.1%	86.0%	88.1%	88.8%	88.8%	88.8%	88.8%
DS Online 2	%	77.4%	83.7%	85.3%	87.3%	89.4%	91.2%	92.2%	92.3%	92.3%	92.3%
DS Online 3	%	77.4%	83.7%	85.3%	87.3%	89.4%	91.2%	92.2%	92.3%	92.3%	92.3%
DS Online 4	%	77.4%	83.7%	85.3%	87.3%	89.4%	91.2%	92.2%	92.3%	92.3%	92.3%
PC Desktop	kWh/a	297	133	126	109	96	89	83	78	73	69
PC Integrated Desktop	kWh/a	319	143	135	127	129	131	129	124	118	113
PC Notebook	kWh/a	0	39	37	32	29	24	20	19	19	18
PC Tablet/slate	kWh/a	0	31	23	19	12	10	10	10	10	9
PC Thin client	kWh/a	0	78	59	43	40	39	37	36	35	33
PC Integrated Thin Client	kWh/a	0	174	133	98	90	87	85	82	79	76
PC Small-scale Server	kWh/a	304	134	126	111	98	90	83	78	74	69
PC Workstation	kWh/a	565	312	292	264	244	230	217	202	187	172
Inkjet Printer	kWh/a	51	15	13	12	12	12	12	12	12	12
Inkjet MFD	kWh/a	77	22	19	18	18	18	18	18	18	18
EP / Laser Printer mono	kWh/a	666	190	174	167	167	167	167	167	167	167
EP / Laser Printer colour	kWh/a		297	274	260	260	260	260	260	260	260
EP / Laser Copier mono	kWh/a	1069	305	287	267						
EP / Laser Copier colour	kWh/a		360	332	315						
EP / Laser MFD mono	kWh/a		305	285	267	267	267	267	267	267	267
EP / Laser MFD colour	kWh/a		360	336	315	315	315	315	315	315	315
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	W	0.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
SB Electric toothbrushes (off mode)	W	0.4	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Audio speakers (wired) (sb & off modes)	W	1.3	3.4	3.4	3.4	3.4					
SB Audio speakers (wireless) (nsb & off modes)	W		3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4	3.4
SB Small appliances (sb & off modes)	W	0.4	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1
SB Media boxes /sticks (sb mode)	W		3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
SB Media players and recorders (sb mode)	W	0.0	3.9	3.9	3.9	3.9					
SB Projectors (sb & off modes)	W	0.0	3.2	3.2	3.2	3.2	3.2				
SB Home phones (nsb mode)	W	4.7	3.5	3.3	3.2	3.0	2.8	2.6	2.4	2.2	2.1
SB Office phones (nsb mode)	W	6.7	4.7	4.2	3.6	3.1	2.5	2.1	2.0	2.0	2.0
SB Home NAS (nsb mode)	W		8.0	7.7	7.3	7.0	6.6	6.2	5.9	5.5	5.2
SB Home Network Equipment (nsb mode)	W		9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0	9.0
SB Office Network Equipment (nsb mode)	W		15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0	15.0
SB Coffee makers (off mode)	W	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Regulated also for (networked) standby ((n)sb)											
(already accounted elsewhere; here for info only)											
SB Washing Machines (sb & off modes)	W	0.0	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
SB Dishwashers (sb & off modes)	W	0.0	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Laundry Dryers (sb & off modes)	W	0.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Electric Ovens (sb mode)	W	0.0	2.1	2.6	2.9	3.0	3.0	3.0	3.0	3.0	3.0
SB Electric Hobs (sb mode)	W	0.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
SB Game consoles (non-active modes)	W	see games consoles above									
EPS Average Active Efficiency (of stock)											
EPS ≤ 6W, low-V	%	64.2%	66.2%	66.7%	67.2%	67.7%	68.2%	68.8%	69.3%	69.8%	70.3%
EPS 6–10 W	%	68.4%	71.9%	72.8%	73.7%	74.6%	75.5%	76.4%	77.3%	78.2%	78.5%
EPS 10–12 W	%		73.4%	74.2%	75.0%	75.9%	76.7%	77.6%	78.4%	79.3%	79.7%
EPS 15–20 W	%		76.9%	77.5%	78.1%	78.9%	79.6%	80.3%	81.0%	81.5%	81.6%
EPS 20–30 W	%	78.8%	80.8%	81.3%	81.8%	82.3%	82.9%	83.4%	83.9%	84.5%	85.0%
EPS 30–65 W, multiple-V	%				83.0%	83.0%	83.0%	83.0%	83.0%	83.0%	83.0%
EPS 30-65 W	%				85.6%	85.9%	86.2%	86.5%	86.9%	87.2%	87.6%
EPS 65–120 W	%	83.6%	84.9%	85.2%	85.5%	85.8%	86.1%				
EPS 65–120 W, multiple-V	%		86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%
EPS 12–15 W	%	72.2%	75.2%	75.9%	76.6%	77.4%	78.2%	79.0%	79.7%	80.5%	80.9%
EPS Average No-load power (of stock)											
EPS ≤ 6W, low-V	W	0.56	0.44	0.41	0.38	0.35	0.33	0.30	0.27	0.25	0.23
EPS 6–10 W	W	0.56	0.44	0.41	0.38	0.35	0.33	0.30	0.27	0.25	0.23
EPS 10–12 W	W		0.61	0.56	0.51	0.46	0.41	0.36	0.32	0.28	0.25
EPS 15–20 W	W		0.60	0.56	0.51	0.46	0.41	0.36	0.31	0.28	0.25
EPS 20–30 W	W	0.83	0.62	0.57	0.52	0.47	0.42	0.37	0.32	0.28	0.25
EPS 30–65 W, multiple-V	W				0.92	0.90	0.87	0.84	0.81	0.78	0.76
EPS 30-65 W	W				0.60	0.57	0.53	0.50	0.46	0.43	0.40
EPS 65–120 W	W	0.82	0.67	0.64	0.60	0.57	0.54				
EPS 65–120 W, multiple-V	W		0.99	0.96	0.93	0.90	0.87	0.84	0.81	0.78	0.76
EPS 12–15 W	W	0.83	0.62	0.57	0.52	0.47	0.42	0.37	0.32	0.28	0.25
RF AEC	kWh/a	490	446	438	429	421	413	406	400	393	387
RF EEI	EEI	109	88	84	80	76	72	69	65	62	59

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
CF open vertical chilled multi deck (RVC2)	EEI	164	135	122	113	107	105	102	101	100	98
CF open horizontal frozen island (RHF4)	EEI	162	133	120	111	106	103	101	99	98	97
CF other supermarket display (non-BCs)	EEI	137	112	102	94	91	91	90	89	88	87
CF Plug in one door beverage cooler	EEI	200	162	147	136	129	126	123	121	119	118
CF Plug in horizontal ice cream freezer	EEI	110	89	81	75	72	70	68	67	67	66
CF Spiral vending machine	EEI	102	76	66	60	59	59	59	59	58	57
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	96	96	96	96	96	96	96
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	91	91	91	91	91	91	91
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	109	109	109	109	109	109	109
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	106	106	106	106	106	106	106
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**	**98**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0	3.0
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**	**2.4**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.7
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5	1.5
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit, All MT&LT	**COP/SEPR**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
CA Electric Hobs (active modes)	Wh/ltr	196	190	188	187	186	185	184	183	182	181
CA Electric Hobs (low-power modes)	W	0.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
CA Electric Ovens (active modes)	kWh/a	134	122	110	99	92	89	89	88	88	87
CA Electric Ovens (low-power modes)	W	0.0	2.1	2.6	2.9	3.0	3.0	3.0	3.0	3.0	3.0
CA Gas Hobs	%	60.0%	60.6%	60.7%	60.9%	61.0%	61.2%	61.3%	61.5%	61.6%	61.8%
CA Gas Ovens	kWh prim/a	244	224	214	204	195	190	186	182	178	175
CA Range Hoods	kWh/a	133	133	133	133	133	133	133	133	133	133
WM Washing Machines, active modes	kWh/a	433	225	203	184	167	153	142	131	121	110
WM Washing Machines, low-power modes	kWh/a	0.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
WM Washing Machines, all modes	kWh/a	434	236	213	194	177	164	152	142	131	120
WD Washer-Dryers, active modes	kWh/a	1600	1348	1251	1161	1077	999	929	882	857	845
WD Washer-Dryers, low-power modes	kWh/a	0.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3	10.3
WD Washer-Dryers, all modes	kWh/a	1600	1358	1261	1171	1087	1009	939	892	868	855
DW Dishwashers, active modes	kWh/a	343	271	263	255	248	241	234	226	219	212
DW Dishwashers, low-power modes	kWh/a	0.0	6.9	8.0	8.3	8.3	8.3	8.3	8.3	8.3	8.3
DW Dishwashers (all modes, annual)	kWh/a	343	278	271	264	256	249	242	234	227	220
DW Dishwashers (all modes, per cycle)	kWh/cycle	1.56	1.26	1.23	1.20	1.17	1.13	1.10	1.07	1.03	1.00
LD at current cycles and user loading											
LD condensing heat pump	kWh elec/a		232	197	160	144	141	141	141	141	141
LD condensing electric heat element	kWh elec/a	455	407	382	318	282	272	272	272	272	272
LD vented electric	kWh elec/a	425	382	370	316	277	266	266	266	266	266
LD vented gas	kWh gas /a	432	492	509	484	417	374	374			
LD Laundry Dryers, low-power modes	kWh elec/a	0.0	7.3	8.2	8.3	8.3	8.3	8.3	8.3	8.3	8.3
kWh/a/unit, real-life											
VC Cylinder Domestic mains	kWh real/a	70	56	72	79	86	92	95	94	91	89
VC Upright Domestic mains	kWh real/a	65	52	65	70	75	81	83	82	80	78
VC Handstick Domestic mains	kWh real/a	35	28	34	38	41	45	48	48	47	46
VC Cylinder Commercial mains	kWh real/a	191	451	486	516	546	576	606	618	618	618
VC Upright Commercial mains	kWh real/a	191	450	486	516	546	576	606	618	618	618
VC Cordless - domestic - cleaning	kWh real/a	27	23	22	24	30	35	37	36	35	35
VC Cordless - commercial - cleaning	kWh real/a	131	131	131	150	190	221	233	233	233	233
VC Cordless - domestic - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh real/a	0	20	19	18	18	18	18	18	17	17
VC Robot - commercial - cleaning	kWh real/a	0	68	68	68	68	68	68	68	68	68
VC Robot - domestic -standby	kWh real/a	0	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh real/a	0	31	31	31	31	31	31	31	31	31

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
kWh/a/unit, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	kWh std/a	70	85	95	105	114	122	126	126	126	126
VC Upright Domestic mains	kWh std/a	65	78	85	93	101	107	110	111	111	111
VC Handstick Domestic mains	kWh std/a	35	43	45	50	55	60	64	65	66	66
VC Cylinder Commercial mains	kWh std/a	32	75	81	86	91	96	101	103	103	103
VC Upright Commercial mains	kWh std/a	32	75	81	86	91	96	101	103	103	103
VC Cordless - domestic - cleaning	kWh std/a	22	22	22	25	32	37	39	39	39	39
VC Cordless - commercial - cleaning	kWh std/a	22	22	22	25	32	37	39	39	39	39
VC Cordless - domestic - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh std/a	0	11	11	11	11	11	11	11	11	11
VC Robot - commercial - cleaning	kWh std/a	0	11	11	11	11	11	11	11	11	11
VC Robot - domestic -standby	kWh std/a	0	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh std/a	0	31	31	31	31	31	31	31	31	31
Power, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	W std	1400	1693	1897	2095	2290	2441	2511	2520	2520	2520
VC Upright Domestic mains	W std	1300	1561	1702	1861	2012	2136	2202	2210	2210	2210
VC Handstick Domestic mains	W std	700	862	904	998	1095	1197	1274	1307	1310	1310
VC Cylinder Commercial mains	W std	638	1503	1620	1720	1820	1920	2020	2060	2060	2060
VC Upright Commercial mains	W std	638	1500	1619	1720	1820	1920	2020	2060	2060	2060
VC Cordless - domestic - cleaning	W std	436	436	436	499	632	737	778	778	778	778
VC Cordless - commercial - cleaning	W std	436	436	436	499	632	737	778	778	778	778
VC Cordless Standby charged and docked [W]	W	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
VC Cordless Standby of empty dock [W]	W	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
VC Robot - domestic - cleaning	W std	0	227	227	227	227	227	227	227	227	227
VC Robot - commercial - cleaning	W std	0	227	227	227	227	227	227	227	227	227
VC Robot Standby charged and docked [W]	W	0.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
VC Robot Standby of empty dock [W]	W	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VC load factor domestic mains		1.00	0.80	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FAN Axial<300Pa (all FAN types >125W)	%	31%	31%	31%	31%	31%	31%	31%	31%	31%	31%
FAN Axial>300Pa	%	37%	37%	37%	37%	37%	37%	37%	37%	37%	37%
FAN Centr.FC	%	32%	32%	32%	32%	32%	32%	32%	32%	32%	32%
FAN Centr.BC-free	%	56%	56%	56%	56%	56%	56%	56%	56%	56%	56%
FAN Centr.BC	%	54%	54%	54%	54%	54%	54%	54%	54%	54%	54%
FAN Cross-flow	%	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
MT motors											
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	69.7%	75.4%	76.1%	76.7%	77.3%	78.0%	78.7%	79.4%	80.1%	80.8%
Medium (M) 3-ph 7.5-75 kW no VSD	%	85.0%	87.6%	87.9%	88.2%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%
Medium (L) 3-ph 75-375 kW no VSD	%	91.8%	93.0%	93.4%	93.5%	93.7%	93.8%	94.0%	94.1%	94.2%	94.4%
Medium (S) 3-ph 0.75-7.5 kW with VSD	%	59.1%	65.7%	66.9%	67.7%	68.5%	69.4%	70.2%	71.1%	71.9%	72.8%
Medium (M) 3-ph 7.5-75 kW with VSD	%	77.2%	81.0%	81.7%	82.2%	82.7%	83.1%	83.5%	83.9%	84.3%	84.7%
Medium (L) 3-ph 75-375 kW with VSD	%	84.8%	87.2%	87.9%	88.4%	88.7%	89.0%	89.3%	89.6%	89.8%	90.1%
Small 1 ph 0.12-0.75 kW no VSD	%	62.4%	64.8%	65.5%	66.2%	67.0%	67.7%	68.4%	69.2%	70.0%	70.7%
Small 1 ph 0.12-0.75 kW with VSD	%	47.7%	50.5%	51.4%	52.2%	53.1%	53.9%	54.8%	55.7%	56.7%	57.6%
Small 3 ph 0.12-0.75 kW no VSD	%	62.4%	64.8%	65.5%	66.2%	67.0%	67.7%	68.4%	69.2%	70.0%	70.7%
Small 3 ph 0.12-0.75 kW with VSD	%	47.7%	50.5%	51.4%	52.2%	53.1%	53.9%	54.8%	55.7%	56.7%	57.6%
Large 3-ph LV 375-1000 kW no VSD	%	93.5%	93.9%	94.2%	94.4%	94.7%	95.0%	95.3%	95.5%	95.7%	95.8%
Large 3-ph LV 375-1000kW with VSD	%	86.6%	87.9%	88.3%	88.7%	89.0%	89.4%	89.7%	90.0%	90.2%	90.4%
Explosion motors (S) 3-ph 0.75-7.5 kW	%	69.7%	75.4%	76.1%	76.7%	77.4%	78.1%	78.8%	79.5%	80.2%	80.9%
Explosion motors (M) 3-ph 7.5-75 kW	%	85.0%	87.6%	87.9%	88.2%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%
Explosion motors (L) 3-ph 75-375 kW	%	91.8%	93.0%	93.4%	93.5%	93.7%	93.8%	94.0%	94.1%	94.3%	94.4%
Brake motors (S) 3-ph 0.75-7.5 kW	%	69.7%	75.4%	76.1%	76.7%	77.4%	78.1%	78.8%	79.5%	80.2%	80.9%
Brake motors (M) 3-ph 7.5-75 kW	%	85.0%	87.6%	87.9%	88.2%	88.4%	88.7%	89.0%	89.2%	89.5%	89.8%
Brake motors (L) 3-ph 75-375 kW	%	91.8%	93.0%	93.4%	93.5%	93.7%	93.8%	94.0%	94.1%	94.3%	94.4%
8-pole motors (S) 3-ph 0.75-7.5 kW	%	61.7%	67.4%	68.1%	68.7%	69.4%	70.1%	70.8%	71.5%	72.2%	72.9%
8-pole motors (M) 3-ph 7.5-75 kW	%	82.0%	84.6%	84.9%	85.2%	85.4%	85.7%	86.0%	86.2%	86.5%	86.8%
8-pole motors (L) 3-ph 75-375 kW	%	89.8%	91.0%	91.4%	91.5%	91.7%	91.8%	92.0%	92.1%	92.3%	92.4%
1-phase motors >0.75 kW (no VSD)	%	69.5%	75.0%	75.9%	76.5%	77.2%	77.8%	78.5%	79.2%	79.9%	80.6%
ESOB<45_VF	%	45.9%	46.8%	47.1%	47.2%	47.4%	47.5%	47.6%	47.8%	47.9%	48.1%
ESOB<45_CF	%	60.4%	61.6%	61.9%	62.1%	62.3%	62.5%	62.7%	62.8%	63.0%	63.2%
ESOB<45_VSD-VF	%	52.3%	53.4%	53.6%	53.7%	53.9%	54.0%	54.2%	54.3%	54.5%	54.7%
ESOB_45-150_VF	%	51.3%	52.4%	52.6%	52.8%	53.0%	53.1%	53.3%	53.4%	53.5%	53.5%
ESOB_45-150_CF	%	65.7%	67.1%	67.4%	67.6%	67.8%	68.0%	68.2%	68.4%	68.5%	68.5%
ESOB_45-150_VSD-VF	%	56.5%	57.6%	57.9%	58.0%	58.2%	58.3%	58.5%	58.7%	58.8%	58.8%
ESCC<45_VF	%	45.3%	46.2%	46.4%	46.6%	46.7%	46.8%	47.0%	47.1%	47.3%	47.4%
ESCC<45_CF	%	59.6%	60.8%	61.1%	61.3%	61.5%	61.7%	61.9%	62.0%	62.2%	62.4%
ESCC<45_VSD-VF	%	51.7%	52.8%	53.0%	53.1%	53.3%	53.4%	53.6%	53.7%	53.9%	54.1%

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESCC_45-150_VF	%	51.3%	52.3%	52.5%	52.7%	52.9%	53.0%	53.2%	53.3%	53.4%	53.4%
ESCC_45-150_CF	%	65.7%	67.0%	67.4%	67.6%	67.8%	68.0%	68.2%	68.4%	68.4%	68.4%
ESCC_45-150_VSD-VF	%	56.4%	57.5%	57.8%	57.9%	58.1%	58.2%	58.4%	58.6%	58.7%	58.7%
ESCCi<45_VF	%	44.3%	45.2%	45.4%	45.6%	45.7%	45.9%	46.0%	46.2%	46.3%	46.4%
ESCCi<45_CF	%	58.5%	59.6%	59.9%	60.1%	60.3%	60.5%	60.7%	60.8%	61.0%	61.2%
ESCCi<45_VSD-VF	%	50.9%	51.9%	52.1%	52.3%	52.4%	52.6%	52.7%	52.9%	53.0%	53.2%
ESCCi_45-150_VF	%	50.9%	51.9%	52.2%	52.4%	52.5%	52.7%	52.8%	53.0%	53.0%	53.0%
ESCCi_45-150_CF	%	65.7%	67.0%	67.3%	67.6%	67.8%	68.0%	68.2%	68.3%	68.4%	68.4%
ESCCi_45-150_VSD-VF	%	56.4%	57.6%	57.8%	58.0%	58.1%	58.3%	58.5%	58.6%	58.7%	58.8%
MSSB<6"_VF	%	33.9%	34.6%	34.7%	34.9%	35.0%	35.1%	35.2%	35.3%	35.4%	35.5%
MSSB<6"_CF	%	45.6%	46.5%	46.7%	46.9%	47.0%	47.1%	47.3%	47.4%	47.6%	47.7%
MSSB<6"_VSD-VF	%	35.4%	36.1%	36.3%	36.4%	36.5%	36.6%	36.7%	36.8%	36.9%	37.0%
MS-V<25bar_VF	%	43.2%	44.1%	44.3%	44.4%	44.5%	44.7%	44.8%	44.9%	45.1%	45.2%
MS-V<25bar_CF	%	59.9%	61.2%	61.4%	61.7%	61.8%	62.0%	62.2%	62.4%	62.6%	62.8%
MS-V<25bar_VSD-VF	%	43.7%	44.5%	44.7%	44.9%	45.0%	45.2%	45.3%	45.4%	45.6%	45.7%
WE arc-on-mode efficiency	%	63.8%	73.8%	75.6%	76.5%	76.7%	76.8%	76.9%	76.9%	77.0%	77.0%
WE idle mode power	W	91.6	81.6	80.1	79.7	79.3	79.1	79.0	79.0	78.9	78.9
TRAFO Distribution	kWh/a	7859	7859	7859	7859	7859	7859	7859	7859	7859	7859
TRAFO Industry oil	kWh/a	27168	27168	27168	27168	27168	27168	27168	27168	27168	27168
TRAFO Industry dry	kWh/a	39727	39727	39727	39727	39727	39727	39727	39727	39727	39727
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a		59094	59094	59094	59094	59094	59094	59094	59094	59094
TRAFO DER dry	kWh/a		62415	62415	62415	62415	62415	62415	62415	62415	62415
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
(Fuel losses due to RRC in L/100km/vehicle)											
Tyres C1, replacement for cars	L/100km	1.95	1.27	1.16	1.03	0.92	0.81	0.75	0.71	0.68	0.64
Tyres C1, OEM for cars	L/100km	1.95	1.27	1.16	1.03	0.92	0.81	0.75	0.71	0.68	0.64
Tyres C2, replacement for vans	L/100km	2.65	2.01	1.91	1.80	1.71	1.62	1.54	1.47	1.39	1.33
Tyres C2, OEM for vans	L/100km	2.65	2.02	1.91	1.80	1.71	1.62	1.54	1.47	1.39	1.33
Tyres C3, replacement for trucks/busses	L/100km	7.46	5.43	5.19	5.08	5.01	4.95	4.89	4.83	4.77	4.71
Tyres C3, OEM for trucks/busses	L/100km	7.46	5.44	5.19	5.08	5.01	4.95	4.89	4.83	4.77	4.71

EFFICIENCY STOCK ECO	unit	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
DWH Primary efficiency in GCV using PEF 2.1											
EIWH Electric Instant. < 12 kW (secondary)	%GCV,PEF2.1	33%	34%	36%	39%	42%	44%	44%	44%	44%	44%
EIWH Electric Instant. ≥ 12 kW (primary)	%GCV,PEF2.1	35%	36%	37%	40%	43%	45%	46%	46%	46%	46%
EIWHS Electric Instant. Shower (secondary)	%GCV,PEF2.1	33%	34%	35%	39%	42%	44%	44%	44%	44%	44%
ESWH Electric Storage ≤ 30 L (secondary)	%GCV,PEF2.1	31%	35%	36%	38%	40%	41%	41%	41%	41%	41%
ESWH Electric Storage > 30 L (primary)	%GCV,PEF2.1	36%	37%	37%	39%	40%	42%	42%	42%	42%	42%
GIWH Gas Instant. < 13 L/min (secondary)	%GCV,PEF2.1	29%	33%	36%	43%	51%	55%	55%	55%	55%	55%
GIWH Gas Instant. ≥ 13 L/min (primary)	%GCV,PEF2.1	43%	48%	53%	61%	71%	75%	75%	75%	75%	75%
GSWH Gas Storage, Condensing	%GCV,PEF2.1	0%	48%	60%	73%	82%	87%	87%	87%	87%	87%
GSWH Gas Storage, Non-condensing	%GCV,PEF2.1	35%	39%	43%	50%	59%	65%	65%	65%	65%	65%
Dedicated WH Heat Pump	%GCV,PEF2.1	0%	75%	101%	125%	137%	142%	142%	142%	142%	142%
Dedicated WH Solar (3.5 m2)	%GCV,PEF2.1	72%	78%	82%	89%	95%	103%	108%	111%	113%	116%
CHB Primary WH efficiency in GCV using PEF 2.1											
CHB Gas Combi Instant. WH	%GCV,PEF2.1	56%	62%	67%	73%	79%	83%	85%	85%	85%	85%
CHB Gas + Cyl. WH	%GCV,PEF2.1	55%	61%	65%	71%	78%	82%	84%	84%	84%	84%
CHB Jet Burner Gas + Cyl. WH	%GCV,PEF2.1	53%	58%	60%	63%	67%	74%	80%	83%	83%	83%
CHB Jet Burner Oil + Cyl. WH	%GCV,PEF2.1	53%	58%	60%	63%	67%	74%	80%	83%	83%	83%
CHB Electric (Joule) + Cyl. WH	%GCV,PEF2.1	35%	38%	40%	41%	41%	42%	42%	42%	42%	42%
CHB Hybrid Gas/Electric WH	%GCV,PEF2.1	86%	86%	86%	86%	86%	86%	86%	86%	86%	86%
CHB Electric HP + Cyl. WH	%GCV,PEF2.1	120%	124%	124%	133%	146%	155%	161%	163%	166%	168%
CHB Gas HP + Cyl. WH	%GCV,PEF2.1	106%	119%	125%	135%	142%	146%	149%	152%	154%	156%
CHB Gas mCHP + Cyl. WH	%GCV,PEF2.1	110%	110%	110%	114%	119%	123%	128%	133%	138%	141%
CHB Solar Combi (16 m2)	%GCV,PEF2.1	171%	199%	218%	244%	271%	298%	324%	347%	370%	395%
CHB Primary SH efficiency in GCV using PEF 2.1											
CHB Gas non-condensing	%GCV,PEF2.1	45%	50%	52%	55%	60%	63%	64%	64%	64%	64%
CHB Gas condensing	%GCV,PEF2.1	61%	65%	68%	71%	73%	75%	75%	75%	75%	75%
CHB Gas Jet burner non-condensing	%GCV,PEF2.1	41%	46%	47%	49%	51%	54%	59%	60%	60%	60%
CHB Gas Jet burner condensing	%GCV,PEF2.1	59%	63%	66%	68%	69%	70%	71%	71%	71%	71%
CHB Oil Jet burner non-condensing	%GCV,PEF2.1	41%	46%	47%	49%	50%	54%	59%	60%	60%	60%
CHB Oil Jet burner condensing	%GCV,PEF2.1	59%	63%	66%	68%	69%	70%	71%	71%	71%	71%
CHB Electric Joule-effect	%GCV,PEF2.1	29%	30%	31%	32%	33%	34%	34%	34%	34%	34%
CHB Hybrid (gas-electric)	%GCV,PEF2.1	84%	86%	89%	94%	98%	99%	100%	101%	102%	103%
CHB Electric Heat Pump	%GCV,PEF2.1	91%	95%	100%	109%	119%	126%	129%	131%	133%	135%
CHB Gas Heat Pump	%GCV,PEF2.1	90%	94%	101%	109%	114%	117%	119%	121%	123%	125%
CHB micro CHP	%GCV,PEF2.1	81%	84%	88%	92%	96%	99%	103%	106%	110%	113%
CHB Solar combi (16 m2)	%GCV,PEF2.1	53%	67%	76%	85%	94%	102%	110%	117%	125%	134%
SFB Wood Manual	%	28%	47%	50%	54%	59%	67%	76%	78%	78%	78%
SFB Wood Direct Draft	%	49%	71%	73%	74%	75%	76%	77%	78%	78%	78%
SFB Coal	%	39%	64%	65%	67%	69%	72%	77%	78%	78%	78%
SFB Pellets	%		70%	72%	74%	75%	76%	77%	78%	78%	78%
SFB Wood chips	%		71%	72%	73%	75%	76%	77%	77%	77%	77%
CHAE-S (≤ 400 kW)	%	97%	122%	129%	137%	148%	159%	169%	176%	181%	184%
CHAE-L (> 400 kW)	%	99%	123%	130%	139%	153%	166%	178%	188%	195%	198%
CHWE-S (≤ 400 kW)	%	124%	159%	172%	185%	199%	210%	220%	227%	234%	239%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	144%	185%	198%	213%	229%	249%	267%	281%	293%	303%
CHWE-L (> 1500 kW)	%	144%	185%	198%	214%	233%	253%	270%	285%	296%	303%
CHF	%	46%	96%	101%	123%	146%	165%	171%	172%	174%	175%
HT PCH-AE-S	SEPR	4.0	4.5	4.7	4.9	5.3	5.6	5.8	5.9	6.0	6.0
HT PCH-AE-L	SEPR	4.3	4.9	5.1	5.4	5.9	6.4	6.7	6.9	7.1	7.1
HT PCH-WE-S	SEPR	6.5	7.1	7.3	7.6	8.0	8.3	8.6	8.7	8.8	9.0
HT PCH-WE-M	SEPR	7.5	8.2	8.5	8.8	9.2	9.5	9.7	9.8	10.0	10.2
HT PCH-WE-L	SEPR	7.3	8.1	8.4	8.7	9.2	9.6	10.0	10.3	10.5	10.6
AC rooftop	%	77%	109%	117%	125%	133%	140%	149%	157%	162%	164%
AC splits	%	116%	140%	150%	163%	176%	188%	193%	196%	198%	201%
AC VRF	%	111%	146%	159%	171%	183%	193%	200%	205%	208%	210%
ACF	%	46%	96%	101%	123%	147%	167%	174%	177%	179%	180%
AC rooftop (rev)	%	84%	93%	96%	103%	111%	120%	127%	128%	130%	131%
AC splits (rev)	%	109%	118%	120%	125%	130%	137%	141%	143%	145%	147%
AC VRF (rev)	%	108%	122%	127%	131%	135%	139%	142%	145%	147%	149%
ACF (rev)	%	93%	124%	128%	134%	142%	150%	157%	162%	164%	167%
AHF	%	56%	61%	62%	66%	71%	77%	81%	82%	83%	83%
AHE	%	25%	29%	30%	30%	31%	32%	33%	33%	33%	34%
LH open fireplace	%	26%	28%	29%	30%	34%	38%	41%	45%	47%	47%
LH closed fireplace/inset	%	60%	66%	68%	70%	74%	78%	81%	84%	86%	86%
LH wood stove	%	60%	65%	67%	70%	74%	78%	81%	84%	86%	86%
LH coal stove	%	59%	65%	67%	69%	73%	76%	79%	83%	86%	86%
LH cooker	%	56%	62%	64%	66%	70%	73%	75%	75%	75%	75%
LH SHR stove	%	80%	80%	80%	81%	82%	84%	85%	85%	86%	86%
LH pellet stove	%		83%	85%	87%	90%	93%	94%	94%	94%	94%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	%elec	65%	73%	76%	84%	91%	92%	92%	92%	92%	92%
LH Electric fixed > 250W	%elec	68%	75%	78%	81%	86%	90%	92%	92%	92%	92%
LH Electric fixed ≤ 250W	%elec	63%	70%	72%	76%	80%	84%	85%	86%	86%	86%
LH Electric storage	%elec	64%	72%	75%	82%	90%	96%	97%	97%	97%	97%
LH Electric underfloor	%elec	64%	68%	70%	72%	74%	76%	77%	78%	79%	80%
LH Electric visibly glowing > 1.2 kW	%elec	67%	75%	77%	82%	88%	89%	90%	90%	90%	90%
LH Electric visibly glowing ≤ 1.2 kW	%elec	60%	67%	70%	75%	79%	81%	81%	82%	82%	82%
LH Electric Towel Heaters	%elec	68%	68%	69%	73%	78%	81%	82%	83%	83%	83%
LH Gas luminous (commercial)	%NCV	72%	80%	83%	87%	92%	95%	97%	97%	97%	97%
LH Gaseous Tube (commercial < 120 kW)	%NCV	63%	70%	72%	76%	80%	84%	87%	88%	88%	88%
LH Gas open front	%NCV	36%	40%	41%	42%	43%	44%	45%	46%	46%	46%
LH Gas closed front	%NCV	55%	61%	63%	66%	70%	74%	77%	78%	78%	78%
LH Gas balanced flue	%NCV	59%	64%	66%	69%	72%	77%	81%	82%	82%	82%
LH Gas flueless	%NCV	100%	100%	100%	100%	100%					
LH Liquid tube (commercial < 120 kW)	%NCV	61%	67%	70%	74%	77%	81%	84%	85%	85%	85%
LH Liquid open front	%NCV	36%	40%	41%	42%	43%	44%	45%	46%	46%	46%
LH Liquid closed front	%NCV	55%	61%	63%	66%	70%	74%	77%	78%	78%	78%
LH Liquid balanced flue	%NCV	59%	64%	66%	69%	72%	77%	81%	82%	82%	82%
LH Liquid flueless	%NCV	100%	100%	100%	100%	100%					
RAC fixed < 6 kW, cooling	SEER	2.14	3.62	4.54	5.69	6.34	6.71	7.06	7.42	7.78	8.13
RAC fixed 6-12 kW, cooling	SEER	1.84	3.41	4.41	5.46	5.99	6.22	6.43	6.65	6.86	7.07
RAC portable < 12 kW, cooling	SEER	1.11	1.51	1.67	1.81	1.87	1.92	1.96	2.01	2.05	2.10
RAC fixed < 6 kW, reversible, heating	SCOP	1.82	2.78	3.26	3.84	4.09	4.18	4.26	4.35	4.43	4.51
RAC fixed 6-12 kW, reversible, heating	SCOP	1.57	2.66	3.24	3.81	4.04	4.09	4.13	4.17	4.21	4.26
RAC portable < 12 kW, reversible, heating	SCOP										
CIRC Integrated circulators	EEI	0.49	0.46	0.38	0.27	0.22	0.21	0.21	0.21	0.21	0.21
CIRC Large standalone circulators	EEI	0.41	0.39	0.32	0.23	0.21	0.21	0.20	0.20	0.20	0.20
CIRC Small standalone circulators	EEI	0.58	0.54	0.40	0.25	0.21	0.21	0.20	0.20	0.20	0.20
CIRC Integrated circulators	kWh elec/a	303	284	233	166	134	130	129	128	128	128
CIRC Large standalone circulators	kWh elec/a	1452	1381	1124	826	739	735	729	727	727	727
CIRC Small standalone circulators	kWh elec/a	199	185	138	86	71	71	70	70	70	70
R-UVU ≤ 100 m3/h for Extract Spaces											
Unit annual electricity consumption	kWhe/a	64	52	43	33	25	21	20	19	19	19
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-UVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	0	0	0	0	18	18	18	18	18	18
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU ≤ 100 m3/h for Habitable Spaces											
Unit annual electricity consumption	kWhe/a	115	99	90	81	75	73	73	72	71	70
Heat recovery efficiency	%	60%	63%	65%	67%	70%	70%	70%	70%	71%	71%
Heat recovered per unit per year	kWh heat/a	286	252	264	302	344	340	328	313	299	285
R-UVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	193	174	157	134	114	103	98	98	98	98
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU 100-250 m3/h											
Unit annual electricity consumption	kWhe/a	375	325	290	250	202	188	185	184	184	183
Heat recovery efficiency	%	70%	70%	72%	75%	81%	83%	83%	83%	83%	83%
Heat recovered per unit per year	kWh heat/a	902	761	798	923	1153	1193	1163	1114	1066	1020
R-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	801	745	656	564	507	478	471	466	462
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
R-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	1653	1442	1316	1202	1081	1048	1035	1025	1012	1001
Heat recovery efficiency	%	65%	68%	70%	75%	81%	83%	83%	83%	83%	83%
Heat recovered per unit per year	kWh heat/a	3786	3315	3512	4047	4995	5149	5016	4809	4607	4413
R-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1766	1586	1416	1230	1097	1024	985	973	963	952
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
R-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	0	4313	3993	3686	3453	3307	3233	3201	3171	3140
Heat recovery efficiency	%	0%	70%	72%	75%	79%	82%	83%	83%	83%	83%
Heat recovered per unit per year	kWh heat/a	0	10742	11226	12758	14379	15585	15652	15029	14397	13790
NR-UVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	852	805	746	656	572	509	478	471	467	462
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
NR-BVU 250-1000 m3/h											
Unit annual electricity consumption	kWhe/a	0	1447	1314	1196	1111	1063	1037	1025	1014	1003
Heat recovery efficiency	%	0%	67%	70%	75%	79%	82%	83%	83%	83%	83%
Heat recovered per unit per year	kWh heat/a	0	3311	3529	4060	4600	4987	5009	4809	4607	4413
NR-UVU > 1000 m3/h											
Unit annual electricity consumption	kWhe/a	1256	1030	833	638	517	467	443	438	434	430
Heat recovery efficiency	%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Heat recovered per unit per year	kWh heat/a	0	0	0	0	0	0	0	0	0	0
NR-BVU 1000-2500 m3/h											
Unit annual electricity consumption	kWhe/a	0	2667	2304	1997	1790	1686	1639	1624	1610	1595
Heat recovery efficiency	%	0%	65%	69%	73%	77%	79%	80%	80%	81%	81%
Heat recovered per unit per year	kWh heat/a	0	11280	11455	11672	11733	11590	11237	10773	10320	9883
NR-AHU-S 2500-5500 m3/h											
Unit annual electricity consumption	kWhe/a	7618	6241	5417	4703	4233	3999	3882	3853	3827	3798
Heat recovery efficiency	%	30%	37%	44%	54%	62%	67%	70%	70%	70%	70%
Heat recovered per unit per year	kWh heat/a	12994	13536	15447	17965	19772	20698	20601	19761	18915	18099
NR-AHU-M 5500-14500 m3/h											
Unit annual electricity consumption	kWhe/a	24456	20992	17886	15094	13512	12916	12625	12539	12457	12367
Heat recovery efficiency	%	30%	35%	42%	52%	60%	67%	70%	70%	70%	70%
Heat recovered per unit per year	kWh heat/a	30937	30444	34870	41224	46200	49035	49040	47053	45038	43097
NR-AHU-L > 14500 m3/h											
Unit annual electricity consumption	kWhe/a	79692	68321	58030	48628	43172	40990	39943	39677	39428	39154
Heat recovery efficiency	%	30%	35%	42%	52%	60%	67%	70%	70%	70%	70%
Heat recovered per unit per year	kWh heat/a	86624	85244	97635	115428	129360	137299	137311	131748	126106	120670
LS, stock average efficiency incl. control gear											
LFL (T12,T8h,T8t,T5,other)	lm/W	60	67	73	76	78	80	82	83	84	84
HID (HPM, HPS, MH)	lm/W	58	72	83	92	93	94	96	97	98	98
CFLni (all shapes)	lm/W	48	51	54	55	55	55	55	55	55	55
CFLi (retrofit for GLS, HL)	lm/W	55	55	55	55	55	55	55	55	55	55
GLS (DLS & NDLS)	lm/W	9	9	11	11	11	11	11	11	11	11
HL (DLS & NDLS, LV & MV)	lm/W	13	12	13	15	17	19	19	19	19	19
LED replacing LFL (retrofit & luminaire)	lm/W			80	111	140	162	173	180	185	188
LED replacing HID (retrofit & luminaire)	lm/W			72	100	133	166	184	189	190	190
LED replacing CFLni (retrofit & luminaire)	lm/W			85	109	128	153	172	178	180	182
LED replacing DLS (retrofit & luminaire)	lm/W		16	45	58	68	70	72	74	76	78
LED replacing NDLS (retrofit & luminaire)	lm/W		24	76	96	107	112	116	118	120	123
DP TV on-mode power (avg. all types)	W/dm2	9.2	5.0	2.8	1.6	0.9	0.6	0.4	0.4	0.4	0.4
DP TV standard (NoNA) standby power	W	8.0	2.0	0.8	0.5						
DP TV LoNA standby power	W		2.0	2.0	2.0	2.0	2.0				
DP TV HiNA ('Smart') standby power	W		0.0	5.1	5.6	5.0	4.4	3.9	3.4	2.9	2.4
DP Monitor on-mode power	W/dm2	9.2	5.1	2.9	1.2	1.0	0.6	0.4	0.4	0.3	0.3
DP Monitor standby power	W	9.0	2.4	0.9	0.3	0.2	0.2	0.2	0.2	0.2	0.2
DP Signage on-mode power	W/dm2		8.0	4.2	2.6	1.8	1.3	0.9	0.7	0.7	0.7
DP Signage standby power	W/dm2		8.0	4.2	2.6	1.8	1.3	0.9	0.7	0.7	0.7
SSTB	kWh/a		19.2	18.5	15.3						
CSTB (all covered modes)	kWh/a		117	100	76	71	69	68	68	68	68
Game consoles > 20 W Active modes (SRI)	kWh/a	12	46	68	65	65	65	65	65	65	65
Game consoles > 20 W Non-Active (CR)	kWh/a	8	24	27	17	11	11	11	11	11	11
Game consoles < 20 W Non-Active (CR)	kWh/a	8	47	47	27	16	16	16	16	16	16
Game consoles < 20 W Active (no reg.)	kWh/a	7	7	8	6	5	5	5	5	5	5
Total Game consoles > 20 W, all modes	kWh/a	20	69	95	82	76	76	76	76	76	76
Total Game consoles < 20 W, all modes	kWh/a	16	54	55	33	21	21	21	21	21	21

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PSU efficiency for ES&DS											
ES tower 1-socket traditional	%	67.4%	74.4%	76.2%	79.7%	85.9%	89.1%	89.8%	89.8%	89.8%	89.8%
ES rack 1-socket traditional	%	67.4%	74.4%	76.2%	79.8%	86.0%	89.1%	89.8%	89.8%	89.8%	89.8%
ES rack 2-socket traditional	%	71.6%	78.4%	80.2%	83.7%	88.9%	91.5%	92.1%	92.1%	92.1%	92.1%
ES rack 2-socket cloud	%		78.6%	80.4%	83.7%	88.9%	91.5%	92.1%	92.1%	92.1%	92.1%
ES rack 4-socket traditional	%	70.7%	77.4%	79.2%	83.4%	88.6%	90.9%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket cloud	%		77.6%	79.4%	83.4%	88.6%	90.9%	91.5%	91.5%	91.5%	91.5%
ES rack 2-socket resilient trad.	%	70.7%	77.4%	79.2%	82.8%	88.3%	90.9%	91.5%	91.5%	91.5%	91.5%
ES rack 2-socket resilient cloud	%		77.6%	79.4%	82.8%	88.3%	90.9%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket resilient trad.	%	70.7%	77.4%	79.2%	83.4%	88.6%	90.9%	91.5%	91.5%	91.5%	91.5%
ES rack 4-socket resilient cloud	%		77.6%	79.4%	83.4%	88.6%	90.9%	91.5%	91.5%	91.5%	91.5%
ES blade 1-socket traditional	%	71.6%	78.4%	80.3%	84.2%	89.3%	91.5%	92.1%	92.1%	92.1%	92.1%
ES blade 2-socket traditional	%	71.6%	78.4%	80.2%	84.3%	89.3%	91.5%	92.1%	92.1%	92.1%	92.1%
ES blade 2-socket cloud	%		78.5%	80.4%	84.3%	89.3%	91.5%	92.1%	92.1%	92.1%	92.1%
ES blade 4-socket traditional	%	71.6%	78.4%	80.2%	84.3%	89.3%	91.5%	92.1%	92.1%	92.1%	92.1%
ES blade 4-socket cloud	%		78.5%	80.4%	84.3%	89.3%	91.5%	92.1%	92.1%	92.1%	92.1%
DS Online 2	%	77.4%	83.7%	85.3%	88.1%	91.4%	93.5%	94.7%	94.8%	94.8%	94.8%
DS Online 3	%	77.4%	83.7%	85.3%	88.1%	91.5%	93.6%	94.8%	94.9%	94.9%	94.9%
DS Online 4	%	77.4%	83.7%	85.3%	88.2%	91.6%	93.6%	94.8%	94.9%	94.9%	94.9%
PC Desktop	kWh/a	297	133	126	109	96	89	83	78	73	69
PC Integrated Desktop	kWh/a	319	143	135	127	129	131	129	124	118	113
PC Notebook	kWh/a	0	39	37	32	29	24	20	19	19	18
PC Tablet/slate	kWh/a	0	31	23	19	12	10	10	10	10	9
PC Thin client	kWh/a	0	78	59	43	40	39	37	36	35	33
PC Integrated Thin Client	kWh/a	0	174	133	98	90	87	85	82	79	76
PC Small-scale Server	kWh/a	304	134	126	111	98	90	83	78	74	69
PC Workstation	kWh/a	565	312	292	264	244	230	217	202	187	172
Inkjet Printer	kWh/a	51	9	6	2	2	2	2	2	2	2
Inkjet MFD	kWh/a	77	14	9	6	6	6	6	6	6	6
EP / Laser Printer mono	kWh/a	666	151	109	77	71	71	71	71	71	71
EP / Laser Printer colour	kWh/a		268	194	126	110	110	110	110	110	110
EP / Laser Copier mono	kWh/a	1069	196	142	102						
EP / Laser Copier colour	kWh/a		284	192	125						
EP / Laser MFD mono	kWh/a		218	140	90	79	79	79	79	79	79
EP / Laser MFD colour	kWh/a		302	201	113	92	92	92	92	92	92
Regulated only for (networked) standby ((n)sb)											
SB Radios (sb & off modes)	W	0.4	1.5	1.2	1.0	1.0	1.0	1.0	1.0	1.0	1.0
SB Electric toothbrushes (off mode)	W	0.4	1.0	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Audio speakers (wired) (sb & off modes)	W	1.3	2.7	0.6	0.5	0.5					
SB Audio speakers (wireless) (nsb & off modes)	W		2.9	2.3	1.5	1.3	1.3	1.3	1.3	1.3	1.3
SB Small appliances (sb & off modes)	W	0.4	1.1	0.7	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Media boxes /sticks (sb mode)	W		2.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
SB Media players and recorders (sb mode)	W	0.0	3.2	1.0	0.5	0.5					
SB Projectors (sb & off modes)	W	0.0	2.5	0.6	0.5	0.5	0.5				
SB Home phones (nsb mode)	W	4.7	3.5	3.3	2.8	2.0	2.0	2.0	2.0	2.0	2.0
SB Office phones (nsb mode)	W	6.7	4.7	4.2	3.0	2.0	2.0	2.0	2.0	2.0	2.0
SB Home NAS (nsb mode)	W		8.0	7.2	2.4	2.0	2.0	2.0	2.0	2.0	2.0
SB Home Network Equipment (nsb mode)	W		9.0	9.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
SB Office Network Equipment (nsb mode)	W		15.0	14.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
SB Coffee makers (off mode)	W	1.0	1.0	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Regulated also for (networked) standby ((n)sb)											
SB Washing Machines (sb & off modes)	W	0.0	0.9	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3
SB Dishwashers (sb & off modes)	W	0.0	0.8	0.8	0.7	0.5	0.5	0.5	0.5	0.5	0.5
SB Laundry Dryers (sb & off modes)	W	0.0	0.9	0.8	0.6	0.5	0.4	0.4	0.3	0.3	0.3
SB Electric Ovens (sb mode)	W	0.0	2.0	2.0	1.6	1.0	0.5	0.5	0.5	0.5	0.5
SB Electric Hobs (sb mode)	W	0.0	1.1	1.0	0.8	0.5	0.5	0.5	0.5	0.5	0.5
SB Game consoles (non-active modes)	W	see games consoles above									
EPS Average Active Efficiency (of stock)											
EPS ≤ 6W, low-V	%	64.2%	66.3%	69.5%	72.4%	73.6%	73.7%	73.7%	73.7%	73.7%	73.7%
EPS 6–10 W	%	68.4%	72.2%	76.4%	80.1%	81.9%	82.0%	82.0%	82.0%	82.0%	82.0%
EPS 10–12 W	%		73.6%	77.1%	80.7%	83.0%	83.1%	83.1%	83.1%	83.1%	83.1%
EPS 15–20 W	%		77.3%	79.6%	83.3%	85.0%	85.1%	85.1%	85.1%	85.1%	85.1%
EPS 20–30 W	%	78.8%	80.9%	83.8%	86.3%	87.3%	87.3%	87.3%	87.3%	87.3%	87.3%
EPS 30–65 W, multiple-V	%				83.3%	83.3%	83.3%	83.3%	83.3%	83.3%	83.3%
EPS 30-65 W	%				88.5%	88.5%	88.5%	88.5%	88.6%	88.6%	88.6%
EPS 65–120 W	%	83.6%	84.9%	86.6%	88.3%	88.5%	88.5%				
EPS 65–120 W, multiple-V	%		86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%	86.0%
EPS 12–15 W	%	72.2%	75.3%	78.3%	81.5%	84.1%	84.1%	84.2%	84.2%	84.2%	84.2%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EPS Average No-load power (of stock)											
EPS ≤ 6W, low-V	W	0.56	0.43	0.24	0.14	0.09	0.09	0.09	0.09	0.09	0.09
EPS 6–10 W	W	0.56	0.43	0.30	0.17	0.10	0.09	0.09	0.09	0.09	0.09
EPS 10–12 W	W		0.60	0.38	0.19	0.10	0.10	0.09	0.09	0.09	0.09
EPS 15–20 W	W		0.56	0.34	0.17	0.10	0.10	0.10	0.10	0.10	0.10
EPS 20–30 W	W	0.83	0.61	0.34	0.15	0.09	0.09	0.09	0.09	0.09	0.09
EPS 30–65 W, multiple-V	W				0.43	0.31	0.30	0.30	0.30	0.30	0.30
EPS 30-65 W	W				0.20	0.18	0.18	0.18	0.18	0.18	0.18
EPS 65–120 W	W	0.82	0.66	0.43	0.23	0.18	0.18				
EPS 65–120 W, multiple-V	W		0.99	0.96	0.79	0.32	0.31	0.30	0.30	0.30	0.30
EPS 12–15 W	W	0.83	0.60	0.39	0.21	0.10	0.10	0.09	0.09	0.09	0.09
RF household Refrigerators & Freezers AEC	kWh/a	490	333	271	227	183	148	121	106	98	89
RF household Refrigerators & Freezers EEI	EEI	109	66	52	42	33	26	20	17	15	14
CF open vertical chilled multi deck (RVC2)	EEI	164	135	122	112	95	68	49	44	43	43
CF open horizontal frozen island (RHF4)	EEI	162	133	120	111	95	73	59	55	54	54
CF other supermarket display (non-BCs)	EEI	137	112	102	94	85	72	62	59	59	58
CF Plug in one door beverage cooler	EEI	200	162	147	134	103	72	62	59	58	58
CF Plug in horizontal ice cream freezer	EEI	110	89	81	74	61	49	47	46	45	45
CF Spiral vending machine	EEI	102	76	66	60	57	53	49	47	46	46
PF Storage cabinet Chilled Vertical (CV)	EEI	96	96	96	83	62	57	57	57	57	57
PF Storage cabinet Frozen Vertical (FV)	EEI	91	91	91	78	58	53	53	53	53	53
PF Storage cabinet Chilled Horizontal (CH)	EEI	109	109	109	94	71	65	65	65	65	65
PF Storage cabinet Frozen Horizontal (FH)	EEI	106	106	106	91	67	61	61	61	61	61
PF Storage cabinets All types	**EEI**	**98**	**98**	**98**	**85**	**63**	**58**	**58**	**58**	**58**	**58**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2.7	2.7	2.7	2.8	2.8	2.9	2.9	2.9	2.9	2.9
PF Process Chiller AC MT L > 300 kW	SEPR	3.0	3.0	3.0	3.1	3.1	3.2	3.2	3.2	3.2	3.2
PF Process Chiller AC LT S ≤ 200 kW	SEPR	1.6	1.6	1.6	1.6	1.7	1.7	1.7	1.7	1.7	1.7
PF Process Chiller AC LT L > 200 kW	SEPR	1.7	1.7	1.7	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Process Chiller WC MT S ≤ 300 kW	SEPR	3.6	3.6	3.6	3.7	3.8	3.9	3.9	3.9	3.9	3.9
PF Process Chiller WC MT L > 300 kW	SEPR	3.9	3.9	3.9	4.0	4.1	4.2	4.2	4.2	4.2	4.2
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2.0	2.0	2.0	2.0	2.1	2.1	2.2	2.2	2.2	2.2
PF Process Chiller WC LT L > 200 kW	SEPR	2.3	2.3	2.3	2.3	2.4	2.4	2.4	2.4	2.4	2.4
PF Process Chiller All MT&LT	**SEPR**	**2.4**	**2.4**	**2.4**	**2.5**	**2.5**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
PF Condensing Unit MT S 0.2-1 kW	COP	1.4	1.4	1.4	1.5	1.6	1.6	1.6	1.6	1.6	1.6
PF Condensing Unit MT M 1-5 kW	COP	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit MT L 5-20 kW	SEPR	2.6	2.6	2.6	2.8	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit MT XL 20-50 kW	SEPR	2.7	2.7	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9
PF Condensing Unit LT S 0.1-0.4 kW	COP	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
PF Condensing Unit LT M 0.4-2 kW	COP	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1
PF Condensing Unit LT L 2-8 kW	SEPR	1.5	1.5	1.5	1.6	1.7	1.7	1.7	1.7	1.7	1.7
PF Condensing Unit LT XL 8-20 kW	SEPR	1.6	1.6	1.6	1.7	1.8	1.8	1.8	1.8	1.8	1.8
PF Condensing Unit, All MT&LT	**COP/SEPR**	**2.1**	**2.1**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**	**2.2**
CA Electric Hobs (active modes)	Wh/ltr	196	190	188	187	185	184	183	182	181	180
CA Electric Hobs (low-power modes)	W	0.0	1.1	1.0	0.8	0.5	0.5	0.5	0.5	0.5	0.5
CA Electric Ovens (active modes)	kWh/cyc	134	122	110	97	87	82	79	79	78	78
CA Electric Ovens (low-power modes)	W	0.0	2.0	2.0	1.6	1.0	0.5	0.5	0.5	0.5	0.5
CA Gas Hobs	%	60%	61%	61%	61%	62%	62%	63%	63%	63%	63%
CA Gas Ovens	kWh prim/a	244	224	214	195	176	158	144	139	135	131
CA Range Hoods	kWh/a	133	133	132	126	115	103	97	95	94	93
WM Washing Machines, active modes	kWh/a	433	177	139	115	102	96	93	93	93	93
WM Washing Machines, low-power modes	kWh/a	0.3	7.8	3.8	3.8	3.4	2.7	2.7	2.7	2.7	2.7
WM Washing Machines, all modes	kWh/a	434	185	143	119	105	98	96	96	96	96
WD Washer-Dryers, active modes	kWh/a	1600	1214	1050	942	884	850	833	830	830	830
WD Washer-Dryers, low-power modes	kWh/a	0.3	7.8	3.8	3.8	3.4	2.7	2.7	2.7	2.7	2.7
WD Washer-Dryers, all modes	kWh/a	1600	1222	1054	945	887	853	836	833	833	833
DW Dishwashers, active modes	kWh/a	343	216	195	183	173	165	158	150	143	136
DW Dishwashers, low-power modes	kWh/a	0.0	6.9	6.6	5.5	4.3	4.1	4.1	4.1	4.1	4.1
DW Dishwashers (all modes, annual)	kWh/a	343	223	202	188	178	169	162	154	147	140
DW Dishwashers (all modes, per cycle)	kWh/cycle	1.56	1.01	0.92	0.86	0.81	0.77	0.74	0.70	0.67	0.64
LD at current cycles and user loading											
LD condensing heat pump	kWh elec/a		223	162	128	111	103	102	101	101	101
LD condensing electric heat element	kWh elec/a	455	407	386	323	269	255	255	255	255	255
LD vented electric	kWh elec/a	425	382	378	326	268	252	251	251		
LD vented gas	kWh gas /a	432	492	509	484	417	374	374			
LD Laundry Dryers, low-power modes	kWh elec/a	0.0	7.3	6.7	4.9	3.9	3.5	2.9	2.6	2.5	2.5

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
kWh/a/unit, real-life											
VC Cylinder Domestic mains	kWh real/a	70	56	66	43	27	28	29	28	27	27
VC Upright Domestic mains	kWh real/a	65	52	60	38	24	26	26	25	25	24
VC Handstick Domestic mains	kWh real/a	35	28	32	27	24	26	26	25	25	24
VC Cylinder Commercial mains	kWh real/a	191	451	420	224	215	211	209	209	209	209
VC Upright Commercial mains	kWh real/a	191	450	421	224	215	211	209	209	209	209
VC Cordless - domestic - cleaning	kWh real/a	27	23	22	24	30	35	37	36	35	35
VC Cordless - commercial - cleaning	kWh real/a	131	131	131	150	190	221	233	233	233	233
VC Cordless - domestic - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh real/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh real/a	0	20	19	18	18	18	18	18	17	17
VC Robot - commercial - cleaning	kWh real/a	0	68	68	68	68	68	68	68	68	68
VC Robot - domestic -standby	kWh real/a	0	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh real/a	0	31	31	31	31	31	31	31	31	31
kWh/a/unit, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	kWh std/a	70	85	87	57	36	37	38	38	38	38
VC Upright Domestic mains	kWh std/a	65	78	79	51	33	34	34	34	34	34
VC Handstick Domestic mains	kWh std/a	35	43	43	35	32	34	34	34	34	34
VC Cylinder Commercial mains	kWh std/a	32	75	70	37	36	35	35	35	35	35
VC Upright Commercial mains	kWh std/a	32	75	70	37	36	35	35	35	35	35
VC Cordless - domestic - cleaning	kWh std/a	22	22	22	25	32	37	39	39	39	39
VC Cordless - commercial - cleaning	kWh std/a	22	22	22	25	32	37	39	39	39	39
VC Cordless - domestic - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Cordless - commercial - standby	kWh std/a	21	21	21	21	21	21	21	21	21	21
VC Robot - domestic - cleaning	kWh std/a	0	11	11	11	11	11	11	11	11	11
VC Robot - commercial - cleaning	kWh std/a	0	11	11	11	11	11	11	11	11	11
VC Robot - domestic -standby	kWh std/a	0	31	31	31	31	31	31	31	31	31
VC Robot - commercial - standby	kWh std/a	0	31	31	31	31	31	31	31	31	31
Power, standard&regulation (50 h/a)											
VC Cylinder Domestic mains	W std	1400	1693	1740	1140	720	747	754	754	754	754
VC Upright Domestic mains	W std	1300	1561	1575	1016	654	681	681	681	681	681
VC Handstick Domestic mains	W std	700	862	855	708	647	684	685	685	685	685
VC Cylinder Commercial mains	W std	638	1503	1400	746	716	702	695	695	695	695
VC Upright Commercial mains	W std	638	1500	1404	746	716	702	695	695	695	695
VC Cordless - domestic - cleaning	W std	436	436	436	499	632	737	778	778	778	778
VC Cordless - commercial - cleaning	W std	436	436	436	499	632	737	778	778	778	778
VC Cordless Standby charged and docked [W]	W	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.6
VC Cordless Standby of empty dock [W]	W	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7	1.7
VC Robot - domestic - cleaning	W std	0	227	227	227	227	227	227	227	227	227
VC Robot - commercial - cleaning	W std	0	227	227	227	227	227	227	227	227	227
VC Robot Standby charged and docked [W]	W	0.0	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7	3.7
VC Robot Standby of empty dock [W]	W	0.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
VC load factor domestic mains		1.00	0.80	0.95	1.00	1.00	1.00	1.00	1.00	1.00	1.00
FAN Axial<300Pa (all FAN types >125W)	%	31%	30.9%	32.1%	34.4%	37.0%	38.4%	39.0%	39.0%	39.0%	39.0%
FAN Axial>300Pa	%	37%	37.1%	37.8%	39.6%	41.8%	43.4%	44.0%	44.0%	44.0%	44.0%
FAN Centr.FC	%	32%	32.1%	33.4%	37.2%	41.6%	44.5%	45.4%	45.4%	45.4%	45.4%
FAN Centr.BC-free	%	56%	56.4%	58.6%	62.0%	65.4%	66.8%	67.0%	67.0%	67.0%	67.0%
FAN Centr.BC	%	54%	53.7%	56.1%	59.7%	63.3%	64.6%	64.8%	64.8%	64.8%	64.8%
FAN Cross-flow	%	7%	7.3%	9.0%	13.5%	17.8%	20.6%	21.0%	21.0%	21.0%	21.0%
MT motors											
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	69.7%	75.5%	78.0%	81.1%	83.3%	84.4%	84.7%	84.9%	85.0%	85.2%
Medium (M) 3-ph 7.5-75 kW no VSD	%	85.0%	87.6%	88.5%	89.5%	90.7%	91.5%	91.7%	91.8%	91.9%	92.0%
Medium (L) 3-ph 75-375 kW no VSD	%	91.8%	93.0%	93.6%	94.0%	94.7%	95.5%	96.0%	96.2%	96.2%	96.2%
Medium (S) 3-ph 0.75-7.5 kW with VSD	%	59.1%	65.8%	68.8%	72.2%	74.4%	75.8%	76.3%	76.6%	76.9%	77.2%
Medium (M) 3-ph 7.5-75 kW with VSD	%	77.2%	81.0%	82.5%	84.0%	85.3%	86.3%	86.7%	86.9%	87.1%	87.3%
Medium (L) 3-ph 75-375 kW with VSD	%	84.8%	87.2%	88.3%	89.3%	90.3%	91.2%	91.9%	92.2%	92.3%	92.4%
Small 1 ph 0.12-0.75 kW no VSD	%	62.4%	64.8%	65.5%	66.2%	68.9%	72.6%	73.2%	73.6%	74.0%	74.4%
Small 1 ph 0.12-0.75 kW with VSD	%	47.7%	50.5%	51.4%	52.2%	54.5%	57.4%	58.3%	59.0%	59.7%	60.4%
Small 3 ph 0.12-0.75 kW no VSD	%	62.4%	64.8%	65.5%	66.4%	70.3%	73.0%	73.4%	73.8%	74.2%	74.6%
Small 3 ph 0.12-0.75 kW with VSD	%	47.7%	50.5%	51.4%	52.4%	57.2%	60.3%	60.7%	61.1%	61.6%	62.0%
Large 3-ph LV 375-1000 kW no VSD	%	93.5%	93.9%	94.2%	94.4%	94.9%	95.4%	95.8%	96.1%	96.1%	96.2%
Large 3-ph LV 375-1000kW with VSD	%	86.6%	87.9%	88.3%	88.7%	89.7%	90.5%	91.3%	91.8%	91.9%	91.9%
Explosion motors (S) 3-ph 0.75-7.5 kW	%	69.7%	75.4%	76.1%	76.8%	79.5%	82.5%	83.2%	83.4%	83.6%	83.8%
Explosion motors (M) 3-ph 7.5-75 kW	%	85.0%	87.6%	87.9%	88.2%	89.2%	90.3%	90.8%	91.0%	91.1%	91.2%
Explosion motors (L) 3-ph 75-375 kW	%	91.8%	93.0%	93.4%	93.6%	94.0%	94.4%	94.9%	95.1%	95.2%	95.2%
Brake motors (S) 3-ph 0.75-7.5 kW	%	69.7%	75.4%	76.1%	76.9%	80.6%	84.2%	84.7%	84.8%	85.0%	85.1%
Brake motors (M) 3-ph 7.5-75 kW	%	85.0%	87.6%	87.9%	88.2%	89.6%	91.1%	91.7%	91.8%	91.9%	92.0%
Brake motors (L) 3-ph 75-375 kW	%	91.8%	93.0%	93.4%	93.6%	94.1%	94.8%	95.3%	95.6%	95.6%	95.7%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
8-pole motors (S) 3-ph 0.75-7.5 kW	%	61.7%	67.4%	68.1%	68.9%	73.4%	77.7%	78.3%	78.7%	79.1%	79.5%
8-pole motors (M) 3-ph 7.5-75 kW	%	82.0%	84.6%	84.9%	85.2%	86.7%	88.2%	88.8%	88.9%	89.1%	89.2%
8-pole motors (L) 3-ph 75-375 kW	%	89.8%	91.0%	91.4%	91.6%	92.2%	92.9%	93.6%	93.9%	94.0%	94.1%
1-phase motors >0.75 kW (no VSD)	%	69.5%	75.0%	75.9%	76.5%	78.0%	80.1%	81.7%	82.2%	82.6%	83.0%
ESOB<45_VF	%	45.9%	46.8%	47.4%	48.1%	48.3%	48.3%	48.3%	48.3%	48.3%	48.3%
ESOB<45_CF	%	60.4%	61.6%	62.4%	63.3%	63.6%	63.6%	63.6%	63.6%	63.6%	63.6%
ESOB<45_VSD-VF	%	52.3%	53.4%	53.6%	54.5%	55.0%	55.1%	55.1%	55.1%	55.1%	55.1%
ESOB_45-150_VF	%	51.3%	52.4%	52.8%	53.3%	53.5%	53.5%	53.5%	53.5%	53.5%	53.5%
ESOB_45-150_CF	%	65.7%	67.1%	67.7%	68.3%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
ESOB_45-150_VSD-VF	%	56.5%	57.6%	57.9%	58.4%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%
ESCC<45_VF	%	45.3%	46.2%	46.7%	47.4%	47.7%	47.7%	47.7%	47.7%	47.7%	47.7%
ESCC<45_CF	%	59.6%	60.8%	61.6%	62.5%	62.8%	62.8%	62.8%	62.8%	62.8%	62.8%
ESCC<45_VSD-VF	%	51.7%	52.8%	53.0%	53.9%	54.4%	54.5%	54.5%	54.5%	54.5%	54.5%
ESCC_45-150_VF	%	51.3%	52.3%	52.7%	53.2%	53.4%	53.4%	53.4%	53.4%	53.4%	53.4%
ESCC_45-150_CF	%	65.7%	67.0%	67.6%	68.2%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
ESCC_45-150_VSD-VF	%	56.4%	57.5%	57.8%	58.3%	58.7%	58.7%	58.7%	58.7%	58.7%	58.7%
ESCCi<45_VF	%	44.3%	45.2%	45.8%	46.6%	46.8%	46.8%	46.8%	46.8%	46.8%	46.8%
ESCCi<45_CF	%	58.5%	59.6%	60.4%	61.4%	61.7%	61.7%	61.7%	61.7%	61.7%	61.7%
ESCCi<45_VSD-VF	%	50.9%	51.9%	52.2%	53.1%	53.7%	53.7%	53.7%	53.7%	53.7%	53.7%
ESCCi_45-150_VF	%	50.9%	51.9%	52.4%	52.9%	53.0%	53.0%	53.0%	53.0%	53.0%	53.0%
ESCCi_45-150_CF	%	65.7%	67.0%	67.6%	68.2%	68.4%	68.4%	68.4%	68.4%	68.4%	68.4%
ESCCi_45-150_VSD-VF	%	56.4%	57.6%	57.8%	58.4%	58.8%	58.8%	58.8%	58.8%	58.8%	58.8%
MSSB<6"_VF	%	33.9%	34.6%	35.1%	35.8%	36.0%	36.0%	36.0%	36.0%	36.0%	36.0%
MSSB<6"_CF	%	45.6%	46.5%	47.2%	48.2%	48.7%	48.9%	48.9%	48.9%	48.9%	48.9%
MSSB<6"_VSD-VF	%	35.4%	36.1%	36.3%	37.0%	37.6%	37.6%	37.6%	37.6%	37.6%	37.6%
MS-V<25bar_VF	%	43.2%	44.1%	44.6%	45.3%	45.6%	45.6%	45.6%	45.6%	45.6%	45.6%
MS-V<25bar_CF	%	59.9%	61.2%	62.0%	63.0%	63.6%	63.8%	63.9%	63.9%	63.9%	63.9%
MS-V<25bar_VSD-VF	%	43.7%	44.5%	45.2%	45.9%	46.1%	46.1%	46.1%	46.1%	46.1%	46.1%
WE arc-on-mode efficiency	%	63.8%	73.8%	75.6%	76.5%	81.8%	87.3%	87.6%	87.9%	88.1%	88.4%
WE idle mode power	W	91.6	81.6	80.1	79.7	64.7	49.9	49.8	49.7	49.6	49.5
TRAFO Distribution	kWh/a	7859	7859	7656	7194	6789	6425	6094	5786	5493	5215
TRAFO Industry oil	kWh/a	27168	27168	26020	23399	21050	18860	16801	15631	15631	15631
TRAFO Industry dry	kWh/a	39727	39727	38758	36555	34600	32815	31130	29537	28629	28629
TRAFO Power	kWh/a	724886	724886	724886	724886	724886	724886	724886	724886	724886	724886
TRAFO DER oil	kWh/a		59094	54147	46067	41074	38065	36262	35515	35515	35515
TRAFO DER dry	kWh/a		62415	59204	53910	50715	48765	47595	47109	47109	47109
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
(Fuel losses due to RRC in L/100km/vehicle)											
Tyres C1, replacement for cars	L/100km	1.95	1.26	1.00	0.94	0.82	0.71	0.66	0.64	0.62	0.60
Tyres C1, OEM for cars	L/100km	1.95	1.27	1.16	1.02	0.86	0.74	0.69	0.66	0.64	0.61
Tyres C2, replacement for vans	L/100km	2.65	1.99	1.75	1.73	1.57	1.49	1.43	1.37	1.31	1.26
Tyres C2, OEM for vans	L/100km	2.65	2.02	1.91	1.79	1.64	1.54	1.47	1.41	1.35	1.29
Tyres C3, replacement for trucks/busses	L/100km	7.46	5.38	4.75	4.88	4.74	4.65	4.59	4.53	4.47	4.42
Tyres C3, OEM for trucks/busses	L/100km	7.46	5.44	5.19	5.04	4.86	4.78	4.71	4.64	4.58	4.51

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	1	1	1	1	1	1	1	1
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	8	7	7	7	7	7	8	9	9
	EIWHS Electric Instant. Shower (secondary)	1.00	1	1	1	1	1	1	1	1	2	2
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	9	9	8	8	9	9	9	10	10
	ESWH Electric Storage > 30 L (primary)	1.00	57	80	82	80	77	80	85	89	94	99
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	0	0	0	0	0	0	0	0	0	0
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Condensing	0.010	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	0.008	0	0	0	0	0	0	0	0	0	0
	Dedicated WH Heat Pump	1.00	0	0	1	2	4	6	8	10	12	13
	Dedicated WH Solar (3.5 m2)	0.80	1	5	6	6	6	6	6	6	6	6
	WH dedicated Water Heater		**73**	**103**	**107**	**106**	**104**	**109**	**116**	**124**	**132**	**140**
	CHB Gas Combi Instant. WH	0.04	1	3	3	3	3	3	3	3	3	3
	CHB Gas + Cyl. WH	0.04	1	1	1	1	1	1	1	1	1	1
	CHB Jet Burner Gas + Cyl. WH	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	0.04	1	1	1	1	1	0	0	0	0	0
	CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1
	CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	0	0	0	0
	CHB Electric HP + Cyl. WH	1.00	0	2	3	4	5	5	6	7	8	10
	CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0.04	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating		**5**	**9**	**10**	**11**	**11**	**12**	**13**	**14**	**15**	**16**
	TOTAL WATER HEATING		**78**	**112**	**117**	**117**	**116**	**121**	**129**	**138**	**147**	**156**
	CHB Gas non-condensing	0.04	16	18	15	11	8	7	6	5	4	4
	CHB Gas condensing	0.04	0	6	9	11	13	14	14	14	14	13
	CHB Gas Jet burner non-condensing	0.04	2	1	1	1	0	0	0	0	0	0
	CHB Gas Jet burner condensing	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Oil Jet burner non-condensing	0.04	21	14	10	7	5	2	1	1	1	1
	CHB Oil Jet burner condensing	0.04	0	0	0	1	1	1	1	1	1	1
	CHB Electric Joule-effect	1.00	13	14	14	15	16	15	13	11	10	9
	CHB Hybrid (gas-electric)	0.60	0	0	0	0	0	0	1	1	2	3
	CHB Electric Heat Pump	1.00	2	12	16	22	26	29	32	35	39	44
	CHB Gas Heat Pump	0.04	0	0	0	0	0	0	0	0	0	0
	CHB micro CHP	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Solar combi (16 m2)	0.10	0	0	0	0	0	0	0	0	0	0
	CHB Central Heating boiler < 400 kW, space heating		**54**	**65**	**66**	**69**	**70**	**69**	**70**	**70**	**72**	**75**
	SFB Wood Manual	0	0	0	0	0	0	0	0	0	0	0
	SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0	0
	SFB Coal	0	0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0	0	0	0	0	0	0	0	0	0	0
	SFB Wood chips	0	0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CHAE-S (≤ 400 kW)	1	3	9	10	11	11	11	11	11	11	11
	CHAE-L (> 400 kW)	1	5	13	14	15	14	13	12	12	11	11
	CHWE-S (≤ 400 kW)	1	0	1	1	1	1	1	1	1	1	1
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	1	3	3	3	3	3	3	2	2	2
	CHWE-L (> 1500 kW)	1	1	2	2	2	2	2	2	2	2	1
	CHF	0.05	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	20	32	35	38	40	40	41	41	42	42
	HT PCH-AE-L	1	19	31	34	36	37	38	38	39	39	40
	HT PCH-WE-S	1	4	7	7	8	8	9	9	9	9	9
	HT PCH-WE-M	1	8	13	15	16	16	17	17	17	17	18
	HT PCH-WE-L	1	2	3	3	3	3	3	4	4	4	4
	AC rooftop	1	3	7	7	6	4	3	1	1	0	0
	AC splits	1	4	11	11	10	10	9	8	7	6	5
	AC VRF	1	0	3	4	6	7	8	10	10	11	11
	ACF	0.05	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**70**	**133**	**146**	**155**	**157**	**157**	**156**	**156**	**156**	**156**
	AC rooftop (rev)	1	4	11	12	10	8	5	2	1	0	0
	AC splits (rev)	1	7	21	22	22	20	18	16	15	13	12
	AC VRF (rev)	1	0	7	10	14	18	21	24	25	25	25
	ACF (rev)	0.05	0	0	0	0	0	0	0	0	0	0
	AHF	0.05	4	3	3	2	2	2	2	1	1	1
	AHE	1	1	3	2	1	1	1	1	1	1	1
	SubTotal AHC central Air Heating		**16**	**45**	**49**	**50**	**49**	**48**	**46**	**43**	**41**	**39**
	Total AHC central Air Heating & Cooling		**86**	**178**	**194**	**204**	**207**	**205**	**202**	**199**	**197**	**195**

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH Solid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Electric portable	1	23	22	21	21	20	18	17	17	16	15
	LH Electric fixed > 250W	1	124	111	102	88	75	66	62	59	56	54
	LH Electric fixed ≤ 250W	1	8	7	7	6	5	4	4	4	4	4
	LH Electric storage	1	7	7	6	6	5	5	4	4	4	4
	LH Electric underfloor	1	21	21	20	20	19	19	18	17	16	16
	LH Electric visibly glowing > 1.2 kW	1	2	2	2	2	2	2	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	1	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	1	7	9	10	9	9	8	7	7	7	7
	LH Electric sum		**193**	**179**	**168**	**152**	**134**	**122**	**115**	**110**	**105**	**100**
	LH Gaseous fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Liquid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Local Space Heaters total		**193**	**179**	**168**	**152**	**134**	**122**	**115**	**110**	**105**	**100**
	RAC fixed < 6 kW, cooling	1	2	17	15	11	11	12	12	14	15	17
	RAC fixed 6-12 kW, cooling	1	1	9	9	7	7	7	7	7	8	9
	RAC portable < 12 kW, cooling	1	0	1	1	1	1	1	1	1	1	1
	RAC < 12 kW total, cooling mode	1	**3**	**27**	**25**	**19**	**19**	**20**	**21**	**22**	**24**	**27**
	RAC fixed < 6 kW, reversible, heating	1	1	20	23	23	27	34	40	48	55	62
	RAC fixed 6-12 kW, reversible, heating	1	0	10	13	14	16	19	21	24	27	29
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	1	**1**	**31**	**36**	**36**	**43**	**53**	**62**	**72**	**82**	**91**
	RAC Room Air Conditioner		**4**	**57**	**61**	**56**	**62**	**72**	**82**	**94**	**107**	**117**
1	CIRC Integrated circulators	1	13	19	19	20	21	21	21	20	19	18
0.38	CIRC Large standalone circulators	1	8	12	11	10	9	8	7	6	6	6
0.38	CIRC Small standalone circulators	1	6	9	8	7	7	6	5	5	5	4
	CIRC Circulator pumps <2.5 kW, all	1	**27**	**39**	**38**	**37**	**36**	**35**	**33**	**31**	**30**	**28**
	CIRC Circulator pumps <2.5 kW, excl. double		**9**	**13**	**12**	**11**	**10**	**8**	**8**	**7**	**7**	**6**
	TOTAL SPACE HEATING		**273**	**332**	**331**	**317**	**307**	**300**	**300**	**302**	**307**	**311**
	TOTAL SPACE COOLING		**73**	**160**	**171**	**174**	**176**	**177**	**177**	**178**	**180**	**183**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.1	0.1	0.2	0.7	1.4	2.2	3.0	3.8	4.7
	R-UVU 100-250 m3/h	1	0.4	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
	R-BVU 100-250 m3/h	1	0.0	0.1	0.1	0.1	0.3	0.5	0.8	1.1	1.4	1.7
	R-UVU 250-1000 m3/h	1	2.1	5.0	5.5	5.8	6.0	6.3	6.5	6.6	6.7	6.7
	R-BVU 250-1000 m3/h	1	0.0	0.5	0.7	0.9	1.8	3.3	4.8	6.5	8.2	10.0
	R-UVU > 1000 m3/h	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	R-BVU 1000-2500 m3/h	1	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	RVU, Total residential		**3**	**7**	**8**	**8**	**10**	**13**	**16**	**19**	**22**	**25**
	NR-UVU 250-1000 m3/h	1	0.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0
	NR-BVU 250-1000 m3/h	1	0.0	0.9	1.2	1.4	1.7	2.0	2.4	2.7	3.1	3.4
	NR-UVU > 1000 m3/h	1	0.6	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8
	NR-BVU 1000-2500 m3/h	1	0.0	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.3	2.5
	NR-AHU-S 2500-5500 m3/h	1	0.2	2.5	3.5	4.4	5.2	6.0	6.8	7.7	8.5	9.3
	NR-AHU-M 5500-14500 m3/h	1	17.2	22.9	21.9	21.0	20.9	21.8	22.9	23.9	24.9	25.9
	NR-AHU-L > 14500 m3/h	1	4.9	6.5	6.2	5.9	5.9	6.1	6.4	6.7	7.0	7.3
	NRVU, Total non-residential		**24**	**36**	**37**	**37**	**38**	**40**	**43**	**46**	**49**	**51**
	VU Ventilation Units, res + non-res		**26**	**43**	**44**	**45**	**48**	**53**	**59**	**65**	**70**	**76**
	TOTAL VENTILATION (VU own electricity)		**26**	**43**	**44**	**45**	**48**	**53**	**59**	**65**	**70**	**76**
1	***Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)***		-	-	-	-	-	-	-	-	-	-
	LS, incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	77	122	146	165	163	140	110	86	67	53
	HID (HPM, HPS, MH)	1	29	62	65	66	56	38	20	11	6	3
	CFLni (all shapes)	1	2	8	9	9	8	6	3	2	1	1
	CFLi (retrofit for GLS, HL)	1	1	11	15	15	13	11	7	4	3	2
	GLS (DLS & NDLS)	1	74	62	45	33	19	11	7	4	2	1
	HL (DLS & NDLS, LV & MV)	1	6	36	48	56	40	20	11	6	3	2
	LED replacing LFL (retrofit & luminaire)	1	0	0	1	8	24	49	74	97	120	143
	LED replacing HID (retrofit & luminaire)	1	0	0	0	6	19	33	45	54	64	74
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	0	1	2	4	5	5	6
	LED replacing DLS (retrofit & luminaire)	1	0	0	0	1	2	4	4	5	6	6
	LED replacing NDLS (retrofit & luminaire)	1	0	0	0	3	9	14	19	22	25	28
	Standby (estimate)	*1*	*9*	*15*	*13*	*11*	*9*	*7*	*7*	*7*	*7*	*7*
	SUBTOTAL non-LED		188	301	328	345	301	226	157	112	82	62
	SUBTOTAL LED		0	0	2	19	55	102	145	183	220	258
	TOTAL LIGHTING (incl. standby)		**198**	**316**	**342**	**375**	**364**	**335**	**310**	**303**	**310**	**327**

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV on-mode, total all types	1	23	62	71	74	68	76	76	71	69	71
	DP TV standby, standard (NoNA)	1	3	2	1	0	0	0	0	0	0	0
	DP TV standby, LoNA	1	0	0	1	1	1	0	0	0	0	0
	DP TV standby, HiNA ('Smart')	1	0	0	2	4	6	8	8	7	6	5
	DP TV standby, total all types		**3**	**2**	**3**	**5**	**7**	**8**	**8**	**7**	**6**	**5**
	DP TV total on-mode + standby		**27**	**64**	**73**	**80**	**75**	**84**	**84**	**78**	**75**	**76**
	DP Monitor on-mode	1	1	12	8	5	5	5	4	3	3	3
	DP Monitor standby	1	0	1	0	0	0	0	0	0	0	0
	DP Monitor total		**1**	**13**	**8**	**5**	**5**	**5**	**4**	**3**	**3**	**3**
	DP Signage on-mode	1	0	1	8	18	22	21	19	19	18	17
	DP Signage standby	1	0	0	1	3	3	3	3	3	3	3
	DP Signage total		**0**	**1**	**9**	**21**	**25**	**24**	**22**	**21**	**20**	**20**
	DP Electronic Displays, total on-mode		**24**	**75**	**86**	**98**	**95**	**102**	**99**	**93**	**90**	**91**
	DP Electronic Displays, total standby		**3**	**3**	**4**	**8**	**10**	**11**	**11**	**10**	**9**	**8**
	DP Electronic Displays, total		**27**	**78**	**90**	**106**	**105**	**113**	**110**	**103**	**99**	**99**
	SSTB	1	0	3	1	0	0	0	0	0	0	0
	CSTB (low-power modes)	1	0	5	12	12	11	10	10	10	10	10
	CSTB (other modes)	1	0	3	6	6	6	6	5	5	5	5
	CSTB (all covered modes)	1	0	8	18	18	17	16	15	15	15	15
	Total STB set top boxes (Complex & Simple)		**0**	**10**	**20**	**18**	**17**	**16**	**15**	**15**	**15**	**15**
	Game consoles > 20 W Active modes (SRI)	1	0.0	2.4	4.5	5.6	5.3	5.3	5.3	5.3	5.3	5.3
	Game consoles > 20 W Non-Active (CR)	1	0.0	1.3	2.0	2.4	2.2	2.2	2.2	2.2	2.2	2.2
	Game consoles < 20 W Non-Active (CR)	1	0.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Game consoles < 20 W Active (no reg.)	1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total Game consoles, active modes		0.0	2.6	4.6	5.7	5.4	5.4	5.4	5.4	5.4	5.4
	Total Game consoles, non-active modes		0.0	2.2	3.0	3.5	3.2	3.2	3.2	3.2	3.2	3.2
	Total Game consoles > 20 W, all modes		0.0	3.7	6.4	8.0	7.5	7.5	7.5	7.5	7.5	7.5
	Total Game consoles < 20 W, all modes		0.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Total Game consoles, all modes		**0.0**	**4.8**	**7.6**	**9.2**	**8.7**	**8.6**	**8.6**	**8.6**	**8.6**	**8.6**
	ES & DS, without effects on infrastructure											
	ES tower 1-socket traditional	1	0.0	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3
	ES rack 1-socket traditional	1	0.1	2.8	2.1	1.9	1.9	2.0	2.0	2.0	2.0	2.0
	ES rack 2-socket traditional	1	0.6	13.0	7.0	4.2	4.9	5.8	6.2	6.2	6.2	6.2
	ES rack 2-socket cloud	1		7.3	11.3	12.6	14.7	17.4	18.8	18.8	18.8	18.8
	ES rack 4-socket traditional	1	0.1	1.4	0.7	0.6	0.7	0.8	0.9	0.9	0.9	0.9
	ES rack 4-socket cloud	1		0.8	1.4	1.9	2.3	2.7	2.9	2.9	2.9	2.9
	ES rack 2-socket resilient trad.	1	0.0	0.7	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	ES rack 2-socket resilient cloud	1		0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	ES rack 4-socket resilient trad.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1		0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	1	0.0	0.8	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7
	ES blade 2-socket traditional	1	0.5	5.9	3.0	1.9	2.3	2.7	2.9	2.9	2.9	2.9
	ES blade 2-socket cloud	1		3.3	5.0	6.1	7.1	8.5	9.2	9.2	9.2	9.2
	ES blade 4-socket traditional	1	0.1	0.7	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	ES blade 4-socket cloud	1		0.4	0.6	0.8	0.9	1.1	1.2	1.2	1.2	1.2
	ES total traditional		**2**	**26**	**15**	**10**	**11**	**13**	**14**	**14**	**14**	**14**
	ES total cloud		**0**	**12**	**19**	**22**	**26**	**30**	**33**	**33**	**33**	**33**
	ES Enterprise Servers total		**2**	**38**	**34**	**32**	**37**	**43**	**46**	**46**	**46**	**46**
	DS Online 2	1	0.3	5.7	7.7	10.5	13.3	15.9	16.7	16.8	16.8	16.8
	DS Online 3	1	0.1	0.8	1.1	1.5	1.9	2.2	2.4	2.4	2.4	2.4
	DS Online 4	1	0.2	3.3	4.3	5.8	7.3	8.7	9.2	9.2	9.2	9.2
	DS Data Storage products total		**1**	**10**	**13**	**18**	**23**	**27**	**28**	**28**	**28**	**28**
	ES + DS total (excl. infrastructure)		**2**	**48**	**47**	**50**	**59**	**70**	**75**	**75**	**75**	**75**
	PC Desktop	1	16	21	14	9	10	11	11	10	10	9
	PC Integrated Desktop	1	0	1	1	0	1	1	1	1	1	1
	PC Notebook	1	0	7	8	7	7	8	8	8	8	8
	PC Tablet/slate	1	0	0	2	2	1	1	1	1	1	1
	PC Thin client	1	0	1	0	0	0	0	0	0	0	0
	PC Integrated Thin Client	1	0	0	0	0	0	0	0	0	0	0
	PC Small-scale Server	1	0	0	0	0	0	0	0	0	0	0
	PC Workstation	1	1	1	1	2	2	2	2	2	2	2
	Total PC, electricity		**17**	**31**	**27**	**20**	**21**	**23**	**23**	**23**	**22**	**21**

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Inkjet Printer	1	0.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	1.2	0.9	1.0	1.1	1.0	1.0	0.9	0.9	0.8	0.8
	EP / Laser Printer mono	1	7.9	2.3	1.8	1.4	1.1	0.9	0.7	0.5	0.4	0.2
	EP / Laser Printer colour	1	0.0	1.2	1.7	2.4	2.7	2.9	3.1	3.1	3.2	3.3
	EP / Laser Copier mono	1	8.8	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.2	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	2.1	2.7	2.9	2.8	2.6	2.5	2.4	2.2	2.1
	EP / Laser MFD colour	1	0.0	2.5	3.2	3.4	3.2	3.1	2.9	2.8	2.7	2.5
	Total IE Imaging Equipment		**19**	**11**	**12**	**12**	**11**	**11**	**10**	**10**	**9**	**9**
	of which for modes under CR 1275/2008		*14*	*8*	*9*	*9*	*8*	*8*	*8*	*7*	*7*	*7*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	2.0	5.9	5.2	4.4	3.9	3.5	3.2	2.8	2.5	2.2
	SB Electric toothbrushes (off mode)	1	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	SB Audio speakers (wired) (sb & off modes)	1	1.7	2.7	2.0	1.0	0.2	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.7	3.2	5.0	5.2	5.2	5.2	5.2	5.2
	SB Small appliances (sb & off modes)	1	1.3	6.9	7.2	7.4	7.6	7.7	7.8	7.8	7.9	8.0
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.4	1.1	1.2	1.2	1.2	1.2	1.2	1.2
	SB Media players and recorders (sb mode)	1	0.0	3.4	4.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.4	3.1	3.3	3.2	2.8	2.5	2.3	2.1	1.9	1.7
	SB Office phones (nsb mode)	1	0.6	2.2	1.9	1.5	1.2	1.0	0.8	0.8	0.8	0.7
	SB Home NAS (nsb mode)	1	0.0	0.9	1.5	2.0	2.5	2.9	3.2	3.3	3.3	3.1
	SB Home Network Equipment (nsb mode)	1	0.0	2.7	3.2	3.5	3.7	3.9	4.1	4.3	4.3	4.3
	SB Office Network Equipment (nsb mode)	1	0.0	0.3	1.1	2.4	3.7	5.0	6.1	6.2	6.2	6.2
	SB Coffee makers (off mode)	1	0.8	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	1.6	1.7	1.8	*1.8*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.5	0.7	0.8	*0.9*	*1.0*	*1.2*	*1.3*	*1.4*	*1.5*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
1	SB Electric Ovens (sb mode)	1	0.0	3.1	4.2	4.9	5.3	5.6	5.8	5.9	5.9	6.0
1	SB Electric Hobs (sb mode)	1	0.0	1.2	1.6	1.9	2.0	2.2	2.3	2.4	2.5	2.6
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	5.0	11.9	11.9	11.1	10.2	9.9	9.9	9.9	9.9
1	SB Game consoles (non-active modes)	1	0.0	2.2	3.0	3.5	3.2	3.2	3.2	3.2	3.2	3.2
1	SB IE Inkjet Printers (nsb mode)	1	0.8	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	1.0	0.8	0.9	1.0	0.9	0.9	0.8	0.8	0.8	0.7
1	SB IE Laser Printers (nsb mode)	1	5.9	2.6	2.7	2.9	2.9	2.9	2.8	2.8	2.7	2.6
1	SB IE Laser Copiers (nsb mode)	1	6.6	1.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	3.4	4.5	4.7	4.5	4.3	4.1	3.9	3.7	3.5
	Total (networked) SB (incl. double)		21	52	65	66	64	64	65	65	64	64
	Total (networked) SB (excl. double)		**7**	**30**	**32**	**32**	**33**	**35**	**36**	**36**	**35**	**35**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.1	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
0.6	EPS 10–12 W	1	0	6.8	10.8	11.8	11.4	11.0	10.5	10.1	9.6	9.5
0.5	EPS 15–20 W	1	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	1	0.0	0.8	0.9	0.9	0.8	0.7	0.6	0.6	0.5	0.4
0.8	EPS 30–65 W, multiple-V	1	0	0	0	0.1	0.1	0.2	0.3	0.3	0.4	0.5
1.0	EPS 30-65 W	1	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	1	0.0	0.2	0.2	0.2	0.1	0.1	0	0	0	0
0.5	EPS 65–120 W, multiple-V	1	0	1.2	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	EPS 12–15 W	1	0.0	0.2	0.5	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	EPS, total for active mode		**0.1**	**10.5**	**14.7**	**15.2**	**14.7**	**14.2**	**13.6**	**13.1**	**12.6**	**12.4**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7
0.0	EPS 10–12 W	1	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.1**	**1.5**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**	**1.0**	**0.9**
	EPS, overall total (active + no-load)		**0.2**	**12.0**	**16.3**	**16.6**	**16.1**	**15.4**	**14.8**	**14.2**	**13.6**	**13.3**
	EPS, double counted subtracted		**0.2**	**6.3**	**8.2**	**8.4**	**8.1**	**7.8**	**7.4**	**7.0**	**6.7**	**6.6**
	TOTAL ELECTRONICS		**72**	**219**	**244**	**256**	**264**	**284**	**285**	**277**	**271**	**269**

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**112**	**113**	**115**	**116**	**117**	**117**	**117**	**117**	**116**	**116**
	CF open vertical chilled multi deck (RVC2)	1	13.9	12.7	11.9	11.1	10.7	10.6	10.5	10.5	10.6	10.6
	CF open horizontal frozen island (RHF4)	1	1.2	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
	CF other supermarket display (non-BCs)	1	24.3	23.0	22.8	22.3	22.5	23.2	24.0	24.6	25.1	25.7
	CF Plug in one door beverage cooler	1	15.4	15.6	14.8	13.9	13.7	13.8	13.9	14.2	14.5	14.7
	CF Plug in horizontal ice cream freezer	1	3.5	3.6	3.4	3.2	3.1	3.2	3.2	3.3	3.3	3.4
	CF Spiral vending machine	1	3.6	2.7	1.9	1.4	1.4	1.4	1.5	1.5	1.6	1.6
	Total CF Commercial Refrigeration		**62**	**59**	**56**	**53**	**52**	**53**	**54**	**55**	**56**	**57**
	PF Storage cabinet Chilled Vertical (CV)	1	1.5	2.2	2.3	2.4	2.5	2.6	2.7	2.9	3.0	3.1
	PF Storage cabinet Frozen Vertical (FV)	1	1.8	2.5	2.7	2.8	2.9	3.1	3.2	3.4	3.5	3.6
	PF Storage cabinet Chilled Horizontal (CH)	1	1.2	1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4
	PF Storage cabinet Frozen Horizontal (FH)	1	0.7	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4
	PF Storage cabinets All types	1	**5**	**7**	**8**	**8**	**9**	**9**	**9**	**10**	**10**	**11**
	PF Process Chiller AC MT S ≤ 300 kW	1	2.9	6.3	7.4	8.5	9.5	10.5	11.5	12.6	13.6	14.6
	PF Process Chiller AC MT L > 300 kW	1	2.8	6.0	7.1	8.2	9.2	10.2	11.1	12.1	13.1	14.1
	PF Process Chiller AC LT S ≤ 200 kW	1	2.9	6.3	7.4	8.6	9.6	10.6	11.6	12.6	13.7	14.7
	PF Process Chiller AC LT L > 200 kW	1	3.0	6.5	7.7	8.9	9.9	10.9	12.0	13.1	14.1	15.2
	PF Process Chiller WC MT S ≤ 300 kW	1	0.8	1.7	2.1	2.4	2.7	2.9	3.2	3.5	3.8	4.1
	PF Process Chiller WC MT L > 300 kW	1	1.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.0
	PF Process Chiller WC LT S ≤ 200 kW	1	1.0	2.2	2.6	3.1	3.4	3.8	4.1	4.5	4.9	5.2
	PF Process Chiller WC LT L > 200 kW	1	1.3	2.8	3.3	3.9	4.3	4.8	5.2	5.7	6.2	6.6
	PF Process Chiller All MT&LT	1	**16**	**35**	**41**	**47**	**53**	**58**	**64**	**69**	**75**	**81**
	PF Condensing Unit MT S 0.2-1 kW	1	6	5	4	5	5	5	6	6	7	7
	PF Condensing Unit MT M 1-5 kW	1	14	12	11	12	13	14	15	16	17	19
	PF Condensing Unit MT L 5-20 kW	1	17	14	14	15	16	17	18	20	21	23
	PF Condensing Unit MT XL 20-50 kW	1	17	14	14	14	16	17	18	20	21	23
	PF Condensing Unit LT S 0.1-0.4 kW	1	1	1	1	1	1	1	1	1	1	1
	PF Condensing Unit LT M 0.4-2 kW	1	3	2	2	2	2	3	3	3	3	3
	PF Condensing Unit LT L 2-8 kW	1	4	4	3	4	4	4	5	5	5	6
	PF Condensing Unit LT XL 8-20 kW	1	13	11	11	11	12	13	14	15	16	18
0.6	**PF Condensing Unit, All MT&LT**	1	**75**	**62**	**60**	**63**	**68**	**74**	**79**	**85**	**92**	**99**
	PF Professional Refrigeration, Total		**51**	**67**	**73**	**80**	**89**	**96**	**105**	**113**	**122**	**131**
	TOTAL FOOD PRESERVATION		**225**	**239**	**243**	**249**	**258**	**267**	**276**	**285**	**294**	**304**
	CA Electric Hobs (active modes)	1	19	29	32	35	38	40	42	44	46	48
	CA Electric Hobs (low-power modes)	1	0.0	1.2	1.6	1.9	2.0	2.2	2.3	2.4	2.5	2.6
	CA Electric Hobs (sum all modes)	1	19	30	34	37	40	43	45	47	49	51
	CA Electric Ovens (active modes)	1	21	21	20	19	19	19	20	20	20	20
	CA Electric Ovens (low-power modes)	1	0.0	3.1	4.2	4.9	5.3	5.6	5.8	5.9	5.9	6.0
	CA Electric Ovens (sum all modes)	1	21	25	24	24	24	25	26	26	26	26
	CA Gas Hobs	0	0	0	0	0	0	0	0	0	0	0
	CA Gas Ovens	0	0	0	0	0	0	0	0	0	0	0
	CA Range Hoods	1	9	11	12	13	13	14	15	15	16	17
	CA Elec. Hobs&Ovens low-power modes	1	0	4	6	7	7	8	8	8	8	9
	CA other products or modes		49	62	64	67	70	74	77	80	83	85
	TOTAL COOKING		**49**	**66**	**70**	**74**	**77**	**81**	**85**	**88**	**91**	**94**
	WM Washing Machines, active modes	1	43	34	33	31	28	26	24	22	21	19
	WM Washing Machines, low-power modes	1	0.0	1.6	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.8
	WM Washing Machines, all modes	1	43	36	35	33	30	28	26	24	22	21
	WD Washer-Dryers, active modes	1	7	8	8	8	8	7	7	6	6	6
	WD Washer-Dryers, low-power modes	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	WD Washer-Dryers, all modes	1	7	8	8	8	8	7	7	6	6	6
	WM-WD Washing, sum active modes	1	50	43	41	39	36	34	31	29	27	25
	WM-WD Washing, sum low-power modes	1	0.0	1.7	1.8	1.9	1.9	1.9	1.9	1.9	1.9	1.9
	Total WM-WD household Washing	1	**50**	**44**	**43**	**41**	**38**	**36**	**33**	**31**	**29**	**27**
	DW Dishwashers, active modes	1	10	18	21	25	28	30	33	35	37	39
	DW Dishwashers, low-power modes	1	0.0	0.5	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.5
	Total DW household Dishwasher	1	**10**	**19**	**22**	**25**	**29**	**31**	**34**	**36**	**38**	**40**
	LD condensing heat pump	1		0.1	0.1	0.2	0.3	0.5	0.7	1.0	1.3	1.5
	LD condensing electric heat element	1	1.3	8.8	9.0	9.0	9.5	9.5	9.3	8.8	8.3	7.8
	LD vented electric	1	6.5	7.0	6.0	5.0	4.6	4.4	4.5	4.5	4.5	4.5
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	LD Laundry Dryers, sum active modes		8	16	15	14	14	14	14	14	14	13
	LD Laundry Dryers, low-power modes	1	0.0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	Total LD household Laundry Dryer		**8**	**16**	**15**	**14**	**14**	**14**	**15**	**14**	**14**	**14**

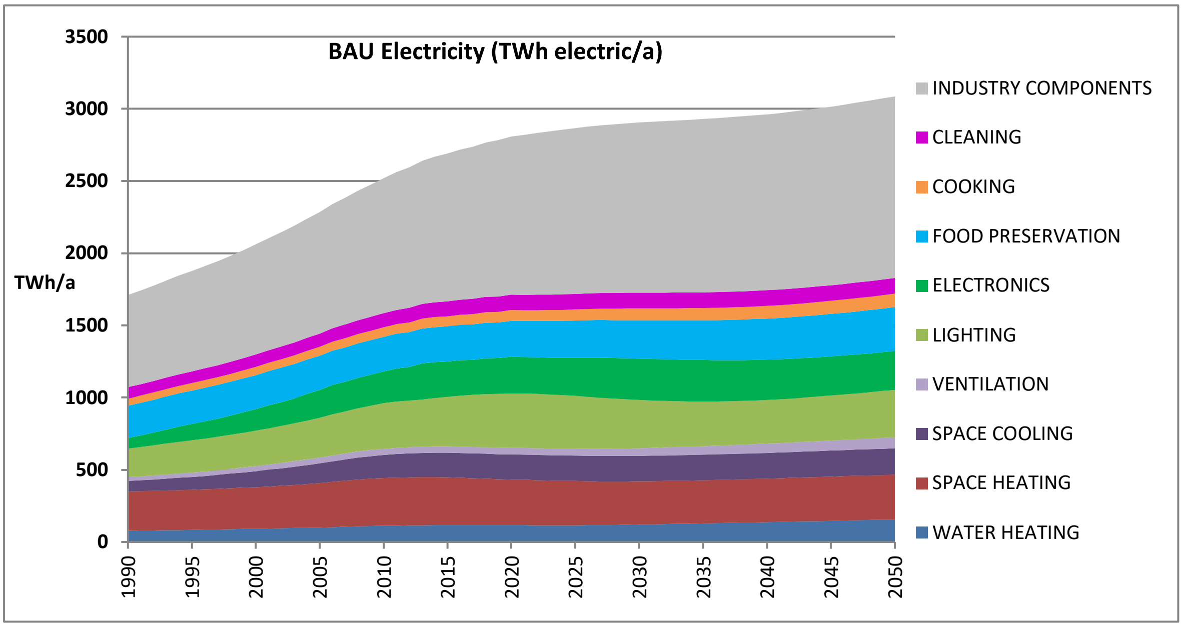
db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	7.5	11.4	14.9	15.6	14.5	12.3	9.2	7.0	6.4	6.2
	VC Upright Domestic mains	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Handstick Domestic mains	1	0.1	0.1	0.3	0.4	0.7	1.0	1.4	1.7	1.7	1.7
	VC Total Domestic mains		**8**	**12**	**15**	**16**	**15**	**13**	**11**	**9**	**8**	**8**
	VC Cylinder Commercial mains	1	1.5	6.0	7.0	7.1	7.5	7.9	8.4	8.5	8.5	8.5
	VC Upright Commercial mains	1	0.3	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
	VC Total Commercial mains		**2**	**7**	**8**	**8**	**8**	**9**	**9**	**9**	**9**	**9**
	VC Total in scope of CR 666/2013		**9**	**19**	**23**	**24**	**24**	**22**	**20**	**18**	**18**	**17**
	VC Cordless - domestic - cleaning	1	0.0	0.1	0.3	0.8	1.7	2.9	3.9	4.4	4.5	4.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.4
	VC Cordless - domestic - standby	1	0.0	0.1	0.2	0.7	1.2	1.7	2.2	2.5	2.7	2.7
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.6	0.7	0.7
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	1	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**8**	**12**	**16**	**18**	**19**	**19**	**18**	**17**	**17**	**17**
	VC Total Commercial mains+cordless+robots		**2**	**7**	**8**	**8**	**9**	**9**	**10**	**10**	**10**	**10**
	Total VC Vacuum Cleaner		**10**	**19**	**24**	**26**	**28**	**28**	**28**	**27**	**27**	**27**
	TOTAL CLEANING		**77**	**98**	**104**	**106**	**108**	**110**	**109**	**109**	**108**	**108**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	55	62	68	72	73	73	73	73
0.5	FAN Axial>300Pa	1	28	85	98	104	109	112	113	113	113	113
0.5	FAN Centr.FC	1	7	15	18	21	23	24	24	24	24	24
0.5	FAN Centr.BC-free	1	18	39	47	51	57	62	66	68	69	70
0.5	FAN Centr.BC	1	19	44	53	59	65	71	77	82	90	97
0.5	FAN Cross-flow	1	1	2	3	3	3	4	4	4	5	5
	Total FAN, industrial (excl. box & roof fans)		**45**	**115**	**137**	**150**	**162**	**172**	**178**	**182**	**187**	**191**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	97	124	132	136	136	133	128	122	115	106
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	146	192	204	211	210	204	194	181	166	148
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	297	381	399	409	403	382	348	304	264	238
0.45	**Total 3ph 0.75-375 kW no VSD**		**541**	**697**	**735**	**757**	**750**	**718**	**670**	**608**	**544**	**492**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	7	15	19	23	27	31	36	42	48	56
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	12	29	36	44	53	62	72	85	99	114
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	34	84	105	131	158	187	220	257	293	320
0.45	**Total 3-ph 0.75-375 kW with VSD**		**52**	**128**	**160**	**198**	**237**	**280**	**328**	**383**	**440**	**490**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**593**	**825**	**896**	**955**	**987**	**998**	**998**	**991**	**985**	**982**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	7	10	10	10	10	10	10	10	10	10
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	1	1	1	1	1	1	1	1	1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**7**	**10**	**11**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	10	14	14	15	15	15	15	15	15	15
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	1	2	2	2	2	2	3	3	3
0.45	**Total Small 3-ph 0.12-0.75 kW**		**11**	**15**	**16**	**17**	**17**	**17**	**17**	**17**	**18**	**18**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	152	185	181	172	161	153	151	150	148	147
0.45	Large 3-ph LV 375-1000kW with VSD	1	8	42	63	86	107	122	129	136	142	149
0.45	**Total Large 3-ph LV 375-1000 kW**		**160**	**226**	**243**	**258**	**268**	**275**	**280**	**285**	**291**	**296**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	3	4	5	5	5	5	6	6	6	6
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	8	11	12	13	14	14	15	15	15	16
0.45	Explosion motors (L) 3-ph 75-375 kW	1	15	22	24	26	28	29	30	30	31	32
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**26**	**37**	**41**	**45**	**47**	**48**	**50**	**51**	**52**	**53**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	2	3	3	4	4	4	4	4	4	4
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	5	7	8	9	9	9	10	10	10	10
0.45	Brake motors (L) 3-ph 75-375 kW	1	7	11	12	13	14	14	15	15	15	16
0.45	**Total Brake 0.75-375 kW (no VSD)**		**15**	**21**	**24**	**26**	**27**	**28**	**28**	**29**	**30**	**30**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	1	1	2	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**1**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**40**	**55**	**60**	**65**	**67**	**69**	**70**	**71**	**72**	**73**
	Total MT Elec. Motors LV 0.12-1000 kW		**469**	**655**	**711**	**758**	**785**	**797**	**802**	**802**	**803**	**807**
	including double counted amounts		853	1 192	1 293	1 378	1 427	1 449	1 457	1 459	1 461	1 467

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	16.5	21.7	23.0	24.6	25.6	26.3	27.7	29.5	31.2	33.0
	ESOB<45_CF	1	10.9	14.7	15.7	17.0	18.2	19.2	20.4	21.7	23.0	24.2
	ESOB<45_VSD-VF	1	0.5	1.0	1.1	1.5	2.0	2.5	2.8	3.0	3.1	3.3
	ESOB < 45 Total	1	**28**	**37**	**40**	**43**	**46**	**48**	**51**	**54**	**57**	**61**
	ESOB_45-150_VF	1	5.7	7.3	7.7	8.1	8.3	8.3	8.7	9.3	9.9	10.4
	ESOB_45-150_CF	1	9.4	12.7	13.5	14.7	15.7	16.6	17.5	18.7	19.8	21.0
	ESOB_45-150_VSD-VF	1	0.3	0.6	0.7	0.9	1.3	1.6	1.7	1.8	1.9	2.1
	ESOB 45-150 Total	1	**15**	**21**	**22**	**24**	**25**	**26**	**28**	**30**	**32**	**33**
	ESOB < 150 Total	1	**43**	**58**	**62**	**67**	**71**	**75**	**79**	**84**	**89**	**94**
	ESCC<45_VF	1	13.8	18.0	19.0	20.2	20.9	21.3	22.4	23.8	25.3	26.7
	ESCC<45_CF	1	9.2	12.4	13.2	14.3	15.3	16.2	17.1	18.2	19.3	20.4
	ESCC<45_VSD-VF	1	0.5	1.0	1.2	1.5	2.1	2.6	2.9	3.1	3.3	3.5
	ESCC < 45 Total	1	**23**	**31**	**33**	**36**	**38**	**40**	**42**	**45**	**48**	**50**
	ESCC_45-150_VF	1	5.0	6.6	6.9	7.4	7.6	7.8	8.2	8.7	9.2	9.8
	ESCC_45-150_CF	1	3.5	4.7	5.0	5.4	5.8	6.1	6.5	6.9	7.3	7.8
	ESCC_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCC 45-150 Total	1	**9**	**12**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
	ESCC < 150 Total	1	**32**	**43**	**46**	**49**	**53**	**55**	**58**	**62**	**66**	**69**
	ESCCi<45_VF	1	6.9	8.3	8.5	8.4	7.4	6.5	6.5	6.9	7.3	7.7
	ESCCi<45_CF	1	0.6	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3
	ESCCi<45_VSD-VF	1	1.0	2.0	2.3	3.0	4.2	5.1	5.7	6.0	6.4	6.7
	ESCCi < 45 Total	1	**9**	**11**	**12**	**12**	**13**	**13**	**13**	**14**	**15**	**16**
	ESCCi_45-150_VF	1	1.3	1.5	1.6	1.6	1.4	1.2	1.2	1.3	1.4	1.4
	ESCCi_45-150_CF	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCCi 45-150 Total	1	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
	ESCCi < 150 Total	1	**10**	**13**	**14**	**15**	**15**	**15**	**16**	**17**	**18**	**19**
	MSSB<6"_VF	1	2.4	2.8	2.9	2.9	2.8	2.7	2.8	3.0	3.2	3.3
	MSSB<6"_CF	1	13.3	17.9	19.1	20.8	22.3	23.5	24.8	26.4	28.0	29.6
	MSSB<6"_VSD-VF	1	0.3	0.6	0.7	0.9	1.1	1.3	1.4	1.5	1.6	1.7
	MSSB <6" Total	1	**16**	**21**	**23**	**25**	**26**	**27**	**29**	**31**	**33**	**35**
	MS-V<25bar_VF	1	10.2	13.0	13.7	14.3	14.4	14.3	14.9	15.9	16.8	17.8
	MS-V<25bar_CF	1	6.4	8.6	9.2	10.0	10.7	11.3	12.0	12.7	13.5	14.2
	MS-V<25bar_VSD-VF	1	0.7	1.3	1.6	2.1	2.8	3.5	3.9	4.1	4.4	4.6
	MS_V <25 bar Total	1	**17**	**23**	**24**	**26**	**28**	**29**	**31**	**33**	**35**	**37**
	WP Water pumps		**119**	**159**	**169**	**182**	**193**	**201**	**213**	**226**	**240**	**253**
	WE arc-on-mode	1	6.2	6.1	6.1	6.0	6.0	6.1	6.2	6.2	6.2	6.3
	WE idle mode	1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Total WE Welding Equipment		**6.5**	**6.4**	**6.4**	**6.4**	**6.4**	**6.5**	**6.5**	**6.6**	**6.6**	**6.7**
	TOTAL INDUSTRY COMPONENTS		**639**	**936**	**1023**	**1096**	**1146**	**1177**	**1199**	**1218**	**1237**	**1258**
1	TRAFO Distribution	1	10	18	20	22	24	27	29	31	34	36
1	TRAFO Industry oil	1	8	14	15	17	19	20	22	23	25	27
1	TRAFO Industry dry	1	2	4	5	5	6	6	7	7	8	8
1	TRAFO Power	1	30	47	52	58	64	70	76	82	87	94
1	TRAFO DER oil	1	0	0	1	1	2	4	6	9	13	17
1	TRAFO DER dry	1	0	2	3	6	9	15	25	37	53	71
1	TRAFO Small	1	2	2	2	2	2	2	2	2	2	2
	Total TRAFO Utility Transformers		**53**	**86**	**98**	**111**	**126**	**144**	**166**	**192**	**221**	**254**
	TOTAL ENERGY SECTOR (BAU taken as reference = 0) (not final energy: distribution losses)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	BAU Electricity, Total excl. Energy Sector, in TWh		**1711**	**2520**	**2690**	**2808**	**2865**	**2905**	**2929**	**2962**	**3015**	**3086**
	BAU Electricity, Total excl. Energy Sector, in PJ		6161	9072	9683	10109	10315	10457	10545	10663	10855	11110
	BAU Electricity, Total excl. Energy Sector, in mtoe		147	217	231	241	246	250	252	255	259	265

BAU Electricity Summary, TWh	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	78	112	117	117	116	121	129	138	147	156
SPACE HEATING	273	332	331	317	307	300	300	302	307	311
SPACE COOLING	73	160	171	174	176	177	177	178	180	183
VENTILATION	26	43	44	45	48	53	59	65	70	76
1 *Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
LIGHTING	198	316	342	375	364	335	310	303	310	327
ELECTRONICS	72	219	244	256	264	284	285	277	271	269
FOOD PRESERVATION	225	239	243	249	258	267	276	285	294	304
COOKING	49	66	70	74	77	81	85	88	91	94
CLEANING	77	98	104	106	108	110	109	109	108	108
INDUSTRY COMPONENTS	639	936	1023	1096	1146	1177	1199	1218	1237	1258
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0
BAU Electricity, Total excl. Energy Sector, in TWh	**1711**	**2520**	**2690**	**2808**	**2865**	**2905**	**2929**	**2962**	**3015**	**3086**
BAU Electricity, Total excl. Energy Sector, in PJ	6161	9072	9683	10109	10315	10457	10545	10663	10855	11110
BAU Electricity, Total excl. Energy Sector, in mtoe	147	217	231	241	246	250	252	255	259	265

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (reference BAU=0)	0	0	0	0	0	0	0	0	0	0
BAU Electricity, Total incl. Energy Sector, in TWh	**1711**	**2520**	**2690**	**2808**	**2865**	**2905**	**2929**	**2962**	**3015**	**3086**
BAU Electricity, Total incl. Energy Sector, in PJ	6161	9072	9683	10109	10315	10457	10545	10663	10855	11110
BAU Electricity, Total incl. Energy Sector, in mtoe	147	217	231	241	246	250	252	255	259	265



Sector subdivision for BAU Electricity (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears, and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

BAU Electricity (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2	3	4	3	3	4	4	4	4	5
SPACE HEATING	13	18	17	16	15	15	14	14	14	14
SPACE & HT PROCESS COOLING	19	34	37	39	40	40	40	40	40	40
VENTILATION	3	5	5	5	5	5	6	6	6	7
LIGHTING	25	41	47	53	55	54	51	51	52	55
ELECTRONICS	1	9	9	10	12	14	14	14	14	14
FOOD PRESERVATION	20	36	41	47	53	58	63	69	74	80
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	1	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	428	606	658	703	731	746	755	761	768	776
BAU Electricity, Industry, in TWh	**512**	**753**	**819**	**878**	**916**	**936**	**948**	**960**	**974**	**992**
BAU Electricity, Industry, in PJ	1843	2709	2950	3161	3298	3369	3413	3456	3506	3570
BAU Electricity, Industry, in mtoe	44	65	70	75	79	80	82	83	84	85

BAU Electricity (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TYRES for SERVICE-sector-related transport	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TYRES for RESIDENTIAL-sector-related transport	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TYRES for OTHER-sector-related transport	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BAU Electricity, Transport, in TWh	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BAU Electricity, Transport, in PJ	0	0	0	0	0	0	0	0	0	0
BAU Electricity, Transport, in mtoe	0	0	0	0	0	0	0	0	0	0

BAU Electricity (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**23**	**33**	**35**	**34**	**34**	**35**	**38**	**40**	**43**	**46**
SPACE HEATING	**84**	**118**	**120**	**117**	**115**	**113**	**112**	**112**	**112**	**112**
SPACE & HT PROCESS COOLING	**47**	**98**	**107**	**111**	**112**	**112**	**112**	**112**	**112**	**113**
VENTILATION	**20**	**31**	**31**	**32**	**33**	**35**	**37**	**39**	**42**	**44**
LIGHTING	**101**	**179**	**200**	**227**	**236**	**227**	**215**	**213**	**221**	**236**
ELECTRONICS	**27**	**80**	**86**	**97**	**109**	**119**	**121**	**119**	**117**	**116**
FOOD PRESERVATION	**99**	**94**	**91**	**90**	**92**	**95**	**98**	**102**	**106**	**109**
COOKING	**6**	**7**	**7**	**7**	**7**	**8**	**8**	**8**	**8**	**9**
CLEANING	**4**	**9**	**10**	**11**	**11**	**12**	**12**	**13**	**13**	**13**
INDUSTRY COMPONENTS	156	256	285	308	325	337	345	352	358	366
BAU Electricity, Services, in TWh	**568**	**906**	**974**	**1034**	**1074**	**1093**	**1099**	**1110**	**1133**	**1164**
BAU Electricity, Services, in PJ	2045	3261	3506	3721	3866	3934	3955	3997	4078	4190
BAU Electricity, Services, in mtoe	49	78	84	89	92	94	94	95	97	100

BAU Electricity (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**51**	**74**	**78**	**78**	**77**	**81**	**86**	**92**	**98**	**104**
SPACE HEATING	**173**	**193**	**191**	**181**	**174**	**170**	**171**	**174**	**178**	**182**
SPACE & HT PROCESS COOLING	**2**	**18**	**17**	**13**	**13**	**13**	**14**	**15**	**16**	**18**
VENTILATION	**3**	**7**	**8**	**8**	**10**	**13**	**16**	**19**	**22**	**25**
LIGHTING	**69**	**92**	**92**	**91**	**70**	**51**	**41**	**36**	**33**	**32**
ELECTRONICS	**44**	**129**	**148**	**148**	**142**	**150**	**148**	**143**	**139**	**138**
FOOD PRESERVATION	**103**	**104**	**106**	**107**	**108**	**108**	**108**	**107**	**107**	**107**
COOKING	**43**	**59**	**63**	**66**	**70**	**74**	**77**	**80**	**83**	**85**
CLEANING	**73**	**88**	**93**	**95**	**96**	**97**	**96**	**94**	**94**	**94**
INDUSTRY COMPONENTS	20	27	29	31	33	34	36	38	41	43
BAU Electricity, Residential, in TWh	**582**	**792**	**822**	**817**	**792**	**790**	**793**	**798**	**811**	**828**
BAU Electricity, Residential, in PJ	2096	2851	2959	2940	2851	2844	2853	2872	2918	2981
BAU Electricity, Residential, in mtoe	50	68	71	70	68	68	68	69	70	71

BAU Electricity (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**
SPACE HEATING	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**2**	**3**	**3**
SPACE & HT PROCESS COOLING	**5**	**9**	**10**	**11**	**11**	**11**	**11**	**11**	**12**	**12**
VENTILATION	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**1**
LIGHTING	**2**	**3**	**4**	**4**	**4**	**4**	**3**	**3**	**3**	**4**
ELECTRONICS	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
FOOD PRESERVATION	**4**	**4**	**5**	**5**	**6**	**6**	**7**	**7**	**8**	**8**
COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CLEANING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
INDUSTRY COMPONENTS	35	47	51	55	58	60	63	66	70	73
BAU Electricity, Other sectors, in TWh	**49**	**70**	**74**	**80**	**84**	**86**	**90**	**94**	**98**	**103**
BAU Electricity, Other sectors, in PJ	177	251	268	286	301	311	323	338	353	369
BAU Electricity, Other sectors, in mtoe	4	6	6	7	7	7	8	8	8	9

BAU Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	78	112	117	117	116	121	129	138	147	156
	Residential	51	74	78	78	77	81	86	92	98	104
	Tertiary / Services	23	33	35	34	34	35	38	40	43	46
	Industry	2	3	4	3	3	4	4	4	4	5
	Other	1	1	1	1	1	1	1	1	1	2
SPACE HEATING.	All sectors, TWh	273	332	331	317	307	300	300	302	307	311
	Residential	173	193	191	181	174	170	171	174	178	182
	Tertiary / Services	84	118	120	117	115	113	112	112	112	112
	Industry	13	18	17	16	15	15	14	14	14	14
	Other	2	3	3	3	3	3	2	2	3	3
SPACE COOLING.	All sectors, TWh	73	160	171	174	176	177	177	178	180	183
& HT PROCESS	Residential	2	18	17	13	13	13	14	15	16	18
	Tertiary / Services	47	98	107	111	112	112	112	112	112	113
	Industry	19	34	37	39	40	40	40	40	40	40
	Other	5	9	10	11	11	11	11	11	12	12
VENTILATION.	All sectors, TWh	26	43	44	45	48	53	59	65	70	76
	Residential	3	7	8	8	10	13	16	19	22	25
	Tertiary / Services	20	31	31	32	33	35	37	39	42	44
	Industry	3	5	5	5	5	5	6	6	6	7
	Other	0	0	0	0	0	0	0	0	0	1
LIGHTING.	All sectors, TWh	198	316	342	375	364	335	310	303	310	327
	Residential	69	92	92	91	70	51	41	36	33	32
	Tertiary / Services	101	179	200	227	236	227	215	213	221	236
	Industry	25	41	47	53	55	54	51	51	52	55
	Other	2	3	4	4	4	4	3	3	3	4
ELECTRONICS.	All sectors, TWh	72	219	244	256	264	284	285	277	271	269
	Residential	44	129	148	148	142	150	148	143	139	138
	Tertiary / Services	27	80	86	97	109	119	121	119	117	116
	Industry	1	9	9	10	12	14	14	14	14	14
	Other	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVE.	All sectors, TWh	225	239	243	249	258	267	276	285	294	304
	Residential	103	104	106	107	108	108	108	107	107	107
	Tertiary / Services	99	94	91	90	92	95	98	102	106	109
	Industry	20	36	41	47	53	58	63	69	74	80
	Other	4	4	5	5	6	6	7	7	8	8
COOKING.	All sectors, TWh	49	66	70	74	77	81	85	88	91	94
	Residential	43	59	63	66	70	74	77	80	83	85
	Tertiary / Services	6	7	7	7	7	8	8	8	8	9
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	77	98	104	106	108	110	109	109	108	108
	Residential	73	88	93	95	96	97	96	94	94	94
	Tertiary / Services	4	9	10	11	11	12	12	13	13	13
	Industry	0	1	1	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	639	936	1023	1096	1146	1177	1199	1218	1237	1258
	Residential	20	27	29	31	33	34	36	38	41	43
	Tertiary / Services	156	256	285	308	325	337	345	352	358	366
	Industry	428	606	658	703	731	746	755	761	768	776
	Other	35	47	51	55	58	60	63	66	70	73
TYRES.	Transport sector, TWh	0	0	0	0	0	0	0	0	0	0
	Residential transport	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services transport	0	0	0	0	0	0	0	0	0	0
	Industry transport	0	0	0	0	0	0	0	0	0	0
	Other transport	0	0	0	0	0	0	0	0	0	0
ALL PRODUCTS.	All sectors, TWh	1711	2520	2690	2808	2865	2905	2929	2962	3015	3086
	Residential	582	792	822	817	792	790	793	798	811	828
	Tertiary / Services	568	906	974	1034	1074	1093	1099	1110	1133	1164
	Industry	512	753	819	878	916	936	948	960	974	992
	Other	49	70	74	80	84	86	90	94	98	103
	Transport	0	0	0	0	0	0	0	0	0	0

BAU Electricity (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	66%	66%	66%	67%	67%	67%	67%	67%	67%	67%
	Tertiary / Services	30%	30%	30%	29%	29%	29%	29%	29%	29%	29%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	64%	58%	58%	57%	57%	57%	57%	58%	58%	59%
	Tertiary / Services	31%	36%	36%	37%	37%	38%	37%	37%	37%	36%
	Industry	5%	5%	5%	5%	5%	5%	5%	5%	5%	5%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE COOLING.											
& HT PROCESS	Residential	3%	11%	10%	8%	7%	8%	8%	8%	9%	10%
	Tertiary / Services	64%	62%	63%	64%	64%	63%	63%	63%	62%	62%
	Industry	26%	21%	22%	23%	23%	23%	22%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION											
	Residential	10%	16%	17%	19%	21%	24%	27%	29%	31%	33%
	Tertiary / Services	77%	72%	71%	70%	68%	65%	63%	61%	59%	58%
	Industry	12%	11%	11%	11%	10%	10%	9%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	29%	27%	24%	19%	15%	13%	12%	11%	10%
	Tertiary / Services	51%	57%	59%	61%	65%	68%	69%	70%	71%	72%
	Industry	13%	13%	14%	14%	15%	16%	17%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	61%	58%	54%	53%	52%	51%	51%	51%
	Tertiary / Services	37%	36%	35%	38%	41%	42%	43%	43%	43%	43%
	Industry	2%	4%	4%	4%	5%	5%	5%	5%	5%	5%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential	46%	44%	43%	43%	42%	40%	39%	38%	36%	35%
	Tertiary / Services	44%	39%	38%	36%	36%	36%	36%	36%	36%	36%
	Industry	9%	15%	17%	19%	20%	22%	23%	24%	25%	26%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
COOKING.											
	Residential	88%	89%	90%	90%	90%	90%	91%	91%	91%	91%
	Tertiary / Services	12%	11%	10%	10%	10%	10%	9%	9%	9%	9%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	89%	89%	89%	89%	88%	87%	87%	87%	87%
	Tertiary / Services	5%	10%	10%	10%	10%	11%	11%	12%	12%	12%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Tertiary / Services	24%	27%	28%	28%	28%	29%	29%	29%	29%	29%
	Industry	67%	65%	64%	64%	64%	63%	63%	63%	62%	62%
	Other	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%
TYRES.											
	Residential transport										
	Tertiary / Services transport										
	Industry transport										
	Other transport										
ALL PRODUCTS.											
	Residential	34%	31%	31%	29%	28%	27%	27%	27%	27%	27%
	Tertiary / Services	33%	36%	36%	37%	37%	38%	38%	37%	38%	38%
	Industry	30%	30%	30%	31%	32%	32%	32%	32%	32%	32%
	Other	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Transport	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	1	1	1	1	1	1	1	1
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	8	7	6	6	6	6	6	7	8
	EIWHS Electric Instant. Shower (secondary)	1.00	1	1	1	1	1	1	1	1	1	1
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	9	9	8	8	8	9	9	10	10
	ESWH Electric Storage > 30 L (primary)	1.00	57	80	81	76	71	72	76	81	86	90
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	0	0	0	0	0	0	0	0	0	0
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Condensing	0.010	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	0.008	0	0	0	0	0	0	0	0	0	0
	Dedicated WH Heat Pump	1.00	0	0	1	1	2	3	4	5	7	8
	Dedicated WH Solar (3.5 m2)	0.80	1	5	6	6	6	5	5	5	5	5
	WH dedicated Water Heater		**73**	**103**	**106**	**100**	**94**	**95**	**101**	**109**	**116**	**123**
	CHB Gas Combi Instant. WH	0.04	1	3	3	3	3	2	2	2	2	2
	CHB Gas + Cyl. WH	0.04	1	1	1	1	1	1	1	1	1	1
	CHB Jet Burner Gas + Cyl. WH	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	0.04	1	1	1	1	1	0	0	0	0	0
	CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1
	CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	0	0	0	1
	CHB Electric HP + Cyl. WH	1.00	0	2	3	4	6	9	12	16	21	25
	CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0.04	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating		**5**	**9**	**10**	**11**	**12**	**14**	**18**	**22**	**26**	**29**
	TOTAL WATER HEATING		**78**	**112**	**115**	**111**	**106**	**109**	**119**	**130**	**141**	**152**
	CHB Gas non-condensing	0.04	16	18	14	9	4	2	1	0	0	0
	CHB Gas condensing	0.04	0	6	8	11	13	14	13	12	10	9
	CHB Gas Jet burner non-condensing	0.04	2	1	1	1	0	0	0	0	0	0
	CHB Gas Jet burner condensing	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Oil Jet burner non-condensing	0.04	21	13	10	7	4	2	1	0	0	0
	CHB Oil Jet burner condensing	0.04	0	0	0	1	1	1	2	2	2	2
	CHB Electric Joule-effect	1.00	13	13	14	15	14	13	12	10	9	8
	CHB Hybrid (gas-electric)	0.60	0	0	0	0	1	2	3	5	6	8
	CHB Electric Heat Pump	1.00	2	11	15	20	28	38	52	66	79	91
	CHB Gas Heat Pump	0.04	0	0	0	0	0	0	0	0	0	0
	CHB micro CHP	0.04	0	0	0	0	0	0	0	0	0	0
	CHB Solar combi (16 m2)	0.10	0	0	0	0	0	0	0	0	0	0
	CHB Central Heating boiler < 400 kW, space heating		**54**	**64**	**63**	**63**	**66**	**72**	**83**	**95**	**107**	**118**
	SFB Wood Manual	0	0	0	0	0	0	0	0	0	0	0
	SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0	0
	SFB Coal	0	0	0	0	0	0	0	0	0	0	0
	SFB Pellets	0	0	0	0	0	0	0	0	0	0	0
	SFB Wood chips	0	0	0	0	0	0	0	0	0	0	0
	Total Solid Fuel Boiler		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CHAE-S (≤ 400 kW)	1	3	9	10	11	11	10	10	10	10	10
	CHAE-L (> 400 kW)	1	5	13	14	14	14	13	12	11	10	10
	CHWE-S (≤ 400 kW)	1	0	1	1	1	1	1	1	1	1	1
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	1	3	3	3	3	3	3	2	2	2
	CHWE-L (> 1500 kW)	1	1	2	2	2	2	2	2	2	1	1
	CHF	0.05	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	20	32	35	37	37	37	37	38	39	40
	HT PCH-AE-L	1	19	31	34	35	35	33	33	33	34	35
	HT PCH-WE-S	1	4	7	7	8	8	8	8	8	9	9
	HT PCH-WE-M	1	8	13	15	16	16	16	17	17	17	18
	HT PCH-WE-L	1	2	3	3	3	3	3	3	3	3	4
	AC rooftop	1	3	7	7	6	4	3	1	1	0	0
	AC splits	1	4	11	11	10	9	8	7	6	6	5
	AC VRF	1	0	3	4	5	6	8	9	9	10	10
	ACF	0.05	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**70**	**133**	**146**	**151**	**149**	**145**	**142**	**142**	**144**	**146**
	AC rooftop (rev)	1	4	11	11	10	7	4	2	1	0	0
	AC splits (rev)	1	7	21	22	21	19	16	14	13	11	10
	AC VRF (rev)	1	0	7	10	14	16	19	21	22	22	22
	ACF (rev)	0.05	0	0	0	0	0	0	0	0	0	0
	AHF	0.05	4	3	3	2	2	1	1	1	1	1
	AHE	1	1	3	2	1	1	1	1	1	1	1
	SubTotal AHC central Air Heating		**16**	**45**	**48**	**47**	**45**	**42**	**39**	**37**	**36**	**34**
	Total AHC central Air Heating & Cooling		**86**	**178**	**194**	**199**	**194**	**186**	**181**	**180**	**180**	**180**

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH Solid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Electric portable	1	23	22	21	18	16	15	15	14	13	13
	LH Electric fixed > 250W	1	124	111	101	85	68	58	54	52	49	47
	LH Electric fixed ≤ 250W	1	8	7	7	6	5	4	4	3	3	3
	LH Electric storage	1	7	7	6	5	4	4	4	3	3	3
	LH Electric underfloor	1	21	21	20	20	19	18	17	16	16	15
	LH Electric visibly glowing > 1.2 kW	1	2	2	2	2	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	1	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	1	7	9	10	9	9	8	7	7	7	6
	LH Electric sum		**193**	**179**	**167**	**145**	**123**	**108**	**102**	**97**	**93**	**89**
	LH Gaseous fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Liquid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH total		**193**	**179**	**167**	**145**	**123**	**108**	**102**	**97**	**93**	**89**
	RAC fixed < 6 kW, cooling	1	2	13	10	7	7	8	9	10	11	12
	RAC fixed 6-12 kW, cooling	1	1	6	6	4	4	5	5	5	6	6
	RAC portable < 12 kW, cooling	1	0	1	1	1	1	1	1	1	1	1
	RAC < 12 kW total, cooling mode		**3**	**20**	**17**	**12**	**12**	**13**	**15**	**16**	**18**	**19**
	RAC fixed < 6 kW, reversible, heating	1	1	16	17	16	20	26	33	41	48	53
	RAC fixed 6-12 kW, reversible, heating	1	0	8	9	9	10	13	16	19	22	23
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**1**	**24**	**26**	**25**	**31**	**39**	**49**	**59**	**69**	**77**
	RAC Room Air Conditioner		**4**	**44**	**43**	**37**	**43**	**53**	**64**	**76**	**87**	**96**
1	CIRC Integrated circulators	1	13	19	17	14	12	13	13	13	13	13
0.38	CIRC Large standalone circulators	1	8	12	10	7	6	5	5	5	5	5
0.38	CIRC Small standalone circulators	1	6	9	7	4	3	3	3	3	3	3
	CIRC Circulator pumps <2.5 kW, all	1	**27**	**39**	**33**	**24**	**21**	**21**	**21**	**20**	**20**	**20**
	CIRC Circulator pumps <2.5 kW, excl. double		**9**	**13**	**10**	**7**	**6**	**5**	**5**	**5**	**5**	**5**
	TOTAL SPACE HEATING		**273**	**324**	**314**	**287**	**270**	**266**	**277**	**293**	**310**	**322**
	TOTAL SPACE COOLING		**73**	**153**	**162**	**164**	**161**	**158**	**157**	**159**	**162**	**165**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.1	0.1	0.2	0.6	1.2	1.9	2.6	3.3	4.0
	R-UVU 100-250 m3/h	1	0.4	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7
	R-BVU 100-250 m3/h	1	0.0	0.1	0.1	0.1	0.2	0.4	0.6	0.8	0.9	1.2
	R-UVU 250-1000 m3/h	1	2.1	5.0	5.3	5.3	4.9	4.6	4.5	4.5	4.5	4.5
	R-BVU 250-1000 m3/h	1	0.0	0.5	0.7	0.8	1.6	2.8	4.1	5.5	6.8	8.3
	R-UVU > 1000 m3/h	1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	R-BVU 1000-2500 m3/h	1	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	RVU, Total residential		**3**	**7**	**8**	**8**	**8**	**10**	**12**	**15**	**17**	**19**
	NR-UVU 250-1000 m3/h	1	0.9	1.9	2.0	1.9	1.7	1.5	1.4	1.4	1.4	1.3
	NR-BVU 250-1000 m3/h	1	0.0	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.6	2.8
	NR-UVU > 1000 m3/h	1	0.6	1.1	1.0	0.8	0.7	0.6	0.6	0.6	0.6	0.5
	NR-BVU 1000-2500 m3/h	1	0.0	0.7	0.9	1.0	1.1	1.3	1.4	1.6	1.8	2.0
	NR-AHU-S 2500-5500 m3/h	1	0.2	2.5	3.4	4.1	4.5	5.0	5.5	6.2	6.8	7.4
	NR-AHU-M 5500-14500 m3/h	1	17.2	22.9	21.7	20.2	19.3	19.4	19.8	20.5	21.3	22.0
	NR-AHU-L > 14500 m3/h	1	4.9	6.5	6.1	5.6	5.4	5.3	5.4	5.7	5.9	6.0
	NRVU, Total non-residential		**24**	**36**	**36**	**35**	**34**	**35**	**36**	**38**	**40**	**42**
	VU Ventilation Units, res + non-res		**26**	**43**	**44**	**43**	**43**	**45**	**49**	**53**	**57**	**61**
	TOTAL VENTILATION (VU own electricity)		**26**	**43**	**44**	**43**	**43**	**45**	**49**	**53**	**57**	**61**
1	***Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)***		*-*	*-*	*-1*	*-3*	*-6*	*-9*	*-12*	*-13*	*-14*	*-15*
	LS, electricity incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	77	120	141	151	122	68	31	15	9	5
	HID (HPM, HPS, MH)	1	29	61	53	45	33	17	7	2	1	0
	CFLni (all shapes)	1	2	8	8	7	5	2	1	0	0	0
	CFLi (retrofit for GLS, HL)	1	1	14	18	14	5	1	0	0	0	0
	GLS (DLS & NDLS)	1	74	42	12	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	1	6	40	50	21	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	1	0	0	2	12	39	74	100	117	132	149
	LED replacing HID (retrofit & luminaire)	1	0	0	9	19	29	38	46	54	62	70
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	1	2	3	4	4	5	5
	LED replacing DLS (retrofit & luminaire)	1	0	0	1	3	5	5	6	6	6	7
	LED replacing NDLS (retrofit & luminaire)	1	0	0	2	11	19	22	24	25	26	28
	Standby (estimate)	1	9	15	13	11	9	7	7	7	7	7
	SUBTOTAL non-LED		188	286	281	237	166	89	39	18	10	6
	SUBTOTAL LED		0	0	13	45	94	142	179	206	232	259
	TOTAL LIGHTING (incl. standby)		**198**	**300**	**307**	**294**	**269**	**239**	**225**	**232**	**249**	**273**

db ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
DP TV on-mode, total all types	1	23	62	66	57	35	32	28	30	35	41
DP TV standby, standard (NoNA)	1	3	2	1	0	0	0	0	0	0	0
DP TV standby, LoNA	1	0	0	1	1	1	0	0	0	0	0
DP TV standby, HiNA ('Smart')	1	0	0	2	4	6	8	8	7	6	5
DP TV standby, total all types		**3**	**2**	**3**	**5**	**7**	**8**	**8**	**7**	**6**	**5**
DP TV total on-mode + standby		**27**	**64**	**68**	**62**	**42**	**40**	**36**	**38**	**42**	**46**
DP Monitor on-mode	1	1	12	7	3	2	2	1	1	1	1
DP Monitor standby	1	0	1	0	0	0	0	0	0	0	0
DP Monitor total		**1**	**13**	**7**	**3**	**2**	**2**	**1**	**1**	**1**	**1**
DP Signage on-mode	1	0	1	8	18	21	18	13	13	14	17
DP Signage standby	1	0	0	1	3	3	3	2	2	2	2
DP Signage total		**0**	**1**	**9**	**21**	**24**	**20**	**15**	**15**	**17**	**19**
DP Electronic Displays, total on-mode		**24**	**75**	**80**	**77**	**59**	**51**	**43**	**45**	**51**	**59**
DP Electronic Displays, total standby		**3**	**3**	**4**	**8**	**10**	**11**	**10**	**9**	**9**	**8**
DP Electronic Displays, total		**27**	**78**	**84**	**85**	**69**	**62**	**53**	**54**	**60**	**67**
SSTB	1	0	2	1	0	0	0	0	0	0	0
CSTB (low-power modes)	1	0.0	5.0	10.6	8.6	8.0	7.8	7.7	7.7	7.7	7.7
CSTB (other modes)	1	0.0	2.7	5.7	4.6	4.3	4.2	4.1	4.1	4.1	4.1
CSTB (all covered modes)	1	0	8	16	13	12	12	12	12	12	12
Total STB set top boxes (Complex & Simple)		**0**	**9**	**18**	**13**	**12**	**12**	**12**	**12**	**12**	**12**
Game consoles > 20 W Active modes (SRI)	1	0.0	2.4	3.7	3.6	3.5	3.5	3.5	3.5	3.5	3.5
Game consoles > 20 W Non-Active (CR)	1	0.0	1.3	1.5	0.9	0.6	0.6	0.6	0.6	0.6	0.6
Game consoles < 20 W Non-Active (CR)	1	0.0	0.9	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3
Game consoles < 20 W Active (no reg.)	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Game consoles, active modes		0.0	2.6	3.9	3.7	3.6	3.6	3.6	3.6	3.6	3.6
Total Game consoles, non-active modes		0.0	2.2	2.4	1.5	0.9	0.9	0.9	0.9	0.9	0.9
Total Game consoles > 20 W, all modes		0.0	3.7	5.2	4.5	4.1	4.1	4.1	4.1	4.1	4.1
Total Game consoles < 20 W, all modes		0.0	1.1	1.1	0.6	0.4	0.4	0.4	0.4	0.4	0.4
Total Game consoles, all modes		**0.0**	**4.7**	**6.3**	**5.1**	**4.6**	**4.5**	**4.5**	**4.5**	**4.5**	**4.5**
ES&DS only, without effects on infrastructure											
ES tower 1-socket traditional	1	0.0	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3
ES rack 1-socket traditional	1	0.1	2.8	2.1	1.7	1.8	1.9	2.0	2.0	2.0	2.0
ES rack 2-socket traditional	1	0.6	13.0	7.0	3.9	4.5	5.4	5.8	5.8	5.8	5.8
ES rack 2-socket cloud	1		7.3	11.3	11.9	13.9	16.6	18.0	18.0	18.0	18.0
ES rack 4-socket traditional	1	0.1	1.4	0.7	0.6	0.6	0.8	0.8	0.8	0.8	0.8
ES rack 4-socket cloud	1		0.8	1.4	1.8	2.1	2.5	2.7	2.7	2.7	2.7
ES rack 2-socket resilient trad.	1	0.0	0.7	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.3
ES rack 2-socket resilient cloud	1		0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
ES rack 4-socket resilient trad.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	1		0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ES blade 1-socket traditional	1	0.0	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
ES blade 2-socket traditional	1	0.5	5.9	3.0	1.9	2.2	2.6	2.8	2.8	2.8	2.8
ES blade 2-socket cloud	1		3.3	5.0	5.8	6.8	8.1	8.8	8.8	8.8	8.8
ES blade 4-socket traditional	1	0.1	0.7	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3
ES blade 4-socket cloud	1		0.4	0.6	0.7	0.8	0.9	1.0	1.0	1.0	1.0
ES total traditional		**2**	**26**	**15**	**10**	**11**	**12**	**13**	**13**	**13**	**13**
ES total cloud		**0**	**12**	**19**	**21**	**24**	**29**	**31**	**31**	**31**	**31**
ES Enterprise Servers total		**2**	**38**	**34**	**30**	**35**	**41**	**44**	**44**	**44**	**44**
DS Online 2	1	0.3	5.7	7.7	10.4	13.0	15.6	16.3	16.4	16.4	16.4
DS Online 3	1	0.1	0.8	1.1	1.5	1.8	2.2	2.3	2.3	2.3	2.3
DS Online 4	1	0.2	3.3	4.3	5.7	7.1	8.5	8.9	9.0	9.0	9.0
DS Data Storage products total		**1**	**10**	**13**	**18**	**22**	**26**	**27**	**28**	**28**	**28**
ES + DS total (excl. infrastructure)		**2**	**48**	**47**	**48**	**57**	**67**	**72**	**72**	**72**	**72**
PC Desktop	1	16	21	14	9	10	11	11	10	10	9
PC Integrated Desktop	1	0	1	1	0	1	1	1	1	1	1
PC Notebook	1	0	7	8	7	7	8	8	8	8	8
PC Tablet/slate	1	0	0	2	2	1	1	1	1	1	1
PC Thin client	1	0	1	0	0	0	0	0	0	0	0
PC Integrated Thin Client	1	0	0	0	0	0	0	0	0	0	0
PC Small-scale Server	1	0	0	0	0	0	0	0	0	0	0
PC Workstation	1	1	1	1	2	2	2	2	2	2	2
Total PC, electricity		**17**	**31**	**27**	**20**	**21**	**23**	**23**	**23**	**22**	**21**

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Inkjet Printer	1	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	1.2	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	EP / Laser Printer mono	1	7.9	1.8	1.2	0.7	0.5	0.4	0.3	0.2	0.2	0.1
	EP / Laser Printer colour	1	0.0	1.1	1.2	1.1	1.2	1.2	1.3	1.3	1.4	1.4
	EP / Laser Copier mono	1	8.8	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	1.5	1.3	1.0	0.8	0.8	0.7	0.7	0.7	0.6
	EP / Laser MFD colour	1	0.0	2.1	1.9	1.2	0.9	0.9	0.9	0.8	0.8	0.7
	Total IE Imaging Equipment		**19**	**8**	**7**	**5**	**4**	**4**	**4**	**3**	**3**	**3**
	of which for modes under CR 1275/2008		*14*	*6*	*5*	*3*	*3*	*3*	*3*	*3*	*2*	*2*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	2.0	5.9	4.5	2.9	2.5	2.3	2.1	1.9	1.6	1.4
	SB Electric toothbrushes (off mode)	1	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	SB Audio speakers (wired) (sb & off modes)	1	1.7	2.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
	SB Small appliances (sb & off modes)	1	1.3	6.9	5.0	3.5	3.6	3.6	3.6	3.7	3.7	3.8
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	SB Media players and recorders (sb mode)	1	0.0	2.7	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.4	3.1	3.3	2.8	1.9	1.8	1.7	1.7	1.7	1.6
	SB Office phones (nsb mode)	1	0.6	2.2	1.9	1.2	0.8	0.8	0.8	0.8	0.8	0.7
	SB Home NAS (nsb mode)	1	0.0	0.9	1.4	0.7	0.7	0.9	1.0	1.1	1.2	1.2
	SB Home Network Equipment (nsb mode)	1	0.0	2.7	3.2	3.1	3.3	3.4	3.7	3.8	3.8	3.8
	SB Office Network Equipment (nsb mode)	1	0.0	0.3	1.0	1.3	2.0	2.7	3.2	3.3	3.3	3.3
	SB Coffee makers (off mode)	1	0.8	1.0	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7
	Products regulated also for (networked) standby											
	(already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	1.2	0.6	0.7	*0.6*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.5	0.5	0.5	*0.5*	*0.5*	*0.6*	*0.6*	*0.7*	*0.7*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	1	0.0	3.1	3.2	2.7	1.8	1.0	0.9	0.9	0.9	0.9
1	SB Electric Hobs (sb mode)	1	0.0	1.2	1.2	1.0	0.8	0.7	0.8	0.8	0.8	0.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	5.0	10.6	8.6	8.0	7.8	7.7	7.7	7.7	7.7
1	SB Game consoles (non-active modes)	1	0.0	2.2	2.4	1.5	0.9	0.9	0.9	0.9	0.9	0.9
1	SB IE Inkjet Printers (nsb mode)	1	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	1.0	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2
1	SB IE Laser Printers (nsb mode)	1	5.9	2.2	1.8	1.4	1.2	1.2	1.2	1.2	1.1	1.1
1	SB IE Laser Copiers (nsb mode)	1	6.6	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	2.7	2.5	1.6	1.3	1.3	1.2	1.1	1.1	1.0
	Total (networked) SB (incl. double)		21	48	47	37	32	32	32	32	32	32
	Total (networked) SB (excl. double)		**7**	**29**	**23**	**18**	**18**	**18**	**19**	**19**	**19**	**19**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.1	0.9	0.8	0.7	0.6	0.7	0.7	0.7	0.7	0.8
0.6	EPS 10–12 W	1	0	6.7	9.3	8.5	7.3	7.3	7.4	7.4	7.5	7.5
0.5	EPS 15–20 W	1	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1.0	EPS 20–30 W	1	0.0	0.8	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.4
0.8	EPS 30–65 W, multiple-V	1	0	0	0	0.1	0.1	0.2	0.3	0.3	0.4	0.5
1.0	EPS 30-65 W	1	0	0	0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	1	0.0	0.2	0.2	0.2	0.1	0.0	0	0	0	0
0.5	EPS 65–120 W, multiple-V	1	0	1.2	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	EPS 12–15 W	1	0.0	0.2	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5
	EPS, total for active mode		**0.1**	**10.4**	**12.7**	**11.0**	**9.6**	**9.7**	**9.7**	**9.8**	**9.9**	**10.0**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.1	1.0	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.0	EPS 10–12 W	1	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.1**	**1.5**	**1.1**	**0.6**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
	EPS, overall total (active + no-load)		**0.2**	**11.9**	**13.8**	**11.6**	**10.0**	**10.0**	**10.1**	**10.2**	**10.3**	**10.4**
	EPS, double counted subtracted		**0.2**	**6.2**	**6.8**	**5.7**	**4.7**	**4.7**	**4.8**	**4.8**	**4.9**	**4.9**
	TOTAL ELECTRONICS		**72**	**214**	**219**	**200**	**190**	**195**	**192**	**193**	**197**	**203**

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**112**	**85**	**71**	**61**	**51**	**42**	**35**	**31**	**29**	**27**
	CF open vertical chilled multi deck (RVC2)	1	14	13	12	11	9	7	5	5	5	5
	CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	1	1	1	1	1
	CF other supermarket display (non-BCs)	1	24	23	23	22	21	19	17	16	17	17
	CF Plug in one door beverage cooler	1	15	16	15	14	11	8	7	7	7	7
	CF Plug in horizontal ice cream freezer	1	3	4	3	3	3	2	2	2	2	2
	CF Spiral vending machine	1	4	3	2	1	1	1	1	1	1	1
	Total CF Commercial Refrigeration		**62**	**59**	**56**	**52**	**46**	**37**	**33**	**32**	**32**	**33**
	PF Storage cabinet Chilled Vertical (CV)	1	1.5	2.2	2.3	2.1	1.6	1.6	1.6	1.7	1.8	1.8
	PF Storage cabinet Frozen Vertical (FV)	1	1.8	2.5	2.7	2.4	1.9	1.8	1.9	2.0	2.0	2.1
	PF Storage cabinet Chilled Horizontal (CH)	1	1.2	1.7	1.8	1.6	1.3	1.2	1.3	1.3	1.4	1.5
	PF Storage cabinet Frozen Horizontal (FH)	1	0.7	1.0	1.1	1.0	0.7	0.7	0.7	0.8	0.8	0.8
	PF Storage cabinets All types	1	**5**	**7**	**8**	**7**	**6**	**5**	**6**	**6**	**6**	**6**
	PF Process Chiller AC MT S ≤ 300 kW	1	2.9	6.3	7.4	8.3	9.1	9.8	10.6	11.6	12.5	13.5
	PF Process Chiller AC MT L > 300 kW	1	2.8	6.0	7.1	8.0	8.8	9.5	10.3	11.2	12.1	13.1
	PF Process Chiller AC LT S ≤ 200 kW	1	2.9	6.3	7.4	8.4	9.2	9.9	10.8	11.8	12.7	13.7
	PF Process Chiller AC LT L > 200 kW	1	3.0	6.5	7.7	8.7	9.5	10.2	11.2	12.1	13.1	14.1
	PF Process Chiller WC MT S ≤ 300 kW	1	0.8	1.7	2.1	2.3	2.5	2.7	3.0	3.2	3.5	3.8
	PF Process Chiller WC MT L > 300 kW	1	1.2	2.6	3.0	3.4	3.8	4.1	4.4	4.8	5.2	5.6
	PF Process Chiller WC LT S ≤ 200 kW	1	1.0	2.2	2.6	3.0	3.3	3.5	3.8	4.2	4.5	4.9
	PF Process Chiller WC LT L > 200 kW	1	1.3	2.8	3.3	3.8	4.1	4.4	4.8	5.3	5.7	6.1
	PF Process Chiller All MT&LT	1	**16**	**35**	**41**	**46**	**50**	**54**	**59**	**64**	**69**	**75**
	PF Condensing Unit MT S 0.2-1 kW	1	6	5	4	4	5	5	5	6	6	7
	PF Condensing Unit MT M 1-5 kW	1	14	12	11	11	12	13	14	15	16	17
	PF Condensing Unit MT L 5-20 kW	1	17	14	14	14	14	16	17	18	19	21
	PF Condensing Unit MT XL 20-50 kW	1	17	14	14	14	14	16	17	18	19	21
	PF Condensing Unit LT S 0.1-0.4 kW	1	1	1	1	1	1	1	1	1	1	1
	PF Condensing Unit LT M 0.4-2 kW	1	3	2	2	2	2	2	2	3	3	3
	PF Condensing Unit LT L 2-8 kW	1	4	4	3	3	3	4	4	4	4	5
	PF Condensing Unit LT XL 8-20 kW	1	13	11	11	11	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	1	**75**	**62**	**60**	**60**	**62**	**67**	**72**	**78**	**84**	**90**
	PF Professional Refrigeration, Total		**51**	**67**	**73**	**77**	**81**	**86**	**93**	**101**	**109**	**117**
	TOTAL FOOD PRESERVATION		**225**	**210**	**200**	**191**	**178**	**166**	**161**	**164**	**170**	**177**
	CA Electric Hobs (active modes)	1	19	29	32	35	38	40	42	44	46	48
	CA Electric Hobs (low-power modes)	1	0.0	1.2	1.2	1.0	0.8	0.7	0.8	0.8	0.8	0.8
	CA Electric Hobs (sum all modes)	1	19	30	33	36	39	41	43	45	47	49
	CA Electric Ovens (active modes)	1	21	21	20	19	18	18	18	18	18	18
	CA Electric Ovens (low-power modes)	1	0.0	3.1	3.2	2.7	1.8	1.0	0.9	0.9	0.9	0.9
	CA Electric Ovens (sum all modes)	1	21	24	23	22	20	19	19	19	19	19
	CA Gas Hobs	0	0	0	0	0	0	0	0	0	0	0
	CA Gas Ovens	0	0	0	0	0	0	0	0	0	0	0
	CA Range Hoods	1	9	11	12	12	11	11	11	11	11	12
	CA Elec. Hobs&Ovens low-power modes	1	0	4	4	4	3	2	2	2	2	2
	CA other products or modes		49	62	64	66	67	69	71	73	76	78
	TOTAL COOKING		**49**	**66**	**69**	**70**	**70**	**71**	**72**	**75**	**77**	**80**
	WM Washing Machines, active modes	1	43	27	23	19	17	17	16	16	16	16
	WM Washing Machines, low-power modes	1	0.0	1.2	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5
	WM Washing Machines, all modes	1	43	28	23	20	18	17	17	16	16	16
	WD Washer-Dryers, active modes	1	7.1	7.6	6.9	6.5	6.2	6.1	6.0	6.0	6.0	6.0
	WD Washer-Dryers, low-power modes	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers, all modes	1	7	8	7	7	6	6	6	6	6	6
	WM-WD Washing, sum active modes	1	50	34	29	26	24	23	22	22	22	22
	WM-WD Washing, sum low-power modes	1	0.0	1.3	0.7	0.7	0.6	0.5	0.5	0.5	0.5	0.5
	Total WM-WD household Washing	1	**50**	**36**	**30**	**27**	**24**	**23**	**23**	**22**	**22**	**22**
	DW Dishwashers, active modes	1	10	15	16	18	19	21	22	23	24	25
	DW Dishwashers, low-power modes	1	0.0	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7
	Total DW household Dishwasher	1	**10**	**15**	**16**	**18**	**20**	**21**	**23**	**24**	**25**	**26**
	LD condensing heat pump	1		0.1	1.0	2.3	3.3	3.8	4.3	4.6	4.6	4.6
	LD condensing electric heat element	1	1.3	8.8	8.1	6.1	4.6	3.8	3.3	2.9	2.9	2.9
	LD vented electric	1	6.5	6.9	5.0	2.8	1.6	0.9	0.3	0.0		
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	LD Laundry Dryers, sum active modes		8	15	14	11	9	8	8	7	7	7
	LD Laundry Dryers, low-power modes	1	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	Total LD household Laundry Dryer		**8**	**16**	**14**	**11**	**9**	**9**	**8**	**7**	**7**	**7**

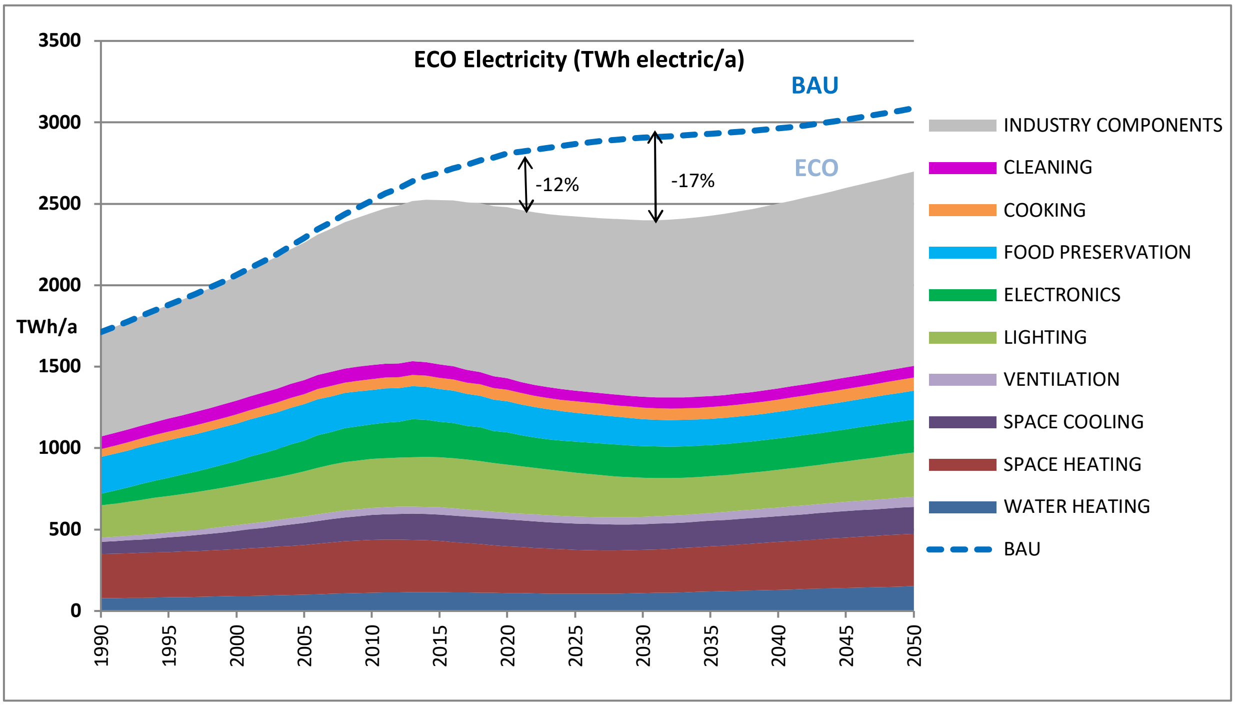
db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	7.5	11.4	13.7	8.5	4.6	3.8	2.8	2.1	1.9	1.9
	VC Upright Domestic mains	1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	1	0.1	0.1	0.3	0.3	0.4	0.6	0.7	0.9	0.9	0.9
	VC Total Domestic mains		**8**	**12**	**14**	**9**	**5**	**4**	**4**	**3**	**3**	**3**
	VC Cylinder Commercial mains	1	1.5	6.0	6.0	3.1	3.0	2.9	2.9	2.9	2.9	2.9
	VC Upright Commercial mains	1	0.3	0.9	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	VC Total Commercial mains		**2**	**7**	**7**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	VC Total in scope of CR 666/2013		**9**	**19**	**21**	**12**	**8**	**8**	**7**	**6**	**6**	**6**
	VC Cordless - domestic - cleaning	1	0.0	0.1	0.3	0.8	1.7	2.9	3.9	4.4	4.5	4.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.4
	VC Cordless - domestic - standby	1	0.0	0.1	0.2	0.7	1.2	1.7	2.2	2.5	2.7	2.7
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.6	0.7	0.7
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	1	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total VC Vacuum Cleaner		**10**	**19**	**22**	**14**	**12**	**14**	**15**	**15**	**16**	**16**
	TOTAL CLEANING		**77**	**86**	**82**	**70**	**66**	**67**	**68**	**69**	**70**	**71**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	53	55	57	58	58	58	58	58
0.5	FAN Axial>300Pa	1	28	85	96	98	97	96	95	95	95	95
0.5	FAN Centr.FC	1	7	15	18	18	17	17	17	17	17	17
0.5	FAN Centr.BC-free	1	18	39	45	47	49	52	55	57	58	59
0.5	FAN Centr.BC	1	19	44	51	53	55	59	64	68	74	81
0.5	FAN Cross-flow	1	1	2	2	2	1	1	1	1	2	2
	Total FAN, industrial (excl. box & roof fans)		**45**	**115**	**132**	**136**	**138**	**142**	**145**	**148**	**152**	**156**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	97	124	127	114	100	98	97	96	95	94
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	146	191	197	176	151	144	141	138	134	131
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	297	381	385	356	313	270	253	239	229	224
0.45	**Total 3ph 0.75-375 kW no VSD**		**541**	**696**	**709**	**646**	**565**	**512**	**491**	**473**	**458**	**449**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	7	15	19	31	42	45	48	51	54	57
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	12	29	40	64	86	94	100	106	113	119
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	34	84	113	162	209	249	268	287	304	318
0.45	**Total 3-ph 0.75-375 kW with VSD**		**52**	**128**	**173**	**257**	**337**	**388**	**416**	**443**	**471**	**495**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**593**	**824**	**881**	**903**	**901**	**899**	**907**	**917**	**929**	**944**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	7	10	10	10	10	10	10	10	10	10
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	1	1	1	1	1	1	1	1	1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**7**	**10**	**11**	**12**	**11**	**11**	**11**	**11**	**11**	**11**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	10	14	14	15	14	14	14	14	14	14
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	1	2	2	2	2	2	2	3	3
0.45	**Total Small 3-ph 0.12-0.75 kW**		**11**	**15**	**16**	**17**	**16**	**16**	**16**	**16**	**17**	**17**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	152	185	181	172	161	153	150	149	148	146
0.45	Large 3-ph LV 375-1000kW with VSD	1	8	42	63	86	106	120	127	133	140	147
0.45	**Total Large 3-ph LV 375-1000 kW**		**160**	**226**	**243**	**258**	**267**	**273**	**277**	**282**	**287**	**293**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	3	4	5	5	5	5	5	5	5	6
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	8	11	12	13	14	14	14	15	15	15
0.45	Explosion motors (L) 3-ph 75-375 kW	1	15	22	24	26	28	29	29	30	31	31
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**26**	**37**	**41**	**45**	**47**	**48**	**49**	**50**	**51**	**52**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	2	3	3	4	4	4	4	4	4	4
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	5	7	8	9	9	9	9	10	10	10
0.45	Brake motors (L) 3-ph 75-375 kW	1	7	11	12	13	14	14	15	15	15	16
0.45	**Total Brake 0.75-375 kW (no VSD)**		**15**	**21**	**24**	**25**	**26**	**27**	**28**	**28**	**29**	**30**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	1	1	1	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**40**	**55**	**60**	**65**	**67**	**67**	**67**	**69**	**70**	**71**
	MT Elec. Motors LV 0.12-1000 kW		**469**	**655**	**703**	**729**	**736**	**738**	**746**	**756**	**768**	**781**
	including double counted amounts		853	1 191	1 279	1 326	1 338	1 343	1 357	1 375	1 396	1 421

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	16.5	21.7	22.9	24.1	25.1	25.9	27.3	29.1	31.0	32.8
	ESOB<45_CF	1	10.9	14.7	15.6	16.7	17.9	18.9	20.1	21.4	22.8	24.1
	ESOB<45_VSD-VF	1	0.5	1.0	1.1	1.4	2.0	2.5	2.7	2.9	3.1	3.3
	ESOB < 45 Total	1	**28**	**37**	**40**	**42**	**45**	**47**	**50**	**53**	**57**	**60**
	ESOB_45-150_VF	1	5.7	7.3	7.7	8.1	8.2	8.3	8.7	9.3	9.9	10.4
	ESOB_45-150_CF	1	9.4	12.7	13.5	14.5	15.6	16.4	17.5	18.6	19.8	21.0
	ESOB_45-150_VSD-VF	1	0.3	0.6	0.7	0.9	1.2	1.5	1.7	1.8	1.9	2.1
	ESOB 45-150 Total	1	**15**	**21**	**22**	**23**	**25**	**26**	**28**	**30**	**32**	**33**
	ESOB < 150 Total	1	**43**	**58**	**61**	**66**	**70**	**74**	**78**	**83**	**88**	**94**
	ESCC<45_VF	1	13.8	18.0	18.9	19.8	20.4	21.0	22.1	23.6	25.0	26.5
	ESCC<45_CF	1	9.2	12.4	13.1	14.0	15.0	15.9	16.9	18.0	19.1	20.3
	ESCC<45_VSD-VF	1	0.5	1.0	1.2	1.5	2.1	2.6	2.9	3.1	3.2	3.4
	ESCC < 45 Total	1	**23**	**31**	**33**	**35**	**38**	**39**	**42**	**45**	**47**	**50**
	ESCC_45-150_VF	1	5.0	6.6	6.9	7.3	7.5	7.7	8.1	8.7	9.2	9.8
	ESCC_45-150_CF	1	3.5	4.7	5.0	5.4	5.8	6.1	6.5	6.9	7.3	7.8
	ESCC_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCC 45-150 Total	1	**9**	**12**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
	ESCC < 150 Total	1	**32**	**43**	**46**	**49**	**52**	**54**	**58**	**61**	**65**	**69**
	ESCCi<45_VF	1	6.9	8.3	8.4	8.2	7.2	6.3	6.4	6.8	7.2	7.6
	ESCCi<45_CF	1	0.6	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3
	ESCCi<45_VSD-VF	1	1.0	2.0	2.3	3.0	4.1	5.0	5.6	5.9	6.3	6.7
	ESCCi < 45 Total	1	**9**	**11**	**12**	**12**	**12**	**12**	**13**	**14**	**15**	**16**
	ESCCi_45-150_VF	1	1.3	1.5	1.6	1.5	1.4	1.2	1.2	1.3	1.4	1.4
	ESCCi_45-150_CF	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCCi 45-150 Total	1	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
	ESCCi < 150 Total	1	**10**	**13**	**14**	**14**	**15**	**15**	**16**	**17**	**18**	**19**
	MSSB<6"_VF	1	2.4	2.8	2.9	2.9	2.8	2.7	2.7	2.9	3.1	3.3
	MSSB<6"_CF	1	13.3	17.9	18.9	20.2	21.5	22.6	24.0	25.6	27.2	28.8
	MSSB<6"_VSD-VF	1	0.3	0.6	0.7	0.8	1.1	1.3	1.4	1.5	1.6	1.7
	MSSB <6" Total	1	**16**	**21**	**22**	**24**	**25**	**27**	**28**	**30**	**32**	**34**
	MS-V<25bar_VF	1	10.2	13.0	13.6	14.0	14.0	14.0	14.7	15.7	16.6	17.6
	MS-V<25bar_CF	1	6.4	8.6	9.1	9.8	10.4	11.0	11.7	12.4	13.2	14.0
	MS-V<25bar_VSD-VF	1	0.7	1.3	1.6	2.0	2.8	3.4	3.8	4.1	4.3	4.6
	MS_V <25 bar Total	1	**17**	**23**	**24**	**26**	**27**	**28**	**30**	**32**	**34**	**36**
	WP Water pumps		**119**	**159**	**167**	**179**	**189**	**198**	**209**	**223**	**237**	**251**
	WE arc-on-mode	1	6.2	6.1	6.1	6.0	5.7	5.4	5.4	5.4	5.4	5.5
	WE idle mode	1	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2
	Total WE Welding Equipment		**6.5**	**6.4**	**6.4**	**6.4**	**6.0**	**5.6**	**5.6**	**5.7**	**5.7**	**5.7**
	TOTAL INDUSTRY COMPONENTS		**639**	**935**	**1009**	**1050**	**1069**	**1084**	**1107**	**1134**	**1163**	**1194**
1	TRAFO Distribution	1	10	18	19	20	21	22	22	23	24	24
1	TRAFO Industry oil	1	8	14	15	15	14	14	13	13	14	15
1	TRAFO Industry dry	1	2	4	5	5	5	5	5	5	6	6
1	TRAFO Power	1	30	47	52	58	64	70	76	82	87	94
1	TRAFO DER oil	1	0	0	1	1	2	2	4	5	8	10
1	TRAFO DER dry	1	0	2	3	5	8	12	19	28	40	53
1	TRAFO Small	1	2	2	2	2	2	2	2	2	2	2
	Total TRAFO Utility Transformers		**53**	**86**	**96**	**105**	**115**	**127**	**141**	**159**	**180**	**204**
	TOTAL ENERGY SECTOR (only improvement over BAU) (not final energy: distribution losses)		**0**	**0**	**-2**	**-6**	**-11**	**-17**	**-24**	**-33**	**-41**	**-50**
	Tyres C1, replacement for cars	0	0	0	0	0	0	0	0	0	0	0
	Tyres C1, OEM for cars	0	0	0	0	0	0	0	0	0	0	0
	Tyres C1, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C2, replacement for vans	0	0	0	0	0	0	0	0	0	0	0
	Tyres C2, OEM for vans	0	0	0	0	0	0	0	0	0	0	0
	Tyres C2, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C3, replacement for trucks/busses	0	0	0	0	0	0	0	0	0	0	0
	Tyres C3, OEM for trucks/busses	0	0	0	0	0	0	0	0	0	0	0
	Tyres C3, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres, total C1+C2+C3		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	ECO Electricity, Total excl. Energy Sector, in TWh		**1711**	**2445**	**2523**	**2479**	**2422**	**2399**	**2426**	**2501**	**2597**	**2699**
	ECO Electricity, Total excl. Energy Sector, in PJ		6161	8801	9082	8925	8718	8637	8735	9002	9348	9715
	ECO Electricity, Total excl. Energy Sector, in mtoe		147	210	217	213	208	206	209	215	223	232

ECO Electricity Summary, TWh	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	78	112	115	111	106	109	119	130	141	152
SPACE HEATING	273	324	314	287	270	266	277	293	310	322
SPACE COOLING	73	153	162	164	161	158	157	159	162	165
VENTILATION	26	43	44	43	43	45	49	53	57	61
1 *Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)*	*0*	*0*	*-1*	*-3*	*-6*	*-9*	*-12*	*-13*	*-14*	*-15*
LIGHTING	198	300	307	294	269	239	225	232	249	273
ELECTRONICS	72	214	219	200	190	195	192	193	197	203
FOOD PRESERVATION	225	210	200	191	178	166	161	164	170	177
COOKING	49	66	69	70	70	71	72	75	77	80
CLEANING	77	86	82	70	66	67	68	69	70	71
INDUSTRY COMPONENTS	639	935	1009	1050	1069	1084	1107	1134	1163	1194
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0
ECO Electricity, Total excl. Energy Sector, in TWh	**1711**	**2445**	**2523**	**2479**	**2422**	**2399**	**2426**	**2501**	**2597**	**2699**
ECO Electricity, Total excl. Energy Sector, in PJ	6161	8801	9082	8925	8718	8637	8735	9002	9348	9715
ECO Electricity, Total excl. Energy Sector, in mtoe	147	210	217	213	208	206	209	215	223	232
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Electricity EU27 (2020) (in mtoe)	162	216	211	205						

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

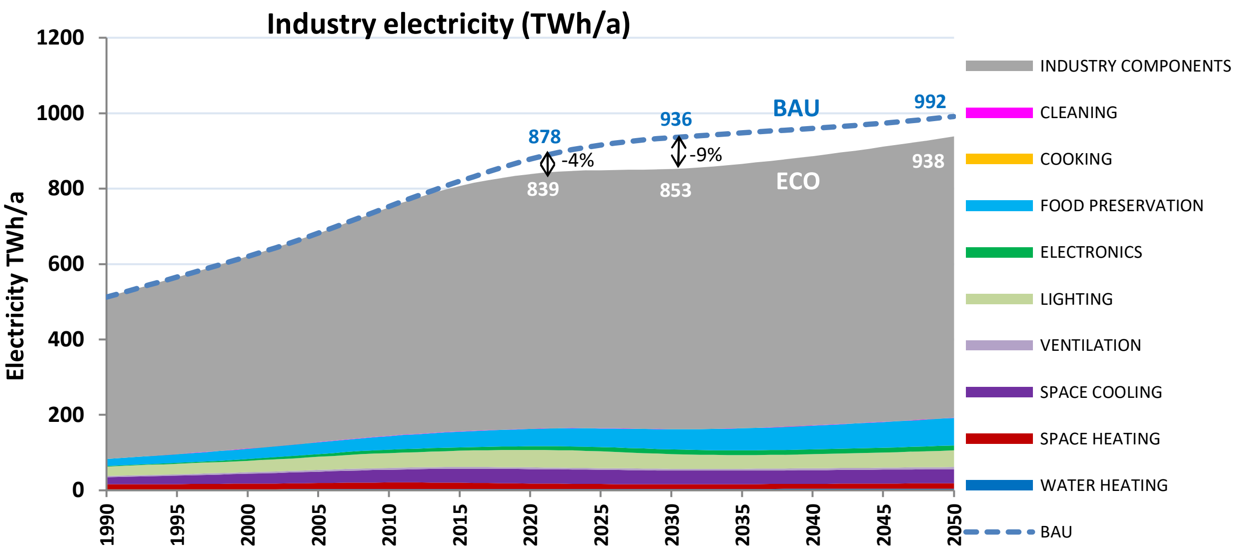
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (only improvement over BAU)	0	0	-2	-6	-11	-17	-24	-33	-41	-50
ECO Electricity, Total incl. Energy Sector, in TWh	**1711**	**2445**	**2521**	**2473**	**2411**	**2383**	**2402**	**2468**	**2556**	**2649**
ECO Electricity, Total incl. Energy Sector, in PJ	6161	8801	9077	8904	8679	8577	8647	8885	9200	9535
ECO Electricity, Total incl. Energy Sector, in mtoe	147	210	217	213	207	205	207	212	220	228



Sector subdivision for ECO Electricity (same sector definitions and same order of presentation as in Eurostat Energy Balances)

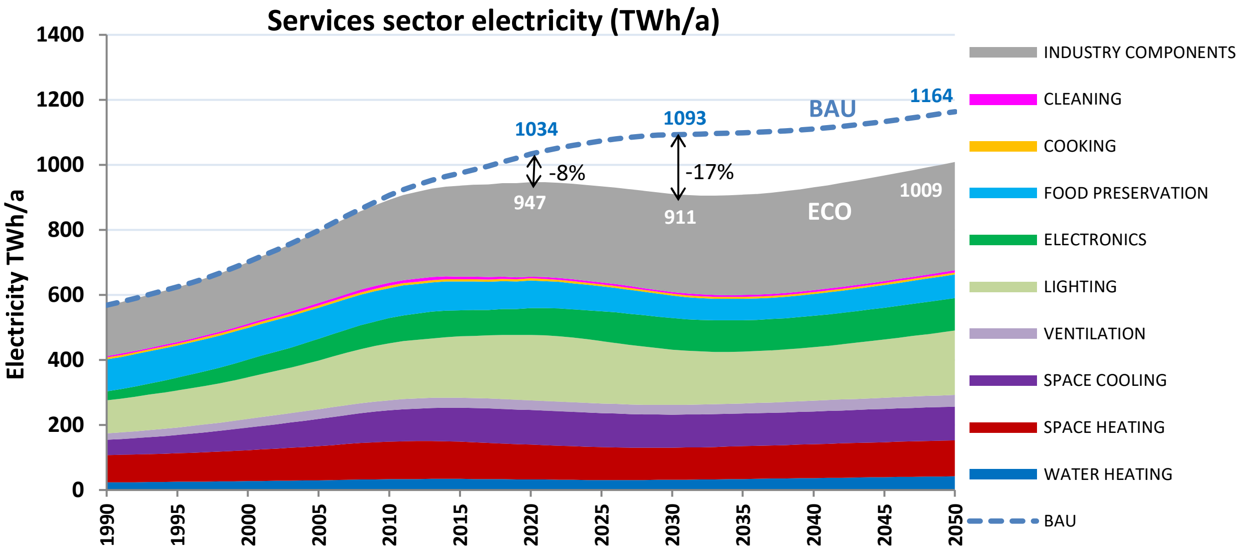
Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

ECO Electricity (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2	3	3	3	3	3	4	4	4	5
SPACE HEATING	13	17	17	15	13	13	13	13	14	14
SPACE COOLING	19	34	37	38	38	36	36	36	37	37
VENTILATION	3	5	5	5	4	5	5	5	5	5
LIGHTING	25	40	44	47	45	39	37	38	41	45
ELECTRONICS	1	9	9	10	11	12	13	13	13	13
FOOD PRESERVATION	20	36	41	46	49	53	58	63	68	73
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	1	1	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	428	606	651	676	685	690	701	715	729	746
ECO Electricity, Industry, in TWh	**512**	**750**	**807**	**839**	**849**	**853**	**866**	**886**	**911**	**938**
ECO Electricity, Industry, in PJ	1843	2701	2904	3021	3057	3069	3118	3191	3280	3378
ECO Electricity, Industry, in mtoe	44	65	69	72	73	73	74	76	78	81
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Electricity EU27 (2020) Industry (in mtoe)	77	80	79	76						

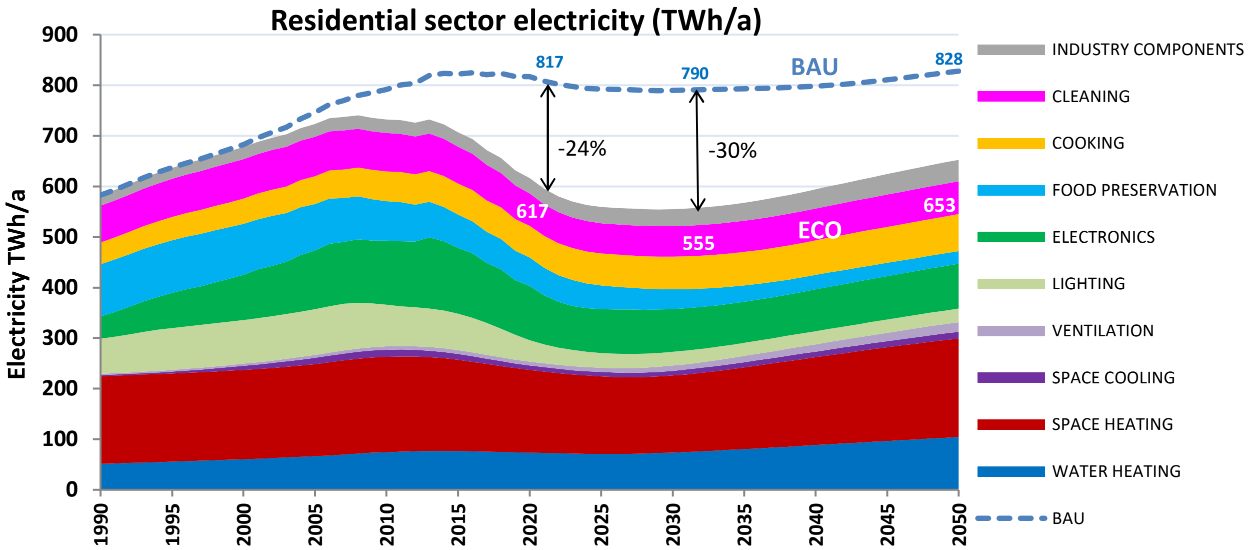


ECO Electricity (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for SERVICE-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for RESIDENTIAL-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for OTHER-sector-related transport	0	0	0	0	0	0	0	0	0	0
ECO Electricity, Transport, in TWh	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ECO Electricity, Transport, in PJ	0	0	0	0	0	0	0	0	0	0
ECO Electricity, Transport, in mtoe	0	0	0	0	0	0	0	0	0	0

ECO Electricity (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	23	33	34	32	31	31	34	37	39	42
SPACE HEATING	84	115	115	107	101	99	101	104	108	110
SPACE COOLING	47	96	104	106	105	102	100	101	102	104
VENTILATION	20	31	31	30	29	30	31	33	35	36
LIGHTING	101	175	188	201	192	170	159	165	179	198
ELECTRONICS	27	78	80	83	91	97	97	96	98	100
FOOD PRESERVATION	99	92	89	84	77	69	66	67	70	73
COOKING	6	7	7	7	6	6	6	6	6	6
CLEANING	4	9	9	6	6	6	6	6	6	6
INDUSTRY COMPONENTS	156	256	280	291	296	302	308	316	325	333
ECO Electricity, Services, in TWh	**568**	**893**	**937**	**947**	**935**	**911**	**908**	**931**	**967**	**1009**
ECO Electricity, Services, in PJ	2045	3214	3372	3411	3365	3280	3270	3352	3482	3632
ECO Electricity, Services, in mtoe	49	77	81	81	80	78	78	80	83	87
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Electricity EU27 (2020) Services (in mtoe)	32	64	63	58						

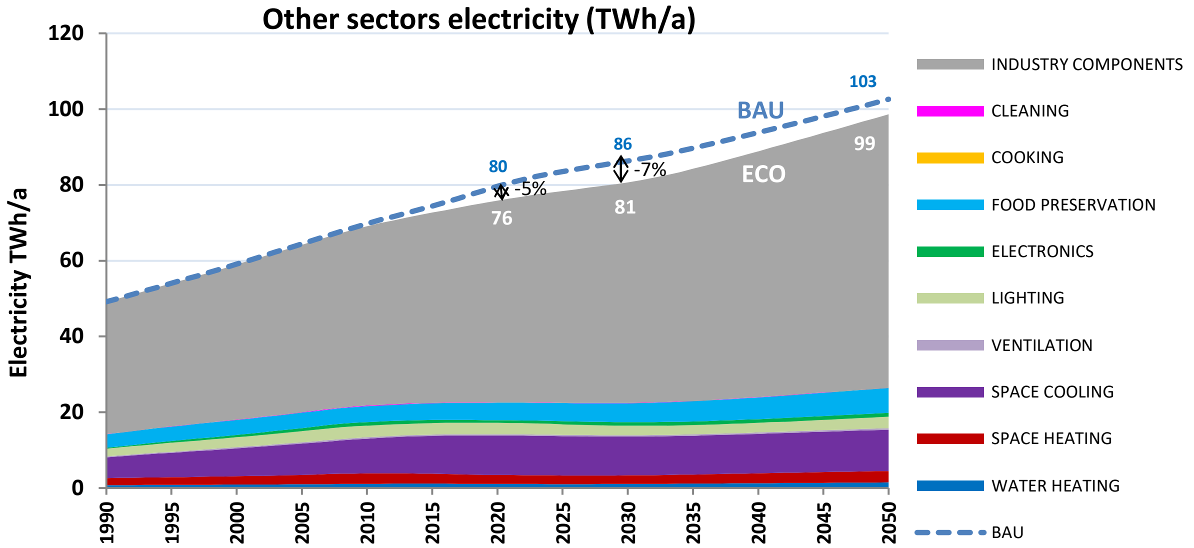


ECO Electricity (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	51	74	77	74	71	74	80	88	96	104
SPACE HEATING	173	189	180	163	153	152	162	174	185	195
SPACE COOLING	2	14	12	9	9	9	10	11	12	13
VENTILATION	3	7	8	8	8	10	12	15	17	19
LIGHTING	69	82	72	43	29	27	26	26	26	27
ELECTRONICS	44	127	130	107	86	85	81	83	86	89
FOOD PRESERVATION	103	78	66	56	47	39	32	29	27	25
COOKING	43	59	62	63	64	65	66	69	71	74
CLEANING	73	76	73	64	60	60	62	63	64	65
INDUSTRY COMPONENTS	20	27	28	30	32	34	36	38	40	43
ECO Electricity, Residential, in TWh	**582**	**732**	**707**	**617**	**559**	**555**	**568**	**594**	**624**	**653**
ECO Electricity, Residential, in PJ	2096	2637	2545	2220	2013	1998	2044	2139	2248	2350
ECO Electricity, Residential, in mtoe	50	63	61	53	48	48	49	51	54	56
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Electricity EU27 (2020) Households (mtoe)	44	63	60	61						



(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

ECO Electric energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	1	1	1	1	1	1	1	1	1	1
SPACE HEATING	2	3	3	2	2	2	2	3	3	3
SPACE COOLING	5	9	10	10	10	10	10	10	11	11
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	2	3	3	3	3	3	2	3	3	3
ELECTRONICS	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVATION	4	4	4	5	5	5	5	6	6	7
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	35	47	50	53	56	58	61	65	69	72
ECO Electricity, Other sectors, in TWh	**49**	**69**	**73**	**76**	**78**	**81**	**84**	**89**	**94**	**99**
ECO Electricity, Other sectors, in PJ	177	249	262	273	282	290	303	320	338	355
ECO Electricity, Other sectors, in mtoe	4	6	6	7	7	7	7	8	8	8
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Electricity EU27 (2020) Other (in mtoe)	4	4	4	5						



ECO Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		78	112	115	111	106	109	119	130	141	152
	Residential	51	74	77	74	71	74	80	88	96	104
	Tertiary / Services	23	33	34	32	31	31	34	37	39	42
	Industry	2	3	3	3	3	3	4	4	4	5
	Other	1	1	1	1	1	1	1	1	1	1
SPACE HEATING. All sectors, TWh		273	324	314	287	270	266	277	293	310	322
	Residential	173	189	180	163	153	152	162	174	185	195
	Tertiary / Services	84	115	115	107	101	99	101	104	108	110
	Industry	13	17	17	15	13	13	13	13	14	14
	Other	2	3	3	2	2	2	2	3	3	3
SPACE COOLING. All sectors, TWh		73	153	162	164	161	158	157	159	162	165
& HT PROCESS	Residential	2	14	12	9	9	9	10	11	12	13
	Tertiary / Services	47	96	104	106	105	102	100	101	102	104
	Industry	19	34	37	38	38	36	36	36	37	37
	Other	5	9	10	10	10	10	10	10	11	11
VENTILATION.	All sectors, TWh	26	43	44	43	43	45	49	53	57	61
	Residential	3	7	8	8	8	10	12	15	17	19
	Tertiary / Services	20	31	31	30	29	30	31	33	35	36
	Industry	3	5	5	5	4	5	5	5	5	5
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	198	300	307	294	269	239	225	232	249	273
	Residential	69	82	72	43	29	27	26	26	26	27
	Tertiary / Services	101	175	188	201	192	170	159	165	179	198
	Industry	25	40	44	47	45	39	37	38	41	45
	Other	2	3	3	3	3	3	2	3	3	3
ELECTRONICS.	All sectors, TWh	72	214	219	200	190	195	192	193	197	203
	Residential	44	127	130	107	86	85	81	83	86	89
	Tertiary / Services	27	78	80	83	91	97	97	96	98	100
	Industry	1	9	9	10	11	12	13	13	13	13
	Other	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVE.	All sectors, TWh	225	210	200	191	178	166	161	164	170	177
	Residential	103	78	66	56	47	39	32	29	27	25
	Tertiary / Services	99	92	89	84	77	69	66	67	70	73
	Industry	20	36	41	46	49	53	58	63	68	73
	Other	4	4	4	5	5	5	5	6	6	7
COOKING.	All sectors, TWh	49	66	69	70	70	71	72	75	77	80
	Residential	43	59	62	63	64	65	66	69	71	74
	Tertiary / Services	6	7	7	7	6	6	6	6	6	6
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	77	86	82	70	66	67	68	69	70	71
	Residential	73	76	73	64	60	60	62	63	64	65
	Tertiary / Services	4	9	9	6	6	6	6	6	6	6
	Industry	0	1	1	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		639	935	1009	1050	1069	1084	1107	1134	1163	1194
	Residential	20	27	28	30	32	34	36	38	40	43
	Tertiary / Services	156	256	280	291	296	302	308	316	325	333
	Industry	428	606	651	676	685	690	701	715	729	746
	Other	35	47	50	53	56	58	61	65	69	72
TYRES. Transport sector, TWh		0	0	0	0	0	0	0	0	0	0
	Residential transport	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services transport	0	0	0	0	0	0	0	0	0	0
	Industry transport	0	0	0	0	0	0	0	0	0	0
	Other transport	0	0	0	0	0	0	0	0	0	0
ALL PRODUCTS.	All sectors, TWh	1711	2445	2523	2479	2422	2399	2426	2501	2597	2699
	Residential	582	732	707	617	559	555	568	594	624	653
	Tertiary / Services	568	893	937	947	935	911	908	931	967	1009
	Industry	512	750	807	839	849	853	866	886	911	938
	Other	49	69	73	76	78	81	84	89	94	99
	Transport	0	0	0	0	0	0	0	0	0	0

ECO Electricity (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	66%	66%	66%	67%	67%	67%	68%	68%	68%	68%
	Tertiary / Services	30%	30%	30%	29%	29%	29%	28%	28%	28%	28%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	64%	58%	57%	57%	57%	57%	58%	59%	60%	61%
	Tertiary / Services	31%	36%	37%	37%	37%	37%	36%	35%	35%	34%
	Industry	5%	5%	5%	5%	5%	5%	5%	4%	4%	4%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE COOLING.											
& HT PROCESS	Residential	3%	9%	7%	5%	5%	6%	7%	7%	8%	8%
	Tertiary / Services	64%	63%	64%	65%	65%	64%	64%	64%	63%	63%
	Industry	26%	22%	23%	23%	23%	23%	23%	23%	23%	23%
	Other	8%	6%	6%	6%	6%	6%	7%	7%	7%	7%
VENTILATION											
	Residential	10%	16%	17%	18%	20%	23%	25%	28%	29%	31%
	Tertiary / Services	77%	72%	71%	71%	69%	67%	64%	62%	61%	59%
	Industry	12%	11%	11%	11%	10%	10%	10%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	27%	24%	15%	11%	11%	12%	11%	11%	10%
	Tertiary / Services	51%	58%	61%	68%	71%	71%	71%	71%	72%	73%
	Industry	13%	13%	14%	16%	17%	17%	16%	16%	16%	16%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	59%	53%	45%	43%	42%	43%	43%	44%
	Tertiary / Services	37%	36%	36%	42%	48%	50%	51%	50%	50%	49%
	Industry	2%	4%	4%	5%	6%	6%	7%	7%	6%	6%
	Other	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%
FOOD PRESERVE.											
	Residential	46%	37%	33%	30%	26%	23%	20%	17%	16%	14%
	Tertiary / Services	44%	44%	44%	44%	43%	42%	41%	41%	41%	41%
	Industry	9%	17%	21%	24%	28%	32%	36%	38%	40%	41%
	Other	2%	2%	2%	2%	3%	3%	3%	3%	4%	4%
COOKING.											
	Residential	88%	89%	90%	90%	91%	92%	92%	92%	92%	92%
	Tertiary / Services	12%	11%	10%	10%	9%	8%	8%	8%	8%	8%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	88%	88%	91%	91%	91%	91%	91%	91%	91%
	Tertiary / Services	5%	10%	10%	8%	9%	9%	9%	9%	9%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
	Tertiary / Services	24%	27%	28%	28%	28%	28%	28%	28%	28%	28%
	Industry	67%	65%	64%	64%	64%	64%	63%	63%	63%	62%
	Other	5%	5%	5%	5%	5%	5%	6%	6%	6%	6%
TYRES.											
	Residential transport										
	Tertiary / Services transport										
	Industry transport										
	Other transport										
ALL PRODUCTS.											
	Residential	34%	30%	28%	25%	23%	23%	23%	24%	24%	24%
	Tertiary / Services	33%	37%	37%	38%	39%	38%	37%	37%	37%	37%
	Industry	30%	31%	32%	34%	35%	36%	36%	35%	35%	35%
	Other	3%	3%	3%	3%	3%	3%	3%	4%	4%	4%
	Transport	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

db SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	1.00	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0.0	0.0	0.2	0.7	1.1	1.4	1.6	1.7	1.8	1.9
EIWHS Electric Instant. Shower (secondary)	1.00	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0.0	0.0	0.1	0.3	0.4	0.3	0.2	0.0	0.0	0.0
ESWH Electric Storage > 30 L (primary)	1.00	0.0	0.0	0.6	3.5	6.1	8.2	8.3	8.5	8.6	8.7
GIWH Gas Instant. < 13 L/min (secondary)	0.003	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GSWH Gas Storage, Condensing	0.010	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GSWH Gas Storage, Non-condensing	0.008	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dedicated WH Heat Pump	1.00	0.0	0.0	0.3	0.8	1.6	2.4	3.3	4.1	4.8	5.5
Dedicated WH Solar (3.5 m2)	0.80	0.0	0.0	0.2	0.5	0.8	1.0	1.0	1.0	0.9	0.9
WH dedicated Water Heater		**0**	**0**	**2**	**6**	**10**	**14**	**15**	**16**	**17**	**18**
CHB Gas Combi Instant. WH	0.04	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.1	1.2
CHB Gas + Cyl. WH	0.04	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5
CHB Jet Burner Gas + Cyl. WH	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHB Jet Burner Oil + Cyl. WH	0.04	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
CHB Electric (Joule) + Cyl. WH	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHB Hybrid Gas/Electric WH	0.10	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.4
CHB Electric HP + Cyl. WH	1.00	0.0	0.0	-0.1	-0.3	-1.2	-3.1	-5.8	-9.1	-12.3	-15.3
CHB Gas HP + Cyl. WH	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHB Gas mCHP + Cyl. WH	0.02	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHB Solar Combi (16 m2)	0.04	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHC Central Heating combi, water heating		**0**	**0**	**0**	**0**	**-1**	**-2**	**-5**	**-8**	**-11**	**-14**
TOTAL WATER HEATING		**0**	**0**	**2**	**6**	**10**	**12**	**10**	**8**	**6**	**4**
CHB Gas non-condensing	0.04	0	0	1	3	4	5	5	5	4	4
CHB Gas condensing	0.04	0	0	0	0	0	0	1	2	3	5
CHB Gas Jet burner non-condensing	0.04	0	0	0	0	0	0	0	0	0	0
CHB Gas Jet burner condensing	0.04	0	0	0	0	0	0	0	0	0	0
CHB Oil Jet burner non-condensing	0.04	0	0	0	0	1	1	1	1	1	1
CHB Oil Jet burner condensing	0.04	0	0	0	0	0	0	0	0	0	0
CHB Electric Joule-effect	1.00	0	0	0	1	1	2	2	1	1	1
CHB Hybrid (gas-electric)	0.60	0	0	0	0	-1	-1	-2	-4	-5	-5
CHB Electric Heat Pump	1.00	0	0	1	2	-1	-9	-19	-30	-40	-48
CHB Gas Heat Pump	0.04	0	0	0	0	0	0	0	0	0	0
CHB micro CHP	0.04	0	0	0	0	0	0	0	0	0	0
CHB Solar combi (16 m2)	0.10	0	0	0	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating		**0**	**1**	**3**	**5**	**4**	**-2**	**-13**	**-25**	**-35**	**-43**
SFB Wood Manual	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SFB Wood Direct Draft	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SFB Coal	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SFB Pellets	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SFB Wood chips	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Solid Fuel Boiler		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CHAE-S (≤ 400 kW)	1	0	0	0.0	0.1	0.3	0.6	0.8	0.9	0.8	0.7
CHAE-L (> 400 kW)	1	0	0	0.0	0.2	0.6	0.8	0.9	1.0	0.9	0.7
CHWE-S (≤ 400 kW)	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHWE-M (> 400 kW; ≤ 1500 kW)	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHWE-L (> 1500 kW)	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CHF	0.05	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HT PCH-AE-S	1	0	0	0.0	1.0	2.4	3.5	3.8	3.4	3.0	2.5
HT PCH-AE-L	1	0	0	0.1	1.1	2.8	4.5	5.4	5.5	5.2	4.8
HT PCH-WE-S	1	0	0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.1
HT PCH-WE-M	1	0	0	0.0	0.2	0.4	0.5	0.4	0.2	0.1	0.0
HT PCH-WE-L	1	0	0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1
AC rooftop	1	0	0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
AC splits	1	0	0	0.0	0.4	0.7	1.0	0.9	0.7	0.6	0.4
AC VRF	1	0	0	0.0	0.1	0.4	0.7	1.0	1.0	1.0	0.9
ACF	0.05	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SubTotal AHC central Air Cooling		**0**	**0**	**0**	**3**	**8**	**12**	**14**	**13**	**12**	**10**
AC rooftop (rev)	1	0	0	0.1	0.6	1.0	1.0	0.6	0.2	0.0	0.0
AC splits (rev)	1	0	0	0.1	1.0	1.9	2.5	2.4	2.0	1.7	1.4
AC VRF (rev)	1	0	0	0.1	0.4	1.1	2.2	3.0	3.2	3.0	2.7
ACF (rev)	0.05	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AHF	0.05	0	0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2
AHE	1	0	0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1
SubTotal AHC central Air Heating		**0**	**0**	**0**	**2**	**4**	**6**	**6**	**6**	**5**	**4**
Total AHC central Air Heating & Cooling		**0**	**0**	**0**	**5**	**13**	**18**	**20**	**19**	**17**	**15**

db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH Solid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Electric portable	1	0.0	0.0	0.5	2.2	3.1	3.0	2.8	2.7	2.6	2.5
	LH Electric fixed > 250W	1	0.0	0.0	0.7	3.5	6.3	7.8	7.8	7.3	7.0	6.8
	LH Electric fixed ≤ 250W	1	0.0	0.0	0.0	0.2	0.4	0.5	0.5	0.5	0.4	0.4
	LH Electric storage	1	0.0	0.0	0.1	0.5	0.8	1.0	0.9	0.9	0.8	0.8
	LH Electric underfloor	1	0.0	0.0	0.1	0.3	0.5	0.7	0.8	0.8	0.8	0.8
	LH Electric visibly glowing > 1.2 kW	1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric visibly glowing ≤ 1.2 kW	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	LH Electric sum		**0**	**0**	**1**	**7**	**11**	**13**	**13**	**12**	**12**	**12**
	LH Gaseous fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Liquid fuel sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH total		**0**	**0**	**1**	**7**	**11**	**13**	**13**	**12**	**12**	**12**
	RAC fixed < 6 kW, cooling	1	0.0	4.0	4.6	4.0	3.8	3.7	3.6	3.7	4.1	4.9
	RAC fixed 6-12 kW, cooling	1	0.0	2.6	3.3	2.9	2.7	2.4	2.1	2.0	2.1	2.3
	RAC portable < 12 kW, cooling	1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode		**0.0**	**6.7**	**8.1**	**7.1**	**6.7**	**6.3**	**5.9**	**5.9**	**6.4**	**7.4**
	RAC fixed < 6 kW, reversible, heating	1	0.0	3.9	5.8	6.5	7.3	7.6	7.4	7.4	7.8	8.5
	RAC fixed 6-12 kW, reversible, heating	1	0.0	2.6	4.3	5.0	5.5	5.7	5.5	5.4	5.4	5.5
	RAC portable < 12 kW, reversible, heating	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode		**0.0**	**6.5**	**10.1**	**11.4**	**12.8**	**13.3**	**12.9**	**12.7**	**13.2**	**14.0**
	RAC Room Air Conditioner		**0**	**13**	**18**	**18**	**19**	**20**	**19**	**19**	**20**	**21**
1	CIRC Integrated circulators	1	0.0	0.0	2.0	6.2	8.6	8.5	8.0	7.1	6.1	5.2
0.38	CIRC Large standalone circulators	1	0.0	0.0	1.3	3.0	3.1	2.5	2.0	1.6	1.3	1.0
0.38	CIRC Small standalone circulators	1	0.0	0.0	1.4	3.2	3.4	2.9	2.5	2.2	1.9	1.7
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**5**	**13**	**15**	**14**	**12**	**11**	**9**	**8**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**2**	**4**	**4**	**3**	**3**	**2**	**2**	**2**
	TOTAL SPACE HEATING		**0**	**7**	**17**	**30**	**37**	**34**	**22**	**8**	**-3**	**-12**
	TOTAL SPACE COOLING		**0**	**7**	**8**	**10**	**15**	**19**	**20**	**19**	**18**	**18**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7
	R-UVU 100-250 m3/h	1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	R-BVU 100-250 m3/h	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5
	R-UVU 250-1000 m3/h	1	0.0	0.0	0.1	0.5	1.2	1.7	2.1	2.2	2.2	2.3
	R-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.0	1.3	1.7
	R-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	RVU, Total residential		**0**	**0**	**0**	**1**	**2**	**3**	**4**	**4**	**5**	**6**
	NR-UVU 250-1000 m3/h	1	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.7	0.7	0.7
	NR-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.5	0.6
	NR-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	NR-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.5
	NR-AHU-S 2500-5500 m3/h	1	0.0	0.0	0.1	0.3	0.6	1.0	1.3	1.5	1.7	1.9
	NR-AHU-M 5500-14500 m3/h	1	0.0	0.0	0.2	0.8	1.6	2.5	3.1	3.3	3.6	3.9
	NR-AHU-L > 14500 m3/h	1	0.0	0.0	0.1	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	NRVU, Total non-residential		**0**	**0**	**0**	**2**	**4**	**6**	**7**	**8**	**8**	**9**
	VU Ventilation Units, res + non-res		**0**	**0**	**1**	**2**	**5**	**8**	**11**	**12**	**13**	**15**
	TOTAL VENTILATION (VU own electricity)		-	-	**1**	**2**	**5**	**8**	**11**	**12**	**13**	**15**
1	***Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)***		-	-	**1**	**3**	**6**	**9**	**12**	**13**	**14**	**15**
	LS, incl. control gear (BAU-ECO)											
	LFL (T12,T8h,T8t,T5,other)	1	0	1	5	14	41	72	79	71	59	48
	HID (HPM, HPS, MH)	1	0	1	12	21	23	20	13	9	5	3
	CFLni (all shapes)	1	0	0	1	2	4	3	2	1	1	1
	CFLi (retrofit for GLS, HL)	1	0	-3	-3	1	8	9	7	4	3	2
	GLS (DLS & NDLS)	1	0	19	34	33	19	11	7	4	2	1
	HL (DLS & NDLS, LV & MV)	1	0	-4	-3	36	39	20	11	6	3	2
	LED replacing LFL (retrofit & luminaire)	1	0	0	-1	-4	-15	-25	-26	-20	-13	-6
	LED replacing HID (retrofit & luminaire)	1	0	0	-9	-12	-10	-5	-2	0	2	4
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	-1	-1	-1	0	0	0	1
	LED replacing DLS (retrofit & luminaire)	1	0	0	-1	-2	-3	-2	-1	-1	0	0
	LED replacing NDLS (retrofit & luminaire)	1	0	0	-1	-8	-10	-8	-5	-3	-1	0
	Standby (estimate)	1	0	0	0	0	0	0	0	0	0	0
	SUBTOTAL non-LED		0	15	46	108	135	137	119	95	73	56
	SUBTOTAL LED		0	0	-12	-27	-39	-41	-34	-23	-12	-2
	TOTAL LIGHTING (incl. standby)		**0**	**15**	**35**	**81**	**95**	**96**	**85**	**71**	**61**	**54**

db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV on-mode, total all types	1	0.0	0.0	4.9	17.7	32.3	44.4	47.8	40.5	33.7	30.0
	DP TV standby, standard (NoNA)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, total all types		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP TV total on-mode + standby		**0**	**0**	**5**	**18**	**32**	**44**	**48**	**40**	**34**	**30**
	DP Monitor on-mode	1	0.0	0.0	0.9	2.7	2.8	3.1	2.6	2.0	1.8	1.7
	DP Monitor standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total		**0**	**0**	**1**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
	DP Signage on-mode	1	0.0	0.0	0.0	0.0	0.7	3.4	6.0	5.6	3.3	0.9
	DP Signage standby	1	0.0	0.0	0.0	0.0	0.1	0.5	0.9	0.8	0.5	0.1
	DP Signage total		**0**	**0**	**0**	**0**	**1**	**4**	**7**	**6**	**4**	**1**
	DP Electronic Displays, total on-mode		**0**	**0**	**6**	**20**	**36**	**51**	**56**	**48**	**39**	**33**
	DP Electronic Displays, total standby		**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**
	DP Electronic Displays, total		**0**	**0**	**6**	**20**	**36**	**51**	**57**	**49**	**39**	**33**
	SSTB	1	0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	1	0	0.0	1.3	3.3	3.1	2.5	2.3	2.3	2.3	2.3
	CSTB (other modes)	1	0	0.0	0.7	1.8	1.7	1.3	1.2	1.2	1.2	1.2
	CSTB (all covered modes)	1	0	0.0	2.0	5.1	4.7	3.8	3.5	3.5	3.5	3.5
	Total STB set top boxes (Complex & Simple)		**0**	**1**	**2**	**5**	**5**	**4**	**3**	**3**	**3**	**3**
	Game consoles > 20 W Active modes (SRI)	1	0.0	0.0	0.7	2.0	1.8	1.8	1.8	1.8	1.8	1.8
	Game consoles > 20 W Non-Active (CR)	1	0.0	0.0	0.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6
	Game consoles < 20 W Non-Active (CR)	1	0.0	0.0	0.1	0.5	0.7	0.7	0.7	0.7	0.7	0.7
	Game consoles < 20 W Active (no reg.)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes		0.0	0.0	0.8	2.0	1.8	1.8	1.8	1.8	1.8	1.8
	Total Game consoles, non-active modes		0.0	0.0	0.6	2.0	2.3	2.3	2.3	2.3	2.3	2.3
	Total Game consoles > 20 W, all modes		0.0	0.0	1.2	3.5	3.4	3.4	3.4	3.4	3.4	3.4
	Total Game consoles < 20 W, all modes		0.0	0.0	0.1	0.5	0.7	0.7	0.7	0.7	0.7	0.7
	Total Game consoles, all modes		**0.0**	**0.0**	**1.3**	**4.0**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**
	ES&DS only, without effects on infrastructure											
	ES tower 1-socket traditional	1	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	1	0	0	0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ES rack 2-socket traditional	1	0	0	0	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	ES rack 2-socket cloud	1	0	0	0	0.7	0.8	0.9	0.9	0.9	0.9	0.9
	ES rack 4-socket traditional	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket cloud	1	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ES rack 2-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket traditional	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 2-socket cloud	1	0	0	0	0.2	0.3	0.3	0.4	0.4	0.4	0.4
	ES blade 4-socket traditional	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES total traditional		**0**	**0**	**0**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	ES total cloud		**0**	**0**	**0**	**1.2**	**1.5**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**
	ES Enterprise Servers total		**0**	**0**	**0**	**1.8**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**
	DS Online 2	1	0	0	0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
	DS Online 3	1	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	DS Online 4	1	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	DS Data Storage products total		**0**	**0**	**0**	**0.2**	**0.5**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**
	ES + DS total (excl. infrastructure)		**0**	**0**	**0**	**2.0**	**2.7**	**3.0**	**3.1**	**3.1**	**3.1**	**3.1**
	PC Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Inkjet Printer	1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	0.0	0.3	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.5
	EP / Laser Printer mono	1	0.0	0.5	0.7	0.8	0.6	0.5	0.4	0.3	0.2	0.1
	EP / Laser Printer colour	1	0.0	0.1	0.5	1.2	1.6	1.7	1.8	1.8	1.9	1.9
	EP / Laser Copier mono	1	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	0.6	1.4	1.9	1.9	1.8	1.8	1.7	1.6	1.5
	EP / Laser MFD colour	1	0.0	0.4	1.3	2.2	2.3	2.2	2.1	2.0	1.9	1.8
	Total IE Imaging Equipment		**0**	**3**	**5**	**7**	**7**	**7**	**7**	**6**	**6**	**6**
	of which for modes under CR 1275/2008		*0*	*2*	*4*	*5*	*5*	*5*	*5*	*5*	*5*	*4*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	0	0.0	0.7	1.5	1.3	1.2	1.1	1.0	0.9	0.7
	SB Electric toothbrushes (off mode)	1	0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	SB Audio speakers (wired) (sb & off modes)	1	0	0.5	1.6	0.8	0.1	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0	0.0	0.2	1.8	3.1	3.2	3.2	3.2	3.2	3.2
	SB Small appliances (sb & off modes)	1	0	0.1	2.2	3.9	4.0	4.1	4.1	4.2	4.2	4.3
	SB Media boxes /sticks (sb mode)	1	0	0.0	0.3	1.0	1.1	1.1	1.1	1.1	1.1	1.1
	SB Media players and recorders (sb mode)	1	0	0.6	3.1	0.9	0.1	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0	0.0	0.0	0.4	0.9	0.7	0.5	0.4	0.2	0.1
	SB Office phones (nsb mode)	1	0	0.0	0.0	0.3	0.4	0.2	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	1	0	0.0	0.1	1.4	1.8	2.0	2.2	2.2	2.1	1.9
	SB Home Network Equipment (nsb mode)	1	0	0.0	0.0	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	SB Office Network Equipment (nsb mode)	1	0	0.0	0.1	1.1	1.7	2.3	2.8	2.9	2.9	2.9
	SB Coffee makers (off mode)	1	0	0.0	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.7
	Products regulated also for (networked) standby											
	(already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0	0.4	1.1	1.1	*1.2*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
1	SB Dishwashers (sb & off, until 2021)	1	0	0.0	0.1	0.3	*0.4*	*0.5*	*0.6*	*0.6*	*0.7*	*0.8*
1	SB Laundry Dryers (sb & off modes)	1	0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
1	SB Electric Ovens (sb mode)	1	0	0.1	1.0	2.2	3.5	4.6	4.9	5.0	5.1	5.1
1	SB Electric Hobs (sb mode)	1	0	0.1	0.4	0.8	1.3	1.4	1.5	1.6	1.7	1.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0	0.0	1.3	3.3	3.1	2.5	2.3	2.3	2.3	2.3
1	SB Game consoles (non-active modes)	1	0	0.0	0.6	2.0	2.3	2.3	2.3	2.3	2.3	2.3
1	SB IE Inkjet Printers (nsb mode)	1	0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	0	0.3	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5
1	SB IE Laser Printers (nsb mode)	1	0	0.4	0.9	1.5	1.7	1.7	1.6	1.6	1.6	1.5
1	SB IE Laser Copiers (nsb mode)	1	0	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0	0.7	2.0	3.1	3.2	3.0	2.9	2.7	2.6	2.5
	Total (networked) SB (incl. double)		0	4	17	30	32	32	33	33	32	32
	Total (networked) SB (excl. double)		**0**	**1**	**9**	**14**	**16**	**16**	**16**	**16**	**16**	**16**
db	*EPS Active mode (for electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.0	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2
0.6	EPS 10–12 W	1	0.0	0.1	1.6	3.3	4.1	3.6	3.2	2.7	2.2	2.0
0.5	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1
	EPS, total for active mode		**0.0**	**0.1**	**2.0**	**4.1**	**5.1**	**4.5**	**3.9**	**3.3**	**2.7**	**2.4**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.0	0.0	0.3	0.6	0.7	0.7	0.6	0.6	0.5	0.4
0.0	EPS 10–12 W	1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.0**	**0.0**	**0.5**	**0.9**	**1.0**	**0.9**	**0.8**	**0.7**	**0.6**	**0.6**
	EPS, overall total (active + no-load)		**0.0**	**0.1**	**2.5**	**5.0**	**6.1**	**5.4**	**4.7**	**4.0**	**3.3**	**2.9**
	EPS, double counted subtracted		**0.0**	**0.1**	**1.4**	**2.8**	**3.4**	**3.0**	**2.6**	**2.2**	**1.9**	**1.7**
	TOTAL ELECTRONICS		**0**	**5**	**25**	**56**	**74**	**88**	**94**	**85**	**74**	**67**
	Total RF household Refrigerators & Freezers	1	**0**	**28**	**43**	**55**	**66**	**75**	**82**	**86**	**88**	**89**

db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CF open vertical chilled multi deck (RVC2)	1	0	0	0.0	0.0	1.2	3.7	5.5	5.9	5.9	6.0
	CF open horizontal frozen island (RHF4)	1	0	0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4
	CF other supermarket display (non-BCs)	1	0	0	0.0	0.1	1.4	4.7	7.4	8.3	8.5	8.6
	CF Plug in one door beverage cooler	1	0	0	0.0	0.2	2.8	5.9	6.9	7.2	7.4	7.5
	CF Plug in horizontal ice cream freezer	1	0	0	0.0	0.0	0.5	0.9	1.0	1.0	1.1	1.1
	CF Spiral vending machine	1	0	0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration		**0**	**0**	**0**	**0**	**6**	**16**	**21**	**23**	**24**	**24**
	PF Storage cabinet Chilled Vertical (CV)	1	0	0	0	0.3	0.9	1.1	1.1	1.2	1.2	1.3
	PF Storage cabinet Frozen Vertical (FV)	1	0	0	0	0.4	1.1	1.3	1.3	1.4	1.5	1.5
	PF Storage cabinet Chilled Horizontal (CH)	1	0	0	0	0.3	0.7	0.8	0.8	0.9	0.9	1.0
	PF Storage cabinet Frozen Horizontal (FH)	1	0	0	0	0.2	0.4	0.5	0.5	0.6	0.6	0.6
	PF Storage cabinets All types	1	**0**	**0**	**0**	**1.1**	**3.0**	**3.7**	**3.8**	**4.0**	**4.2**	**4.3**
	PF Process Chiller AC MT S ≤ 300 kW	1	0	0	0	0.2	0.5	0.8	0.9	1.0	1.1	1.1
	PF Process Chiller AC MT L > 300 kW	1	0	0	0	0.2	0.4	0.7	0.8	0.9	1.0	1.0
	PF Process Chiller AC LT S ≤ 200 kW	1	0	0	0	0.2	0.4	0.7	0.8	0.9	1.0	1.0
	PF Process Chiller AC LT L > 200 kW	1	0	0	0	0.2	0.4	0.7	0.9	0.9	1.0	1.1
	PF Process Chiller WC MT S ≤ 300 kW	1	0	0	0	0.1	0.1	0.2	0.3	0.3	0.3	0.3
	PF Process Chiller WC MT L > 300 kW	1	0	0	0	0.1	0.2	0.3	0.3	0.4	0.4	0.4
	PF Process Chiller WC LT S ≤ 200 kW	1	0	0	0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	PF Process Chiller WC LT L > 200 kW	1	0	0	0	0.1	0.2	0.3	0.4	0.4	0.5	0.5
	PF Process Chiller All MT&LT	1	**0**	**0**	**0**	**1.0**	**2.5**	**4.0**	**4.7**	**5.1**	**5.5**	**5.9**
	PF Condensing Unit MT S 0.2-1 kW	1	0	0	0	0.2	0.5	0.5	0.6	0.6	0.6	0.7
	PF Condensing Unit MT M 1-5 kW	1	0	0	0	0.4	0.9	0.9	1.0	1.1	1.2	1.3
	PF Condensing Unit MT L 5-20 kW	1	0	0	0	0.7	1.3	1.4	1.5	1.6	1.8	1.9
	PF Condensing Unit MT XL 20-50 kW	1	0	0	0	0.6	1.2	1.3	1.4	1.5	1.6	1.8
	PF Condensing Unit LT S 0.1-0.4 kW	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT M 0.4-2 kW	1	0	0	0	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT L 2-8 kW	1	0	0	0	0.4	0.6	0.6	0.7	0.7	0.8	0.9
	PF Condensing Unit LT XL 8-20 kW	1	0	0	0	0.7	1.2	1.3	1.3	1.5	1.6	1.7
0.6	**PF Condensing Unit, All MT&LT**	1	**0**	**0**	**0**	**3.1**	**5.9**	**6.4**	**6.9**	**7.5**	**8.0**	**8.6**
	PF Professional Refrigeration, Total		**0**	**0**	**0**	**3.4**	**7.9**	**10.2**	**11.3**	**12.1**	**12.9**	**13.7**
	TOTAL FOOD PRESERVATION		**0**	**28**	**43**	**58**	**80**	**101**	**115**	**121**	**124**	**127**
	CA Electric Hobs (active modes)	1	0	0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	CA Electric Hobs (low-power modes)	1	0	0	0.4	0.8	1.3	1.4	1.5	1.6	1.7	1.8
	CA Electric Hobs (sum all modes)	1	0	0	0.4	0.9	1.4	1.6	1.7	1.8	1.9	2.0
	CA Electric Ovens (active modes)	1	0	0	0.0	0.4	1.0	1.5	2.0	2.1	2.2	2.2
	CA Electric Ovens (low-power modes)	1	0	0	1.0	2.2	3.5	4.6	4.9	5.0	5.1	5.1
	CA Electric Ovens (sum all modes)	1	0	0	1.0	2.6	4.5	6.1	6.9	7.1	7.2	7.3
	CA Gas Hobs	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CA Gas Ovens	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CA Range Hoods	1	0	0	0.1	0.6	1.8	3.1	4.0	4.4	4.7	5.0
	CA Elec. Hobs&Ovens low-power modes	1	0	0	1.4	3.1	4.8	6.0	6.4	6.6	6.8	6.9
	CA other products or modes		0	0	0.1	1.1	2.8	4.8	6.2	6.7	7.1	7.4
	TOTAL COOKING		**0**	**0**	**1**	**4**	**8**	**11**	**13**	**13**	**14**	**14**
	WM Washing Machines, active modes	1	0.0	7.3	10.3	11.4	11.1	9.9	8.4	6.5	4.7	2.8
	WM Washing Machines, low-power modes	1	0.0	0.4	1.1	1.1	1.2	1.4	1.4	1.4	1.4	1.4
	WM Washing Machines, all modes	1	0.0	7.7	11.4	12.5	12.3	11.3	9.8	7.9	6.0	4.2
	WD Washer-Dryers, active modes	1	0.0	0.8	1.3	1.5	1.4	1.1	0.7	0.4	0.2	0.1
	WD Washer-Dryers, low-power modes	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	WD Washer-Dryers, all modes	1	0.0	0.9	1.4	1.6	1.4	1.1	0.7	0.4	0.3	0.2
	WM-WD Washing, sum active modes	1	0.0	8.2	11.7	12.9	12.4	11.0	9.1	6.9	4.9	3.0
	WM-WD Washing, sum low-power modes	1	0.0	0.4	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4
	Total WM-WD household Washing	1	**0**	**9**	**13**	**14**	**14**	**12**	**10**	**8**	**6**	**4**
	DW Dishwashers, active modes	1	0.0	3.8	5.5	7.0	8.3	9.5	10.6	11.7	12.8	13.9
	DW Dishwashers, low-power modes	1	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.7	0.8
	Total DW household Dishwasher	1	**0**	**4**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**15**
	LD condensing heat pump	1		0.0	-0.9	-2.1	-2.9	-3.3	-3.5	-3.6	-3.3	-3.1
	LD condensing electric heat element	1	0.0	0.0	0.9	2.9	4.9	5.7	6.0	5.9	5.4	4.9
	LD vented electric	1	0.0	0.1	1.0	2.2	3.0	3.5	4.2	4.5		
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	LD Laundry Dryers, sum active modes		0.0	0.0	0.9	2.8	4.7	5.7	6.3	6.5	6.3	6.1
	LD Laundry Dryers, low-power modes	1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total LD household Laundry Dryer		**0.0**	**0.0**	**1.0**	**3.0**	**4.9**	**6.0**	**6.6**	**6.8**	**6.6**	**6.4**

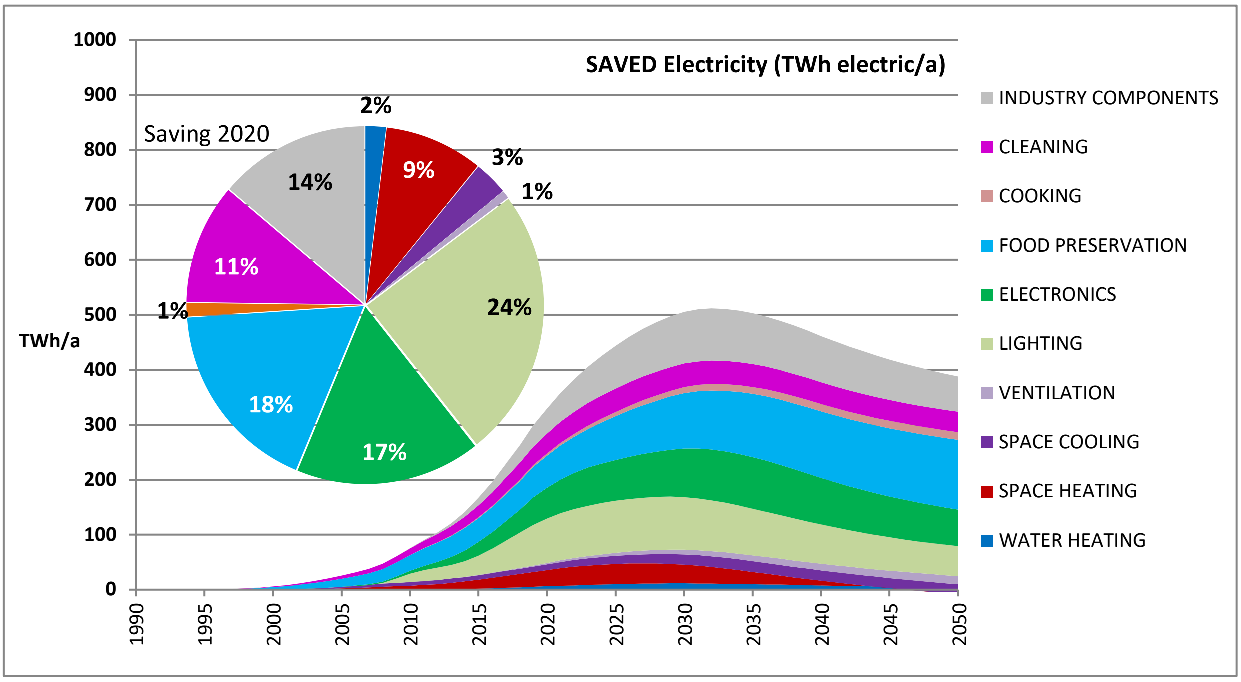
db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	0.0	0.0	1.2	7.1	10.0	8.5	6.4	4.9	4.5	4.4
	VC Upright Domestic mains	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	VC Handstick Domestic mains	1	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.8	0.8	0.8
	VC Total Domestic mains		**0**	**0**	**1**	**7**	**10**	**9**	**7**	**6**	**5**	**5**
	VC Cylinder Commercial mains	1	0.0	0.0	0.9	4.0	4.6	5.0	5.5	5.6	5.6	5.6
	VC Upright Commercial mains	1	0.0	0.0	0.1	0.4	0.5	0.5	0.6	0.6	0.6	0.6
	VC Total Commercial mains		**0**	**0**	**1**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
	VC Total in scope of CR 666/2013		**0**	**0**	**2**	**12**	**15**	**15**	**13**	**12**	**12**	**11**
	VC Cordless - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**0**	**0**	**1**	**7**	**10**	**9**	**7**	**6**	**5**	**5**
	VC Total Commercial mains+cordless+robots		**0**	**0**	**1**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
	Total VC Vacuum Cleaner		**0**	**0**	**2**	**12**	**15**	**15**	**13**	**12**	**12**	**11**
	TOTAL CLEANING		**0**	**12**	**22**	**36**	**43**	**43**	**42**	**40**	**38**	**37**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	0	0	2.1	6.3	11.2	14.2	15.2	15.2	15.2	15.2
0.5	FAN Axial>300Pa	1	0	0	1.9	6.6	12.4	16.3	17.8	17.8	17.8	17.8
0.5	FAN Centr.FC	1	0	0	0.7	2.8	5.1	6.7	7.1	7.1	7.1	7.1
0.5	FAN Centr.BC-free	1	0	0	1.7	4.6	7.8	9.6	10.4	10.7	10.9	11.1
0.5	FAN Centr.BC	1	0	0	2.3	5.9	9.8	12.0	13.1	14.1	15.3	16.6
0.5	FAN Cross-flow	1	0	0	0.5	1.4	2.0	2.4	2.6	2.8	3.0	3.3
	Total FAN, industrial (excl. box & roof fans)		**0**	**0**	**5**	**14**	**24**	**31**	**33**	**34**	**35**	**36**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	0	0	5.2	22.3	35.8	35.0	31.1	26.0	19.7	12.1
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	0	0	7.6	34.9	59.3	59.9	53.0	43.6	31.6	16.5
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	0	0	13.8	53.2	89.8	111.8	94.6	65.0	35.0	13.8
0.45	**Total 3ph 0.75-375 kW no VSD**		**0**	**1**	**27**	**110**	**185**	**207**	**179**	**135**	**86**	**42**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	0	0	-0.8	-8.6	-15.4	-14.1	-11.8	-9.1	-5.6	-1.3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	0	0	-3.8	-19.3	-32.8	-31.8	-27.2	-21.5	-14.1	-4.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	0	0	-7.8	-31.0	-50.9	-61.6	-48.5	-29.2	-10.8	1.9
0.45	**Total 3-ph 0.75-375 kW with VSD**		**0**	**0**	**-12**	**-59**	**-99**	**-107**	**-88**	**-60**	**-30**	**-4**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**0**	**0**	**14**	**52**	**86**	**99**	**91**	**75**	**56**	**38**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	0	0	0	0.0	0.3	0.7	0.7	0.6	0.6	0.5
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.0**	**0.3**	**0.8**	**0.7**	**0.7**	**0.6**	**0.6**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	0	0	0	0.0	0.7	1.1	1.0	0.9	0.8	0.8
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
0.45	**Total Small 3-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.0**	**0.9**	**1.3**	**1.2**	**1.2**	**1.1**	**1.0**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	0	0	0	0.0	0.3	0.5	0.7	0.8	0.7	0.5
0.45	Large 3-ph LV 375-1000kW with VSD	1	0	0	0	0.1	0.7	1.5	2.2	2.7	2.5	2.5
0.45	**Total Large 3-ph LV 375-1000 kW**		**0**	**0**	**0**	**0.1**	**1.0**	**2.1**	**3.0**	**3.5**	**3.2**	**3.0**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.2	0.2
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.3	0.2
0.45	Explosion motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.3**	**0.7**	**0.9**	**0.9**	**0.8**	**0.7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.2	0.2	0.2
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.3	0.3
0.45	Brake motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
0.45	**Total Brake 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.8**	**0.7**	**0.7**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**0**	**0**	**0**	**0.0**	**0.8**	**1.9**	**2.7**	**2.5**	**2.3**	**2.1**
	Total MT Elec. Motors LV 0.12-1000 kW		**0**	**0**	**8**	**28**	**49**	**59**	**55**	**46**	**36**	**25**
	including double counted amounts		0	0	14	52	89	107	100	84	65	46

db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	0	0	0.2	0.5	0.5	0.5	0.4	0.3	0.3	0.2
	ESOB<45_CF	1	0	0	0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.1
	ESOB<45_VSD-VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB < 45 Total	1	**0**	**0**	**0.3**	**0.8**	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**
	ESOB_45-150_VF	1	0	0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	1	0	0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ESOB_45-150_VSD-VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	1	**0**	**0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**
	ESOB < 150 Total	1	**0**	**0**	**0.4**	**1.0**	**1.2**	**1.0**	**0.8**	**0.7**	**0.5**	**0.4**
	ESCC<45_VF	1	0	0	0.1	0.4	0.4	0.4	0.3	0.3	0.2	0.2
	ESCC<45_CF	1	0	0	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.1
	ESCC<45_VSD-VF	1	0	0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	ESCC < 45 Total	1	**0**	**0**	**0.3**	**0.7**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**
	ESCC_45-150_VF	1	0	0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ESCC_45-150_CF	1	0	0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_VSD-VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	1	**0**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
	ESCC < 150 Total	1	**0**	**0**	**0.3**	**0.8**	**0.9**	**0.8**	**0.7**	**0.5**	**0.4**	**0.3**
	ESCCi<45_VF	1	0	0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	ESCCi<45_CF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi<45_VSD-VF	1	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ESCCi < 45 Total	1	**0**	**0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**
	ESCCi_45-150_VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	1	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	1	**0**	**0**	**0.1**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**
	MSSB<6"_VF	1	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	MSSB<6"_CF	1	0	0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.7
	MSSB<6"_VSD-VF	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MSSB <6" Total	1	**0**	**0**	**0.2**	**0.6**	**0.9**	**0.9**	**0.9**	**0.9**	**0.8**	**0.8**
	MS-V<25bar_VF	1	0	0	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.1
	MS-V<25bar_CF	1	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	MS-V<25bar_VSD-VF	1	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
	MS_V <25 bar Total	1	**0**	**0**	**0.2**	**0.6**	**0.7**	**0.7**	**0.6**	**0.6**	**0.5**	**0.4**
	WP Water pumps		**0.0**	**0.0**	**1.2**	**3.3**	**4.0**	**3.7**	**3.3**	**2.9**	**2.5**	**2.0**
	WE arc-on-mode	1	0	0	0	0.0	0.4	0.7	0.8	0.8	0.8	0.8
	WE idle mode	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	Total WE Welding Equipment		**0.0**	**0.0**	**0.0**	**0.0**	**0.4**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**
	TOTAL INDUSTRY COMPONENTS		**0**	**0**	**14**	**45**	**78**	**94**	**93**	**84**	**74**	**64**
1	TRAFO Distribution	1	0	0	0.5	1.8	3.3	4.8	6.5	8.3	10.2	12.2
1	TRAFO Industry oil	1	0	0	0.6	2.4	4.2	6.2	8.3	9.9	10.6	11.3
1	TRAFO Industry dry	1	0	0	0.1	0.4	0.8	1.1	1.5	1.9	2.2	2.3
1	TRAFO Power	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	TRAFO DER oil	1	0	0	0.1	0.3	0.7	1.3	2.3	3.5	5.0	6.7
1	TRAFO DER dry	1	0	0	0.2	0.8	1.7	3.4	5.9	9.2	13.0	17.3
1	TRAFO Small	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers		**0**	**0**	**2**	**6**	**11**	**17**	**24**	**33**	**41**	**50**
	TOTAL ENERGY SECTOR (not final energy: distribution losses)		**0**	**0**	**2**	**6**	**11**	**17**	**24**	**33**	**41**	**50**
	Tyres C1, replacement for cars	0	0	0	0	0	0	0	0	0	0	0
	Tyres C1, OEM for cars	0	0	0	0	0	0	0	0	0	0	0
	Tyres C1, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C2, replacement for vans	0	0	0	0	0	0	0	0	0	0	0
	Tyres C2, OEM for vans	0	0	0	0	0	0	0	0	0	0	0
	Tyres C2, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C3, replacement for trucks/busses	0	0	0	0	0	0	0	0	0	0	0
	Tyres C3, OEM for trucks/busses	0	0	0	0	0	0	0	0	0	0	0
	Tyres C3, total		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres, total C1+C2+C3		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL TRANSPORT SECTOR		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	SAVED Electricity, Total excl. Energy Sector, in TWh		**0**	**75**	**167**	**329**	**444**	**505**	**503**	**461**	**419**	**388**
	SAVED Electricity, Total excl. Energy Sector, in PJ		0	272	601	1184	1597	1819	1810	1660	1508	1395
	SAVED Electricity, Total excl. Energy Sector, in mtoe		0	6	14	28	38	43	43	40	36	33

SAVED Electricity (BAU-ECO, summary in TWh elec)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	2	6	10	12	10	8	6	4
SPACE HEATING	0	7	17	30	37	34	22	8	-3	-12
SPACE COOLING	0	7	8	10	15	19	20	19	18	18
VENTILATION	0	0	1	2	5	8	11	12	13	15
1 *Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)*	*0*	*0*	*1*	*3*	*6*	*9*	*12*	*13*	*14*	*15*
LIGHTING	0	15	35	81	95	96	85	71	61	54
ELECTRONICS	0	5	25	56	74	88	94	85	74	67
FOOD PRESERVATION	0	28	43	58	80	101	115	121	124	127
COOKING	0	0	1	4	8	11	13	13	14	14
CLEANING	0	12	22	36	43	43	42	40	38	37
INDUSTRY COMPONENTS	0	0	14	45	78	94	93	84	74	64
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0
SAVED Electricity, Total excl. Energy Sector, in TWh	**0**	**75**	**167**	**329**	**444**	**505**	**503**	**461**	**419**	**388**
SAVED Electricity, Total excl. Energy Sector, in PJ	0	272	601	1184	1597	1819	1810	1660	1508	1395
SAVED Electricity, Total excl. Energy Sector, in mtoe	0	6	14	28	38	43	43	40	36	33

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported :

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (improvement over BAU)	0	0	2	6	11	17	24	33	41	50
SAVED Electricity, Total incl. Energy Sector, in TWh	**0**	**75**	**168**	**335**	**454**	**522**	**527**	**494**	**460**	**437**
SAVED Electricity, Total incl. Energy Sector, in PJ	0	272	606	1205	1636	1880	1898	1778	1655	1575
SAVED Electricity, Total incl. Energy Sector, in mtoe	0	6	14	29	39	45	45	42	40	38
trafo ELEC save / total Eco ELEC	0.00%	0.00%	0.06%	0.23%	0.44%	0.70%	1.01%	1.31%	1.58%	1.85%
Saving in % versus BAU (from 1990=0)	0.0%	3.0%	6.2%	11.7%	15.5%	17.4%	17.2%	15.6%	13.9%	12.6%
Saving In % versus BAU (from 2010=0)	-4.4%	0.0%	3.4%	9.0%	12.9%	14.8%	14.6%	13.0%	11.4%	10.1%



Sector subdivision for SAVED Electricity (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

SAVED Electricity (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	0	0	0	0	0
SPACE HEATING	0	0	1	2	2	2	1	1	0	0
SPACE COOLING	0	0	0	1	2	3	4	4	3	3
VENTILATION	0	0	0	0	0	1	1	1	1	1
LIGHTING	0	1	3	6	10	14	14	13	11	10
ELECTRONICS	0	0	0	1	1	1	2	2	1	1
FOOD PRESERVATION	0	0	0	2	3	5	5	6	6	7
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	0	0	8	27	46	56	54	47	38	30
SAVED Electricity, Industry, in TWh	**0**	**2**	**13**	**39**	**67**	**83**	**82**	**73**	**63**	**53**
SAVED Electricity, Industry, in PJ	0	8	46	140	240	299	296	265	226	192
SAVED Electricity, Industry, in mtoe	0	0	1	3	6	7	7	6	5	5

SAVED Electricity (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for SERVICE-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for RESIDENTIAL-sector-related transport	0	0	0	0	0	0	0	0	0	0
TYRES for OTHER-sector-related transport	0	0	0	0	0	0	0	0	0	0
SAVED Electricity, Transport, in TWh	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
SAVED Electricity, Transport, in PJ	0	0	0	0	0	0	0	0	0	0
SAVED Electricity, Transport, in mtoe	0	0	0	0	0	0	0	0	0	0

SAVED Electricity (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	2	3	4	4	4	4	4
SPACE HEATING	0	2	5	10	14	14	12	8	4	2
SPACE COOLING	0	2	3	4	8	10	11	11	10	9
VENTILATION	0	0	0	1	3	5	6	7	7	8
LIGHTING	0	4	12	26	43	57	55	48	42	38
ELECTRONICS	0	2	7	14	17	22	25	23	19	16
FOOD PRESERVATION	0	2	3	6	15	26	33	35	36	37
COOKING	0	0	0	1	1	2	2	2	2	2
CLEANING	0	1	2	5	6	6	7	7	7	7
INDUSTRY COMPONENTS	0	0	5	17	29	36	37	35	34	32
SAVED Electricity, Services, in TWh	**0**	**13**	**37**	**86**	**139**	**182**	**190**	**179**	**165**	**155**
SAVED Electricity, Services, in PJ	0	47	134	311	501	654	686	645	596	558
SAVED Electricity, Services, in mtoe	0	1	3	7	12	16	16	15	14	13

SAVED Electricity (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	4	6	7	6	4	2	0
SPACE HEATING	0	5	10	17	21	17	9	0	-7	-13
SPACE COOLING	0	4	5	4	4	4	4	4	4	5
VENTILATION	0	0	0	1	2	3	4	4	5	6
LIGHTING	0	10	19	48	41	24	15	10	7	5
ELECTRONICS	0	3	18	41	55	65	67	60	53	49
FOOD PRESERVATION	0	26	40	50	60	69	76	79	81	82
COOKING	0	0	1	3	6	9	10	11	11	12
CLEANING	0	12	20	31	36	36	34	32	30	29
INDUSTRY COMPONENTS	0	0	0	1	1	1	1	0	0	0
SAVED Electricity, Residential, in TWh	**0**	**59**	**115**	**200**	**233**	**235**	**225**	**204**	**186**	**175**
SAVED Electricity, Residential, in PJ	0	214	414	720	838	846	809	733	670	631
SAVED Electricity, Residential, in mtoe	0	5	10	17	20	20	19	18	16	15

(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

SAVED Electricity (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	0	0	0	0	0
SPACE HEATING	0	0	0	0	0	0	0	0	0	0
SPACE COOLING	0	0	0	0	1	1	1	1	1	1
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	1	1	1	1	1	1	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	1	1	1	1	1	1	1
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	1	2	2	2	2	1	1
SAVED Electricity, Other sectors, in TWh	**0**	**1**	**2**	**4**	**5**	**6**	**5**	**5**	**4**	**4**
SAVED Electricity, Other sectors, in PJ	0	2	6	13	18	20	20	18	16	14
SAVED Electricity, Other sectors, in mtoe	0	0	0	0	0	0	0	0	0	0

SAVED Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		0	0	2	6	10	12	10	8	6	4
	Residential	0	0	1	4	6	7	6	4	2	0
	Tertiary / Services	0	0	0	2	3	4	4	4	4	4
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
SPACE HEATING. All sectors, TWh		0	7	17	30	37	34	22	8	-3	-12
	Residential	0	5	10	17	21	17	9	0	-7	-13
	Tertiary / Services	0	2	5	10	14	14	12	8	4	2
	Industry	0	0	1	2	2	2	1	1	0	0
	Other	0	0	0	0	0	0	0	0	0	0
SPACE COOLING. All sectors, TWh		0	7	8	10	15	19	20	19	18	18
& HT PROCESS	Residential	0	4	5	4	4	4	4	4	4	5
	Tertiary / Services	0	2	3	4	8	10	11	11	10	9
	Industry	0	0	0	1	2	3	4	4	3	3
	Other	0	0	0	0	1	1	1	1	1	1
VENTILATION.	All sectors, TWh	0	0	1	2	5	8	11	12	13	15
	Residential	0	0	0	1	2	3	4	4	5	6
	Tertiary / Services	0	0	0	1	3	5	6	7	7	8
	Industry	0	0	0	0	0	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	15	35	81	95	96	85	71	61	54
	Residential	0	10	19	48	41	24	15	10	7	5
	Tertiary / Services	0	4	12	26	43	57	55	48	42	38
	Industry	0	1	3	6	10	14	14	13	11	10
	Other	0	0	1	1	1	1	1	1	1	1
ELECTRONICS.	All sectors, TWh	0	5	25	56	74	88	94	85	74	67
	Residential	0	3	18	41	55	65	67	60	53	49
	Tertiary / Services	0	2	7	14	17	22	25	23	19	16
	Industry	0	0	0	1	1	1	2	2	1	1
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	28	43	58	80	101	115	121	124	127
	Residential	0	26	40	50	60	69	76	79	81	82
	Tertiary / Services	0	2	3	6	15	26	33	35	36	37
	Industry	0	0	0	2	3	5	5	6	6	7
	Other	0	0	0	1	1	1	1	1	1	1
COOKING.	All sectors, TWh	0	0	1	4	8	11	13	13	14	14
	Residential	0	0	1	3	6	9	10	11	11	12
	Tertiary / Services	0	0	0	1	1	2	2	2	2	2
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	12	22	36	43	43	42	40	38	37
	Residential	0	12	20	31	36	36	34	32	30	29
	Tertiary / Services	0	1	2	5	6	6	7	7	7	7
	Industry	0	0	0	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		0	0	14	45	78	94	93	84	74	64
	Residential	0	0	0	1	1	1	1	0	0	0
	Tertiary / Services	0	0	5	17	29	36	37	35	34	32
	Industry	0	0	8	27	46	56	54	47	38	30
	Other	0	0	0	1	2	2	2	2	1	1
TYRES. Transport sector, TWh		0	0	0	0	0	0	0	0	0	0
	Residential transport	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services transport	0	0	0	0	0	0	0	0	0	0
	Industry transport	0	0	0	0	0	0	0	0	0	0
	Other transport	0	0	0	0	0	0	0	0	0	0
ALL PRODUCTS.	All sectors, TWh	0	75	167	329	444	505	503	461	419	388
	Residential	0	59	115	200	233	235	225	204	186	175
	Tertiary / Services	0	13	37	86	139	182	190	179	165	155
	Industry	0	2	13	39	67	83	82	73	63	53
	Other	0	1	2	4	5	6	5	5	4	4
	Transport	0	0	0	0	0	0	0	0	0	0

SAVED Electricity (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			65%	65%	64%	62%	57%	47%	31%	-1%
	Tertiary / Services			31%	31%	32%	34%	39%	49%	65%	96%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential		62%	61%	59%	56%	51%	41%	-1%		
	Tertiary / Services		32%	33%	35%	38%	42%	52%	91%		
	Industry		5%	5%	5%	5%	6%	7%	11%		
	Other		1%	1%	1%	1%	1%	0%	-1%		
SPACE COOLING.											
& HT PROCESS	Residential		62%	60%	42%	28%	21%	19%	20%	22%	27%
	Tertiary / Services		32%	34%	43%	51%	55%	56%	56%	55%	52%
	Industry		5%	5%	11%	16%	18%	19%	19%	18%	16%
	Other		1%	1%	3%	5%	5%	6%	5%	5%	5%
VENTILATION											
	Residential			28%	29%	33%	34%	35%	36%	37%	39%
	Tertiary / Services			62%	61%	58%	57%	56%	55%	54%	53%
	Industry			9%	9%	9%	9%	8%	8%	8%	8%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential		66%	56%	59%	43%	25%	17%	13%	11%	10%
	Tertiary / Services		26%	34%	32%	45%	59%	65%	68%	69%	71%
	Industry		7%	9%	8%	11%	15%	17%	18%	19%	19%
	Other		1%	2%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential		53%	73%	74%	75%	74%	72%	71%	72%	74%
	Tertiary / Services		47%	26%	25%	24%	25%	26%	27%	26%	24%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential		92%	92%	86%	76%	68%	66%	65%	65%	65%
	Tertiary / Services		6%	6%	10%	19%	26%	28%	29%	29%	29%
	Industry		1%	1%	3%	4%	5%	5%	5%	5%	5%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential		87%	85%	84%	84%	83%	83%	83%	83%	83%
	Tertiary / Services		13%	15%	16%	16%	17%	17%	17%	17%	17%
	Industry		0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential		96%	91%	85%	85%	84%	82%	80%	80%	79%
	Tertiary / Services		4%	8%	14%	13%	14%	16%	17%	18%	19%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential		0%	2%	1%	1%	1%	1%	1%	1%	1%
	Tertiary / Services		20%	39%	37%	37%	38%	40%	42%	46%	50%
	Industry		79%	56%	59%	60%	59%	58%	56%	52%	47%
	Other		1%	3%	3%	2%	2%	2%	2%	2%	2%
TYRES.											
	Residential transport										
	Tertiary / Services transport										
	Industry transport										
	Other transport										
ALL PRODUCTS.											
	Residential		79%	69%	61%	52%	46%	45%	44%	44%	45%
	Tertiary / Services		17%	22%	26%	31%	36%	38%	39%	40%	40%
	Industry		3%	8%	12%	15%	16%	16%	16%	15%	14%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
	Transport		0%	0%	0%	0%	0%	0%	0%	0%	0%

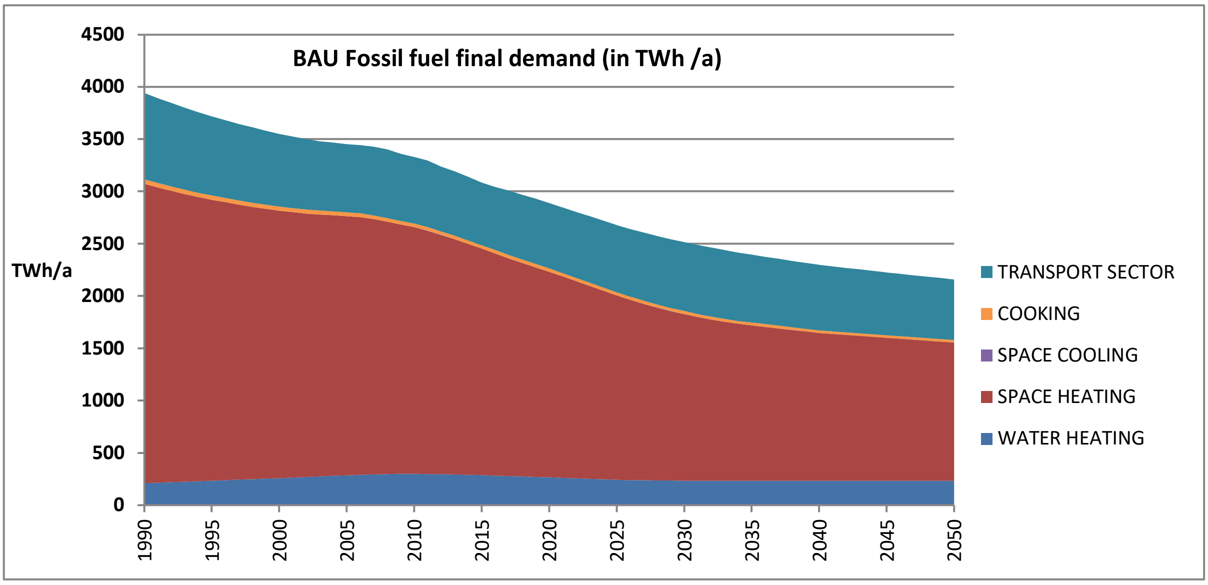
db BAU Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	0	0	0	0	0	0	0	0
EIWHS Electric Instant. Shower (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage > 30 L (primary)	1.00	0	0	0	0	0	0	0	0	0	0
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	13	10	9	8	8	8	7	7
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	8	7	6	6	6	5	5	5
GSWH Gas Storage, Condensing	0.010	0	0	0	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	18	13	9	6	5	4	3	3
Dedicated WH Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
Dedicated WH Solar (3.5 m2)	0.80	0	2	3	3	3	3	3	3	3	3
WH dedicated Water Heater		**46**	**47**	**41**	**34**	**28**	**25**	**23**	**21**	**20**	**19**
CHB Gas Combi Instant. WH	0.04	55	132	137	137	132	134	137	137	137	136
CHB Gas + Cyl. WH	0.04	35	56	56	54	52	52	53	54	53	53
CHB Jet Burner Gas + Cyl. WH	0.04	8	7	6	5	4	3	2	2	2	2
CHB Jet Burner Oil + Cyl. WH	0.04	66	57	46	36	27	19	17	17	17	17
CHB Electric (Joule) + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	0	1	1	2
CHB Electric HP + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	2
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	1	1
CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
CHC Central Heating combi, water heating		**165**	**254**	**247**	**234**	**217**	**211**	**212**	**213**	**214**	**214**
TOTAL WATER HEATING		**211**	**301**	**288**	**268**	**244**	**235**	**234**	**234**	**234**	**233**
CHB Gas non-condensing	0.04	737	837	674	508	364	313	271	229	196	167
CHB Gas condensing	0.04	7	264	395	516	605	632	640	629	622	609
CHB Gas Jet burner non-condensing	0.04	80	52	40	28	18	10	6	5	4	4
CHB Gas Jet burner condensing	0.04	0	1	2	3	5	6	7	7	7	7
CHB Oil Jet burner non-condensing	0.04	992	641	484	342	221	118	67	55	48	41
CHB Oil Jet burner condensing	0.04	0	9	21	33	45	56	61	63	65	66
CHB Electric Joule-effect	1.00	0	0	0	0	0	0	0	0	0	0
CHB Hybrid (gas-electric)	0.60	0	0	0	0	0	1	1	1	2	3
CHB Electric Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
CHB Gas Heat Pump	0.04	0	0	0	0	1	1	1	1	2	3
CHB micro CHP	0.04	0	0	0	1	1	1	1	2	3	4
CHB Solar combi (16 m2)	0.10	5	6	6	6	6	6	6	5	5	5
CHB Central Heating boiler < 400 kW, space heating		**1821**	**1811**	**1621**	**1439**	**1267**	**1143**	**1061**	**998**	**954**	**910**
SFB Wood Manual	0	342	90	69	51	34	20	12	8	7	6
SFB Wood Direct Draft	0	2	23	43	60	71	69	69	74	85	98
SFB Coal	0	364	107	105	85	61	37	26	24	21	18
SFB Pellets	0	0	9	16	22	27	29	30	30	31	33
SFB Wood chips	0	0	14	17	19	18	17	18	19	20	21
Total Solid Fuel Boiler		**709**	**243**	**251**	**237**	**210**	**172**	**155**	**155**	**164**	**175**
CHAE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHAE-L (> 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-L (> 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
CHF	0.05	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
HT PCH-AE-S	1	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-L	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-S	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-M	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-L	1	0	0	0	0	0	0	0	0	0	0
AC rooftop	1	0	0	0	0	0	0	0	0	0	0
AC splits	1	0	0	0	0	0	0	0	0	0	0
AC VRF	1	0	0	0	0	0	0	0	0	0	0
ACF	0.05	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
SubTotal AHC central Air Cooling		**0.0**	**0.1**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
AC rooftop (rev)	1	0	0	0	0	0	0	0	0	0	0
AC splits (rev)	1	0	0	0	0	0	0	0	0	0	0
AC VRF (rev)	1	0	0	0	0	0	0	0	0	0	0
ACF (rev)	0.05	0.0	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6
AHF	0.05	194	141	121	105	92	81	72	63	56	49
AHE	1	0	0	0	0	0	0	0	0	0	0
SubTotal AHC central Air Heating		**194**	**141**	**121**	**106**	**93**	**82**	**72**	**64**	**57**	**50**
Total AHC central Air Heating & Cooling		**194**	**141**	**121**	**106**	**93**	**82**	**73**	**64**	**57**	**50**

db	BAU Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	20	20	20	20	20	20	20
	LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60
	LH wood stove	0	38	37	37	37	37	38	38	37	36	36
	LH coal stove	0	23	13	11	10	9	8	6	5	4	3
	LH cooker	0	7	11	12	14	15	15	15	15	15	14
	LH SHR stove	0	16	21	22	24	27	29	32	33	34	34
	LH pellet stove	0	0	8	11	14	16	17	17	17	17	17
	LH Solid fuel sum		**117**	**148**	**161**	**173**	**184**	**190**	**192**	**191**	**188**	**184**
	LH Electric sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	1.0	0.9	0.8	0.6	0.6	0.5	0.5
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.2	1.2
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.5	1.2	0.9	0.8	0.7	0.6	0.6
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.8	1.3	1.0	0.9	0.8	0.8
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0					
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.7**	**8.0**	**6.6**	**5.4**	**4.6**	**4.0**	**3.6**	**3.4**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0					
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.7**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
	LH Local Space Heaters total		**137**	**161**	**171**	**182**	**191**	**195**	**196**	**195**	**192**	**187**
	RAC < 12 kW total, cooling mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC < 12 kW total, heating mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC Room Air Conditioner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	CIRC Integrated circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Large standalone circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Small standalone circulators	1	0	0	0	0	0	0	0	0	0	0
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING		**2860**	**2357**	**2165**	**1964**	**1760**	**1592**	**1485**	**1412**	**1366**	**1322**
	TOTAL SPACE COOLING		**0.0**	**0.1**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
	TOTAL VENTILATION (VU own fuel)		-	-	-	-	-	-	-	-	-	-
1	***Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)***		-	-	-	-	-	-	-	-	-	-
	TOTAL LIGHTING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CA Electric Hobs (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Electric Ovens (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Gas Hobs	0	31	25	25	24	23	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	7	6	6	6	6	6
	CA Range Hoods	1	0	0	0	0	0	0	0	0	0	0
	TOTAL COOKING		**43**	**34**	**33**	**31**	**29**	**28**	**27**	**25**	**24**	**23**
	Total WM-WD household Washing	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total DW household Dishwasher	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total LD household Laundry Dryer		**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Total VC Vacuum Cleaner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	-	-	-
	TOTAL INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR (BAU taken as reference =0) (not final energy: distribution losses)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C1, replacement for cars	0	372	281	259	252	252	246	236	225	213	203
	Tyres C1, OEM for cars	0	112	82	81	77	76	74	71	68	64	61
	Tyres C1, total		**484**	**364**	**340**	**329**	**328**	**320**	**308**	**292**	**277**	**264**
	Tyres C2, replacement for vans	0	109	96	91	96	101	107	104	99	94	90
	Tyres C2, OEM for vans	0	23	20	19	21	21	22	22	21	20	19
	Tyres C2, total		**131**	**116**	**109**	**117**	**123**	**129**	**126**	**120**	**114**	**109**
	Tyres C3, replacement for trucks/busses	0	173	129	119	147	158	173	176	174	171	169
	Tyres C3, OEM for trucks/busses	0	38	28	28	32	35	39	39	39	38	38
	Tyres C3, total		**211**	**158**	**147**	**179**	**193**	**211**	**215**	**212**	**210**	**207**
	Tyres, total C1+C2+C3		**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
	TOTAL TRANSPORT SECTOR		**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
	BAU Final Fuel, Total excl. Energy Sector, in TWh		**3940**	**3329**	**3082**	**2888**	**2678**	**2516**	**2395**	**2297**	**2226**	**2158**
	BAU Final Fuel, Total excl. Energy Sector, in PJ		14185	11983	11097	10396	9639	9057	8621	8268	8012	7767
	BAU Final Fuel, Total excl. Energy Sector, in mtoe		339	286	265	248	230	216	206	197	191	186

db	BAU Fuel Summary, TWh	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING		211	301	288	268	244	235	234	234	234	233
	SPACE HEATING		2860	2357	2165	1964	1760	1592	1485	1412	1366	1322
	SPACE COOLING		0	0	0	0	0	0	0	0	0	0
	VENTILATION		0	0	0	0	0	0	0	0	0	0
1	*Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)*		*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	LIGHTING		0	0	0	0	0	0	0	0	0	0
	ELECTRONICS		0	0	0	0	0	0	0	0	0	0
	FOOD PRESERVATION		0	0	0	0	0	0	0	0	0	0
	COOKING		43	34	33	31	29	28	27	25	24	23
	CLEANING		0	0	0	0	0	0	0	-	-	-
	INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0
	ENERGY SECTOR (see separate below)											
	TRANSPORT SECTOR		826	637	597	625	643	660	649	625	601	579
	BAU Final Fuel, Total excl. Energy Sector, in TWh		**3940**	**3329**	**3082**	**2888**	**2678**	**2516**	**2395**	**2297**	**2226**	**2158**
	BAU Final Fuel, Total excl. Energy Sector, in PJ		14185	11983	11097	10396	9639	9057	8621	8268	8012	7767
	BAU Final Fuel, Total excl. Energy Sector, in mtoe		339	286	265	248	230	216	206	197	191	186

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported :

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (reference BAU=0)	0	0	0	0	0	0	0	0	0	0
BAU Fuel, Total incl. Energy Sector, in TWh	**3940**	**3329**	**3082**	**2888**	**2678**	**2516**	**2395**	**2297**	**2226**	**2158**
BAU Fuel, Total incl. Energy Sector, in PJ	14185	11983	11097	10396	9639	9057	8621	8268	8012	7767
BAU Fuel, Total incl. Energy Sector, in mtoe	339	286	265	248	230	216	206	197	191	186



Sector subdivision for BAU Final Fuel (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears, and includes estimate for Special Purpose Lamps, controls and standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

BAU Final Fuel (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	6	9	9	8	7	7	7	7	7	7
SPACE HEATING	162	137	124	112	99	89	82	77	73	70
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Final Fuel, Industry, in TWh	**168**	**146**	**132**	**120**	**106**	**96**	**89**	**84**	**80**	**76**
BAU Final Fuel, Industry, in PJ	604	526	476	431	383	346	322	303	288	275
BAU Final Fuel, Industry, in mtoe	14	13	11	10	9	8	8	7	7	7

BAU Final Fuel (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	110	103	117	123	132	132	128	124	121
TYRES for SERVICE-sector-related transport	278	218	205	227	238	252	251	243	236	229
TYRES for RESIDENTIAL-sector-related transport	387	291	272	263	262	256	246	234	222	211
TYRES for OTHER-sector-related transport	22	17	16	18	19	20	20	20	19	18
BAU Final Fuel, Transport, in TWh	**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
BAU Final Fuel, Transport, in PJ	2974	2292	2149	2251	2315	2377	2337	2249	2165	2085
BAU Final Fuel, Transport, in mtoe	71	55	51	54	55	57	56	54	52	50

BAU Final Fuel (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	37	50	47	43	38	37	36	36	36	35
SPACE HEATING	605	551	498	447	398	360	334	315	302	289
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	7	6	6	5	5	5	5	4	4	4
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Final Fuel, Services, in TWh	**650**	**606**	**551**	**496**	**442**	**402**	**376**	**356**	**342**	**329**
BAU Final Fuel, Services, in PJ	2339	2183	1983	1784	1590	1446	1352	1282	1233	1185
BAU Final Fuel, Services, in mtoe	56	52	47	43	38	35	32	31	29	28

BAU Fuel (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	166	240	230	215	197	189	189	189	189	189
SPACE HEATING	2036	1616	1495	1362	1225	1109	1036	990	963	937
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	35	28	27	25	24	23	22	21	20	19
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Final Fuel, Residential, in TWh	**2237**	**1884**	**1752**	**1602**	**1446**	**1322**	**1247**	**1200**	**1172**	**1144**
BAU Final Fuel, Residential, in PJ	8053	6783	6308	5766	5206	4758	4489	4321	4218	4120
BAU Final Fuel, Residential, in mtoe	192	162	151	138	124	114	107	103	101	98

(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

BAU Fuel (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2	3	3	2	2	2	2	2	2	2
SPACE HEATING	58	53	48	43	38	34	32	30	28	26
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Final Fuel, Other sectors, in TWh	**60**	**55**	**50**	**45**	**40**	**36**	**34**	**32**	**30**	**29**
BAU Final Fuel, Other sectors, in PJ	215	199	181	163	145	131	121	114	108	103
BAU Final Fuel, Other sectors, in mtoe	5	5	4	4	3	3	3	3	3	2

BAU Final Fuel (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	211	301	288	268	244	235	234	234	234	233
	Residential	166	240	230	215	197	189	189	189	189	189
	Tertiary / Services	37	50	47	43	38	37	36	36	36	35
	Industry	6	9	9	8	7	7	7	7	7	7
	Other	2	3	3	2	2	2	2	2	2	2
SPACE HEATING.	All sectors, TWh	2860	2357	2165	1964	1760	1592	1485	1412	1366	1322
	Residential	2036	1616	1495	1362	1225	1109	1036	990	963	937
	Tertiary / Services	605	551	498	447	398	360	334	315	302	289
	Industry	162	137	124	112	99	89	82	77	73	70
	Other	58	53	48	43	38	34	32	30	28	26
SPACE COOLING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
& HT PROCESS	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
VENTILATION.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
COOKING.	All sectors, TWh	43	34	33	31	29	28	27	25	24	23
	Residential	35	28	27	25	24	23	22	21	20	19
	Tertiary / Services	7	6	6	5	5	5	5	4	4	4
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
TYRES. Transport sector, TWh		826	637	597	625	643	660	649	625	601	579
	Residential transport	387	291	272	263	262	256	246	234	222	211
	Tertiary / Services transport	278	218	205	227	238	252	251	243	236	229
	Industry transport	139	110	103	117	123	132	132	128	124	121
	Other transport	22	17	16	18	19	20	20	20	19	18
ALL PRODUCTS.	All sectors, TWh	3940	3329	3082	2888	2678	2516	2395	2297	2226	2158
	Residential	2237	1884	1752	1602	1446	1322	1247	1200	1172	1144
	Tertiary / Services	650	606	551	496	442	402	376	356	342	329
	Industry	168	146	132	120	106	96	89	84	80	76
	Other	60	55	50	45	40	36	34	32	30	29
	Transport	826	637	597	625	643	660	649	625	601	579

BAU Final Fuel (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	79%	80%	80%	80%	80%	81%	81%	81%	81%	81%
	Tertiary / Services	18%	16%	16%	16%	16%	16%	15%	15%	15%	15%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	71%	69%	69%	69%	70%	70%	70%	70%	70%	71%
	Tertiary / Services	21%	23%	23%	23%	23%	23%	23%	22%	22%	22%
	Industry	6%	6%	6%	6%	6%	6%	6%	5%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Tertiary / Services	88%	88%	88%	88%	88%	88%	88%	88%	88%	88%
	Industry	7%	7%	7%	7%	7%	7%	7%	7%	7%	7%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VENTILATION											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
LIGHTING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
ELECTRONICS.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
FOOD PRESERVE.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
COOKING.											
	Residential	83%	83%	82%	82%	82%	82%	82%	82%	82%	82%
	Tertiary / Services	17%	17%	18%	18%	18%	18%	18%	18%	18%	18%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
INDUSTRY COMP.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
TYRES.											
	Residential transport	47%	46%	46%	42%	41%	39%	38%	37%	37%	36%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	20%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	57%	57%	57%	55%	54%	53%	52%	52%	53%	53%
	Tertiary / Services	16%	18%	18%	17%	16%	16%	16%	16%	15%	15%
	Industry	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Other	2%	2%	2%	2%	2%	1%	1%	1%	1%	1%
	Transport	21%	19%	19%	22%	24%	26%	27%	27%	27%	27%

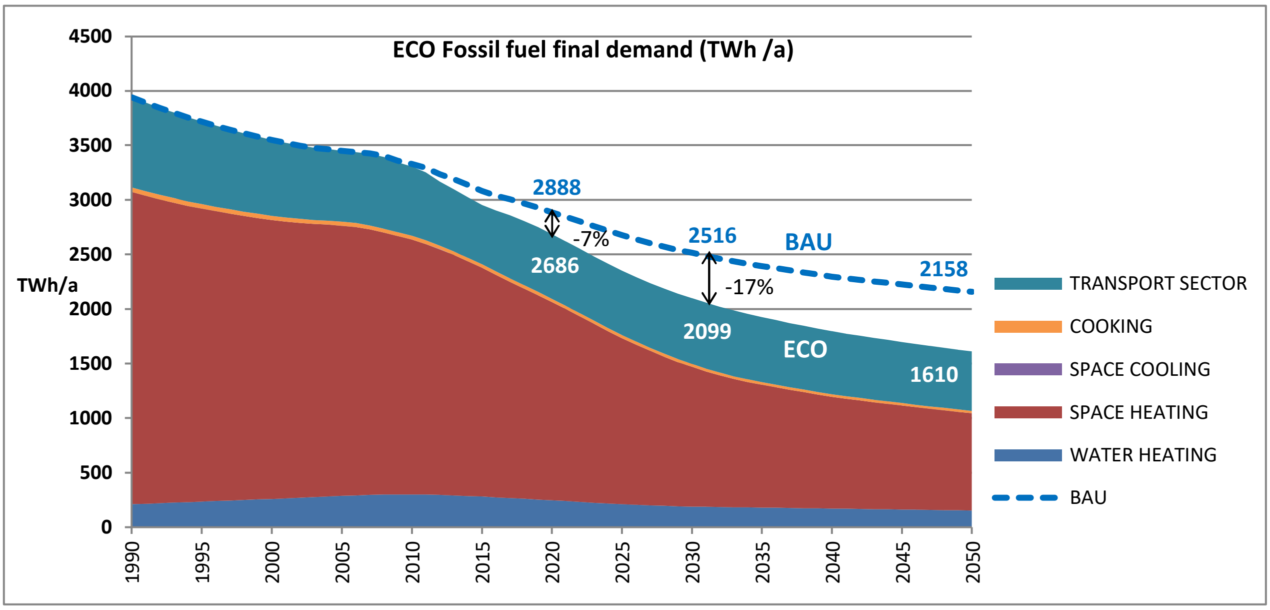
db	ECO Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	0	0	0	0	0	0	0	0
	EIWHS Electric Instant. Shower (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage > 30 L (primary)	1.00	0	0	0	0	0	0	0	0	0	0
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	7	6	5	4	4	4	4	4
	GSWH Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1
	GSWH Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	3	2
	Dedicated WH Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
	Dedicated WH Solar (3.5 m2)	0.80	0	2	3	3	3	2	2	2	2	2
	WH dedicated Water Heater		**46**	**47**	**39**	**28**	**20**	**17**	**16**	**16**	**15**	**15**
	CHB Gas Combi Instant. WH	0.04	55	132	135	129	117	110	104	97	89	80
	CHB Gas + Cyl. WH	0.04	35	56	54	49	43	39	37	34	31	28
	CHB Jet Burner Gas + Cyl. WH	0.04	8	7	6	5	3	2	2	2	2	2
	CHB Jet Burner Oil + Cyl. WH	0.04	66	57	46	35	25	17	14	14	14	14
	CHB Electric (Joule) + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	1	1	3	4	6	9
	CHB Electric HP + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
	CHB Gas HP + Cyl. WH	0.02	0	0	0	0	1	1	2	2	3	4
	CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	1
	CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
	CHC Central Heating combi, water heating		**165**	**254**	**242**	**219**	**191**	**172**	**163**	**155**	**147**	**139**
	TOTAL WATER HEATING		**211**	**301**	**281**	**247**	**211**	**189**	**179**	**171**	**163**	**154**
	CHB Gas non-condensing	0.04	737	827	635	394	187	87	35	19	10	7
	CHB Gas condensing	0.04	7	257	376	514	601	618	594	526	466	403
	CHB Gas Jet burner non-condensing	0.04	80	52	39	26	16	7	2	1	1	1
	CHB Gas Jet burner condensing	0.04	0	1	2	4	5	7	8	8	9	9
	CHB Oil Jet burner non-condensing	0.04	992	638	475	322	190	79	26	12	8	6
	CHB Oil Jet burner condensing	0.04	0	9	21	36	52	67	75	79	79	79
	CHB Electric Joule-effect	1.00	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid (gas-electric)	0.60	0	0	0	0	1	2	4	6	8	10
	CHB Electric Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
	CHB Gas Heat Pump	0.04	0	0	0	1	1	2	3	4	4	5
	CHB micro CHP	0.04	0	0	0	1	1	2	3	3	4	4
	CHB Solar combi (16 m2)	0.10	5	6	6	6	5	5	4	4	4	3
	CHB Central Heating boiler < 400 kW, space heating		**1821**	**1791**	**1554**	**1304**	**1059**	**876**	**753**	**661**	**592**	**527**
	SFB Wood Manual	0	342	90	69	48	30	16	9	6	5	4
	SFB Wood Direct Draft	0	2	23	43	60	70	67	66	71	81	93
	SFB Coal	0	364	107	105	84	59	35	23	21	19	16
	SFB Pellets	0	0	9	16	22	26	28	29	29	30	31
	SFB Wood chips	0	0	14	17	19	17	15	16	17	18	19
	Total Solid Fuel Boiler		**709**	**243**	**250**	**233**	**202**	**161**	**143**	**144**	**152**	**164**
	CHAE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
	CHAE-L (> 400 kW)	1	0	0	0	0	0	0	0	0	0	0
	CHWE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
	CHWE-L (> 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
	CHF	0.05	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-AE-S	1	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-L	1	0	0	0	0	0	0	0	0	0	0
	HT PCH-WE-S	1	0	0	0	0	0	0	0	0	0	0
	HT PCH-WE-M	1	0	0	0	0	0	0	0	0	0	0
	HT PCH-WE-L	1	0	0	0	0	0	0	0	0	0	0
	AC rooftop	1	0	0	0	0	0	0	0	0	0	0
	AC splits	1	0	0	0	0	0	0	0	0	0	0
	AC VRF	1	0	0	0	0	0	0	0	0	0	0
	ACF	0.05	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SubTotal AHC central Air Cooling		**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**
	AC rooftop (rev)	1	0	0	0	0	0	0	0	0	0	0
	AC splits (rev)	1	0	0	0	0	0	0	0	0	0	0
	AC VRF (rev)	1	0	0	0	0	0	0	0	0	0	0
	ACF (rev)	0.05	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
	AHF	0.05	194	141	120	100	81	65	55	49	43	38
	AHE	1	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Heating		**194**	**141**	**121**	**100**	**81**	**66**	**56**	**49**	**44**	**39**
	Total AHC central Air Heating & Cooling		**194**	**141**	**121**	**100**	**81**	**66**	**56**	**49**	**44**	**39**

db	ECO Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	19	17	16	14	13	13	12
	LH closed fireplace/inset	0	18	41	48	53	56	57	56	54	52	51
	LH wood stove	0	38	37	37	37	35	34	33	32	31	30
	LH coal stove	0	23	13	11	10	9	7	6	4	3	3
	LH cooker	0	7	11	12	13	14	14	14	13	13	13
	LH SHR stove	0	16	21	22	24	26	29	31	32	33	33
	LH pellet stove	0	0	8	11	13	15	16	16	17	16	16
	LH Solid fuel sum		**117**	**148**	**161**	**170**	**173**	**172**	**170**	**166**	**161**	**158**
	LH Electric sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	0.9	0.8	0.6	0.5	0.5	0.5	0.4
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.1	1.8	1.5	1.3	1.1	1.0	1.0
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.4	1.1	0.8	0.7	0.6	0.5	0.5
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.7	1.1	0.9	0.8	0.7	0.6
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.6**	**7.7**	**6.1**	**4.8**	**3.9**	**3.4**	**3.1**	**2.9**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.6**	**0.5**	**0.4**	**0.3**	**0.3**	**0.2**	**0.2**
	LH Local Space Heaters total		**137**	**161**	**171**	**179**	**179**	**178**	**174**	**169**	**164**	**161**
	RAC < 12 kW total, cooling mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC < 12 kW total, heating mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC Room Air Conditioner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	CIRC Integrated circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Large standalone circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Small standalone circulators	1	0	0	0	0	0	0	0	0	0	0
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING		**2860**	**2336**	**2095**	**1815**	**1522**	**1280**	**1126**	**1024**	**953**	**890**
	TOTAL SPACE COOLING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL VENTILATION (VU own fuel)		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
1	***Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)***		***-***	***-***	***-3***	***-13***	***-25***	***-35***	***-38***	***-38***	***-37***	***-37***
	TOTAL LIGHTING (incl. standby)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CA Electric Hobs (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Electric Ovens (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Gas Hobs	0	31	25	25	24	22	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	6	5	5	5	4	4
	CA Range Hoods	1	0	0	0	0	0	0	0	0	0	0
	TOTAL COOKING		**43**	**34**	**33**	**31**	**28**	**26**	**25**	**23**	**22**	**21**
	Total WM-WD household Washing	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total DW household Dishwasher	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total LD household Laundry Dryer		**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Total VC Vacuum Cleaner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**-**	**-**	**-**
	TOTAL INDUSTRY COMPONENTS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ENERGY SECTOR (only improvement over BAU) (not final energy: distribution losses)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C1, replacement for cars	0	372	279	225	230	223	216	209	201	195	188
	Tyres C1, OEM for cars	0	112	82	81	77	70	68	66	63	60	58
	Tyres C1, total		**484**	**361**	**305**	**307**	**293**	**284**	**275**	**264**	**255**	**246**
	Tyres C2, replacement for vans	0	109	95	83	92	93	98	97	92	89	85
	Tyres C2, OEM for vans	0	23	20	19	21	20	21	21	20	19	18
	Tyres C2, total		**131**	**115**	**102**	**113**	**114**	**119**	**118**	**113**	**108**	**104**
	Tyres C3, replacement for trucks/busses	0	173	128	109	141	149	162	165	163	161	159
	Tyres C3, OEM for trucks/busses	0	38	28	28	32	34	37	38	37	37	36
	Tyres C3, total		**211**	**156**	**137**	**173**	**183**	**199**	**203**	**200**	**198**	**195**
	Tyres, total C1+C2+C3		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
	TOTAL TRANSPORT SECTOR		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
	ECO Final Fuel, Total excl. Energy Sector, in TWh		**3940**	**3303**	**2954**	**2686**	**2351**	**2099**	**1925**	**1795**	**1698**	**1610**
	ECO Final Fuel, Total excl. Energy Sector, in PJ		14185	11892	10633	9668	8462	7556	6931	6462	6112	5797
	ECO Final Fuel, Total excl. Energy Sector, in mtoe		339	284	254	231	202	180	166	154	146	138

db	ECO Fuel Summary, TWh	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING		211	301	281	247	211	189	179	171	163	154
	SPACE HEATING		2860	2336	2095	1815	1522	1280	1126	1024	953	890
	SPACE COOLING		0	0	0	0	0	0	0	0	0	0
	VENTILATION		0	0	0	0	0	0	0	0	0	0
1	*Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)*		*0*	*0*	*-3*	*-13*	*-25*	*-35*	*-38*	*-38*	*-37*	*-37*
	LIGHTING		0	0	0	0	0	0	0	0	0	0
	ELECTRONICS		0	0	0	0	0	0	0	0	0	0
	FOOD PRESERVATION		0	0	0	0	0	0	0	0	0	0
	COOKING		43	34	33	31	28	26	25	23	22	21
	CLEANING		0	0	0	0	0	0	0	-	-	-
	INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0
	ENERGY SECTOR (see separate below)											
	TRANSPORT SECTOR		826	632	545	593	590	603	595	576	560	545
	ECO Final Fuel, Total excl. Energy Sector, in TWh		**3940**	**3303**	**2954**	**2686**	**2351**	**2099**	**1925**	**1795**	**1698**	**1610**
	ECO Final Fuel, Total excl. Energy Sector, in PJ		14185	11892	10633	9668	8462	7556	6931	6462	6112	5797
	ECO Final Fuel, Total excl. Energy Sector, in mtoe		339	284	254	231	202	180	166	154	146	138
	For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat		744	757	699	681						

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported :

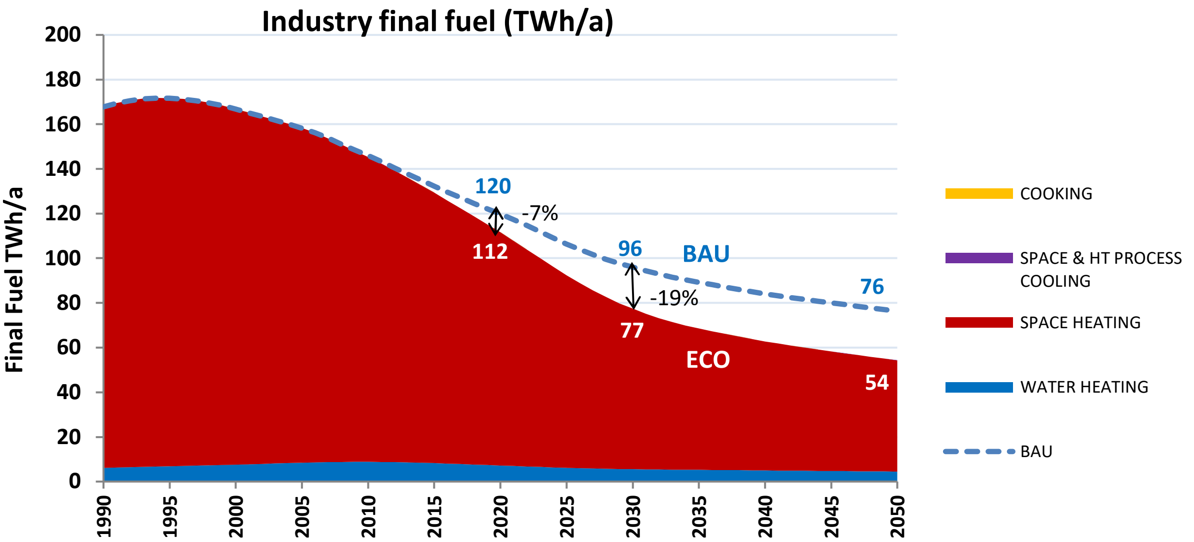
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (only improvement over BAU)	0	0	0	0	0	0	0	0	0	0
ECO Fuel, Total incl. Energy Sector, in TWh	**3940**	**3303**	**2954**	**2686**	**2351**	**2099**	**1925**	**1795**	**1698**	**1610**
ECO Fuel, Total incl. Energy Sector, in PJ	14185	11892	10633	9668	8462	7556	6931	6462	6112	5797
ECO Fuel, Total incl. Energy Sector, in mtoe	339	284	254	231	202	180	166	154	146	138



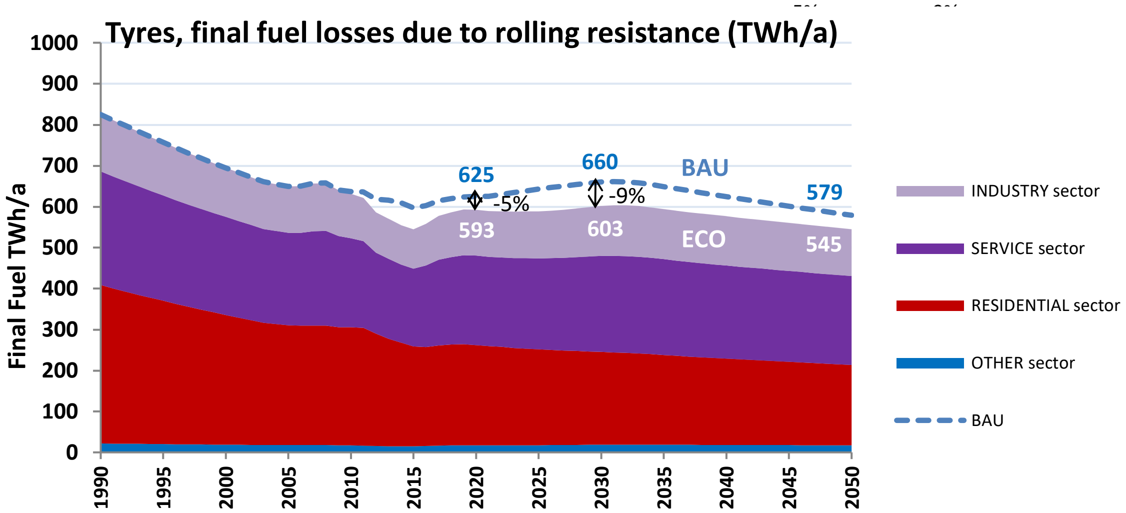
Sector subdivision for ECO Final Fuel (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

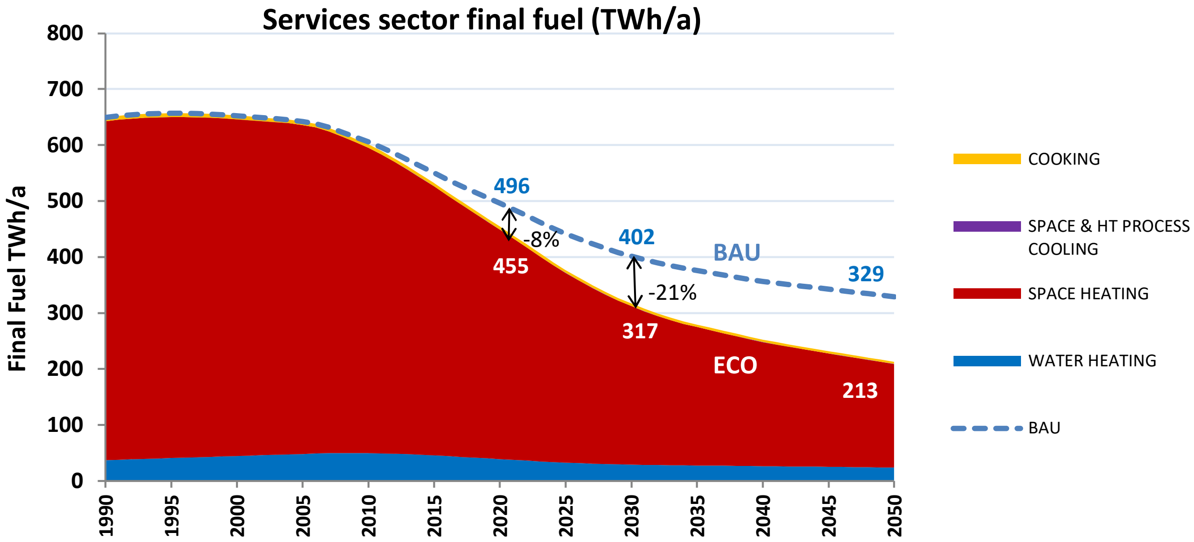
ECO Final Fuel (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	6	9	8	7	6	6	5	5	5	5
SPACE HEATING	162	136	121	104	86	72	63	58	54	50
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Final Fuel, Industry, in TWh	**168**	**145**	**129**	**112**	**92**	**77**	**69**	**63**	**58**	**54**
ECO Final Fuel, Industry, in PJ	604	523	466	402	333	279	247	226	210	196
ECO Final Fuel, Industry, in mtoe	14	12	11	10	8	7	6	5	5	5
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for Industry for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	234	164	155	155						



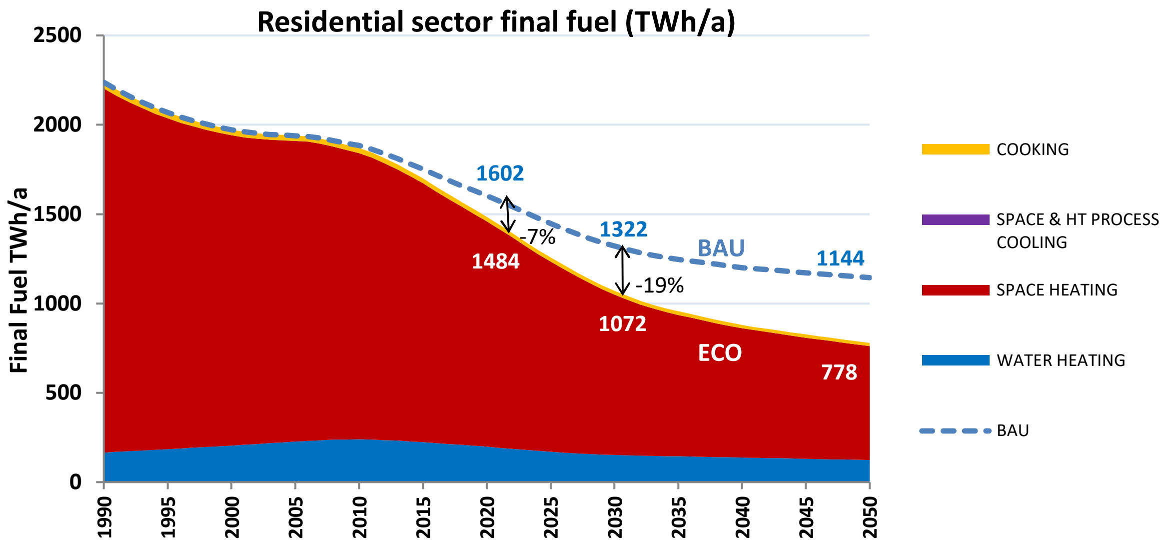
ECO Final Fuel (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	109	96	112	116	123	123	120	117	114
TYRES for SERVICE-sector-related transport	278	217	189	218	222	234	233	227	222	216
TYRES for RESIDENTIAL-sector-related transport	387	289	244	245	234	227	220	211	204	197
TYRES for OTHER-sector-related transport	22	17	15	17	18	19	19	18	18	17
ECO Final Fuel, Transport, in TWh	**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
ECO Final Fuel, Transport, in PJ	2974	2276	1960	2135	2122	2169	2142	2075	2017	1961
ECO Final Fuel, Transport, in mtoe	71	54	47	51	51	52	51	50	48	47
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for Road Transport for EU27 (2020))	202	261	255	238						



ECO Fuel (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	37	50	45	39	33	29	28	26	25	24
SPACE HEATING	605	545	481	410	339	283	247	221	202	185
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	7	6	6	5	5	5	4	4	4	4
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Final Fuel, Services, in TWh	**650**	**601**	**532**	**455**	**377**	**317**	**279**	**252**	**232**	**213**
ECO Final Fuel, Services, in PJ	2339	2164	1915	1637	1357	1143	1005	907	834	766
ECO Final Fuel, Services, in mtoe	56	52	46	39	32	27	24	22	20	18
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for Services for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	66	76	66	63						

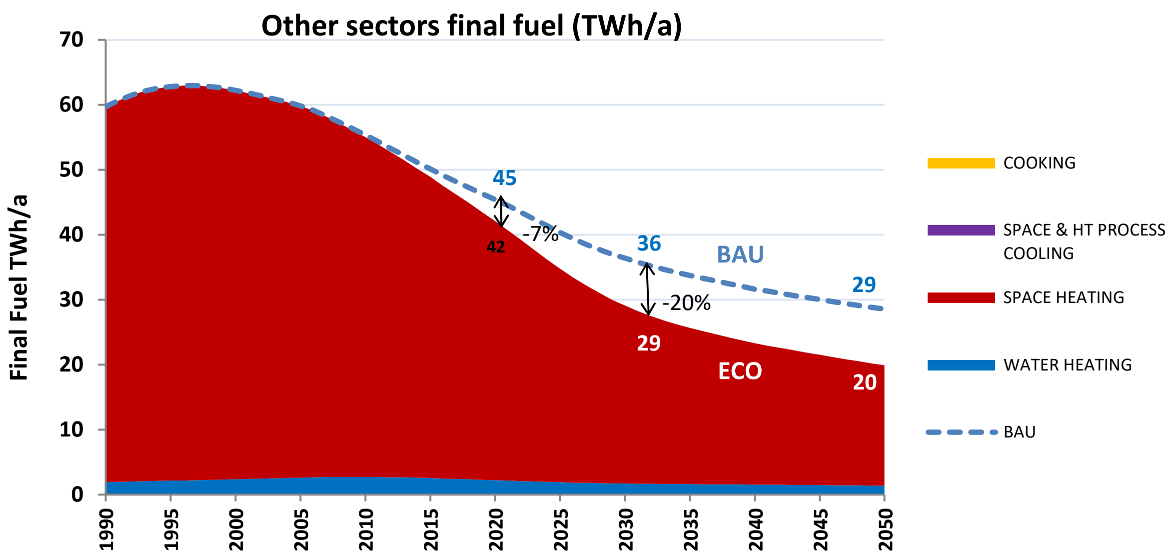


ECO Fuel (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	166	240	225	198	170	153	145	138	131	124
SPACE HEATING	2036	1602	1447	1261	1064	898	792	723	677	637
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	35	28	27	25	23	22	20	19	18	17
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Final Fuel, Residential, in TWh	**2237**	**1870**	**1699**	**1484**	**1257**	**1072**	**957**	**880**	**826**	**778**
ECO Final Fuel, Residential, in PJ	8053	6731	6116	5343	4525	3860	3445	3170	2974	2802
ECO Final Fuel, Residential, in mtoe	192	161	146	128	108	92	82	76	71	67
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for Households for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	193	216	186	187						
				-7%		-19%				



(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

ECO Fuel (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	2	3	3	2	2	2	2	2	1	1
SPACE HEATING	58	52	46	40	33	27	24	22	20	19
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Final Fuel, Other sectors, in TWh	60	55	49	42	35	29	26	23	22	20
ECO Final Fuel, Other sectors, in PJ	215	198	176	152	125	105	92	84	77	72
ECO Final Fuel, Other sectors, in mtoe	5	5	4	4	3	3	2	2	2	2
For comparison: Eurostat Energy Balance ed. Apr. 2022, Final Energy except Electricity (in mtoe for Other sectors for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	29	23	21	25						



ECO Final Fuel (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	211	301	281	247	211	189	179	171	163	154
	Residential	166	240	225	198	170	153	145	138	131	124
	Tertiary / Services	37	50	45	39	33	29	28	26	25	24
	Industry	6	9	8	7	6	6	5	5	5	5
	Other	2	3	3	2	2	2	2	2	1	1
SPACE HEATING.	All sectors, TWh	2860	2336	2095	1815	1522	1280	1126	1024	953	890
	Residential	2036	1602	1447	1261	1064	898	792	723	677	637
	Tertiary / Services	605	545	481	410	339	283	247	221	202	185
	Industry	162	136	121	104	86	72	63	58	54	50
	Other	58	52	46	40	33	27	24	22	20	19
SPACE COOLING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
& HT PROCESS	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
VENTILATION.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
COOKING.	All sectors, TWh	43	34	33	31	28	26	25	23	22	21
	Residential	35	28	27	25	23	22	20	19	18	17
	Tertiary / Services	7	6	6	5	5	5	4	4	4	4
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
TYRES.	Transport sector, TWh	826	632	545	593	590	603	595	576	560	545
	Residential transport	387	289	244	245	234	227	220	211	204	197
	Tertiary / Services transport	278	217	189	218	222	234	233	227	222	216
	Industry transport	139	109	96	112	116	123	123	120	117	114
	Other transport	22	17	15	17	18	19	19	18	18	17
ALL PRODUCTS.	All sectors, TWh	3940	3303	2954	2686	2351	2099	1925	1795	1698	1610
	Residential	2237	1870	1699	1484	1257	1072	957	880	826	778
	Tertiary / Services	650	601	532	455	377	317	279	252	232	213
	Industry	168	145	129	112	92	77	69	63	58	54
	Other	60	55	49	42	35	29	26	23	22	20
	Transport	826	632	545	593	590	603	595	576	560	545

ECO Final Fuel (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	79%	80%	80%	80%	81%	81%	81%	81%	81%	81%
	Tertiary / Services	18%	16%	16%	16%	15%	15%	15%	15%	15%	15%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	71%	69%	69%	69%	70%	70%	70%	71%	71%	72%
	Tertiary / Services	21%	23%	23%	23%	22%	22%	22%	22%	21%	21%
	Industry	6%	6%	6%	6%	6%	6%	6%	6%	6%	6%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	4%	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Tertiary / Services	88%	88%	88%	88%	88%	89%	89%	89%	89%	89%
	Industry	7%	7%	7%	7%	7%	6%	6%	6%	6%	6%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
VENTILATION											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
LIGHTING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
ELECTRONICS.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
FOOD PRESERVE.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
COOKING.											
	Residential	83%	83%	82%	82%	82%	82%	82%	82%	82%	82%
	Tertiary / Services	17%	17%	18%	18%	18%	18%	18%	18%	18%	18%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
INDUSTRY COMP.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
TYRES.											
	Residential transport	47%	46%	45%	41%	40%	38%	37%	37%	36%	36%
	Tertiary / Services transport	34%	34%	35%	37%	38%	39%	39%	39%	40%	40%
	Industry transport	17%	17%	18%	19%	20%	20%	21%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	57%	57%	58%	55%	53%	51%	50%	49%	49%	48%
	Tertiary / Services	16%	18%	18%	17%	16%	15%	15%	14%	14%	13%
	Industry	4%	4%	4%	4%	4%	4%	4%	3%	3%	3%
	Other	2%	2%	2%	2%	1%	1%	1%	1%	1%	1%
	Transport	21%	19%	18%	22%	25%	29%	31%	32%	33%	34%

Comparison per fuel type with Eurostat Energy Balance ed. Apr. 2022 (for EU27 (2020)) (1 mtoe = 11.63 TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SOLID FUEL (ref. ESTAT FC_E, C0000X0350-0370)										
RESIDENTIAL sector (ESTAT FC_OTH_HH_E)										
EIA total (TWh/a)	349	108	105	85	61	38	26	23	20	17
ESTAT total (TWh/a)	317	129	99	78						
ESTAT total (mtoe)	27.2	11.1	8.5	6.7						
SERVICES sector (ESTAT FC_OTH_CP_E)										
EIA total (TWh/a)	31	10	9	8	6	3	2	2	2	2
ESTAT total (TWh/a)	139	18	12	7						
ESTAT total (mtoe)	12.0	1.5	1.1	0.6						
SUM RESIDENTIAL and SERVICES sectors										
EIA total (TWh/a)	380	117	114	92	66	41	29	25	22	18
ESTAT total (TWh/a)	456	147	111	86						
ESTAT total (mtoe)	39.2	12.7	9.5	7.4						
INDUSTRY sector (ESTAT FC_IND_E)										
EIA total (TWh/a)	8	2	2	2	1	1	1	0	0	0
ESTAT total (TWh/a)	516	153	150	125						
ESTAT total (mtoe)	44.4	13.2	12.9	10.7						
OTHER sector (ESTAT FC_OTH_AF_E + FC_OTH_FISH_E)										
EIA total (TWh/a)	0	0	0	0	0	0	0	0	0	0
ESTAT total (TWh/a)	21	15	11	9						
ESTAT total (mtoe)	1.8	1.3	1.0	0.8						
SUM of above sectors										
EIA total (TWh/a)	388	120	116	94	68	42	29	26	22	19
ESTAT total (TWh/a)	992	315	272	219						
ESTAT total (mtoe)	85.3	27.1	23.4	18.9						
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	19	1	0	1						
ESTAT total (mtoe)	1.6	0.1	0.0	0.1						
Total all sectors										
EIA total (TWh/a)	388	120	116	94	68	42	29	26	22	19
ESTAT total (TWh/a)	1011	317	272	220						
ESTAT total (mtoe)	86.9	27.2	23.4	19.0						
OIL AND PETROLEUM PRODUCTS (ref. ESTAT FC_E, O4000XBIO)										
RESIDENTIAL sector (ESTAT FC_OTH_HH_E)										
EIA total (TWh/a)	751	501	386	280	190	116	82	75	73	72
ESTAT total (TWh/a)	678	477	372	356						
ESTAT total (mtoe)	58.3	41.0	32.0	31						
SERVICES sector (ESTAT FC_OTH_CP_E)										
EIA total (TWh/a)	274	182	140	103	71	44	32	29	28	27
ESTAT total (TWh/a)	279	206	170	113						
ESTAT total (mtoe)	24.0	17.7	14.7	9.7						
SUM RESIDENTIAL and SERVICES sectors										
EIA total (TWh/a)	1025	683	526	383	261	161	114	104	101	99
ESTAT total (TWh/a)	957	683	543	469						
ESTAT total (mtoe)	82.3	58.7	46.6	40.3						
INDUSTRY sector (ESTAT FC_IND_E)										
EIA total (TWh/a)	53	36	29	22	16	11	9	8	7	7
ESTAT total (TWh/a)	632	357	287	272						
ESTAT total (mtoe)	54.3	30.7	24.7	23.4						
OTHER sector (ESTAT FC_OTH_AF_E + FC_OTH_FISH_E)										
EIA total (TWh/a)	21	14	11	9	6	4	3	3	3	3
ESTAT total (TWh/a)	239	171	161	196						
ESTAT total (mtoe)	20.5	14.7	13.8	16.9						
SUM of above sectors										
EIA total (TWh/a)	1099	734	567	414	283	176	126	115	111	108
ESTAT total (TWh/a)	1827	1210	990	937						
ESTAT total (mtoe)	157.1	104.1	85.1	80.6						
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	2525	3047	2952	2672						
ESTAT total (mtoe)	217.1	262.0	253.8	229.7						
Total all sectors										
EIA total (TWh/a)	1099	734	567	414	283	176	126	115	111	108
ESTAT total (TWh/a)	4352	4258	3942	3609						
ESTAT total (mtoe)	374.2	366.1	338.9	310.3						

NATURAL GAS (ref. ESTAT FC_E, G3000)										
RESIDENTIAL sector (ESTAT FC_OTH_HH_E)										
EIA total (TWh/a)	743	1031	962	863	750	675	614	548	493	441
ESTAT total (TWh/a)	622	1072	891	914						
ESTAT total (mtoe)	53.4	92.2	76.6	78.6						
SERVICES sector (ESTAT FC_OTH_CP_E)										
EIA total (TWh/a)	309	382	351	310	266	237	213	188	169	150
ESTAT total (TWh/a)	273	469	430	401						
ESTAT total (mtoe)	23.5	40.3	37.0	34.5						
SUM RESIDENTIAL and SERVICES sectors										
EIA total (TWh/a)	1052	1413	1313	1173	1016	912	826	737	662	590
ESTAT total (TWh/a)	894	1541	1321	1315						
ESTAT total (mtoe)	76.9	132.5	113.6	113.1						
INDUSTRY sector (ESTAT FC_IND_E)										
EIA total (TWh/a)	99	95	85	74	62	53	47	41	37	33
ESTAT total (TWh/a)	1013	896	839	860						
ESTAT total (mtoe)	87.1	77.0	72.2	73.9						
OTHER sector (ESTAT FC_OTH_AF_E + FC_OTH_FISH_E)										
EIA total (TWh/a)	39	38	34	30	25	21	19	17	15	13
ESTAT total (TWh/a)	58	51	40	42						
ESTAT total (mtoe)	5.0	4.3	3.5	3.6						
SUM of above sectors										
EIA total (TWh/a)	1190	1546	1432	1276	1103	986	892	795	714	637
ESTAT total (TWh/a)	1965	2487	2201	2217						
ESTAT total (mtoe)	168.9	213.9	189.2	190.6						
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	22	44	38	39						
ESTAT total (mtoe)	1.9	3.8	3.3	3.3						
Total all sectors										
EIA total (TWh/a)	1190	1546	1432	1276	1103	986	892	795	714	637
ESTAT total (TWh/a)	1987	2531	2239	2255						
ESTAT total (mtoe)	170.8	217.6	192.5	193.9						

Primary Solid Biofuels/ EIA Wood (logs, chips, pellets) (ref. ESTAT FC_E, R5110-5150_W6000RI)										
RESIDENTIAL sector (ESTAT FC_OTH_HH_E)										
EIA total (TWh/a)	394	230	246	257	256	243	235	234	240	249
ESTAT total (TWh/a)	265	511	479	484						
ESTAT total (mtoe)	22.8	44.0	41.2	41.6						
SERVICES sector (ESTAT FC_OTH_CP_E)										
EIA total (TWh/a)	36	28	31	34	34	33	32	33	34	35
ESTAT total (TWh/a)	4	29	27	33						
ESTAT total (mtoe)	0.3	2.5	2.3	2.8						
SUM RESIDENTIAL and SERVICES sectors										
EIA total (TWh/a)	430	258	278	291	290	276	268	267	273	284
ESTAT total (TWh/a)	269	540	506	517						
ESTAT total (mtoe)	23.1	46.5	43.5	44.4						
INDUSTRY sector (ESTAT FC_IND_E)										
EIA total (TWh/a)	8	11	13	14	13	12	13	13	14	15
ESTAT total (TWh/a)	149	220	229	250						
ESTAT total (mtoe)	12.8	18.9	19.7	21.5						
OTHER sector (ESTAT FC_OTH_AF_E + FC_OTH_FISH_E)										
EIA total (TWh/a)	0	3	4	4	4	3	4	4	4	4
ESTAT total (TWh/a)	9	16	17	19						
ESTAT total (mtoe)	0.7	1.4	1.5	1.6						
SUM of above sectors										
EIA total (TWh/a)	438	272	294	309	307	292	284	284	291	302
ESTAT total (TWh/a)	427	776	752	785						
ESTAT total (mtoe)	36.7	66.8	64.7	67.5						
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	11	1	1	0						
ESTAT total (mtoe)	0.9	0.1	0.1	0.0						
Total all sectors										
EIA total (TWh/a)	438	272	294	309	307	292	284	284	291	302
ESTAT total (TWh/a)	438	778	753	785						
ESTAT total (mtoe)	37.7	66.9	64.8	67.5						

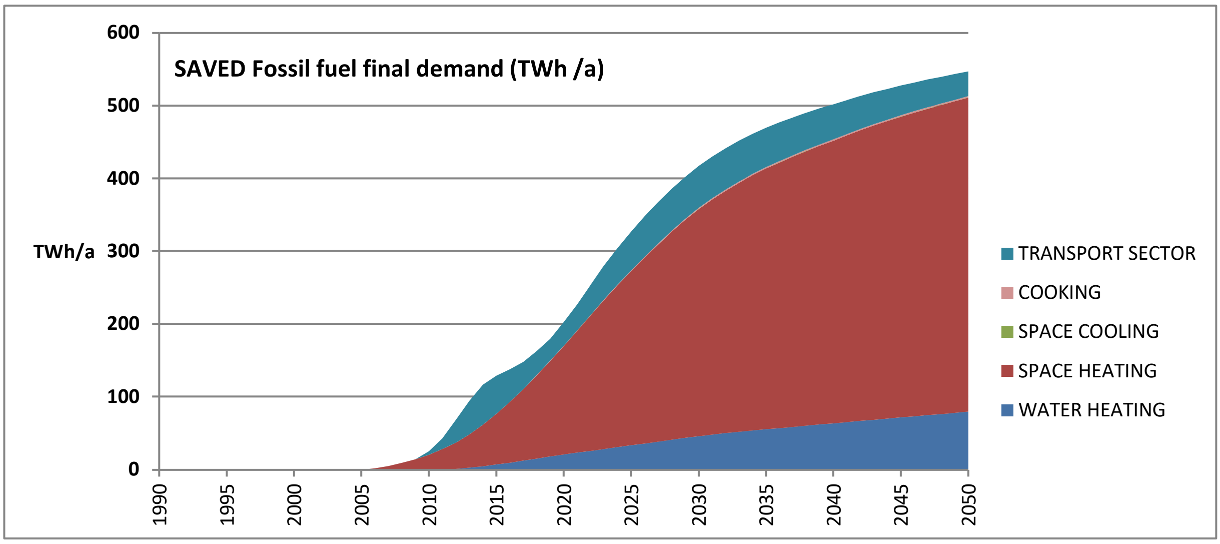
db SAVED Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	0	0	0	0	0	0	0	0
EIWHS Electric Instant. Shower (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage > 30 L (primary)	1.00	0	0	0	0	0	0	0	0	0	0
GIWH Gas Instant. < 13 L/min (secondary)	0.003	0	0	1	2	3	3	3	2	2	2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	1	2	2	1	1	1	1
GSWH Gas Storage, Condensing	0.010	0	0	0	0	0	0	0	0	0	1
GSWH Gas Storage, Non-condensing	0.008	0	0	1	2	2	2	2	1	1	1
Dedicated WH Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
Dedicated WH Solar (3.5 m2)	0.80	0	0	0	0	0	0	0	0	0	0
WH dedicated Water Heater		**0**	**0**	**3**	**6**	**7**	**7**	**6**	**6**	**5**	**4**
CHB Gas Combi Instant. WH	0.04	0	0	2	9	15	24	32	40	48	55
CHB Gas + Cyl. WH	0.04	0	0	2	5	9	13	16	19	22	25
CHB Jet Burner Gas + Cyl. WH	0.04	0	0	0	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	0.04	0	0	0	1	2	3	3	3	3	3
CHB Electric (Joule) + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	-1	-2	-4	-5	-6
CHB Electric HP + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	-1	-1	-1	-2	-2
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
CHB Solar Combi (16 m2)	0.04	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating		**0**	**0**	**5**	**15**	**26**	**39**	**49**	**58**	**66**	**75**
TOTAL WATER HEATING		**0**	**0**	**7**	**21**	**34**	**46**	**55**	**63**	**71**	**79**
CHB Gas non-condensing	0.04	0	10	39	114	178	225	236	210	186	160
CHB Gas condensing	0.04	0	7	19	3	5	14	46	104	157	206
CHB Gas Jet burner non-condensing	0.04	0	0	1	2	3	3	3	4	3	3
CHB Gas Jet burner condensing	0.04	0	0	0	0	-1	-1	-1	-2	-1	-1
CHB Oil Jet burner non-condensing	0.04	0	3	9	20	31	38	41	43	39	35
CHB Oil Jet burner condensing	0.04	0	0	0	-3	-7	-10	-14	-16	-15	-13
CHB Electric Joule-effect	1.00	0	0	0	0	0	0	0	0	0	0
CHB Hybrid (gas-electric)	0.60	0	0	0	0	-1	-2	-3	-4	-6	-7
CHB Electric Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0
CHB Gas Heat Pump	0.04	0	0	0	0	-1	-1	-2	-2	-2	-2
CHB micro CHP	0.04	0	0	0	0	-1	-1	-1	-1	-1	0
CHB Solar combi (16 m2)	0.10	0	0	0	0	1	1	1	1	1	2
CHB Central Heating boiler < 400 kW, space heating		**0**	**21**	**68**	**135**	**207**	**267**	**308**	**336**	**362**	**382**
SFB Wood Manual	0	0.0	0.0	0.5	2.7	4.1	4.3	3.5	2.4	1.9	1.5
SFB Wood Direct Draft	0	0.0	0.0	0.0	0.2	1.0	1.8	2.5	3.1	3.7	4.5
SFB Coal	0	0.0	0.0	0.1	0.8	1.8	2.4	2.7	2.7	2.4	2.1
SFB Pellets	0	0.0	0.0	0.0	0.2	0.5	1.0	1.2	1.4	1.5	1.6
SFB Wood chips	0	0.0	0.0	0.1	0.5	1.0	1.4	1.7	1.9	1.9	2.0
Total Solid Fuel Boiler		**0**	**0**	**1**	**4**	**8**	**11**	**12**	**12**	**11**	**12**
CHAE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHAE-L (> 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
CHWE-L (> 1500 kW)	1	0	0	0	0	0	0	0	0	0	0
CHF	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
HT PCH-AE-S	1	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-L	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-S	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-M	1	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-L	1	0	0	0	0	0	0	0	0	0	0
AC rooftop	1	0	0	0	0	0	0	0	0	0	0
AC splits	1	0	0	0	0	0	0	0	0	0	0
AC VRF	1	0	0	0	0	0	0	0	0	0	0
ACF	0.05	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
SubTotal AHC central Air Cooling		**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
AC rooftop (rev)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AC splits (rev)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AC VRF (rev)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ACF (rev)	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
AHF	0.05	0.0	0.0	0.8	5.8	11.8	16.0	16.4	14.8	12.9	11.2
AHE	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SubTotal AHC central Air Heating		**0**	**0**	**1**	**6**	**12**	**16**	**16**	**15**	**13**	**11**
Total AHC central Air Heating & Cooling		**0**	**0**	**1**	**6**	**12**	**16**	**17**	**15**	**13**	**11**

db	SAVED Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	0.0	0.0	0.0	0.8	2.7	4.3	5.5	6.5	7.1	7.1
	LH closed fireplace/inset	0	0.0	0.0	0.0	1.1	3.7	5.9	7.7	9.2	9.9	9.6
	LH wood stove	0	0.0	0.0	0.0	0.7	2.2	3.5	4.5	5.4	5.8	5.6
	LH coal stove	0	0.0	0.0	0.0	0.1	0.4	0.6	0.7	0.7	0.7	0.5
	LH cooker	0	0.0	0.0	0.0	0.3	0.9	1.4	1.6	1.6	1.5	1.5
	LH SHR stove	0	0.0	0.0	0.0	0.1	0.5	0.7	0.9	1.1	1.1	1.0
	LH pellet stove	0	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.7
	LH Solid fuel sum		**0**	**0**	**0**	**3**	**11**	**17**	**22**	**25**	**27**	**26**
	LH Electric sum		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Gas luminous (commercial)	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gaseous Tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2
	LH Gas open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0					
	LH Gaseous fuel sum		**0.0**	**0.0**	**0.1**	**0.3**	**0.5**	**0.7**	**0.7**	**0.6**	**0.5**	**0.5**
	LH Liquid tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0	0.0	0.0	0.0	0.0	0.0					
	LH Liquid fuel sum		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
	Total LH Local Heaters		**0**	**0**	**0**	**4**	**11**	**18**	**22**	**26**	**27**	**27**
	RAC < 12 kW total, cooling mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC < 12 kW total, heating mode		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RAC Room Air Conditioner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
1	CIRC Integrated circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Large standalone circulators	1	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Small standalone circulators	1	0	0	0	0	0	0	0	0	0	0
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL SPACE HEATING		**0**	**21**	**69**	**149**	**239**	**312**	**358**	**388**	**413**	**432**
	TOTAL SPACE COOLING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL VENTILATION (VU own fuel)		**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**
1	***Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)***		*-*	*-*	***3***	***13***	***25***	***35***	***38***	***38***	***37***	***37***
	TOTAL LIGHTING (incl. standby)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CA Electric Hobs (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Electric Ovens (sum all modes)	1	0	0	0	0	0	0	0	0	0	0
	CA Gas Hobs	0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
	CA Gas Ovens	0	0.0	0.0	0.0	0.3	0.7	1.1	1.4	1.4	1.4	1.4
	CA Range Hoods	1	0	0	0	0	0	0	0	0	0	0
	TOTAL COOKING		0	0	0	0	1	1	2	2	2	2
	Total WM-WD household Washing	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total DW household Dishwasher	1	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total LD household Laundry Dryer		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total VC Vacuum Cleaner		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL INDUSTRY COMPONENTS		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ENERGY SECTOR (not final energy)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C1, replacement for cars	0	0	3	35	22	29	30	28	24	19	14
	Tyres C1, OEM for cars	0	0	0	0	1	5	6	5	5	4	3
	Tyres C1, total		**0**	**3**	**35**	**23**	**35**	**36**	**33**	**28**	**23**	**17**
	Tyres C2, replacement for vans	0	0	1	8	4	8	9	8	7	6	4
	Tyres C2, OEM for vans	0	0	0	0	0	1	1	1	1	1	1
	Tyres C2, total		**0**	**1**	**8**	**4**	**9**	**10**	**9**	**8**	**6**	**5**
	Tyres C3, replacement for trucks/busses	0	0	1	10	6	9	11	11	11	11	10
	Tyres C3, OEM for trucks/busses	0	0	0	0	0	1	1	1	1	2	2
	Tyres C3, total		**0**	**1**	**10**	**6**	**10**	**12**	**12**	**12**	**12**	**12**
	Tyres, total C1+C2+C3		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
	TOTAL TRANSPORT SECTOR		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
	SAVED Final Fuel, Total excl. Energy Sector, in TWh		**0**	**25**	**129**	**202**	**327**	**417**	**470**	**502**	**528**	**547**
	SAVED Final Fuel, Total excl. Energy Sector, in PJ		0	91	464	728	1177	1501	1691	1807	1900	1971
	SAVED Final Fuel, Total excl. Energy Sector, in mtoe		0	2	11	17	28	36	40	43	45	47

db	SAVED Fuel Summary, TWh	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING		0	0	7	21	34	46	55	63	71	79
	SPACE HEATING		0	21	69	149	239	312	358	388	413	432
	SPACE COOLING		0	0	0	0	0	0	0	0	0	0
	VENTILATION		0	0	0	0	0	0	0	0	0	0
1	*Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)*		*0*	*0*	*3*	*13*	*25*	*35*	*38*	*38*	*37*	*37*
	LIGHTING		0	0	0	0	0	0	0	0	0	0
	ELECTRONICS		0	0	0	0	0	0	0	0	0	0
	FOOD PRESERVATION		0	0	0	0	0	0	0	0	0	0
	COOKING		0	0	0	0	1	1	2	2	2	2
	CLEANING		0	0	0	0	0	0	0	0	0	0
	INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0
	ENERGY SECTOR											
	TRANSPORT SECTOR		0	5	52	32	54	58	54	48	41	34
	SAVED Final Fuel, Total excl. Energy Sector, in TWh		**0**	**25**	**129**	**202**	**327**	**417**	**470**	**502**	**528**	**547**
	SAVED Final Fuel, Total excl. Energy Sector, in PJ		0	91	464	728	1177	1501	1691	1807	1900	1971
	SAVED Final Fuel, Total excl. Energy Sector, in mtoe		0	2	11	17	28	36	40	43	45	47

In Eurostat, energy consumed in Energy Sector and Distribution losses are not counted as Final energy, therefore Energy Sector separately reported :

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (only improvement over BAU)	0	0	0	0	0	0	0	0	0	0
SAVED Fuel, Total incl. Energy Sector, in TWh	**0**	**25**	**129**	**202**	**327**	**417**	**470**	**502**	**528**	**547**
SAVED Fuel, Total incl. Energy Sector, in PJ	-5E-08	91	464	728	1177	1501	1691	1807	1900	1971
SAVED Fuel, Total incl. Energy Sector, in mtoe	0	2	11	17	28	36	40	43	45	47



Sector subdivision for SAVED Final Fuel (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

SAVED Final Fuel (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	1	1	1	2	2	2	2
SPACE HEATING	0	1	3	8	13	17	19	19	20	20
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Final Fuel, Industry, in TWh	**0**	**1**	**3**	**8**	**14**	**19**	**21**	**21**	**22**	**22**
SAVED Final Fuel, Industry, in PJ	0	3	11	29	51	67	75	77	78	79
SAVED Final Fuel, Industry, in mtoe	0	0	0	1	1	2	2	2	2	2

SAVED Final Fuel (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	1	8	4	8	9	9	8	7	7
TYRES for SERVICE-sector-related transport	0	2	16	9	17	18	18	16	14	13
TYRES for RESIDENTIAL-sector-related transport	0	2	28	18	28	29	26	23	18	14
TYRES for OTHER-sector-related transport	0	0	1	1	1	1	1	1	1	1
SAVED Final Fuel, Transport, in TWh	**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
SAVED Final Fuel, Transport, in PJ	0	17	189	116	193	207	195	174	147	123
SAVED Final Fuel, Transport, in mtoe	0	0	5	3	5	5	5	4	4	3

SAVED Final Fuel (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	4	6	8	9	10	11	12
SPACE HEATING	0	5	17	37	59	76	87	94	100	104
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Final Fuel, Services, in TWh	**0**	**5**	**19**	**41**	**65**	**84**	**96**	**104**	**111**	**116**
SAVED Final Fuel, Services, in PJ	0	19	67	147	233	304	347	375	399	419
SAVED Final Fuel, Services, in mtoe	0	0	2	4	6	7	8	9	10	10

SAVED Final Fuel (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	5	16	26	37	44	51	58	65
SPACE HEATING	0	14	48	101	162	211	244	267	286	300
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	1	1	2	2	2	2
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Final Fuel, Residential, in TWh	**0**	**14**	**53**	**118**	**189**	**249**	**290**	**320**	**345**	**366**
SAVED Final Fuel, Residential, in PJ	0	52	193	423	680	897	1045	1151	1244	1318
SAVED Final Fuel, Residential, in mtoe	0	1	5	10	16	21	25	27	30	31

(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

SAVED Final Fuel (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	0	0	1	1	1
SPACE HEATING	0	0	1	3	5	7	8	8	8	8
SPACE COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Final Fuel, Other sectors, in TWh	**0**	**0**	**1**	**3**	**6**	**7**	**8**	**8**	**8**	**9**
SAVED Final Fuel, Other sectors, in PJ	-4E-10	1	4	12	20	26	29	30	31	31
SAVED Final Fuel, Other sectors, in mtoe	0	0	0	0	0	1	1	1	1	1

SAVED Final Fuel (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	7	21	34	46	55	63	71	79
	Residential	0	0	5	16	26	37	44	51	58	65
	Tertiary / Services	0	0	1	4	6	8	9	10	11	12
	Industry	0	0	0	1	1	1	2	2	2	2
	Other	0	0	0	0	0	0	0	1	1	1
SPACE HEATING.	All sectors, TWh	0	21	69	149	239	312	358	388	413	432
	Residential	0	14	48	101	162	211	244	267	286	300
	Tertiary / Services	0	5	17	37	59	76	87	94	100	104
	Industry	0	1	3	8	13	17	19	19	20	20
	Other	0	0	1	3	5	7	8	8	8	8
SPACE COOLING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
& HT PROCESS	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
VENTILATION.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
COOKING.	All sectors, TWh	0	0	0	0	1	1	2	2	2	2
	Residential	0	0	0	0	1	1	2	2	2	2
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	0	0	0	0	0	0	0	0	0
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
TYRES.	Transport sector, TWh	0	5	52	32	54	58	54	48	41	34
	Residential transport	0	2	28	18	28	29	26	23	18	14
	Tertiary / Services transport	0	2	16	9	17	18	18	16	14	13
	Industry transport	0	1	8	4	8	9	9	8	7	7
	Other transport	0	0	1	1	1	1	1	1	1	1
ALL PRODUCTS.	All sectors, TWh	0	25	129	202	327	417	470	502	528	547
	Residential	0	14	53	118	189	249	290	320	345	366
	Tertiary / Services	0	5	19	41	65	84	96	104	111	116
	Industry	0	1	3	8	14	19	21	21	22	22
	Other	0	0	1	3	6	7	8	8	8	9
	Transport	0	5	52	32	54	58	54	48	41	34

SAVED Final Fuel (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			76%	78%	79%	80%	80%	81%	81%	81%
	Tertiary / Services			20%	19%	18%	17%	16%	15%	15%	15%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential		70%	69%	68%	68%	68%	68%	69%	69%	69%
	Tertiary / Services		25%	25%	25%	25%	25%	24%	24%	24%	24%
	Industry		4%	4%	5%	5%	6%	5%	5%	5%	5%
	Other		1%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential							4%	4%	4%	4%
	Tertiary / Services							88%	88%	88%	88%
	Industry							7%	7%	7%	7%
	Other							1%	1%	1%	1%
VENTILATION.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
LIGHTING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
ELECTRONICS.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
FOOD PRESERVE.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
COOKING.											
	Residential				87%	87%	87%	88%	88%	88%	88%
	Tertiary / Services				13%	13%	13%	12%	12%	12%	12%
	Industry				0%	0%	0%	0%	0%	0%	0%
	Other				0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
INDUSTRY COMP.											
	Residential										
	Tertiary / Services										
	Industry										
	Other										
TYRES.											
	Residential transport			53%	56%	52%	50%	49%	47%	44%	41%
	Tertiary / Services transport			30%	28%	31%	32%	33%	33%	35%	37%
	Industry transport			15%	13%	15%	16%	16%	17%	18%	19%
	Other transport			2%	2%	2%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential		57%	42%	58%	58%	60%	62%	64%	65%	67%
	Tertiary / Services		20%	15%	20%	20%	20%	21%	21%	21%	21%
	Industry		3%	2%	4%	4%	4%	4%	4%	4%	4%
	Other		1%	1%	2%	2%	2%	2%	2%	2%	2%
	Transport		18%	41%	16%	16%	14%	12%	10%	8%	6%

db BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	1	1	1	1	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	8	7	7	7	7	7	8	9	9
EIWHS Electric Instant. Shower (secondary)	1.00	1	1	1	1	1	1	1	1	2	2
ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	9	9	8	8	9	9	9	10	10
ESWH Electric Storage > 30 L (primary)	1.00	57	80	82	80	77	80	85	89	94	99
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	13	10	9	8	8	8	7	7
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	8	7	6	6	6	6	5	5
GSWH Gas Storage, Condensing	0.010	0	0	0	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	18	13	9	6	5	4	4	3
Dedicated WH Heat Pump	1.00	0	0	1	2	4	6	8	10	12	13
Dedicated WH Solar (3.5 m2)	0.80	1	7	9	9	10	9	8	8	8	8
WH dedicated Water Heater		**119**	**150**	**149**	**140**	**132**	**134**	**139**	**146**	**153**	**160**
CHB Gas Combi Instant. WH	0.04	56	135	140	140	135	137	140	140	140	139
CHB Gas + Cyl. WH	0.04	36	57	57	55	53	54	55	55	55	54
CHB Jet Burner Gas + Cyl. WH	0.04	9	8	6	5	4	3	2	2	2	3
CHB Jet Burner Oil + Cyl. WH	0.04	68	58	47	37	27	20	17	17	17	17
CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	1	1	1	2
CHB Electric HP + Cyl. WH	1.00	0	2	3	4	5	5	6	7	8	10
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	2
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	1	1
CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
CHC Central Heating combi, water heating		**170**	**262**	**256**	**244**	**228**	**222**	**225**	**227**	**228**	**229**
TOTAL WATER HEATING		**289**	**413**	**405**	**384**	**360**	**356**	**363**	**372**	**381**	**389**
CHB Gas non-condensing	0.04	753	855	689	520	372	319	277	234	200	171
CHB Gas condensing	0.04	7	270	403	528	619	646	654	643	636	623
CHB Gas Jet burner non-condensing	0.04	81	53	40	29	19	10	6	5	4	4
CHB Gas Jet burner condensing	0.04	0	1	2	4	5	6	7	7	7	7
CHB Oil Jet burner non-condensing	0.04	1013	655	494	350	226	120	69	56	49	42
CHB Oil Jet burner condensing	0.04	0	9	21	33	46	57	62	64	66	68
CHB Electric Joule-effect	1.00	13	14	14	15	16	15	13	11	10	9
CHB Hybrid (gas-electric)	0.60	0	0	0	0	1	1	2	2	4	6
CHB Electric Heat Pump	1.00	2	12	16	22	26	29	32	35	39	44
CHB Gas Heat Pump	0.04	0	0	0	0	1	1	1	1	2	3
CHB micro CHP	0.04	0	0	0	1	1	1	1	2	3	4
CHB Solar combi (16 m2)	0.10	6	6	6	6	7	6	6	6	5	5
CHB Central Heating boiler < 400 kW, space heating		**1875**	**1876**	**1687**	**1507**	**1337**	**1212**	**1131**	**1068**	**1026**	**985**
SFB Wood Manual	0	342	90	69	51	34	20	12	8	7	6
SFB Wood Direct Draft	0	2	23	43	60	71	69	69	74	85	98
SFB Coal	0	364	107	105	85	61	37	26	24	21	18
SFB Pellets	0	0	9	16	22	27	29	30	30	31	33
SFB Wood chips	0	0	14	17	19	18	17	18	19	20	21
Total Solid Fuel Boiler		**709**	**243**	**251**	**237**	**210**	**172**	**155**	**155**	**164**	**175**
CHAE-S (≤ 400 kW)	1	3	9	10	11	11	11	11	11	11	11
CHAE-L (> 400 kW)	1	5	13	14	15	14	13	12	12	11	11
CHWE-S (≤ 400 kW)	1	0	1	1	1	1	1	1	1	1	1
CHWE-M (> 400 kW; ≤ 1500 kW)	1	1	3	3	3	3	3	3	2	2	2
CHWE-L (> 1500 kW)	1	1	2	2	2	2	2	2	2	2	1
CHF	0.05	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	1	20	32	35	38	40	40	41	41	42	42
HT PCH-AE-L	1	19	31	34	36	37	38	38	39	39	40
HT PCH-WE-S	1	4	7	7	8	8	9	9	9	9	9
HT PCH-WE-M	1	8	13	15	16	16	17	17	17	17	18
HT PCH-WE-L	1	2	3	3	3	3	3	4	4	4	4
AC rooftop	1	3	7	7	6	4	3	1	1	0	0
AC splits	1	4	11	11	10	10	9	8	7	6	5
AC VRF	1	0	3	4	6	7	8	10	10	11	11
ACF	0.05	0	0	0	0	0	0	0	0	0	0
SubTotal AHC central Air Cooling		**70**	**133**	**146**	**155**	**158**	**157**	**156**	**156**	**156**	**157**
AC rooftop (rev)	1	4	11	12	10	8	5	2	1	0	0
AC splits (rev)	1	7	21	22	22	20	18	16	15	13	12
AC VRF (rev)	1	0	7	10	14	18	21	24	25	25	25
ACF (rev)	0.05	0	0	0	0	0	1	1	1	1	1
AHF	0.05	198	144	124	108	94	83	73	65	57	50
AHE	1	1	3	2	1	1	1	1	1	1	1
SubTotal AHC central Air Heating		**209**	**186**	**170**	**156**	**142**	**130**	**118**	**107**	**98**	**89**
Total AHC central Air Heating & Cooling		**280**	**320**	**316**	**310**	**300**	**287**	**274**	**263**	**254**	**245**

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	20	20	20	20	20	20	20
	LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60
	LH wood stove	0	38	37	37	37	37	38	38	37	36	36
	LH coal stove	0	23	13	11	10	9	8	6	5	4	3
	LH cooker	0	7	11	12	14	15	15	15	15	15	14
	LH SHR stove	0	16	21	22	24	27	29	32	33	34	34
	LH pellet stove	0	0	8	11	14	16	17	17	17	17	17
	LH Solid fuel sum		**117**	**148**	**161**	**173**	**184**	**190**	**192**	**191**	**188**	**184**
	LH Electric portable	1	23	22	21	21	20	18	17	17	16	15
	LH Electric fixed > 250W	1	124	111	102	88	75	66	62	59	56	54
	LH Electric fixed ≤ 250W	1	8	7	7	6	5	4	4	4	4	4
	LH Electric storage	1	7	7	6	6	5	5	4	4	4	4
	LH Electric underfloor	1	21	21	20	20	19	19	18	17	16	16
	LH Electric visibly glowing > 1.2 kW	1	2	2	2	2	2	2	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	1	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	1	7	9	10	9	9	8	7	7	7	7
	LH Electric sum		**193**	**179**	**168**	**152**	**134**	**122**	**115**	**110**	**105**	**100**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	1.0	0.9	0.8	0.6	0.6	0.5	0.5
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.2	1.2
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.5	1.2	0.9	0.8	0.7	0.6	0.6
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.8	1.3	1.0	0.9	0.8	0.8
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.7**	**8.0**	**6.6**	**5.4**	**4.6**	**4.0**	**3.6**	**3.4**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.7**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
	LH Local Space Heaters total		**330**	**339**	**340**	**334**	**325**	**317**	**312**	**305**	**296**	**288**
	RAC fixed < 6 kW, cooling	1	2	17	15	11	11	12	12	14	15	17
	RAC fixed 6-12 kW, cooling	1	1	9	9	7	7	7	7	7	8	9
	RAC portable < 12 kW, cooling	1	0	1	1	1	1	1	1	1	1	1
	RAC < 12 kW total, cooling mode		**3**	**27**	**25**	**19**	**19**	**20**	**21**	**22**	**24**	**27**
	RAC fixed < 6 kW, reversible, heating	1	1	20	23	23	27	34	40	48	55	62
	RAC fixed 6-12 kW, reversible, heating	1	0	10	13	14	16	19	21	24	27	29
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**1**	**31**	**36**	**36**	**43**	**53**	**62**	**72**	**82**	**91**
	RAC Room Air Conditioner		**4**	**57**	**61**	**56**	**62**	**72**	**82**	**94**	**107**	**117**
1	CIRC Integrated circulators	1	13	19	19	20	21	21	21	20	19	18
0.38	CIRC Large standalone circulators	1	8	12	11	10	9	8	7	6	6	6
0.38	CIRC Small standalone circulators	1	6	9	8	7	7	6	5	5	5	4
	CIRC Circulator pumps <2.5 kW, all	1	**27**	**39**	**38**	**37**	**36**	**35**	**33**	**31**	**30**	**28**
	CIRC Circulator pumps <2.5 kW, excl. double		**9**	**13**	**12**	**11**	**10**	**8**	**8**	**7**	**7**	**6**
	TOTAL SPACE HEATING		**3133**	**2688**	**2496**	**2281**	**2067**	**1892**	**1784**	**1714**	**1673**	**1633**
	TOTAL SPACE COOLING		**73**	**160**	**171**	**174**	**177**	**177**	**177**	**178**	**180**	**183**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.1	0.1	0.2	0.7	1.4	2.2	3.0	3.8	4.7
	R-UVU 100-250 m3/h	1	0.4	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.0
	R-BVU 100-250 m3/h	1	0.0	0.1	0.1	0.1	0.3	0.5	0.8	1.1	1.4	1.7
	R-UVU 250-1000 m3/h	1	2.1	5.0	5.5	5.8	6.0	6.3	6.5	6.6	6.7	6.7
	R-BVU 250-1000 m3/h	1	0.0	0.5	0.7	0.9	1.8	3.3	4.8	6.5	8.2	10.0
	R-UVU > 1000 m3/h	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	R-BVU 1000-2500 m3/h	1	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	RVU, Total residential, VU own electricity		**3**	**7**	**8**	**8**	**10**	**13**	**16**	**19**	**22**	**25**
	NR-UVU 250-1000 m3/h	1	0.9	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0	2.0
	NR-BVU 250-1000 m3/h	1	0.0	0.9	1.2	1.4	1.7	2.0	2.4	2.7	3.1	3.4
	NR-UVU > 1000 m3/h	1	0.6	1.1	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8
	NR-BVU 1000-2500 m3/h	1	0.0	0.7	0.9	1.1	1.3	1.5	1.8	2.0	2.3	2.5
	NR-AHU-S 2500-5500 m3/h	1	0.2	2.5	3.5	4.4	5.2	6.0	6.8	7.7	8.5	9.3
	NR-AHU-M 5500-14500 m3/h	1	17.2	22.9	21.9	21.0	20.9	21.8	22.9	23.9	24.9	25.9
	NR-AHU-L > 14500 m3/h	1	4.9	6.5	6.2	5.9	5.9	6.1	6.4	6.7	7.0	7.3
	NRVU, Total non-residential, VU own electricity		**24**	**36**	**37**	**37**	**38**	**40**	**43**	**46**	**49**	**51**
	VU Ventilation Units, res + non-res., VU own electricity		**26**	**43**	**44**	**45**	**48**	**53**	**59**	**65**	**70**	**76**
	TOTAL VENTILATION (VU own electricity)		**26**	**43**	**44**	**45**	**48**	**53**	**59**	**65**	**70**	**76**
1	***Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)***		-	-	-	-	-	-	-	-	-	-

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS, final energy incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	77	122	146	165	163	140	110	86	67	53
	HID (HPM, HPS, MH)	1	29	62	65	66	56	38	20	11	6	3
	CFLni (all shapes)	1	2	8	9	9	8	6	3	2	1	1
	CFLi (retrofit for GLS, HL)	1	1	11	15	15	13	11	7	4	3	2
	GLS (DLS & NDLS)	1	74	62	45	33	19	11	7	4	2	1
	HL (DLS & NDLS, LV & MV)	1	6	36	48	56	40	20	11	6	3	2
	LED replacing LFL (retrofit & luminaire)	1	0	0	1	8	24	49	74	97	120	143
	LED replacing HID (retrofit & luminaire)	1	0	0	0	6	19	33	45	54	64	74
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	0	1	2	4	5	5	6
	LED replacing DLS (retrofit & luminaire)	1	0	0	0	1	2	4	4	5	6	6
	LED replacing NDLS (retrofit & luminaire)	1	0	0	0	3	9	14	19	22	25	28
	Standby	1	*9*	*15*	*13*	*11*	*9*	*7*	*7*	*7*	*7*	*7*
	TOTAL LIGHTING (incl. standby)		**198**	**316**	**342**	**375**	**364**	**335**	**310**	**303**	**310**	**327**
	DP TV on-mode, total all types	1	23.5	61.6	70.7	74.2	67.7	76.4	75.9	71.0	69.0	70.7
	DP TV standby, standard (NoNA)	1	3.1	1.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	1	0.0	0.1	0.6	1.0	0.7	0.2	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	1	0.0	0.0	1.5	4.1	6.3	7.9	8.2	7.5	6.4	5.3
	DP TV standby, total all types		**3**	**2**	**3**	**5**	**7**	**8**	**8**	**7**	**6**	**5**
	DP TV total on-mode + standby		**27**	**64**	**73**	**80**	**75**	**84**	**84**	**78**	**75**	**76**
	DP Monitor on-mode	1	0.7	12.4	7.6	5.4	5.2	4.7	3.8	3.2	3.1	3.0
	DP Monitor standby	1	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total		**1**	**13**	**8**	**5**	**5**	**5**	**4**	**3**	**3**	**3**
	DP Signage on-mode	1	0.0	0.9	7.9	17.9	21.8	21.0	19.5	18.6	17.7	17.5
	DP Signage standby	1	0.0	0.1	1.2	2.7	3.3	3.1	2.9	2.8	2.7	2.6
	DP Signage total		**0**	**1**	**9**	**21**	**25**	**24**	**22**	**21**	**20**	**20**
	DP Electronic Displays, total on-mode		**24**	**75**	**86**	**98**	**95**	**102**	**99**	**93**	**90**	**91**
	DP Electronic Displays, total standby		**3**	**3**	**4**	**8**	**10**	**11**	**11**	**10**	**9**	**8**
	DP Electronic Displays, total		**27**	**78**	**90**	**106**	**105**	**113**	**110**	**103**	**99**	**99**
	SSTB	1	0.0	2.7	1.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	1	0.0	5.0	11.9	11.9	11.1	10.2	9.9	9.9	9.9	9.9
	CSTB (other modes)	1	0.0	2.7	6.4	6.4	6.0	5.5	5.3	5.3	5.3	5.3
	CSTB (all covered modes)	1	0.0	7.8	18.3	18.2	17.0	15.8	15.3	15.3	15.3	15.3
	Total STB set top boxes (Complex & Simple)		**0**	**10**	**20**	**18**	**17**	**16**	**15**	**15**	**15**	**15**
	Game consoles > 20 W Active modes (SRI)	1	0.0	2.4	4.5	5.6	5.3	5.3	5.3	5.3	5.3	5.3
	Game consoles > 20 W Non-Active (CR)	1	0.0	1.3	2.0	2.4	2.2	2.2	2.2	2.2	2.2	2.2
	Game consoles < 20 W Non-Active (CR)	1	0.0	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	Game consoles < 20 W Active (no reg.)	1	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total Game consoles, active modes		0.0	2.6	4.6	5.7	5.4	5.4	5.4	5.4	5.4	5.4
	Total Game consoles, non-active modes		0.0	2.2	3.0	3.5	3.2	3.2	3.2	3.2	3.2	3.2
	Total Game consoles > 20 W, all modes		0.0	3.7	6.4	8.0	7.5	7.5	7.5	7.5	7.5	7.5
	Total Game consoles < 20 W, all modes		0.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
	Total Game consoles, all modes		**0**	**5**	**8**	**9**	**9**	**9**	**9**	**9**	**9**	**9**
	ES&DS only, without effects on infrastructure											
	ES tower 1-socket traditional	1	0.0	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3
	ES rack 1-socket traditional	1	0.1	2.8	2.1	1.9	1.9	2.0	2.0	2.0	2.0	2.0
	ES rack 2-socket traditional	1	0.6	13.0	7.0	4.2	4.9	5.8	6.2	6.2	6.2	6.2
	ES rack 2-socket cloud	1	0.0	7.3	11.3	12.6	14.7	17.4	18.8	18.8	18.8	18.8
	ES rack 4-socket traditional	1	0.1	1.4	0.7	0.6	0.7	0.8	0.9	0.9	0.9	0.9
	ES rack 4-socket cloud	1	0.0	0.8	1.4	1.9	2.3	2.7	2.9	2.9	2.9	2.9
	ES rack 2-socket resilient trad.	1	0.0	0.7	0.4	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	ES rack 2-socket resilient cloud	1	0.0	0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	ES rack 4-socket resilient trad.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	1	0.0	0.8	0.7	0.6	0.6	0.6	0.7	0.7	0.7	0.7
	ES blade 2-socket traditional	1	0.5	5.9	3.0	1.9	2.3	2.7	2.9	2.9	2.9	2.9
	ES blade 2-socket cloud	1	0.0	3.3	5.0	6.1	7.1	8.5	9.2	9.2	9.2	9.2
	ES blade 4-socket traditional	1	0.1	0.7	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	ES blade 4-socket cloud	1	0.0	0.4	0.6	0.8	0.9	1.1	1.2	1.2	1.2	1.2
	ES total traditional		**2**	**26**	**15**	**10**	**11**	**13**	**14**	**14**	**14**	**14**
	ES total cloud		**0**	**12**	**19**	**22**	**26**	**30**	**33**	**33**	**33**	**33**
	ES Enterprise Servers total		**2**	**38**	**34**	**32**	**37**	**43**	**46**	**46**	**46**	**46**
	DS Online 2	1	0.3	5.7	7.7	10.5	13.3	15.9	16.7	16.8	16.8	16.8
	DS Online 3	1	0.1	0.8	1.1	1.5	1.9	2.2	2.4	2.4	2.4	2.4
	DS Online 4	1	0.2	3.3	4.3	5.8	7.3	8.7	9.2	9.2	9.2	9.2
	DS Data Storage products total		**1**	**10**	**13**	**18**	**23**	**27**	**28**	**28**	**28**	**28**
	ES + DS total (excl. infrastructure)		**2**	**48**	**47**	**50**	**59**	**70**	**75**	**75**	**75**	**75**

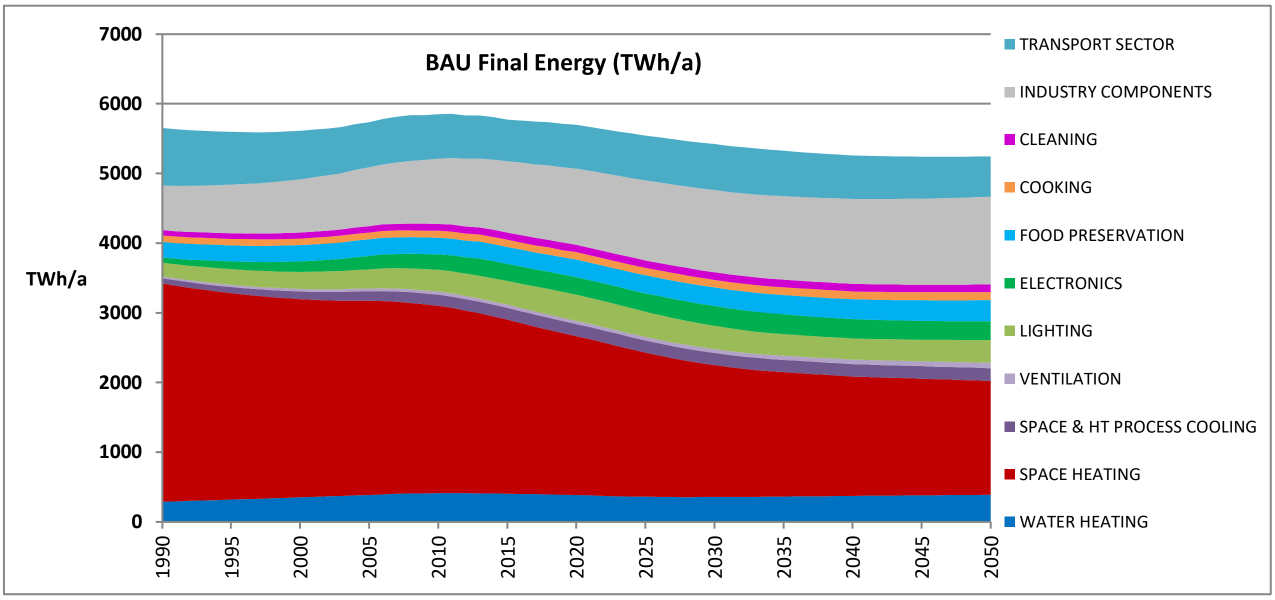
db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	15.6	20.8	13.9	8.8	9.8	10.8	10.6	10.2	9.7	9.1
	PC Integrated Desktop	1	0.5	0.9	0.6	0.4	0.5	0.7	0.8	0.8	0.8	0.8
	PC Notebook	1	0.0	7.3	8.3	6.7	7.3	7.7	7.8	8.1	8.0	7.7
	PC Tablet/slate	1	0.0	0.3	2.2	2.3	1.5	1.4	1.4	1.4	1.4	1.4
	PC Thin client	1	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2
	PC Integrated Thin Client	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Small-scale Server	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Workstation	1	0.7	1.4	1.4	1.6	1.7	1.9	2.1	2.1	2.0	1.8
	Total PC, electricity		**17**	**31**	**27**	**20**	**21**	**23**	**23**	**23**	**22**	**21**
	Inkjet Printer	1	0.9	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	1.2	0.9	1.0	1.1	1.0	1.0	0.9	0.9	0.8	0.8
	EP / Laser Printer mono	1	7.9	2.3	1.8	1.4	1.1	0.9	0.7	0.5	0.4	0.2
	EP / Laser Printer colour	1	0.0	1.2	1.7	2.4	2.7	2.9	3.1	3.1	3.2	3.3
	EP / Laser Copier mono	1	8.8	1.1	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.2	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	2.1	2.7	2.9	2.8	2.6	2.5	2.4	2.2	2.1
	EP / Laser MFD colour	1	0.0	2.5	3.2	3.4	3.2	3.1	2.9	2.8	2.7	2.5
	Total IE Imaging Equipment		**19**	**11**	**12**	**12**	**11**	**11**	**10**	**10**	**9**	**9**
	of which for modes under CR 1275/2008		*14*	*8*	*9*	*9*	*8*	*8*	*8*	*7*	*7*	*7*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	2.0	5.9	5.2	4.4	3.9	3.5	3.2	2.8	2.5	2.2
	SB Electric toothbrushes (off mode)	1	0.1	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	SB Audio speakers (wired) (sb & off modes)	1	1.7	2.7	2.0	1.0	0.2	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.7	3.2	5.0	5.2	5.2	5.2	5.2	5.2
	SB Small appliances (sb & off modes)	1	1.3	6.9	7.2	7.4	7.6	7.7	7.8	7.8	7.9	8.0
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.4	1.1	1.2	1.2	1.2	1.2	1.2	1.2
	SB Media players and recorders (sb mode)	1	0.0	3.4	4.2	1.0	0.1	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.4	3.1	3.3	3.2	2.8	2.5	2.3	2.1	1.9	1.7
	SB Office phones (nsb mode)	1	0.6	2.2	1.9	1.5	1.2	1.0	0.8	0.8	0.8	0.7
	SB Home NAS (nsb mode)	1	0.0	0.9	1.5	2.0	2.5	2.9	3.2	3.3	3.3	3.1
	SB Home Network Equipment (nsb mode)	1	0.0	2.7	3.2	3.5	3.7	3.9	4.1	4.3	4.3	4.3
	SB Office Network Equipment (nsb mode)	1	0.0	0.3	1.1	2.4	3.7	5.0	6.1	6.2	6.2	6.2
	SB Coffee makers (off mode)	1	0.8	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	1.6	1.7	1.8	*1.8*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.5	0.7	0.8	*0.9*	*1.0*	*1.2*	*1.3*	*1.4*	*1.5*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
1	SB Electric Ovens (sb mode)	1	0.0	3.1	4.2	4.9	5.3	5.6	5.8	5.9	5.9	6.0
1	SB Electric Hobs (sb mode)	1	0.0	1.2	1.6	1.9	2.0	2.2	2.3	2.4	2.5	2.6
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	5.0	11.9	11.9	11.1	10.2	9.9	9.9	9.9	9.9
1	SB Game consoles (non-active modes)	1	0.0	2.2	3.0	3.5	3.2	3.2	3.2	3.2	3.2	3.2
1	SB IE Inkjet Printers (nsb mode)	1	0.8	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	1.0	0.8	0.9	1.0	0.9	0.9	0.8	0.8	0.8	0.7
1	SB IE Laser Printers (nsb mode)	1	5.9	2.6	2.7	2.9	2.9	2.9	2.8	2.8	2.7	2.6
1	SB IE Laser Copiers (nsb mode)	1	6.6	1.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	3.4	4.5	4.7	4.5	4.3	4.1	3.9	3.7	3.5
	Total (networked) SB (incl. double)		21	52	65	66	64	64	65	65	64	64
	Total (networked) SB (excl. double)		**7**	**30**	**32**	**32**	**33**	**35**	**36**	**36**	**35**	**35**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.1	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9
0.6	EPS 10–12 W	1	0.0	6.8	10.8	11.8	11.4	11.0	10.5	10.1	9.6	9.5
0.5	EPS 15–20 W	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	1	0.0	0.8	0.9	0.9	0.8	0.7	0.6	0.6	0.5	0.4
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	1	0.0	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	1.2	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	EPS 12–15 W	1	0.0	0.2	0.5	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	EPS, total for active mode		**0.1**	**10.5**	**14.7**	**15.2**	**14.7**	**14.2**	**13.6**	**13.1**	**12.6**	**12.4**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.1	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7
0.0	EPS 10–12 W	1	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.1**	**1.5**	**1.6**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**	**1.0**	**0.9**
	EPS, overall total (active + no-load)		**0.2**	**12.0**	**16.3**	**16.6**	**16.1**	**15.4**	**14.8**	**14.2**	**13.6**	**13.3**
	EPS, double counted subtracted		**0.2**	**6.3**	**8.2**	**8.4**	**8.1**	**7.8**	**7.4**	**7.0**	**6.7**	**6.6**
	TOTAL ELECTRONICS		**72**	**219**	**244**	**256**	**264**	**284**	**285**	**277**	**271**	**269**

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**112**	**113**	**115**	**116**	**117**	**117**	**117**	**117**	**116**	**116**
	CF open vertical chilled multi deck (RVC2)	1	14	13	12	11	11	11	11	11	11	11
	CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	1	1	1	1	1
	CF other supermarket display (non-BCs)	1	24	23	23	22	22	23	24	25	25	26
	CF Plug in one door beverage cooler	1	15	16	15	14	14	14	14	14	14	15
	CF Plug in horizontal ice cream freezer	1	3	4	3	3	3	3	3	3	3	3
	CF Spiral vending machine	1	4	3	2	1	1	1	1	2	2	2
	Total CF Commercial Refrigeration		**62**	**59**	**56**	**53**	**52**	**53**	**54**	**55**	**56**	**57**
	PF Storage cabinet Chilled Vertical (CV)	1	1.5	2.2	2.3	2.4	2.5	2.6	2.7	2.9	3.0	3.1
	PF Storage cabinet Frozen Vertical (FV)	1	1.8	2.5	2.7	2.8	2.9	3.1	3.2	3.4	3.5	3.6
	PF Storage cabinet Chilled Horizontal (CH)	1	1.2	1.7	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4
	PF Storage cabinet Frozen Horizontal (FH)	1	0.7	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4
	PF Storage cabinets All types	1	**5**	**7**	**8**	**8**	**9**	**9**	**9**	**10**	**10**	**11**
	PF Process Chiller AC MT S ≤ 300 kW	1	2.9	6.3	7.4	8.5	9.5	10.5	11.5	12.6	13.6	14.6
	PF Process Chiller AC MT L > 300 kW	1	2.8	6.0	7.1	8.2	9.2	10.2	11.1	12.1	13.1	14.1
	PF Process Chiller AC LT S ≤ 200 kW	1	2.9	6.3	7.4	8.6	9.6	10.6	11.6	12.6	13.7	14.7
	PF Process Chiller AC LT L > 200 kW	1	3.0	6.5	7.7	8.9	9.9	10.9	12.0	13.1	14.1	15.2
	PF Process Chiller WC MT S ≤ 300 kW	1	0.8	1.7	2.1	2.4	2.7	2.9	3.2	3.5	3.8	4.1
	PF Process Chiller WC MT L > 300 kW	1	1.2	2.6	3.0	3.5	3.9	4.3	4.8	5.2	5.6	6.0
	PF Process Chiller WC LT S ≤ 200 kW	1	1.0	2.2	2.6	3.1	3.4	3.8	4.1	4.5	4.9	5.2
	PF Process Chiller WC LT L > 200 kW	1	1.3	2.8	3.3	3.9	4.3	4.8	5.2	5.7	6.2	6.6
	PF Process Chiller All MT&LT	1	**16**	**35**	**41**	**47**	**53**	**58**	**64**	**69**	**75**	**81**
	PF Condensing Unit MT S 0.2-1 kW	1	5.6	4.6	4.5	4.7	5.0	5.4	5.8	6.3	6.8	7.3
	PF Condensing Unit MT M 1-5 kW	1	14.1	11.6	11.3	11.8	12.8	13.8	14.8	16.0	17.2	18.6
	PF Condensing Unit MT L 5-20 kW	1	17.4	14.3	13.9	14.6	15.7	16.9	18.2	19.7	21.2	22.8
	PF Condensing Unit MT XL 20-50 kW	1	17.3	14.2	13.8	14.5	15.6	16.8	18.1	19.5	21.1	22.7
	PF Condensing Unit LT S 0.1-0.4 kW	1	0.7	0.6	0.6	0.6	0.7	0.7	0.8	0.8	0.9	0.9
	PF Condensing Unit LT M 0.4-2 kW	1	2.7	2.2	2.1	2.2	2.4	2.6	2.8	3.0	3.2	3.5
	PF Condensing Unit LT L 2-8 kW	1	4.3	3.6	3.5	3.6	3.9	4.2	4.5	4.9	5.3	5.7
	PF Condensing Unit LT XL 8-20 kW	1	13.4	11.1	10.7	11.3	12.2	13.1	14.1	15.2	16.4	17.6
0.6	**PF Condensing Unit, All MT&LT**	1	**75**	**62**	**60**	**63**	**68**	**74**	**79**	**85**	**92**	**99**
	PF Professional Refrigeration, Total		**51**	**67**	**73**	**80**	**89**	**96**	**105**	**113**	**122**	**131**
	TOTAL FOOD PRESERVATION		**225**	**239**	**243**	**249**	**258**	**267**	**276**	**285**	**294**	**304**
	CA Electric Hobs (active modes)	1	19	29	32	35	38	40	42	44	46	48
	CA Electric Hobs (low-power modes)	1	0.0	1.2	1.6	1.9	2.0	2.2	2.3	2.4	2.5	2.6
	CA Electric Hobs (sum all modes)	1	19	30	34	37	40	43	45	47	49	51
	CA Electric Ovens (active modes)	1	21	21	20	19	19	19	20	20	20	20
	CA Electric Ovens (low-power modes)	1	0.0	3.1	4.2	4.9	5.3	5.6	5.8	5.9	5.9	6.0
	CA Electric Ovens (sum all modes)	1	21	25	24	24	24	25	26	26	26	26
	CA Gas Hobs	0	31	25	25	24	23	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	7	6	6	6	6	6
	CA Range Hoods	1	9	11	12	13	13	14	15	15	16	17
	CA Elec. Hobs&Ovens low-power modes	1	0.0	4.4	5.8	6.8	7.3	7.8	8.1	8.3	8.5	8.6
	CA other products or modes		92	96	97	98	99	101	103	105	107	108
	TOTAL COOKING		**92**	**100**	**103**	**105**	**107**	**109**	**111**	**113**	**115**	**117**
	WM Washing Machines, active modes	1	43	34	33	31	28	26	24	22	21	19
	WM Washing Machines, low-power modes	1	0.0	1.6	1.7	1.8	1.8	1.9	1.9	1.8	1.8	1.8
	WM Washing Machines, all modes	1	43	36	35	33	30	28	26	24	22	21
	WD Washer-Dryers, active modes	1	7	8	8	8	8	7	7	6	6	6
	WD Washer-Dryers, low-power modes	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	WD Washer-Dryers, all modes	1	7	8	8	8	8	7	7	6	6	6
	WM-WD Washing, sum active modes	1	50	43	41	39	36	34	31	29	27	25
	WM-WD Washing, sum low-power modes	1	0	2	2	2	2	2	2	2	2	2
	Total WM-WD household Washing	1	**50**	**44**	**43**	**41**	**38**	**36**	**33**	**31**	**29**	**27**
	DW Dishwashers, active modes	1	10	18	21	25	28	30	33	35	37	39
	DW Dishwashers, low-power modes	1	0.0	0.5	0.7	0.8	0.9	1.0	1.2	1.3	1.4	1.5
	Total DW household Dishwasher	1	**10**	**19**	**22**	**25**	**29**	**31**	**34**	**36**	**38**	**40**
	LD condensing heat pump	1		0	0	0	0	1	1	1	1	2
	LD condensing electric heat element	1	1	9	9	9	9	10	9	9	8	8
	LD vented electric	1	6	7	6	5	5	4	4	5	5	5
	LD vented gas	0	0	0	0	0	0	0	0			
	LD Laundry Dryers, sum active modes		8	16	15	14	14	14	14	14	14	13
	LD Laundry Dryers, low-power modes	1	0.0	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	Total LD household Laundry Dryer		**8**	**16**	**15**	**14**	**14**	**14**	**15**	**14**	**14**	**14**

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	7.5	11.4	14.9	15.6	14.5	12.3	9.2	7.0	6.4	6.2
	VC Upright Domestic mains	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Handstick Domestic mains	1	0.1	0.1	0.3	0.4	0.7	1.0	1.4	1.7	1.7	1.7
	VC Total Domestic mains		**8**	**12**	**15**	**16**	**15**	**13**	**11**	**9**	**8**	**8**
	VC Cylinder Commercial mains	1	1.5	6.0	7.0	7.1	7.5	7.9	8.4	8.5	8.5	8.5
	VC Upright Commercial mains	1	0.3	0.9	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9
	VC Total Commercial mains		**2**	**7**	**8**	**8**	**8**	**9**	**9**	**9**	**9**	**9**
	VC Total in scope of CR 666/2013		**9**	**19**	**23**	**24**	**24**	**22**	**20**	**18**	**18**	**17**
	VC Cordless - domestic - cleaning	1	0.0	0.1	0.3	0.8	1.7	2.9	3.9	4.4	4.5	4.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.4
	VC Cordless - domestic - standby	1	0.0	0.1	0.2	0.7	1.2	1.7	2.2	2.5	2.7	2.7
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.6	0.7	0.7
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	1	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**8**	**12**	**16**	**18**	**19**	**19**	**18**	**17**	**17**	**17**
	VC Total Commercial mains+cordless+robots		**2**	**7**	**8**	**8**	**9**	**9**	**10**	**10**	**10**	**10**
	Total VC Vacuum Cleaner		**10**	**19**	**24**	**26**	**28**	**28**	**28**	**27**	**27**	**27**
	TOTAL CLEANING		**77**	**98**	**104**	**106**	**108**	**110**	**109**	**109**	**108**	**108**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	55	62	68	72	73	73	73	73
0.5	FAN Axial>300Pa	1	28	85	98	104	109	112	113	113	113	113
0.5	FAN Centr.FC	1	7	15	18	21	23	24	24	24	24	24
0.5	FAN Centr.BC-free	1	18	39	47	51	57	62	66	68	69	70
0.5	FAN Centr.BC	1	19	44	53	59	65	71	77	82	90	97
0.5	FAN Cross-flow	1	1	2	3	3	3	4	4	4	5	5
	Total FAN, industrial (excl. box & roof fans)		**45**	**115**	**137**	**150**	**162**	**172**	**178**	**182**	**187**	**191**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	97	124	132	136	136	133	128	122	115	106
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	146	192	204	211	210	204	194	181	166	148
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	297	381	399	409	403	382	348	304	264	238
0.45	**Total 3ph 0.75-375 kW no VSD**		**541**	**697**	**735**	**757**	**750**	**718**	**670**	**608**	**544**	**492**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	7	15	19	23	27	31	36	42	48	56
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	12	29	36	44	53	62	72	85	99	114
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	34	84	105	131	158	187	220	257	293	320
0.45	**Total 3-ph 0.75-375 kW with VSD**		**52**	**128**	**160**	**198**	**237**	**280**	**328**	**383**	**440**	**490**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**593**	**825**	**896**	**955**	**987**	**998**	**998**	**991**	**985**	**982**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	7	10	10	10	10	10	10	10	10	10
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	1	1	1	1	1	1	1	1	1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**7**	**10**	**11**	**12**	**12**	**12**	**12**	**12**	**12**	**12**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	10	14	14	15	15	15	15	15	15	15
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	1	2	2	2	2	2	3	3	3
0.45	**Total Small 3-ph 0.12-0.75 kW**		**11**	**15**	**16**	**17**	**17**	**17**	**17**	**17**	**18**	**18**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	152	185	181	172	161	153	151	150	148	147
0.45	Large 3-ph LV 375-1000kW with VSD	1	8	42	63	86	107	122	129	136	142	149
0.45	**Total Large 3-ph LV 375-1000 kW**		**160**	**226**	**243**	**258**	**268**	**275**	**280**	**285**	**291**	**296**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	3	4	5	5	5	5	6	6	6	6
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	8	11	12	13	14	14	15	15	15	16
0.45	Explosion motors (L) 3-ph 75-375 kW	1	15	22	24	26	28	29	30	30	31	32
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**26**	**37**	**41**	**45**	**47**	**48**	**50**	**51**	**52**	**53**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	2	3	3	4	4	4	4	4	4	4
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	5	7	8	9	9	9	10	10	10	10
0.45	Brake motors (L) 3-ph 75-375 kW	1	7	11	12	13	14	14	15	15	15	16
0.45	**Total Brake 0.75-375 kW (no VSD)**		**15**	**21**	**24**	**26**	**27**	**28**	**28**	**29**	**30**	**30**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	1	1	2	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**1**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**40**	**55**	**60**	**65**	**67**	**69**	**70**	**71**	**72**	**73**
	MT Elec. Motors LV 0.12-1000 kW		**469**	**655**	**711**	**758**	**785**	**797**	**802**	**802**	**803**	**807**

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	16.5	21.7	23.0	24.6	25.6	26.3	27.7	29.5	31.2	33.0
	ESOB<45_CF	1	10.9	14.7	15.7	17.0	18.2	19.2	20.4	21.7	23.0	24.2
	ESOB<45_VSD-VF	1	0.5	1.0	1.1	1.5	2.0	2.5	2.8	3.0	3.1	3.3
	ESOB < 45 Total	1	**28**	**37**	**40**	**43**	**46**	**48**	**51**	**54**	**57**	**61**
	ESOB_45-150_VF	1	5.7	7.3	7.7	8.1	8.3	8.3	8.7	9.3	9.9	10.4
	ESOB_45-150_CF	1	9.4	12.7	13.5	14.7	15.7	16.6	17.5	18.7	19.8	21.0
	ESOB_45-150_VSD-VF	1	0.3	0.6	0.7	0.9	1.3	1.6	1.7	1.8	1.9	2.1
	ESOB 45-150 Total	1	**15**	**21**	**22**	**24**	**25**	**26**	**28**	**30**	**32**	**33**
	ESOB < 150 Total	1	**43**	**58**	**62**	**67**	**71**	**75**	**79**	**84**	**89**	**94**
	ESCC<45_VF	1	13.8	18.0	19.0	20.2	20.9	21.3	22.4	23.8	25.3	26.7
	ESCC<45_CF	1	9.2	12.4	13.2	14.3	15.3	16.2	17.1	18.2	19.3	20.4
	ESCC<45_VSD-VF	1	0.5	1.0	1.2	1.5	2.1	2.6	2.9	3.1	3.3	3.5
	ESCC < 45 Total	1	**23**	**31**	**33**	**36**	**38**	**40**	**42**	**45**	**48**	**50**
	ESCC_45-150_VF	1	5.0	6.6	6.9	7.4	7.6	7.8	8.2	8.7	9.2	9.8
	ESCC_45-150_CF	1	3.5	4.7	5.0	5.4	5.8	6.1	6.5	6.9	7.3	7.8
	ESCC_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCC 45-150 Total	1	**9**	**12**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
	ESCC < 150 Total	1	**32**	**43**	**46**	**49**	**53**	**55**	**58**	**62**	**66**	**69**
	ESCCi<45_VF	1	6.9	8.3	8.5	8.4	7.4	6.5	6.5	6.9	7.3	7.7
	ESCCi<45_CF	1	0.6	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3	1.3
	ESCCi<45_VSD-VF	1	1.0	2.0	2.3	3.0	4.2	5.1	5.7	6.0	6.4	6.7
	ESCCi < 45 Total	1	**9**	**11**	**12**	**12**	**13**	**13**	**13**	**14**	**15**	**16**
	ESCCi_45-150_VF	1	1.3	1.5	1.6	1.6	1.4	1.2	1.2	1.3	1.4	1.4
	ESCCi_45-150_CF	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCCi 45-150 Total	1	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
	ESCCi < 150 Total	1	**10**	**13**	**14**	**15**	**15**	**15**	**16**	**17**	**18**	**19**
	MSSB<6"_VF	1	2.4	2.8	2.9	2.9	2.8	2.7	2.8	3.0	3.2	3.3
	MSSB<6"_CF	1	13.3	17.9	19.1	20.8	22.3	23.5	24.8	26.4	28.0	29.6
	MSSB<6"_VSD-VF	1	0.3	0.6	0.7	0.9	1.1	1.3	1.4	1.5	1.6	1.7
	MSSB <6" Total	1	**16**	**21**	**23**	**25**	**26**	**27**	**29**	**31**	**33**	**35**
	MS-V<25bar_VF	1	10.2	13.0	13.7	14.3	14.4	14.3	14.9	15.9	16.8	17.8
	MS-V<25bar_CF	1	6.4	8.6	9.2	10.0	10.7	11.3	12.0	12.7	13.5	14.2
	MS-V<25bar_VSD-VF	1	0.7	1.3	1.6	2.1	2.8	3.5	3.9	4.1	4.4	4.6
	MS_V <25 bar Total	1	**17**	**23**	**24**	**26**	**28**	**29**	**31**	**33**	**35**	**37**
	WP Water pumps		**119**	**159**	**169**	**182**	**193**	**201**	**213**	**226**	**240**	**253**
	WE arc-on-mode	1	6.2	6.1	6.1	6.0	6.0	6.1	6.2	6.2	6.2	6.3
	WE idle mode	1	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Total WE Welding Equipment		**6.5**	**6.4**	**6.4**	**6.4**	**6.4**	**6.5**	**6.5**	**6.6**	**6.6**	**6.7**
	TOTAL INDUSTRY COMPONENTS		639	936	1023	1096	1146	1177	1199	1218	1237	1258
	Total TRAFO Utility Transformers											
	TOTAL ENERGY SECTOR											
	(not final energy: distribution losses)											
	Tyres C1, replacement for cars	0	372	281	259	252	252	246	236	225	213	203
	Tyres C1, OEM for cars	0	112	82	81	77	76	74	71	68	64	61
	Tyres C1, total		**484**	**364**	**340**	**329**	**328**	**320**	**308**	**292**	**277**	**264**
	Tyres C2, replacement for vans	0	109	96	91	96	101	107	104	99	94	90
	Tyres C2, OEM for vans	0	23	20	19	21	21	22	22	21	20	19
	Tyres C2, total		**131**	**116**	**109**	**117**	**123**	**129**	**126**	**120**	**114**	**109**
	Tyres C3, replacement for trucks/busses	0	173	129	119	147	158	173	176	174	171	169
	Tyres C3, OEM for trucks/busses	0	38	28	28	32	35	39	39	39	38	38
	Tyres C3, total		**211**	**158**	**147**	**179**	**193**	**211**	**215**	**212**	**210**	**207**
	Tyres, total C1+C2+C3		**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
	TRANSPORT SECTOR		826	637	597	625	643	660	649	625	601	579
	BAU Final Energy, Total, in TWh		**5652**	**5849**	**5772**	**5696**	**5543**	**5420**	**5324**	**5259**	**5241**	**5244**
	BAU Final Energy, Total, in PJ		20346	21055	20780	20505	19954	19514	19166	18931	18867	18877
	BAU Final Energy, Total, in mtoe		486	503	496	490	477	466	458	452	451	451

	BAU Final Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	289	413	405	384	360	356	363	372	381	389
	SPACE HEATING	3133	2688	2496	2281	2067	1892	1784	1714	1673	1633
	SPACE & HT PROCESS COOLING	73	160	171	174	177	177	177	178	180	183
	VENTILATION	26	43	44	45	48	53	59	65	70	76
1	*Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	LIGHTING	198	316	342	375	364	335	310	303	310	327
	ELECTRONICS	72	219	244	256	264	284	285	277	271	269
	FOOD PRESERVATION	225	239	243	249	258	267	276	285	294	304
	COOKING	92	100	103	105	107	109	111	113	115	117
	CLEANING	77	98	104	106	108	110	109	109	108	108
	INDUSTRY COMPONENTS	639	936	1023	1096	1146	1177	1199	1218	1237	1258
	ENERGY SECTOR (not final energy)										
	TRANSPORT SECTOR	826	637	597	625	643	660	649	625	601	579
	BAU Final Energy, Total, in TWh	**5652**	**5849**	**5772**	**5696**	**5543**	**5420**	**5324**	**5259**	**5241**	**5244**
	BAU Final Energy, Total, in PJ	20346	21055	20780	20505	19954	19514	19166	18931	18867	18877
	BAU Final Energy, Total, in mtoe	486	503	496	490	477	466	458	452	451	451



Sector subdivision for BAU Final Energy (same sector definitions and same order of presentation as in Eurostat Energy Balances

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

BAU Final Energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	9	12	12	11	11	11	11	11	11	12
SPACE HEATING	175	155	141	128	115	104	97	91	87	84
SPACE & HT PROCESS COOLING	19	34	37	39	40	40	40	40	40	40
VENTILATION	3	5	5	5	5	5	6	6	6	7
LIGHTING	25	41	47	53	55	54	51	51	52	55
ELECTRONICS	1	9	9	10	12	14	14	14	14	14
FOOD PRESERVATION	20	36	41	47	53	58	63	69	74	80
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	1	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	428	606	658	703	731	746	755	761	768	776
BAU Final Energy, Industry, in TWh	**680**	**899**	**952**	**998**	**1022**	**1032**	**1037**	**1044**	**1054**	**1068**
BAU Final Energy, Industry, in PJ	2447	3235	3426	3592	3681	3714	3735	3759	3794	3845
BAU Final Energy, Industry, in mtoe	58	77	82	86	88	89	89	90	91	92

BAU Final Energy (summary TRANSPORT)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	110	103	117	123	132	132	128	124	121
TYRES for SERVICE-sector-related transport	278	218	205	227	238	252	251	243	236	229
TYRES for RESIDENTIAL-sector-related transport	387	291	272	263	262	256	246	234	222	211
TYRES for OTHER-sector-related transport	22	17	16	18	19	20	20	20	19	18
BAU Final Energy, Transport, in TWh	**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
BAU Final Energy, Transport, in PJ	2974	2292	2149	2251	2315	2377	2337	2249	2165	2085
BAU Final Energy, Transport, in mtoe	71	55	51	54	55	57	56	54	52	50

BAU Final Energy (summary SERVICES)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	60	83	81	77	72	72	74	76	79	81
SPACE HEATING	690	668	618	565	513	473	447	427	414	401
SPACE & HT PROCESS COOLING	47	99	107	111	113	112	112	112	113	113
VENTILATION	20	31	31	32	33	35	37	39	42	44
LIGHTING	101	179	200	227	236	227	215	213	221	236
ELECTRONICS	27	80	86	97	109	119	121	119	117	116
FOOD PRESERVATION	99	94	91	90	92	95	98	102	106	109
COOKING	13	13	13	13	13	13	13	13	13	13
CLEANING	4	9	10	11	11	12	12	13	13	13
INDUSTRY COMPONENTS	156	256	285	308	325	337	345	352	358	366
BAU Final Energy, Services, in TWh	**1218**	**1512**	**1525**	**1529**	**1516**	**1494**	**1474**	**1467**	**1475**	**1493**
BAU Final Energy, Services, in PJ	4384	5444	5489	5506	5456	5380	5308	5279	5311	5375
BAU Final Energy, Services, in mtoe	105	130	131	131	130	128	127	126	127	128

BAU Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	217	314	308	292	274	270	275	281	287	293
SPACE HEATING	2209	1810	1686	1542	1399	1279	1207	1164	1141	1119
SPACE & HT PROCESS COOLING	2	18	17	13	13	13	14	15	16	18
VENTILATION	3	7	8	8	10	13	16	19	22	25
LIGHTING	69	92	92	91	70	51	41	36	33	32
ELECTRONICS	44	129	148	148	142	150	148	143	139	138
FOOD PRESERVATION	103	104	106	107	108	108	108	107	107	107
COOKING	78	87	90	92	94	96	99	101	102	104
CLEANING	73	88	93	95	96	97	96	94	94	94
INDUSTRY COMPONENTS	20	27	29	31	33	34	36	38	41	43
BAU Final Energy, Residential, in TWh	**2819**	**2676**	**2574**	**2418**	**2238**	**2111**	**2040**	**1998**	**1982**	**1972**
BAU Final Energy, Residential, in PJ	10149	9634	9267	8706	8057	7601	7343	7193	7136	7101
BAU Final Energy, Residential, in mtoe	242	230	221	208	192	182	175	172	170	170

(OTHER sectors corresponds to Agriculture, Forestry, Fishing, Non-specified (other) of Eurostat)

BAU Final Energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3	4	4	4	3	3	3	3	4	4
SPACE HEATING	60	55	50	46	41	37	34	32	30	29
SPACE & HT PROCESS COOLING	5	9	10	11	11	11	11	11	12	12
VENTILATION	0	0	0	0	0	0	0	0	0	1
LIGHTING	2	3	4	4	4	4	3	3	3	4
ELECTRONICS	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVATION	4	4	5	5	6	6	7	7	8	8
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	35	47	51	55	58	60	63	66	70	73
BAU Final Energy, Other sectors, in TWh	**109**	**125**	**125**	**125**	**124**	**123**	**123**	**125**	**128**	**131**
BAU Final Energy, Other sectors, in PJ	392	450	448	450	446	442	444	451	461	472
BAU Final Energy, Other sectors, in mtoe	9	11	11	11	11	11	11	11	11	11

BAU Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		289	413	405	384	360	356	363	372	381	389
	Residential	217	314	308	292	274	270	275	281	287	293
	Tertiary / Services	60	83	81	77	72	72	74	76	79	81
	Industry	9	12	12	11	11	11	11	11	11	12
	Other	3	4	4	4	3	3	3	3	4	4
SPACE HEATING. All sectors, TWh		3133	2688	2496	2281	2067	1892	1784	1714	1673	1633
	Residential	2209	1810	1686	1542	1399	1279	1207	1164	1141	1119
	Tertiary / Services	690	668	618	565	513	473	447	427	414	401
	Industry	175	155	141	128	115	104	97	91	87	84
	Other	60	55	50	46	41	37	34	32	30	29
SPACE COOLING. All sectors, TWh		73	160	171	174	177	177	177	178	180	183
& HT PROCESS	Residential	2	18	17	13	13	13	14	15	16	18
	Tertiary / Services	47	99	107	111	113	112	112	112	113	113
	Industry	19	34	37	39	40	40	40	40	40	40
	Other	5	9	10	11	11	11	11	11	12	12
VENTILATION.	All sectors, TWh	26	43	44	45	48	53	59	65	70	76
	Residential	3	7	8	8	10	13	16	19	22	25
	Tertiary / Services	20	31	31	32	33	35	37	39	42	44
	Industry	3	5	5	5	5	5	6	6	6	7
	Other	0	0	0	0	0	0	0	0	0	1
LIGHTING.	All sectors, TWh	198	316	342	375	364	335	310	303	310	327
	Residential	69	92	92	91	70	51	41	36	33	32
	Tertiary / Services	101	179	200	227	236	227	215	213	221	236
	Industry	25	41	47	53	55	54	51	51	52	55
	Other	2	3	4	4	4	4	3	3	3	4
ELECTRONICS.	All sectors, TWh	72	219	244	256	264	284	285	277	271	269
	Residential	44	129	148	148	142	150	148	143	139	138
	Tertiary / Services	27	80	86	97	109	119	121	119	117	116
	Industry	1	9	9	10	12	14	14	14	14	14
	Other	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVE.	All sectors, TWh	225	239	243	249	258	267	276	285	294	304
	Residential	103	104	106	107	108	108	108	107	107	107
	Tertiary / Services	99	94	91	90	92	95	98	102	106	109
	Industry	20	36	41	47	53	58	63	69	74	80
	Other	4	4	5	5	6	6	7	7	8	8
COOKING.	All sectors, TWh	92	100	103	105	107	109	111	113	115	117
	Residential	78	87	90	92	94	96	99	101	102	104
	Tertiary / Services	13	13	13	13	13	13	13	13	13	13
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	77	98	104	106	108	110	109	109	108	108
	Residential	73	88	93	95	96	97	96	94	94	94
	Tertiary / Services	4	9	10	11	11	12	12	13	13	13
	Industry	0	1	1	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	639	936	1023	1096	1146	1177	1199	1218	1237	1258
	Residential	20	27	29	31	33	34	36	38	41	43
	Tertiary / Services	156	256	285	308	325	337	345	352	358	366
	Industry	428	606	658	703	731	746	755	761	768	776
	Other	35	47	51	55	58	60	63	66	70	73
TYRES. Transport sector, TWh		826	637	597	625	643	660	649	625	601	579
	Residential transport	387	291	272	263	262	256	246	234	222	211
	Tertiary / Services transport	278	218	205	227	238	252	251	243	236	229
	Industry transport	139	110	103	117	123	132	132	128	124	121
	Other transport	22	17	16	18	19	20	20	20	19	18
ALL PRODUCTS.	All sectors, TWh	5652	5849	5772	5696	5543	5420	5324	5259	5241	5244
	Residential	2819	2676	2574	2418	2238	2111	2040	1998	1982	1972
	Tertiary / Services	1218	1512	1525	1529	1516	1494	1474	1467	1475	1493
	Industry	680	899	952	998	1022	1032	1037	1044	1054	1068
	Other	109	125	125	125	124	123	123	125	128	131
	Transport	826	637	597	625	643	660	649	625	601	579

BAU Final Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	75%	76%	76%	76%	76%	76%	76%	76%	75%	75%
	Tertiary / Services	21%	20%	20%	20%	20%	20%	20%	21%	21%	21%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	71%	67%	68%	68%	68%	68%	68%	68%	68%	69%
	Tertiary / Services	22%	25%	25%	25%	25%	25%	25%	25%	25%	25%
	Industry	6%	6%	6%	6%	6%	5%	5%	5%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	11%	10%	8%	7%	8%	8%	8%	9%	10%
	Tertiary / Services	64%	62%	63%	64%	64%	63%	63%	63%	62%	62%
	Industry	26%	21%	22%	22%	23%	23%	22%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION											
	Residential	10%	16%	17%	19%	21%	24%	27%	29%	31%	33%
	Tertiary / Services	77%	72%	71%	70%	68%	65%	63%	61%	59%	58%
	Industry	12%	11%	11%	11%	10%	10%	9%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	29%	27%	24%	19%	15%	13%	12%	11%	10%
	Tertiary / Services	51%	57%	59%	61%	65%	68%	69%	70%	71%	72%
	Industry	13%	13%	14%	14%	15%	16%	17%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	61%	58%	54%	53%	52%	51%	51%	51%
	Tertiary / Services	37%	36%	35%	38%	41%	42%	43%	43%	43%	43%
	Industry	2%	4%	4%	4%	5%	5%	5%	5%	5%	5%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential	46%	44%	43%	43%	42%	40%	39%	38%	36%	35%
	Tertiary / Services	44%	39%	38%	36%	36%	36%	36%	36%	36%	36%
	Industry	9%	15%	17%	19%	20%	22%	23%	24%	25%	26%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
COOKING.											
	Residential	85%	87%	87%	88%	88%	88%	89%	89%	89%	89%
	Tertiary / Services	15%	13%	13%	12%	12%	12%	11%	11%	11%	11%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	89%	89%	89%	89%	88%	87%	87%	87%	87%
	Tertiary / Services	5%	10%	10%	10%	10%	11%	11%	12%	12%	12%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Tertiary / Services	24%	27%	28%	28%	28%	29%	29%	29%	29%	29%
	Industry	67%	65%	64%	64%	64%	63%	63%	63%	62%	62%
	Other	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%
TYRES.											
	Residential transport	47%	46%	46%	42%	41%	39%	38%	37%	37%	36%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	20%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	50%	46%	45%	42%	40%	39%	38%	38%	38%	38%
	Tertiary / Services	22%	26%	26%	27%	27%	28%	28%	28%	28%	28%
	Industry	12%	15%	16%	18%	18%	19%	19%	20%	20%	20%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	3%
	Transport	15%	11%	10%	11%	12%	12%	12%	12%	11%	11%

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	1	1	1	1	1	1	1	1
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	8	7	6	6	6	6	6	7	8
	EIWHS Electric Instant. Shower (secondary)	1.00	1	1	1	1	1	1	1	1	1	1
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	9	9	8	8	8	9	9	10	10
	ESWH Electric Storage > 30 L (primary)	1.00	57	80	81	76	71	72	76	81	86	90
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	8	6	5	4	4	4	4	4
	GSWH Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1
	GSWH Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	3	2
	Dedicated WH Heat Pump	1.00	0	0	1	1	2	3	4	5	7	8
	Dedicated WH Solar (3.5 m2)	0.80	1	7	9	9	8	7	7	7	7	7
	WH dedicated Water Heater		**119**	**150**	**145**	**128**	**114**	**113**	**118**	**124**	**131**	**138**
	CHB Gas Combi Instant. WH	0.04	56	135	137	131	120	112	107	99	91	82
	CHB Gas + Cyl. WH	0.04	36	57	55	50	44	40	38	35	32	29
	CHB Jet Burner Gas + Cyl. WH	0.04	9	8	6	5	3	2	2	2	2	2
	CHB Jet Burner Oil + Cyl. WH	0.04	68	58	47	35	25	17	14	14	14	14
	CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1
	CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	1	2	3	5	7	9
	CHB Electric HP + Cyl. WH	1.00	0	2	3	4	6	9	12	16	21	25
	CHB Gas HP + Cyl. WH	0.02	0	0	0	0	1	1	2	2	3	4
	CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	1
	CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
	CHC Central Heating combi, water heating		**170**	**262**	**252**	**229**	**203**	**186**	**181**	**177**	**173**	**168**
	TOTAL WATER HEATING		**289**	**413**	**396**	**357**	**317**	**299**	**298**	**301**	**304**	**306**
	CHB Gas non-condensing	0.04	753	845	649	403	191	89	36	19	10	7
	CHB Gas condensing	0.04	7	263	384	525	614	632	607	537	476	412
	CHB Gas Jet burner non-condensing	0.04	81	53	40	27	16	7	2	1	1	1
	CHB Gas Jet burner condensing	0.04	0	1	2	4	6	7	8	9	9	9
	CHB Oil Jet burner non-condensing	0.04	1013	652	485	329	194	81	27	13	9	7
	CHB Oil Jet burner condensing	0.04	0	9	21	37	53	68	76	80	81	81
	CHB Electric Joule-effect	1.00	13	13	14	15	14	13	12	10	9	8
	CHB Hybrid (gas-electric)	0.60	0	0	0	1	2	4	7	10	14	18
	CHB Electric Heat Pump	1.00	2	11	15	20	28	38	52	66	79	91
	CHB Gas Heat Pump	0.04	0	0	0	1	1	2	3	4	5	5
	CHB micro CHP	0.04	0	0	0	1	1	2	3	3	4	4
	CHB Solar combi (16 m2)	0.10	6	6	6	6	6	5	5	4	4	4
	CHB Central Heating boiler < 400 kW, space heating		**1875**	**1854**	**1617**	**1367**	**1126**	**947**	**836**	**757**	**700**	**646**
	SFB Wood Manual	0	342	90	69	48	30	16	9	6	5	4
	SFB Wood Direct Draft	0	2	23	43	60	70	67	66	71	81	93
	SFB Coal	0	364	107	105	84	59	35	23	21	19	16
	SFB Pellets	0	0	9	16	22	26	28	29	29	30	31
	SFB Wood chips	0	0	14	17	19	17	15	16	17	18	19
	Total Solid Fuel Boiler		**709**	**243**	**250**	**233**	**202**	**161**	**143**	**144**	**152**	**164**
	CHAE-S (≤ 400 kW)	1	3	9	10	11	11	10	10	10	10	10
	CHAE-L (> 400 kW)	1	5	13	14	14	14	13	12	11	10	10
	CHWE-S (≤ 400 kW)	1	0	1	1	1	1	1	1	1	1	1
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	1	3	3	3	3	3	3	2	2	2
	CHWE-L (> 1500 kW)	1	1	2	2	2	2	2	2	2	1	1
	CHF	0.05	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	20	32	35	37	37	37	37	38	39	40
	HT PCH-AE-L	1	19	31	34	35	35	33	33	33	34	35
	HT PCH-WE-S	1	4	7	7	8	8	8	8	8	9	9
	HT PCH-WE-M	1	8	13	15	16	16	16	17	17	17	18
	HT PCH-WE-L	1	2	3	3	3	3	3	3	3	3	4
	AC rooftop	1	3	7	7	6	4	3	1	1	0	0
	AC splits	1	4	11	11	10	9	8	7	6	6	5
	AC VRF	1	0	3	4	5	6	8	9	9	10	10
	ACF	0.05	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**70**	**133**	**146**	**152**	**149**	**145**	**142**	**143**	**144**	**146**
	AC rooftop (rev)	1	4	11	11	10	7	4	2	1	0	0
	AC splits (rev)	1	7	21	22	21	19	16	14	13	11	10
	AC VRF (rev)	1	0	7	10	14	16	19	21	22	22	22
	ACF (rev)	0.05	0	0	0	0	0	0	1	1	1	1
	AHF	0.05	198	144	123	102	82	67	56	50	44	39
	AHE	1	1	3	2	1	1	1	1	1	1	1
	SubTotal AHC central Air Heating		**209**	**186**	**169**	**148**	**126**	**107**	**95**	**86**	**79**	**73**
	Total AHC central Air Heating & Cooling		**280**	**320**	**315**	**299**	**275**	**252**	**237**	**229**	**224**	**219**

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	19	17	16	14	13	13	12
	LH closed fireplace/inset	0	18	41	48	53	56	57	56	54	52	51
	LH wood stove	0	38	37	37	37	35	34	33	32	31	30
	LH coal stove	0	23	13	11	10	9	7	6	4	3	3
	LH cooker	0	7	11	12	13	14	14	14	13	13	13
	LH SHR stove	0	16	21	22	24	26	29	31	32	33	33
	LH pellet stove	0	0	8	11	13	15	16	16	17	16	16
	LH Solid fuel sum		**117**	**148**	**161**	**170**	**173**	**172**	**170**	**166**	**161**	**158**
	LH Electric portable	1	23	22	21	18	16	15	15	14	13	13
	LH Electric fixed > 250W	1	124	111	101	85	68	58	54	52	49	47
	LH Electric fixed ≤ 250W	1	8	7	7	6	5	4	4	3	3	3
	LH Electric storage	1	7	7	6	5	4	4	4	3	3	3
	LH Electric underfloor	1	21	21	20	20	19	18	17	16	16	15
	LH Electric visibly glowing > 1.2 kW	1	2	2	2	2	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	1	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	1	7	9	10	9	9	8	7	7	7	6
	LH Electric sum		**193**	**179**	**167**	**145**	**123**	**108**	**102**	**97**	**93**	**89**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	0.9	0.8	0.6	0.5	0.5	0.5	0.4
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.1	1.8	1.5	1.3	1.1	1.0	1.0
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.4	1.1	0.8	0.7	0.6	0.5	0.5
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.7	1.1	0.9	0.8	0.7	0.6
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.6**	**7.7**	**6.1**	**4.8**	**3.9**	**3.4**	**3.1**	**2.9**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.6**	**0.5**	**0.4**	**0.3**	**0.3**	**0.2**	**0.2**
	LH Local Space Heaters total		**330**	**339**	**338**	**323**	**302**	**286**	**276**	**266**	**257**	**249**
	RAC fixed < 6 kW, cooling	1	2	13	10	7	7	8	9	10	11	12
	RAC fixed 6-12 kW, cooling	1	1	6	6	4	4	5	5	5	6	6
	RAC portable < 12 kW, cooling	1	0	1	1	1	1	1	1	1	1	1
	RAC < 12 kW total, cooling mode		**3**	**20**	**17**	**12**	**12**	**13**	**15**	**16**	**18**	**19**
	RAC fixed < 6 kW, reversible, heating	1	1	16	17	16	20	26	33	41	48	53
	RAC fixed 6-12 kW, reversible, heating	1	0	8	9	9	10	13	16	19	22	23
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**1**	**24**	**26**	**25**	**31**	**39**	**49**	**59**	**69**	**77**
	RAC Room Air Conditioner		**4**	**44**	**43**	**37**	**43**	**53**	**64**	**76**	**87**	**96**
1	CIRC Integrated circulators	1	13	19	17	14	12	13	13	13	13	13
0.38	CIRC Large standalone circulators	1	8	12	10	7	6	5	5	5	5	5
0.38	CIRC Small standalone circulators	1	6	9	7	4	3	3	3	3	3	3
	CIRC Circulator pumps <2.5 kW, all	1	**27**	**39**	**33**	**24**	**21**	**21**	**21**	**20**	**20**	**20**
	CIRC Circulator pumps <2.5 kW, excl. double		**9**	**13**	**10**	**7**	**6**	**5**	**5**	**5**	**5**	**5**
	TOTAL SPACE HEATING		**3133**	**2660**	**2410**	**2102**	**1792**	**1546**	**1404**	**1317**	**1262**	**1213**
	TOTAL SPACE COOLING		**73**	**153**	**163**	**164**	**162**	**158**	**157**	**159**	**162**	**165**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.1	0.1	0.2	0.6	1.2	1.9	2.6	3.3	4.0
	R-UVU 100-250 m3/h	1	0.4	0.8	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.7
	R-BVU 100-250 m3/h	1	0.0	0.1	0.1	0.1	0.2	0.4	0.6	0.8	0.9	1.2
	R-UVU 250-1000 m3/h	1	2.1	5.0	5.3	5.3	4.9	4.6	4.5	4.5	4.5	4.5
	R-BVU 250-1000 m3/h	1	0.0	0.5	0.7	0.8	1.6	2.8	4.1	5.5	6.8	8.3
	R-UVU > 1000 m3/h	1	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	R-BVU 1000-2500 m3/h	1	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	RVU, Total residential, VU own electricity		**3**	**7**	**8**	**8**	**8**	**10**	**12**	**15**	**17**	**19**
	NR-UVU 250-1000 m3/h	1	0.9	1.9	2.0	1.9	1.7	1.5	1.4	1.4	1.4	1.3
	NR-BVU 250-1000 m3/h	1	0.0	0.9	1.1	1.4	1.6	1.8	2.0	2.3	2.6	2.8
	NR-UVU > 1000 m3/h	1	0.6	1.1	1.0	0.8	0.7	0.6	0.6	0.6	0.6	0.5
	NR-BVU 1000-2500 m3/h	1	0.0	0.7	0.9	1.0	1.1	1.3	1.4	1.6	1.8	2.0
	NR-AHU-S 2500-5500 m3/h	1	0.2	2.5	3.4	4.1	4.5	5.0	5.5	6.2	6.8	7.4
	NR-AHU-M 5500-14500 m3/h	1	17.2	22.9	21.7	20.2	19.3	19.4	19.8	20.5	21.3	22.0
	NR-AHU-L > 14500 m3/h	1	4.9	6.5	6.1	5.6	5.4	5.3	5.4	5.7	5.9	6.0
	NRVU, Total non-residential, VU own electricity		**24**	**36**	**36**	**35**	**34**	**35**	**36**	**38**	**40**	**42**
	VU Ventilation Units, res + non-res., VU own electricity		**26**	**43**	**44**	**43**	**43**	**45**	**49**	**53**	**57**	**61**
	TOTAL VENTILATION (VU own electricity)		26	43	44	43	43	45	49	53	57	61
1	*Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)*		*-*	*-*	*-4*	*-16*	*-31*	*-44*	*-50*	*-51*	*-51*	*-52*

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS, final energy incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	77	120	141	151	122	68	31	15	9	5
	HID (HPM, HPS, MH)	1	29	61	53	45	33	17	7	2	1	0
	CFLni (all shapes)	1	2	8	8	7	5	2	1	0	0	0
	CFLi (retrofit for GLS, HL)	1	1	14	18	14	5	1	0	0	0	0
	GLS (DLS & NDLS)	1	74	42	12	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	1	6	40	50	21	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	1	0	0	2	12	39	74	100	117	132	149
	LED replacing HID (retrofit & luminaire)	1	0	0	9	19	29	38	46	54	62	70
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	1	2	3	4	4	5	5
	LED replacing DLS (retrofit & luminaire)	1	0	0	1	3	5	5	6	6	6	7
	LED replacing NDLS (retrofit & luminaire)	1	0	0	2	11	19	22	24	25	26	28
	Standby	1	9	15	13	11	9	7	7	7	7	7
	TOTAL LIGHTING (incl. standby)		**198**	**300**	**307**	**294**	**269**	**239**	**225**	**232**	**249**	**273**
	DP TV on-mode, total all types	1	23.5	61.6	65.8	56.5	35.4	32.0	28.1	30.5	35.3	40.8
	DP TV standby, standard (NoNA)	1	3.1	1.9	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	1	0.0	0.1	0.6	1.0	0.7	0.2	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	1	0.0	0.0	1.5	4.1	6.3	7.9	8.2	7.5	6.4	5.3
	DP TV standby, total all types		**3**	**2**	**3**	**5**	**7**	**8**	**8**	**7**	**6**	**5**
	DP TV total on-mode + standby		**27**	**64**	**68**	**62**	**42**	**40**	**36**	**38**	**42**	**46**
	DP Monitor on-mode	1	0.7	12.4	6.8	2.7	2.4	1.6	1.2	1.2	1.3	1.4
	DP Monitor standby	1	0.1	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total		**1**	**13**	**7**	**3**	**2**	**2**	**1**	**1**	**1**	**1**
	DP Signage on-mode	1	0.0	0.9	7.9	17.9	21.1	17.5	13.4	12.9	14.4	16.6
	DP Signage standby	1	0.0	0.1	1.2	2.7	3.2	2.6	2.0	1.9	2.2	2.5
	DP Signage total		**0**	**1**	**9**	**21**	**24**	**20**	**15**	**15**	**17**	**19**
	DP Electronic Displays, total on-mode		**24**	**75**	**80**	**77**	**59**	**51**	**43**	**45**	**51**	**59**
	DP Electronic Displays, total standby		**3**	**3**	**4**	**8**	**10**	**11**	**10**	**9**	**9**	**8**
	DP Electronic Displays, total		**27**	**78**	**84**	**85**	**69**	**62**	**53**	**54**	**60**	**67**
	SSTB	1	0	2	1	0	0	0	0	0	0	0
	CSTB (low-power modes)	1	0	5	11	9	8	8	8	8	8	8
	CSTB (other modes)	1	0	3	6	5	4	4	4	4	4	4
	CSTB (all covered modes)	1	0	8	16	13	12	12	12	12	12	12
	Total STB set top boxes (Complex & Simple)		**0**	**9**	**18**	**13**	**12**	**12**	**12**	**12**	**12**	**12**
	Game consoles > 20 W Active modes (SRI)	1	0.0	2.4	3.7	3.6	3.5	3.5	3.5	3.5	3.5	3.5
	Game consoles > 20 W Non-Active (CR)	1	0.0	1.3	1.5	0.9	0.6	0.6	0.6	0.6	0.6	0.6
	Game consoles < 20 W Non-Active (CR)	1	0.0	0.9	0.9	0.5	0.3	0.3	0.3	0.3	0.3	0.3
	Game consoles < 20 W Active (no reg.)	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total Game consoles, active modes		0.0	2.6	3.9	3.7	3.6	3.6	3.6	3.6	3.6	3.6
	Total Game consoles, non-active modes		0.0	2.2	2.4	1.5	0.9	0.9	0.9	0.9	0.9	0.9
	Total Game consoles > 20 W, all modes		0.0	3.7	5.2	4.5	4.1	4.1	4.1	4.1	4.1	4.1
	Total Game consoles < 20 W, all modes		0.0	1.1	1.1	0.6	0.4	0.4	0.4	0.4	0.4	0.4
	Total Game consoles, all modes		**0**	**5**	**6**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
	ES&DS only, without effects on infrastructure											
	ES tower 1-socket traditional	1	0.0	0.9	0.8	0.5	0.4	0.3	0.3	0.3	0.3	0.3
	ES rack 1-socket traditional	1	0.1	2.8	2.1	1.7	1.8	1.9	2.0	2.0	2.0	2.0
	ES rack 2-socket traditional	1	0.6	13.0	7.0	3.9	4.5	5.4	5.8	5.8	5.8	5.8
	ES rack 2-socket cloud	1	0.0	7.3	11.3	11.9	13.9	16.6	18.0	18.0	18.0	18.0
	ES rack 4-socket traditional	1	0.1	1.4	0.7	0.6	0.6	0.8	0.8	0.8	0.8	0.8
	ES rack 4-socket cloud	1	0.0	0.8	1.4	1.8	2.1	2.5	2.7	2.7	2.7	2.7
	ES rack 2-socket resilient trad.	1	0.0	0.7	0.4	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	ES rack 2-socket resilient cloud	1	0.0	0.3	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	ES rack 4-socket resilient trad.	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	1	0.0	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	ES blade 2-socket traditional	1	0.5	5.9	3.0	1.9	2.2	2.6	2.8	2.8	2.8	2.8
	ES blade 2-socket cloud	1	0.0	3.3	5.0	5.8	6.8	8.1	8.8	8.8	8.8	8.8
	ES blade 4-socket traditional	1	0.1	0.7	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	ES blade 4-socket cloud	1	0.0	0.4	0.6	0.7	0.8	0.9	1.0	1.0	1.0	1.0
	ES total traditional		**2**	**26**	**15**	**10**	**11**	**12**	**13**	**13**	**13**	**13**
	ES total cloud		**0**	**12**	**19**	**21**	**24**	**29**	**31**	**31**	**31**	**31**
	ES Enterprise Servers total		**2**	**38**	**34**	**30**	**35**	**41**	**44**	**44**	**44**	**44**
	DS Online 2	1	0.3	5.7	7.7	10.4	13.0	15.6	16.3	16.4	16.4	16.4
	DS Online 3	1	0.1	0.8	1.1	1.5	1.8	2.2	2.3	2.3	2.3	2.3
	DS Online 4	1	0.2	3.3	4.3	5.7	7.1	8.5	8.9	9.0	9.0	9.0
	DS Data Storage products total		**1**	**10**	**13**	**18**	**22**	**26**	**27**	**28**	**28**	**28**
	ES + DS total (excl. infrastructure)		**2**	**48**	**47**	**48**	**57**	**67**	**72**	**72**	**72**	**72**

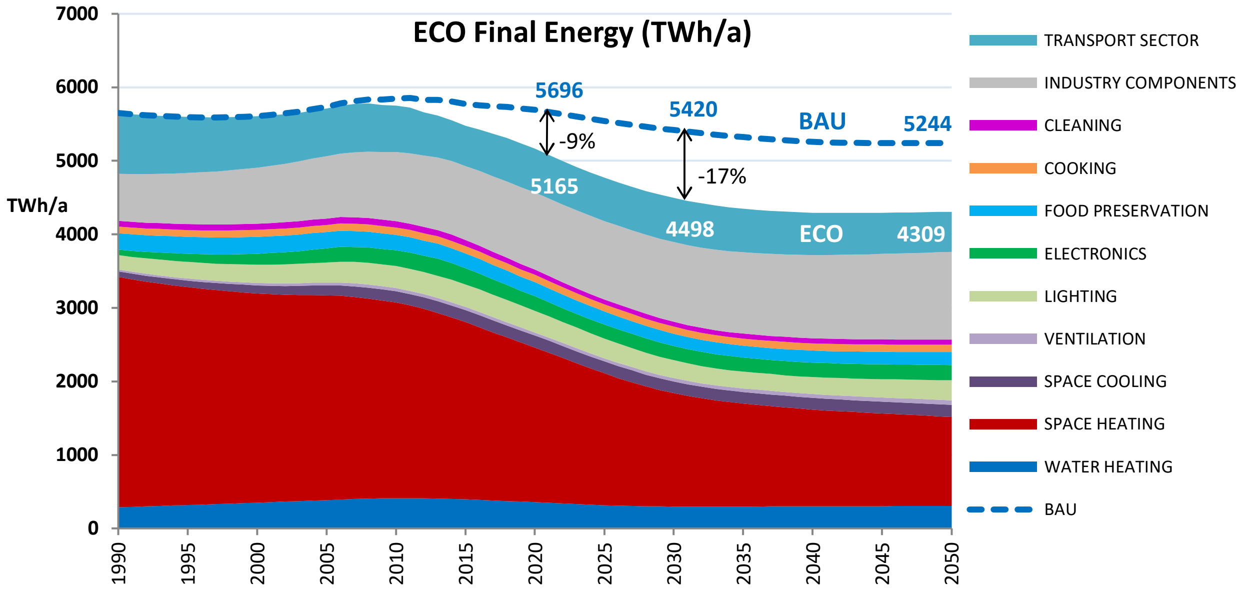
db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	15.6	20.8	13.9	8.8	9.8	10.8	10.6	10.2	9.7	9.1
	PC Integrated Desktop	1	0.5	0.9	0.6	0.4	0.5	0.7	0.8	0.8	0.8	0.8
	PC Notebook	1	0.0	7.3	8.3	6.7	7.3	7.7	7.8	8.1	8.0	7.7
	PC Tablet/slate	1	0.0	0.3	2.2	2.3	1.5	1.4	1.4	1.4	1.4	1.4
	PC Thin client	1	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2	0.2
	PC Integrated Thin Client	1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Small-scale Server	1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Workstation	1	0.7	1.4	1.4	1.6	1.7	1.9	2.1	2.1	2.0	1.8
	Total PC, electricity		**17**	**31**	**27**	**20**	**21**	**23**	**23**	**23**	**22**	**21**
	Inkjet Printer	1	0.9	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	1.2	0.6	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	EP / Laser Printer mono	1	7.9	1.8	1.2	0.7	0.5	0.4	0.3	0.2	0.2	0.1
	EP / Laser Printer colour	1	0.0	1.1	1.2	1.1	1.2	1.2	1.3	1.3	1.4	1.4
	EP / Laser Copier mono	1	8.8	0.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.2	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	1.5	1.3	1.0	0.8	0.8	0.7	0.7	0.7	0.6
	EP / Laser MFD colour	1	0.0	2.1	1.9	1.2	0.9	0.9	0.9	0.8	0.8	0.7
	Total IE Imaging Equipment		**19**	**8**	**7**	**5**	**4**	**4**	**4**	**3**	**3**	**3**
	of which for modes under CR 1275/2008		*14*	*6*	*5*	*3*	*3*	*3*	*3*	*3*	*2*	*2*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	2.0	5.9	4.5	2.9	2.5	2.3	2.1	1.9	1.6	1.4
	SB Electric toothbrushes (off mode)	1	0.1	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	SB Audio speakers (wired) (sb & off modes)	1	1.7	2.2	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.5	1.5	2.0	2.0	2.0	2.0	2.0	2.0
	SB Small appliances (sb & off modes)	1	1.3	6.9	5.0	3.5	3.6	3.6	3.6	3.7	3.7	3.8
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	SB Media players and recorders (sb mode)	1	0.0	2.7	1.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.4	3.1	3.3	2.8	1.9	1.8	1.7	1.7	1.7	1.6
	SB Office phones (nsb mode)	1	0.6	2.2	1.9	1.2	0.8	0.8	0.8	0.8	0.8	0.7
	SB Home NAS (nsb mode)	1	0.0	0.9	1.4	0.7	0.7	0.9	1.0	1.1	1.2	1.2
	SB Home Network Equipment (nsb mode)	1	0.0	2.7	3.2	3.1	3.3	3.4	3.7	3.8	3.8	3.8
	SB Office Network Equipment (nsb mode)	1	0.0	0.3	1.0	1.3	2.0	2.7	3.2	3.3	3.3	3.3
	SB Coffee makers (off mode)	1	0.8	1.0	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	1.2	0.6	0.7	*0.6*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.5	0.5	0.5	*0.5*	*0.5*	*0.6*	*0.6*	*0.7*	*0.7*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	1	0.0	3.1	3.2	2.7	1.8	1.0	0.9	0.9	0.9	0.9
1	SB Electric Hobs (sb mode)	1	0.0	1.2	1.2	1.0	0.8	0.7	0.8	0.8	0.8	0.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	5.0	10.6	8.6	8.0	7.8	7.7	7.7	7.7	7.7
1	SB Game consoles (non-active modes)	1	0.0	2.2	2.4	1.5	0.9	0.9	0.9	0.9	0.9	0.9
1	SB IE Inkjet Printers (nsb mode)	1	0.8	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	1.0	0.5	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.2
1	SB IE Laser Printers (nsb mode)	1	5.9	2.2	1.8	1.4	1.2	1.2	1.2	1.2	1.1	1.1
1	SB IE Laser Copiers (nsb mode)	1	6.6	0.7	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	2.7	2.5	1.6	1.3	1.3	1.2	1.1	1.1	1.0
	Total (networked) SB (incl. double)		21	48	47	37	32	32	32	32	32	32
	Total (networked) SB (excl. double)		**7**	**29**	**23**	**18**	**18**	**18**	**19**	**19**	**19**	**19**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.1	0.9	0.8	0.7	0.6	0.7	0.7	0.7	0.7	0.8
0.6	EPS 10–12 W	1	0.0	6.7	9.3	8.5	7.3	7.3	7.4	7.4	7.5	7.5
0.5	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
1.0	EPS 20–30 W	1	0.0	0.8	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.4
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4	0.5
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	1	0.0	0.2	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	1.2	1.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	EPS 12–15 W	1	0.0	0.2	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5
	EPS, total for active mode		**0.1**	**10.4**	**12.7**	**11.0**	**9.6**	**9.7**	**9.7**	**9.8**	**9.9**	**10.0**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.1	1.0	0.7	0.4	0.3	0.3	0.3	0.3	0.3	0.3
0.0	EPS 10–12 W	1	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.1**	**1.5**	**1.1**	**0.6**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
	EPS, overall total (active + no-load)		**0.2**	**11.9**	**13.8**	**11.6**	**10.0**	**10.0**	**10.1**	**10.2**	**10.3**	**10.4**
	EPS, double counted subtracted		**0.2**	**6.2**	**6.8**	**5.7**	**4.7**	**4.7**	**4.8**	**4.8**	**4.9**	**4.9**
	TOTAL ELECTRONICS		**72**	**214**	**219**	**200**	**190**	**195**	**192**	**193**	**197**	**203**

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**112**	**85**	**71**	**61**	**51**	**42**	**35**	**31**	**29**	**27**
	CF open vertical chilled multi deck (RVC2)	1	14	13	12	11	9	7	5	5	5	5
	CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	1	1	1	1	1
	CF other supermarket display (non-BCs)	1	24	23	23	22	21	19	17	16	17	17
	CF Plug in one door beverage cooler	1	15	16	15	14	11	8	7	7	7	7
	CF Plug in horizontal ice cream freezer	1	3	4	3	3	3	2	2	2	2	2
	CF Spiral vending machine	1	4	3	2	1	1	1	1	1	1	1
	Total CF Commercial Refrigeration		**62**	**59**	**56**	**52**	**46**	**37**	**33**	**32**	**32**	**33**
	PF Storage cabinet Chilled Vertical (CV)	1	1.5	2.2	2.3	2.1	1.6	1.6	1.6	1.7	1.8	1.8
	PF Storage cabinet Frozen Vertical (FV)	1	1.8	2.5	2.7	2.4	1.9	1.8	1.9	2.0	2.0	2.1
	PF Storage cabinet Chilled Horizontal (CH)	1	1.2	1.7	1.8	1.6	1.3	1.2	1.3	1.3	1.4	1.5
	PF Storage cabinet Frozen Horizontal (FH)	1	0.7	1.0	1.1	1.0	0.7	0.7	0.7	0.8	0.8	0.8
	PF Storage cabinets All types	1	**5**	**7**	**8**	**7**	**6**	**5**	**6**	**6**	**6**	**6**
	PF Process Chiller AC MT S ≤ 300 kW	1	3	6	7	8	9	10	11	12	13	13
	PF Process Chiller AC MT L > 300 kW	1	3	6	7	8	9	9	10	11	12	13
	PF Process Chiller AC LT S ≤ 200 kW	1	3	6	7	8	9	10	11	12	13	14
	PF Process Chiller AC LT L > 200 kW	1	3	7	8	9	9	10	11	12	13	14
	PF Process Chiller WC MT S ≤ 300 kW	1	1	2	2	2	3	3	3	3	3	4
	PF Process Chiller WC MT L > 300 kW	1	1	3	3	3	4	4	4	5	5	6
	PF Process Chiller WC LT S ≤ 200 kW	1	1	2	3	3	3	4	4	4	5	5
	PF Process Chiller WC LT L > 200 kW	1	1	3	3	4	4	4	5	5	6	6
	PF Process Chiller All MT&LT	1	**16**	**35**	**41**	**46**	**50**	**54**	**59**	**64**	**69**	**75**
	PF Condensing Unit MT S 0.2-1 kW	1	6	5	4	4	5	5	5	6	6	7
	PF Condensing Unit MT M 1-5 kW	1	14	12	11	11	12	13	14	15	16	17
	PF Condensing Unit MT L 5-20 kW	1	17	14	14	14	14	16	17	18	19	21
	PF Condensing Unit MT XL 20-50 kW	1	17	14	14	14	14	16	17	18	19	21
	PF Condensing Unit LT S 0.1-0.4 kW	1	1	1	1	1	1	1	1	1	1	1
	PF Condensing Unit LT M 0.4-2 kW	1	3	2	2	2	2	2	2	3	3	3
	PF Condensing Unit LT L 2-8 kW	1	4	4	3	3	3	4	4	4	4	5
	PF Condensing Unit LT XL 8-20 kW	1	13	11	11	11	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	1	**75**	**62**	**60**	**60**	**62**	**67**	**72**	**78**	**84**	**90**
	PF Professional Refrigeration, Total		**51**	**67**	**73**	**77**	**81**	**86**	**93**	**101**	**109**	**117**
	TOTAL FOOD PRESERVATION		**225**	**210**	**200**	**191**	**178**	**166**	**161**	**164**	**170**	**177**
	CA Electric Hobs (active modes)	1	19	29	32	35	38	40	42	44	46	48
	CA Electric Hobs (low-power modes)	1	0.0	1.2	1.2	1.0	0.8	0.7	0.8	0.8	0.8	0.8
	CA Electric Hobs (sum all modes)	1	19	30	33	36	39	41	43	45	47	49
	CA Electric Ovens (active modes)	1	21	21	20	19	18	18	18	18	18	18
	CA Electric Ovens (low-power modes)	1	0.0	3.1	3.2	2.7	1.8	1.0	0.9	0.9	0.9	0.9
	CA Electric Ovens (sum all modes)	1	21	24	23	22	20	19	19	19	19	19
	CA Gas Hobs	0	31	25	25	24	22	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	6	5	5	5	4	4
	CA Range Hoods	1	9	11	12	12	11	11	11	11	11	12
	CA Elec. Hobs&Ovens low-power modes	1	0.0	4.2	4.4	3.7	2.6	1.7	1.6	1.7	1.7	1.7
	CA other products or modes		92	96	97	96	96	95	95	96	98	99
	TOTAL COOKING		**92**	**100**	**101**	**100**	**98**	**97**	**97**	**98**	**99**	**101**
	WM Washing Machines, active modes	1	43	27	23	19	17	17	16	16	16	16
	WM Washing Machines, low-power modes	1	0.0	1.2	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.5
	WM Washing Machines, all modes	1	43	28	23	20	18	17	17	16	16	16
	WD Washer-Dryers, active modes	1	7	8	7	6	6	6	6	6	6	6
	WD Washer-Dryers, low-power modes	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers, all modes	1	7	8	7	7	6	6	6	6	6	6
	WM-WD Washing, sum active modes	1	50	34	29	26	24	23	22	22	22	22
	WM-WD Washing, sum low-power modes	1	0	1	1	1	1	1	1	0	0	0
	Total WM-WD household Washing	1	**50**	**36**	**30**	**27**	**24**	**23**	**23**	**22**	**22**	**22**
	DW Dishwashers, active modes	1	10	15	16	18	19	21	22	23	24	25
	DW Dishwashers, low-power modes	1	0.0	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7
	Total DW household Dishwasher	1	**10**	**15**	**16**	**18**	**20**	**21**	**23**	**24**	**25**	**26**
	LD condensing heat pump	1		0	1	2	3	4	4	5	5	5
	LD condensing electric heat element	1	1	9	8	6	5	4	3	3	3	3
	LD vented electric	1	6	7	5	3	2	1	0	0		
	LD vented gas	0	0	0	0	0	0	0	0			
	LD Laundry Dryers, sum active modes		8	16	14	11	9	8	8	7	7	7
	LD Laundry Dryers, low-power modes	1	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	Total LD household Laundry Dryer		**8**	**16**	**14**	**11**	**9**	**9**	**8**	**7**	**7**	**7**

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	7.5	11.4	13.7	8.5	4.6	3.8	2.8	2.1	1.9	1.9
	VC Upright Domestic mains	1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	1	0.1	0.1	0.3	0.3	0.4	0.6	0.7	0.9	0.9	0.9
	VC Total Domestic mains		**8**	**12**	**14**	**9**	**5**	**4**	**4**	**3**	**3**	**3**
	VC Cylinder Commercial mains	1	1.5	6.0	6.0	3.1	3.0	2.9	2.9	2.9	2.9	2.9
	VC Upright Commercial mains	1	0.3	0.9	0.7	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	VC Total Commercial mains		**2**	**7**	**7**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	VC Total in scope of CR 666/2013		**9**	**19**	**21**	**12**	**8**	**8**	**7**	**6**	**6**	**6**
	VC Cordless - domestic - cleaning	1	0.0	0.1	0.3	0.8	1.7	2.9	3.9	4.4	4.5	4.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.4
	VC Cordless - domestic - standby	1	0.0	0.1	0.2	0.7	1.2	1.7	2.2	2.5	2.7	2.7
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.6	0.7	0.7
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	1	0.0	0.1	0.2	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**8**	**12**	**15**	**11**	**9**	**10**	**11**	**12**	**12**	**12**
	VC Total Commercial mains+cordless+robots		**2**	**7**	**7**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
	Total VC Vacuum Cleaner		**10**	**19**	**22**	**14**	**12**	**14**	**15**	**15**	**16**	**16**
	TOTAL CLEANING		**77**	**86**	**82**	**70**	**66**	**67**	**68**	**69**	**70**	**71**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	53	55	57	58	58	58	58	58
0.5	FAN Axial>300Pa	1	28	85	96	98	97	96	95	95	95	95
0.5	FAN Centr.FC	1	7	15	18	18	17	17	17	17	17	17
0.5	FAN Centr.BC-free	1	18	39	45	47	49	52	55	57	58	59
0.5	FAN Centr.BC	1	19	44	51	53	55	59	64	68	74	81
0.5	FAN Cross-flow	1	1	2	2	2	1	1	1	1	2	2
	Total FAN, industrial (excl. box & roof fans)		**45**	**115**	**132**	**136**	**138**	**142**	**145**	**148**	**152**	**156**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	97	124	127	114	100	98	97	96	95	94
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	146	191	197	176	151	144	141	138	134	131
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	297	381	385	356	313	270	253	239	229	224
0.45	**Total 3ph 0.75-375 kW no VSD**		**541**	**696**	**709**	**646**	**565**	**512**	**491**	**473**	**458**	**449**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	7	15	19	31	42	45	48	51	54	57
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	12	29	40	64	86	94	100	106	113	119
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	34	84	113	162	209	249	268	287	304	318
0.45	**Total 3-ph 0.75-375 kW with VSD**		**52**	**128**	**173**	**257**	**337**	**388**	**416**	**443**	**471**	**495**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**593**	**824**	**881**	**903**	**901**	**899**	**907**	**917**	**929**	**944**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	7	10	10	10	10	10	10	10	10	10
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	1	1	1	1	1	1	1	1	1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**7**	**10**	**11**	**12**	**11**	**11**	**11**	**11**	**11**	**11**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	10	14	14	15	14	14	14	14	14	14
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	1	2	2	2	2	2	2	3	3
0.45	**Total Small 3-ph 0.12-0.75 kW**		**11**	**15**	**16**	**17**	**16**	**16**	**16**	**16**	**17**	**17**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	152	185	181	172	161	153	150	149	148	146
0.45	Large 3-ph LV 375-1000kW with VSD	1	8	42	63	86	106	120	127	133	140	147
0.45	**Total Large 3-ph LV 375-1000 kW**		**160**	**226**	**243**	**258**	**267**	**273**	**277**	**282**	**287**	**293**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	3	4	5	5	5	5	5	5	5	6
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	8	11	12	13	14	14	14	15	15	15
0.45	Explosion motors (L) 3-ph 75-375 kW	1	15	22	24	26	28	29	29	30	31	31
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**26**	**37**	**41**	**45**	**47**	**48**	**49**	**50**	**51**	**52**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	2	3	3	4	4	4	4	4	4	4
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	5	7	8	9	9	9	9	10	10	10
0.45	Brake motors (L) 3-ph 75-375 kW	1	7	11	12	13	14	14	15	15	15	16
0.45	**Total Brake 0.75-375 kW (no VSD)**		**15**	**21**	**24**	**25**	**26**	**27**	**28**	**28**	**29**	**30**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	1	1	1	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**1**	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**40**	**55**	**60**	**65**	**67**	**67**	**67**	**69**	**70**	**71**
	Total MT Elec. Motors LV 0.12-1000 kW		**469**	**655**	**703**	**729**	**736**	**738**	**746**	**756**	**768**	**781**

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	16.5	21.7	22.9	24.1	25.1	25.9	27.3	29.1	31.0	32.8
	ESOB<45_CF	1	10.9	14.7	15.6	16.7	17.9	18.9	20.1	21.4	22.8	24.1
	ESOB<45_VSD-VF	1	0.5	1.0	1.1	1.4	2.0	2.5	2.7	2.9	3.1	3.3
	ESOB < 45 Total	1	**28**	**37**	**40**	**42**	**45**	**47**	**50**	**53**	**57**	**60**
	ESOB_45-150_VF	1	5.7	7.3	7.7	8.1	8.2	8.3	8.7	9.3	9.9	10.4
	ESOB_45-150_CF	1	9.4	12.7	13.5	14.5	15.6	16.4	17.5	18.6	19.8	21.0
	ESOB_45-150_VSD-VF	1	0.3	0.6	0.7	0.9	1.2	1.5	1.7	1.8	1.9	2.1
	ESOB 45-150 Total	1	**15**	**21**	**22**	**23**	**25**	**26**	**28**	**30**	**32**	**33**
	ESOB < 150 Total	1	**43**	**58**	**61**	**66**	**70**	**74**	**78**	**83**	**88**	**94**
	ESCC<45_VF	1	13.8	18.0	18.9	19.8	20.4	21.0	22.1	23.6	25.0	26.5
	ESCC<45_CF	1	9.2	12.4	13.1	14.0	15.0	15.9	16.9	18.0	19.1	20.3
	ESCC<45_VSD-VF	1	0.5	1.0	1.2	1.5	2.1	2.6	2.9	3.1	3.2	3.4
	ESCC < 45 Total	1	**23**	**31**	**33**	**35**	**38**	**39**	**42**	**45**	**47**	**50**
	ESCC_45-150_VF	1	5.0	6.6	6.9	7.3	7.5	7.7	8.1	8.7	9.2	9.8
	ESCC_45-150_CF	1	3.5	4.7	5.0	5.4	5.8	6.1	6.5	6.9	7.3	7.8
	ESCC_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCC 45-150 Total	1	**9**	**12**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
	ESCC < 150 Total	1	**32**	**43**	**46**	**49**	**52**	**54**	**58**	**61**	**65**	**69**
	ESCCi<45_VF	1	6.9	8.3	8.4	8.2	7.2	6.3	6.4	6.8	7.2	7.6
	ESCCi<45_CF	1	0.6	0.8	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.3
	ESCCi<45_VSD-VF	1	1.0	2.0	2.3	3.0	4.1	5.0	5.6	5.9	6.3	6.7
	ESCCi < 45 Total	1	**9**	**11**	**12**	**12**	**12**	**12**	**13**	**14**	**15**	**16**
	ESCCi_45-150_VF	1	1.3	1.5	1.6	1.5	1.4	1.2	1.2	1.3	1.4	1.4
	ESCCi_45-150_CF	1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_VSD-VF	1	0.2	0.4	0.5	0.6	0.8	1.0	1.1	1.2	1.3	1.3
	ESCCi 45-150 Total	1	**2**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
	ESCCi < 150 Total	1	**10**	**13**	**14**	**14**	**15**	**15**	**16**	**17**	**18**	**19**
	MSSB<6"_VF	1	2.4	2.8	2.9	2.9	2.8	2.7	2.7	2.9	3.1	3.3
	MSSB<6"_CF	1	13.3	17.9	18.9	20.2	21.5	22.6	24.0	25.6	27.2	28.8
	MSSB<6"_VSD-VF	1	0.3	0.6	0.7	0.8	1.1	1.3	1.4	1.5	1.6	1.7
	MSSB <6" Total	1	**16**	**21**	**22**	**24**	**25**	**27**	**28**	**30**	**32**	**34**
	MS-V<25bar_VF	1	10.2	13.0	13.6	14.0	14.0	14.0	14.7	15.7	16.6	17.6
	MS-V<25bar_CF	1	6.4	8.6	9.1	9.8	10.4	11.0	11.7	12.4	13.2	14.0
	MS-V<25bar_VSD-VF	1	0.7	1.3	1.6	2.0	2.8	3.4	3.8	4.1	4.3	4.6
	MS_V <25 bar Total	1	**17**	**23**	**24**	**26**	**27**	**28**	**30**	**32**	**34**	**36**
	WP Water pumps		**119**	**159**	**167**	**179**	**189**	**198**	**209**	**223**	**237**	**251**
	WE arc-on-mode	1	6.2	6.1	6.1	6.0	5.7	5.4	5.4	5.4	5.4	5.5
	WE idle mode	1	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2
	Total WE Welding Equipment		**6.5**	**6.4**	**6.4**	**6.4**	**6.0**	**5.6**	**5.6**	**5.7**	**5.7**	**5.7**
	TOTAL INDUSTRY COMPONENTS		639	935	1009	1050	1069	1084	1107	1134	1163	1194
	Total TRAFO Utility Transformers											
	TOTAL ENERGY SECTOR											
	(not final energy: distribution losses)											
	Tyres C1, replacement for cars	0	372	279	225	230	223	216	209	201	195	188
	Tyres C1, OEM for cars	0	112	82	81	77	70	68	66	63	60	58
	Tyres C1, total		**484**	**361**	**305**	**307**	**293**	**284**	**275**	**264**	**255**	**246**
	Tyres C2, replacement for vans	0	109	95	83	92	93	98	97	92	89	85
	Tyres C2, OEM for vans	0	23	20	19	21	20	21	21	20	19	18
	Tyres C2, total		**131**	**115**	**102**	**113**	**114**	**119**	**118**	**113**	**108**	**104**
	Tyres C3, replacement for trucks/busses	0	173	128	109	141	149	162	165	163	161	159
	Tyres C3, OEM for trucks/busses	0	38	28	28	32	34	37	38	37	37	36
	Tyres C3, total		**211**	**156**	**137**	**173**	**183**	**199**	**203**	**200**	**198**	**195**
	Tyres, total C1+C2+C3		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
	TOTAL TRANSPORT SECTOR		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
	ECO Final Energy, Total, in TWh		**5652**	**5748**	**5476**	**5165**	**4772**	**4498**	**4351**	**4296**	**4294**	**4309**
	ECO Final Energy, Total, in PJ		20346	20692	19715	18593	17180	16193	15665	15464	15460	15512
	ECO Final Energy, Total, in mtoe		486	494	471	444	410	387	374	369	369	370

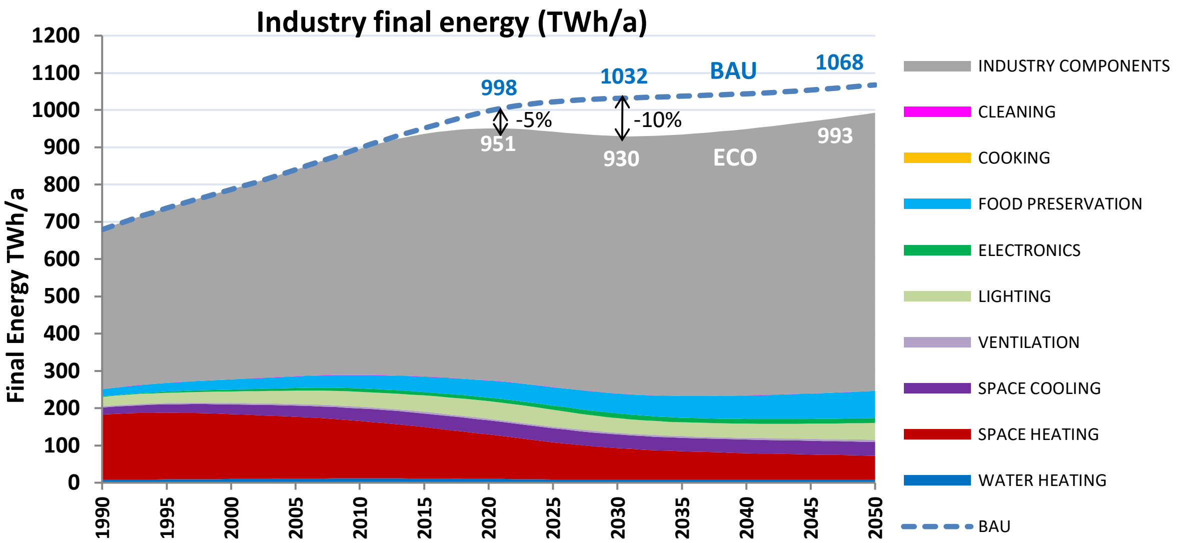
ECO Final Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	289	413	396	357	317	299	298	301	304	306
SPACE HEATING	3133	2660	2410	2102	1792	1546	1404	1317	1262	1213
SPACE COOLING	73	153	163	164	162	158	157	159	162	165
VENTILATION (from electricity)	26	43	44	43	43	45	49	53	57	61
1 *Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)*	*0*	*0*	*-4*	*-16*	*-31*	*-44*	*-50*	*-51*	*-51*	*-52*
LIGHTING	198	300	307	294	269	239	225	232	249	273
ELECTRONICS	72	214	219	200	190	195	192	193	197	203
FOOD PRESERVATION	225	210	200	191	178	166	161	164	170	177
COOKING	92	100	101	100	98	97	97	98	99	101
CLEANING	77	86	82	70	66	67	68	69	70	71
INDUSTRY COMPONENTS	639	935	1009	1050	1069	1084	1107	1134	1163	1194
ENERGY SECTOR (not final energy)										
TRANSPORT SECTOR	826	632	545	593	590	603	595	576	560	545
ECO Final Energy, Total, in TWh	**5652**	**5748**	**5476**	**5165**	**4772**	**4498**	**4351**	**4296**	**4294**	**4309**
ECO Final Energy, Total, in PJ	20346	20692	19715	18593	17180	16193	15665	15464	15460	15512
ECO Final Energy, Total, in mtoe	486	494	471	444	410	387	374	369	369	370
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption (in mtoe for EU27 (2020))	907	973	910	886						



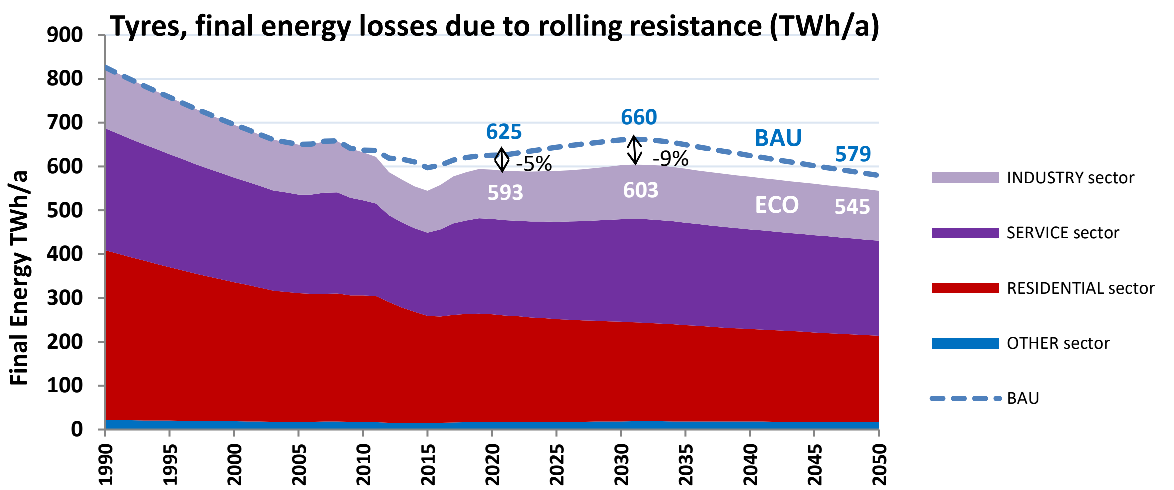
Sector subdivision for ECO Final energy (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

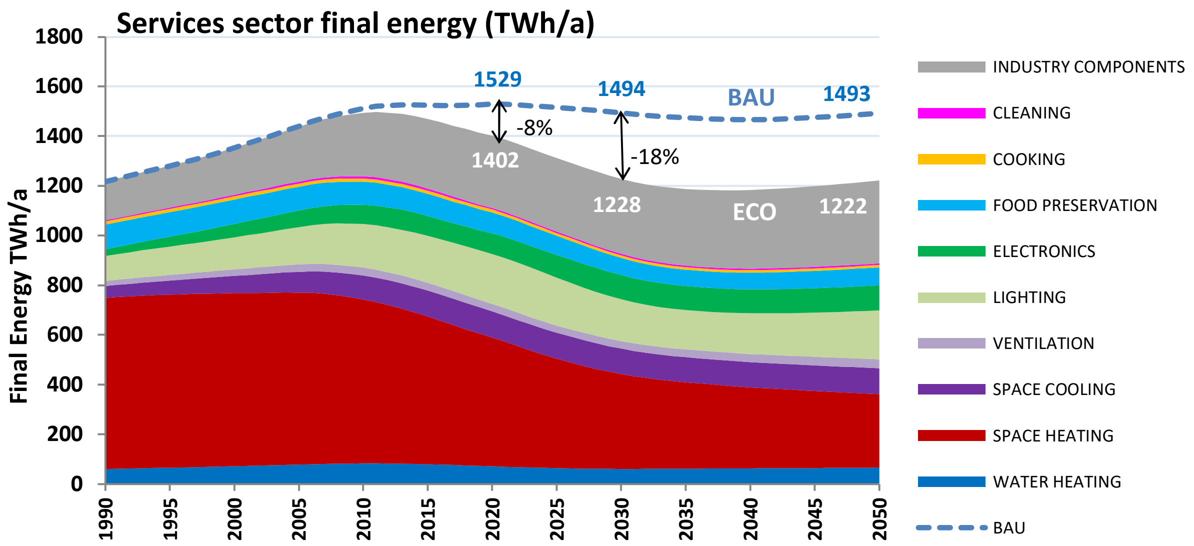
ECO Final Energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	9	12	12	11	9	9	9	9	9	9
SPACE HEATING	175	154	138	119	100	84	76	71	67	64
SPACE COOLING	19	34	37	38	38	36	36	36	37	37
VENTILATION	3	5	5	5	4	5	5	5	5	5
LIGHTING	25	40	44	47	45	39	37	38	41	45
ELECTRONICS	1	9	9	10	11	12	13	13	13	13
FOOD PRESERVATION	20	36	41	46	49	53	58	63	68	73
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	1	1	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	428	606	651	676	685	690	701	715	729	746
ECO Final Energy, Industry, in TWh	**680**	**896**	**936**	**951**	**942**	**930**	**935**	**949**	**969**	**993**
ECO Final Energy, Industry, in PJ	2447	3225	3370	3423	3390	3348	3364	3417	3490	3573
ECO Final Energy, Industry, in mtoe	58	77	80	82	81	80	80	82	83	85
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption Industry (in mtoe for EU27 (2020))	310	244	233	231						



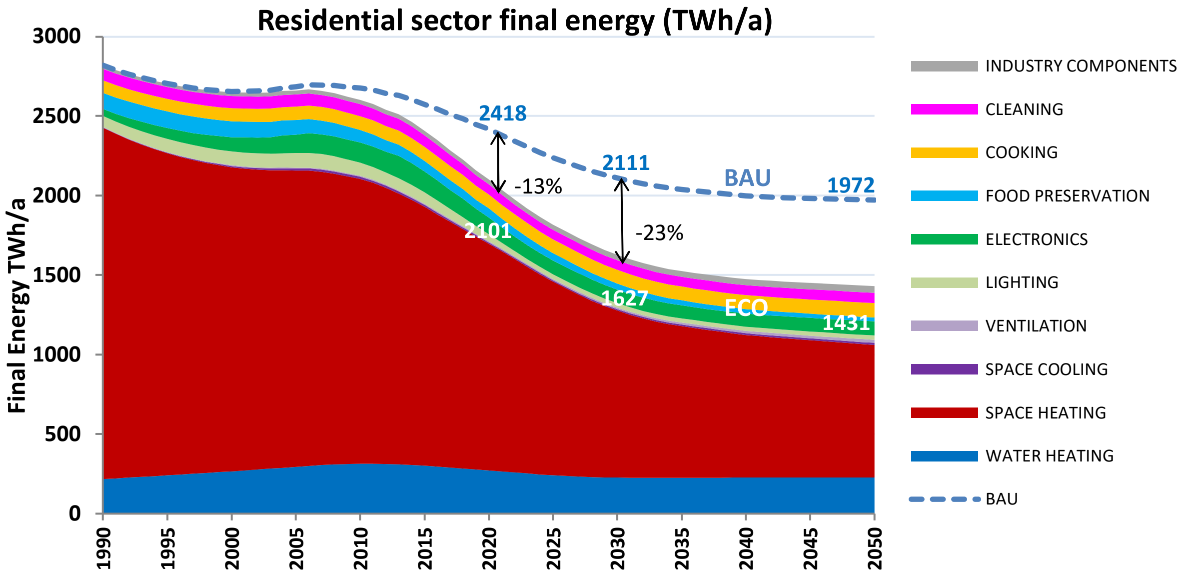
ECO Final Energy (summary TRANSPORT)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	109	96	112	116	123	123	120	117	114
TYRES for SERVICE-sector-related transport	278	217	189	218	222	234	233	227	222	216
TYRES for RESIDENTIAL-sector-related transport	387	289	244	245	234	227	220	211	204	197
TYRES for OTHER-sector-related transport	22	17	15	17	18	19	19	18	18	17
ECO Final Energy, Transport, in TWh	**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
ECO Final Energy, Transport, in PJ	2974	2276	1960	2135	2122	2169	2142	2075	2017	1961
ECO Final Energy, Transport, in mtoe	71	54	47	51	51	52	51	50	48	47
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption Road Transport (in mtoe for EU27 (2020))	202	261	256	238						



ECO Final Energy (summary SERVICES)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	60	83	80	71	63	61	61	63	64	66
SPACE HEATING	690	661	595	517	440	382	348	325	310	295
SPACE COOLING	47	96	104	107	105	102	101	101	102	104
VENTILATION	20	31	31	30	29	30	31	33	35	36
LIGHTING	101	175	188	201	192	170	159	165	179	198
ELECTRONICS	27	78	80	83	91	97	97	96	98	100
FOOD PRESERVATION	99	92	89	84	77	69	66	67	70	73
COOKING	13	13	13	12	11	11	10	10	10	10
CLEANING	4	9	9	6	6	6	6	6	6	6
INDUSTRY COMPONENTS	156	256	280	291	296	302	308	316	325	333
ECO Final Energy, Services, in TWh	**1218**	**1494**	**1469**	**1402**	**1312**	**1228**	**1187**	**1183**	**1199**	**1222**
ECO Final Energy, Services, in PJ	4384	5378	5287	5048	4722	4422	4275	4259	4316	4398
ECO Final Energy, Services, in mtoe	105	128	126	121	113	106	102	102	103	105
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption Services (in mtoe for EU27 (2020))	98	140	129	121						

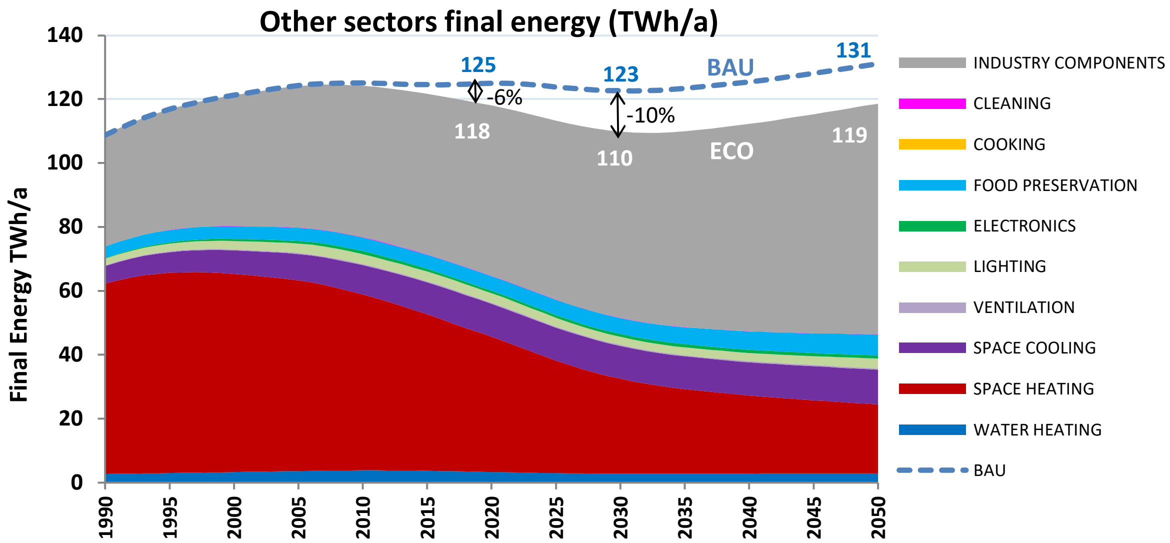


ECO Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	217	314	301	272	241	226	225	227	227	228
SPACE HEATING	2209	1791	1628	1424	1217	1050	953	897	862	832
SPACE COOLING	2	14	12	9	9	9	10	11	12	13
VENTILATION	3	7	8	8	8	10	12	15	17	19
LIGHTING	69	82	72	43	29	27	26	26	26	27
ELECTRONICS	44	127	130	107	86	85	81	83	86	89
FOOD PRESERVATION	103	78	66	56	47	39	32	29	27	25
COOKING	78	87	88	88	87	86	87	88	89	91
CLEANING	73	76	73	64	60	60	62	63	64	65
INDUSTRY COMPONENTS	20	27	28	30	32	34	36	38	40	43
ECO Final Energy, Residential, in TWh	**2819**	**2602**	**2406**	**2101**	**1816**	**1627**	**1525**	**1475**	**1451**	**1431**
ECO Final Energy, Residential, in PJ	10149	9368	8661	7563	6539	5858	5489	5309	5222	5152
ECO Final Energy, Residential, in mtoe	242	224	207	181	156	140	131	127	125	123
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption Households (in mtoe for EU27 (2020))	237	279	245	248						



(OTHER sectors corresponds to Agriculture, Forestry, Fishing, of Eurostat)

ECO Final Energy (summary OTHER)	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
WATER HEATING	**3**	**4**	**4**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
SPACE HEATING	**60**	**55**	**49**	**42**	**35**	**30**	**26**	**24**	**23**	**22**
SPACE COOLING	**5**	**9**	**10**	**10**	**10**	**10**	**10**	**10**	**11**	**11**
VENTILATION	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
LIGHTING	**2**	**3**	**3**	**3**	**3**	**3**	**2**	**3**	**3**	**3**
ELECTRONICS	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
FOOD PRESERVATION	**4**	**4**	**4**	**5**	**5**	**5**	**5**	**6**	**6**	**7**
COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CLEANING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
INDUSTRY COMPONENTS	35	47	50	53	56	58	61	65	69	72
ECO Final Energy, Other sectors, in TWh	**109**	**124**	**122**	**118**	**113**	**110**	**110**	**112**	**115**	**119**
ECO Final Energy, Other sectors, in PJ	392	447	438	425	408	395	396	404	415	427
ECO Final Energy, Other sectors, in mtoe	9	11	10	10	10	9	9	10	10	10
For comparison: Eurostat Energy Balance Apr. 2022, Final Energy Consumption Other sectors (in mtoe for EU27 (2020))	33	27	26	29						



ECO Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		289	413	396	357	317	299	298	301	304	306
	Residential	217	314	301	272	241	226	225	227	227	228
	Tertiary / Services	60	83	80	71	63	61	61	63	64	66
	Industry	9	12	12	11	9	9	9	9	9	9
	Other	3	4	4	3	3	3	3	3	3	3
SPACE HEATING. All sectors, TWh		3133	2660	2410	2102	1792	1546	1404	1317	1262	1213
	Residential	2209	1791	1628	1424	1217	1050	953	897	862	832
	Tertiary / Services	690	661	595	517	440	382	348	325	310	295
	Industry	175	154	138	119	100	84	76	71	67	64
	Other	60	55	49	42	35	30	26	24	23	22
SPACE COOLING. All sectors, TWh		73	153	163	164	162	158	157	159	162	165
& HT PROCESS	Residential	2	14	12	9	9	9	10	11	12	13
	Tertiary / Services	47	96	104	107	105	102	101	101	102	104
	Industry	19	34	37	38	38	36	36	36	37	37
	Other	5	9	10	10	10	10	10	10	11	11
VENTILATION.	All sectors, TWh	26	43	44	43	43	45	49	53	57	61
	Residential	3	7	8	8	8	10	12	15	17	19
	Tertiary / Services	20	31	31	30	29	30	31	33	35	36
	Industry	3	5	5	5	4	5	5	5	5	5
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	198	300	307	294	269	239	225	232	249	273
	Residential	69	82	72	43	29	27	26	26	26	27
	Tertiary / Services	101	175	188	201	192	170	159	165	179	198
	Industry	25	40	44	47	45	39	37	38	41	45
	Other	2	3	3	3	3	3	2	3	3	3
ELECTRONICS.	All sectors, TWh	72	214	219	200	190	195	192	193	197	203
	Residential	44	127	130	107	86	85	81	83	86	89
	Tertiary / Services	27	78	80	83	91	97	97	96	98	100
	Industry	1	9	9	10	11	12	13	13	13	13
	Other	0	1	1	1	1	1	1	1	1	1
FOOD PRESERVE.All sectors, TWh		225	210	200	191	178	166	161	164	170	177
	Residential	103	78	66	56	47	39	32	29	27	25
	Tertiary / Services	99	92	89	84	77	69	66	67	70	73
	Industry	20	36	41	46	49	53	58	63	68	73
	Other	4	4	4	5	5	5	5	6	6	7
COOKING.	All sectors, TWh	92	100	101	100	98	97	97	98	99	101
	Residential	78	87	88	88	87	86	87	88	89	91
	Tertiary / Services	13	13	13	12	11	11	10	10	10	10
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	77	86	82	70	66	67	68	69	70	71
	Residential	73	76	73	64	60	60	62	63	64	65
	Tertiary / Services	4	9	9	6	6	6	6	6	6	6
	Industry	0	1	1	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		639	935	1009	1050	1069	1084	1107	1134	1163	1194
	Residential	20	27	28	30	32	34	36	38	40	43
	Tertiary / Services	156	256	280	291	296	302	308	316	325	333
	Industry	428	606	651	676	685	690	701	715	729	746
	Other	35	47	50	53	56	58	61	65	69	72
TYRES. Transport sector, TWh		826	632	545	593	590	603	595	576	560	545
	Residential transport	387	289	244	245	234	227	220	211	204	197
	Tertiary / Services transport	278	217	189	218	222	234	233	227	222	216
	Industry transport	139	109	96	112	116	123	123	120	117	114
	Other transport	22	17	15	17	18	19	19	18	18	17
ALL PRODUCTS.	All sectors excl. Energy, TWh	5652	5748	5476	5165	4772	4498	4351	4296	4294	4309
	Residential	2819	2602	2406	2101	1816	1627	1525	1475	1451	1431
	Tertiary / Services	1218	1494	1469	1402	1312	1228	1187	1183	1199	1222
	Industry	680	896	936	951	942	930	935	949	969	993
	Other	109	124	122	118	113	110	110	112	115	119
	Transport	826	632	545	593	590	603	595	576	560	545

ECO Final energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	75%	76%	76%	76%	76%	76%	76%	75%	75%	75%
	Tertiary / Services	21%	20%	20%	20%	20%	20%	21%	21%	21%	22%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	71%	67%	68%	68%	68%	68%	68%	68%	68%	69%
	Tertiary / Services	22%	25%	25%	25%	25%	25%	25%	25%	25%	24%
	Industry	6%	6%	6%	6%	6%	5%	5%	5%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	9%	7%	5%	5%	6%	7%	7%	8%	8%
	Tertiary / Services	64%	63%	64%	65%	65%	64%	64%	64%	63%	63%
	Industry	26%	22%	23%	23%	23%	23%	23%	23%	23%	23%
	Other	8%	6%	6%	6%	6%	6%	7%	7%	7%	7%
VENTILATION											
	Residential	10%	16%	17%	18%	20%	23%	25%	28%	29%	31%
	Tertiary / Services	77%	72%	71%	71%	69%	67%	64%	62%	61%	59%
	Industry	12%	11%	11%	11%	10%	10%	10%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	27%	24%	15%	11%	11%	12%	11%	11%	10%
	Tertiary / Services	51%	58%	61%	68%	71%	71%	71%	71%	72%	73%
	Industry	13%	13%	14%	16%	17%	17%	16%	16%	16%	16%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	59%	53%	45%	43%	42%	43%	43%	44%
	Tertiary / Services	37%	36%	36%	42%	48%	50%	51%	50%	50%	49%
	Industry	2%	4%	4%	5%	6%	6%	7%	7%	6%	6%
	Other	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%
FOOD PRESERVE.											
	Residential	46%	37%	33%	30%	26%	23%	20%	17%	16%	14%
	Tertiary / Services	44%	44%	44%	44%	43%	42%	41%	41%	41%	41%
	Industry	9%	17%	21%	24%	28%	32%	36%	38%	40%	41%
	Other	2%	2%	2%	2%	3%	3%	3%	3%	4%	4%
COOKING.											
	Residential	85%	87%	87%	88%	88%	89%	89%	90%	90%	90%
	Tertiary / Services	15%	13%	13%	12%	12%	11%	11%	10%	10%	10%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	88%	88%	91%	91%	91%	91%	91%	91%	91%
	Tertiary / Services	5%	10%	10%	8%	9%	9%	9%	9%	9%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
	Tertiary / Services	24%	27%	28%	28%	28%	28%	28%	28%	28%	28%
	Industry	67%	65%	64%	64%	64%	64%	63%	63%	63%	62%
	Other	5%	5%	5%	5%	5%	5%	6%	6%	6%	6%
TYRES.											
	Residential transport	47%	46%	45%	41%	40%	38%	37%	37%	36%	36%
	Tertiary / Services transport	34%	34%	35%	37%	38%	39%	39%	39%	40%	40%
	Industry transport	17%	17%	18%	19%	20%	20%	21%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS (excl. Energy sector).											
	Residential	50%	45%	44%	41%	38%	36%	35%	34%	34%	33%
	Tertiary / Services	22%	26%	27%	27%	27%	27%	27%	28%	28%	28%
	Industry	12%	16%	17%	18%	20%	21%	21%	22%	23%	23%
	Other	2%	2%	2%	2%	2%	2%	3%	3%	3%	3%
	Transport	15%	11%	10%	11%	12%	13%	14%	13%	13%	13%

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	1.00	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.1
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0.0	0.0	0.2	0.7	1.1	1.4	1.6	1.7	1.8	1.9
	EIWHS Electric Instant. Shower (secondary)	1.00	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	0.0	0.0	0.1	0.3	0.4	0.3	0.2	0.0	0.0	0.0
	ESWH Electric Storage > 30 L (primary)	1.00	0.0	0.0	0.6	3.5	6.1	8.2	8.3	8.5	8.6	8.7
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	0.0	0.0	0.8	2.0	2.7	2.8	2.5	2.3	2.0	1.8
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0.0	0.0	0.5	1.2	1.6	1.7	1.5	1.3	1.2	1.0
	GSWH Gas Storage, Condensing	0.010	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.5
	GSWH Gas Storage, Non-condensing	0.008	0.0	0.0	1.0	2.2	2.5	2.1	1.5	1.2	0.9	0.7
	Dedicated WH Heat Pump	1.00	0.0	0.0	0.3	0.8	1.6	2.4	3.3	4.1	4.8	5.5
	Dedicated WH Solar (3.5 m2)	0.80	0.0	0.0	0.3	0.8	1.2	1.5	1.4	1.4	1.4	1.4
	WH dedicated Water Heater		**0**	**0**	**4**	**12**	**18**	**21**	**21**	**21**	**22**	**22**
	CHB Gas Combi Instant. WH	0.04	0.0	0.0	2.5	8.7	15.7	24.5	32.9	40.9	48.9	56.6
	CHB Gas + Cyl. WH	0.04	0.0	0.0	1.8	5.4	9.3	13.8	16.8	19.6	22.4	25.1
	CHB Jet Burner Gas + Cyl. WH	0.04	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.4
	CHB Jet Burner Oil + Cyl. WH	0.04	0.0	0.0	0.4	1.4	2.3	2.8	3.3	3.4	3.2	2.9
	CHB Electric (Joule) + Cyl. WH	1.00	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.10	0.0	0.0	0.0	-0.1	-0.5	-1.2	-2.3	-3.8	-5.3	-6.7
	CHB Electric HP + Cyl. WH	1.00	0.0	0.0	-0.1	-0.3	-1.2	-3.1	-5.8	-9.1	-12.3	-15.3
	CHB Gas HP + Cyl. WH	0.02	0.0	0.0	0.0	-0.1	-0.4	-0.7	-1.1	-1.5	-1.8	-2.0
	CHB Gas mCHP + Cyl. WH	0.02	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.3	-0.4	-0.3	-0.2
	CHB Solar Combi (16 m2)	0.04	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3
	CHC Central Heating combi, water heating		**0**	**0**	**5**	**15**	**26**	**36**	**44**	**50**	**55**	**61**
	TOTAL WATER HEATING		**0**	**0**	**9**	**27**	**43**	**58**	**65**	**71**	**77**	**83**
	CHB Gas non-condensing	0.04	0.0	10.6	39.7	116.9	181.7	230.4	241.6	214.8	190.1	163.6
	CHB Gas condensing	0.04	0.0	6.8	19.6	2.6	4.8	14.7	47.2	106.0	160.3	210.8
	CHB Gas Jet burner non-condensing	0.04	0.0	0.3	0.7	1.7	2.7	3.3	3.6	3.7	3.4	3.0
	CHB Gas Jet burner condensing	0.04	0.0	0.0	0.0	-0.3	-0.7	-1.0	-1.3	-1.6	-1.4	-1.3
	CHB Oil Jet burner non-condensing	0.04	0.0	3.1	8.8	20.3	31.7	39.2	42.1	43.5	40.0	35.6
	CHB Oil Jet burner condensing	0.04	0.0	0.2	0.3	-3.2	-7.4	-10.6	-13.8	-16.1	-14.9	-12.9
	CHB Electric Joule-effect	1.00	0.0	0.1	0.4	1.0	1.5	1.7	1.6	1.4	1.1	1.0
	CHB Hybrid (gas-electric)	0.60	0.0	0.0	-0.1	-0.3	-1.2	-2.9	-5.3	-8.0	-10.3	-12.1
	CHB Electric Heat Pump	1.00	0.0	0.3	1.1	1.5	-1.4	-8.6	-19.2	-30.4	-39.9	-47.5
	CHB Gas Heat Pump	0.04	0.0	0.0	0.0	-0.2	-0.6	-1.1	-1.7	-2.2	-2.5	-2.5
	CHB micro CHP	0.04	0.0	0.0	-0.1	-0.3	-0.7	-1.1	-1.3	-1.4	-1.1	-0.5
	CHB Solar combi (16 m2)	0.10	0.0	0.1	0.1	0.4	0.7	1.0	1.4	1.5	1.6	1.6
	CHB Central Heating boiler < 400 kW, space heating		**0**	**22**	**71**	**140**	**211**	**265**	**295**	**311**	**326**	**339**
	SFB Wood Manual	0	0.0	0.0	0.5	2.7	4.1	4.3	3.5	2.4	1.9	1.5
	SFB Wood Direct Draft	0	0.0	0.0	0.0	0.2	1.0	1.8	2.5	3.1	3.7	4.5
	SFB Coal	0	0.0	0.0	0.1	0.8	1.8	2.4	2.7	2.7	2.4	2.1
	SFB Pellets	0	0.0	0.0	0.0	0.2	0.5	1.0	1.2	1.4	1.5	1.6
	SFB Wood chips	0	0.0	0.0	0.1	0.5	1.0	1.4	1.7	1.9	1.9	2.0
	Total Solid Fuel Boiler		**0**	**0**	**1**	**4**	**8**	**11**	**12**	**12**	**11**	**12**
	CHAE-S (≤ 400 kW)	1	0.0	0.0	0.0	0.1	0.3	0.6	0.8	0.9	0.8	0.7
	CHAE-L (> 400 kW)	1	0.0	0.0	0.0	0.2	0.6	0.8	0.9	1.0	0.9	0.7
	CHWE-S (≤ 400 kW)	1	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.00	0.00
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-L (> 1500 kW)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHF	0.05	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	HT PCH-AE-S	1	0.0	0.0	0.0	1.0	2.4	3.5	3.8	3.4	3.0	2.5
	HT PCH-AE-L	1	0.0	0.0	0.1	1.1	2.8	4.5	5.4	5.5	5.2	4.8
	HT PCH-WE-S	1	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.1
	HT PCH-WE-M	1	0.0	0.0	0.0	0.2	0.4	0.5	0.4	0.2	0.1	0.0
	HT PCH-WE-L	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1
	AC rooftop	1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	AC splits	1	0.0	0.0	0.0	0.4	0.7	1.0	0.9	0.7	0.6	0.4
	AC VRF	1	0.0	0.0	0.0	0.1	0.4	0.7	1.0	1.0	1.0	0.9
	ACF	0.05	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SubTotal AHC central Air Cooling		**0**	**0**	**0**	**3**	**8**	**12**	**14**	**13**	**12**	**10**
	AC rooftop (rev)	1	0.0	0.0	0.1	0.6	1.0	1.0	0.6	0.2	0.0	0.0
	AC splits (rev)	1	0.0	0.0	0.1	1.0	1.9	2.5	2.4	2.0	1.7	1.4
	AC VRF (rev)	1	0.0	0.0	0.1	0.4	1.1	2.2	3.0	3.2	3.0	2.7
	ACF (rev)	0.05	0.00	0.00	0.00	0.01	0.03	0.05	0.06	0.06	0.06	0.06
	AHF	0.05	0.0	0.0	0.8	5.9	12.0	16.3	16.8	15.1	13.2	11.4
	AHE	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1
	SubTotal AHC central Air Heating		**0**	**0**	**1**	**8**	**16**	**22**	**23**	**21**	**18**	**16**
	Total AHC central Air Heating & Cooling		**0**	**0**	**1**	**11**	**24**	**35**	**37**	**34**	**30**	**26**

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	0.0	0.0	0.0	0.8	2.7	4.3	5.5	6.5	7.1	7.1
	LH closed fireplace/inset	0	0.0	0.0	0.0	1.1	3.7	5.9	7.7	9.2	9.9	9.6
	LH wood stove	0	0.0	0.0	0.0	0.7	2.2	3.5	4.5	5.4	5.8	5.6
	LH coal stove	0	0.0	0.0	0.0	0.1	0.4	0.6	0.7	0.7	0.7	0.5
	LH cooker	0	0.0	0.0	0.0	0.3	0.9	1.4	1.6	1.6	1.5	1.5
	LH SHR stove	0	0.0	0.0	0.0	0.1	0.5	0.7	0.9	1.1	1.1	1.0
	LH pellet stove	0	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.7
	LH Solid fuel sum		**0**	**0**	**0**	**3**	**11**	**17**	**22**	**25**	**27**	**26**
	LH Electric portable	1	0.0	0.0	0.5	2.2	3.1	3.0	2.8	2.7	2.6	2.5
	LH Electric fixed > 250W	1	0.0	0.0	0.7	3.5	6.3	7.8	7.8	7.3	7.0	6.8
	LH Electric fixed ≤ 250W	1	0.0	0.0	0.0	0.2	0.4	0.5	0.5	0.5	0.4	0.4
	LH Electric storage	1	0.0	0.0	0.1	0.5	0.8	1.0	0.9	0.9	0.8	0.8
	LH Electric underfloor	1	0.0	0.0	0.1	0.3	0.5	0.7	0.8	0.8	0.8	0.8
	LH Electric visibly glowing > 1.2 kW	1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric visibly glowing ≤ 1.2 kW	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2
	LH Electric sum		**0**	**0**	**1**	**7**	**11**	**13**	**13**	**12**	**12**	**12**
	LH Gas luminous (commercial)	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gaseous Tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2
	LH Gas open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**0.0**	**0.0**	**0.1**	**0.3**	**0.5**	**0.7**	**0.7**	**0.6**	**0.5**	**0.5**
	LH Liquid tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
	LH total		**0**	**0**	**2**	**10**	**23**	**31**	**36**	**38**	**39**	**38**
	RAC fixed < 6 kW, cooling	1	0.0	4.0	4.6	4.0	3.8	3.7	3.6	3.7	4.1	4.9
	RAC fixed 6-12 kW, cooling	1	0.0	2.6	3.3	2.9	2.7	2.4	2.1	2.0	2.1	2.3
	RAC portable < 12 kW, cooling	1	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode		**0**	**7**	**8**	**7**	**7**	**6**	**6**	**6**	**6**	**7**
	RAC fixed < 6 kW, reversible, heating	1	0.0	3.9	5.8	6.5	7.3	7.6	7.4	7.4	7.8	8.5
	RAC fixed 6-12 kW, reversible, heating	1	0.0	2.6	4.3	5.0	5.5	5.7	5.5	5.4	5.4	5.5
	RAC portable < 12 kW, reversible, heating	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode		**0**	**6**	**10**	**11**	**13**	**13**	**13**	**13**	**13**	**14**
	RAC Room Air Conditioner		**0**	**13**	**18**	**18**	**19**	**20**	**19**	**19**	**20**	**21**
1	CIRC Integrated circulators	1	0.0	0.0	2.0	6.2	8.6	8.5	8.0	7.1	6.1	5.2
0.38	CIRC Large standalone circulators	1	0.0	0.0	1.3	3.0	3.1	2.5	2.0	1.6	1.3	1.0
0.38	CIRC Small standalone circulators	1	0.0	0.0	1.4	3.2	3.4	2.9	2.5	2.2	1.9	1.7
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**5**	**13**	**15**	**14**	**12**	**11**	**9**	**8**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**2**	**4**	**4**	**3**	**3**	**2**	**2**	**2**
	TOTAL SPACE HEATING		**0**	**28**	**86**	**178**	**276**	**346**	**381**	**397**	**410**	**420**
	TOTAL SPACE COOLING		**0**	**7**	**8**	**10**	**15**	**19**	**20**	**19**	**19**	**18**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.6	0.7
	R-UVU 100-250 m3/h	1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	R-BVU 100-250 m3/h	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5
	R-UVU 250-1000 m3/h	1	0.0	0.0	0.1	0.5	1.2	1.7	2.1	2.2	2.2	2.3
	R-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.0	1.3	1.7
	R-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	RVU, Total residential, VU own electricity		**0**	**0**	**0**	**1**	**2**	**3**	**4**	**4**	**5**	**6**
	NR-UVU 250-1000 m3/h	1	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.7	0.7	0.7
	NR-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.3	0.3	0.4	0.5	0.6
	NR-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	NR-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.5
	NR-AHU-S 2500-5500 m3/h	1	0.0	0.0	0.1	0.3	0.6	1.0	1.3	1.5	1.7	1.9
	NR-AHU-M 5500-14500 m3/h	1	0.0	0.0	0.2	0.8	1.6	2.5	3.1	3.3	3.6	3.9
	NR-AHU-L > 14500 m3/h	1	0.0	0.0	0.1	0.3	0.5	0.8	1.0	1.1	1.2	1.2
	NRVU, Total non-residential, VU own electricity		**0**	**0**	**0**	**2**	**4**	**6**	**7**	**8**	**8**	**9**
	VU Ventilation Units, res + non-res., VU own electricity		**0**	**0**	**1**	**2**	**5**	**8**	**11**	**12**	**13**	**15**
	TOTAL VENTILATION (VU own electricity)		-	-	1	2	5	8	11	12	13	15
1	***Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)***		*-*	*-*	*4*	*16*	*31*	*44*	*50*	*51*	*51*	*52*

db SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LS, final energy incl. control gear (BAU-ECO)											
LFL (T12,T8h,T8t,T5,other)	1	0	1	5	14	41	72	79	71	59	48
HID (HPM, HPS, MH)	1	0	1	12	21	23	20	13	9	5	3
CFLni (all shapes)	1	0	0	1	2	4	3	2	1	1	1
CFLi (retrofit for GLS, HL)	1	0	-3	-3	1	8	9	7	4	3	2
GLS (DLS & NDLS)	1	0	19	34	33	19	11	7	4	2	1
HL (DLS & NDLS, LV & MV)	1	0	-4	-3	36	39	20	11	6	3	2
LED replacing LFL (retrofit & luminaire)	1	0	0	-1	-4	-15	-25	-26	-20	-13	-6
LED replacing HID (retrofit & luminaire)	1	0	0	-9	-12	-10	-5	-2	0	2	4
LED replacing CFLni (retrofit & luminaire)	1	0	0	0	-1	-1	-1	0	0	0	1
LED replacing DLS (retrofit & luminaire)	1	0	0	-1	-2	-3	-2	-1	-1	0	0
LED replacing NDLS (retrofit & luminaire)	1	0	0	-1	-8	-10	-8	-5	-3	-1	0
Standby	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
TOTAL LIGHTING (incl. standby)		**0**	**15**	**35**	**81**	**95**	**96**	**85**	**71**	**61**	**54**
DP TV on-mode, total all types	1	0.0	0.0	4.9	17.7	32.3	44.4	47.8	40.5	33.7	30.0
DP TV standby, standard (NoNA)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, LoNA	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, HiNA ('Smart')	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, total all types		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
DP TV total on-mode + standby		**0**	**0**	**5**	**18**	**32**	**44**	**48**	**40**	**34**	**30**
DP Monitor on-mode	1	0.0	0.0	0.9	2.7	2.8	3.1	2.6	2.0	1.8	1.7
DP Monitor standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP Monitor total		**0**	**0**	**1**	**3**	**3**	**3**	**3**	**2**	**2**	**2**
DP Signage on-mode	1	0.0	0.0	0.0	0.0	0.7	3.4	6.0	5.6	3.3	0.9
DP Signage standby	1	0.0	0.0	0.0	0.0	0.1	0.5	0.9	0.8	0.5	0.1
DP Signage total		**0**	**0**	**0**	**0**	**1**	**4**	**7**	**6**	**4**	**1**
DP Electronic Displays, total on-mode		**0**	**0**	**6**	**20**	**36**	**51**	**56**	**48**	**39**	**33**
DP Electronic Displays, total standby		**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**0**	**0**
DP Electronic Displays, total		**0**	**0**	**6**	**20**	**36**	**51**	**57**	**49**	**39**	**33**
SSTB	1	0.0	1.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (low-power modes)	1	0.0	0.0	1.3	3.3	3.1	2.5	2.3	2.3	2.3	2.3
CSTB (other modes)	1	0.0	0.0	0.7	1.8	1.7	1.3	1.2	1.2	1.2	1.2
CSTB (all covered modes)	1	0.0	0.0	2.0	5.1	4.7	3.8	3.5	3.5	3.5	3.5
Total STB set top boxes (Complex & Simple)		**0**	**1**	**2**	**5**	**5**	**4**	**3**	**3**	**3**	**3**
Game consoles > 20 W Active modes (SRI)	1	0.0	0.0	0.7	2.0	1.8	1.8	1.8	1.8	1.8	1.8
Game consoles > 20 W Non-Active (CR)	1	0.0	0.0	0.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6
Game consoles < 20 W Non-Active (CR)	1	0.0	0.0	0.1	0.5	0.7	0.7	0.7	0.7	0.7	0.7
Game consoles < 20 W Active (no reg.)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Game consoles, active modes		0.0	0.0	0.8	2.0	1.8	1.8	1.8	1.8	1.8	1.8
Total Game consoles, non-active modes		0.0	0.0	0.6	2.0	2.3	2.3	2.3	2.3	2.3	2.3
Total Game consoles > 20 W, all modes		0.0	0.0	1.2	3.5	3.4	3.4	3.4	3.4	3.4	3.4
Total Game consoles < 20 W, all modes		0.0	0.0	0.1	0.5	0.7	0.7	0.7	0.7	0.7	0.7
Total Game consoles, all modes		**0**	**0**	**1**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
ES&DS only, without effects on infrastructure											
ES tower 1-socket traditional	1	0	0	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 1-socket traditional	1	0	0	0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
ES rack 2-socket traditional	1	0	0	0	0.3	0.4	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket cloud	1	0	0	0	0.7	0.8	0.9	0.9	0.9	0.9	0.9
ES rack 4-socket traditional	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 4-socket cloud	1	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
ES rack 2-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 2-socket resilient cloud	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 1-socket traditional	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 2-socket traditional	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 2-socket cloud	1	0	0	0	0.2	0.3	0.3	0.4	0.4	0.4	0.4
ES blade 4-socket traditional	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 4-socket cloud	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES total traditional		**0**	**0**	**0**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
ES total cloud		**0**	**0**	**0**	**1.2**	**1.5**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**
ES Enterprise Servers total		**0**	**0**	**0**	**1.8**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**	**2.3**
DS Online 2	1	0	0	0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
DS Online 3	1	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
DS Online 4	1	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
DS Data Storage products total		**0**	**0**	**0**	**0.2**	**0.5**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**
ES + DS total (excl. infrastructure)		**0**	**0**	**0**	**2.0**	**2.7**	**3.0**	**3.1**	**3.1**	**3.1**	**3.1**

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Inkjet Printer	1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	0.0	0.3	0.5	0.7	0.7	0.7	0.6	0.6	0.6	0.5
	EP / Laser Printer mono	1	0.0	0.5	0.7	0.8	0.6	0.5	0.4	0.3	0.2	0.1
	EP / Laser Printer colour	1	0.0	0.1	0.5	1.2	1.6	1.7	1.8	1.8	1.9	1.9
	EP / Laser Copier mono	1	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	0.6	1.4	1.9	1.9	1.8	1.8	1.7	1.6	1.5
	EP / Laser MFD colour	1	0.0	0.4	1.3	2.2	2.3	2.2	2.1	2.0	1.9	1.8
	Total IE Imaging Equipment		**0.0**	**2.6**	**5.1**	**7.1**	**7.2**	**6.9**	**6.7**	**6.4**	**6.1**	**5.9**
	of which for modes under CR 1275/2008		*0.0*	*2.0*	*3.9*	*5.4*	*5.5*	*5.3*	*5.1*	*4.9*	*4.7*	*4.5*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	0.0	0.0	0.7	1.5	1.3	1.2	1.1	1.0	0.9	0.7
	SB Electric toothbrushes (off mode)	1	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	SB Audio speakers (wired) (sb & off modes)	1	0.0	0.5	1.6	0.8	0.1	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.2	1.8	3.1	3.2	3.2	3.2	3.2	3.2
	SB Small appliances (sb & off modes)	1	0.0	0.1	2.2	3.9	4.0	4.1	4.1	4.2	4.2	4.3
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.3	1.0	1.1	1.1	1.1	1.1	1.1	1.1
	SB Media players and recorders (sb mode)	1	0.0	0.6	3.1	0.9	0.1	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.0	0.0	0.0	0.4	0.9	0.7	0.5	0.4	0.2	0.1
	SB Office phones (nsb mode)	1	0.0	0.0	0.0	0.3	0.4	0.2	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	1	0.0	0.0	0.1	1.4	1.8	2.0	2.2	2.2	2.1	1.9
	SB Home Network Equipment (nsb mode)	1	0.0	0.0	0.0	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	SB Office Network Equipment (nsb mode)	1	0.0	0.0	0.1	1.1	1.7	2.3	2.8	2.9	2.9	2.9
	SB Coffee makers (off mode)	1	0.0	0.0	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.7
	Products regulated also for (networked) standby											
	(already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	0.4	1.1	1.1	*1.2*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.0	0.1	0.3	*0.4*	*0.5*	*0.6*	*0.6*	*0.7*	*0.8*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
1	SB Electric Ovens (sb mode)	1	0.0	0.1	1.0	2.2	3.5	4.6	4.9	5.0	5.1	5.1
1	SB Electric Hobs (sb mode)	1	0.0	0.1	0.4	0.8	1.3	1.4	1.5	1.6	1.7	1.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	0.0	1.3	3.3	3.1	2.5	2.3	2.3	2.3	2.3
1	SB Game consoles (non-active modes)	1	0.0	0.0	0.6	2.0	2.3	2.3	2.3	2.3	2.3	2.3
1	SB IE Inkjet Printers (nsb mode)	1	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	0.0	0.3	0.5	0.6	0.6	0.6	0.6	0.5	0.5	0.5
1	SB IE Laser Printers (nsb mode)	1	0.0	0.4	0.9	1.5	1.7	1.7	1.6	1.6	1.6	1.5
1	SB IE Laser Copiers (nsb mode)	1	0.0	0.3	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	0.7	2.0	3.1	3.2	3.0	2.9	2.7	2.6	2.5
	Total (networked) SB (incl. double)		0	4	17	30	32	32	33	33	32	32
	Total (networked) SB (excl. double)		**0**	**1**	**9**	**14**	**16**	**16**	**16**	**16**	**16**	**16**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.0	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.2
0.6	EPS 10–12 W	1	0.0	0.1	1.6	3.3	4.1	3.6	3.2	2.7	2.2	2.0
0.5	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.1	0.1
	EPS, total for active mode		**0.0**	**0.1**	**2.0**	**4.1**	**5.1**	**4.5**	**3.9**	**3.3**	**2.7**	**2.4**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.0	0.0	0.3	0.6	0.7	0.7	0.6	0.6	0.5	0.4
0.0	EPS 10–12 W	1	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.0**	**0.0**	**0.5**	**0.9**	**1.0**	**0.9**	**0.8**	**0.7**	**0.6**	**0.6**
	EPS, overall total (active + no-load)		**0.0**	**0.1**	**2.5**	**5.0**	**6.1**	**5.4**	**4.7**	**4.0**	**3.3**	**2.9**
	EPS, double counted subtracted		**0.0**	**0.1**	**1.4**	**2.8**	**3.4**	**3.0**	**2.6**	**2.2**	**1.9**	**1.7**
	TOTAL ELECTRONICS		**0**	**5**	**25**	**56**	**74**	**88**	**94**	**85**	**74**	**67**

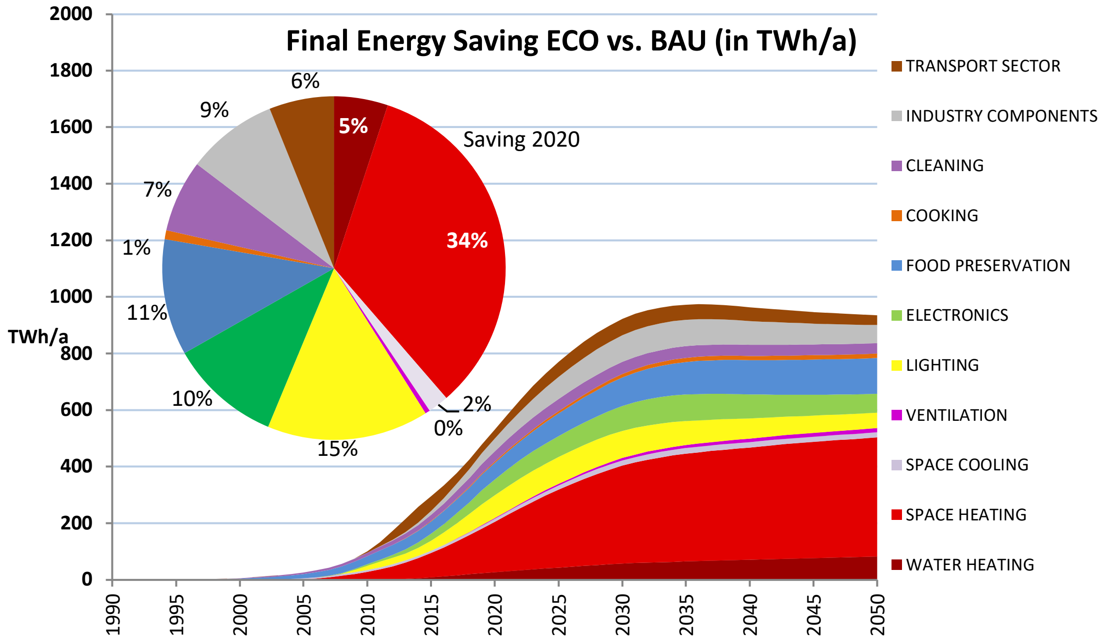
db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**0**	**28**	**43**	**55**	**66**	**75**	**82**	**86**	**88**	**89**
	CF open vertical chilled multi deck (RVC2)	1	0.0	0.0	0.0	0.0	1.2	3.7	5.5	5.9	5.9	6.0
	CF open horizontal frozen island (RHF4)	1	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4
	CF other supermarket display (non-BCs)	1	0.0	0.0	0.0	0.1	1.4	4.7	7.4	8.3	8.5	8.6
	CF Plug in one door beverage cooler	1	0.0	0.0	0.0	0.2	2.8	5.9	6.9	7.2	7.4	7.5
	CF Plug in horizontal ice cream freezer	1	0.0	0.0	0.0	0.0	0.5	0.9	1.0	1.0	1.1	1.1
	CF Spiral vending machine	1	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration		**0**	**0**	**0**	**0**	**6**	**16**	**21**	**23**	**24**	**24**
	PF Storage cabinet Chilled Vertical (CV)	1	0.0	0.0	0.0	0.3	0.9	1.1	1.1	1.2	1.2	1.3
	PF Storage cabinet Frozen Vertical (FV)	1	0.0	0.0	0.0	0.4	1.1	1.3	1.3	1.4	1.5	1.5
	PF Storage cabinet Chilled Horizontal (CH)	1	0.0	0.0	0.0	0.3	0.7	0.8	0.8	0.9	0.9	1.0
	PF Storage cabinet Frozen Horizontal (FH)	1	0.0	0.0	0.0	0.2	0.4	0.5	0.5	0.6	0.6	0.6
	PF Storage cabinets All types	1	**0**	**0**	**0**	**1**	**3**	**4**	**4**	**4**	**4**	**4**
	PF Process Chiller AC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.2	0.5	0.8	0.9	1.0	1.1	1.1
	PF Process Chiller AC MT L > 300 kW	1	0.0	0.0	0.0	0.2	0.4	0.7	0.8	0.9	1.0	1.0
	PF Process Chiller AC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.2	0.4	0.7	0.8	0.9	1.0	1.0
	PF Process Chiller AC LT L > 200 kW	1	0.0	0.0	0.0	0.2	0.4	0.7	0.9	0.9	1.0	1.1
	PF Process Chiller WC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3
	PF Process Chiller WC MT L > 300 kW	1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4
	PF Process Chiller WC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	PF Process Chiller WC LT L > 200 kW	1	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5
	PF Process Chiller All MT&LT	1	**0**	**0**	**0**	**1**	**2**	**4**	**5**	**5**	**6**	**6**
	PF Condensing Unit MT S 0.2-1 kW	1	0.0	0.0	0.0	0.2	0.5	0.5	0.6	0.6	0.6	0.7
	PF Condensing Unit MT M 1-5 kW	1	0.0	0.0	0.0	0.4	0.9	0.9	1.0	1.1	1.2	1.3
	PF Condensing Unit MT L 5-20 kW	1	0.0	0.0	0.0	0.7	1.3	1.4	1.5	1.6	1.8	1.9
	PF Condensing Unit MT XL 20-50 kW	1	0.0	0.0	0.0	0.6	1.2	1.3	1.4	1.5	1.6	1.8
	PF Condensing Unit LT S 0.1-0.4 kW	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT M 0.4-2 kW	1	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT L 2-8 kW	1	0.0	0.0	0.0	0.4	0.6	0.6	0.7	0.7	0.8	0.9
	PF Condensing Unit LT XL 8-20 kW	1	0.0	0.0	0.0	0.7	1.2	1.3	1.3	1.5	1.6	1.7
0.6	**PF Condensing Unit, All MT&LT**	1	**0**	**0**	**0**	**3**	**6**	**6**	**7**	**7**	**8**	**9**
	PF Professional Refrigeration, Total		**0**	**0**	**0**	**3**	**8**	**10**	**11**	**12**	**13**	**14**
	TOTAL FOOD PRESERVATION		**0**	**28**	**43**	**58**	**80**	**101**	**115**	**121**	**124**	**127**
	CA Electric Hobs (active modes)	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	CA Electric Hobs (low-power modes)	1	0.0	0.1	0.4	0.8	1.3	1.4	1.5	1.6	1.7	1.8
	CA Electric Hobs (sum all modes)	1	0.0	0.1	0.4	0.9	1.4	1.6	1.7	1.8	1.9	2.0
	CA Electric Ovens (active modes)	1	0.0	0.0	0.0	0.4	1.0	1.5	2.0	2.1	2.2	2.2
	CA Electric Ovens (low-power modes)	1	0.0	0.1	1.0	2.2	3.5	4.6	4.9	5.0	5.1	5.1
	CA Electric Ovens (sum all modes)	1	0.0	0.1	1.0	2.6	4.5	6.1	6.9	7.1	7.2	7.3
	CA Gas Hobs	0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
	CA Gas Ovens	0	0.0	0.0	0.0	0.3	0.7	1.1	1.4	1.4	1.4	1.4
	CA Range Hoods	1	0.0	0.0	0.1	0.6	1.8	3.1	4.0	4.4	4.7	5.0
	CA Elec. Hobs&Ovens low-power modes	1	0.0	0.1	1.4	3.1	4.8	6.0	6.4	6.6	6.8	6.9
	CA other products or modes		0.0	0.0	0.1	1.5	3.8	6.2	8.0	8.5	8.9	9.2
	TOTAL COOKING		**0**	**0**	**1**	**5**	**9**	**12**	**14**	**15**	**16**	**16**
	WM Washing Machines, active modes	1	0.0	7.3	10.3	11.4	11.1	9.9	8.4	6.5	4.7	2.8
	WM Washing Machines, low-power modes	1	0.0	0.4	1.1	1.1	1.2	1.4	1.4	1.4	1.4	1.4
	WM Washing Machines, all modes	1	0.0	7.7	11.4	12.5	12.3	11.3	9.8	7.9	6.0	4.2
	WD Washer-Dryers, active modes	1	0.0	0.8	1.3	1.5	1.4	1.1	0.7	0.4	0.2	0.1
	WD Washer-Dryers, low-power modes	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	WD Washer-Dryers, all modes	1	0.0	0.9	1.4	1.6	1.4	1.1	0.7	0.4	0.3	0.2
	WM-WD Washing, sum active modes	1	0.0	8.2	11.7	12.9	12.4	11.0	9.1	6.9	4.9	3.0
	WM-WD Washing, sum low-power modes	1	0.0	0.4	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4
	Total WM-WD household Washing	1	**0**	**9**	**13**	**14**	**14**	**12**	**10**	**8**	**6**	**4**
	DW Dishwashers, active modes	1	0.0	3.8	5.5	7.0	8.3	9.5	10.6	11.7	12.8	13.9
	DW Dishwashers, low-power modes	1	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.7	0.8
	Total DW household Dishwasher	1	**0**	**4**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**15**
	LD condensing heat pump	1		0.0	-0.9	-2.1	-2.9	-3.3	-3.5	-3.6	-3.3	-3.1
	LD condensing electric heat element	1	0.0	0.0	0.9	2.9	4.9	5.7	6.0	5.9	5.4	4.9
	LD vented electric	1	0.0	0.1	1.0	2.2	3.0	3.5	4.2	4.5		
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0			
	LD Laundry Dryers, sum active modes		0.0	0.0	0.9	2.8	4.7	5.7	6.3	6.5	6.3	6.1
	LD Laundry Dryers, low-power modes	1	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total LD household Laundry Dryer		**0**	**0**	**1**	**3**	**5**	**6**	**7**	**7**	**7**	**6**

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	0.0	0.0	1.2	7.1	10.0	8.5	6.4	4.9	4.5	4.4
	VC Upright Domestic mains	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	VC Handstick Domestic mains	1	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.8	0.8	0.8
	VC Total Domestic mains		**0**	**0**	**1**	**7**	**10**	**9**	**7**	**6**	**5**	**5**
	VC Cylinder Commercial mains	1	0.0	0.0	0.9	4.0	4.6	5.0	5.5	5.6	5.6	5.6
	VC Upright Commercial mains	1	0.0	0.0	0.1	0.4	0.5	0.5	0.6	0.6	0.6	0.6
	VC Total Commercial mains		**0**	**0**	**1**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
	VC Total in scope of CR 666/2013		**0**	**0**	**2**	**12**	**15**	**15**	**13**	**12**	**12**	**11**
	VC Cordless - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**0**	**0**	**1**	**7**	**10**	**9**	**7**	**6**	**5**	**5**
	VC Total Commercial mains+cordless+robots		**0**	**0**	**1**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
	Total VC Vacuum Cleaner		**0**	**0**	**2**	**12**	**15**	**15**	**13**	**12**	**12**	**11**
	TOTAL CLEANING		**-**	**12**	**22**	**36**	**43**	**43**	**42**	**40**	**38**	**37**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	0	0	2	6	11	14	15	15	15	15
0.5	FAN Axial>300Pa	1	0	0	2	7	12	16	18	18	18	18
0.5	FAN Centr.FC	1	0	0	1	3	5	7	7	7	7	7
0.5	FAN Centr.BC-free	1	0	0	2	5	8	10	10	11	11	11
0.5	FAN Centr.BC	1	0	0	2	6	10	12	13	14	15	17
0.5	FAN Cross-flow	1	0	0	0	1	2	2	3	3	3	3
	Total FAN, industrial (excl. box & roof fans)		**0**	**0**	**5**	**14**	**24**	**31**	**33**	**34**	**35**	**36**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	0	0	5	22	36	35	31	26	20	12
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	0	0	8	35	59	60	53	44	32	16
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	0	0	14	53	90	112	95	65	35	14
0.45	**Total 3ph 0.75-375 kW no VSD**		**0**	**1**	**27**	**110**	**185**	**207**	**179**	**135**	**86**	**42**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	0	0	-1	-9	-15	-14	-12	-9	-6	-1
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	0	0	-4	-19	-33	-32	-27	-21	-14	-5
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	0	0	-8	-31	-51	-62	-48	-29	-11	2
0.45	**Total 3-ph 0.75-375 kW with VSD**		**0**	**0**	**-12**	**-59**	**-99**	**-107**	**-88**	**-60**	**-30**	**-4**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**0**	**0**	**14**	**52**	**86**	**99**	**91**	**75**	**56**	**38**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	0	0	0	0.0	0.3	0.7	0.7	0.6	0.6	0.5
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.0**	**0.3**	**0.8**	**0.7**	**0.7**	**0.6**	**0.6**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	0	0	0	0.0	0.7	1.1	1.0	0.9	0.8	0.8
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
0.45	**Total Small 3-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.0**	**0.9**	**1.3**	**1.2**	**1.2**	**1.1**	**1.0**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	0	0	0	0.0	0.3	0.5	0.7	0.8	0.7	0.5
0.45	Large 3-ph LV 375-1000kW with VSD	1	0	0	0	0.1	0.7	1.5	2.2	2.7	2.5	2.5
0.45	**Total Large 3-ph LV 375-1000 kW**		**0**	**0**	**0**	**0.1**	**1.0**	**2.1**	**3.0**	**3.5**	**3.2**	**3.0**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.2	0.2
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.3	0.2
0.45	Explosion motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.3**	**0.7**	**0.9**	**0.9**	**0.8**	**0.7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.2	0.2	0.2
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.1	0.3	0.3	0.3	0.3	0.3
0.45	Brake motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
0.45	**Total Brake 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.8**	**0.7**	**0.7**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**0**	**0**	**0**	**0.0**	**0.8**	**1.9**	**2.7**	**2.5**	**2.3**	**2.1**
	Total MT Elec. Motors LV 0.12-1000 kW		**0**	**0**	**8**	**28**	**49**	**59**	**55**	**46**	**36**	**25**

db SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	1	0.0	0.0	0.2	0.5	0.5	0.5	0.4	0.3	0.3	0.2
ESOB<45_CF	1	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.3	0.2	0.1
ESOB<45_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB < 45 Total	1	**0.0**	**0.0**	**0.3**	**0.8**	**0.9**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**
ESOB_45-150_VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
ESOB_45-150_CF	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
ESOB_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB 45-150 Total	1	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**
ESOB < 150 Total	1	**0.0**	**0.0**	**0.4**	**1.0**	**1.2**	**1.0**	**0.8**	**0.7**	**0.5**	**0.4**
ESCC<45_VF	1	0.0	0.0	0.1	0.4	0.4	0.4	0.3	0.3	0.2	0.2
ESCC<45_CF	1	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.1
ESCC<45_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
ESCC < 45 Total	1	**0.0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.3**
ESCC_45-150_VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
ESCC_45-150_CF	1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
ESCC_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCC 45-150 Total	1	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
ESCC < 150 Total	1	**0.0**	**0.0**	**0.3**	**0.8**	**0.9**	**0.8**	**0.7**	**0.5**	**0.4**	**0.3**
ESCCi<45_VF	1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
ESCCi<45_CF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi<45_VSD-VF	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ESCCi < 45 Total	1	**0.0**	**0.0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**
ESCCi_45-150_VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_CF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi 45-150 Total	1	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ESCCi < 150 Total	1	**0.0**	**0.0**	**0.1**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**
MSSB<6"_VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
MSSB<6"_CF	1	0.0	0.0	0.2	0.6	0.8	0.8	0.8	0.8	0.8	0.7
MSSB<6"_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MSSB <6" Total	1	**0.0**	**0.0**	**0.2**	**0.6**	**0.9**	**0.9**	**0.9**	**0.9**	**0.8**	**0.8**
MS-V<25bar_VF	1	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.1
MS-V<25bar_CF	1	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
MS-V<25bar_VSD-VF	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
MS_V <25 bar Total	1	**0.0**	**0.0**	**0.2**	**0.6**	**0.7**	**0.7**	**0.6**	**0.6**	**0.5**	**0.4**
WP Water pumps		**0.0**	**0.0**	**1.2**	**3.3**	**4.0**	**3.7**	**3.3**	**2.9**	**2.5**	**2.0**
WE arc-on-mode	1	0	0	0	0.0	0.4	0.7	0.8	0.8	0.8	0.8
WE idle mode	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
Total WE Welding Equipment		**0**	**0**	**0**	**0.0**	**0.4**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**
TOTAL INDUSTRY COMPONENTS		**0**	**0**	**14**	**45**	**78**	**94**	**93**	**84**	**74**	**64**
Total TRAFO Utility Transformers											
TOTAL ENERGY SECTOR											
(not final energy: distribution losses)											
Tyres C1, replacement for cars	0	0	3	35	22	29	30	28	24	19	14
Tyres C1, OEM for cars	0	0	0	0	1	5	6	5	5	4	3
Tyres C1, total		**0**	**3**	**35**	**23**	**35**	**36**	**33**	**28**	**23**	**17**
Tyres C2, replacement for vans	0	0	1	8	4	8	9	8	7	6	4
Tyres C2, OEM for vans	0	0	0	0	0	1	1	1	1	1	1
Tyres C2, total		**0**	**1**	**8**	**4**	**9**	**10**	**9**	**8**	**6**	**5**
Tyres C3, replacement for trucks/busses	0	0	1	10	6	9	11	11	11	11	10
Tyres C3, OEM for trucks/busses	0	0	0	0	0	1	1	1	1	2	2
Tyres C3, total		**0**	**1**	**10**	**6**	**10**	**12**	**12**	**12**	**12**	**12**
Tyres, total C1+C2+C3		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
TOTAL TRANSPORT SECTOR		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
SAVED Final Energy, Total, in TWh		**0**	**101**	**296**	**531**	**771**	**922**	**973**	**963**	**946**	**935**
SAVED Final Energy, Total, in PJ		0	363	1065	1912	2774	3321	3501	3467	3407	3366
SAVED Final Energy, Total, in mtoe		0	9	25	46	66	79	84	83	81	80

SAVED Final Energy (BAU-ECO, ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	9	27	43	58	65	71	77	83
SPACE HEATING	0	28	86	178	276	346	381	397	410	420
SPACE COOLING	0	7	8	10	15	19	20	19	19	18
VENTILATION	0	0	1	2	5	8	11	12	13	15
1 *Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)*	*0*	*0*	*4*	*16*	*31*	*44*	*50*	*51*	*51*	*52*
LIGHTING	0	15	35	81	95	96	85	71	61	54
ELECTRONICS	0	5	25	56	74	88	94	85	74	67
FOOD PRESERVATION	0	28	43	58	80	101	115	121	124	127
COOKING	0	0	1	5	9	12	14	15	16	16
CLEANING	0	12	22	36	43	43	42	40	38	37
INDUSTRY COMPONENTS	0	0	14	45	78	94	93	84	74	64
ENERGY SECTOR (not final energy)										
TRANSPORT SECTOR	0	5	52	32	54	58	54	48	41	34
SAVED Final Energy, Total, in TWh	**0**	**101**	**296**	**531**	**771**	**922**	**973**	**963**	**946**	**935**
SAVED Final Energy, Total, in PJ	0	363	1065	1912	2774	3321	3501	3467	3407	3366
SAVED Final Energy, Total, in mtoe	0	9	25	46	66	79	84	83	81	80

Saving in % versus BAU (from 1990=0)	0.0%	1.7%	5.1%	9.3%	13.9%	17.0%	18.3%	18.3%	18.1%	17.8%
Saving In % versus BAU (from 2010=0)	-1.8%	0.0%	3.4%	7.6%	12.1%	15.2%	16.4%	16.4%	16.1%	15.9%



Sector subdivision for SAVED Final Energy (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Energy Sector: see separate reporting above; not included in other sector totals
Transport Sector: see separate reporting below; not included in other sector totals

SAVED Final Energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	1	1	2	2	2	2	2
SPACE HEATING	0	1	4	9	15	19	21	20	20	20
SPACE COOLING	0	0	0	1	2	3	4	4	3	3
VENTILATION	0	0	0	0	0	1	1	1	1	1
LIGHTING	0	1	3	6	10	14	14	13	11	10
ELECTRONICS	0	0	0	1	1	1	2	2	1	1
FOOD PRESERVATION	0	0	0	2	3	5	5	6	6	7
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	0	0	8	27	46	56	54	47	38	30
SAVED Final Energy, Industry, in TWh	**0**	**3**	**16**	**47**	**81**	**102**	**103**	**95**	**85**	**75**
SAVED Final Energy, Industry, in PJ	0	11	57	170	291	366	371	341	305	272
SAVED Final Energy, Industry, in mtoe	0	0	1	4	7	9	9	8	7	6

SAVED Final Energy (summary TRANSPORT)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are decreased energy losses due to improved rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	1	8	4	8	9	9	8	7	7
TYRES for SERVICE-sector-related transport	0	2	16	9	17	18	18	16	14	13
TYRES for RESIDENTIAL-sector-related transport	0	2	28	18	28	29	26	23	18	14
TYRES for OTHER-sector-related transport	0	0	1	1	1	1	1	1	1	1
SAVED Final Energy, Transport, in TWh	**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
SAVED Final Energy, Transport, in PJ	0	17	189	116	193	207	195	174	147	123
SAVED Final Energy, Transport, in mtoe	0	0	5	3	5	5	5	4	4	3

SAVED Final Energy (summary SERVICES)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	2	6	9	12	13	14	14	15
SPACE HEATING	0	8	23	47	73	91	99	102	104	106
SPACE COOLING	0	2	3	5	8	10	11	11	10	9
VENTILATION	0	0	0	1	3	5	6	7	7	8
LIGHTING	0	4	12	26	43	57	55	48	42	38
ELECTRONICS	0	2	7	14	17	22	25	23	19	16
FOOD PRESERVATION	0	2	3	6	15	26	33	35	36	37
COOKING	0	0	0	1	1	2	2	3	3	3
CLEANING	0	1	2	5	6	6	7	7	7	7
INDUSTRY COMPONENTS	0	0	5	17	29	36	37	35	34	32
SAVED Final Energy, Services, in TWh	**0**	**18**	**56**	**127**	**204**	**266**	**287**	**283**	**276**	**271**
SAVED Final Energy, Services, in PJ	0	66	202	458	735	958	1033	1020	995	976
SAVED Final Energy, Services, in mtoe	0	2	5	11	18	23	25	24	24	23

SAVED Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	6	20	33	44	50	55	60	65
SPACE HEATING	0	19	58	118	182	229	253	267	279	287
SPACE COOLING	0	4	5	4	4	4	4	4	4	5
VENTILATION	0	0	0	1	2	3	4	4	5	6
LIGHTING	0	10	19	48	41	24	15	10	7	5
ELECTRONICS	0	3	18	41	55	65	67	60	53	49
FOOD PRESERVATION	0	26	40	50	60	69	76	79	81	82
COOKING	0	0	1	4	7	10	12	13	13	13
CLEANING	0	12	20	31	36	36	34	32	30	29
INDUSTRY COMPONENTS	0	0	0	1	1	1	1	0	0	0
SAVED Final Energy, Residential, in TWh	**0**	**74**	**169**	**318**	**422**	**484**	**515**	**523**	**532**	**541**
SAVED Final Energy, Residential, in PJ	0	266	607	1143	1518	1743	1854	1884	1914	1949
SAVED Final Energy, Residential, in mtoe	0	6	14	27	36	42	44	45	46	47

(OTHER sectors corresponds to Agriculture, Forestry, Fishing of Eurostat)

SAVED Final Energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	1	1	1	1	1
SPACE HEATING	0	0	1	3	6	7	8	8	8	8
SPACE COOLING	0	0	0	0	1	1	1	1	1	1
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	1	1	1	1	1	1	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	1	1	1	1	1	1	1
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	1	2	2	2	2	1	1
SAVED Final Energy, Other sectors, in TWh	**0**	**1**	**3**	**7**	**11**	**13**	**13**	**13**	**13**	**13**
SAVED Final Energy, Other sectors, in PJ	0	3	11	25	38	46	49	48	46	45
SAVED Final Energy, Other sectors, in mtoe	0	0	0	1	1	1	1	1	1	1

SAVED Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	9	27	43	58	65	71	77	83
	Residential	0	0	6	20	33	44	50	55	60	65
	Tertiary / Services	0	0	2	6	9	12	13	14	14	15
	Industry	0	0	0	1	1	2	2	2	2	2
	Other	0	0	0	0	0	1	1	1	1	1
SPACE HEATING.	All sectors, TWh	0	28	86	178	276	346	381	397	410	420
	Residential	0	19	58	118	182	229	253	267	279	287
	Tertiary / Services	0	8	23	47	73	91	99	102	104	106
	Industry	0	1	4	9	15	19	21	20	20	20
	Other	0	0	1	3	6	7	8	8	8	8
SPACE COOLING.	All sectors, TWh	0	7	8	10	15	19	20	19	19	18
& HT PROCESS	Residential	0	4	5	4	4	4	4	4	4	5
	Tertiary / Services	0	2	3	5	8	10	11	11	10	9
	Industry	0	0	0	1	2	3	4	4	3	3
	Other	0	0	0	0	1	1	1	1	1	1
VENTILATION.	All sectors, TWh	0	0	1	2	5	8	11	12	13	15
	Residential	0	0	0	1	2	3	4	4	5	6
	Tertiary / Services	0	0	0	1	3	5	6	7	7	8
	Industry	0	0	0	0	0	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	15	35	81	95	96	85	71	61	54
	Residential	0	10	19	48	41	24	15	10	7	5
	Tertiary / Services	0	4	12	26	43	57	55	48	42	38
	Industry	0	1	3	6	10	14	14	13	11	10
	Other	0	0	1	1	1	1	1	1	1	1
ELECTRONICS.	All sectors, TWh	0	5	25	56	74	88	94	85	74	67
	Residential	0	3	18	41	55	65	67	60	53	49
	Tertiary / Services	0	2	7	14	17	22	25	23	19	16
	Industry	0	0	0	1	1	1	2	2	1	1
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	28	43	58	80	101	115	121	124	127
	Residential	0	26	40	50	60	69	76	79	81	82
	Tertiary / Services	0	2	3	6	15	26	33	35	36	37
	Industry	0	0	0	2	3	5	5	6	6	7
	Other	0	0	0	1	1	1	1	1	1	1
COOKING.	All sectors, TWh	0	0	1	5	9	12	14	15	16	16
	Residential	0	0	1	4	7	10	12	13	13	13
	Tertiary / Services	0	0	0	1	1	2	2	3	3	3
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	12	22	36	43	43	42	40	38	37
	Residential	0	12	20	31	36	36	34	32	30	29
	Tertiary / Services	0	1	2	5	6	6	7	7	7	7
	Industry	0	0	0	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	0	14	45	78	94	93	84	74	64
	Residential	0	0	0	1	1	1	1	0	0	0
	Tertiary / Services	0	0	5	17	29	36	37	35	34	32
	Industry	0	0	8	27	46	56	54	47	38	30
	Other	0	0	0	1	2	2	2	2	1	1
TYRES. Transport sector, TWh		0	5	52	32	54	58	54	48	41	34
	Residential transport	0	2	28	18	28	29	26	23	18	14
	Tertiary / Services transport	0	2	16	9	17	18	18	16	14	13
	Industry transport	0	1	8	4	8	9	9	8	7	7
	Other transport	0	0	1	1	1	1	1	1	1	1
ALL PRODUCTS.	All sectors excl. Energy, TWh	0	101	296	531	771	922	973	963	946	935
	Residential	0	74	169	318	422	484	515	523	532	541
	Tertiary / Services	0	18	56	127	204	266	287	283	276	271
	Industry	0	3	16	47	81	102	103	95	85	75
	Other	0	1	3	7	11	13	13	13	13	13
	Transport	0	5	52	32	54	58	54	48	41	34

SAVED Final Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			74%	75%	75%	76%	77%	77%	77%	78%
	Tertiary / Services			22%	21%	21%	20%	19%	19%	19%	18%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential		68%	68%	66%	66%	66%	67%	67%	68%	68%
	Tertiary / Services		27%	26%	27%	26%	26%	26%	26%	25%	25%
	Industry		4%	4%	5%	5%	6%	5%	5%	5%	5%
	Other		1%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential		62%	60%	42%	28%	21%	19%	20%	22%	27%
	Tertiary / Services		32%	34%	44%	51%	55%	56%	56%	55%	52%
	Industry		5%	5%	11%	16%	18%	19%	19%	18%	16%
	Other		1%	1%	3%	5%	5%	6%	5%	5%	5%
VENTILATION.											
	Residential			28%	29%	33%	34%	35%	36%	37%	39%
	Tertiary / Services			62%	61%	58%	57%	56%	55%	54%	53%
	Industry			9%	9%	9%	9%	8%	8%	8%	8%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential		66%	56%	59%	43%	25%	17%	13%	11%	10%
	Tertiary / Services		26%	34%	32%	45%	59%	65%	68%	69%	71%
	Industry		7%	9%	8%	11%	15%	17%	18%	19%	19%
	Other		1%	2%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential		53%	73%	74%	75%	74%	72%	71%	72%	74%
	Tertiary		47%	26%	25%	24%	25%	26%	27%	26%	24%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential		92%	92%	86%	76%	68%	66%	65%	65%	65%
	Tertiary / Services		6%	6%	10%	19%	26%	28%	29%	29%	29%
	Industry		1%	1%	3%	4%	5%	5%	5%	5%	5%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential		87%	85%	84%	84%	83%	83%	83%	83%	83%
	Tertiary / Services		13%	15%	16%	16%	17%	17%	17%	17%	17%
	Industry		0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential		96%	91%	85%	85%	84%	82%	80%	80%	79%
	Tertiary / Services		4%	8%	14%	13%	14%	16%	17%	18%	19%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential		0%	2%	1%	1%	1%	1%	1%	1%	1%
	Tertiary / Services		20%	39%	37%	37%	38%	40%	42%	46%	50%
	Industry		79%	56%	59%	60%	59%	58%	56%	52%	47%
	Other		1%	3%	3%	2%	2%	2%	2%	2%	2%
TYRES.											
	Residential transport			53%	56%	52%	50%	49%	47%	44%	41%
	Tertiary / Services transport			30%	28%	31%	32%	33%	33%	35%	37%
	Industry transport			15%	13%	15%	16%	16%	17%	18%	19%
	Other transport			2%	2%	2%	3%	3%	3%	3%	3%
ALL PRODUCTS (excl. Energy sector).											
	Residential		73%	57%	60%	55%	52%	53%	54%	56%	58%
	Tertiary / Services		18%	19%	24%	26%	29%	30%	29%	29%	29%
	Industry		3%	5%	9%	10%	11%	11%	10%	9%	8%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
	Transport		5%	18%	6%	7%	6%	6%	5%	4%	4%

db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	efficiency elec. gen.&distr. CC (from sheet General)		*40%*	*40%*	*40%*	*40%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*
	EIWH Electric Instant. < 12 kW (secondary)	1.00	1	1	1	2	1	2	2	2	2	2
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	16	19	19	17	14	15	16	17	18	20
	EIWHS Electric Instant. Shower (secondary)	1.00	2	3	3	3	3	3	3	3	3	3
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	18	22	22	21	18	18	19	20	21	22
	ESWH Electric Storage > 30 L (primary)	1.00	143	199	205	200	162	168	178	188	198	208
	GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	13	10	9	8	8	8	7	7
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	8	9	8	7	6	6	6	6	5	5
	GSWH Gas Storage, Condensing	0.010	0	0	0	1	1	1	1	1	1	2
	GSWH Gas Storage, Non-condensing	0.008	24	22	18	13	9	7	5	4	4	3
	Dedicated WH Heat Pump	1.00	0	1	3	5	8	12	16	20	24	28
	Dedicated WH Solar (3.5 m2)	0.80	2	14	18	19	17	15	15	15	15	15
	WH dedicated Water Heater		**228**	**305**	**310**	**299**	**247**	**254**	**267**	**282**	**298**	**314**
	CHB Gas Combi Instant. WH	0.04	58	139	145	145	139	140	143	143	143	142
	CHB Gas + Cyl. WH	0.04	37	59	59	57	54	55	56	56	56	55
	CHB Jet Burner Gas + Cyl. WH	0.04	9	8	7	5	4	3	3	3	3	3
	CHB Jet Burner Oil + Cyl. WH	0.04	70	60	49	38	28	20	18	18	18	18
	CHB Electric (Joule) + Cyl. WH	1.00	3	4	4	4	4	4	4	3	3	3
	CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	1	1	2	2
	CHB Electric HP + Cyl. WH	1.00	1	5	7	10	10	11	13	15	18	20
	CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	2
	CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	1	1
	CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
	CHC Central Heating combi, water heating		**177**	**276**	**271**	**260**	**240**	**235**	**239**	**242**	**244**	**247**
	TOTAL WATER HEATING		**405**	**581**	**581**	**559**	**487**	**489**	**505**	**524**	**542**	**561**
	CHB Gas non-condensing	0.04	777	883	711	536	381	327	284	240	205	175
	CHB Gas condensing	0.04	8	279	416	545	633	662	670	659	651	638
	CHB Gas Jet burner non-condensing	0.04	84	55	42	30	19	10	6	5	4	4
	CHB Gas Jet burner condensing	0.04	0	1	2	4	5	6	7	7	7	8
	CHB Oil Jet burner non-condensing	0.04	1044	675	509	360	231	123	70	57	50	43
	CHB Oil Jet burner condensing	0.04	0	10	22	34	47	59	64	66	68	69
	CHB Electric Joule-effect	1.00	32	34	36	39	33	31	28	24	21	18
	CHB Hybrid (gas-electric)	0.60	0	0	0	1	1	1	2	4	6	9
	CHB Electric Heat Pump	1.00	5	29	41	54	55	61	68	74	83	92
	CHB Gas Heat Pump	0.04	0	0	0	0	1	1	1	2	2	3
	CHB micro CHP	0.04	0	0	0	1	1	1	1	2	3	4
	CHB Solar combi (16 m2)	0.10	6	7	7	7	7	7	6	6	6	5
	CHB Central Heating boiler < 400 kW, space heating		**1957**	**1973**	**1787**	**1610**	**1414**	**1288**	**1208**	**1145**	**1106**	**1067**
	SFB Wood Manual	0	342	90	69	51	34	20	12	8	7	6
	SFB Wood Direct Draft	0	2	23	43	60	71	69	69	74	85	98
	SFB Coal	0	364	107	105	85	61	37	26	24	21	18
	SFB Pellets	0	0	9	16	22	27	29	30	30	31	33
	SFB Wood chips	0	0	14	17	19	18	17	18	19	20	21
	Total Solid Fuel Boiler		**709**	**243**	**251**	**237**	**210**	**172**	**155**	**155**	**164**	**175**
	CHAE-S (≤ 400 kW)	1	8	23	26	28	23	23	23	23	24	23
	CHAE-L (> 400 kW)	1	13	31	35	36	30	28	26	25	23	22
	CHWE-S (≤ 400 kW)	1	1	2	3	3	2	2	2	2	2	2
	CHWE-M (> 400 kW; ≤ 1500 kW)	1	3	7	8	8	7	6	6	5	5	5
	CHWE-L (> 1500 kW)	1	2	4	5	5	4	4	4	3	3	3
	CHF	0.05	0	0	0	0	0	0	0	0	0	0
	HT PCH-AE-S	1	50	80	88	95	83	85	86	87	88	89
	HT PCH-AE-L	1	48	76	84	90	78	80	81	81	82	83
	HT PCH-WE-S	1	10	17	19	20	18	18	18	18	18	19
	HT PCH-WE-M	1	20	33	36	39	34	35	36	36	37	37
	HT PCH-WE-L	1	4	7	7	8	7	7	7	7	8	8
	AC rooftop	1	7	17	17	15	9	6	3	1	1	1
	AC splits	1	9	28	28	26	20	18	16	15	13	12
	AC VRF	1	0	7	10	14	14	17	20	22	23	24
	ACF	0.05	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC central Air Cooling		**176**	**333**	**365**	**387**	**331**	**330**	**328**	**327**	**328**	**328**
	AC rooftop (rev)	1	9	29	29	26	17	11	5	1	0	0
	AC splits (rev)	1	17	53	55	54	43	39	35	31	27	24
	AC VRF (rev)	1	0	17	26	35	37	45	51	53	54	52
	ACF (rev)	0.05	0	0	0	0	0	1	1	1	1	1
	AHF	0.05	204	148	127	111	96	85	75	66	59	52
	AHE	1	2	6	5	3	3	2	2	2	2	2
	SubTotal AHC central Air Heating		**233**	**254**	**243**	**230**	**196**	**182**	**168**	**154**	**142**	**131**
	Total AHC central Air Heating & Cooling		**409**	**587**	**608**	**617**	**527**	**512**	**496**	**482**	**470**	**459**

db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	20	20	20	20	20	20	20
	LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60
	LH wood stove	0	38	37	37	37	37	38	38	37	36	36
	LH coal stove	0	23	13	11	10	9	8	6	5	4	3
	LH cooker	0	7	11	12	14	15	15	15	15	15	14
	LH SHR stove	0	16	21	22	24	27	29	32	33	34	34
	LH pellet stove	0	0	8	11	14	16	17	17	17	17	17
	LH Solid fuel sum		**117**	**148**	**161**	**173**	**184**	**190**	**192**	**191**	**188**	**184**
	LH Electric portable	1	58	54	53	51	41	39	36	35	33	32
	LH Electric fixed > 250W	1	310	277	254	220	157	138	130	124	118	113
	LH Electric fixed ≤ 250W	1	21	19	17	15	11	9	9	8	8	8
	LH Electric storage	1	18	17	16	14	11	10	9	9	9	8
	LH Electric underfloor	1	53	52	51	50	41	39	38	36	34	33
	LH Electric visibly glowing > 1.2 kW	1	5	5	4	4	3	3	3	3	3	3
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	1	16	23	24	23	18	17	16	15	14	14
	LH Electric sum		**482**	**447**	**421**	**379**	**282**	**255**	**242**	**230**	**220**	**211**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	1.0	0.9	0.8	0.6	0.6	0.5	0.5
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.2	2.0	1.8	1.6	1.4	1.2	1.2
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.5	1.2	0.9	0.8	0.7	0.6	0.6
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.8	1.3	1.0	0.9	0.8	0.8
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.7**	**8.0**	**6.6**	**5.4**	**4.6**	**4.0**	**3.6**	**3.4**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.7**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
	LH Local Space Heaters total		**619**	**607**	**592**	**561**	**473**	**451**	**438**	**425**	**412**	**398**
	RAC fixed < 6 kW, cooling	1	5	42	37	28	23	25	26	29	32	36
	RAC fixed 6-12 kW, cooling	1	2	22	22	18	15	15	15	16	17	18
	RAC portable < 12 kW, cooling	1	0	3	3	3	2	2	2	2	2	2
	RAC < 12 kW total, cooling mode		**7**	**67**	**62**	**48**	**40**	**41**	**43**	**46**	**51**	**56**
	RAC fixed < 6 kW, reversible, heating	1	2	51	58	57	58	71	85	101	116	130
	RAC fixed 6-12 kW, reversible, heating	1	1	25	33	34	34	39	45	51	57	61
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**3**	**76**	**91**	**91**	**91**	**111**	**129**	**151**	**173**	**190**
	RAC Room Air Conditioner		**10**	**143**	**153**	**139**	**131**	**152**	**173**	**198**	**224**	**246**
1	CIRC Integrated circulators	1	32	47	48	50	43	44	44	42	40	38
0.38	CIRC Large standalone circulators	1	21	29	27	24	19	16	14	13	13	12
0.38	CIRC Small standalone circulators	1	16	22	20	18	14	12	11	10	10	9
	CIRC Circulator pumps <2.5 kW, all	1	**69**	**98**	**95**	**92**	**76**	**73**	**69**	**66**	**63**	**60**
	CIRC Circulator pumps <2.5 kW, excl. double		**22**	**31**	**29**	**26**	**20**	**18**	**16**	**15**	**14**	**13**
	TOTAL SPACE HEATING		**3543**	**3186**	**2992**	**2756**	**2405**	**2222**	**2114**	**2046**	**2010**	**1975**
	TOTAL SPACE COOLING		**183**	**399**	**427**	**435**	**370**	**371**	**371**	**374**	**379**	**384**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0	0	0	0	0	0	0	0	0	0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0	0	0	0	0	0	0	0	0	0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0	0	0	1	1	3	5	6	8	10
	R-UVU 100-250 m3/h	1	1	2	2	2	2	2	2	2	2	2
	R-BVU 100-250 m3/h	1	0	0	0	0	1	1	2	2	3	4
	R-UVU 250-1000 m3/h	1	5	13	14	14	13	13	14	14	14	14
	R-BVU 250-1000 m3/h	1	0	1	2	2	4	7	10	14	17	21
	R-UVU > 1000 m3/h	1	0	0	0	0	0	0	0	0	0	0
	R-BVU 1000-2500 m3/h	1	0	0	0	1	1	1	1	1	1	1
	RVU, Total residential, from VU own electricity		**7**	**17**	**19**	**21**	**21**	**27**	**33**	**40**	**46**	**52**
	NR-UVU 250-1000 m3/h	1	2	5	5	5	4	4	4	4	4	4
	NR-BVU 250-1000 m3/h	1	0	2	3	4	4	4	5	6	6	7
	NR-UVU > 1000 m3/h	1	1	3	2	2	2	2	2	2	2	2
	NR-BVU 1000-2500 m3/h	1	0	2	2	3	3	3	4	4	5	5
	NR-AHU-S 2500-5500 m3/h	1	1	6	9	11	11	13	14	16	18	20
	NR-AHU-M 5500-14500 m3/h	1	43	57	55	52	44	46	48	50	52	54
	NR-AHU-L > 14500 m3/h	1	12	16	15	15	12	13	14	14	15	15
	NRVU, Total non-residential, from VU own electricity		**60**	**91**	**92**	**92**	**79**	**85**	**91**	**96**	**102**	**108**
	VU Ventilation Units, res + non-res., from VU own elec.		**66**	**108**	**111**	**113**	**101**	**112**	**124**	**136**	**148**	**160**
	TOTAL VENTILATION (from VU own electricity)		**66**	**108**	**111**	**113**	**101**	**112**	**124**	**136**	**148**	**160**
1	***Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)***		-	-	-	-	-	-	-	-	-	-

db **BAU Primary Energy (in TWh primary NCV)**	**elec**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LS, primary energy incl. control gear											
LFL (T12,T8h,T8t,T5,other)	1	193	304	365	412	343	294	230	180	141	111
HID (HPM, HPS, MH)	1	71	155	162	165	118	79	42	23	13	7
CFLni (all shapes)	1	5	21	23	23	18	12	7	3	2	1
CFLi (retrofit for GLS, HL)	1	2	27	37	38	27	22	14	9	6	4
GLS (DLS & NDLS)	1	184	154	113	82	41	24	14	8	5	3
HL (DLS & NDLS, LV & MV)	1	16	91	119	141	85	43	22	12	7	4
LED replacing LFL (retrofit & luminaire)	1	0	0	2	20	51	102	155	204	251	301
LED replacing HID (retrofit & luminaire)	1	0	0	1	16	39	69	94	114	134	156
LED replacing CFLni (retrofit & luminaire)	1	0	0	0	1	2	5	8	10	11	13
LED replacing DLS (retrofit & luminaire)	1	0	0	0	2	4	7	9	11	12	14
LED replacing NDLS (retrofit & luminaire)	1	0	0	1	8	18	29	39	46	53	58
Standby	1	*23*	*37*	*32*	*27*	*19*	*16*	*16*	*16*	*16*	*16*
TOTAL LIGHTING (incl. standby)		**494**	**789**	**856**	**936**	**765**	**703**	**651**	**636**	**650**	**686**
DP TV on-mode, total all types	1	58.7	153.9	176.8	185.6	142.1	160.3	159.4	149.0	145.0	148.6
DP TV standby, standard (NoNA)	1	7.7	4.9	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, LoNA	1	0.0	0.3	1.5	2.5	1.4	0.3	0.0	0.0	0.0	0.0
DP TV standby, HiNA ('Smart')	1	0.0	0.0	3.8	10.4	13.3	16.6	17.3	15.7	13.4	11.1
DP TV standby, total all types		**8**	**5**	**7**	**13**	**15**	**17**	**17**	**16**	**13**	**11**
DP TV total on-mode + standby		**66**	**159**	**184**	**199**	**157**	**177**	**177**	**165**	**158**	**160**
DP Monitor on-mode	1	1.8	31.0	19.1	13.4	11.0	9.8	7.9	6.7	6.5	6.4
DP Monitor standby	1	0.4	1.3	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0
DP Monitor total		**2**	**32**	**19**	**14**	**11**	**10**	**8**	**7**	**7**	**6**
DP Signage on-mode	1	0.0	2.3	19.7	44.8	45.8	44.1	40.9	39.0	37.1	36.7
DP Signage standby	1	0.0	0.3	3.0	6.7	6.9	6.6	6.1	5.8	5.6	5.5
DP Signage total		**0**	**3**	**23**	**52**	**53**	**51**	**47**	**45**	**43**	**42**
DP Electronic Displays, total on-mode		**61**	**187**	**216**	**244**	**199**	**214**	**208**	**195**	**189**	**192**
DP Electronic Displays, total standby		**8**	**7**	**10**	**20**	**22**	**24**	**23**	**22**	**19**	**17**
DP Electronic Displays, total		**69**	**194**	**226**	**264**	**220**	**238**	**232**	**216**	**208**	**208**
SSTB	1	0	7	3	0	0	0	0	0	0	0
CSTB (low-power modes)	1	0	13	30	30	23	22	21	21	21	21
CSTB (other modes)	1	0	7	16	16	13	12	11	11	11	11
CSTB (all covered modes)	1	0	19	46	46	36	33	32	32	32	32
Total STB set top boxes (Complex & Simple)		**0**	**26**	**49**	**46**	**36**	**33**	**32**	**32**	**32**	**32**
Game consoles > 20 W Active modes (SRI)	1	0.0	6.1	11.1	13.9	11.1	11.1	11.1	11.1	11.1	11.1
Game consoles > 20 W Non-Active (CR)	1	0.0	3.2	5.0	6.1	4.6	4.6	4.6	4.6	4.6	4.6
Game consoles < 20 W Non-Active (CR)	1	0.0	2.3	2.5	2.6	2.2	2.2	2.2	2.2	2.2	2.2
Game consoles < 20 W Active (no reg.)	1	0.0	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
Total Game consoles, active modes		0.0	6.5	11.5	14.3	11.4	11.4	11.4	11.4	11.4	11.4
Total Game consoles, non-active modes		0.0	5.5	7.5	8.7	6.8	6.8	6.8	6.8	6.8	6.8
Total Game consoles > 20 W, all modes		0.0	9.3	16.1	20.1	15.8	15.7	15.7	15.7	15.7	15.7
Total Game consoles < 20 W, all modes		0.0	2.7	2.9	2.9	2.4	2.4	2.4	2.4	2.4	2.4
Total Game consoles, all modes		**0**	**12**	**19**	**23**	**18**	**18**	**18**	**18**	**18**	**18**
ES&DS only, without effects on infrastructure											
ES tower 1-socket traditional	1	0.1	2.3	1.9	1.4	0.9	0.7	0.7	0.7	0.7	0.7
ES rack 1-socket traditional	1	0.3	7.1	5.3	4.6	3.9	4.2	4.2	4.2	4.2	4.2
ES rack 2-socket traditional	1	1.6	32.5	17.4	10.6	10.2	12.1	13.0	13.0	13.0	13.0
ES rack 2-socket cloud	1	0.0	18.2	28.2	31.6	31.0	36.6	39.5	39.5	39.5	39.5
ES rack 4-socket traditional	1	0.2	3.4	1.9	1.5	1.5	1.7	1.9	1.9	1.9	1.9
ES rack 4-socket cloud	1	0.0	2.1	3.6	4.8	4.8	5.7	6.2	6.2	6.2	6.2
ES rack 2-socket resilient trad.	1	0.1	1.7	0.9	0.5	0.5	0.5	0.6	0.6	0.6	0.6
ES rack 2-socket resilient cloud	1	0.0	0.8	1.2	1.2	1.1	1.3	1.4	1.4	1.4	1.4
ES rack 4-socket resilient trad.	1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 1-socket traditional	1	0.1	2.0	1.8	1.5	1.3	1.4	1.4	1.4	1.4	1.4
ES blade 2-socket traditional	1	1.3	14.8	7.6	4.9	4.7	5.6	6.1	6.1	6.1	6.1
ES blade 2-socket cloud	1	0.0	8.3	12.5	15.2	15.0	17.8	19.3	19.3	19.3	19.3
ES blade 4-socket traditional	1	0.2	1.9	1.0	0.7	0.6	0.8	0.8	0.8	0.8	0.8
ES blade 4-socket cloud	1	0.0	1.0	1.6	1.9	1.9	2.2	2.4	2.4	2.4	2.4
ES total traditional		**4**	**66**	**38**	**26**	**24**	**27**	**29**	**29**	**29**	**29**
ES total cloud		**0**	**30**	**47**	**55**	**54**	**64**	**69**	**69**	**69**	**69**
ES Enterprise Servers total		**4**	**96**	**85**	**81**	**77**	**91**	**98**	**98**	**98**	**98**
DS Online 2	1	0.8	14.3	19.3	26.3	28.0	33.5	35.1	35.3	35.3	35.3
DS Online 3	1	0.1	2.1	2.8	3.7	4.0	4.7	5.0	5.0	5.0	5.0
DS Online 4	1	0.5	8.2	10.8	14.5	15.4	18.4	19.3	19.3	19.3	19.3
DS Data Storage products total		**1**	**25**	**33**	**45**	**47**	**57**	**59**	**60**	**60**	**60**
ES + DS total (excl. infrastructure)		**5**	**121**	**118**	**125**	**125**	**147**	**157**	**157**	**157**	**157**

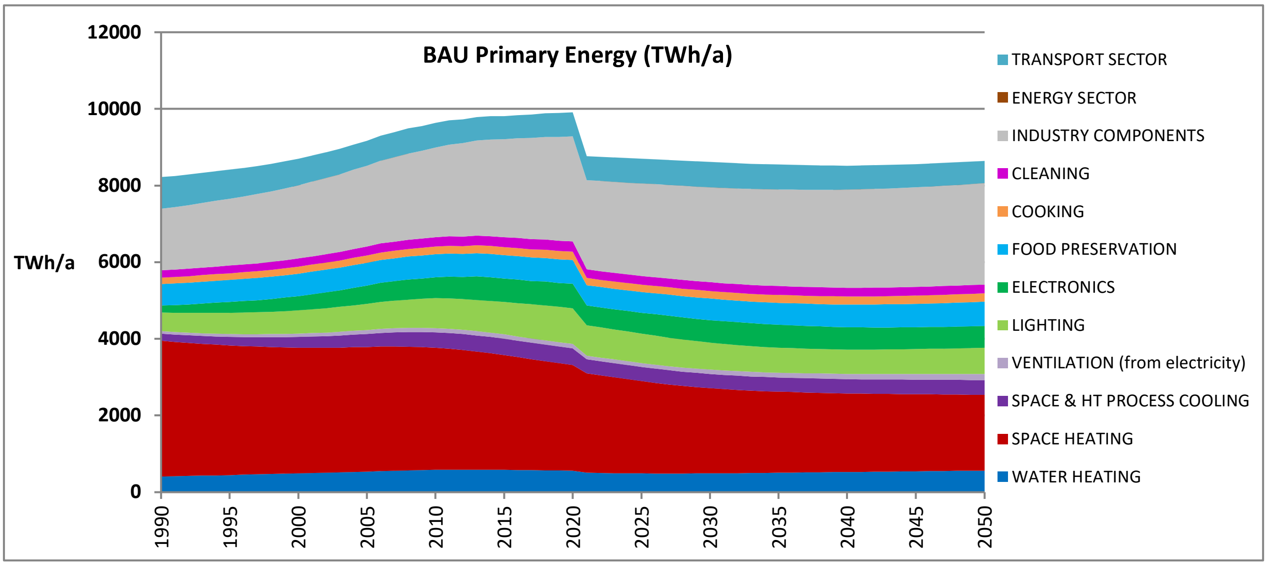
db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	39	52	35	22	21	23	22	21	20	19
	PC Integrated Desktop	1	1	2	1	1	1	1	2	2	2	2
	PC Notebook	1	0	18	21	17	15	16	16	17	17	16
	PC Tablet/slate	1	0	1	6	6	3	3	3	3	3	3
	PC Thin client	1	0	1	1	1	1	1	1	1	1	0
	PC Integrated Thin Client	1	0	0	0	0	0	0	0	0	0	0
	PC Small-scale Server	1	0	0	0	0	0	0	0	0	0	0
	PC Workstation	1	2	3	4	4	4	4	4	4	4	4
	Total PC, electricity		**42**	**78**	**68**	**51**	**45**	**48**	**49**	**48**	**47**	**44**
	Inkjet Printer	1	2.3	1.3	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Inkjet MFD	1	2.9	2.2	2.5	2.7	2.2	2.1	2.0	1.9	1.8	1.7
	EP / Laser Printer mono	1	19.7	5.8	4.6	3.6	2.4	1.9	1.5	1.2	0.8	0.5
	EP / Laser Printer colour	1	0.0	3.0	4.3	5.9	5.7	6.2	6.4	6.6	6.7	6.9
	EP / Laser Copier mono	1	21.9	2.9	1.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.5	1.3	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	5.2	6.9	7.2	5.8	5.5	5.2	5.0	4.7	4.5
	EP / Laser MFD colour	1	0.0	6.2	8.1	8.5	6.8	6.5	6.2	5.9	5.6	5.3
	Total IE Imaging Equipment		**47**	**27**	**30**	**29**	**23**	**22**	**21**	**21**	**20**	**19**
	of which for modes under CR 1275/2008		*36*	*21*	*23*	*22*	*18*	*17*	*16*	*16*	*15*	*14*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	5.1	14.9	13.0	11.0	8.1	7.4	6.7	6.0	5.2	4.5
	SB Electric toothbrushes (off mode)	1	0.2	0.8	0.9	1.0	0.9	1.0	1.2	1.3	1.4	1.5
	SB Audio speakers (wired) (sb & off modes)	1	4.3	6.8	4.9	2.5	0.3	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	1.7	8.1	10.6	11.0	11.0	11.0	11.0	11.0
	SB Small appliances (sb & off modes)	1	3.1	17.3	18.0	18.6	15.9	16.1	16.3	16.5	16.7	16.8
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	1.0	2.8	2.6	2.6	2.6	2.6	2.6	2.6
	SB Media players and recorders (sb mode)	1	0.0	8.4	10.4	2.6	0.2	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	1.1	7.8	8.3	7.9	5.9	5.2	4.7	4.3	3.9	3.5
	SB Office phones (nsb mode)	1	1.6	5.5	4.7	3.7	2.6	2.1	1.7	1.6	1.6	1.6
	SB Home NAS (nsb mode)	1	0.0	2.3	3.7	5.1	5.2	6.0	6.7	7.0	7.0	6.6
	SB Home Network Equipment (nsb mode)	1	0.0	6.7	8.1	8.7	7.7	8.1	8.6	8.9	8.9	8.9
	SB Office Network Equipment (nsb mode)	1	0.0	0.8	2.7	5.9	7.8	10.5	12.8	13.0	13.0	13.0
	SB Coffee makers (off mode)	1	2.1	2.6	2.7	2.8	2.4	2.5	2.5	2.6	2.7	2.8
	Products regulated also for (networked) standby											
	(already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.1	4.1	4.4	4.5	*3.8*	*3.9*	*3.9*	*3.9*	*3.9*	*3.9*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	1.2	1.6	2.0	*1.9*	*2.2*	*2.4*	*2.7*	*2.9*	*3.2*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0
1	SB Electric Ovens (sb mode)	1	0.0	7.9	10.5	12.3	11.2	11.8	12.1	12.3	12.5	12.6
1	SB Electric Hobs (sb mode)	1	0.0	3.1	4.1	4.6	4.2	4.5	4.8	5.0	5.3	5.5
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	12.6	29.8	29.7	23.2	21.5	20.8	20.8	20.8	20.8
1	SB Game consoles (non-active modes)	1	0.0	5.5	7.5	8.7	6.8	6.8	6.8	6.8	6.8	6.8
1	SB IE Inkjet Printers (nsb mode)	1	2.1	1.2	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Inkjet MFDs (nsb mode)	1	2.6	2.0	2.3	2.4	2.0	1.9	1.8	1.7	1.6	1.5
1	SB IE Laser Printers (nsb mode)	1	14.8	6.5	6.7	7.1	6.1	6.0	5.9	5.8	5.7	5.5
1	SB IE Laser Copiers (nsb mode)	1	16.4	2.6	2.2	0.8	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	8.5	11.2	11.8	9.5	9.0	8.5	8.1	7.7	7.3
	Total (networked) SB (incl. double)		54	130	162	166	134	135	137	136	135	134
	Total (networked) SB (excl. double)		**18**	**75**	**81**	**81**	**70**	**73**	**75**	**75**	**74**	**73**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.6	0.5	0.3	0.2	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.2	2.4	2.4	2.5	2.1	2.1	2.1	2.0	2.0	2.0
0.6	EPS 10–12 W	1	0.0	17.0	27.1	29.5	24.0	23.1	22.1	21.2	20.2	19.9
0.5	EPS 15–20 W	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	1	0.0	2.0	2.3	2.2	1.7	1.5	1.4	1.2	1.0	0.9
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.2	0.3	0.4	0.6	0.7	0.8	1.0
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.4	0.4
1.0	EPS 65–120 W	1	0.0	0.5	0.6	0.5	0.3	0.1	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	3.1	2.5	0.6	0.3	0.4	0.4	0.4	0.4	0.4
0.0	EPS 12–15 W	1	0.0	0.6	1.3	1.9	1.6	1.6	1.5	1.4	1.4	1.3
	EPS, total for active mode		**0**	**26**	**37**	**38**	**31**	**30**	**29**	**27**	**26**	**26**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.1	0.9	0.7	0.4	0.2	0.1	0.1	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.2	2.5	2.5	2.5	2.0	2.0	1.9	1.8	1.7	1.6
0.0	EPS 10–12 W	1	0.0	0.5	0.7	0.7	0.5	0.5	0.4	0.4	0.3	0.3
0.0	EPS 15–20 W	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.2**	**3.8**	**3.9**	**3.7**	**2.9**	**2.7**	**2.5**	**2.3**	**2.1**	**1.9**
	EPS, overall total (active + no-load)		**0**	**30**	**41**	**42**	**34**	**32**	**31**	**30**	**28**	**28**
	EPS, double counted subtracted		**0**	**16**	**21**	**21**	**17**	**16**	**16**	**15**	**14**	**14**
	TOTAL ELECTRONICS		**181**	**548**	**610**	**640**	**554**	**596**	**599**	**582**	**569**	**566**

db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**281**	**284**	**287**	**290**	**245**	**246**	**246**	**245**	**245**	**244**
	CF open vertical chilled multi deck (RVC2)	1	35	32	30	28	22	22	22	22	22	22
	CF open horizontal frozen island (RHF4)	1	3	3	3	2	2	2	2	2	2	2
	CF other supermarket display (non-BCs)	1	61	57	57	56	47	49	50	52	53	54
	CF Plug in one door beverage cooler	1	38	39	37	35	29	29	29	30	30	31
	CF Plug in horizontal ice cream freezer	1	9	9	8	8	7	7	7	7	7	7
	CF Spiral vending machine	1	9	7	5	4	3	3	3	3	3	3
	Total CF Commercial Refrigeration		**154**	**147**	**140**	**132**	**110**	**112**	**113**	**115**	**118**	**120**
	PF Storage cabinet Chilled Vertical (CV)	1	3.8	5.4	5.7	6.0	5.3	5.5	5.8	6.0	6.3	6.5
	PF Storage cabinet Frozen Vertical (FV)	1	4.4	6.3	6.7	7.0	6.2	6.5	6.8	7.1	7.3	7.6
	PF Storage cabinet Chilled Horizontal (CH)	1	2.9	4.2	4.5	4.7	4.1	4.3	4.5	4.7	4.9	5.1
	PF Storage cabinet Frozen Horizontal (FH)	1	1.8	2.5	2.7	2.8	2.5	2.6	2.7	2.8	2.9	3.0
	PF Storage cabinets All types	1	**13**	**18**	**20**	**21**	**18**	**19**	**20**	**21**	**21**	**22**
	PF Process Chiller AC MT S ≤ 300 kW	1	7	16	18	21	20	22	24	26	29	31
	PF Process Chiller AC MT L > 300 kW	1	7	15	18	21	19	21	23	25	28	30
	PF Process Chiller AC LT S ≤ 200 kW	1	7	16	19	21	20	22	24	27	29	31
	PF Process Chiller AC LT L > 200 kW	1	7	16	19	22	21	23	25	27	30	32
	PF Process Chiller WC MT S ≤ 300 kW	1	2	4	5	6	6	6	7	7	8	9
	PF Process Chiller WC MT L > 300 kW	1	3	6	8	9	8	9	10	11	12	13
	PF Process Chiller WC LT S ≤ 200 kW	1	3	6	7	8	7	8	9	9	10	11
	PF Process Chiller WC LT L > 200 kW	1	3	7	8	10	9	10	11	12	13	14
	PF Process Chiller All MT&LT	1	**40**	**86**	**102**	**117**	**110**	**122**	**134**	**146**	**158**	**169**
	PF Condensing Unit MT S 0.2-1 kW	1	14	11	11	12	11	11	12	13	14	15
	PF Condensing Unit MT M 1-5 kW	1	35	29	28	30	27	29	31	34	36	39
	PF Condensing Unit MT L 5-20 kW	1	43	36	35	36	33	36	38	41	44	48
	PF Condensing Unit MT XL 20-50 kW	1	43	36	35	36	33	35	38	41	44	48
	PF Condensing Unit LT S 0.1-0.4 kW	1	2	1	1	2	1	1	2	2	2	2
	PF Condensing Unit LT M 0.4-2 kW	1	7	5	5	6	5	5	6	6	7	7
	PF Condensing Unit LT L 2-8 kW	1	11	9	9	9	8	9	10	10	11	12
	PF Condensing Unit LT XL 8-20 kW	1	34	28	27	28	26	28	30	32	34	37
0.6	**PF Condensing Unit, All MT&LT**	1	**189**	**155**	**151**	**158**	**143**	**155**	**166**	**179**	**193**	**208**
	PF Professional Refrigeration, Total		**128**	**167**	**182**	**201**	**186**	**203**	**220**	**238**	**256**	**275**
	TOTAL FOOD PRESERVATION		**563**	**597**	**608**	**623**	**541**	**560**	**579**	**599**	**618**	**638**
	CA Electric Hobs (active modes)	1	47	73	80	88	80	85	89	93	98	102
	CA Electric Hobs (low-power modes)	1	0	3	4	5	4	5	5	5	5	6
	CA Electric Hobs (sum all modes)	1	47	76	85	93	84	89	94	98	103	107
	CA Electric Ovens (active modes)	1	53	54	51	48	40	40	41	42	42	42
	CA Electric Ovens (low-power modes)	1	0	8	10	12	11	12	12	12	12	13
	CA Electric Ovens (sum all modes)	1	53	61	61	60	51	52	54	54	55	55
	CA Gas Hobs	0	31	25	25	24	23	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	7	6	6	6	6	6
	CA Range Hoods	1	23	28	30	31	28	29	31	32	34	35
	CA Elec. Hobs&Ovens low-power modes	1	0.0	11.0	14.5	17.0	15.4	16.3	16.9	17.4	17.8	18.2
	CA other products or modes		166	189	193	199	176	182	188	193	197	202
	TOTAL COOKING		**166**	**200**	**208**	**216**	**192**	**199**	**205**	**210**	**215**	**220**
	WM Washing Machines, active modes	1	107	86	82	77	60	56	51	47	43	39
	WM Washing Machines, low-power modes	1	0.1	4.1	4.4	4.5	3.8	3.9	3.9	3.9	3.9	3.9
	WM Washing Machines, all modes	1	107	90	87	81	64	60	55	51	47	43
	WD Washer-Dryers, active modes	1	18	21	21	20	16	15	14	13	13	13
	WD Washer-Dryers, low-power modes	1	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	WD Washer-Dryers, all modes	1	18	21	21	20	16	15	14	13	13	13
	WM-WD Washing, sum active modes	1	125	107	103	97	76	71	65	61	56	52
	WM-WD Washing, sum low-power modes	1	0	4	5	5	4	4	4	4	4	4
	Total WM-WD household Washing	1	**125**	**111**	**107**	**101**	**80**	**75**	**69**	**65**	**60**	**56**
	DW Dishwashers, active modes	1	26	46	54	62	58	64	69	73	78	81
	DW Dishwashers, low-power modes	1	0.0	1.2	1.6	2.0	1.9	2.2	2.4	2.7	2.9	3.2
	Total DW household Dishwasher	1	**26**	**47**	**55**	**64**	**60**	**66**	**71**	**76**	**80**	**84**
	LD condensing heat pump	1		0	0	1	1	1	2	2	3	3
	LD condensing electric heat element	1	3	22	22	22	20	20	19	18	17	16
	LD vented electric	1	16	17	15	13	10	9	9	9	9	9
	LD vented gas	0	0	0	0	0	0	0	0	0	0	0
	LD Laundry Dryers, sum active modes		19	39	37	35	29	29	29	29	29	28
	LD Laundry Dryers, low-power modes	1	0.0	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0
	Total LD household Laundry Dryer		**19**	**40**	**38**	**36**	**30**	**30**	**30**	**30**	**30**	**29**

db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	18.8	28.4	37.3	38.9	30.5	25.8	19.2	14.8	13.4	13.1
	VC Upright Domestic mains	1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	VC Handstick Domestic mains	1	0.2	0.4	0.7	1.1	1.4	2.1	2.9	3.5	3.6	3.5
	VC Total Domestic mains		**19**	**29**	**38**	**40**	**32**	**28**	**22**	**18**	**17**	**17**
	VC Cylinder Commercial mains	1	3.8	15.1	17.4	17.8	15.8	16.7	17.6	17.9	17.9	17.9
	VC Upright Commercial mains	1	0.7	2.3	2.1	1.9	1.7	1.8	1.9	1.9	1.9	1.9
	VC Total Commercial mains		**4**	**17**	**19**	**20**	**18**	**18**	**19**	**20**	**20**	**20**
	VC Total in scope of CR 666/2013		**24**	**46**	**58**	**60**	**50**	**47**	**42**	**38**	**37**	**37**
	VC Cordless - domestic - cleaning	1	0.1	0.4	0.6	2.0	3.6	6.0	8.1	9.2	9.5	9.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.8	0.9	0.9
	VC Cordless - domestic - standby	1	0.1	0.3	0.6	1.8	2.6	3.6	4.6	5.3	5.6	5.8
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Robot - domestic - cleaning	1	0.0	0.1	0.3	0.5	0.7	0.9	1.2	1.3	1.4	1.4
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	VC Robot - domestic -standby	1	0.0	0.2	0.5	0.9	1.2	1.6	2.1	2.4	2.6	2.6
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Total Domestic mains+cordless+robots		**19**	**30**	**40**	**45**	**40**	**40**	**38**	**37**	**36**	**36**
	VC Total Commercial mains+cordless+robots		**4**	**17**	**20**	**20**	**18**	**19**	**20**	**21**	**21**	**21**
	Total VC Vacuum Cleaner		**24**	**47**	**60**	**65**	**58**	**59**	**59**	**58**	**57**	**57**
	TOTAL CLEANING		**194**	**245**	**261**	**266**	**228**	**230**	**230**	**228**	**228**	**227**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	41	116	137	154	143	151	154	154	154	154
0.5	FAN Axial>300Pa	1	70	211	245	261	229	235	237	237	237	237
0.5	FAN Centr.FC	1	17	38	46	52	47	50	51	51	51	51
0.5	FAN Centr.BC-free	1	46	97	116	129	119	130	138	142	145	148
0.5	FAN Centr.BC	1	47	109	132	146	136	149	161	173	188	204
0.5	FAN Cross-flow	1	3	5	6	7	7	8	8	9	10	11
	Total FAN, industrial (excl. box & roof fans)		**112**	**288**	**341**	**375**	**341**	**362**	**375**	**383**	**392**	**402**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	243	310	330	341	286	279	269	257	242	223
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	366	479	511	528	442	428	407	381	348	310
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	743	953	997	1023	847	802	731	639	554	499
0.45	**Total 3ph 0.75-375 kW no VSD**		**1352**	**1742**	**1839**	**1892**	**1575**	**1508**	**1407**	**1277**	**1143**	**1032**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	16	38	47	56	56	65	75	87	101	118
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	30	72	90	111	111	130	152	177	207	240
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	85	210	264	327	332	394	462	540	616	672
0.45	**Total 3-ph 0.75-375 kW with VSD**		**131**	**320**	**401**	**494**	**499**	**588**	**689**	**805**	**924**	**1030**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**1483**	**2061**	**2239**	**2387**	**2073**	**2097**	**2095**	**2082**	**2068**	**2062**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	19	24	26	26	22	22	22	21	21	21
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	2	2	3	2	3	3	3	3	3
0.45	**Total Small 1-ph 0.12-0.75 kW**		**19**	**26**	**28**	**29**	**24**	**24**	**24**	**24**	**24**	**24**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	26	34	36	37	31	31	31	31	31	31
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	3	4	5	4	5	5	5	6	6
0.45	**Total Small 3-ph 0.12-0.75 kW**		**26**	**37**	**40**	**42**	**36**	**36**	**36**	**37**	**37**	**37**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	380	462	451	429	339	322	317	314	312	309
0.45	Large 3-ph LV 375-1000kW with VSD	1	19	104	156	216	224	255	272	285	299	313
0.45	**Total Large 3-ph LV 375-1000 kW**		**399**	**566**	**608**	**645**	**563**	**577**	**588**	**599**	**610**	**622**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	8	11	12	13	11	11	12	12	12	12
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	19	28	31	33	29	30	31	31	32	33
0.45	Explosion motors (L) 3-ph 75-375 kW	1	37	54	60	65	58	60	62	64	65	67
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**65**	**93**	**103**	**111**	**99**	**102**	**104**	**107**	**109**	**111**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	6	8	8	9	8	8	8	8	8	8
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	13	19	21	22	19	20	20	21	21	22
0.45	Brake motors (L) 3-ph 75-375 kW	1	19	27	30	33	29	30	31	32	33	33
0.45	**Total Brake 0.75-375 kW (no VSD)**		**37**	**54**	**59**	**64**	**56**	**58**	**59**	**61**	**62**	**63**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	1	1	2	2	2	2	2	2	2	2
0.45	8-pole motors (L) 3-ph 75-375 kW	1	2	3	3	3	3	3	3	3	3	3
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**3**	**5**	**5**	**6**	**5**	**5**	**5**	**6**	**6**	**6**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**100**	**137**	**150**	**161**	**141**	**145**	**147**	**149**	**152**	**154**
	MT Elec. Motors LV 0.12-1000 kW		**1173**	**1639**	**1778**	**1894**	**1649**	**1674**	**1683**	**1685**	**1687**	**1694**

db BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	1	41	54	58	61	54	55	58	62	66	69
ESOB<45_CF	1	27	37	39	43	38	40	43	45	48	51
ESOB<45_VSD-VF	1	1	2	3	4	4	5	6	6	7	7
ESOB < 45 Total	1	**70**	**94**	**100**	**108**	**96**	**101**	**107**	**114**	**120**	**127**
ESOB_45-150_VF	1	14	18	19	20	17	18	18	19	21	22
ESOB_45-150_CF	1	23	32	34	37	33	35	37	39	42	44
ESOB_45-150_VSD-VF	1	1	1	2	2	3	3	4	4	4	4
ESOB 45-150 Total	1	**38**	**51**	**55**	**59**	**53**	**56**	**59**	**63**	**66**	**70**
ESOB < 150 Total	1	**108**	**145**	**154**	**167**	**149**	**157**	**166**	**176**	**187**	**197**
ESCC<45_VF	1	34	45	48	51	44	45	47	50	53	56
ESCC<45_CF	1	23	31	33	36	32	34	36	38	41	43
ESCC<45_VSD-VF	1	1	3	3	4	4	6	6	6	7	7
ESCC < 45 Total	1	**59**	**78**	**84**	**90**	**81**	**84**	**89**	**95**	**100**	**106**
ESCC_45-150_VF	1	13	16	17	18	16	16	17	18	19	20
ESCC_45-150_CF	1	9	12	13	14	12	13	14	15	15	16
ESCC_45-150_VSD-VF	1	0	1	1	1	2	2	2	2	3	3
ESCC 45-150 Total	1	**22**	**29**	**31**	**33**	**30**	**31**	**33**	**35**	**37**	**40**
ESCC < 150 Total	1	**80**	**108**	**115**	**124**	**110**	**116**	**122**	**130**	**138**	**146**
ESCCi<45_VF	1	17	21	21	21	15	14	14	14	15	16
ESCCi<45_CF	1	1	2	2	2	2	2	2	2	3	3
ESCCi<45_VSD-VF	1	2	5	6	8	9	11	12	13	13	14
ESCCi < 45 Total	1	**21**	**28**	**29**	**31**	**26**	**27**	**28**	**30**	**31**	**33**
ESCCi_45-150_VF	1	3	4	4	4	3	3	3	3	3	3
ESCCi_45-150_CF	1	0	0	0	0	0	0	0	0	1	1
ESCCi_45-150_VSD-VF	1	0	1	1	1	2	2	2	2	3	3
ESCCi 45-150 Total	1	**4**	**5**	**6**	**6**	**5**	**5**	**5**	**6**	**6**	**6**
ESCCi < 150 Total	1	**25**	**33**	**35**	**37**	**31**	**32**	**33**	**35**	**37**	**40**
MSSB<6"_VF	1	6	7	7	7	6	6	6	6	7	7
MSSB<6"_CF	1	33	45	48	52	47	49	52	55	59	62
MSSB<6"_VSD-VF	1	1	1	2	2	2	3	3	3	3	4
MSSB <6" Total	1	**40**	**53**	**57**	**61**	**55**	**58**	**61**	**65**	**69**	**73**
MS-V<25bar_VF	1	25	33	34	36	30	30	31	33	35	37
MS-V<25bar_CF	1	16	22	23	25	23	24	25	27	28	30
MS-V<25bar_VSD-VF	1	2	3	4	5	6	7	8	9	9	10
MS_V <25 bar Total	1	**43**	**58**	**61**	**66**	**59**	**61**	**65**	**69**	**73**	**77**
WP Water pumps		**297**	**396**	**422**	**454**	**405**	**423**	**447**	**475**	**504**	**532**
WE arc-on-mode	1	15	15	15	15	13	13	13	13	13	13
WE idle mode	1	1	1	1	1	1	1	1	1	1	1
Total WE Welding Equipment		**16**	**16**	**16**	**16**	**13**	**14**	**14**	**14**	**14**	**14**
TOTAL INDUSTRY COMPONENTS		**1599**	**2339**	**2557**	**2739**	**2408**	**2473**	**2518**	**2557**	**2597**	**2642**
TRAFO Distribution	1	26	44	49	55	51	56	61	66	71	76
TRAFO Industry oil	1	20	34	38	42	39	42	46	49	52	56
TRAFO Industry dry	1	6	11	12	13	12	13	14	15	17	18
TRAFO Power	1	75	116	131	146	135	147	159	171	184	196
TRAFO DER oil	1	0	1	2	3	5	8	12	19	26	35
TRAFO DER dry	1	0	4	8	14	20	32	52	79	111	148
TRAFO Small	1	4	4	4	4	4	4	4	4	4	4
Total TRAFO Utility Transformers		**131**	**215**	**244**	**277**	**264**	**302**	**348**	**402**	**464**	**533**
TOTAL ENERGY SECTOR (BAU taken as reference = 0)		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Tyres C1, replacement for cars	0	372	281	259	252	252	246	236	225	213	203
Tyres C1, OEM for cars	0	112	82	81	77	76	74	71	68	64	61
Tyres C1, total		**484**	**364**	**340**	**329**	**328**	**320**	**308**	**292**	**277**	**264**
Tyres C2, replacement for vans	0	109	96	91	96	101	107	104	99	94	90
Tyres C2, OEM for vans	0	23	20	19	21	21	22	22	21	20	19
Tyres C2, total		**131**	**116**	**109**	**117**	**123**	**129**	**126**	**120**	**114**	**109**
Tyres C3, replacement for trucks/busses	0	173	129	119	147	158	173	176	174	171	169
Tyres C3, OEM for trucks/busses	0	38	28	28	32	35	39	39	39	38	38
Tyres C3, total		**211**	**158**	**147**	**179**	**193**	**211**	**215**	**212**	**210**	**207**
Tyres, total C1+C2+C3		**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
TRANSPORT SECTOR		**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
BAU Primary Energy, Total, in TWh		**8219**	**9629**	**9807**	**9908**	**8695**	**8616**	**8546**	**8517**	**8558**	**8638**
BAU Primary Energy, Total, in PJ		29588	34664	35304	35669	31301	31016	30766	30660	30808	31098
BAU Primary Energy, Total, in mtoe		707	828	843	852	748	741	735	732	736	743

BAU Primary Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	405	581	581	559	487	489	505	524	542	561
SPACE HEATING	3543	3186	2992	2756	2405	2222	2114	2046	2010	1975
SPACE & HT PROCESS COOLING	183	399	427	435	370	371	371	374	379	384
VENTILATION (from electricity)	66	108	111	113	101	112	124	136	148	160
1 *Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
LIGHTING	494	789	856	936	765	703	651	636	650	686
ELECTRONICS	181	548	610	640	554	596	599	582	569	566
FOOD PRESERVATION	563	597	608	623	541	560	579	599	618	638
COOKING	166	200	208	216	192	199	205	210	215	220
CLEANING	194	245	261	266	228	230	230	228	228	227
INDUSTRY COMPONENTS	1599	2339	2557	2739	2408	2473	2518	2557	2597	2642
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	826	637	597	625	643	660	649	625	601	579
BAU Primary Energy, Total, in TWh	**8219**	**9629**	**9807**	**9908**	**8695**	**8616**	**8546**	**8517**	**8558**	**8638**
BAU Primary Energy, Total, in PJ	29588	34664	35304	35669	31301	31016	30766	30660	30808	31098
BAU Primary Energy, Total, in mtoe	707	828	843	852	748	741	735	732	736	743



Sector subdivision for BAU Primary Energy

This subdivision uses the same sector definitions as used in Eurostat Energy Balances for Final Energy, plus the Energy sector
The Primary Energy per function and per sector presented here is the sum of the Final Energy consumed for that function in that sector
and the share of the additional energy input required for the generation and distribution of that Final Energy
There is no comparable subdivision in Eurostat (see the FNRG-, ELEC- and FUEL- sheets for a comparison with Eurostat data

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears, and includes estimate for Special Purpose Lamps, controls and standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. The data considered here are Distribution Losses. As these losses are already considered
when computing the Primary Energy for other sectors, only the decrease of the losses in the ECO scenario vs. the BAU scenario is reported.
(reference for BAU = 0)

BAU Primary Energy (summary ENERGY SECTOR, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR (BAU taken as reference = 0)	0	0	0	0	0	0	0	0	0	0
BAU Primary Energy, Energy Sector, in TWh	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
BAU Primary Energy, Energy Sector, in PJ	0	0	0	0	0	0	0	0	0	0
BAU Primary Energy, Energy Sector, in mtoe	0	0	0	0	0	0	0	0	0	0

BAU Primary Energy (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	12	17	17	17	15	15	15	16	16	17
SPACE HEATING	195	181	167	152	132	120	112	107	103	99
SPACE & HT PROCESS COOLING	47	85	93	98	84	84	83	83	84	84
VENTILATION	8	12	12	12	10	11	12	13	13	14
LIGHTING	63	103	117	133	116	112	108	107	110	116
ELECTRONICS	3	23	23	26	26	29	30	30	29	29
FOOD PRESERVATION	49	90	104	118	111	121	133	144	156	167
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	1	2	2	2	2	2	2	3	3	3
INDUSTRY COMPONENTS	1071	1515	1646	1757	1535	1567	1585	1599	1612	1630
BAU Primary Energy, Industry, in TWh	**1448**	**2028**	**2181**	**2315**	**2030**	**2061**	**2080**	**2100**	**2125**	**2159**
BAU Primary Energy, Industry, in PJ	5212	7299	7851	8334	7308	7420	7490	7560	7651	7772
BAU Primary Energy, Industry, in mtoe	124	174	188	199	175	177	179	181	183	186

BAU Primary Energy (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	110	103	117	123	132	132	128	124	121
TYRES for SERVICE-sector-related transport	278	218	205	227	238	252	251	243	236	229
TYRES for RESIDENTIAL-sector-related transport	387	291	272	263	262	256	246	234	222	211
TYRES for OTHER-sector-related transport	22	17	16	18	19	20	20	20	19	18
BAU Primary Energy, Transport, in TWh	**826**	**637**	**597**	**625**	**643**	**660**	**649**	**625**	**601**	**579**
BAU Primary Energy, Transport, in PJ	2974	2292	2149	2251	2315	2377	2337	2249	2165	2085
BAU Primary Energy, Transport, in mtoe	71	55	51	54	55	57	56	54	52	50

BAU Primary Energy (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	95	133	133	129	110	111	116	121	126	131
SPACE HEATING	817	845	799	741	639	597	570	550	538	524
SPACE & HT PROCESS COOLING	117	246	267	277	236	236	235	235	236	238
VENTILATION	51	78	79	79	68	73	78	83	88	93
LIGHTING	253	447	501	567	495	476	451	448	464	496
ELECTRONICS	68	200	216	242	229	250	255	251	246	244
FOOD PRESERVATION	247	235	229	225	193	199	206	214	222	230
COOKING	23	24	24	24	21	21	22	22	22	22
CLEANING	10	24	26	27	24	25	26	27	27	27
INDUSTRY COMPONENTS	390	639	713	769	682	708	725	738	752	768
BAU Primary Energy, Services, in TWh	**2070**	**2871**	**2985**	**3080**	**2697**	**2696**	**2683**	**2688**	**2721**	**2773**
BAU Primary Energy, Services, in PJ	7452	10335	10748	11088	9709	9707	9659	9676	9797	9983
BAU Primary Energy, Services, in mtoe	178	247	257	265	232	232	231	231	234	238

BAU Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	294	425	424	409	359	359	370	383	395	407
SPACE HEATING	2469	2100	1972	1813	1590	1466	1395	1355	1337	1319
SPACE & HT PROCESS COOLING	6	45	41	33	27	28	30	31	34	38
VENTILATION	7	17	19	21	21	27	33	40	46	52
LIGHTING	173	231	229	226	147	107	86	75	69	67
ELECTRONICS	110	323	369	369	298	314	312	300	291	290
FOOD PRESERVATION	258	261	264	267	226	226	226	226	225	224
COOKING	143	176	184	192	171	177	183	188	193	198
CLEANING	183	219	232	237	202	203	201	198	198	197
INDUSTRY COMPONENTS	50	67	72	77	69	72	76	81	86	90
BAU Primary Energy, Residential, in TWh	**3693**	**3864**	**3807**	**3644**	**3109**	**2980**	**2912**	**2876**	**2874**	**2883**
BAU Primary Energy, Residential, in PJ	13294	13910	13706	13117	11193	10729	10482	10352	10345	10380
BAU Primary Energy, Residential, in mtoe	318	332	327	313	267	256	250	247	247	248

BAU Primary Energy (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4	5	6	5	5	5	5	5	5	5
SPACE HEATING	62	60	55	50	44	40	37	35	33	32
SPACE & HT PROCESS COOLING	14	23	25	27	23	24	24	24	24	25
VENTILATION	1	1	1	1	1	1	1	1	1	1
LIGHTING	5	8	9	10	8	7	7	7	7	8
ELECTRONICS	1	2	2	2	2	2	2	2	2	2
FOOD PRESERVATION	9	11	12	13	12	13	14	15	16	17
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	87	118	127	136	121	126	132	139	147	154
BAU Primary Energy, Other sectors, in TWh	**182**	**230**	**236**	**244**	**216**	**218**	**222**	**229**	**236**	**244**
BAU Primary Energy, Other sectors, in PJ	657	827	850	880	777	783	799	823	850	878
BAU Primary Energy, Other sectors, in mtoe	16	20	20	21	19	19	19	20	20	21

BAU Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	405	581	581	559	487	489	505	524	542	561
	Residential	294	425	424	409	359	359	370	383	395	407
	Tertiary / Services	95	133	133	129	110	111	116	121	126	131
	Industry	12	17	17	17	15	15	15	16	16	17
	Other	4	5	6	5	5	5	5	5	5	5
SPACE HEATING.	All sectors, TWh	3543	3186	2992	2756	2405	2222	2114	2046	2010	1975
	Residential	2469	2100	1972	1813	1590	1466	1395	1355	1337	1319
	Tertiary / Services	817	845	799	741	639	597	570	550	538	524
	Industry	195	181	167	152	132	120	112	107	103	99
	Other	62	60	55	50	44	40	37	35	33	32
SPACE COOLING.	All sectors, TWh	183	399	427	435	370	371	371	374	379	384
& HT PROCESS	Residential	6	45	41	33	27	28	30	31	34	38
	Tertiary / Services	117	246	267	277	236	236	235	235	236	238
	Industry	47	85	93	98	84	84	83	83	84	84
	Other	14	23	25	27	23	24	24	24	24	25
VENTILATION.	All sectors, TWh	66	108	111	113	101	112	124	136	148	160
	Residential	7	17	19	21	21	27	33	40	46	52
	Tertiary / Services	51	78	79	79	68	73	78	83	88	93
	Industry	8	12	12	12	10	11	12	13	13	14
	Other	1	1	1	1	1	1	1	1	1	1
LIGHTING.	All sectors, TWh	494	789	856	936	765	703	651	636	650	686
	Residential	173	231	229	226	147	107	86	75	69	67
	Tertiary / Services	253	447	501	567	495	476	451	448	464	496
	Industry	63	103	117	133	116	112	108	107	110	116
	Other	5	8	9	10	8	7	7	7	7	8
ELECTRONICS.	All sectors, TWh	181	548	610	640	554	596	599	582	569	566
	Residential	110	323	369	369	298	314	312	300	291	290
	Tertiary / Services	68	200	216	242	229	250	255	251	246	244
	Industry	3	23	23	26	26	29	30	30	29	29
	Other	1	2	2	2	2	2	2	2	2	2
FOOD PRESERVE.	All sectors, TWh	563	597	608	623	541	560	579	599	618	638
	Residential	258	261	264	267	226	226	226	226	225	224
	Tertiary / Services	247	235	229	225	193	199	206	214	222	230
	Industry	49	90	104	118	111	121	133	144	156	167
	Other	9	11	12	13	12	13	14	15	16	17
COOKING.	All sectors, TWh	166	200	208	216	192	199	205	210	215	220
	Residential	143	176	184	192	171	177	183	188	193	198
	Tertiary / Services	23	24	24	24	21	21	22	22	22	22
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	194	245	261	266	228	230	230	228	228	227
	Residential	183	219	232	237	202	203	201	198	198	197
	Tertiary / Services	10	24	26	27	24	25	26	27	27	27
	Industry	1	2	2	2	2	2	2	3	3	3
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	1599	2339	2557	2739	2408	2473	2518	2557	2597	2642
	Residential	50	67	72	77	69	72	76	81	86	90
	Tertiary / Services	390	639	713	769	682	708	725	738	752	768
	Industry	1071	1515	1646	1757	1535	1567	1585	1599	1612	1630
	Other	87	118	127	136	121	126	132	139	147	154
TYRES.	Transport sector, TWh	826	637	597	625	643	660	649	625	601	579
	Residential transport	387	291	272	263	262	256	246	234	222	211
	Tertiary / Services transport	278	218	205	227	238	252	251	243	236	229
	Industry transport	139	110	103	117	123	132	132	128	124	121
	Other transport	22	17	16	18	19	20	20	20	19	18
ALL PRODUCTS.	All sectors, TWh	8219	9629	9807	9908	8695	8616	8546	8517	8558	8638
	Residential	3693	3864	3807	3644	3109	2980	2912	2876	2874	2883
	Tertiary / Services	2070	2871	2985	3080	2697	2696	2683	2688	2721	2773
	Industry	1448	2028	2181	2315	2030	2061	2080	2100	2125	2159
	Other	182	230	236	244	216	218	222	229	236	244
	Transport	826	637	597	625	643	660	649	625	601	579

BAU Primary Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	73%	73%	73%	74%	73%	73%	73%	73%	73%
	Tertiary / Services	23%	23%	23%	23%	23%	23%	23%	23%	23%	23%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	70%	66%	66%	66%	66%	66%	66%	66%	67%	67%
	Tertiary / Services	23%	27%	27%	27%	27%	27%	27%	27%	27%	27%
	Industry	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	11%	10%	8%	7%	8%	8%	8%	9%	10%
	Tertiary / Services	64%	62%	63%	64%	64%	63%	63%	63%	62%	62%
	Industry	26%	21%	22%	23%	23%	23%	22%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION (from electricity).											
	Residential	10%	16%	17%	19%	21%	24%	27%	29%	31%	33%
	Tertiary / Services	77%	72%	71%	70%	68%	65%	63%	61%	59%	58%
	Industry	12%	11%	11%	11%	10%	10%	9%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	29%	27%	24%	19%	15%	13%	12%	11%	10%
	Tertiary / Services	51%	57%	59%	61%	65%	68%	69%	70%	71%	72%
	Industry	13%	13%	14%	14%	15%	16%	17%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	61%	58%	54%	53%	52%	51%	51%	51%
	Tertiary / Services	37%	36%	35%	38%	41%	42%	43%	43%	43%	43%
	Industry	2%	4%	4%	4%	5%	5%	5%	5%	5%	5%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential	46%	44%	43%	43%	42%	40%	39%	38%	36%	35%
	Tertiary / Services	44%	39%	38%	36%	36%	36%	36%	36%	36%	36%
	Industry	9%	15%	17%	19%	20%	22%	23%	24%	25%	26%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
COOKING.											
	Residential	86%	88%	89%	89%	89%	89%	89%	90%	90%	90%
	Tertiary / Services	14%	12%	11%	11%	11%	11%	11%	10%	10%	10%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	89%	89%	89%	89%	88%	87%	87%	87%	87%
	Tertiary / Services	5%	10%	10%	10%	10%	11%	11%	12%	12%	12%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Tertiary / Services	24%	27%	28%	28%	28%	29%	29%	29%	29%	29%
	Industry	67%	65%	64%	64%	64%	63%	63%	63%	62%	62%
	Other	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%
TYRES.											
	Residential transport	47%	46%	46%	42%	41%	39%	38%	37%	37%	36%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	20%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	45%	40%	39%	37%	36%	35%	34%	34%	34%	33%
	Tertiary / Services	25%	30%	30%	31%	31%	31%	31%	32%	32%	32%
	Industry	18%	21%	22%	23%	23%	24%	24%	25%	25%	25%
	Other	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%
	Transport	10%	7%	6%	6%	7%	8%	8%	7%	7%	7%

db ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
efficiency elec. gen.&distr. CC (from sheet General)		*40%*	*40%*	*40%*	*40%*	*48%*	*48%*	*48%*	*48%*	*48%*	*48%*
EIWH Electric Instant. < 12 kW (secondary)	1.00	1	1	1	1	1	1	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	16	19	18	16	12	12	12	14	15	16
EIWHS Electric Instant. Shower (secondary)	1.00	2	3	3	3	2	2	2	2	3	3
ESWH Electric Storage ≤ 30 L (secondary)	1.00	18	22	22	20	17	17	18	20	21	22
ESWH Electric Storage > 30 L (primary)	1.00	143	199	203	191	149	151	160	170	180	190
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	8	9	8	6	5	4	4	4	4	4
GSWH Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	3	2
Dedicated WH Heat Pump	1.00	0	1	2	3	4	7	9	11	14	17
Dedicated WH Solar (3.5 m2)	0.80	2	14	17	17	14	13	12	12	12	12
WH dedicated Water Heater		**228**	**305**	**303**	**278**	**218**	**217**	**229**	**244**	**258**	**273**
CHB Gas Combi Instant. WH	0.04	58	139	142	136	123	115	109	102	93	84
CHB Gas + Cyl. WH	0.04	37	59	57	52	45	41	39	36	33	30
CHB Jet Burner Gas + Cyl. WH	0.04	9	8	6	5	4	2	2	2	2	2
CHB Jet Burner Oil + Cyl. WH	0.04	70	60	48	36	26	17	14	14	14	15
CHB Electric (Joule) + Cyl. WH	1.00	3	4	4	4	4	4	4	3	3	3
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	1	2	3	5	7	10
CHB Electric HP + Cyl. WH	1.00	1	5	7	10	12	18	26	35	43	52
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	1	1	2	2	3	4
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	1
CHB Solar Combi (16 m2)	0.04	1	1	1	1	1	1	1	1	1	1
CHC Central Heating combi, water heating		**177**	**276**	**266**	**245**	**216**	**201**	**200**	**201**	**201**	**201**
TOTAL WATER HEATING		**405**	**581**	**570**	**523**	**433**	**419**	**429**	**444**	**459**	**474**
CHB Gas non-condensing	0.04	777	872	670	416	195	91	36	20	11	7
CHB Gas condensing	0.04	8	272	396	542	628	646	622	550	487	422
CHB Gas Jet burner non-condensing	0.04	84	55	41	28	16	7	2	1	1	1
CHB Gas Jet burner condensing	0.04	0	1	2	4	6	7	8	9	9	9
CHB Oil Jet burner non-condensing	0.04	1044	672	500	339	199	83	27	13	9	7
CHB Oil Jet burner condensing	0.04	0	10	22	38	54	70	78	82	83	83
CHB Electric Joule-effect	1.00	32	33	34	36	30	27	25	21	19	16
CHB Hybrid (gas-electric)	0.60	0	0	0	1	3	6	10	15	21	27
CHB Electric Heat Pump	1.00	5	28	38	50	58	79	108	138	166	191
CHB Gas Heat Pump	0.04	0	0	0	1	1	2	3	4	5	5
CHB micro CHP	0.04	0	0	1	1	1	2	3	3	4	4
CHB Solar combi (16 m2)	0.10	6	7	7	7	6	6	5	4	4	4
CHB Central Heating boiler < 400 kW, space heating		**1957**	**1950**	**1712**	**1462**	**1198**	**1026**	**927**	**861**	**818**	**776**
SFB Wood Manual	0	342	90	69	48	30	16	9	6	5	4
SFB Wood Direct Draft	0	2	23	43	60	70	67	66	71	81	93
SFB Coal	0	364	107	105	84	59	35	23	21	19	16
SFB Pellets	0	0	9	16	22	26	28	29	29	30	31
SFB Wood chips	0	0	14	17	19	17	15	16	17	18	19
Total Solid Fuel Boiler		**709**	**243**	**250**	**233**	**202**	**161**	**143**	**144**	**152**	**164**
CHAE-S (≤ 400 kW)	1	8	23	26	27	23	22	22	22	22	22
CHAE-L (> 400 kW)	1	13	31	35	36	29	26	24	23	21	21
CHWE-S (≤ 400 kW)	1	1	2	3	3	2	2	2	2	2	2
CHWE-M (> 400 kW; ≤ 1500 kW)	1	3	7	8	8	6	6	6	5	5	5
CHWE-L (> 1500 kW)	1	2	4	5	5	4	4	3	3	3	3
CHF	0.05	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	1	50	80	88	93	78	77	78	80	82	84
HT PCH-AE-L	1	48	76	84	87	73	70	69	70	71	73
HT PCH-WE-S	1	10	17	19	20	17	17	17	18	18	19
HT PCH-WE-M	1	20	33	36	39	34	34	35	36	37	37
HT PCH-WE-L	1	4	7	7	8	7	7	7	7	7	7
AC rooftop	1	7	17	17	15	9	6	3	1	1	1
AC splits	1	9	28	27	25	19	16	14	13	12	11
AC VRF	1	0	7	10	14	13	16	18	20	21	22
ACF	0.05	0	0	0	0	0	0	0	0	0	0
SubTotal AHC central Air Cooling		**176**	**333**	**365**	**379**	**314**	**304**	**299**	**299**	**303**	**307**
AC rooftop (rev)	1	9	29	29	24	15	8	4	1	0	0
AC splits (rev)	1	17	53	55	52	39	34	30	27	24	22
AC VRF (rev)	1	0	17	26	34	35	40	45	46	47	47
ACF (rev)	0.05	0	0	0	0	0	0	1	1	1	1
AHF	0.05	204	148	127	105	84	68	58	51	45	40
AHE	1	2	6	5	3	2	2	2	2	2	2
SubTotal AHC central Air Heating		**233**	**254**	**241**	**219**	**175**	**153**	**138**	**127**	**119**	**111**
Total AHC central Air Heating & Cooling		**409**	**587**	**606**	**598**	**489**	**457**	**437**	**427**	**421**	**417**

db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	14	18	19	19	17	16	14	13	13	12
	LH closed fireplace/inset	0	18	41	48	53	56	57	56	54	52	51
	LH wood stove	0	38	37	37	37	35	34	33	32	31	30
	LH coal stove	0	23	13	11	10	9	7	6	4	3	3
	LH cooker	0	7	11	12	13	14	14	14	13	13	13
	LH SHR stove	0	16	21	22	24	26	29	31	32	33	33
	LH pellet stove	0	0	8	11	13	15	16	16	17	16	16
	LH Solid fuel sum		**117**	**148**	**161**	**170**	**173**	**172**	**170**	**166**	**161**	**158**
	LH Electric portable	1	58	54	52	46	34	32	31	29	28	27
	LH Electric fixed > 250W	1	310	277	253	211	144	121	114	108	103	99
	LH Electric fixed ≤ 250W	1	21	19	17	14	10	8	8	7	7	7
	LH Electric storage	1	18	17	15	13	9	8	7	7	7	6
	LH Electric underfloor	1	53	52	51	49	40	38	36	34	33	31
	LH Electric visibly glowing > 1.2 kW	1	5	5	4	4	3	3	3	3	2	2
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	1	16	23	24	23	18	16	15	15	14	13
	LH Electric sum		**482**	**447**	**417**	**362**	**258**	**227**	**214**	**204**	**195**	**186**
	LH Gas luminous (commercial)	0	1.2	1.0	1.0	0.9	0.8	0.6	0.5	0.5	0.5	0.4
	LH Gaseous Tube (commercial < 120 kW)	0	2.8	2.4	2.3	2.1	1.8	1.5	1.3	1.1	1.0	1.0
	LH Gas open front	0	1.2	1.0	0.9	0.8	0.7	0.6	0.6	0.5	0.4	0.4
	LH Gas closed front	0	4.1	2.4	1.9	1.4	1.1	0.8	0.7	0.6	0.5	0.5
	LH Gas balanced flue	0	8.8	4.8	3.5	2.5	1.7	1.1	0.9	0.8	0.7	0.6
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**18.3**	**11.5**	**9.6**	**7.7**	**6.1**	**4.8**	**3.9**	**3.4**	**3.1**	**2.9**
	LH Liquid tube (commercial < 120 kW)	0	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH Liquid open front	0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	LH Liquid balanced flue	0	0.8	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Liquid flueless	0	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**1.9**	**1.1**	**0.9**	**0.6**	**0.5**	**0.4**	**0.3**	**0.3**	**0.2**	**0.2**
	LH Local Space Heaters total		**619**	**607**	**588**	**541**	**437**	**405**	**388**	**373**	**359**	**347**
	RAC fixed < 6 kW, cooling	1	5	32	25	18	15	17	19	21	23	25
	RAC fixed 6-12 kW, cooling	1	2	16	14	11	9	10	11	11	12	13
	RAC portable < 12 kW, cooling	1	0	3	2	2	2	2	2	2	2	2
	RAC < 12 kW total, cooling mode		**7**	**50**	**41**	**30**	**26**	**28**	**31**	**34**	**37**	**41**
	RAC fixed < 6 kW, reversible, heating	1	2	41	44	41	42	55	69	85	100	112
	RAC fixed 6-12 kW, reversible, heating	1	1	19	22	22	22	27	33	40	45	49
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**3**	**60**	**66**	**62**	**64**	**83**	**102**	**125**	**145**	**161**
	RAC Room Air Conditioner		**10**	**110**	**107**	**93**	**90**	**111**	**133**	**159**	**183**	**201**
1	CIRC Integrated circulators	1	32	47	43	34	25	26	27	27	27	27
0.38	CIRC Large standalone circulators	1	21	29	24	17	12	11	10	10	10	10
0.38	CIRC Small standalone circulators	1	16	22	16	10	7	6	6	6	6	6
	CIRC Circulator pumps <2.5 kW, all	1	**69**	**98**	**83**	**61**	**44**	**44**	**43**	**43**	**43**	**43**
	CIRC Circulator pumps <2.5 kW, excl. double		**22**	**31**	**25**	**17**	**12**	**11**	**10**	**10**	**10**	**10**
	TOTAL SPACE HEATING		**3543**	**3147**	**2881**	**2533**	**2089**	**1839**	**1709**	**1640**	**1603**	**1567**
	TOTAL SPACE COOLING		**183**	**383**	**406**	**409**	**339**	**332**	**330**	**333**	**340**	**347**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0	0	0	0	0	0	0	0	0	0
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0	0	0	0	0	0	0	0	0	0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0	0	0	1	1	3	4	5	7	8
	R-UVU 100-250 m3/h	1	1	2	2	2	2	1	1	1	2	2
	R-BVU 100-250 m3/h	1	0	0	0	0	0	1	1	2	2	2
	R-UVU 250-1000 m3/h	1	5	13	13	13	10	10	9	9	9	9
	R-BVU 250-1000 m3/h	1	0	1	2	2	3	6	9	12	14	17
	R-UVU > 1000 m3/h	1	0	0	0	0	0	0	0	0	0	0
	R-BVU 1000-2500 m3/h	1	0	0	0	1	0	1	1	1	1	1
	RVU, Total residential, from VU own electricity		**7**	**17**	**19**	**19**	**18**	**21**	**26**	**31**	**35**	**40**
	NR-UVU 250-1000 m3/h	1	2	5	5	5	4	3	3	3	3	3
	NR-BVU 250-1000 m3/h	1	0	2	3	3	3	4	4	5	5	6
	NR-UVU > 1000 m3/h	1	1	3	2	2	1	1	1	1	1	1
	NR-BVU 1000-2500 m3/h	1	0	2	2	3	2	3	3	3	4	4
	NR-AHU-S 2500-5500 m3/h	1	1	6	9	10	10	10	12	13	14	16
	NR-AHU-M 5500-14500 m3/h	1	43	57	54	50	40	41	42	43	45	46
	NR-AHU-L > 14500 m3/h	1	12	16	15	14	11	11	11	12	12	13
	NRVU, Total non-residential, from VU own electricity		**60**	**91**	**91**	**87**	**72**	**73**	**76**	**80**	**85**	**88**
	VU Ventilation Units, res + non-res., from VU own elec.		**66**	**108**	**109**	**107**	**90**	**95**	**102**	**111**	**120**	**129**
	TOTAL VENTILATION (from VU own electricity)		**66**	**108**	**109**	**107**	**90**	**95**	**102**	**111**	**120**	**129**
1	***Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)***		*-*	*-*	*-5*	*-21*	*-38*	*-54*	*-62*	*-65*	*-67*	*-69*

db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS, primary energy incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	193	301	352	376	256	143	65	32	18	11
	HID (HPM, HPS, MH)	1	71	152	131	112	70	37	14	5	2	1
	CFLni (all shapes)	1	5	20	21	17	10	5	2	1	0	0
	CFLi (retrofit for GLS, HL)	1	2	34	45	35	11	3	0	0	0	0
	GLS (DLS & NDLS)	1	184	106	29	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	1	16	101	126	52	3	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	1	0	0	4	30	83	154	209	246	278	313
	LED replacing HID (retrofit & luminaire)	1	0	0	22	46	60	80	97	113	130	148
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	3	5	7	8	9	10	12
	LED replacing DLS (retrofit & luminaire)	1	0	0	2	8	10	11	12	12	13	14
	LED replacing NDLS (retrofit & luminaire)	1	0	0	4	27	40	46	49	52	55	58
	Standby	1	*23*	*37*	*32*	*27*	*19*	*16*	*16*	*16*	*16*	*16*
	TOTAL LIGHTING (incl. standby)		**494**	**751**	**769**	**734**	**566**	**502**	**473**	**486**	**522**	**572**
	DP TV on-mode, total all types	1	58.7	153.9	164.5	141.4	74.3	67.1	59.0	64.0	74.2	85.6
	DP TV standby, standard (NoNA)	1	7.7	4.9	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	1	0.0	0.3	1.5	2.5	1.4	0.3	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	1	0.0	0.0	3.8	10.4	13.3	16.6	17.3	15.7	13.4	11.1
	DP TV standby, total all types		**8**	**5**	**7**	**13**	**15**	**17**	**17**	**16**	**13**	**11**
	DP TV total on-mode + standby		**66**	**159**	**171**	**155**	**89**	**84**	**76**	**80**	**88**	**97**
	DP Monitor on-mode	1	1.8	31.0	16.9	6.8	5.0	3.4	2.5	2.5	2.7	2.9
	DP Monitor standby	1	0.4	1.3	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	DP Monitor total		**2**	**32**	**17**	**7**	**5**	**3**	**3**	**3**	**3**	**3**
	DP Signage on-mode	1	0.0	2.3	19.7	44.8	44.3	36.8	28.2	27.1	30.2	34.8
	DP Signage standby	1	0.0	0.3	3.0	6.7	6.6	5.5	4.2	4.1	4.5	5.2
	DP Signage total		**0**	**3**	**23**	**52**	**51**	**42**	**32**	**31**	**35**	**40**
	DP Electronic Displays, total on-mode		**61**	**187**	**201**	**193**	**124**	**107**	**90**	**94**	**107**	**123**
	DP Electronic Displays, total standby		**8**	**7**	**10**	**20**	**21**	**23**	**22**	**20**	**18**	**16**
	DP Electronic Displays, total		**69**	**194**	**211**	**213**	**145**	**130**	**111**	**113**	**125**	**140**
	SSTB	1	0	4	3	0	0	0	0	0	0	0
	CSTB (low-power modes)	1	0	13	26	21	17	16	16	16	16	16
	CSTB (other modes)	1	0	7	14	12	9	9	9	9	9	9
	CSTB (all covered modes)	1	0	19	41	33	26	25	25	25	25	25
	Total STB set top boxes (Complex & Simple)		**0**	**23**	**44**	**33**	**26**	**25**	**25**	**25**	**25**	**25**
	Game consoles > 20 W Active modes (SRI)	1	0.0	6.1	9.3	8.9	7.4	7.4	7.4	7.4	7.4	7.4
	Game consoles > 20 W Non-Active (CR)	1	0.0	3.1	3.7	2.3	1.3	1.2	1.2	1.2	1.2	1.2
	Game consoles < 20 W Non-Active (CR)	1	0.0	2.3	2.3	1.3	0.7	0.7	0.7	0.7	0.7	0.7
	Game consoles < 20 W Active (no reg.)	1	0.0	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	Total Game consoles, active modes		0.0	6.4	9.7	9.2	7.6	7.6	7.6	7.6	7.6	7.6
	Total Game consoles, non-active modes		0.0	5.4	6.0	3.6	1.9	1.9	1.9	1.9	1.9	1.9
	Total Game consoles > 20 W, all modes		0.0	9.2	13.0	11.2	8.7	8.7	8.7	8.7	8.7	8.7
	Total Game consoles < 20 W, all modes		0.0	2.7	2.7	1.6	0.9	0.9	0.9	0.9	0.9	0.9
	Total Game consoles, all modes		**0**	**12**	**16**	**13**	**10**	**10**	**10**	**10**	**10**	**10**
	ES&DS only, without effects on infrastructure											
	ES tower 1-socket traditional	1	0.1	2.3	1.9	1.2	0.8	0.7	0.6	0.6	0.6	0.6
	ES rack 1-socket traditional	1	0.3	7.1	5.3	4.4	3.7	4.1	4.1	4.1	4.1	4.1
	ES rack 2-socket traditional	1	1.6	32.5	17.4	9.8	9.5	11.3	12.2	12.2	12.2	12.2
	ES rack 2-socket cloud	1	0.0	18.2	28.2	29.8	29.2	34.8	37.7	37.7	37.7	37.7
	ES rack 4-socket traditional	1	0.2	3.4	1.9	1.4	1.3	1.6	1.7	1.7	1.7	1.7
	ES rack 4-socket cloud	1	0.0	2.1	3.6	4.5	4.5	5.3	5.8	5.8	5.8	5.8
	ES rack 2-socket resilient trad.	1	0.1	1.7	0.9	0.5	0.4	0.5	0.5	0.5	0.5	0.5
	ES rack 2-socket resilient cloud	1	0.0	0.8	1.2	1.2	1.0	1.2	1.3	1.3	1.3	1.3
	ES rack 4-socket resilient trad.	1	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	1	0.1	2.0	1.8	1.5	1.2	1.3	1.3	1.3	1.3	1.3
	ES blade 2-socket traditional	1	1.3	14.8	7.6	4.7	4.5	5.4	5.9	5.9	5.9	5.9
	ES blade 2-socket cloud	1	0.0	8.3	12.5	14.6	14.3	17.1	18.5	18.5	18.5	18.5
	ES blade 4-socket traditional	1	0.2	1.9	1.0	0.6	0.6	0.7	0.7	0.7	0.7	0.7
	ES blade 4-socket cloud	1	0.0	1.0	1.6	1.8	1.7	2.0	2.1	2.1	2.1	2.1
	ES total traditional		**4**	**66**	**38**	**24**	**22**	**25**	**27**	**27**	**27**	**27**
	ES total cloud		**0**	**30**	**47**	**52**	**51**	**60**	**66**	**66**	**66**	**66**
	ES Enterprise Servers total		**4**	**96**	**85**	**76**	**73**	**86**	**93**	**93**	**93**	**93**
	DS Online 2	1	0.8	14.3	19.3	26.1	27.4	32.7	34.2	34.3	34.3	34.3
	DS Online 3	1	0.1	2.1	2.8	3.7	3.9	4.6	4.8	4.8	4.8	4.8
	DS Online 4	1	0.5	8.2	10.8	14.3	15.0	17.9	18.7	18.8	18.8	18.8
	DS Data Storage products total		**1**	**25**	**33**	**44**	**46**	**55**	**58**	**58**	**58**	**58**
	ES + DS total (excl. infrastructure)		**5**	**121**	**118**	**120**	**119**	**141**	**150**	**151**	**151**	**151**

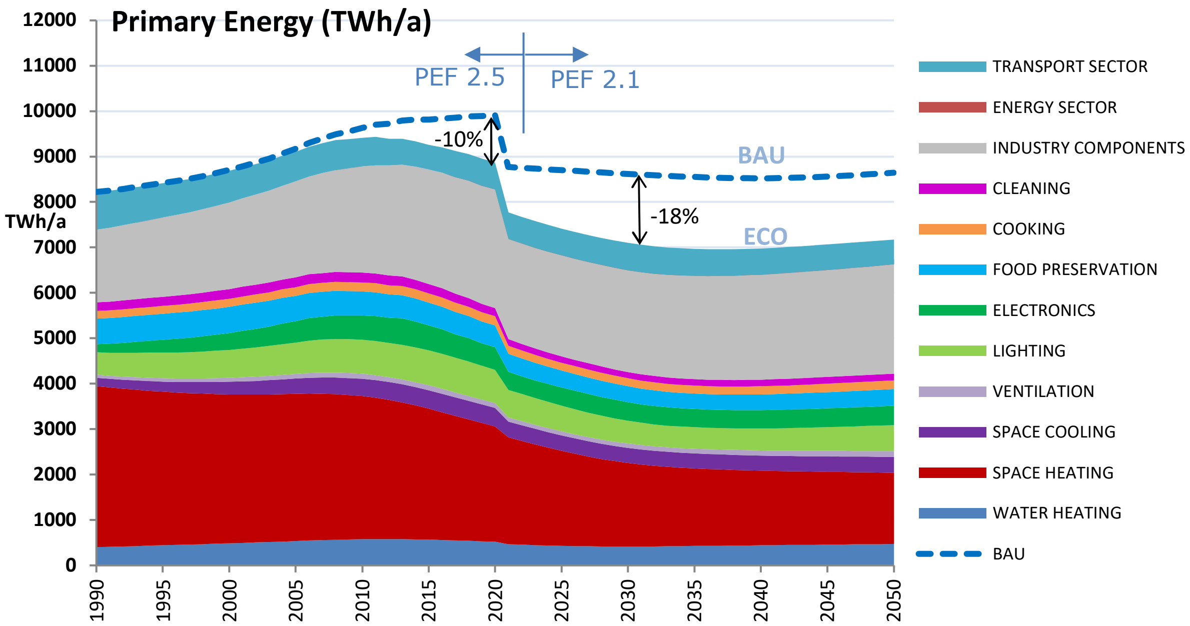
db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	39	52	35	22	21	23	22	21	20	19
	PC Integrated Desktop	1	1	2	1	1	1	1	2	2	2	2
	PC Notebook	1	0	18	21	17	15	16	16	17	17	16
	PC Tablet/slate	1	0	1	6	6	3	3	3	3	3	3
	PC Thin client	1	0	1	1	1	1	1	1	1	1	0
	PC Integrated Thin Client	1	0	0	0	0	0	0	0	0	0	0
	PC Small-scale Server	1	0	0	0	0	0	0	0	0	0	0
	PC Workstation	1	2	3	4	4	4	4	4	4	4	4
	Total PC, electricity		**42**	**78**	**68**	**51**	**45**	**48**	**49**	**48**	**47**	**44**
	Inkjet Printer	1	2.3	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	1	2.9	1.4	1.3	1.0	0.7	0.7	0.7	0.6	0.6	0.6
	EP / Laser Printer mono	1	19.7	4.6	2.9	1.7	1.0	0.8	0.6	0.5	0.4	0.2
	EP / Laser Printer colour	1	0.0	2.7	3.0	2.8	2.4	2.6	2.7	2.8	2.8	2.9
	EP / Laser Copier mono	1	21.9	1.8	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.4	0.8	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	3.7	3.4	2.4	1.7	1.6	1.5	1.5	1.4	1.3
	EP / Laser MFD colour	1	0.0	5.2	4.8	3.0	2.0	1.9	1.8	1.7	1.6	1.5
	Total IE Imaging Equipment		**47**	**21**	**17**	**11**	**8**	**8**	**7**	**7**	**7**	**7**
	of which for modes under CR 1275/2008		*36*	*16*	*13*	*9*	*6*	*6*	*6*	*5*	*5*	*5*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	5.1	14.9	11.2	7.4	5.3	4.8	4.4	3.9	3.4	3.0
	SB Electric toothbrushes (off mode)	1	0.2	0.8	0.5	0.5	0.5	0.5	0.6	0.6	0.7	0.7
	SB Audio speakers (wired) (sb & off modes)	1	4.3	5.6	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	1.2	3.7	4.1	4.2	4.2	4.2	4.3	4.3
	SB Small appliances (sb & off modes)	1	3.1	17.1	12.6	8.7	7.5	7.6	7.6	7.7	7.8	7.9
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.1	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	SB Media players and recorders (sb mode)	1	0.0	6.8	2.7	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	1.1	7.8	8.3	6.9	3.9	3.7	3.6	3.6	3.5	3.4
	SB Office phones (nsb mode)	1	1.6	5.5	4.7	3.0	1.7	1.7	1.7	1.6	1.6	1.6
	SB Home NAS (nsb mode)	1	0.0	2.3	3.5	1.6	1.5	1.8	2.1	2.4	2.5	2.6
	SB Home Network Equipment (nsb mode)	1	0.0	6.7	8.1	7.7	6.9	7.2	7.7	7.9	7.9	7.9
	SB Office Network Equipment (nsb mode)	1	0.0	0.8	2.5	3.2	4.1	5.6	6.8	6.9	6.9	6.9
	SB Coffee makers (off mode)	1	2.1	2.6	1.7	1.4	1.2	1.2	1.3	1.3	1.3	1.4
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.1	3.1	1.6	1.7	*1.3*	*1.0*	*1.0*	*1.0*	*1.0*	*1.0*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	1.2	1.3	1.3	*1.0*	*1.1*	*1.2*	*1.3*	*1.4*	*1.6*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.7	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3
1	SB Electric Ovens (sb mode)	1	0.0	7.6	8.0	6.8	3.8	2.1	1.8	1.8	1.9	1.9
1	SB Electric Hobs (sb mode)	1	0.0	3.0	3.0	2.6	1.6	1.6	1.6	1.6	1.7	1.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	12.6	26.5	21.4	16.8	16.3	16.1	16.1	16.1	16.1
1	SB Game consoles (non-active modes)	1	0.0	5.4	6.0	3.6	1.9	1.9	1.9	1.9	1.9	1.9
1	SB IE Inkjet Printers (nsb mode)	1	2.1	0.7	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	1	2.6	1.2	1.1	0.9	0.7	0.6	0.6	0.6	0.5	0.5
1	SB IE Laser Printers (nsb mode)	1	14.8	5.4	4.4	3.4	2.6	2.6	2.5	2.5	2.4	2.3
1	SB IE Laser Copiers (nsb mode)	1	16.4	1.7	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	6.7	6.2	4.1	2.8	2.6	2.5	2.4	2.3	2.1
	Total (networked) SB (incl. double)		54	121	118	92	68	67	68	68	67	67
	Total (networked) SB (excl. double)		**18**	**71**	**58**	**45**	**37**	**39**	**40**	**41**	**40**	**40**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.6	0.4	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.2	2.3	2.0	1.7	1.4	1.4	1.5	1.5	1.5	1.6
0.6	EPS 10–12 W	1	0.0	16.8	23.1	21.2	15.4	15.4	15.5	15.6	15.7	15.8
0.5	EPS 15–20 W	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	1	0.0	1.9	1.9	1.5	1.1	1.1	1.0	0.9	0.8	0.7
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.7	0.8	1.0
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.4
1.0	EPS 65–120 W	1	0.0	0.5	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	3.1	2.5	0.6	0.3	0.4	0.4	0.4	0.4	0.4
0.0	EPS 12–15 W	1	0.0	0.6	1.2	1.5	1.1	1.1	1.1	1.1	1.1	1.1
	EPS, total for active mode		**0**	**26**	**32**	**28**	**20**	**20**	**20**	**21**	**21**	**21**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.1	0.9	0.4	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.2	2.4	1.8	1.1	0.6	0.6	0.6	0.6	0.6	0.6
0.0	EPS 10–12 W	1	0.0	0.4	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.2**	**3.8**	**2.7**	**1.6**	**0.8**	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**
	EPS, overall total (active + no-load)		**0**	**30**	**34**	**29**	**21**	**21**	**21**	**21**	**22**	**22**
	EPS, double counted subtracted		**0**	**15**	**17**	**14**	**10**	**10**	**10**	**10**	**10**	**10**
	TOTAL ELECTRONICS		**181**	**535**	**548**	**500**	**399**	**410**	**402**	**405**	**414**	**426**

db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**281**	**213**	**178**	**154**	**107**	**89**	**73**	**65**	**61**	**56**
	CF open vertical chilled multi deck (RVC2)	1	35	32	30	28	20	14	10	10	10	10
	CF open horizontal frozen island (RHF4)	1	3	3	3	2	2	1	1	1	1	1
	CF other supermarket display (non-BCs)	1	61	57	57	56	44	39	35	34	35	36
	CF Plug in one door beverage cooler	1	38	39	37	34	23	17	15	15	15	15
	CF Plug in horizontal ice cream freezer	1	9	9	8	8	6	5	5	5	5	5
	CF Spiral vending machine	1	9	7	5	3	3	3	3	3	3	3
	Total CF Commercial Refrigeration		**154**	**147**	**140**	**131**	**97**	**79**	**68**	**67**	**68**	**69**
	PF Storage cabinet Chilled Vertical (CV)	1	3.8	5.4	5.7	5.2	3.4	3.3	3.4	3.6	3.7	3.9
	PF Storage cabinet Frozen Vertical (FV)	1	4.4	6.3	6.7	6.0	3.9	3.8	3.9	4.1	4.3	4.5
	PF Storage cabinet Chilled Horizontal (CH)	1	2.9	4.2	4.5	4.0	2.7	2.6	2.7	2.8	2.9	3.0
	PF Storage cabinet Frozen Horizontal (FH)	1	1.8	2.5	2.7	2.4	1.5	1.5	1.5	1.6	1.7	1.7
	PF Storage cabinets All types	1	**13**	**18**	**20**	**18**	**12**	**11**	**12**	**12**	**13**	**13**
	PF Process Chiller AC MT S ≤ 300 kW	1	7	16	18	21	19	20	22	24	26	28
	PF Process Chiller AC MT L > 300 kW	1	7	15	18	20	18	20	22	24	26	27
	PF Process Chiller AC LT S ≤ 200 kW	1	7	16	19	21	19	21	23	25	27	29
	PF Process Chiller AC LT L > 200 kW	1	7	16	19	22	20	21	23	26	28	30
	PF Process Chiller WC MT S ≤ 300 kW	1	2	4	5	6	5	6	6	7	7	8
	PF Process Chiller WC MT L > 300 kW	1	3	6	8	9	8	9	9	10	11	12
	PF Process Chiller WC LT S ≤ 200 kW	1	3	6	7	7	7	7	8	9	9	10
	PF Process Chiller WC LT L > 200 kW	1	3	7	8	9	9	9	10	11	12	13
	PF Process Chiller All MT&LT	1	**40**	**86**	**102**	**115**	**105**	**114**	**124**	**135**	**146**	**157**
	PF Condensing Unit MT S 0.2-1 kW	1	14	11	11	11	10	10	11	12	13	14
	PF Condensing Unit MT M 1-5 kW	1	35	29	28	29	25	27	29	31	34	36
	PF Condensing Unit MT L 5-20 kW	1	43	36	35	35	30	33	35	38	41	44
	PF Condensing Unit MT XL 20-50 kW	1	43	36	35	35	30	33	35	38	41	44
	PF Condensing Unit LT S 0.1-0.4 kW	1	2	1	1	1	1	1	1	2	2	2
	PF Condensing Unit LT M 0.4-2 kW	1	7	5	5	5	4	5	5	6	6	7
	PF Condensing Unit LT L 2-8 kW	1	11	9	9	8	7	7	8	9	9	10
	PF Condensing Unit LT XL 8-20 kW	1	34	28	27	27	23	25	27	29	31	34
0.6	**PF Condensing Unit, All MT&LT**	1	**189**	**155**	**151**	**150**	**131**	**141**	**152**	**164**	**176**	**190**
	PF Professional Refrigeration, Total		**128**	**167**	**182**	**193**	**169**	**181**	**196**	**212**	**229**	**246**
	TOTAL FOOD PRESERVATION		**563**	**526**	**500**	**477**	**374**	**349**	**338**	**344**	**358**	**372**
	CA Electric Hobs (active modes)	1	47	73	80	88	79	84	89	93	97	101
	CA Electric Hobs (low-power modes)	1	0	3	3	3	2	2	2	2	2	2
	CA Electric Hobs (sum all modes)	1	47	76	84	91	81	86	90	95	99	103
	CA Electric Ovens (active modes)	1	53	54	51	47	38	37	37	37	38	38
	CA Electric Ovens (low-power modes)	1	0	8	8	7	4	2	2	2	2	2
	CA Electric Ovens (sum all modes)	1	53	61	59	54	41	39	39	39	39	40
	CA Gas Hobs	0	31	25	25	24	22	21	20	19	18	17
	CA Gas Ovens	0	12	9	8	7	6	5	5	5	4	4
	CA Range Hoods	1	23	28	30	30	24	23	22	23	24	25
	CA Elec. Hobs&Ovens low-power modes	1	0.0	10.6	11.1	9.3	5.4	3.7	3.4	3.5	3.6	3.7
	CA other products or modes		166	189	193	195	169	171	173	177	181	185
	TOTAL COOKING		**166**	**199**	**204**	**205**	**175**	**175**	**177**	**180**	**184**	**188**
	WM Washing Machines, active modes	1	107	67	56	48	36	35	34	33	33	33
	WM Washing Machines, low-power modes	1	0.1	3.1	1.6	1.7	1.3	1.0	1.0	1.0	1.0	1.0
	WM Washing Machines, all modes	1	107	70	58	50	38	36	35	34	34	34
	WD Washer-Dryers, active modes	1	18	19	17	16	13	13	13	13	13	13
	WD Washer-Dryers, low-power modes	1	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers, all modes	1	18	19	17	16	13	13	13	13	13	13
	WM-WD Washing, sum active modes	1	125	86	74	65	49	48	46	46	46	46
	WM-WD Washing, sum low-power modes	1	0	3	2	2	1	1	1	1	1	1
	Total WM-WD household Washing	1	**125**	**89**	**75**	**66**	**51**	**49**	**47**	**47**	**47**	**47**
	DW Dishwashers, active modes	1	26	37	40	44	41	44	46	49	51	52
	DW Dishwashers, low-power modes	1	0.0	1.2	1.3	1.3	1.0	1.1	1.2	1.3	1.4	1.6
	Total DW household Dishwasher	1	**26**	**38**	**41**	**45**	**42**	**45**	**48**	**50**	**52**	**54**
	LD condensing heat pump	1		0	3	6	7	8	9	10	10	10
	LD condensing electric heat element	1	3	22	20	15	10	8	7	6	6	6
	LD vented electric	1	16	17	13	7	3	2	1	0	0	0
	LD vented gas	0	0	0	0	0	0	0	0	0	0	0
	LD Laundry Dryers, sum active modes		19	39	35	28	19	18	16	15	15	15
	LD Laundry Dryers, low-power modes	1	0.0	0.7	0.7	0.6	0.4	0.4	0.3	0.3	0.3	0.3
	Total LD household Laundry Dryer		**19**	**40**	**35**	**28**	**20**	**18**	**17**	**16**	**16**	**16**

db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	18.8	28.4	34.2	21.2	9.6	7.9	5.8	4.4	4.0	3.9
	VC Upright Domestic mains	1	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	1	0.2	0.4	0.7	0.8	0.8	1.2	1.6	1.8	1.9	1.8
	VC Total Domestic mains		**19**	**29**	**35**	**22**	**10**	**9**	**7**	**6**	**6**	**6**
	VC Cylinder Commercial mains	1	3.8	15.1	15.0	7.7	6.2	6.1	6.0	6.0	6.0	6.0
	VC Upright Commercial mains	1	0.7	2.3	1.8	0.8	0.7	0.7	0.6	0.6	0.6	0.6
	VC Total Commercial mains		**4**	**17**	**17**	**9**	**7**	**7**	**7**	**7**	**7**	**7**
	VC Total in scope of CR 666/2013		**24**	**46**	**52**	**31**	**17**	**16**	**14**	**13**	**13**	**12**
	VC Cordless - domestic - cleaning	1	0.1	0.4	0.6	2.0	3.6	6.0	8.1	9.2	9.5	9.5
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.8	0.9	0.9
	VC Cordless - domestic - standby	1	0.1	0.3	0.6	1.8	2.6	3.6	4.6	5.3	5.6	5.8
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Robot - domestic - cleaning	1	0.0	0.1	0.3	0.5	0.7	0.9	1.2	1.3	1.4	1.4
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	VC Robot - domestic -standby	1	0.0	0.2	0.5	0.9	1.2	1.6	2.1	2.4	2.6	2.6
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Total Domestic mains+cordless+robots		**19**	**30**	**37**	**27**	**18**	**21**	**23**	**25**	**25**	**25**
	VC Total Commercial mains+cordless+robots		**4**	**17**	**17**	**9**	**7**	**8**	**8**	**8**	**8**	**8**
	Total VC Vacuum Cleaner		**24**	**47**	**54**	**36**	**26**	**29**	**31**	**32**	**33**	**33**
	TOTAL CLEANING		**194**	**214**	**206**	**176**	**138**	**140**	**143**	**145**	**148**	**150**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	41	116	132	138	119	122	122	122	122	122
0.5	FAN Axial>300Pa	1	70	211	240	245	203	201	200	200	200	200
0.5	FAN Centr.FC	1	17	38	44	45	36	36	36	36	36	36
0.5	FAN Centr.BC-free	1	46	97	112	117	103	110	116	119	122	124
0.5	FAN Centr.BC	1	47	109	126	132	116	124	134	144	156	169
0.5	FAN Cross-flow	1	3	5	5	4	3	3	3	3	3	4
	Total FAN, industrial (excl. box & roof fans)		**112**	**288**	**330**	**340**	**290**	**298**	**305**	**312**	**319**	**327**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	243	310	317	285	211	205	204	202	200	198
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	366	479	492	441	318	302	296	289	282	276
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	743	952	963	890	658	567	532	503	480	470
0.45	**Total 3ph 0.75-375 kW no VSD**		**1352**	**1740**	**1772**	**1616**	**1186**	**1074**	**1032**	**994**	**962**	**943**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	16	38	49	78	88	94	100	106	113	120
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	30	72	100	159	180	197	209	223	237	250
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	85	210	283	405	439	523	563	602	638	668
0.45	**Total 3-ph 0.75-375 kW with VSD**		**131**	**320**	**432**	**642**	**707**	**814**	**873**	**931**	**988**	**1038**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**1483**	**2060**	**2204**	**2258**	**1893**	**1889**	**1904**	**1925**	**1950**	**1982**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	19	24	26	26	21	20	20	20	20	20
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	2	2	3	2	2	3	3	3	3
0.45	**Total Small 1-ph 0.12-0.75 kW**		**19**	**26**	**28**	**29**	**24**	**23**	**23**	**23**	**23**	**23**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	26	34	36	37	30	29	29	29	29	29
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	3	4	5	4	4	5	5	5	6
0.45	**Total Small 3-ph 0.12-0.75 kW**		**26**	**37**	**40**	**41**	**34**	**33**	**34**	**34**	**35**	**35**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	380	462	451	429	338	321	315	313	310	307
0.45	Large 3-ph LV 375-1000kW with VSD	1	19	104	156	216	223	252	267	279	293	308
0.45	**Total Large 3-ph LV 375-1000 kW**		**399**	**566**	**608**	**644**	**561**	**573**	**582**	**592**	**604**	**616**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	8	11	12	13	11	11	11	11	11	12
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	19	28	31	33	29	29	30	31	31	32
0.45	Explosion motors (L) 3-ph 75-375 kW	1	37	54	60	65	58	60	61	63	64	66
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**65**	**93**	**103**	**111**	**98**	**100**	**102**	**105**	**107**	**110**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	6	8	8	9	7	7	7	8	8	8
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	13	19	21	22	19	19	20	20	21	21
0.45	Brake motors (L) 3-ph 75-375 kW	1	19	27	30	33	29	30	31	31	32	33
0.45	**Total Brake 0.75-375 kW (no VSD)**		**37**	**54**	**59**	**64**	**56**	**57**	**58**	**59**	**61**	**62**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	1	1	2	2	1	2	2	2	2	2
0.45	8-pole motors (L) 3-ph 75-375 kW	1	2	3	3	3	3	3	3	3	3	3
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**3**	**5**	**5**	**6**	**5**	**5**	**5**	**5**	**5**	**6**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**100**	**137**	**150**	**161**	**140**	**140**	**141**	**144**	**147**	**150**
	Total MT Elec. Motors LV 0.12-1000 kW		**1173**	**1638**	**1758**	**1823**	**1545**	**1551**	**1567**	**1588**	**1612**	**1641**

db ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	1	41	54	57	60	53	54	57	61	65	69
ESOB<45_CF	1	27	37	39	42	38	40	42	45	48	51
ESOB<45_VSD-VF	1	1	2	3	4	4	5	6	6	6	7
ESOB < 45 Total	1	**70**	**94**	**99**	**106**	**94**	**99**	**105**	**112**	**119**	**126**
ESOB_45-150_VF	1	14	18	19	20	17	17	18	19	21	22
ESOB_45-150_CF	1	23	32	34	36	33	35	37	39	42	44
ESOB_45-150_VSD-VF	1	1	1	2	2	3	3	4	4	4	4
ESOB_45-150_VSD-CF	1										
ESOB 45-150 Total	1	**38**	**51**	**55**	**59**	**52**	**55**	**59**	**62**	**66**	**70**
ESOB < 150 Total	1	**108**	**145**	**154**	**164**	**147**	**154**	**164**	**175**	**186**	**197**
ESCC<45_VF	1	34	45	47	50	43	44	46	49	53	56
ESCC<45_CF	1	23	31	33	35	32	33	35	38	40	43
ESCC<45_VSD-VF	1	1	3	3	4	4	5	6	6	7	7
ESCC < 45 Total	1	**59**	**78**	**83**	**89**	**79**	**83**	**88**	**94**	**100**	**105**
ESCC_45-150_VF	1	13	16	17	18	16	16	17	18	19	20
ESCC_45-150_CF	1	9	12	12	13	12	13	14	15	15	16
ESCC_45-150_VSD-VF	1	0	1	1	1	2	2	2	2	3	3
ESCC 45-150 Total	1	**22**	**29**	**31**	**33**	**30**	**31**	**33**	**35**	**37**	**40**
ESCC < 150 Total	1	**80**	**108**	**114**	**122**	**108**	**114**	**121**	**129**	**137**	**145**
ESCCi<45_VF	1	17	21	21	20	15	13	13	14	15	16
ESCCi<45_CF	1	1	2	2	2	2	2	2	2	3	3
ESCCi<45_VSD-VF	1	2	5	6	7	9	11	12	12	13	14
ESCCi < 45 Total	1	**21**	**28**	**29**	**30**	**26**	**26**	**27**	**29**	**31**	**33**
ESCCi_45-150_VF	1	3	4	4	4	3	3	3	3	3	3
ESCCi_45-150_CF	1	0	0	0	0	0	0	0	0	1	1
ESCCi_45-150_VSD-VF	1	0	1	1	1	2	2	2	2	3	3
ESCCi 45-150 Total	1	**4**	**5**	**5**	**6**	**5**	**5**	**5**	**6**	**6**	**6**
ESCCi < 150 Total	1	**25**	**33**	**34**	**36**	**31**	**31**	**33**	**35**	**37**	**39**
MSSB<6"_VF	1	6	7	7	7	6	6	6	6	7	7
MSSB<6"_CF	1	33	45	47	51	45	48	50	54	57	61
MSSB<6"_VSD-VF	1	1	1	2	2	2	3	3	3	3	4
MSSB <6" Total	1	**40**	**53**	**56**	**60**	**53**	**56**	**59**	**63**	**67**	**71**
MS-V<25bar_VF	1	25	33	34	35	29	29	31	33	35	37
MS-V<25bar_CF	1	16	22	23	24	22	23	24	26	28	29
MS-V<25bar_VSD-VF	1	2	3	4	5	6	7	8	9	9	10
MS_V <25 bar Total	1	**43**	**58**	**61**	**65**	**57**	**60**	**63**	**68**	**72**	**76**
WP Water pumps		**297**	**396**	**419**	**446**	**396**	**415**	**440**	**469**	**499**	**528**
WE arc-on-mode	1	15	15	15	15	12	11	11	11	11	11
WE idle mode	1	1	1	1	1	1	1	1	1	1	1
Total WE Welding Equipment		**16**	**16**	**16**	**16**	**13**	**12**	**12**	**12**	**12**	**12**
TOTAL INDUSTRY COMPONENTS		1599	2339	2523	2626	2244	2275	2324	2381	2442	2508
TRAFO Distribution	1	26	44	48	50	44	46	47	49	50	50
TRAFO Industry oil	1	20	34	37	37	30	29	28	28	30	32
TRAFO Industry dry	1	6	11	12	12	11	11	11	11	12	13
TRAFO Power	1	75	116	131	146	135	147	159	171	184	196
TRAFO DER oil	1	0	1	2	3	3	5	8	11	16	21
TRAFO DER dry	1	0	4	8	12	16	25	40	59	84	112
TRAFO Small	1	4	4	4	4	4	4	4	4	4	4
Total TRAFO Utility Transformers		**131**	**215**	**241**	**263**	**242**	**267**	**297**	**333**	**379**	**428**
TOTAL ENERGY SECTOR (only improvement over BAU)		**0**	**0**	**-4**	**-14**	**-22**	**-35**	**-51**	**-69**	**-86**	**-105**
Tyres C1, replacement for cars	0	372	279	225	230	223	216	209	201	195	188
Tyres C1, OEM for cars	0	112	82	81	77	70	68	66	63	60	58
Tyres C1, total		**484**	**361**	**305**	**307**	**293**	**284**	**275**	**264**	**255**	**246**
Tyres C2, replacement for vans	0	109	95	83	92	93	98	97	92	89	85
Tyres C2, OEM for vans	0	23	20	19	21	20	21	21	20	19	18
Tyres C2, total		**131**	**115**	**102**	**113**	**114**	**119**	**118**	**113**	**108**	**104**
Tyres C3, replacement for trucks/busses	0	173	128	109	141	149	162	165	163	161	159
Tyres C3, OEM for trucks/busses	0	38	28	28	32	34	37	38	37	37	36
Tyres C3, total		**211**	**156**	**137**	**173**	**183**	**199**	**203**	**200**	**198**	**195**
Tyres, total C1+C2+C3		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
TOTAL TRANSPORT SECTOR		**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
ECO Primary Energy, Total, in TWh		**8219**	**9415**	**9257**	**8869**	**7414**	**7102**	**6969**	**6978**	**7065**	**7173**
ECO Primary Energy, Total, in PJ		29588.1	33893.5	33324.9	31928.8	26689	25567.6	25088.8	25119.1	25433	25821.4
ECO Primary Energy, Total, in mtoe		707	810	796	763	637	611	599	600	607	617

ECO Primary Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	405	581	570	523	433	419	429	444	459	474
SPACE HEATING	3543	3147	2881	2533	2089	1839	1709	1640	1603	1567
SPACE COOLING	183	383	406	409	339	332	330	333	340	347
VENTILATION (from electricity)	66	108	109	107	90	95	102	111	120	129
1 *Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)*	*0*	*0*	*-5*	*-21*	*-38*	*-54*	*-62*	*-65*	*-67*	*-69*
LIGHTING	494	751	769	734	566	502	473	486	522	572
ELECTRONICS	181	535	548	500	399	410	402	405	414	426
FOOD PRESERVATION	563	526	500	477	374	349	338	344	358	372
COOKING	166	199	204	205	175	175	177	180	184	188
CLEANING	194	214	206	176	138	140	143	145	148	150
INDUSTRY COMPONENTS	1599	2339	2523	2626	2244	2275	2324	2381	2442	2508
ENERGY SECTOR	0	0	-4	-14	-22	-35	-51	-69	-86	-105
TRANSPORT SECTOR	826	632	545	593	590	603	595	576	560	545
ECO Primary Energy, Total, in TWh	**8219**	**9415**	**9257**	**8869**	**7414**	**7102**	**6969**	**6978**	**7065**	**7173**
ECO Primary Energy, Total, in PJ	29588.1	33893.5	33324.9	31928.8	26689	25567.6	25088.8	25119.1	25433	25821.4
ECO Primary Energy, Total, in mtoe	707	810	796	763	637	611	599	600	607	617
For comparison: Eurostat Energy Balance ed. Apr. 2022 for EU27 (2020), Primary Energy Consumption (code PEC2020-2030) (in mtoe)	1367	1458	1354	1236.3						
Share EIA products / Eurostat total	52%	56%	59%	62%						
				-10%		-18%				-17%



Sector subdivision for ECO Primary Energy

This subdivision uses the same sector definitions as used in Eurostat Energy Balances for Final Energy, plus the Energy sector
The Primary Energy per function and per sector presented here is the sum of the Final Energy consumed for that function in that sector
and the share of the additional energy input required for the generation and distribution of that Final Energy
There is no comparable subdivision in Eurostat (see the FNRG-, ELEC- and FUEL- sheets for a comparison with Eurostat data

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. The data considered here are Distribution Losses. As these losses are already considered
when computing the Primary Energy for other sectors, only the decrease of the losses in the ECO scenario vs. the BAU scenario is reported.
(reference for BAU = 0)

ECO Primary Energy (summary ENERGY SECTOR, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR (BAU taken as reference = 0)	0	0	-4	-14	-22	-35	-51	-69	-86	-105
ECO Primary Energy, Energy Sector, in TWh	**0**	**0**	**-4**	**-14**	**-22**	**-35**	**-51**	**-69**	**-86**	**-105**
ECO Primary Energy, Energy Sector, in PJ	0	0	-14	-51	-81	-127	-185	-248	-309	-376
ECO Primary Energy, Energy Sector, in mtoe	0	0	0	-1	-2	-3	-4	-6	-7	-9

ECO Primary Energy (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	12	17	17	16	13	12	13	13	14	14
SPACE HEATING	195	180	162	141	114	98	90	85	82	79
SPACE COOLING	47	84	92	95	79	77	76	76	77	78
VENTILATION	8	12	12	11	9	10	10	10	11	11
LIGHTING	63	100	109	117	94	83	78	80	86	94
ELECTRONICS	3	23	23	24	24	26	26	26	27	27
FOOD PRESERVATION	49	89	102	114	104	112	121	132	143	153
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	1	2	2	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	1071	1514	1627	1690	1438	1449	1473	1501	1532	1566
ECO Primary Energy, Industry, in TWh	**1448**	**2021**	**2146**	**2209**	**1876**	**1868**	**1887**	**1924**	**1971**	**2025**
ECO Primary Energy, Industry, in PJ	5212	7277	7726	7954	6753	6725	6794	6928	7097	7289
ECO Primary Energy, Industry, in mtoe	124	174	185	190	161	161	162	165	170	174

ECO Primary Energy (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	109	96	112	116	123	123	120	117	114
TYRES for SERVICE-sector-related transport	278	217	189	218	222	234	233	227	222	216
TYRES for RESIDENTIAL-sector-related transport	387	289	244	245	234	227	220	211	204	197
TYRES for OTHER-sector-related transport	22	17	15	17	18	19	19	18	18	17
ECO Primary Energy, Transport, in TWh	**826**	**632**	**545**	**593**	**590**	**603**	**595**	**576**	**560**	**545**
ECO Primary Energy, Transport, in PJ	2974	2276	1960	2135	2122	2169	2142	2075	2017	1961
ECO Primary Energy, Transport, in mtoe	71	54	47	51	51	52	51	50	48	47

ECO Primary Energy (summary TERTIARY/SERVICES, TWI	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	95	133	131	120	97	95	99	103	108	112
SPACE HEATING	817	834	768	678	551	490	459	440	429	416
SPACE COOLING	117	241	260	266	220	214	211	212	215	218
VENTILATION	51	78	78	75	62	63	65	69	73	76
LIGHTING	253	438	471	502	404	356	335	347	376	415
ELECTRONICS	68	194	199	208	192	204	203	203	206	210
FOOD PRESERVATION	247	231	222	211	161	145	138	141	147	153
COOKING	23	24	23	22	18	17	17	17	17	17
CLEANING	10	22	21	14	12	12	12	12	13	13
INDUSTRY COMPONENTS	390	639	699	727	622	633	648	664	682	700
ECO Primary Energy, Services, in TWh	**2070**	**2833**	**2873**	**2823**	**2340**	**2230**	**2187**	**2207**	**2263**	**2332**
ECO Primary Energy, Services, in PJ	7452	10198	10344	10164	8423	8030	7871	7946	8147	8394
ECO Primary Energy, Services, in mtoe	178	244	247	243	201	192	188	190	195	200

ECO Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	294	425	417	383	319	307	314	324	333	343
SPACE HEATING	2469	2074	1898	1669	1385	1218	1131	1088	1066	1047
SPACE COOLING	6	34	29	22	18	20	22	24	26	28
VENTILATION	7	17	19	19	18	21	26	31	35	40
LIGHTING	173	206	181	107	62	57	55	54	55	56
ELECTRONICS	110	316	324	266	181	178	170	174	180	186
FOOD PRESERVATION	258	196	164	141	99	82	68	60	56	52
COOKING	143	175	181	183	157	157	160	164	168	172
CLEANING	183	189	182	161	125	127	129	132	134	136
INDUSTRY COMPONENTS	50	67	71	76	67	71	75	80	85	90
ECO Primary Energy, Residential, in TWh	**3693**	**3701**	**3466**	**3026**	**2432**	**2238**	**2149**	**2128**	**2137**	**2149**
ECO Primary Energy, Residential, in PJ	13294	13323	12478	10893	8754	8056	7737	7662	7695	7736
ECO Primary Energy, Residential, in mtoe	318	318	298	260	209	192	185	183	184	185

ECO Primary Energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4	5	5	5	4	4	4	4	4	5
SPACE HEATING	62	59	53	46	38	32	29	27	26	25
SPACE COOLING	14	23	25	26	22	22	21	22	22	23
VENTILATION	1	1	1	1	1	1	1	1	1	1
LIGHTING	5	8	8	8	6	5	5	5	6	6
ELECTRONICS	1	2	2	2	2	2	2	2	2	2
FOOD PRESERVATION	9	10	11	11	10	11	11	12	13	14
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	87	118	126	133	117	122	129	136	144	152
ECO Primary Energy, Other sectors, in TWh	**182**	**228**	**231**	**232**	**199**	**199**	**203**	**210**	**218**	**227**
ECO Primary Energy, Other sectors, in PJ	657	820	830	834	718	715	729	756	786	818
ECO Primary Energy, Other sectors, in mtoe	16	20	20	20	17	17	17	18	19	20

ECO Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		405	581	570	523	433	419	429	444	459	474
	Residential	294	425	417	383	319	307	314	324	333	343
	Tertiary / Services	95	133	131	120	97	95	99	103	108	112
	Industry	12	17	17	16	13	12	13	13	14	14
	Other	4	5	5	5	4	4	4	4	4	5
SPACE HEATING. All sectors, TWh		3543	3147	2881	2533	2089	1839	1709	1640	1603	1567
	Residential	2469	2074	1898	1669	1385	1218	1131	1088	1066	1047
	Tertiary / Services	817	834	768	678	551	490	459	440	429	416
	Industry	195	180	162	141	114	98	90	85	82	79
	Other	62	59	53	46	38	32	29	27	26	25
SPACE COOLING. All sectors, TWh		183	383	406	409	339	332	330	333	340	347
& HT PROCESS	Residential	6	34	29	22	18	20	22	24	26	28
	Tertiary / Services	117	241	260	266	220	214	211	212	215	218
	Industry	47	84	92	95	79	77	76	76	77	78
	Other	14	23	25	26	22	22	21	22	22	23
VENTILATION.	All sectors, TWh	66	108	109	107	90	95	102	111	120	129
	Residential	7	17	19	19	18	21	26	31	35	40
	Tertiary / Services	51	78	78	75	62	63	65	69	73	76
	Industry	8	12	12	11	9	10	10	10	11	11
	Other	1	1	1	1	1	1	1	1	1	1
LIGHTING.	All sectors, TWh	494	751	769	734	566	502	473	486	522	572
	Residential	173	206	181	107	62	57	55	54	55	56
	Tertiary / Services	253	438	471	502	404	356	335	347	376	415
	Industry	63	100	109	117	94	83	78	80	86	94
	Other	5	8	8	8	6	5	5	5	6	6
ELECTRONICS.	All sectors, TWh	181	535	548	500	399	410	402	405	414	426
	Residential	110	316	324	266	181	178	170	174	180	186
	Tertiary / Services	68	194	199	208	192	204	203	203	206	210
	Industry	3	23	23	24	24	26	26	26	27	27
	Other	1	2	2	2	2	2	2	2	2	2
FOOD PRESERVE.	All sectors, TWh	563	526	500	477	374	349	338	344	358	372
	Residential	258	196	164	141	99	82	68	60	56	52
	Tertiary / Services	247	231	222	211	161	145	138	141	147	153
	Industry	49	89	102	114	104	112	121	132	143	153
	Other	9	10	11	11	10	11	11	12	13	14
COOKING.	All sectors, TWh	166	199	204	205	175	175	177	180	184	188
	Residential	143	175	181	183	157	157	160	164	168	172
	Tertiary / Services	23	24	23	22	18	17	17	17	17	17
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	194	214	206	176	138	140	143	145	148	150
	Residential	183	189	182	161	125	127	129	132	134	136
	Tertiary / Services	10	22	21	14	12	12	12	12	13	13
	Industry	1	2	2	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		1599	2339	2523	2626	2244	2275	2324	2381	2442	2508
	Residential	50	67	71	76	67	71	75	80	85	90
	Tertiary / Services	390	639	699	727	622	633	648	664	682	700
	Industry	1071	1514	1627	1690	1438	1449	1473	1501	1532	1566
	Other	87	118	126	133	117	122	129	136	144	152
TYRES. Transport sector, TWh		826	632	545	593	590	603	595	576	560	545
	Residential transport	387	289	244	245	234	227	220	211	204	197
	Tertiary / Services transport	278	217	189	218	222	234	233	227	222	216
	Industry transport	139	109	96	112	116	123	123	120	117	114
	Other transport	22	17	15	17	18	19	19	18	18	17
ALL PRODUCTS.	All sectors, TWh	8219	9415	9261	8883	7436	7137	7020	7046	7151	7277
(excl. Energy	Residential	3693	3701	3466	3026	2432	2238	2149	2128	2137	2149
sector)	Tertiary / Services	2070	2833	2873	2823	2340	2230	2187	2207	2263	2332
	Industry	1448	2021	2146	2209	1876	1868	1887	1924	1971	2025
	Other	182	228	231	232	199	199	203	210	218	227
	Transport	826	632	545	593	590	603	595	576	560	545

ECO Primary Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	73%	73%	73%	74%	73%	73%	73%	73%	72%
	Tertiary / Services	23%	23%	23%	23%	22%	23%	23%	23%	23%	24%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	70%	66%	66%	66%	66%	66%	66%	66%	67%	67%
	Tertiary / Services	23%	27%	27%	27%	26%	27%	27%	27%	27%	27%
	Industry	5%	6%	6%	6%	5%	5%	5%	5%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	9%	7%	5%	5%	6%	7%	7%	8%	8%
	Tertiary / Services	64%	63%	64%	65%	65%	64%	64%	64%	63%	63%
	Industry	26%	22%	23%	23%	23%	23%	23%	23%	23%	23%
	Other	8%	6%	6%	6%	6%	6%	7%	7%	7%	7%
VENTILATION (from electricity).											
	Residential	10%	16%	17%	18%	20%	23%	25%	28%	29%	31%
	Tertiary / Services	77%	72%	71%	71%	69%	67%	64%	62%	61%	59%
	Industry	12%	11%	11%	11%	10%	10%	10%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	27%	24%	15%	11%	11%	12%	11%	11%	10%
	Tertiary / Services	51%	58%	61%	68%	71%	71%	71%	71%	72%	73%
	Industry	13%	13%	14%	16%	17%	17%	16%	16%	16%	16%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	59%	53%	45%	43%	42%	43%	43%	44%
	Tertiary / Services	37%	36%	36%	42%	48%	50%	51%	50%	50%	49%
	Industry	2%	4%	4%	5%	6%	6%	7%	7%	6%	6%
	Other	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%
FOOD PRESERVE.											
	Residential	46%	37%	33%	30%	26%	23%	20%	17%	16%	14%
	Tertiary / Services	44%	44%	44%	44%	43%	42%	41%	41%	41%	41%
	Industry	9%	17%	21%	24%	28%	32%	36%	38%	40%	41%
	Other	2%	2%	2%	2%	3%	3%	3%	3%	4%	4%
COOKING.											
	Residential	86%	88%	89%	89%	90%	90%	91%	91%	91%	91%
	Tertiary / Services	14%	12%	11%	11%	10%	10%	9%	9%	9%	9%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	88%	88%	91%	91%	91%	91%	91%	91%	91%
	Tertiary / Services	5%	10%	10%	8%	9%	9%	9%	9%	9%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
	Tertiary / Services	24%	27%	28%	28%	28%	28%	28%	28%	28%	28%
	Industry	67%	65%	64%	64%	64%	64%	63%	63%	63%	62%
	Other	5%	5%	5%	5%	5%	5%	6%	6%	6%	6%
TYRES.											
	Residential transport	47%	46%	45%	41%	40%	38%	37%	37%	36%	36%
	Tertiary / Services transport	34%	34%	35%	37%	38%	39%	39%	39%	40%	40%
	Industry transport	17%	17%	18%	19%	20%	20%	21%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	45%	39%	37%	34%	33%	31%	31%	30%	30%	30%
	Tertiary / Services	25%	30%	31%	32%	31%	31%	31%	31%	32%	32%
	Industry	18%	21%	23%	25%	25%	26%	27%	27%	28%	28%
	Other	2%	2%	2%	3%	3%	3%	3%	3%	3%	3%
	Transport	10%	7%	6%	7%	8%	8%	8%	8%	8%	7%

db SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	1.00	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	1	2	2	3	3	3	4	4
EIWHS Electric Instant. Shower (secondary)	1.00	0	0	0	0	1	1	1	1	1	1
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	0	0	1	1	1	0	0	0	0
ESWH Electric Storage > 30 L (primary)	1.00	0	0	1	9	13	17	18	18	18	18
GIWH Gas Instant. < 13 L/min (secondary)	0.003	0	0	1	2	3	3	3	2	2	2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	1	2	2	1	1	1	1
GSWH Gas Storage, Condensing	0.010	0	0	0	0	0	0	0	0	0	1
GSWH Gas Storage, Non-condensing	0.008	0	0	1	2	2	2	2	1	1	1
Dedicated WH Heat Pump	1.00	0	0	1	2	3	5	7	9	10	12
Dedicated WH Solar (3.5 m2)	0.80	0	0	1	2	2	3	3	2	2	2
WH dedicated Water Heater		**0**	**0**	**6**	**21**	**29**	**36**	**37**	**39**	**40**	**41**
CHB Gas Combi Instant. WH	0.04	0	0	3	9	16	25	34	42	50	58
CHB Gas + Cyl. WH	0.04	0	0	2	6	10	14	17	20	23	26
CHB Jet Burner Gas + Cyl. WH	0.04	0	0	0	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	0.04	0	0	0	1	2	3	3	3	3	3
CHB Electric (Joule) + Cyl. WH	1.00	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	-1	-2	-4	-6	-7
CHB Electric HP + Cyl. WH	1.00	0	0	0	-1	-2	-6	-12	-19	-26	-32
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	-1	-1	-2	-2	-2
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	0
CHB Solar Combi (16 m2)	0.04	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating		**0**	**0**	**5**	**15**	**25**	**34**	**39**	**41**	**43**	**46**
TOTAL WATER HEATING		**0**	**0**	**11**	**36**	**54**	**70**	**76**	**80**	**83**	**87**
CHB Gas non-condensing	0.04	0	11	41	121	186	236	247	220	195	167
CHB Gas condensing	0.04	0	7	20	3	5	15	48	108	164	216
CHB Gas Jet burner non-condensing	0.04	0	0	1	2	3	3	4	4	3	3
CHB Gas Jet burner condensing	0.04	0	0	0	0	-1	-1	-1	-2	-1	-1
CHB Oil Jet burner non-condensing	0.04	0	3	9	21	32	40	43	45	41	36
CHB Oil Jet burner condensing	0.04	0	0	0	-3	-8	-11	-14	-16	-15	-13
CHB Electric Joule-effect	1.00	0	0	1	2	3	4	3	3	2	2
CHB Hybrid (gas-electric)	0.60	0	0	0	0	-2	-4	-8	-12	-15	-18
CHB Electric Heat Pump	1.00	0	1	3	4	-3	-18	-40	-64	-84	-100
CHB Gas Heat Pump	0.04	0	0	0	0	-1	-1	-2	-2	-3	-3
CHB micro CHP	0.04	0	0	0	0	-1	-1	-1	-1	-1	0
CHB Solar combi (16 m2)	0.10	0	0	0	0	1	1	2	2	2	2
CHB Central Heating boiler < 400 kW, space heating		**0**	**23**	**75**	**148**	**216**	**263**	**281**	**284**	**288**	**291**
SFB Wood Manual	0	0.0	0.0	0.5	2.7	4.1	4.3	3.5	2.4	1.9	1.5
SFB Wood Direct Draft	0	0.0	0.0	0.0	0.2	1.0	1.8	2.5	3.1	3.7	4.5
SFB Coal	0	0.0	0.0	0.1	0.8	1.8	2.4	2.7	2.7	2.4	2.1
SFB Pellets	0	0.0	0.0	0.0	0.2	0.5	1.0	1.2	1.4	1.5	1.6
SFB Wood chips	0	0.0	0.0	0.1	0.5	1.0	1.4	1.7	1.9	1.9	2.0
Total Solid Fuel Boiler		**0**	**0**	**1**	**4**	**8**	**11**	**12**	**12**	**11**	**12**
CHAE-S (≤ 400 kW)	1	0.0	0.0	0.0	0.2	0.7	1.2	1.6	1.8	1.7	1.5
CHAE-L (> 400 kW)	1	0.0	0.0	0.0	0.5	1.3	1.8	2.0	2.1	1.9	1.5
CHWE-S (≤ 400 kW)	1	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01	0.00
CHWE-M (> 400 kW; ≤ 1500 kW)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0
CHWE-L (> 1500 kW)	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
CHF	0.05	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
HT PCH-AE-S	1	0.0	0.0	0.1	2.4	5.0	7.4	8.0	7.2	6.3	5.3
HT PCH-AE-L	1	0.0	0.0	0.1	2.7	5.9	9.5	11.3	11.5	11.0	10.1
HT PCH-WE-S	1	0.0	0.0	0.0	0.3	0.5	0.8	0.7	0.5	0.3	0.1
HT PCH-WE-M	1	0.0	0.0	0.0	0.4	0.8	1.1	0.9	0.4	0.1	0.0
HT PCH-WE-L	1	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.4	0.3
AC rooftop	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
AC splits	1	0.0	0.0	0.1	0.9	1.5	2.0	1.9	1.5	1.2	0.9
AC VRF	1	0.0	0.0	0.0	0.4	0.8	1.5	2.0	2.2	2.1	1.9
ACF	0.05	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
SubTotal AHC central Air Cooling		**0**	**0**	**0**	**8**	**17**	**26**	**29**	**28**	**25**	**22**
AC rooftop (rev)	1	0.0	0.0	0.2	1.5	2.2	2.2	1.2	0.4	0.0	0.0
AC splits (rev)	1	0.0	0.0	0.3	2.5	4.0	5.3	5.0	4.3	3.6	2.9
AC VRF (rev)	1	0.0	0.0	0.1	1.0	2.4	4.6	6.3	6.6	6.3	5.6
ACF (rev)	0.05	0.00	0.00	0.00	0.01	0.03	0.05	0.06	0.06	0.06	0.06
AHF	0.05	0.0	0.0	0.8	6.1	12.3	16.7	17.1	15.4	13.5	11.7
AHE	1	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2
SubTotal AHC central Air Heating		**0**	**0**	**1**	**11**	**21**	**29**	**30**	**27**	**24**	**21**
Total AHC central Air Heating & Cooling		**0**	**0**	**2**	**19**	**38**	**55**	**59**	**55**	**49**	**42**

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	0.0	0.0	0.0	0.8	2.7	4.3	5.5	6.5	7.1	7.1
	LH closed fireplace/inset	0	0.0	0.0	0.0	1.1	3.7	5.9	7.7	9.2	9.9	9.6
	LH wood stove	0	0.0	0.0	0.0	0.7	2.2	3.5	4.5	5.4	5.8	5.6
	LH coal stove	0	0.0	0.0	0.0	0.1	0.4	0.6	0.7	0.7	0.7	0.5
	LH cooker	0	0.0	0.0	0.0	0.3	0.9	1.4	1.6	1.6	1.5	1.5
	LH SHR stove	0	0.0	0.0	0.0	0.1	0.5	0.7	0.9	1.1	1.1	1.0
	LH pellet stove	0	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.7
	LH Solid fuel sum		**0**	**0**	**0**	**3**	**11**	**17**	**22**	**25**	**27**	**26**
	LH Electric portable	1	0.0	0.0	1.1	5.4	6.5	6.2	5.8	5.6	5.4	5.3
	LH Electric fixed > 250W	1	0.0	0.0	1.8	8.7	13.2	16.5	16.4	15.2	14.6	14.2
	LH Electric fixed ≤ 250W	1	0.0	0.0	0.1	0.6	0.9	1.1	1.1	1.0	0.9	0.9
	LH Electric storage	1	0.0	0.0	0.3	1.3	1.7	2.1	2.0	1.9	1.8	1.7
	LH Electric underfloor	1	0.0	0.0	0.1	0.6	1.1	1.5	1.7	1.7	1.7	1.7
	LH Electric visibly glowing > 1.2 kW	1	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	LH Electric visibly glowing ≤ 1.2 kW	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3
	LH Electric sum		**0**	**0**	**4**	**17**	**24**	**28**	**28**	**26**	**25**	**25**
	LH Gas luminous (commercial)	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gaseous Tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2
	LH Gas open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum		**0.0**	**0.0**	**0.1**	**0.3**	**0.5**	**0.7**	**0.7**	**0.6**	**0.5**	**0.5**
	LH Liquid tube (commercial < 120 kW)	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total		**0**	**0**	**4**	**21**	**36**	**46**	**50**	**52**	**53**	**51**
	RAC fixed < 6 kW, cooling	1	0	10	12	10	8	8	7	8	9	10
	RAC fixed 6-12 kW, cooling	1	0	6	8	7	6	5	5	4	4	5
	RAC portable < 12 kW, cooling	1	0	0	0	1	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode		**0**	**17**	**20**	**18**	**14**	**13**	**12**	**12**	**13**	**16**
	RAC fixed < 6 kW, reversible, heating	1	0	10	15	16	15	16	16	15	16	18
	RAC fixed 6-12 kW, reversible, heating	1	0	7	11	12	12	12	12	11	11	12
	RAC portable < 12 kW, reversible, heating	1	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode		**0**	**16**	**25**	**29**	**27**	**28**	**27**	**27**	**28**	**29**
	RAC Room Air Conditioner		**0**	**33**	**46**	**46**	**41**	**41**	**40**	**39**	**41**	**45**
1	CIRC Integrated circulators	1	0	0	5	16	18	18	17	15	13	11
0.38	CIRC Large standalone circulators	1	0	0	3	8	7	5	4	3	3	2
0.38	CIRC Small standalone circulators	1	0	0	3	8	7	6	5	5	4	4
	CIRC Circulator pumps <2.5 kW, all	1	**0**	**0**	**12**	**31**	**32**	**29**	**26**	**23**	**20**	**17**
	CIRC Circulator pumps <2.5 kW, excl. double		**0**	**0**	**4**	**10**	**8**	**7**	**6**	**5**	**4**	**4**
	TOTAL SPACE HEATING		**0**	**39**	**111**	**223**	**316**	**383**	**405**	**406**	**407**	**408**
	TOTAL SPACE COOLING		**0**	**17**	**21**	**26**	**31**	**39**	**42**	**40**	**39**	**37**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	R-UVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.8	1.2	1.5
	R-UVU 100-250 m3/h	1	0.0	0.0	0.0	0.2	0.4	0.5	0.6	0.6	0.6	0.6
	R-BVU 100-250 m3/h	1	0.0	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.1
	R-UVU 250-1000 m3/h	1	0.0	0.0	0.3	1.4	2.5	3.6	4.3	4.5	4.7	4.8
	R-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.1	0.4	0.9	1.5	2.1	2.8	3.7
	R-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	R-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	RVU, Total residential, from VU own electricity		**0**	**0**	**0**	**2**	**4**	**6**	**8**	**9**	**11**	**12**
	NR-UVU 250-1000 m3/h	1	0.0	0.0	0.1	0.5	0.8	1.2	1.4	1.4	1.4	1.4
	NR-BVU 250-1000 m3/h	1	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.1	1.2
	NR-UVU > 1000 m3/h	1	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.5	0.5
	NR-BVU 1000-2500 m3/h	1	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.8	1.0	1.1
	NR-AHU-S 2500-5500 m3/h	1	0.0	0.0	0.1	0.7	1.3	2.1	2.7	3.2	3.6	4.1
	NR-AHU-M 5500-14500 m3/h	1	0.0	0.0	0.4	2.0	3.4	5.2	6.4	7.0	7.6	8.3
	NR-AHU-L > 14500 m3/h	1	0.0	0.0	0.1	0.7	1.1	1.7	2.1	2.2	2.4	2.6
	NRVU, Total non-residential, from VU own electricity		**0**	**0**	**1**	**4**	**8**	**12**	**15**	**16**	**18**	**19**
	VU Ventilation Units, res + non-res., from VU own elec.		**0**	**0**	**1**	**6**	**11**	**18**	**22**	**25**	**28**	**31**
	TOTAL VENTILATION (from VU own electricity)		**-**	**-**	**1**	**6**	**11**	**18**	**22**	**25**	**28**	**31**
1	***Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)***		*-*	*-*	*5*	*21*	*38*	*54*	*62*	*65*	*67*	*69*

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS, primary energy incl. control gear (BAU-ECO)											
	LFL (T12,T8h,T8t,T5,other)	1	0	3	13	36	87	151	165	148	123	100
	HID (HPM, HPS, MH)	1	0	3	31	53	48	43	28	18	11	6
	CFLni (all shapes)	1	0	0	2	6	8	7	5	3	2	1
	CFLi (retrofit for GLS, HL)	1	0	-7	-8	3	17	19	14	9	6	4
	GLS (DLS & NDLS)	1	0	48	84	82	41	24	14	8	5	3
	HL (DLS & NDLS, LV & MV)	1	0	-10	-7	89	82	43	22	12	7	4
	LED replacing LFL (retrofit & luminaire)	1	0	0	-2	-9	-31	-52	-54	-42	-27	-12
	LED replacing HID (retrofit & luminaire)	1	0	0	-21	-30	-21	-11	-3	1	4	8
	LED replacing CFLni (retrofit & luminaire)	1	0	0	0	-2	-3	-2	0	0	1	1
	LED replacing DLS (retrofit & luminaire)	1	0	0	-2	-6	-6	-4	-2	-1	-1	0
	LED replacing NDLS (retrofit & luminaire)	1	0	0	-3	-19	-22	-16	-10	-6	-2	0
	Standby	1	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
	TOTAL LIGHTING (incl. standby)		**0**	**38**	**87**	**202**	**200**	**202**	**178**	**150**	**128**	**114**
	DP TV on-mode, total all types	1	0.0	0.0	12.3	44.2	67.8	93.2	100.4	85.0	70.7	62.9
	DP TV standby, standard (NoNA)	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, total all types		**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP TV total on-mode + standby		**0**	**0**	**12**	**44**	**68**	**93**	**100**	**85**	**71**	**63**
	DP Monitor on-mode	1	0.0	0.0	2.2	6.7	6.0	6.4	5.4	4.2	3.9	3.5
	DP Monitor standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total		**0**	**0**	**2**	**7**	**6**	**6**	**5**	**4**	**4**	**4**
	DP Signage on-mode	1	0.0	0.0	0.0	0.0	1.5	7.2	12.7	11.8	7.0	1.9
	DP Signage standby	1	0.0	0.0	0.0	0.0	0.2	1.1	1.9	1.8	1.0	0.3
	DP Signage total		**0**	**0**	**0**	**0**	**2**	**8**	**15**	**14**	**8**	**2**
	DP Electronic Displays, total on-mode		**0**	**0**	**14**	**51**	**75**	**107**	**118**	**101**	**82**	**68**
	DP Electronic Displays, total standby		**0**	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**1**	**0**
	DP Electronic Displays, total		**0**	**0**	**14**	**51**	**75**	**108**	**120**	**103**	**83**	**69**
	SSTB	1	0.0	2.9	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	1	0.0	0.0	3.3	8.3	6.4	5.2	4.7	4.7	4.7	4.7
	CSTB (other modes)	1	0.0	0.0	1.8	4.4	3.5	2.8	2.5	2.5	2.5	2.5
	CSTB (all covered modes)	1	0.0	0.0	5.1	12.7	9.9	8.0	7.3	7.3	7.3	7.3
	Total STB set top boxes (Complex & Simple)		**0**	**3**	**5**	**13**	**10**	**8**	**7**	**7**	**7**	**7**
	Game consoles > 20 W Active modes (SRI)	1	0.0	0.0	1.9	5.0	3.7	3.7	3.7	3.7	3.7	3.7
	Game consoles > 20 W Non-Active (CR)	1	0.0	0.0	1.3	3.8	3.4	3.4	3.4	3.4	3.4	3.4
	Game consoles < 20 W Non-Active (CR)	1	0.0	0.0	0.2	1.2	1.5	1.5	1.5	1.5	1.5	1.5
	Game consoles < 20 W Active (no reg.)	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total Game consoles, active modes		0.0	0.0	1.9	5.1	3.8	3.7	3.7	3.7	3.7	3.7
	Total Game consoles, non-active modes		0.0	0.0	1.4	5.0	4.9	4.9	4.9	4.9	4.9	4.9
	Total Game consoles > 20 W, all modes		0.0	0.1	3.1	8.8	7.1	7.0	7.0	7.0	7.0	7.0
	Total Game consoles < 20 W, all modes		0.0	0.0	0.2	1.3	1.6	1.6	1.6	1.6	1.6	1.6
	Total Game consoles, all modes		**0**	**0**	**3**	**10**	**9**	**9**	**9**	**9**	**9**	**9**
	ES&DS only, without effects on infrastructure											
	ES tower 1-socket traditional	1	0	0	0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	1	0	0	0	0.3	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 2-socket traditional	1	0	0	0	0.7	0.8	0.8	0.8	0.8	0.8	0.8
	ES rack 2-socket cloud	1	0	0	0	1.8	1.8	1.8	1.8	1.8	1.8	1.8
	ES rack 4-socket traditional	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket cloud	1	0	0	0	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	ES rack 2-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket resilient trad.	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	1	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	1	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 2-socket traditional	1	0	0	0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES blade 2-socket cloud	1	0	0	0	0.6	0.7	0.7	0.8	0.8	0.8	0.8
	ES blade 4-socket traditional	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 4-socket cloud	1	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	ES total traditional		**0**	**0**	**0**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	ES total cloud		**0**	**0**	**0**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	ES Enterprise Servers total		**0**	**0**	**0**	**4**	**5**	**5**	**5**	**5**	**5**	**5**
	DS Online 2	1	0	0	0	0.2	0.6	0.8	0.9	0.9	0.9	0.9
	DS Online 3	1	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	DS Online 4	1	0	0	0	0.1	0.4	0.5	0.5	0.5	0.5	0.5
	DS Data Storage products total		**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**2**
	ES + DS total (excl. infrastructure)		**0**	**0**	**0**	**5**	**6**	**6**	**6**	**7**	**7**	**7**

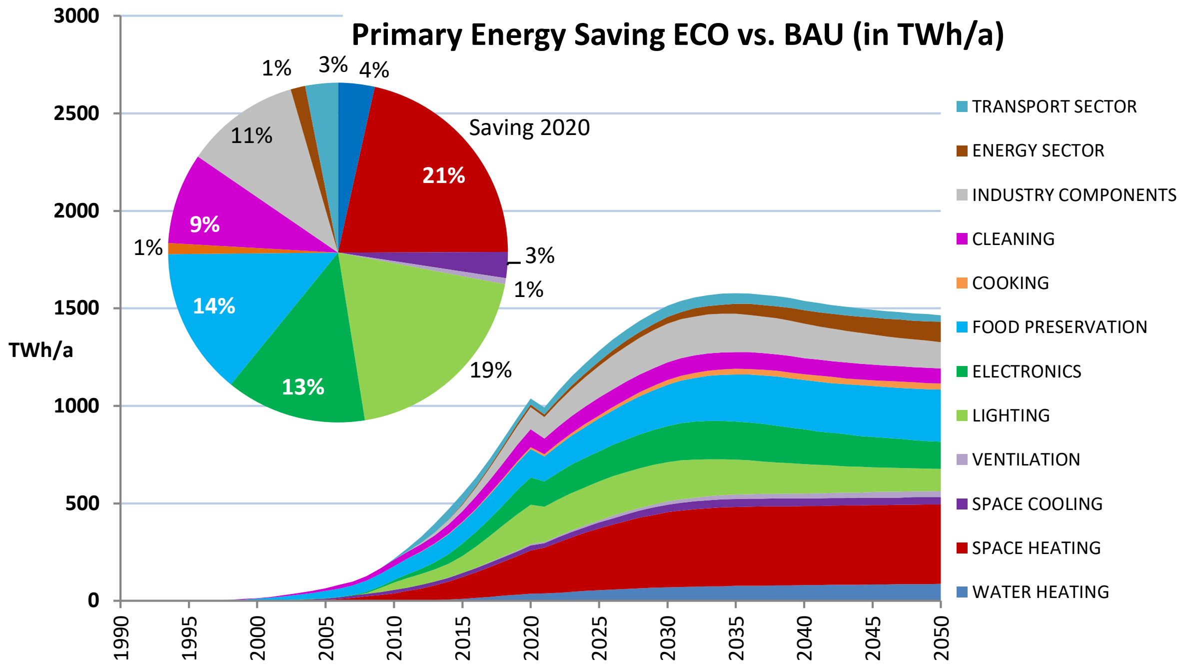
db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Desktop	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity		**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Inkjet Printer	1	0.0	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Inkjet MFD	1	0.0	0.8	1.3	1.7	1.4	1.4	1.3	1.2	1.2	1.1
	EP / Laser Printer mono	1	0.0	1.2	1.7	1.9	1.4	1.1	0.9	0.7	0.5	0.3
	EP / Laser Printer colour	1	0.0	0.3	1.3	3.1	3.3	3.6	3.7	3.8	3.9	4.0
	EP / Laser Copier mono	1	0.0	1.0	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	1	0.0	0.1	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	1	0.0	1.5	3.5	4.8	4.1	3.9	3.7	3.5	3.3	3.1
	EP / Laser MFD colour	1	0.0	1.0	3.3	5.5	4.8	4.6	4.4	4.2	3.9	3.7
	Total IE Imaging Equipment		**0**	**6**	**13**	**18**	**15**	**15**	**14**	**13**	**13**	**12**
	of which for modes under CR 1275/2008		*0*	*5*	*10*	*14*	*12*	*11*	*11*	*10*	*10*	*9*
	Products regulated only for (networked) standby											
	SB Radios (sb & off modes)	1	0.0	0.0	1.9	3.7	2.8	2.6	2.3	2.1	1.8	1.6
	SB Electric toothbrushes (off mode)	1	0.0	0.0	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7
	SB Audio speakers (wired) (sb & off modes)	1	0.0	1.3	4.1	2.1	0.3	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	1	0.0	0.0	0.5	4.4	6.5	6.7	6.7	6.7	6.7	6.8
	SB Small appliances (sb & off modes)	1	0.0	0.2	5.4	9.9	8.5	8.6	8.7	8.8	8.9	8.9
	SB Media boxes /sticks (sb mode)	1	0.0	0.0	0.8	2.5	2.3	2.3	2.3	2.3	2.3	2.3
	SB Media players and recorders (sb mode)	1	0.0	1.6	7.7	2.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	1	0.0	0.1	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	1	0.0	0.0	0.0	1.0	1.9	1.5	1.1	0.8	0.4	0.1
	SB Office phones (nsb mode)	1	0.0	0.0	0.0	0.7	0.9	0.4	0.1	0.0	0.0	0.0
	SB Home NAS (nsb mode)	1	0.0	0.0	0.2	3.5	3.7	4.2	4.5	4.6	4.4	4.0
	SB Home Network Equipment (nsb mode)	1	0.0	0.0	0.0	1.0	0.9	0.9	1.0	1.0	1.0	1.0
	SB Office Network Equipment (nsb mode)	1	0.0	0.0	0.2	2.8	3.6	4.9	6.0	6.1	6.1	6.1
	SB Coffee makers (off mode)	1	0.0	0.0	1.0	1.4	1.2	1.2	1.3	1.3	1.3	1.4
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)											
1	SB Washing Machines (sb & off, until 2021)	1	0.0	1.0	2.8	2.8	*2.6*	*2.9*	*2.9*	*2.9*	*2.9*	*2.9*
1	SB Dishwashers (sb & off, until 2021)	1	0.0	0.0	0.3	0.7	*0.9*	*1.1*	*1.2*	*1.4*	*1.5*	*1.6*
1	SB Laundry Dryers (sb & off modes)	1	0.0	0.0	0.2	0.4	0.5	0.6	0.6	0.7	0.7	0.7
1	SB Electric Ovens (sb mode)	1	0.0	0.2	2.4	5.6	7.4	9.7	10.3	10.5	10.6	10.7
1	SB Electric Hobs (sb mode)	1	0.0	0.1	1.0	2.1	2.6	2.9	3.2	3.4	3.6	3.8
1	SB Complex Set-Top Boxes (low-power modes)	1	0.0	0.0	3.3	8.3	6.4	5.2	4.7	4.7	4.7	4.7
1	SB Game consoles (non-active modes)	1	0.0	0.0	1.4	5.0	4.9	4.9	4.9	4.9	4.9	4.9
1	SB IE Inkjet Printers (nsb mode)	1	0.0	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Inkjet MFDs (nsb mode)	1	0.0	0.7	1.1	1.6	1.3	1.2	1.2	1.1	1.1	1.0
1	SB IE Laser Printers (nsb mode)	1	0.0	1.1	2.2	3.7	3.5	3.5	3.4	3.4	3.3	3.2
1	SB IE Laser Copiers (nsb mode)	1	0.0	0.9	1.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	1	0.0	1.9	5.1	7.7	6.7	6.4	6.0	5.7	5.5	5.2
	Total (networked) SB (incl. double)		0	10	44	74	67	68	69	69	68	67
	Total (networked) SB (excl. double)		**0**	**3**	**23**	**36**	**33**	**34**	**34**	**34**	**34**	**33**
db	*EPS Active mode (electricity losses)*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	1	0.0	0.0	0.4	0.8	0.7	0.7	0.6	0.5	0.4	0.4
0.6	EPS 10–12 W	1	0.0	0.2	4.0	8.3	8.6	7.6	6.6	5.6	4.5	4.1
0.5	EPS 15–20 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	1	0.0	0.0	0.4	0.6	0.5	0.5	0.4	0.3	0.2	0.2
0.8	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
1.0	EPS 65–120 W	1	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.2	0.5	0.6	0.5	0.4	0.4	0.3	0.3
	EPS, total for active mode		**0**	**0**	**5**	**10**	**11**	**9**	**8**	**7**	**6**	**5**
db	*EPS No-load mode*											
0.0	EPS ≤ 6W, low-V	1	0.0	0.0	0.3	0.3	0.2	0.1	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	1	0.0	0.0	0.7	1.4	1.5	1.4	1.3	1.2	1.0	0.9
0.0	EPS 10–12 W	1	0.0	0.0	0.2	0.4	0.4	0.4	0.3	0.3	0.2	0.2
0.0	EPS 15–20 W	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
0.0	EPS 20–30 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode		**0.0**	**0.1**	**1.2**	**2.2**	**2.2**	**1.9**	**1.7**	**1.5**	**1.3**	**1.2**
	EPS, overall total (active + no-load)		**0**	**0**	**6**	**13**	**13**	**11**	**10**	**8**	**7**	**6**
	EPS, double counted subtracted		**0**	**0**	**3**	**7**	**7**	**6**	**6**	**5**	**4**	**4**
	TOTAL ELECTRONICS		**0**	**13**	**62**	**139**	**155**	**185**	**197**	**178**	**155**	**140**

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	**0**	**71**	**109**	**136**	**138**	**157**	**173**	**180**	**184**	**187**
	CF open vertical chilled multi deck (RVC2)	1	0.0	0.0	0.0	0.1	2.6	7.9	11.6	12.4	12.5	12.5
	CF open horizontal frozen island (RHF4)	1	0.0	0.0	0.0	0.0	0.2	0.6	0.8	0.9	0.9	0.9
	CF other supermarket display (non-BCs)	1	0.0	0.0	0.0	0.2	3.0	9.8	15.5	17.4	17.7	18.1
	CF Plug in one door beverage cooler	1	0.0	0.0	0.0	0.4	5.9	12.4	14.6	15.2	15.5	15.8
	CF Plug in horizontal ice cream freezer	1	0.0	0.0	0.0	0.1	1.0	2.0	2.1	2.2	2.2	2.3
	CF Spiral vending machine	1	0.0	0.0	0.0	0.0	0.1	0.3	0.6	0.6	0.7	0.7
	Total CF Commercial Refrigeration		**0**	**0**	**0**	**1**	**13**	**33**	**45**	**49**	**49**	**50**
	PF Storage cabinet Chilled Vertical (CV)	1	0.0	0.0	0.0	0.8	1.9	2.3	2.4	2.5	2.6	2.7
	PF Storage cabinet Frozen Vertical (FV)	1	0.0	0.0	0.0	1.0	2.2	2.7	2.8	2.9	3.1	3.2
	PF Storage cabinet Chilled Horizontal (CH)	1	0.0	0.0	0.0	0.6	1.4	1.7	1.8	1.9	1.9	2.0
	PF Storage cabinet Frozen Horizontal (FH)	1	0.0	0.0	0.0	0.4	0.9	1.1	1.1	1.2	1.2	1.3
	PF Storage cabinets All types	1	**0**	**0**	**0**	**3**	**6**	**8**	**8**	**8**	**9**	**9**
	PF Process Chiller AC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.5	1.0	1.6	1.9	2.1	2.2	2.4
	PF Process Chiller AC MT L > 300 kW	1	0.0	0.0	0.0	0.4	0.9	1.5	1.7	1.9	2.0	2.2
	PF Process Chiller AC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.4	0.9	1.4	1.7	1.9	2.0	2.2
	PF Process Chiller AC LT L > 200 kW	1	0.0	0.0	0.0	0.5	0.9	1.5	1.8	2.0	2.1	2.3
	PF Process Chiller WC MT S ≤ 300 kW	1	0.0	0.0	0.0	0.1	0.3	0.5	0.5	0.6	0.6	0.7
	PF Process Chiller WC MT L > 300 kW	1	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.8	0.9
	PF Process Chiller WC LT S ≤ 200 kW	1	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.7	0.8	0.8
	PF Process Chiller WC LT L > 200 kW	1	0.0	0.0	0.0	0.2	0.4	0.7	0.8	0.9	1.0	1.0
	PF Process Chiller All MT&LT	1	**0**	**0**	**0**	**3**	**5**	**8**	**10**	**11**	**12**	**12**
	PF Condensing Unit MT S 0.2-1 kW	1	0.0	0.0	0.0	0.5	1.0	1.1	1.2	1.3	1.4	1.5
	PF Condensing Unit MT M 1-5 kW	1	0.0	0.0	0.0	1.0	1.8	2.0	2.1	2.3	2.5	2.7
	PF Condensing Unit MT L 5-20 kW	1	0.0	0.0	0.0	1.7	2.8	3.0	3.2	3.4	3.7	4.0
	PF Condensing Unit MT XL 20-50 kW	1	0.0	0.0	0.0	1.6	2.6	2.8	3.0	3.2	3.5	3.7
	PF Condensing Unit LT S 0.1-0.4 kW	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	PF Condensing Unit LT M 0.4-2 kW	1	0.0	0.0	0.0	0.4	0.6	0.6	0.7	0.7	0.8	0.8
	PF Condensing Unit LT L 2-8 kW	1	0.0	0.0	0.0	0.9	1.2	1.3	1.4	1.5	1.7	1.8
	PF Condensing Unit LT XL 8-20 kW	1	0.0	0.0	0.0	1.6	2.4	2.6	2.8	3.0	3.3	3.5
0.6	**PF Condensing Unit, All MT&LT**	1	**0**	**0**	**0**	**8**	**12**	**13**	**15**	**16**	**17**	**18**
	PF Professional Refrigeration, Total		**0**	**0**	**0**	**8**	**17**	**21**	**24**	**25**	**27**	**29**
	TOTAL FOOD PRESERVATION		**0**	**71**	**109**	**145**	**167**	**212**	**241**	**254**	**260**	**266**
	CA Electric Hobs (active modes)	1	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5
	CA Electric Hobs (low-power modes)	1	0.0	0.1	1.0	2.1	2.6	2.9	3.2	3.4	3.6	3.8
	CA Electric Hobs (sum all modes)	1	0.0	0.1	1.0	2.2	2.8	3.3	3.6	3.8	4.0	4.2
	CA Electric Ovens (active modes)	1	0.0	0.0	0.0	1.1	2.0	3.2	4.3	4.5	4.5	4.6
	CA Electric Ovens (low-power modes)	1	0.0	0.2	2.4	5.6	7.4	9.7	10.3	10.5	10.6	10.7
	CA Electric Ovens (sum all modes)	1	0.0	0.2	2.5	6.6	9.4	12.9	14.6	14.9	15.1	15.3
	CA Gas Hobs	0	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
	CA Gas Ovens	0	0.0	0.0	0.0	0.3	0.7	1.1	1.4	1.4	1.4	1.4
	CA Range Hoods	1	0.0	0.0	0.2	1.6	3.7	6.5	8.4	9.2	9.9	10.5
	CA Elec. Hobs&Ovens low-power modes	1	0.0	0.3	3.5	7.6	10.0	12.6	13.5	13.9	14.2	14.5
	CA other products or modes		0.0	0.0	0.3	3.1	6.9	11.5	14.8	15.9	16.6	17.3
	TOTAL COOKING		**0**	**0**	**4**	**11**	**17**	**24**	**28**	**30**	**31**	**32**
	WM Washing Machines, active modes	1	0.0	18.3	25.9	28.5	23.3	20.8	17.6	13.7	9.8	6.0
	WM Washing Machines, low-power modes	1	0.0	1.0	2.8	2.8	2.6	2.9	2.9	2.9	2.9	2.9
	WM Washing Machines, all modes	1	0.0	19.3	28.6	31.3	25.8	23.7	20.5	16.5	12.7	8.8
	WD Washer-Dryers, active modes	1	0.0	2.1	3.3	3.8	2.9	2.2	1.4	0.8	0.4	0.2
	WD Washer-Dryers, low-power modes	1	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	WD Washer-Dryers, all modes	1	0.0	2.1	3.4	3.9	3.0	2.3	1.6	0.9	0.5	0.3
	WM-WD Washing, sum active modes	1	0.0	20.4	29.2	32.3	26.1	23.1	19.1	14.5	10.2	6.2
	WM-WD Washing, sum low-power modes	1	0.0	1.0	2.9	3.0	2.7	3.0	3.0	3.0	3.0	3.0
	Total WM-WD household Washing	1	**0**	**21**	**32**	**35**	**29**	**26**	**22**	**17**	**13**	**9**
	DW Dishwashers, active modes	1	0.0	9.4	13.8	17.5	17.5	20.1	22.3	24.6	26.8	29.1
	DW Dishwashers, low-power modes	1	0.0	0.0	0.3	0.7	0.9	1.1	1.2	1.4	1.5	1.6
	Total DW household Dishwasher	1	**0**	**9**	**14**	**18**	**18**	**21**	**24**	**26**	**28**	**31**
	LD condensing heat pump	1		-0.1	-2.2	-5.2	-6.2	-6.8	-7.4	-7.5	-7.0	-6.4
	LD condensing electric heat element	1	0.0	0.1	2.1	7.2	10.3	12.0	12.6	12.4	11.4	10.4
	LD vented electric	1	0.0	0.2	2.5	5.5	6.3	7.4	8.7	9.4	9.5	9.5
	LD vented gas	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes		0.0	0.1	2.3	7.1	9.9	11.9	13.3	13.7	13.2	12.7
	LD Laundry Dryers, low-power modes	1	0.0	0.0	0.2	0.4	0.5	0.6	0.6	0.7	0.7	0.7
	Total LD household Laundry Dryer		**0**	**0**	**2**	**7**	**10**	**13**	**14**	**14**	**14**	**13**

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1	0.0	0.0	3.1	17.7	20.9	17.9	13.5	10.3	9.4	9.2
	VC Upright Domestic mains	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Handstick Domestic mains	1	0.0	0.0	0.0	0.3	0.6	0.9	1.4	1.7	1.7	1.7
	VC Total Domestic mains		**0**	**0**	**3**	**18**	**22**	**19**	**15**	**12**	**11**	**11**
	VC Cylinder Commercial mains	1	0.0	0.0	2.4	10.1	9.6	10.6	11.5	11.9	11.9	11.9
	VC Upright Commercial mains	1	0.0	0.0	0.3	1.1	1.0	1.1	1.2	1.3	1.3	1.3
	VC Total Commercial mains		**0**	**0**	**3**	**11**	**11**	**12**	**13**	**13**	**13**	**13**
	VC Total in scope of CR 666/2013		**0**	**0**	**6**	**29**	**32**	**31**	**28**	**25**	**24**	**24**
	VC Cordless - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - cleaning	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - standby	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots		**0**	**0**	**3**	**18**	**22**	**19**	**15**	**12**	**11**	**11**
	VC Total Commercial mains+cordless+robots		**0**	**0**	**3**	**11**	**11**	**12**	**13**	**13**	**13**	**13**
	Total VC Vacuum Cleaner		**0**	**0**	**6**	**29**	**32**	**31**	**28**	**25**	**24**	**24**
	TOTAL CLEANING		**-**	**31**	**54**	**90**	**90**	**90**	**87**	**83**	**80**	**77**
0.5	FAN Axial<300Pa (all FAN types >125W)	1	0	0	5	16	24	30	32	32	32	32
0.5	FAN Axial>300Pa	1	0	0	5	16	26	34	37	37	37	37
0.5	FAN Centr.FC	1	0	0	2	7	11	14	15	15	15	15
0.5	FAN Centr.BC-free	1	0	0	4	12	16	20	22	22	23	23
0.5	FAN Centr.BC	1	0	0	6	15	21	25	28	30	32	35
0.5	FAN Cross-flow	1	0	0	1	3	4	5	5	6	6	7
	Total FAN, industrial (excl. box & roof fans)		**0**	**0**	**12**	**35**	**51**	**64**	**70**	**71**	**73**	**75**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	1	0	0	13	56	75	73	65	55	41	25
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	1	0	0	19	87	124	126	111	92	66	35
0.45	Medium (L) 3-ph 75-375 kW no VSD	1	0	1	35	133	189	235	199	137	73	29
0.45	**Total 3ph 0.75-375 kW no VSD**		**0**	**1**	**67**	**276**	**388**	**434**	**375**	**283**	**181**	**89**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	0	0	-2	-21	-32	-30	-25	-19	-12	-3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1	0	0	-9	-48	-69	-67	-57	-45	-30	-10
0.45	Medium (L) 3-ph 75-375 kW with VSD	1	0	0	-20	-78	-107	-129	-102	-61	-23	4
0.45	**Total 3-ph 0.75-375 kW with VSD**		**0**	**0**	**-31**	**-147**	**-208**	**-226**	**-184**	**-126**	**-64**	**-9**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**		**0**	**1**	**36**	**129**	**180**	**208**	**191**	**157**	**117**	**80**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	0	0	0	0.0	0.6	1.5	1.4	1.3	1.2	1.1
0.45	Small 1 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.1	0.2	0.2	0.2	0.1	0.1
0.45	**Total Small 1-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.0**	**0.7**	**1.6**	**1.6**	**1.4**	**1.3**	**1.2**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	0	0	0	0.1	1.5	2.3	2.1	1.9	1.8	1.6
0.45	Small 3 ph 0.12-0.75 kW with VSD	1	0	0	0	0.0	0.3	0.5	0.5	0.5	0.5	0.5
0.45	**Total Small 3-ph 0.12-0.75 kW**		**0**	**0**	**0**	**0.1**	**1.8**	**2.8**	**2.6**	**2.4**	**2.2**	**2.1**
0.45	Large 3-ph LV 375-1000 kW no VSD	1	0	0	0	0.0	0.6	1.1	1.5	1.7	1.4	1.1
0.45	Large 3-ph LV 375-1000kW with VSD	1	0	0	0	0.1	1.6	3.2	4.7	5.6	5.4	5.2
0.45	**Total Large 3-ph LV 375-1000 kW**		**0**	**0**	**0**	**0.1**	**2.1**	**4.3**	**6.2**	**7.4**	**6.7**	**6.3**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.3	0.6	0.6	0.6	0.5	0.4
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.2	0.5	0.6	0.6	0.5	0.5
0.45	Explosion motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.2	0.4	0.6	0.7	0.6	0.6
0.45	**Total Expl. 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.7**	**1.5**	**1.8**	**1.8**	**1.6**	**1.5**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.3	0.6	0.6	0.5	0.5	0.4
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.3	0.5	0.6	0.6	0.6	0.5
0.45	Brake motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.1	0.3	0.4	0.5	0.5	0.4
0.45	**Total Brake 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.7**	**1.4**	**1.6**	**1.6**	**1.5**	**1.4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	0	0	0	0.0	0.0	0.0	0.1	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	1	0	0	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
0.45	**Total 8-pole 0.75-375 kW (no VSD)**		**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**
0.45	**1-phase motors >0.75 kW (no VSD)**	1	**0**	**0**	**0**	**0.0**	**1.6**	**4.1**	**5.7**	**5.3**	**4.9**	**4.4**
	Total MT Elec. Motors LV 0.12-1000 kW		**0**	**1**	**20**	**71**	**103**	**123**	**116**	**97**	**75**	**54**

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	1	0.0	0.0	0.4	1.1	1.1	1.0	0.8	0.7	0.6	0.4
	ESOB<45_CF	1	0.0	0.0	0.3	0.8	0.8	0.7	0.6	0.5	0.4	0.3
	ESOB<45_VSD-VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESOB < 45 Total	1	**0.0**	**0.0**	**0.8**	**2.0**	**2.0**	**1.8**	**1.6**	**1.3**	**1.1**	**0.7**
	ESOB_45-150_VF	1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0
	ESOB_45-150_CF	1	0.0	0.0	0.1	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	ESOB_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	1	**0.0**	**0.0**	**0.2**	**0.6**	**0.5**	**0.4**	**0.2**	**0.1**	**0.0**	**0.0**
	ESOB < 150 Total	1	**0.0**	**0.0**	**1.0**	**2.5**	**2.5**	**2.1**	**1.8**	**1.4**	**1.1**	**0.7**
	ESCC<45_VF	1	0.0	0.0	0.4	0.9	0.9	0.8	0.7	0.6	0.5	0.3
	ESCC<45_CF	1	0.0	0.0	0.3	0.7	0.7	0.6	0.5	0.4	0.4	0.2
	ESCC<45_VSD-VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC < 45 Total	1	**0.0**	**0.0**	**0.6**	**1.7**	**1.7**	**1.5**	**1.3**	**1.1**	**0.9**	**0.6**
	ESCC_45-150_VF	1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0	0.0
	ESCC_45-150_CF	1	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ESCC_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	1	**0.0**	**0.0**	**0.1**	**0.3**	**0.3**	**0.2**	**0.1**	**0.0**	**0.0**	**0.0**
	ESCC < 150 Total	1	**0.0**	**0.0**	**0.8**	**2.0**	**1.9**	**1.7**	**1.4**	**1.2**	**0.9**	**0.6**
	ESCCi<45_VF	1	0.0	0.0	0.2	0.4	0.4	0.3	0.2	0.2	0.2	0.1
	ESCCi<45_CF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi<45_VSD-VF	1	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1
	ESCCi < 45 Total	1	**0.0**	**0.0**	**0.2**	**0.6**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**	**0.3**
	ESCCi_45-150_VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	1	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	1	**0.0**	**0.0**	**0.2**	**0.6**	**0.7**	**0.6**	**0.5**	**0.5**	**0.4**	**0.3**
	MSSB<6"_VF	1	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	MSSB<6"_CF	1	0.0	0.0	0.5	1.4	1.6	1.7	1.7	1.7	1.6	1.5
	MSSB<6"_VSD-VF	1	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	MSSB <6" Total	1	**0.0**	**0.0**	**0.6**	**1.6**	**1.8**	**2.0**	**1.9**	**1.9**	**1.8**	**1.7**
	MS-V<25bar_VF	1	0.0	0.0	0.3	0.7	0.7	0.6	0.5	0.5	0.4	0.3
	MS-V<25bar_CF	1	0.0	0.0	0.2	0.5	0.6	0.7	0.7	0.6	0.6	0.5
	MS-V<25bar_VSD-VF	1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	MS_V <25 bar Total	1	**0.0**	**0.0**	**0.5**	**1.4**	**1.5**	**1.4**	**1.3**	**1.2**	**1.1**	**0.9**
	WP Water pumps		**0.0**	**0.0**	**3.1**	**8.2**	**8.4**	**7.8**	**7.0**	**6.1**	**5.2**	**4.2**
	WE arc-on-mode	1	0.0	0.0	0.0	0.0	0.8	1.5	1.6	1.6	1.7	1.7
	WE idle mode	1	0.0	0.0	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.3
	Total WE Welding Equipment		**0**	**0**	**0**	**0**	**1**	**2**	**2**	**2**	**2**	**2**
	TOTAL INDUSTRY COMPONENTS		0	1	34	114	163	197	194	177	155	134
	TRAFO Distribution	1	0.0	0.0	1.3	4.6	6.9	10.2	13.6	17.4	21.3	25.5
	TRAFO Industry oil	1	0.0	0.0	1.6	5.9	8.8	12.9	17.4	20.8	22.2	23.7
	TRAFO Industry dry	1	0.0	0.0	0.3	1.1	1.6	2.3	3.1	4.0	4.6	4.9
	TRAFO Power	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TRAFO DER oil	1	0.0	0.0	0.2	0.7	1.4	2.7	4.8	7.4	10.5	14.0
	TRAFO DER dry	1	0.0	0.0	0.4	1.9	3.7	7.1	12.4	19.3	27.3	36.4
	TRAFO Small	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers		**0**	**0**	**4**	**14**	**22**	**35**	**51**	**69**	**86**	**105**
	TOTAL ENERGY SECTOR		**0**	**0**	**4**	**14**	**22**	**35**	**51**	**69**	**86**	**105**
	Tyres C1, replacement for cars	0	0	3	35	22	29	30	28	24	19	14
	Tyres C1, OEM for cars	0	0	0	0	1	5	6	5	5	4	3
	Tyres C1, total		**0**	**3**	**35**	**23**	**35**	**36**	**33**	**28**	**23**	**17**
	Tyres C2, replacement for vans	0	0	1	8	4	8	9	8	7	6	4
	Tyres C2, OEM for vans	0	0	0	0	0	1	1	1	1	1	1
	Tyres C2, total		**0**	**1**	**8**	**4**	**9**	**10**	**9**	**8**	**6**	**5**
	Tyres C3, replacement for trucks/busses	0	0	1	10	6	9	11	11	11	11	10
	Tyres C3, OEM for trucks/busses	0	0	0	0	0	1	1	1	1	2	2
	Tyres C3, total		**0**	**1**	**10**	**6**	**10**	**12**	**12**	**12**	**12**	**12**
	Tyres, total C1+C2+C3		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
	TOTAL TRANSPORT SECTOR		**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
	SAVED Primary Energy, Total, in TWh		**0**	**214**	**550**	**1039**	**1281**	**1513**	**1577**	**1539**	**1493**	**1466**
	SAVED Primary Energy, Total, in PJ		0	770	1979	3740	4612	5448	5677	5541	5375	5277
	SAVED Primary Energy, Total, in mtoe		0	18	47	89	110	130	136	132	128	126

SAVED Primary Energy (BAU-ECO, All Sectors)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	11	36	54	70	76	80	83	87
SPACE HEATING	0	39	111	223	316	383	405	406	407	408
SPACE COOLING	0	17	21	26	31	39	42	40	39	37
VENTILATION	0	0	1	6	11	18	22	25	28	31
1 *Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)*	*0*	*0*	*5*	*21*	*38*	*54*	*62*	*65*	*67*	*69*
LIGHTING	0	38	87	202	200	202	178	150	128	114
ELECTRONICS	0	13	62	139	155	185	197	178	155	140
FOOD PRESERVATION	0	71	109	145	167	212	241	254	260	266
COOKING	0	0	4	11	17	24	28	30	31	32
CLEANING	0	31	54	90	90	90	87	83	80	77
INDUSTRY COMPONENTS	0	1	34	114	163	197	194	177	155	134
ENERGY SECTOR	0	0	4	14	22	35	51	69	86	105
TRANSPORT SECTOR	0	5	52	32	54	58	54	48	41	34
SAVED Primary Energy, Total, in TWh	**0**	**214**	**550**	**1039**	**1281**	**1513**	**1577**	**1539**	**1493**	**1466**
SAVED Primary Energy, Total, in PJ	0	770	1979	3740	4612	5448	5677	5541	5375	5277
SAVED Primary Energy, Total, in mtoe	0	18	47	89	110	130	136	132	128	126
Saving in % versus BAU (from 1990=0)	0.0%	2.2%	5.6%	10.5%	14.7%	17.6%	18.5%	18.1%	17.4%	17.0%
Saving In % versus BAU (from 2010=0)	-2.6%	0.0%	3.4%	8.3%	12.3%	15.1%	15.9%	15.6%	14.9%	14.5%



Sector subdivision for SAVED Primary Energy

This subdivision uses the same sector definitions as used in Eurostat Energy Balances for Final Energy, plus the Energy sector
The Primary Energy per function and per sector presented here is the sum of the Final Energy consumed for that function in that sector
and the share of the additional energy input required for the generation and distribution of that Final Energy
There is no comparable subdivision in Eurostat (see the FNRG-, ELEC- and FUEL- sheets for a comparison with Eurostat data

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and estimate for standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. The data considered here are Distribution Losses. As these losses are already considered
when computing the Primary Energy for other sectors, only the decrease of the losses in the ECO scenario vs. the BAU scenario is reported.
(reference for BAU = 0)

SAVED Primary Energy (summary ENERGY SECTOR, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR	0	0	4	14	22	35	51	69	86	105
SAVED Primary Energy, Energy Sector, in TWh	**0**	**0**	**4**	**14**	**22**	**35**	**51**	**69**	**86**	**105**
SAVED Primary Energy, Energy Sector, in PJ	0	0	14	51	81	127	185	248	309	376
SAVED Primary Energy, Energy Sector, in mtoe	0	0	0	1	2	3	4	6	7	9

SAVED Primary Energy (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	1	2	2	2	2	2	3
SPACE HEATING	0	2	5	11	17	21	22	21	21	20
SPACE COOLING	0	1	1	3	5	7	8	8	7	6
VENTILATION	0	0	0	1	1	2	2	2	2	2
LIGHTING	0	3	8	15	22	29	30	27	24	21
ELECTRONICS	0	0	0	2	2	3	4	3	3	2
FOOD PRESERVATION	0	1	1	4	7	10	11	12	13	14
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	1	1	1	2	2	2	2
INDUSTRY COMPONENTS	0	0	19	67	98	117	113	98	80	64
SAVED Primary Energy, Industry, in TWh	**0**	**6**	**35**	**106**	**154**	**193**	**193**	**176**	**154**	**134**
SAVED Primary Energy, Industry, in PJ	0	23	125	380	555	695	696	632	554	483
SAVED Primary Energy, Industry, in mtoe	0	1	3	9	13	17	17	15	13	12

SAVED Primary Energy (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	1	8	4	8	9	9	8	7	7
TYRES for SERVICE-sector-related transport	0	2	16	9	17	18	18	16	14	13
TYRES for RESIDENTIAL-sector-related transport	0	2	28	18	28	29	26	23	18	14
TYRES for OTHER-sector-related transport	0	0	1	1	1	1	1	1	1	1
SAVED Primary Energy, Transport, in TWh	**0**	**5**	**52**	**32**	**54**	**58**	**54**	**48**	**41**	**34**
SAVED Primary Energy, Transport, in PJ	0	17	189	116	193	207	195	174	147	123
SAVED Primary Energy, Transport, in mtoe	0	0	5	3	5	5	5	4	4	3

SAVED Primary Energy (TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	3	9	13	16	17	18	18	19
SPACE HEATING	0	11	31	63	88	106	112	110	109	108
SPACE COOLING	0	5	7	11	16	22	23	23	21	19
VENTILATION	0	0	1	4	6	10	12	14	15	16
LIGHTING	0	10	30	65	91	120	116	101	89	81
ELECTRONICS	0	6	16	35	37	46	52	48	41	34
FOOD PRESERVATION	0	4	7	14	32	55	69	73	75	77
COOKING	0	0	1	2	3	4	5	5	5	5
CLEANING	0	1	4	12	12	13	14	14	14	14
INDUSTRY COMPONENTS	0	0	13	42	61	75	77	74	71	68
SAVED Primary Energy, Services, in TWh	**0**	**38**	**112**	**257**	**357**	**466**	**496**	**481**	**458**	**442**
SAVED Primary Energy, Services, in PJ	0	137	404	924	1286	1677	1787	1730	1651	1590
SAVED Primary Energy, Services, in mtoe	0	3	10	22	31	40	43	41	39	38

SAVED Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	8	26	40	52	56	59	62	65
SPACE HEATING	0	26	74	145	205	248	264	267	271	273
SPACE COOLING	0	10	12	11	9	8	8	8	9	10
VENTILATION	0	0	0	2	4	6	8	9	11	12
LIGHTING	0	25	49	119	85	50	31	20	14	11
ELECTRONICS	0	7	45	103	116	137	141	126	112	103
FOOD PRESERVATION	0	65	100	125	127	145	159	166	169	172
COOKING	0	0	3	9	14	20	24	25	26	26
CLEANING	0	30	50	76	77	76	71	67	64	61
INDUSTRY COMPONENTS	0	0	1	1	1	1	1	1	1	1
SAVED Primary Energy, Residential, in TWh	**0**	**163**	**341**	**618**	**678**	**743**	**762**	**747**	**736**	**734**
SAVED Primary Energy, Residential, in PJ	0	587	1228	2224	2439	2673	2744	2690	2651	2644
SAVED Primary Energy, Residential, in mtoe	0	14	29	53	58	64	66	64	63	63

SAVED Primary Energy (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	1	1	1	1	1	1
SPACE HEATING	0	1	2	4	6	7	8	8	7	7
SPACE COOLING	0	0	0	1	1	2	2	2	2	2
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	1	1	2	2	2	2	2	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	1	1	2	2	2	3	3	3	3
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	1	3	4	4	4	3	3	2
SAVED Primary Energy, Other sectors, in TWh	**0**	**2**	**6**	**13**	**16**	**19**	**19**	**19**	**18**	**17**
SAVED Primary Energy, Other sectors, in PJ	0	7	20	45	59	69	70	67	63	60
SAVED Primary Energy, Other sectorsl, in mtoe	0	0	0	1	1	2	2	2	2	1

SAVED Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		0	0	11	36	54	70	76	80	83	87
	Residential	0	0	8	26	40	52	56	59	62	65
	Tertiary / Services	0	0	3	9	13	16	17	18	18	19
	Industry	0	0	0	1	2	2	2	2	2	3
	Other	0	0	0	0	1	1	1	1	1	1
SPACE HEATING. All sectors, TWh		0	39	111	223	316	383	405	406	407	408
	Residential	0	26	74	145	205	248	264	267	271	273
	Tertiary / Services	0	11	31	63	88	106	112	110	109	108
	Industry	0	2	5	11	17	21	22	21	21	20
	Other	0	1	2	4	6	7	8	8	7	7
SPACE COOLING. All sectors, TWh		0	17	21	26	31	39	42	40	39	37
& HT PROCESS	Residential	0	10	12	11	9	8	8	8	9	10
	Tertiary / Services	0	5	7	11	16	22	23	23	21	19
	Industry	0	1	1	3	5	7	8	8	7	6
	Other	0	0	0	1	1	2	2	2	2	2
VENTILATION.	All sectors, TWh	0	0	1	6	11	18	22	25	28	31
	Residential	0	0	0	2	4	6	8	9	11	12
	Tertiary / Services	0	0	1	4	6	10	12	14	15	16
	Industry	0	0	0	1	1	2	2	2	2	2
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	38	87	202	200	202	178	150	128	114
	Residential	0	25	49	119	85	50	31	20	14	11
	Tertiary / Services	0	10	30	65	91	120	116	101	89	81
	Industry	0	3	8	15	22	29	30	27	24	21
	Other	0	1	1	2	2	2	2	2	1	1
ELECTRONICS.	All sectors, TWh	0	13	62	139	155	185	197	178	155	140
	Residential	0	7	45	103	116	137	141	126	112	103
	Tertiary / Services	0	6	16	35	37	46	52	48	41	34
	Industry	0	0	0	2	2	3	4	3	3	2
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.All sectors, TWh		0	71	109	145	167	212	241	254	260	266
	Residential	0	65	100	125	127	145	159	166	169	172
	Tertiary / Services	0	4	7	14	32	55	69	73	75	77
	Industry	0	1	1	4	7	10	11	12	13	14
	Other	0	1	1	2	2	2	3	3	3	3
COOKING.	All sectors, TWh	0	0	4	11	17	24	28	30	31	32
	Residential	0	0	3	9	14	20	24	25	26	26
	Tertiary / Services	0	0	1	2	3	4	5	5	5	5
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	31	54	90	90	90	87	83	80	77
	Residential	0	30	50	76	77	76	71	67	64	61
	Tertiary / Services	0	1	4	12	12	13	14	14	14	14
	Industry	0	0	0	1	1	1	2	2	2	2
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		0	1	34	114	163	197	194	177	155	134
	Residential	0	0	1	1	1	1	1	1	1	1
	Tertiary / Services	0	0	13	42	61	75	77	74	71	68
	Industry	0	0	19	67	98	117	113	98	80	64
	Other	0	0	1	3	4	4	4	3	3	2
TYRES. Transport sector, TWh		0	5	52	32	54	58	54	48	41	34
	Residential transport	0	2	28	18	28	29	26	23	18	14
	Tertiary / Services transport	0	2	16	9	17	18	18	16	14	13
	Industry transport	0	1	8	4	8	9	9	8	7	7
	Other transport	0	0	1	1	1	1	1	1	1	1
ALL PRODUCTS.	All sectors, TWh	0	214	546	1025	1259	1478	1526	1470	1407	1361
(excl. Energy	Residential	0	163	341	618	678	743	762	747	736	734
sector)	Tertiary / Services	0	38	112	257	357	466	496	481	458	442
	Industry	0	6	35	106	154	193	193	176	154	134
	Other	0	2	6	13	16	19	19	19	18	17
	Transport	0	5	52	32	54	58	54	48	41	34

SAVED Primary Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			72%	72%	73%	73%	74%	74%	74%	74%
	Tertiary / Services			24%	24%	23%	23%	22%	22%	22%	22%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential		66%	66%	65%	65%	65%	65%	66%	66%	67%
	Tertiary / Services		28%	28%	28%	28%	28%	28%	27%	27%	26%
	Industry		4%	4%	5%	5%	6%	5%	5%	5%	5%
	Other		1%	1%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential		62%	60%	42%	28%	21%	19%	20%	22%	27%
	Tertiary / Services		32%	34%	44%	51%	55%	56%	56%	55%	52%
	Industry		5%	5%	11%	16%	18%	19%	19%	18%	16%
	Other		1%	1%	3%	5%	5%	6%	5%	5%	5%
VENTILATION.											
	Residential			28%	29%	33%	34%	35%	36%	37%	39%
	Tertiary / Services			62%	61%	58%	57%	56%	55%	54%	53%
	Industry			9%	9%	9%	9%	8%	8%	8%	8%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential		66%	56%	59%	43%	25%	17%	13%	11%	10%
	Tertiary / Services		26%	34%	32%	45%	59%	65%	68%	69%	71%
	Industry		7%	9%	8%	11%	15%	17%	18%	19%	19%
	Other		1%	2%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential		53%	73%	74%	75%	74%	72%	71%	72%	74%
	Tertiary / Services		47%	26%	25%	24%	25%	26%	27%	26%	24%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential		92%	92%	86%	76%	68%	66%	65%	65%	65%
	Tertiary / Services		6%	6%	10%	19%	26%	28%	29%	29%	29%
	Industry		1%	1%	3%	4%	5%	5%	5%	5%	5%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential		87%	85%	84%	84%	83%	83%	83%	83%	83%
	Tertiary / Services		13%	15%	16%	16%	17%	17%	17%	17%	17%
	Industry		0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential		96%	91%	85%	85%	84%	82%	80%	80%	79%
	Tertiary / Services		4%	8%	14%	13%	14%	16%	17%	18%	19%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential		0%	2%	1%	1%	1%	1%	1%	1%	1%
	Tertiary / Services		20%	39%	37%	37%	38%	40%	42%	46%	50%
	Industry		79%	56%	59%	60%	59%	58%	56%	52%	47%
	Other		1%	3%	3%	2%	2%	2%	2%	2%	2%
TYRES.											
	Residential transport			53%	56%	52%	50%	49%	47%	44%	41%
	Tertiary / Services transport			30%	28%	31%	32%	33%	33%	35%	37%
	Industry transport			15%	13%	15%	16%	16%	17%	18%	19%
	Other transport			2%	2%	2%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential		76%	62%	60%	54%	50%	50%	51%	52%	54%
	Tertiary / Services		18%	21%	25%	28%	32%	33%	33%	33%	32%
	Industry		3%	6%	10%	12%	13%	13%	12%	11%	10%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
	Transport		2%	10%	3%	4%	4%	4%	3%	3%	3%

Emission rates

GWP (Global Warming Potential)

All greenhouse gas emissions in GWP-100, CO_2 equivalent

(values taken from the user choice on sheet General_1)

electricity				1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
GWPel	electricity	kg CO_2/kWh		0.500	0.318	0.305	0.214	0.179	0.143	0.109	0.075	0.061	0.061

heating fuels			**constant**
GWPgas	nat.gas	kg CO_2/kWh	0.198
GWPoil	gas oil heating	kg CO_2/kWh	0.270
GWPfossil	80/20 gas/oil	kg CO_2/kWh	0.212
GWPwood	wood logs	kg CO_2/kWh	0.0216
GWPpellets	pellets	kg CO_2/kWh	0.040
GWPcoal	coal	kg CO_2/kWh	0.3924
GWPwoodchip	wood chips	kg CO_2/kWh	0.0144
automotive fuels			
GWPpetrol	petrol	kg CO_2/kWh	0.264
GWPdiesel	diesel	kg CO_2/kWh	0.267

refrigerant (leakage & EoL not recovered loss)

The main instrument for regulating refrigerants is the F-gas regulation (REGULATION (EU) No 517/2014 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 16 April 2014 on fluorinated greenhouse gases and repealing Regulation (EC) No 842/2006). Most Ecodesign regulations therefore do not specifically address refrigerants, although some give a bonus (in the sense of allowing lower energy efficiency when using refrigerants with low GWP) and some have information requirements on the type and amount of refrigerant used. In past editions, EIA reported contributions of refrigerant losses to GHG emissions (leakage during use, losses at EoL) for information, but without associated savings attributable to ecodesign or energy labelling measures. The average GWP values used (in kgCO2eq/a/unit) were preliminary estimates, constant over the years. Considering the F-gas regulation this was not realistic. Considering also remarks from the European Court of Auditors, it was therefore agreed with the EC policy officer for EIA to remove refrigerant data from the accounting in EIA 2019. Consequently the kgCO2eq/a/unit values are no longer being reported.

NO_x, CO, OGC and PM-emissions

CH boilers (lot 1) & WH (Lot 2), fossil fuel fired*, NO_x emissions			1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NO_xBAU	BAU stock	mg/kWh NCV	190	190	190	190	190	190	190	190	190	190
	limits ED (sales)	mg/kWh NCV	190	190	133	75	75	75	75	75	75	75
NO_xECO	ECO stock	mg/kWh NCV	190	190	179	133	97	75	75	75	75	75

*=ED regulations prescribes max. 56 (gas) and 120 (oil) mg/kWh GCV. At a 80/20 gas-oil share this translates into 75 mg/kWh NCV starting from 26.9.2018.
The IA report mentions currently an average of 175 mg/kWh GCV (190 mg/kWh NCV). Share of CHP and fossil-fuel fired heat pumps neglected.

Solid Fuel Boilers (SFB, Lot 15), NOx, CO, OGC and PM emissions

CR 2015/1189 sets emissions limits for NOx (nitrogen oxides), CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter). For NOx insufficient data were available in IA for a quantitifcation of emissions in EIA and hence no NOx data are reported here for SFB. EIA data are based on the Impact Assessment report and underlying Excel files.

For each emission type, EIA computes (total emissions of the stock) = (average emission rate of the stock in g/GJ fuel input) * (fuel consumption by the stock as reported on FUELBAU or FUELECO in TWh/a, but *1000*3600 to convert to GJ/a). This result in g/a is then divided by 1E9 to convert to kton/a.

The sheet EMISSRATES reports the 'average emission rate of the stock in g/GJ fuel input'. However, the original emission rates in the studies, and the limits set in the CR, are expressed in mg/m3 flue gas. The conversion factor from mg/m3 to g/GJ is not a simple constant, but depends on the energy efficiency, and thus differs per product and changes with the years. In addition, the converted emission rates are first obtained as averages for new sold products. In a next step, this has to be converted to average values for the installed stock of products (in the same way as is done for the energy efficiencies, see sheets EFN and EFS. The conversion of original sales-average emission rates in mg/m3 to stock-average emision rates in g/GJ is not shown in this EIA file, but available on request in a separate file.

Solid Fuel Boilers (SFB, Lot 15), CO emission rates

BAU	mg/m3 in 2010	CO-emission rates in g/GJ, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	4000	7202	3992.8	3739	3628	3614	3598	3580	3567	3562	3562
SFB Wood Direct Draft	200	275	187	184	183	182	181	180	180	180	180
SFB Coal	200	351	226	214	207	205	204	202	202	201	201
SFB Pellets	350	381	316	309	306	305	304	302	302	301	301
SFB Wood chips	350	376	309	306	303	301	299	298	297	297	297

ECO	mg/m3 in 2020	CO-emission rates in g/GJ, average of stock									
	limits from CR	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	700	7202	3992.8	3739	3364	2875	2023	804	612	611	611
SFB Wood Direct Draft	500	275	187	184	183	181	179	177	176	175	175
SFB Coal	500	351	226	214	207	205	203	199	197	196	196
SFB Pellets	500	381	316	309	306	304	300	297	295	294	294
SFB Wood chips	500	376	309	306	303	301	299	298	297	297	297

Solid Fuel Boilers (SFB, Lot 15), OGC emission rates

BAU	mg/m3 in 2010	OGC-emission rates in g/GJ, average of stock									
	sales average	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	350	630	349	327	317	316	315	313	312	312	312
SFB Wood Direct Draft	10	14	9	9	9	9	9	9	9	9	9
SFB Coal	10	18	11	11	10	10	10	10	10	10	10
SFB Pellets	50	54	45	44	44	44	43	43	43	43	43
SFB Wood chips	10	11	9	9	9	9	9	9	8	8	8

Solid Fuel Boilers (SFB, Lot 15), OGC emission rates (continued)

ECO	mg/m3 in 2020 limits from CR	OGC-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	30	630	349	327	292	245	162	44	26	26	26
SFB Wood Direct Draft	20	14	9	9	9	9	9	9	9	9	9
SFB Coal	20	18	11	11	10	10	10	10	10	10	10
SFB Pellets	20	54	45	44	38	31	26	20	17	17	17
SFB Wood chips	20	11	9	9	9	9	9	9	8	8	8

Solid Fuel Boilers (SFB, Lot 15), PM emission rates

BAU	mg/m3 in 2010 sales average	PM-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	180	324	180	168	163	163	162	161	161	160	160
SFB Wood Direct Draft	50	69	47	46	46	46	45	45	45	45	45
SFB Coal	50	88	57	54	52	51	51	51	50	50	50
SFB Pellets	50	54	45	44	44	44	43	43	43	43	43
SFB Wood chips	50	54	44	44	43	43	43	43	42	42	42

ECO	mg/m3 in 2020 limits from CR	PM-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
SFB Wood Manual	60	324	180	168	154	136	105	60	52	52	52
SFB Wood Direct Draft	40	69	47	46	44	41	39	36	35	35	35
SFB Coal	40	88	57	54	52	50	47	41	40	39	39
SFB Pellets	40	54	45	44	42	39	37	35	34	34	34
SFB Wood chips	40	54	44	44	42	40	37	35	34	34	34

Local Space Heaters (LSH, Lot 20), NOx, CO, OGC and PM emissions

CR 2015/1185 (solid fuel LSH) sets emissions limits for NOx (nitrogen oxides), CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter). CR 2015/1188 (liquid and gaseous fuel LSH) sets emissions limits for NOx. For NOx emissions limited data were available in the Impact Assessment report and underlying Excel sheet. Consequently NOx data are reported in EIA only for LSH using liquid or gaseous fuel and even these data are to be considered indicative only. EIA data are based on the Impact Assessment report and underlying Excel files.

As regards the computation method in EIA the same explanation applies as for Solid Fuel Boilers (see further above).

Local Space Heaters (LSH, Lot 20), CO emission rates

BAU	mg/m3 in 2010 sales average	CO-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	3600	3834	2751.2	2517	2301	2097	1902	1732	1601	1511	1459
LH closed fireplace/inset	3600	3747	2675	2451	2245	2056	1874	1717	1596	1509	1459
LH wood stove	3600	3866	2779	2534	2298	2081	1881	1717	1596	1509	1459
LH coal stove	3600	4605	3303	3011	2743	2503	2293	2105	1934	1792	1704
LH cooker	3600	3569	2518	2291	2077	1881	1697	1552	1468	1445	1445
LH SHR stove	3600	3191	2572	2411	2247	2086	1932	1810	1722	1659	1620
LH pellet stove	600	1072	546	396	251	151	98	87	87	87	87

ECO	mg/m3 in 2022 limits from CR	CO-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	2000	3834	2751.2	2517	2244	1835	1472	1146	857	658	648
LH closed fireplace/inset	1500	3747	2675	2451	2184	1793	1476	1203	965	799	790
LH wood stove	1500	3866	2779	2534	2245	1833	1488	1205	965	799	790
LH coal stove	1500	4605	3303	3011	2698	2300	1956	1620	1250	937	920
LH cooker	1500	3569	2518	2291	1978	1452	1030	742	726	726	726
LH SHR stove	1500	3191	2572	2411	2185	1805	1497	1260	1069	935	928
LH pellet stove	300	1072	546	396	250	149	97	87	87	87	87

Local Space Heaters (LSH, Lot 20), OGC emission rates

BAU	mg/m3 in 2010 sales average	OGC-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	180	364	194	157	123	91	64	43	28	19	17
LH closed fireplace/inset	180	350	182	147	114	84	60	41	27	19	17
LH wood stove	180	369	198	159	123	88	61	41	27	19	17
LH coal stove	180	446	241	195	153	116	85	60	39	24	20
LH cooker	180	322	157	121	88	57	34	21	17	17	17
LH SHR stove	180	304	180	148	115	83	57	40	28	21	19
LH pellet stove	150	214	111	97	90	89	88	87	87	87	87

ECO	mg/m3 in 2022 limits from CR	OGC-emission rates in g/GJ, average of stock									
		1990	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
LH open fireplace	120	364	194	157	123	91	64	43	28	19	17
LH closed fireplace/inset	120	350	182	147	114	84	60	41	27	19	17
LH wood stove	120	369	198	159	123	88	61	41	27	19	17
LH coal stove	120	446	241	195	153	116	85	60	39	24	20
LH cooker	120	322	157	121	88	57	34	21	17	17	17
LH SHR stove	120	304	180	148	115	83	57	40	28	21	19
LH pellet stove	60	214	111	97	85	65	48	36	35	35	35

Local Space Heaters (LSH, Lot 20), PM emission rates

BAU	mg/m3 in 2010 sales average	PM-emission rates in g/GJ, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	910	794	638	587	503	429	362	299	256	252	251
LH closed fireplace/inset	210	264	169	148	127	111	95	82	72	67	62
LH wood stove	210	274	178	156	132	113	96	82	72	67	62
LH coal stove	210	329	214	187	161	139	120	103	89	81	73
LH cooker	235	266	172	147	118	98	85	81	77	75	75
LH SHR stove	160	195	133	117	101	85	69	57	48	42	38
LH pellet stove	85	125	71	55	40	25	15	10	9	9	9

ECO	mg/m3 in 2022 limits from CR	PM-emission rates in g/GJ, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	50	794	638	587	490	369	256	147	57	18	16
LH closed fireplace/inset	40	264	169	148	123	93	69	48	31	22	21
LH wood stove	40	274	178	156	129	96	70	48	31	22	21
LH coal stove	40	329	214	187	158	125	98	71	44	26	25
LH cooker	40	266	172	147	111	68	37	20	19	19	19
LH SHR stove	40	195	133	117	98	74	55	42	32	25	25
LH pellet stove	20	125	71	55	40	25	15	10	9	9	9

Local Space Heaters (LSH, Lot 20), NOx emission rates

BAU	mg/kWh in 2012 sales average	NOx-emission rates in mg/kWh, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fire gas	300	361	322	312	302	292	282	274	269	265	264
LH closed fire gas	200	263	223	213	203	193	183	174	168	165	164
LH luminous heaters	100	100	100	100	100	100	100	100	100	100	100
LH tube heaters	230	292	252	242	233	223	213	205	199	195	194

ECO	mg/kWh in 2018 limits from CR	NOx-emission rates in mg/kWh, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fire gas	130	361	322	312	266	218	176	138	130	130	130
LH closed fire gas	130	263	223	213	191	169	149	133	130	130	130
LH luminous heaters	200	100	100	100	100	100	100	100	100	100	100
LH tube heaters	200	292	252	242	229	218	208	199	196	195	194

Air Heaters and Coolers (AHC, ENER Lot 21 / ENTR Lot 6), NOx emissions

The draft regulation (WD of 2015) sets emissions limits for NOx (nitrogen oxides) for warm air heaters, heat pumps, confort chillers, high temperature chillers and air conditioners working on gaseous or liquid fuels. The first proposed tier is in September 2018; for warm air heaters a second tier with lower emission limits is proposed for January 2021. EIA data are based on the Impact Assessment report and underlying Excel files. However, in the IA the same emission limits were used for the BAU and ECO scenarios, meaning that emission savings derive only from reduced fuel consumption. In EIA the (reduced) emission limits of the 2015 WD are used for the ECO scenario, leading to lower ECO-emissions and to higher emission savings than in the IA.

As regards the computation method in EIA the same explanation applies as for Solid Fuel Boilers (see further above).

BAU	mg/kWh in 2012 sales average	NOx-emission rates in mg/kWh, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
CHF	900	900	900	900	900	900	900	900	900	900	900
ACF	900	900	900	900	900	900	900	900	900	900	900
ACF (rev)	900	900	900	900	900	900	900	900	900	900	900
AHF	275	275	275	275	275	275	275	275	275	275	275

ECO	mg/kWh in 2018 limits from WD	mg/kWh in 2021 limits from WD	NOx-emission rates in mg/kWh, average of stock 1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
CHF	240	240	900	900	882	656	435	265	240	240	240	240
ACF	240	240	900	900	882	656	435	265	240	240	240	240
ACF (rev)	240	240	900	900	882	656	435	265	240	240	240	240
AHF	100	70	275	275	272	224	156	88	70	70	70	70

NOISE

Heat pump space heaters, heat pump combination heaters (Lot 1) and heat pump water heaters (Lot 2), max. sound power level (LWA) (from 26.9.2015)

		max. dB(A)
Rated heat output ≤ 6 kW	indoors	60
	outdoors	65
Rated heat output > 6 kW and ≤ 12 kW	indoors	65
	outdoors	70
Rated heat output > 12 kW and ≤ 30 kW	indoors	70
	outdoors	78
Rated heat output > 30 kW and ≤ 70 kW	indoors	80
	outdoors	88

RAC, Lot 10 (applicable max. sound power levels, from 1.1.2013)

Rated capacity ≤ 6 kW	indoors	60
	outdoors	65
6 < Rated capacity ≤12 kW	indoors	65
	outdoors	70

Vacuum cleaners, Lot 17 (from 1.9.2017)

Sound power level shall be less than or equal to 80 dB(A),

Tyres: Rolling Noise requirements

(GSR, Regulation (EC) No 661/2009, Annex II, Part C)
(maximum allowed noise level)

Tyre class	max dB(A)
C1A	70
C1B	71
C1C	71
C1D	72
C1E	74
C2 normal	72
C2 traction	73
C3 normal	73
C3 traction	75

For C1 snow tyres limits +1 dB(A)
For C2 traction snow tyres limits +2 dB(A)
For C3 and other C2 snow tyres limits +1 dB(A)

db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also other emissions at bottom of Table										
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	3	2	2	1	1	1	1	1	1	1
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	4	3	3	2	2	1	1	1	1	1
	ESWH Electric Storage > 30 L (primary)	29	25	25	17	14	11	9	7	6	6
	GIWH Gas Instant. < 13 L/min (secondary)	3	3	2	2	2	2	2	2	1	1
	GIWH Gas Instant. ≥ 13 L/min (primary)	1	2	2	1	1	1	1	1	1	1
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	5	4	4	3	2	1	1	1	1	1
	Dedicated WH Heat Pump	0	0	0	0	1	1	1	1	1	1
	Dedicated WH Solar (3.5 m2)	0	2	2	2	2	1	1	1	1	1
	WH dedicated Water Heater	**45**	**42**	**41**	**29**	**24**	**20**	**17**	**14**	**12**	**12**
	CHB Gas Combi Instant. WH	11	27	28	28	27	27	27	27	27	27
	CHB Gas + Cyl. WH	7	11	11	11	11	11	11	11	11	11
	CHB Jet Burner Gas + Cyl. WH	2	2	1	1	1	1	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	19	16	13	10	7	5	5	5	5	5
	CHB Electric (Joule) + Cyl. WH	1	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	0	0
	CHB Electric HP + Cyl. WH	0	1	1	1	1	1	1	1	1	1
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**40**	**57**	**55**	**51**	**47**	**45**	**45**	**44**	**44**	**45**
	TOTAL WATER HEATING	**85**	**99**	**96**	**81**	**71**	**65**	**62**	**58**	**57**	**57**
	CHB Gas non-condensing	154	172	138	103	74	63	54	46	39	33
	CHB Gas condensing	2	54	81	105	122	127	128	126	124	121
	CHB Gas Jet burner non-condensing	17	11	8	6	4	2	1	1	1	1
	CHB Gas Jet burner condensing	0	0	0	1	1	1	1	1	1	1
	CHB Oil Jet burner non-condensing	278	177	134	94	61	32	18	15	13	11
	CHB Oil Jet burner condensing	0	3	6	9	12	15	17	17	18	18
	CHB Electric Joule-effect	6	4	4	3	3	2	1	1	1	1
	CHB Hybrid (gas-electric)	0	0	0	0	0	0	0	0	1	1
	CHB Electric Heat Pump	1	4	5	5	5	4	4	3	2	3
	CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	1
	CHB micro CHP	0	0	0	0	0	0	0	0	1	1
	CHB Solar combi (16 m2)	1	1	1	1	1	1	1	1	1	1
	CHB Central Heating boiler < 400 kW, space heating	**459**	**426**	**378**	**327**	**283**	**249**	**227**	**211**	**201**	**192**
	SFB Wood Manual	7.4	1.9	1.5	1.1	0.7	0.4	0.3	0.2	0.1	0.1
	SFB Wood Direct Draft	0.1	0.5	0.9	1.3	1.5	1.5	1.5	1.6	1.8	2.1
	SFB Coal	142.9	41.9	41.2	33.2	23.8	14.6	10.2	9.4	8.2	7.1
	SFB Pellets	0.0	0.4	0.6	0.9	1.1	1.2	1.2	1.2	1.2	1.3
	SFB Wood chips	0.0	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3
	Total Solid Fuel Boiler	**150**	**45**	**44**	**37**	**27**	**18**	**13**	**13**	**12**	**11**
	CHAE-S (≤ 400 kW)	1.6	2.9	3.2	2.4	2.0	1.6	1.2	0.8	0.7	0.7
	CHAE-L (> 400 kW)	2.6	4.0	4.2	3.1	2.6	1.9	1.4	0.9	0.7	0.6
	CHWE-S (≤ 400 kW)	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.6	0.9	0.9	0.7	0.6	0.4	0.3	0.2	0.1	0.1
	CHWE-L (> 1500 kW)	0.4	0.6	0.6	0.4	0.4	0.3	0.2	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	10.0	10.2	10.8	8.1	7.1	5.8	4.5	3.1	2.6	2.6
	HT PCH-AE-L	9.6	9.7	10.2	7.7	6.7	5.4	4.2	2.9	2.4	2.4
	HT PCH-WE-S	2.0	2.1	2.3	1.7	1.5	1.2	0.9	0.7	0.5	0.5
	HT PCH-WE-M	4.1	4.2	4.4	3.4	2.9	2.4	1.9	1.3	1.1	1.1
	HT PCH-WE-L	0.8	0.8	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.2
	AC rooftop	1.4	2.1	2.0	1.2	0.8	0.4	0.1	0.0	0.0	0.0
	AC splits	1.9	3.5	3.4	2.2	1.7	1.2	0.8	0.5	0.4	0.3
	AC VRF	0.0	0.9	1.2	1.2	1.2	1.2	1.0	0.8	0.7	0.7
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC central Air Cooling	**35**	**42**	**45**	**33**	**28**	**22**	**17**	**12**	**10**	**10**
	AC rooftop (rev)	1.9	3.7	3.5	2.2	1.4	0.7	0.3	0.1	0.0	0.0
	AC splits (rev)	3.4	6.8	6.8	4.6	3.7	2.6	1.8	1.1	0.8	0.7
	AC VRF (rev)	0.0	2.2	3.1	3.0	3.1	3.0	2.6	1.9	1.6	1.5
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	43	31	26	23	20	17	15	14	12	11
	AHE	0.5	0.8	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1
	SubTotal AHC central Air Heating	**49**	**44**	**41**	**33**	**29**	**24**	**20**	**17**	**15**	**13**
	Total AHC central Air Heating & Cooling	**84**	**87**	**85**	**66**	**57**	**47**	**37**	**29**	**24**	**23**

db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	LH closed fireplace/inset	0.4	0.9	1.0	1.2	1.3	1.4	1.4	1.4	1.3	1.3
	LH wood stove	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	LH coal stove	9.2	5.0	4.5	4.1	3.6	3.1	2.5	2.0	1.6	1.3
	LH cooker	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH SHR stove	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7
	LH pellet stove	0.0	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7
	LH Solid fuel sum	**11**	**8**	**8**	**8**	**8**	**7**	**7**	**6**	**6**	**6**
	LH Electric portable	12	7	6	4	3	3	2	1	1	1
	LH Electric fixed > 250W	62	35	31	19	13	9	7	4	3	3
	LH Electric fixed ≤ 250W	4	2	2	1	1	1	0	0	0	0
	LH Electric storage	4	2	2	1	1	1	0	0	0	0
	LH Electric underfloor	11	7	6	4	3	3	2	1	1	1
	LH Electric visibly glowing > 1.2 kW	1	1	1	0	0	0	0	0	0	0
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	3	3	3	2	2	1	1	1	0	0
	LH Electric sum	**96**	**57**	**51**	**32**	**24**	**17**	**13**	**8**	**6**	**6**
	LH Gas luminous (commercial)	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gaseous Tube (commercial < 120 kW)	0.6	0.5	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2
	LH Gas open front	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gas closed front	0.8	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1
	LH Gas balanced flue	1.7	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**3.6**	**2.3**	**1.9**	**1.6**	**1.3**	**1.1**	**0.9**	**0.8**	**0.7**	**0.7**
	LH Liquid tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.5**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Local Space Heaters total	**112**	**67**	**61**	**42**	**33**	**26**	**20**	**15**	**13**	**12**
	RAC fixed < 6 kW, cooling	0.9	5.3	4.5	2.4	1.9	1.7	1.4	1.0	0.9	1.0
	RAC fixed 6-12 kW, cooling	0.5	2.8	2.7	1.5	1.2	1.0	0.8	0.6	0.5	0.5
	RAC portable < 12 kW, cooling	0.1	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	RAC < 12 kW total, cooling mode	**1**	**8**	**8**	**4**	**3**	**3**	**2**	**2**	**1**	**2**
	RAC fixed < 6 kW, reversible, heating	0.4	6.5	7.1	4.9	4.9	4.8	4.4	3.6	3.4	3.8
	RAC fixed 6-12 kW, reversible, heating	0.2	3.2	4.0	2.9	2.9	2.7	2.3	1.8	1.7	1.8
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**1**	**10**	**11**	**8**	**8**	**8**	**7**	**5**	**5**	**6**
	RAC Room Air Conditioner	**2**	**18**	**19**	**12**	**11**	**10**	**9**	**7**	**7**	**7**
1	CIRC Integrated circulators	6.5	6.0	5.9	4.3	3.7	3.0	2.3	1.5	1.2	1.1
0.38	CIRC Large standalone circulators	4.1	3.7	3.3	2.1	1.6	1.1	0.8	0.5	0.4	0.4
0.38	CIRC Small standalone circulators	3.1	2.7	2.4	1.5	1.2	0.8	0.6	0.4	0.3	0.3
	CIRC Circulator pumps <2.5 kW, all	**14**	**12**	**12**	**8**	**6**	**5**	**4**	**2**	**2**	**2**
	CIRC Circulator pumps <2.5 kW, excl. double	**4**	**4**	**4**	**2**	**2**	**1**	**1**	**1**	**0**	**0**
	TOTAL SPACE HEATING	**775**	**596**	**539**	**448**	**381**	**325**	**289**	**262**	**246**	**235**
	TOTAL SPACE COOLING	**37**	**51**	**52**	**37**	**32**	**25**	**19**	**13**	**11**	**11**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3
	R-UVU 100-250 m3/h	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	R-UVU 250-1000 m3/h	1.1	1.6	1.7	1.2	1.1	0.9	0.7	0.5	0.4	0.4
	R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.2	0.3	0.5	0.5	0.5	0.5	0.6
	R-UVU > 1000 m3/h	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential, from VU own electricity	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**1**	**1**	**2**
	NR-UVU 250-1000 m3/h	0.5	0.6	0.6	0.4	0.4	0.3	0.2	0.2	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.3	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2
	NR-UVU > 1000 m3/h	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.1	0.2
	NR-AHU-S 2500-5500 m3/h	0.1	0.8	1.1	0.9	0.9	0.9	0.7	0.6	0.5	0.6
	NR-AHU-M 5500-14500 m3/h	8.6	7.3	6.7	4.5	3.7	3.1	2.5	1.8	1.5	1.6
	NR-AHU-L > 14500 m3/h	2.4	2.1	1.9	1.3	1.1	0.9	0.7	0.5	0.4	0.4
	NRVU, Total non-residential, from VU own electricity	**12**	**12**	**11**	**8**	**7**	**6**	**5**	**3**	**3**	**3**
	VU Ventilation Units, res + non-res. from VU own elec.	**13**	**14**	**14**	**10**	**9**	**8**	**6**	**5**	**4**	**5**
	TOTAL VENTILATION (from VU own electricity)	**13**	**14**	**14**	**10**	**9**	**8**	**6**	**5**	**4**	**5**
1	***Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)***	-	-	-	-	-	-	-	-	-	-

db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	38.6	38.7	44.6	35.3	29.2	20.0	12.0	6.5	4.1	3.2
	HID (HPM, HPS, MH)	14.3	19.7	19.8	14.1	10.1	5.4	2.2	0.8	0.4	0.2
	CFLni (all shapes)	1.0	2.6	2.8	2.0	1.5	0.8	0.3	0.1	0.1	0.0
	CFLi (retrofit for GLS, HL)	0.4	3.5	4.5	3.3	2.3	1.5	0.7	0.3	0.2	0.1
	GLS (DLS & NDLS)	36.8	19.5	13.8	7.0	3.5	1.6	0.7	0.3	0.1	0.1
	HL (DLS & NDLS, LV & MV)	3.1	11.5	14.5	12.1	7.2	2.9	1.2	0.4	0.2	0.1
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.3	1.7	4.4	6.9	8.1	7.3	7.3	8.7
	LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	1.4	3.3	4.7	4.9	4.1	3.9	4.5
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.2	0.4	0.4	0.3	0.3	0.4
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.4	0.5	0.5	0.4	0.4	0.4
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.6	1.6	2.0	2.0	1.7	1.5	1.7
	Standby	*4.7*	*4.7*	*3.9*	*2.3*	*1.6*	*1.1*	*0.8*	*0.6*	*0.5*	*0.5*
	TOTAL LIGHTING (incl. standby)	**99**	**100**	**104**	**80**	**65**	**48**	**34**	**23**	**19**	**20**
	DP TV on-mode, total all types	11.7	19.6	21.6	15.9	12.1	10.9	8.3	5.4	4.2	4.3
	DP TV standby, standard (NoNA)	1.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	0.0	0.0	0.5	0.9	1.1	1.1	0.9	0.6	0.4	0.3
	DP TV standby, total all types	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**
	DP TV total on-mode + standby	**13**	**20**	**22**	**17**	**13**	**12**	**9**	**6**	**5**	**5**
	DP Monitor on-mode	0.4	3.9	2.3	1.2	0.9	0.7	0.4	0.2	0.2	0.2
	DP Monitor standby	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total	**0**	**4**	**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
	DP Signage on-mode	0.0	0.3	2.4	3.8	3.9	3.0	2.1	1.4	1.1	1.1
	DP Signage standby	0.0	0.0	0.4	0.6	0.6	0.4	0.3	0.2	0.2	0.2
	DP Signage total	**0**	**0**	**3**	**4**	**4**	**3**	**2**	**2**	**1**	**1**
	DP Electronic Displays, total on-mode	**12**	**24**	**26**	**21**	**17**	**15**	**11**	**7**	**6**	**6**
	DP Electronic Displays, total standby	**2**	**1**	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**0**
	DP Electronic Displays, total	**14**	**25**	**28**	**23**	**19**	**16**	**12**	**8**	**6**	**6**
	SSTB	0.0	0.9	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	0.0	1.6	3.6	2.5	2.0	1.5	1.1	0.7	0.6	0.6
	CSTB (other modes)	0.0	0.9	2.0	1.4	1.1	0.8	0.6	0.4	0.3	0.3
	CSTB (all covered modes)	0.0	2.5	5.6	3.9	3.0	2.2	1.7	1.1	0.9	0.9
	Total STB set top boxes (Complex & Simple)	**0**	**3**	**6**	**4**	**3**	**2**	**2**	**1**	**1**	**1**
	Game consoles > 20 W Active modes (SRI)	0.0	0.8	1.4	1.2	1.0	0.8	0.6	0.4	0.3	0.3
	Game consoles > 20 W Non-Active (CR)	0.0	0.4	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1
	Game consoles < 20 W Non-Active (CR)	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes	0.0	0.8	1.4	1.2	1.0	0.8	0.6	0.4	0.3	0.3
	Total Game consoles, non-active modes	0.0	0.7	0.9	0.7	0.6	0.5	0.4	0.2	0.2	0.2
	Total Game consoles > 20 W, all modes	0.0	1.2	2.0	1.7	1.3	1.1	0.8	0.6	0.5	0.5
	Total Game consoles < 20 W, all modes	0.0	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	Total Game consoles, all modes	**0**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0.0	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	0.1	0.9	0.6	0.4	0.3	0.3	0.2	0.2	0.1	0.1
	ES rack 2-socket traditional	0.3	4.1	2.1	0.9	0.9	0.8	0.7	0.5	0.4	0.4
	ES rack 2-socket cloud	0.0	2.3	3.4	2.7	2.6	2.5	2.1	1.4	1.2	1.1
	ES rack 4-socket traditional	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket cloud	0.0	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2
	ES rack 2-socket resilient trad.	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ES blade 2-socket traditional	0.3	1.9	0.9	0.4	0.4	0.4	0.3	0.2	0.2	0.2
	ES blade 2-socket cloud	0.0	1.1	1.5	1.3	1.3	1.2	1.0	0.7	0.6	0.6
	ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	ES total traditional	**1**	**8**	**5**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
	ES total cloud	**0**	**4**	**6**	**5**	**5**	**4**	**4**	**2**	**2**	**2**
	ES Enterprise Servers total	**1**	**12**	**10**	**7**	**7**	**6**	**5**	**4**	**3**	**3**
	DS Online 2	0.2	1.8	2.4	2.3	2.4	2.3	1.8	1.3	1.0	1.0
	DS Online 3	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.1	0.1
	DS Online 4	0.1	1.0	1.3	1.2	1.3	1.2	1.0	0.7	0.6	0.6
	DS Data Storage products total	**0**	**3**	**4**	**4**	**4**	**4**	**3**	**2**	**2**	**2**
	ES + DS total (excl. infrastructure)	**1**	**15**	**14**	**11**	**11**	**10**	**8**	**6**	**5**	**5**

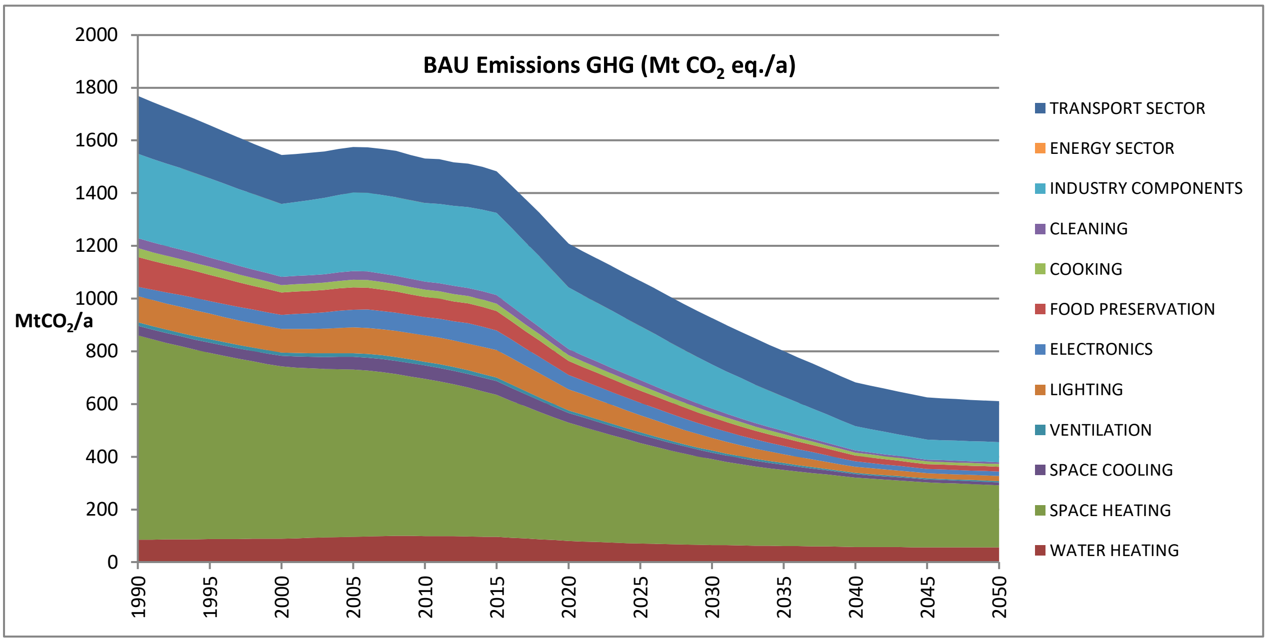
db	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	7.8	6.6	4.2	1.9	1.8	1.5	1.2	0.8	0.6	0.6
	PC Integrated Desktop	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	PC Notebook	0.0	2.3	2.5	1.4	1.3	1.1	0.9	0.6	0.5	0.5
	PC Tablet/slate	0.0	0.1	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1
	PC Thin client	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1
	Total PC, electricity	**8**	**10**	**8**	**4**	**4**	**3**	**3**	**2**	**1**	**1**
	Inkjet Printer	0.5	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.6	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.0
	EP / Laser Printer mono	3.9	0.7	0.6	0.3	0.2	0.1	0.1	0.0	0.0	0.0
	EP / Laser Printer colour	0.0	0.4	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2
	EP / Laser Copier mono	4.4	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.7	0.8	0.6	0.5	0.4	0.3	0.2	0.1	0.1
	EP / Laser MFD colour	0.0	0.8	1.0	0.7	0.6	0.4	0.3	0.2	0.2	0.2
	Total IE Imaging Equipment, from electricity	**9**	**3**	**4**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
	of which for modes under CR 1275/2008	*7*	*3*	*3*	*2*	*1*	*1*	*1*	*1*	*0*	*0*
	(see Resources for contributions from paper, toner)										
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	1.0	1.9	1.6	0.9	0.7	0.5	0.3	0.2	0.2	0.1
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	SB Audio speakers (wired) (sb & off modes)	0.9	0.9	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.2	0.7	0.9	0.7	0.6	0.4	0.3	0.3
	SB Small appliances (sb & off modes)	0.6	2.2	2.2	1.6	1.4	1.1	0.8	0.6	0.5	0.5
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	SB Media players and recorders (sb mode)	0.0	1.1	1.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.2	1.0	1.0	0.7	0.5	0.4	0.2	0.2	0.1	0.1
	SB Office phones (nsb mode)	0.3	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.3	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2
	SB Home Network Equipment (nsb mode)	0.0	0.8	1.0	0.7	0.7	0.6	0.4	0.3	0.3	0.3
	SB Office Network Equipment (nsb mode)	0.0	0.1	0.3	0.5	0.7	0.7	0.7	0.5	0.4	0.4
	SB Coffee makers (off mode)	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.5	0.5	0.4	*0.3*	*0.3*	*0.2*	*0.1*	*0.1*	*0.1*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.2	0.2	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	1.0	1.3	1.1	1.0	0.8	0.6	0.4	0.4	0.4
1	SB Electric Hobs (sb mode)	0.0	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2
1	SB Complex Set-Top Boxes (low-power modes)	0.0	1.6	3.6	2.5	2.0	1.5	1.1	0.7	0.6	0.6
1	SB Game consoles (non-active modes)	0.0	0.7	0.9	0.7	0.6	0.5	0.4	0.2	0.2	0.2
1	SB IE Inkjet Printers (nsb mode)	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.5	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0
1	SB IE Laser Printers (nsb mode)	3.0	0.8	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.2
1	SB IE Laser Copiers (nsb mode)	3.3	0.3	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	1.1	1.4	1.0	0.8	0.6	0.4	0.3	0.2	0.2
	Total (networked) SB (incl. double)	11	17	20	14	11	9	7	5	4	4
	Total (networked) SB (excl. double)	**4**	**9**	**10**	**7**	**6**	**5**	**4**	**3**	**2**	**2**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
0.6	EPS 10–12 W	0.0	2.2	3.3	2.5	2.0	1.6	1.1	0.8	0.6	0.6
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0
	EPS, total for active mode	**0.0**	**3.3**	**4.5**	**3.2**	**2.6**	**2.0**	**1.5**	**1.0**	**0.8**	**0.8**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0
0.0	EPS 10–12 W	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.5**	**0.5**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
	EPS, overall total (active + no-load)	**0.1**	**3.8**	**5.0**	**3.6**	**2.9**	**2.2**	**1.6**	**1.1**	**0.8**	**0.8**
	EPS, double counted subtracted	**0.1**	**2.0**	**2.5**	**1.8**	**1.5**	**1.1**	**0.8**	**0.5**	**0.4**	**0.4**
	TOTAL ELECTRONICS	**36**	**70**	**74**	**55**	**47**	**40**	**31**	**21**	**17**	**16**

	BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
db											
	Total RF household Refrigerators & Freezers	**56**	**36**	**35**	**25**	**21**	**17**	**13**	**9**	**7**	**7**
	CF open vertical chilled multi deck (RVC2)	6.9	4.0	3.6	2.4	1.9	1.5	1.1	0.8	0.6	0.6
	CF open horizontal frozen island (RHF4)	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	12.1	7.3	6.9	4.8	4.0	3.3	2.6	1.9	1.5	1.6
	CF Plug in one door beverage cooler	7.7	5.0	4.5	3.0	2.5	2.0	1.5	1.1	0.9	0.9
	CF Plug in horizontal ice cream freezer	1.7	1.1	1.0	0.7	0.6	0.5	0.3	0.2	0.2	0.2
	CF Spiral vending machine	1.8	0.9	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	Total CF Commercial Refrigeration	**31**	**19**	**17**	**11**	**9**	**8**	**6**	**4**	**3**	**3**
	PF Storage cabinet Chilled Vertical (CV)	0.8	0.7	0.7	0.5	0.5	0.4	0.3	0.2	0.2	0.2
	PF Storage cabinet Frozen Vertical (FV)	0.9	0.8	0.8	0.6	0.5	0.4	0.4	0.3	0.2	0.2
	PF Storage cabinet Chilled Horizontal (CH)	0.6	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	0.4	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**2.6**	**2.3**	**2.4**	**1.8**	**1.5**	**1.3**	**1.0**	**0.7**	**0.6**	**0.6**
	PF Process Chiller AC MT S ≤ 300 kW	1.4	2.0	2.2	1.8	1.7	1.5	1.3	0.9	0.8	0.9
	PF Process Chiller AC MT L > 300 kW	1.4	1.9	2.2	1.8	1.6	1.4	1.2	0.9	0.8	0.9
	PF Process Chiller AC LT S ≤ 200 kW	1.4	2.0	2.3	1.8	1.7	1.5	1.3	1.0	0.8	0.9
	PF Process Chiller AC LT L > 200 kW	1.5	2.1	2.3	1.9	1.8	1.6	1.3	1.0	0.9	0.9
	PF Process Chiller WC MT S ≤ 300 kW	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.2	0.2
	PF Process Chiller WC MT L > 300 kW	0.6	0.8	0.9	0.8	0.7	0.6	0.5	0.4	0.3	0.4
	PF Process Chiller WC LT S ≤ 200 kW	0.5	0.7	0.8	0.7	0.6	0.5	0.5	0.3	0.3	0.3
	PF Process Chiller WC LT L > 200 kW	0.7	0.9	1.0	0.8	0.8	0.7	0.6	0.4	0.4	0.4
	PF Process Chiller All MT&LT	**8**	**11**	**12**	**10**	**9**	**8**	**7**	**5**	**5**	**5**
	PF Condensing Unit MT S 0.2-1 kW	2.8	1.5	1.4	1.0	0.9	0.8	0.6	0.5	0.4	0.4
	PF Condensing Unit MT M 1-5 kW	7.1	3.7	3.4	2.5	2.3	2.0	1.6	1.2	1.1	1.1
	PF Condensing Unit MT L 5-20 kW	8.7	4.5	4.2	3.1	2.8	2.4	2.0	1.5	1.3	1.4
	PF Condensing Unit MT XL 20-50 kW	8.6	4.5	4.2	3.1	2.8	2.4	2.0	1.5	1.3	1.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT M 0.4-2 kW	1.3	0.7	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2
	PF Condensing Unit LT L 2-8 kW	2.2	1.1	1.1	0.8	0.7	0.6	0.5	0.4	0.3	0.3
	PF Condensing Unit LT XL 8-20 kW	6.7	3.5	3.3	2.4	2.2	1.9	1.5	1.1	1.0	1.1
0.6	**PF Condensing Unit, All MT&LT**	**38**	**20**	**18**	**14**	**12**	**10**	**9**	**6**	**6**	**6**
	PF Professional Refrigeration, Total	**26**	**21**	**22**	**17**	**16**	**14**	**11**	**9**	**7**	**8**
	TOTAL FOOD PRESERVATION	**113**	**76**	**74**	**53**	**46**	**38**	**30**	**21**	**18**	**19**
	CA Electric Hobs (active modes)	9.4	9.2	9.8	7.5	6.8	5.8	4.6	3.4	2.8	3.0
	CA Electric Hobs (low-power modes)	0.0	0.4	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2
	CA Electric Hobs (sum all modes)	9	10	10	8	7	6	5	4	3	3
	CA Electric Ovens (active modes)	10.7	6.8	6.2	4.1	3.4	2.7	2.2	1.5	1.2	1.2
	CA Electric Ovens (low-power modes)	0.0	1.0	1.3	1.1	1.0	0.8	0.6	0.4	0.4	0.4
	CA Electric Ovens (sum all modes)	11	8	7	5	4	4	3	2	2	2
	CA Gas Hobs	6.1	5.0	4.9	4.7	4.5	4.3	4.0	3.8	3.6	3.4
	CA Gas Ovens	2.4	1.7	1.6	1.4	1.3	1.3	1.2	1.2	1.1	1.1
	CA Range Hoods	4.5	3.6	3.6	2.7	2.4	2.0	1.6	1.2	1.0	1.0
	CA Elec. Hobs&Ovens low-power modes	0.0	1.4	1.8	1.5	1.3	1.1	0.9	0.6	0.5	0.5
	CA other products or modes	33	26	26	20	18	16	14	11	10	10
	TOTAL COOKING	**33**	**28**	**28**	**22**	**20**	**17**	**15**	**12**	**10**	**10**
	WM Washing Machines, active modes	21.4	10.9	10.0	6.6	5.1	3.8	2.7	1.7	1.3	1.1
	WM Washing Machines, low-power modes	0.0	0.5	0.5	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	WM Washing Machines, all modes	21.4	11.4	10.6	7.0	5.4	4.0	2.9	1.8	1.4	1.3
	WD Washer-Dryers, active modes	3.6	2.7	2.5	1.7	1.4	1.0	0.7	0.5	0.4	0.4
	WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers, all modes	3.6	2.7	2.5	1.7	1.4	1.0	0.7	0.5	0.4	0.4
	WM-WD Washing, sum active modes	24.9	13.5	12.5	8.3	6.5	4.8	3.4	2.2	1.6	1.5
	WM-WD Washing, sum low-power modes	0.0	0.5	0.6	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	Total WM-WD household Washing	**25**	**14**	**13**	**9**	**7**	**5**	**4**	**2**	**2**	**2**
	DW Dishwashers, active modes	5.1	5.9	6.5	5.3	5.0	4.3	3.6	2.6	2.3	2.4
	DW Dishwashers, low-power modes	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	Total DW household Dishwasher	**5**	**6**	**7**	**5**	**5**	**4**	**4**	**3**	**2**	**2**
	LD condensing heat pump	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LD condensing electric heat element	0.6	2.8	2.7	1.9	1.7	1.4	1.0	0.7	0.5	0.5
	LD vented electric	3.2	2.2	1.8	1.1	0.8	0.6	0.5	0.3	0.3	0.3
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	3.9	4.9	4.5	3.0	2.5	2.0	1.5	1.0	0.8	0.8
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	Total LD household Laundry Dryer	**4**	**5**	**5**	**3**	**3**	**2**	**2**	**1**	**1**	**1**

db	BAU Emissions GHG (in MtCO$_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	3.8	3.6	4.5	3.3	2.6	1.8	1.0	0.5	0.4	0.4
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1	0.1	0.1
	VC Total Domestic mains	**4**	**4**	**5**	**3**	**3**	**2**	**1**	**1**	**0**	**0**
	VC Cylinder Commercial mains	0.8	1.9	2.1	1.5	1.3	1.1	0.9	0.6	0.5	0.5
	VC Upright Commercial mains	0.1	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**
	VC Total in scope of CR 666/2013	**5**	**6**	**7**	**5**	**4**	**3**	**2**	**1**	**1**	**1**
	VC Cordless - domestic - cleaning	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.3
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**4**	**4**	**5**	**4**	**3**	**3**	**2**	**1**	**1**	**1**
	VC Total Commercial mains+cordless+robots	**1**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
	Total VC Vacuum Cleaner	**5**	**6**	**7**	**6**	**5**	**4**	**3**	**2**	**2**	**2**
	TOTAL CLEANING	**39**	**31**	**32**	**23**	**19**	**16**	**12**	**8**	**7**	**7**
0.5	FAN Axial<300Pa (all FAN types >125W)	8.2	14.7	16.7	13.2	12.2	10.3	8.0	5.5	4.5	4.5
0.5	FAN Axial>300Pa	14.1	26.9	29.9	22.3	19.6	16.0	12.3	8.5	6.9	6.9
0.5	FAN Centr.FC	3.5	4.8	5.6	4.4	4.0	3.4	2.6	1.8	1.5	1.5
0.5	FAN Centr.BC-free	9.1	12.3	14.2	11.0	10.2	8.8	7.2	5.1	4.2	4.3
0.5	FAN Centr.BC	9.5	13.9	16.1	12.5	11.6	10.1	8.4	6.2	5.5	5.9
0.5	FAN Cross-flow	0.6	0.7	0.8	0.6	0.6	0.5	0.4	0.3	0.3	0.3
	Total FAN, industrial (excl. box & roof fans)	**22**	**37**	**42**	**32**	**29**	**25**	**19**	**14**	**11**	**12**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	49	39	40	29	24	19	14	9	7	6
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	73	61	62	45	38	29	21	14	10	9
0.45	Medium (L) 3-ph 75-375 kW no VSD	149	121	122	87	72	54	38	23	16	14
0.45	**Total 3ph 0.75-375 kW no VSD**	**270**	**221**	**224**	**162**	**134**	**102**	**73**	**46**	**33**	**30**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	3	5	6	5	5	4	4	3	3	3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	6	9	11	9	9	9	8	6	6	7
0.45	Medium (L) 3-ph 75-375 kW with VSD	17	27	32	28	28	27	24	19	18	20
0.45	**Total 3-ph 0.75-375 kW with VSD**	**26**	**41**	**49**	**42**	**43**	**40**	**36**	**29**	**27**	**30**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**297**	**262**	**273**	**204**	**177**	**142**	**109**	**75**	**60**	**60**
0.45	Small 1 ph 0.12-0.75 kW no VSD	4	3	3	2	2	1	1	1	1	1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**4**	**3**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	5	4	4	3	3	2	2	1	1	1
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**5**	**5**	**5**	**4**	**3**	**2**	**2**	**1**	**1**	**1**
0.45	Large 3-ph LV 375-1000 kW no VSD	76	59	55	37	29	22	16	11	9	9
0.45	Large 3-ph LV 375-1000kW with VSD	4	13	19	18	19	17	14	10	9	9
0.45	**Total Large 3-ph LV 375-1000 kW**	**80**	**72**	**74**	**55**	**48**	**39**	**31**	**22**	**18**	**18**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	2	1	1	1	1	1	1	0	0	0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	4	4	3	2	2	2	1	1	1
0.45	Explosion motors (L) 3-ph 75-375 kW	7	7	7	6	5	4	3	2	2	2
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**13**	**12**	**13**	**10**	**8**	**7**	**5**	**4**	**3**	**3**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	1	1	1	1	1	0	0	0	0
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	2	3	2	2	1	1	1	1	1
0.45	Brake motors (L) 3-ph 75-375 kW	4	3	4	3	2	2	2	1	1	1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**7**	**7**	**7**	**5**	**5**	**4**	**3**	**2**	**2**	**2**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**20**	**17**	**18**	**14**	**12**	**10**	**8**	**5**	**4**	**4**
	MT Elec. Motors LV 0.12-1000 kW	**235**	**208**	**217**	**162**	**141**	**114**	**87**	**60**	**49**	**49**
	including also double counted amounts	426	379	394	295	256	207	159	110	90	90

db BAU Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	8.3	6.9	7.0	5.3	4.6	3.8	3.0	2.2	1.9	2.0
ESOB<45_CF	5.5	4.7	4.8	3.6	3.3	2.7	2.2	1.6	1.4	1.5
ESOB<45_VSD-VF	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2
ESOB < 45 Total	**14**	**12**	**12**	**9**	**8**	**7**	**6**	**4**	**4**	**4**
ESOB_45-150_VF	2.8	2.3	2.4	1.7	1.5	1.2	1.0	0.7	0.6	0.6
ESOB_45-150_CF	4.7	4.0	4.1	3.1	2.8	2.4	1.9	1.4	1.2	1.3
ESOB_45-150_VSD-VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
ESOB 45-150 Total	**8**	**7**	**7**	**5**	**5**	**4**	**3**	**2**	**2**	**2**
ESOB < 150 Total	**22**	**18**	**19**	**14**	**13**	**11**	**9**	**6**	**5**	**6**
ESCC<45_VF	6.9	5.7	5.8	4.3	3.7	3.0	2.4	1.8	1.5	1.6
ESCC<45_CF	4.6	3.9	4.0	3.1	2.7	2.3	1.9	1.4	1.2	1.2
ESCC<45_VSD-VF	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2
ESCC < 45 Total	**12**	**10**	**10**	**8**	**7**	**6**	**5**	**3**	**3**	**3**
ESCC_45-150_VF	2.5	2.1	2.1	1.6	1.4	1.1	0.9	0.7	0.6	0.6
ESCC_45-150_CF	1.7	1.5	1.5	1.2	1.0	0.9	0.7	0.5	0.5	0.5
ESCC_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ESCC 45-150 Total	**4**	**4**	**4**	**3**	**3**	**2**	**2**	**1**	**1**	**1**
ESCC < 150 Total	**16**	**14**	**14**	**11**	**9**	**8**	**6**	**5**	**4**	**4**
ESCCi<45_VF	3.5	2.6	2.6	1.8	1.3	0.9	0.7	0.5	0.4	0.5
ESCCi<45_CF	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
ESCCi<45_VSD-VF	0.5	0.6	0.7	0.6	0.7	0.7	0.6	0.5	0.4	0.4
ESCCi < 45 Total	**4**	**4**	**4**	**3**	**2**	**2**	**1**	**1**	**1**	**1**
ESCCi_45-150_VF	0.6	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1
ESCCi_45-150_CF	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ESCCi 45-150 Total	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ESCCi < 150 Total	**5**	**4**	**4**	**3**	**3**	**2**	**2**	**1**	**1**	**1**
MSSB<6"_VF	1.2	0.9	0.9	0.6	0.5	0.4	0.3	0.2	0.2	0.2
MSSB<6"_CF	6.7	5.7	5.8	4.4	4.0	3.3	2.7	2.0	1.7	1.8
MSSB<6"_VSD-VF	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
MSSB <6" Total	**8**	**7**	**7**	**5**	**5**	**4**	**3**	**2**	**2**	**2**
MS-V<25bar_VF	5.1	4.1	4.2	3.1	2.6	2.0	1.6	1.2	1.0	1.1
MS-V<25bar_CF	3.2	2.7	2.8	2.1	1.9	1.6	1.3	1.0	0.8	0.9
MS-V<25bar_VSD-VF	0.3	0.4	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.3
MS_V <25 bar Total	**9**	**7**	**7**	**6**	**5**	**4**	**3**	**2**	**2**	**2**
WP Water pumps	**59**	**50**	**51**	**39**	**35**	**29**	**23**	**17**	**15**	**15**
WE arc-on-mode, from electricity	3.1	1.9	1.9	1.3	1.1	0.9	0.7	0.5	0.4	0.4
WE idle mode, from electricity	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
Total WE Welding Equipment	**3**	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
TOTAL INDUSTRY COMPONENTS	**320**	**297**	**312**	**234**	**205**	**168**	**131**	**92**	**76**	**77**
TRAFO Distribution	5.2	5.6	6.0	4.7	4.3	3.8	3.2	2.4	2.1	2.2
TRAFO Industry oil	3.9	4.3	4.7	3.6	3.3	2.9	2.4	1.8	1.5	1.6
TRAFO Industry dry	1.2	1.4	1.5	1.1	1.0	0.9	0.7	0.6	0.5	0.5
TRAFO Power	15.0	14.8	16.0	12.4	11.5	10.0	8.3	6.1	5.4	5.7
TRAFO DER oil	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	1.0
TRAFO DER dry	0.0	0.6	1.0	1.2	1.7	2.2	2.7	2.8	3.2	4.3
TRAFO Small	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1
Total TRAFO Utility Transformers	**26**	**27**	**30**	**24**	**23**	**21**	**18**	**14**	**14**	**15**
TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
(Emissions due to fuel losses due to RRC)										
Tyres C1, replacement for cars	99	75	69	67	67	65	63	60	57	54
Tyres C1, OEM for cars	30	22	21	21	20	20	19	18	17	16
Tyres C1, total	**128**	**96**	**90**	**87**	**87**	**85**	**82**	**77**	**74**	**70**
Tyres C2, replacement for vans	29	26	24	26	27	28	28	26	25	24
Tyres C2, OEM for vans	6	5	5	6	6	6	6	6	5	5
Tyres C2, total	**35**	**31**	**29**	**31**	**33**	**34**	**34**	**32**	**30**	**29**
Tyres C3, replacement for trucks/busses	46	34	32	39	42	46	47	46	46	45
Tyres C3, OEM for trucks/busses	10	8	8	9	9	10	10	10	10	10
Tyres C3, total	**56**	**42**	**39**	**48**	**51**	**56**	**57**	**57**	**56**	**55**
Tyres, total C1+C2+C3	**220**	**169**	**159**	**166**	**171**	**176**	**173**	**166**	**160**	**154**
TRANSPORT SECTOR	**220**	**169**	**159**	**166**	**171**	**176**	**173**	**166**	**160**	**154**
GENERAL TOTAL (in Mt CO_2)	**1769**	**1531**	**1483**	**1209**	**1067**	**926**	**801**	**682**	**625**	**610**

BAU Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	85	99	96	81	71	65	62	58	57	57
SPACE HEATING	775	596	539	448	381	325	289	262	246	235
SPACE COOLING	37	51	52	37	32	25	19	13	11	11
VENTILATION	13	14	14	10	9	8	6	5	4	5
1 *VENTILATION (from heat saving vs. BAU; already included in EMIS for space heating)*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
LIGHTING	99	100	104	80	65	48	34	23	19	20
ELECTRONICS	36	70	74	55	47	40	31	21	17	16
FOOD PRESERVATION	113	76	74	53	46	38	30	21	18	19
COOKING	33	28	28	22	20	17	15	12	10	10
CLEANING	39	31	32	23	19	16	12	8	7	7
INDUSTRY COMPONENTS	320	297	312	234	205	168	131	92	76	77
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	220	169	159	166	171	176	173	166	160	154
TOTAL in Mt CO_2	1769	1531	1483	1209	1067	926	801	682	625	610



Sector subdivision for BAU GHG emissions

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard emissions due to electricity consumed by VUs; heat saving effects are included in Space Heating
Lighting: includes emissions due to energy consumption by control gears, and estimate for standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. Only emissions due to Distribution Losses considered.Assumed that these losses are already considered in GWP for electricity that is used when computing emissions for other sectors. Consequently only the decrease in emissions due to the decrease of the losses in the ECO scenario vs. the BAU scenario is reported. (reference for BAU = 0)

BAU GHG emission (ENERGY SECTOR, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR (BAU taken as reference = 0)	0	0	0	0	0	0	0	0	0	0
BAU GHG emission, Energy Sector, MtCO2eq	0	0	0	0	0	0	0	0	0	0

BAU GHG emission (INDUSTRY, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3	3	3	2	2	2	2	2	2	2
SPACE HEATING	42	34	30	25	21	18	16	15	13	12
SPACE & HT PROCESS COOLING	9	11	11	8	7	6	4	3	2	2
VENTILATION	2	2	1	1	1	1	1	0	0	0
LIGHTING	13	13	14	11	10	8	6	4	3	3
ELECTRONICS	1	3	3	2	2	2	2	1	1	1
FOOD PRESERVATION	10	11	13	10	9	8	7	5	5	5
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	214	192	201	150	131	106	82	57	47	47
BAU GHG emission, Industry, MtCO2eq	293	269	276	211	184	151	119	87	74	73

BAU GHG emission (TRANSPORT, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are emissions related to energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	37	29	28	31	33	35	35	34	33	32
TYRES for SERVICE-sector-related transport	74	58	55	60	64	67	67	65	63	61
TYRES for RESIDENTIAL-sector-related transport	103	77	72	70	70	68	65	62	59	56
TYRES for OTHER-sector-related transport	6	5	4	5	5	5	5	5	5	5
BAU GHG emission, Transport, MtCO2eq	220	169	159	166	171	176	173	166	160	154

BAU GHG emission (TERTIARY/SERVICES, MtCO2eq	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	20	21	20	16	14	13	11	10	10	10
SPACE HEATING	181	156	141	117	100	86	76	68	63	60
SPACE & HT PROCESS COOLING	23	31	33	24	20	16	12	8	7	7
VENTILATION	10	10	10	7	6	5	4	3	3	3
LIGHTING	51	57	61	49	42	32	23	16	14	14
ELECTRONICS	14	25	26	21	20	17	13	9	7	7
FOOD PRESERVATION	49	30	28	19	16	14	11	8	6	7
COOKING	4	3	3	3	2	2	2	2	1	1
CLEANING	2	3	3	2	2	2	1	1	1	1
INDUSTRY COMPONENTS	78	81	87	66	58	48	38	27	22	22
BAU GHG emission, Services, MtCO2eq	432	418	413	322	280	234	191	151	134	132

BAU GHG emission (RESIDENTIAL, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	62	74	72	61	54	50	48	45	44	45
SPACE HEATING	538	395	357	298	252	215	191	175	165	157
SPACE & HT PROCESS COOLING	1	6	5	3	2	2	2	1	1	1
VENTILATION	1	2	2	2	2	2	2	1	1	2
LIGHTING	35	29	28	19	13	7	4	3	2	2
ELECTRONICS	22	41	45	32	25	21	16	11	9	8
FOOD PRESERVATION	52	33	32	23	19	15	12	8	7	7
COOKING	29	24	24	19	17	15	13	10	9	9
CLEANING	37	28	28	20	17	14	10	7	6	6
INDUSTRY COMPONENTS	10	9	9	7	6	5	4	3	3	3
BAU GHG emission, Residential, MtCO2eq	786	642	603	484	408	346	301	264	246	239

BAU GHG emission (OTHER sectors, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	1	1	1	1	1	1	1	1	1	1
SPACE HEATING	14	12	10	9	8	7	6	6	5	5
SPACE & HT PROCESS COOLING	3	3	3	2	2	2	1	1	1	1
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	1	1	1	1	1	1	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	2	1	1	1	1	1	1	1	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	17	15	15	12	10	9	7	5	4	4
BAU GHG emission, Other sectors, MtCO2eq	38	34	33	26	23	19	16	13	11	11

BAU GHG emissions (per FUNCTION, MTCO2eq)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	85	99	96	81	71	65	62	58	57	57
	Residential	62	74	72	61	54	50	48	45	44	45
	Tertiary / Services	20	21	20	16	14	13	11	10	10	10
	Industry	3	3	3	2	2	2	2	2	2	2
	Other	1	1	1	1	1	1	1	1	1	1
SPACE HEATING.	All sectors, TWh	775	596	539	448	381	325	289	262	246	235
	Residential	538	395	357	298	252	215	191	175	165	157
	Tertiary / Services	181	156	141	117	100	86	76	68	63	60
	Industry	42	34	30	25	21	18	16	15	13	12
	Other	14	12	10	9	8	7	6	6	5	5
SPACE COOLING.	All sectors, TWh	37	51	52	37	32	25	19	13	11	11
& HT PROCESS	Residential	1	6	5	3	2	2	2	1	1	1
	Tertiary / Services	23	31	33	24	20	16	12	8	7	7
	Industry	9	11	11	8	7	6	4	3	2	2
	Other	3	3	3	2	2	2	1	1	1	1
VENTILATION.	All sectors, TWh	13	14	14	10	9	8	6	5	4	5
	Residential	1	2	2	2	2	2	2	2	1	1	2
	Tertiary / Services	10	10	10	7	6	5	4	3	3	3
	Industry	2	2	1	1	1	1	1	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	99	100	104	80	65	48	34	23	19	20
	Residential	35	29	28	19	13	7	4	3	2	2
	Tertiary / Services	51	57	61	49	42	32	23	16	14	14
	Industry	13	13	14	11	10	8	6	4	3	3
	Other	1	1	1	1	1	1	0	0	0	0
ELECTRONICS.	All sectors, TWh	36	70	74	55	47	40	31	21	17	16
	Residential	22	41	45	32	25	21	16	11	9	8
	Tertiary / Services	14	25	26	21	20	17	13	9	7	7
	Industry	1	3	3	2	2	2	2	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	113	76	74	53	46	38	30	21	18	19
	Residential	52	33	32	23	19	15	12	8	7	7
	Tertiary / Services	49	30	28	19	16	14	11	8	6	7
	Industry	10	11	13	10	9	8	7	5	5	5
	Other	2	1	1	1	1	1	1	1	0	0
COOKING.	All sectors, TWh	33	28	28	22	20	17	15	12	10	10
	Residential	29	24	24	19	17	15	13	10	9	9
	Tertiary / Services	4	3	3	3	2	2	2	2	1	1
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	39	31	32	23	19	16	12	8	7	7
	Residential	37	28	28	20	17	14	10	7	6	6
	Tertiary / Services	2	3	3	2	2	2	1	1	1	1
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	320	297	312	234	205	168	131	92	76	77
	Residential	10	9	9	7	6	5	4	3	3	3
	Tertiary / Services	78	81	87	66	58	48	38	27	22	22
	Industry	214	192	201	150	131	106	82	57	47	47
	Other	17	15	15	12	10	9	7	5	4	4
TYRES.	Transport sector, TWh	220	169	159	166	171	176	173	166	160	154
	Residential transport	103	77	72	70	70	68	65	62	59	56
	Tertiary / Services transport	74	58	55	60	64	67	67	65	63	61
	Industry transport	37	29	28	31	33	35	35	34	33	32
	Other transport	6	5	4	5	5	5	5	5	5	5
ALL PRODUCTS.	All sectors, TWh	1769	1531	1483	1209	1067	926	801	682	625	610
	Residential	786	642	603	484	408	346	301	264	246	239
	Tertiary / Services	432	418	413	322	280	234	191	151	134	132
	Industry	293	269	276	211	184	151	119	87	74	73
	Other	38	34	33	26	23	19	16	13	11	11
	Transport	220	169	159	166	171	176	173	166	160	154

BAU GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	75%	75%	76%	76%	77%	78%	78%	79%	79%
	Tertiary / Services	23%	21%	21%	20%	20%	19%	19%	18%	17%	18%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	69%	66%	66%	66%	66%	66%	66%	67%	67%	67%
	Tertiary / Services	23%	26%	26%	26%	26%	26%	26%	26%	26%	26%
	Industry	5%	6%	6%	6%	6%	6%	6%	6%	5%	5%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	11%	10%	8%	7%	8%	8%	8%	9%	10%
	Tertiary / Services	64%	62%	63%	64%	64%	64%	63%	63%	63%	62%
	Industry	26%	21%	22%	22%	23%	23%	22%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION (from electricity).											
	Residential	10%	16%	17%	19%	21%	24%	27%	29%	31%	33%
	Tertiary / Services	77%	72%	71%	70%	68%	65%	63%	61%	59%	58%
	Industry	12%	11%	11%	11%	10%	10%	9%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	29%	27%	24%	19%	15%	13%	12%	11%	10%
	Tertiary / Services	51%	57%	59%	61%	65%	68%	69%	70%	71%	72%
	Industry	13%	13%	14%	14%	15%	16%	17%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	61%	58%	54%	53%	52%	51%	51%	51%
	Tertiary / Services	37%	36%	35%	38%	41%	42%	43%	43%	43%	43%
	Industry	2%	4%	4%	4%	5%	5%	5%	5%	5%	5%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential	46%	44%	43%	43%	42%	40%	39%	38%	36%	35%
	Tertiary / Services	44%	39%	38%	36%	36%	36%	36%	36%	36%	36%
	Industry	9%	15%	17%	19%	20%	22%	23%	24%	25%	26%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
COOKING.											
	Residential	86%	88%	88%	88%	88%	88%	88%	87%	87%	87%
	Tertiary / Services	14%	12%	12%	12%	12%	12%	12%	13%	13%	13%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	89%	89%	89%	89%	88%	87%	87%	87%	87%
	Tertiary / Services	5%	10%	10%	10%	10%	11%	11%	12%	12%	12%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Tertiary / Services	24%	27%	28%	28%	28%	29%	29%	29%	29%	29%
	Industry	67%	65%	64%	64%	64%	63%	63%	63%	62%	62%
	Other	5%	5%	5%	5%	5%	5%	5%	5%	6%	6%
TYRES.											
	Residential transport	47%	46%	45%	42%	41%	39%	38%	37%	37%	36%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	44%	42%	41%	40%	38%	37%	38%	39%	39%	39%
	Tertiary / Services	24%	27%	28%	27%	26%	25%	24%	22%	21%	22%
	Industry	17%	18%	19%	17%	17%	16%	15%	13%	12%	12%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
	Transport	12%	11%	11%	14%	16%	19%	22%	24%	26%	25%

OTHER EMISSIONS

db BAU direct emissions NO_x (in kt NO_x/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	**9**	**9**	**8**	**6**	**5**	**5**	**4**	**4**	**4**	**4**
Total CH Central Heating combi, water heat	**31**	**48**	**47**	**44**	**41**	**40**	**40**	**40**	**41**	**41**
Total CH Central Heating boiler, space heat	**346**	**344**	**308**	**273**	**241**	**217**	**202**	**190**	**181**	**173**
LH open fire gas	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
LH closed fire gas	3.4	1.6	1.2	0.8	0.6	0.4	0.3	0.3	0.2	0.2
LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH luminous heaters	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LH tube heaters	0.9	0.7	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2
Local Space Heaters, total direct NOx-emission	**5**	**3**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**
CHF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
ACF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
ACF (rev)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
AHF	53	39	33	29	25	22	20	17	15	14
Air Heaters & Coolers, total direct Nox emission	**53**	**39**	**34**	**30**	**26**	**23**	**21**	**18**	**16**	**15**
Total direct NO_x BAU in kt NO_x	**444**	**443**	**399**	**355**	**315**	**286**	**268**	**253**	**243**	**232**
Direct NO_x BAU in kt SO_2 eq.(=0.7*NO_x)	**311**	**310**	**279**	**249**	**220**	**200**	**187**	**177**	**170**	**163**
Ref. EU27 (2020) total NOx emissions (EEA) in kton	14805	7630	6410							
Share EIA Nox / ref. EU total	3.0%	5.8%	6.2%							

Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.6 (EU28 minus UK, adjusted data).

NOx emission data in EIA are incomplete: insufficient data were available to quantify NOx emissions for Solid Fuel Boilers and for a part of the Local Space Heaters. Note that Ecodesign and Energy Labelling affects NOx emissions also through energy saving for product groups without explicit direct NOx emission-limits and indirectly through electricity savings (NOx from power plants).

db BAU direct CO-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	8873	1287	930	666	444	260	155	108	88	74
SFB Wood Direct Draft	2	16	29	40	46	45	45	48	55	63
SFB Coal	459	87	81	63	45	27	19	17	15	13
SFB Pellets	0	11	18	25	30	32	32	33	34	35
SFB Wood chips	0	16	19	21	19	18	19	20	21	22
Solid Fuel Boilers, total CO-emission	**9334**	**1416**	**1076**	**814**	**584**	**382**	**270**	**226**	**213**	**208**
LH open fireplace	187	179	172	163	152	138	125	114	107	103
LH closed fireplace/inset	245	393	424	441	442	423	392	362	336	316
LH wood stove	535	374	339	309	281	254	232	214	198	187
LH coal stove	390	153	124	102	83	65	48	36	26	21
LH cooker	84	97	100	101	99	93	85	79	76	74
LH SHR stove	189	193	194	198	201	204	207	207	204	199
LH pellet stove	0	15	15	12	8	6	5	5	5	5
Local Space Heaters, total CO-emission	**1630**	**1403**	**1368**	**1326**	**1267**	**1183**	**1094**	**1017**	**952**	**905**
Total direct CO-emissions, BAU, in kt/a	**10964**	**2819**	**2444**	**2140**	**1850**	**1565**	**1365**	**1243**	**1165**	**1113**
Ref. EU27 (2020) total CO emissions (EEA) in kton	55423	23888	18916							
Share EIA CO / ref. EU total	19.8%	11.8%	12.9%							

Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.14 (EU28 minus UK).

db BAU direct OGC-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	776	113	81	58	39	23	14	9	8	6
SFB Wood Direct Draft	0	1	1	2	2	2	2	2	3	3
SFB Coal	23	4	4	3	2	1	1	1	1	1
SFB Pellets	0	2	3	4	4	5	5	5	5	5
SFB Wood chips	0	0	1	1	1	1	1	1	1	1
Solid Fuel Boilers, total OGC-emission	**799**	**120**	**90**	**68**	**48**	**31**	**22**	**18**	**17**	**16**
LH open fireplace	18	13	11	9	7	5	3	2	1	1
LH closed fireplace/inset	23	27	25	22	18	13	9	6	4	4
LH wood stove	51	27	21	16	12	8	6	4	3	2
LH coal stove	38	11	8	6	4	2	1	1	0	0
LH cooker	8	6	5	4	3	2	1	1	1	1
LH SHR stove	18	14	12	10	8	6	5	3	3	2
LH pellet stove	0	3	4	4	5	5	5	5	5	5
Local Space Heaters, total OGC-emission	**155**	**100**	**86**	**72**	**57**	**42**	**30**	**22**	**17**	**16**
Total direct OGC-emissions, BAU, in kt/a	**955**	**219**	**176**	**140**	**105**	**73**	**52**	**40**	**34**	**32**
Ref. EU27 (2020) total NMVOC emissions (EEA) in kt	15664	6875	5865							
Share EIA OGC / ref. EU total NMVOC	6.1%	3.2%	3.0%							

Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary

No statistical reference values for total OGC (organic gaseous carbon) emissions in Europe could be found. However such statistics are available for NMVOC (non-methane volatile organic compound), which is the same as OGC but without the methane contribution.

db BAU direct PM-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	399	58	42	30	20	12	7	5	4	3
SFB Wood Direct Draft	1	4	7	10	12	11	11	12	14	16
SFB Coal	115	22	20	16	11	7	5	4	4	3
SFB Pellets	0	2	3	4	4	5	5	5	5	5
SFB Wood chips	0	2	3	3	3	3	3	3	3	3
Solid Fuel Boilers, total PM-emission	**515**	**87**	**75**	**62**	**50**	**37**	**30**	**29**	**29**	**31**
LH open fireplace	39	42	40	36	31	26	21	18	18	18
LH closed fireplace/inset	17	25	26	25	24	21	19	16	15	14
LH wood stove	38	24	21	18	15	13	11	10	9	8
LH coal stove	28	10	8	6	5	3	2	2	1	1
LH cooker	6	7	6	6	5	5	4	4	4	4
LH SHR stove	12	10	9	9	8	7	7	6	5	5
LH pellet stove	0	2	2	2	1	1	1	1	1	1
Local Space Heaters, total PM-emission	**140**	**119**	**112**	**101**	**90**	**77**	**65**	**56**	**52**	**49**
Total direct PM-emissions, BAU, in kt/a	**654**	**206**	**187**	**163**	**139**	**114**	**95**	**85**	**82**	**80**
Ref. EU27 (2020) total PM10 emissions (EEA) in kton		2178	1884							
Share EIA PM / ref. EU total PM		9.5%	9.9%							

Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.7 (EU28 minus UK; adjusted data used).

db BAU noise emissions by tyres (in dB(A))	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Tyres C1, replacement for cars		71.2	71.1	71.0	71.0	71.0				
Tyres C1, OEM for cars		71.2	71.1	71.0	71.0	71.0				
Tyres C2, replacement for vans		72.5	72.4	72.3	72.3	72.3				
Tyres C2, OEM for vans		72.5	72.4	72.3	72.3	72.3				
Tyres C3, replacement for trucks/busses		72.0	71.9	71.8	71.8	71.8				
Tyres C3, OEM for trucks/busses		72.0	71.9	71.8	71.8	71.8				

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	see also other emissions at bottom of Table										
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	3	2	2	1	1	1	1	0	0	0
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	4	3	3	2	1	1	1	1	1	1
	ESWH Electric Storage > 30 L (primary)	29	25	25	16	13	10	8	6	5	6
	GIWH Gas Instant. < 13 L/min (secondary)	3	3	2	2	1	1	1	1	1	1
	GIWH Gas Instant. ≥ 13 L/min (primary)	1	2	1	1	1	1	1	1	1	1
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	5	4	3	2	1	1	1	1	1	0
	Dedicated WH Heat Pump	0	0	0	0	0	0	0	0	0	0
	Dedicated WH Solar (3.5 m2)	0	2	2	2	2	1	1	1	1	1
	WH dedicated Water Heater	**45**	**42**	**40**	**27**	**21**	**17**	**14**	**11**	**10**	**10**
	CHB Gas Combi Instant. WH	11	27	28	26	24	22	21	19	18	16
	CHB Gas + Cyl. WH	7	11	11	10	9	8	7	7	6	6
	CHB Jet Burner Gas + Cyl. WH	2	2	1	1	1	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	19	16	13	9	7	5	4	4	4	4
	CHB Electric (Joule) + Cyl. WH	1	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	1	1	1	2
	CHB Electric HP + Cyl. WH	0	1	1	1	1	1	1	1	1	2
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	1	1
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**40**	**57**	**54**	**48**	**42**	**37**	**35**	**33**	**32**	**30**
	TOTAL WATER HEATING	**85**	**99**	**94**	**75**	**62**	**54**	**49**	**45**	**42**	**41**
	CHB Gas non-condensing	154	169	130	80	38	18	7	4	2	1
	CHB Gas condensing	2	53	77	104	121	124	119	105	93	80
	CHB Gas Jet burner non-condensing	17	11	8	5	3	1	0	0	0	0
	CHB Gas Jet burner condensing	0	0	0	1	1	1	2	2	2	2
	CHB Oil Jet burner non-condensing	278	177	131	89	52	22	7	3	2	2
	CHB Oil Jet burner condensing	0	3	6	10	14	18	20	21	22	21
	CHB Electric Joule-effect	6	4	4	3	3	2	1	1	1	0
	CHB Hybrid (gas-electric)	0	0	0	0	0	1	1	1	2	2
	CHB Electric Heat Pump	1	4	5	4	5	5	6	5	5	6
	CHB Gas Heat Pump	0	0	0	0	0	0	1	1	1	1
	CHB micro CHP	0	0	0	0	0	0	1	1	1	1
	CHB Solar combi (16 m2)	1	1	1	1	1	1	1	1	1	1
	CHB Central Heating boiler < 400 kW, space heating	**459**	**421**	**363**	**297**	**239**	**194**	**165**	**145**	**130**	**118**
	SFB Wood Manual	7.4	1.9	1.5	1.0	0.6	0.3	0.2	0.1	0.1	0.1
	SFB Wood Direct Draft	0.1	0.5	0.9	1.3	1.5	1.4	1.4	1.5	1.7	2.0
	SFB Coal	142.9	41.9	41.1	32.9	23.1	13.7	9.2	8.4	7.3	6.3
	SFB Pellets	0.0	0.4	0.6	0.9	1.0	1.1	1.1	1.1	1.2	1.2
	SFB Wood chips	0.0	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3
	Total Solid Fuel Boiler	**150**	**45**	**44**	**36**	**27**	**17**	**12**	**11**	**11**	**10**
	CHAE-S (≤ 400 kW)	1.6	2.9	3.2	2.3	1.9	1.5	1.1	0.8	0.6	0.6
	CHAE-L (> 400 kW)	2.6	4.0	4.2	3.1	2.5	1.8	1.3	0.8	0.6	0.6
	CHWE-S (≤ 400 kW)	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.6	0.9	0.9	0.7	0.6	0.4	0.3	0.2	0.1	0.1
	CHWE-L (> 1500 kW)	0.4	0.6	0.6	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	10.0	10.2	10.8	7.9	6.7	5.3	4.0	2.9	2.4	2.4
	HT PCH-AE-L	9.6	9.7	10.2	7.5	6.2	4.8	3.6	2.5	2.1	2.1
	HT PCH-WE-S	2.0	2.1	2.3	1.7	1.5	1.2	0.9	0.6	0.5	0.5
	HT PCH-WE-M	4.1	4.2	4.4	3.3	2.9	2.3	1.8	1.3	1.1	1.1
	HT PCH-WE-L	0.8	0.8	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.2
	AC rooftop	1.4	2.1	2.0	1.2	0.8	0.4	0.1	0.0	0.0	0.0
	AC splits	1.9	3.5	3.4	2.1	1.6	1.1	0.7	0.5	0.3	0.3
	AC VRF	0.0	0.9	1.2	1.2	1.1	1.1	0.9	0.7	0.6	0.6
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC central Air Cooling	**35**	**42**	**45**	**32**	**27**	**21**	**16**	**11**	**9**	**9**
	AC rooftop (rev)	1.9	3.7	3.5	2.1	1.3	0.6	0.2	0.0	0.0	0.0
	AC splits (rev)	3.4	6.8	6.7	4.4	3.3	2.3	1.5	1.0	0.7	0.6
	AC VRF (rev)	0.0	2.2	3.1	2.9	2.9	2.7	2.3	1.7	1.4	1.4
	ACF (rev)	0	0	0	0	0	0	0	0	0	0
	AHF	43	31	26	22	17	14	12	10	9	8
	AHE	0.5	0.8	0.6	0.3	0.2	0.1	0.1	0.1	0.1	0.0
	SubTotal AHC central Air Heating	**49**	**44**	**40**	**31**	**25**	**20**	**16**	**13**	**11**	**10**
	Total AHC central Air Heating & Cooling	**84**	**87**	**85**	**64**	**52**	**41**	**32**	**24**	**20**	**19**

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3
	LH closed fireplace/inset	0.4	0.9	1.0	1.2	1.2	1.2	1.2	1.2	1.1	1.1
	LH wood stove	0.8	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.6
	LH coal stove	9.2	5.0	4.5	4.0	3.5	2.9	2.2	1.7	1.3	1.1
	LH cooker	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH SHR stove	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7
	LH pellet stove	0.0	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.6	0.6
	LH Solid fuel sum	**11**	**8**	**8**	**8**	**7**	**7**	**6**	**6**	**5**	**5**
	LH Electric portable	12	7	6	4	3	2	2	1	1	1
	LH Electric fixed > 250W	62	35	31	18	12	8	6	4	3	3
	LH Electric fixed ≤ 250W	4	2	2	1	1	1	0	0	0	0
	LH Electric storage	4	2	2	1	1	1	0	0	0	0
	LH Electric underfloor	11	7	6	4	3	3	2	1	1	1
	LH Electric visibly glowing > 1.2 kW	1	1	1	0	0	0	0	0	0	0
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	3	3	3	2	2	1	1	1	0	0
	LH Electric sum	**96**	**57**	**51**	**31**	**22**	**15**	**11**	**7**	**6**	**5**
	LH Gas luminous (commercial)	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gaseous Tube (commercial < 120 kW)	0.6	0.5	0.4	0.4	0.4	0.3	0.3	0.2	0.2	0.2
	LH Gas open front	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas closed front	0.8	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1
	LH Gas balanced flue	1.7	0.9	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**3.6**	**2.3**	**1.9**	**1.5**	**1.2**	**0.9**	**0.8**	**0.7**	**0.6**	**0.6**
	LH Liquid tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.5**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Local Space Heaters total	**112**	**67**	**61**	**40**	**31**	**23**	**18**	**14**	**11**	**11**
	RAC fixed < 6 kW, cooling	1	4	3	2	1	1	1	1	1	1
	RAC fixed 6-12 kW, cooling	0	2	2	1	1	1	1	0	0	0
	RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode	**1**	**6**	**5**	**3**	**2**	**2**	**2**	**1**	**1**	**1**
	RAC fixed < 6 kW, reversible, heating	0	5	5	3	4	4	4	3	3	3
	RAC fixed 6-12 kW, reversible, heating	0	2	3	2	2	2	2	1	1	1
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**1**	**8**	**8**	**5**	**5**	**6**	**5**	**4**	**4**	**5**
	RAC Room Air Conditioner	**2**	**14**	**13**	**8**	**8**	**8**	**7**	**6**	**5**	**6**
1	CIRC Integrated circulators	6.5	6.0	5.3	2.9	2.2	1.8	1.4	1.0	0.8	0.8
0.38	CIRC Large standalone circulators	4.1	3.7	2.9	1.4	1.0	0.8	0.5	0.4	0.3	0.3
0.38	CIRC Small standalone circulators	3.1	2.7	2.0	0.8	0.6	0.4	0.3	0.2	0.2	0.2
	CIRC Circulator pumps <2.5 kW, all	**14**	**12**	**10**	**5**	**4**	**3**	**2**	**2**	**1**	**1**
	CIRC Circulator pumps <2.5 kW, excl. double	**4**	**4**	**3**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
	TOTAL SPACE HEATING	**775**	**590**	**519**	**412**	**328**	**260**	**218**	**188**	**168**	**154**
	TOTAL SPACE COOLING	**37**	**49**	**50**	**35**	**29**	**23**	**17**	**12**	**10**	**10**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	R-UVU 100-250 m3/h	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	R-UVU 250-1000 m3/h	1.1	1.6	1.6	1.1	0.9	0.7	0.5	0.3	0.3	0.3
	R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.2	0.3	0.4	0.4	0.4	0.4	0.5
	R-UVU > 1000 m3/h	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential, from VU own electricity	**1**	**2**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
	NR-UVU 250-1000 m3/h	0.5	0.6	0.6	0.4	0.3	0.2	0.2	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	NR-UVU > 1000 m3/h	0.3	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	NR-AHU-S 2500-5500 m3/h	0.1	0.8	1.0	0.9	0.8	0.7	0.6	0.5	0.4	0.5
	NR-AHU-M 5500-14500 m3/h	8.6	7.3	6.6	4.3	3.5	2.8	2.2	1.5	1.3	1.3
	NR-AHU-L > 14500 m3/h	2.4	2.1	1.9	1.2	1.0	0.8	0.6	0.4	0.4	0.4
	NRVU, Total non-residential, from VU own electricity	**12**	**12**	**11**	**7**	**6**	**5**	**4**	**3**	**2**	**3**
	VU Ventilation Units, res + non-res. from VU own elec.	**13**	**14**	**13**	**9**	**8**	**6**	**5**	**4**	**4**	**4**
	TOTAL VENTILATION (from VU own electricity)	**13**	**14**	**13**	**9**	**8**	**6**	**5**	**4**	**4**	**4**
1	***Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)***	*-*	*-*	*-1*	*-3*	*-6*	*-8*	*-8*	*-7*	*-7*	*-7*

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	38.6	38.3	43.0	32.2	21.8	9.7	3.4	1.1	0.5	0.3
	HID (HPM, HPS, MH)	14.3	19.4	16.0	9.6	6.0	2.5	0.7	0.2	0.1	0.0
	CFLni (all shapes)	1.0	2.6	2.5	1.5	0.8	0.3	0.1	0.0	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.4	4.3	5.4	3.0	0.9	0.2	0.0	0.0	0.0	0.0
	GLS (DLS & NDLS)	36.8	13.4	3.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HL (DLS & NDLS, LV & MV)	3.1	12.8	15.3	4.4	0.2	0.0	0.0	0.0	0.0	0.0
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.5	2.5	7.1	10.5	10.9	8.8	8.1	9.1
	LED replacing HID (retrofit & luminaire)	0.0	0.0	2.7	4.0	5.1	5.4	5.1	4.1	3.8	4.3
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.1	0.3	0.4	0.5	0.4	0.3	0.3	0.3
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.3	0.7	0.9	0.8	0.6	0.4	0.4	0.4
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.5	2.3	3.4	3.1	2.6	1.9	1.6	1.7
	Standby	4.7	4.7	3.9	2.3	1.6	1.1	0.8	0.6	0.5	0.5
	TOTAL LIGHTING (incl. standby)	**99**	**95**	**94**	**63**	**48**	**34**	**25**	**17**	**15**	**17**
	DP TV on-mode, total all types	11.7	19.6	20.1	12.1	6.3	4.6	3.1	2.3	2.2	2.5
	DP TV standby, standard (NoNA)	1.5	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	0.0	0.0	0.5	0.9	1.1	1.1	0.9	0.6	0.4	0.3
	DP TV standby, total all types	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**0**	**0**
	DP TV total on-mode + standby	**13**	**20**	**21**	**13**	**8**	**6**	**4**	**3**	**3**	**3**
	DP Monitor on-mode	0.4	3.9	2.1	0.6	0.4	0.2	0.1	0.1	0.1	0.1
	DP Monitor standby	0.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total	**0**	**4**	**2**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
	DP Signage on-mode	0.0	0.3	2.4	3.8	3.8	2.5	1.5	1.0	0.9	1.0
	DP Signage standby	0.0	0.0	0.4	0.6	0.6	0.4	0.2	0.1	0.1	0.2
	DP Signage total	**0**	**0**	**3**	**4**	**4**	**3**	**2**	**1**	**1**	**1**
	DP Electronic Displays, total on-mode	**12**	**24**	**25**	**17**	**11**	**7**	**5**	**3**	**3**	**4**
	DP Electronic Displays, total standby	**2**	**1**	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**0**
	DP Electronic Displays, total	**14**	**25**	**26**	**18**	**12**	**9**	**6**	**4**	**4**	**4**
	SSTB	0.0	0.5	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	0.0	1.6	3.2	1.8	1.4	1.1	0.8	0.6	0.5	0.5
	CSTB (other modes)	0.0	0.9	1.7	1.0	0.8	0.6	0.4	0.3	0.3	0.3
	CSTB (all covered modes)	0.0	2.5	5.0	2.8	2.2	1.7	1.3	0.9	0.7	0.7
	Total STB set top boxes (Complex & Simple)	**0**	**3**	**5**	**3**	**2**	**2**	**1**	**1**	**1**	**1**
	Game consoles > 20 W Active modes (SRI)	0.0	0.8	1.1	0.8	0.6	0.5	0.4	0.3	0.2	0.2
	Game consoles > 20 W Non-Active (CR)	0.0	0.4	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0
	Game consoles < 20 W Non-Active (CR)	0.0	0.3	0.3	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes	0.0	0.8	1.2	0.8	0.7	0.5	0.4	0.3	0.2	0.2
	Total Game consoles, non-active modes	0.0	0.7	0.7	0.3	0.2	0.1	0.1	0.1	0.1	0.1
	Total Game consoles > 20 W, all modes	0.0	1.2	1.6	1.0	0.7	0.6	0.4	0.3	0.3	0.3
	Total Game consoles < 20 W, all modes	0.0	0.3	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	Total Game consoles, all modes	**0**	**2**	**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0.0	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	0.1	0.9	0.6	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	ES rack 2-socket traditional	0.3	4.1	2.1	0.8	0.8	0.8	0.6	0.4	0.4	0.4
	ES rack 2-socket cloud	0.0	2.3	3.4	2.5	2.5	2.4	2.0	1.4	1.1	1.1
	ES rack 4-socket traditional	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket cloud	0.0	0.3	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2
	ES rack 2-socket resilient trad.	0.0	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ES blade 2-socket traditional	0.3	1.9	0.9	0.4	0.4	0.4	0.3	0.2	0.2	0.2
	ES blade 2-socket cloud	0.0	1.1	1.5	1.2	1.2	1.2	1.0	0.7	0.5	0.5
	ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	ES total traditional	**1**	**8**	**5**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
	ES total cloud	**0**	**4**	**6**	**4**	**4**	**4**	**3**	**2**	**2**	**2**
	ES Enterprise Servers total	**1**	**12**	**10**	**7**	**6**	**6**	**5**	**3**	**3**	**3**
	DS Online 2	0.2	1.8	2.4	2.2	2.3	2.2	1.8	1.2	1.0	1.0
	DS Online 3	0.0	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.1	0.1
	DS Online 4	0.1	1.0	1.3	1.2	1.3	1.2	1.0	0.7	0.5	0.5
	DS Data Storage products total	**0**	**3**	**4**	**4**	**4**	**4**	**3**	**2**	**2**	**2**
	ES + DS total (excl. infrastructure)	**1**	**15**	**14**	**10**	**10**	**10**	**8**	**5**	**4**	**4**

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	7.8	6.6	4.2	1.9	1.8	1.5	1.2	0.8	0.6	0.6
	PC Integrated Desktop	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	PC Notebook	0.0	2.3	2.5	1.4	1.3	1.1	0.9	0.6	0.5	0.5
	PC Tablet/slate	0.0	0.1	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1
	PC Thin client	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.1	0.1
	Total PC, electricity	**8**	**10**	**8**	**4**	**4**	**3**	**3**	**2**	**1**	**1**
	Inkjet Printer	0.5	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.6	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	EP / Laser Printer mono	3.9	0.6	0.4	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	EP / Laser Printer colour	0.0	0.3	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	EP / Laser Copier mono	4.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.5	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0
	EP / Laser MFD colour	0.0	0.7	0.6	0.3	0.2	0.1	0.1	0.1	0.0	0.0
	Total IE Imaging Equipment, from electricity	**9**	**3**	**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
	of which for modes under CR 1275/2008	*7*	*2*	*2*	*1*	*1*	*0*	*0*	*0*	*0*	*0*
	(see Resources for contributions from paper, toner)										
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	1.0	1.9	1.4	0.6	0.5	0.3	0.2	0.1	0.1	0.1
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wired) (sb & off modes)	0.9	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.1
	SB Small appliances (sb & off modes)	0.6	2.2	1.5	0.7	0.6	0.5	0.4	0.3	0.2	0.2
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Media players and recorders (sb mode)	0.0	0.9	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.2	1.0	1.0	0.6	0.3	0.3	0.2	0.1	0.1	0.1
	SB Office phones (nsb mode)	0.3	0.7	0.6	0.3	0.1	0.1	0.1	0.1	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.3	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Home Network Equipment (nsb mode)	0.0	0.8	1.0	0.7	0.6	0.5	0.4	0.3	0.2	0.2
	SB Office Network Equipment (nsb mode)	0.0	0.1	0.3	0.3	0.4	0.4	0.4	0.2	0.2	0.2
	SB Coffee makers (off mode)	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	1.0	1.0	0.6	0.3	0.1	0.1	0.1	0.1	0.1
1	SB Electric Hobs (sb mode)	0.0	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.1
1	SB Complex Set-Top Boxes (low-power modes)	0.0	1.6	3.2	1.8	1.4	1.1	0.8	0.6	0.5	0.5
1	SB Game consoles (non-active modes)	0.0	0.7	0.7	0.3	0.2	0.1	0.1	0.1	0.1	0.1
1	SB IE Inkjet Printers (nsb mode)	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.5	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser Printers (nsb mode)	3.0	0.7	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1
1	SB IE Laser Copiers (nsb mode)	3.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.8	0.8	0.4	0.2	0.2	0.1	0.1	0.1	0.1
	Total (networked) SB (incl. double)	11	15	14	8	6	5	4	2	2	2
	Total (networked) SB (excl. double)	**4**	**9**	**7**	**4**	**3**	**3**	**2**	**1**	**1**	**1**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0
0.6	EPS 10–12 W	0.0	2.1	2.8	1.8	1.3	1.0	0.8	0.6	0.5	0.5
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.4	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	EPS, total for active mode	**0.0**	**3.3**	**3.9**	**2.4**	**1.7**	**1.4**	**1.1**	**0.7**	**0.6**	**0.6**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.3	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 10–12 W	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.5**	**0.3**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	EPS, overall total (active + no-load)	**0.1**	**3.8**	**4.2**	**2.5**	**1.8**	**1.4**	**1.1**	**0.8**	**0.6**	**0.6**
	EPS, double counted subtracted	**0.1**	**2.0**	**2.1**	**1.2**	**0.8**	**0.7**	**0.5**	**0.4**	**0.3**	**0.3**
	TOTAL ELECTRONICS	**36**	**68**	**67**	**43**	**34**	**28**	**21**	**15**	**12**	**12**

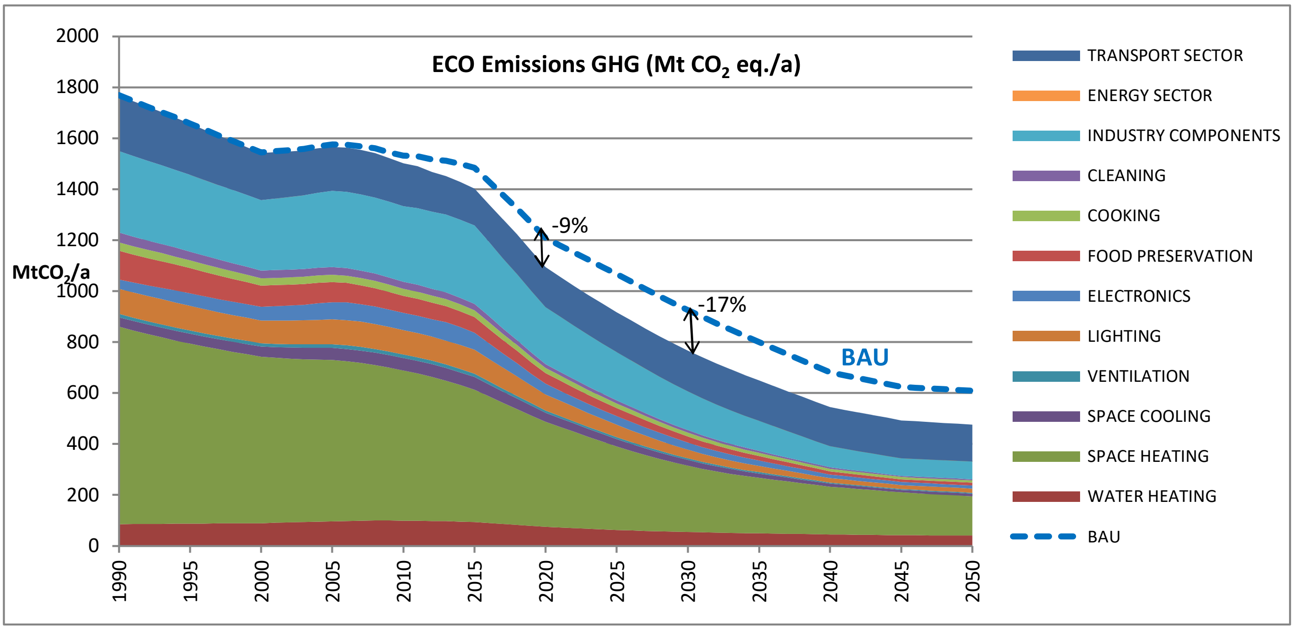
db ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total RF household Refrigerators & Freezers	**56**	**27**	**22**	**13**	**9**	**6**	**4**	**2**	**2**	**2**
CF open vertical chilled multi deck (RVC2)	6.9	4.0	3.6	2.4	1.7	1.0	0.5	0.3	0.3	0.3
CF open horizontal frozen island (RHF4)	0.6	0.4	0.3	0.2	0.1	0.1	0.1	0.0	0.0	0.0
CF other supermarket display (non-BCs)	12.1	7.3	6.9	4.8	3.8	2.6	1.8	1.2	1.0	1.0
CF Plug in one door beverage cooler	7.7	5.0	4.5	2.9	2.0	1.1	0.8	0.5	0.4	0.4
CF Plug in horizontal ice cream freezer	1.7	1.1	1.0	0.7	0.5	0.3	0.2	0.2	0.1	0.1
CF Spiral vending machine	1.8	0.9	0.6	0.3	0.2	0.2	0.1	0.1	0.1	0.1
Total CF Commercial Refrigeration	**31**	**19**	**17**	**11**	**8**	**5**	**4**	**2**	**2**	**2**
PF Storage cabinet Chilled Vertical (CV)	0.8	0.7	0.7	0.4	0.3	0.2	0.2	0.1	0.1	0.1
PF Storage cabinet Frozen Vertical (FV)	0.9	0.8	0.8	0.5	0.3	0.3	0.2	0.1	0.1	0.1
PF Storage cabinet Chilled Horizontal (CH)	0.6	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1
PF Storage cabinet Frozen Horizontal (FH)	0.4	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.1
PF Storage cabinets All types	**2.6**	**2.3**	**2.4**	**1.5**	**1.0**	**0.8**	**0.6**	**0.4**	**0.4**	**0.4**
PF Process Chiller AC MT S ≤ 300 kW	1.4	2.0	2.2	1.8	1.6	1.4	1.2	0.9	0.8	0.8
PF Process Chiller AC MT L > 300 kW	1.4	1.9	2.2	1.7	1.6	1.3	1.1	0.8	0.7	0.8
PF Process Chiller AC LT S ≤ 200 kW	1.4	2.0	2.3	1.8	1.6	1.4	1.2	0.9	0.8	0.8
PF Process Chiller AC LT L > 200 kW	1.5	2.1	2.3	1.9	1.7	1.5	1.2	0.9	0.8	0.9
PF Process Chiller WC MT S ≤ 300 kW	0.4	0.6	0.6	0.5	0.5	0.4	0.3	0.2	0.2	0.2
PF Process Chiller WC MT L > 300 kW	0.6	0.8	0.9	0.7	0.7	0.6	0.5	0.4	0.3	0.3
PF Process Chiller WC LT S ≤ 200 kW	0.5	0.7	0.8	0.6	0.6	0.5	0.4	0.3	0.3	0.3
PF Process Chiller WC LT L > 200 kW	0.7	0.9	1.0	0.8	0.7	0.6	0.5	0.4	0.4	0.4
PF Process Chiller All MT&LT	**8**	**11**	**12**	**10**	**9**	**8**	**6**	**5**	**4**	**5**
PF Condensing Unit MT S 0.2-1 kW	2.8	1.5	1.4	1.0	0.8	0.7	0.6	0.4	0.4	0.4
PF Condensing Unit MT M 1-5 kW	7.1	3.7	3.4	2.4	2.1	1.8	1.5	1.1	1.0	1.1
PF Condensing Unit MT L 5-20 kW	8.7	4.5	4.2	3.0	2.6	2.2	1.8	1.4	1.2	1.3
PF Condensing Unit MT XL 20-50 kW	8.6	4.5	4.2	3.0	2.6	2.2	1.8	1.4	1.2	1.3
PF Condensing Unit LT S 0.1-0.4 kW	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.1
PF Condensing Unit LT M 0.4-2 kW	1.3	0.7	0.6	0.4	0.4	0.3	0.3	0.2	0.2	0.2
PF Condensing Unit LT L 2-8 kW	2.2	1.1	1.1	0.7	0.6	0.5	0.4	0.3	0.3	0.3
PF Condensing Unit LT XL 8-20 kW	6.7	3.5	3.3	2.3	2.0	1.7	1.4	1.0	0.9	1.0
0.6 **PF Condensing Unit, All MT&LT**	**38**	**20**	**18**	**13**	**11**	**10**	**8**	**6**	**5**	**6**
PF Professional Refrigeration, Total	**26**	**21**	**22**	**16**	**14**	**12**	**10**	**8**	**7**	**7**
TOTAL FOOD PRESERVATION	**113**	**67**	**61**	**41**	**32**	**24**	**18**	**12**	**10**	**11**
CA Electric Hobs (active modes)	9.4	9.2	9.8	7.5	6.8	5.7	4.6	3.3	2.8	2.9
CA Electric Hobs (low-power modes)	0.0	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.1
CA Electric Hobs (sum all modes)	9	10	10	8	7	6	5	3	3	3
CA Electric Ovens (active modes)	10.7	6.8	6.2	4.0	3.2	2.5	1.9	1.3	1.1	1.1
CA Electric Ovens (low-power modes)	0.0	1.0	1.0	0.6	0.3	0.1	0.1	0.1	0.1	0.1
CA Electric Ovens (sum all modes)	11	8	7	5	4	3	2	1	1	1
CA Gas Hobs	6.1	5.0	4.9	4.7	4.4	4.2	4.0	3.7	3.5	3.3
CA Gas Ovens	2.4	1.7	1.6	1.4	1.2	1.1	0.9	0.9	0.9	0.8
CA Range Hoods	4.5	3.6	3.6	2.6	2.1	1.5	1.2	0.8	0.7	0.7
CA Elec. Hobs&Ovens low-power modes	0.0	1.3	1.4	0.8	0.5	0.2	0.2	0.1	0.1	0.1
CA other products or modes	33	26	26	20	18	15	13	10	9	9
TOTAL COOKING	**33**	**28**	**27**	**21**	**18**	**15**	**13**	**10**	**9**	**9**
WM Washing Machines, active modes	21.4	8.5	6.9	4.1	3.1	2.4	1.8	1.2	1.0	1.0
WM Washing Machines, low-power modes	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
WM Washing Machines, all modes	21.4	8.9	7.1	4.3	3.2	2.4	1.8	1.2	1.0	1.0
WD Washer-Dryers, active modes	3.6	2.4	2.1	1.4	1.1	0.9	0.7	0.5	0.4	0.4
WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
WD Washer-Dryers, all modes	3.6	2.4	2.1	1.4	1.1	0.9	0.7	0.5	0.4	0.4
WM-WD Washing, sum active modes	24.9	11.0	9.0	5.5	4.2	3.2	2.4	1.7	1.3	1.3
WM-WD Washing, sum low-power modes	0.0	0.4	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Total WM-WD household Washing	**25**	**11**	**9**	**6**	**4**	**3**	**2**	**2**	**1**	**1**
DW Dishwashers, active modes	5.1	4.7	4.9	3.8	3.5	3.0	2.4	1.8	1.5	1.5
DW Dishwashers, low-power modes	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
Total DW household Dishwasher	**5**	**5**	**5**	**4**	**4**	**3**	**2**	**2**	**2**	**2**
LD condensing heat pump	0.0	0.0	0.3	0.5	0.6	0.5	0.5	0.3	0.3	0.3
LD condensing electric heat element	0.6	2.8	2.5	1.3	0.8	0.5	0.4	0.2	0.2	0.2
LD vented electric	3.2	2.2	1.5	0.6	0.3	0.1	0.0	0.0	0.0	0.0
LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LD Laundry Dryers, sum active modes	3.9	4.9	4.2	2.4	1.7	1.2	0.8	0.6	0.4	0.4
LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total LD household Laundry Dryer	**4**	**5**	**4**	**2**	**2**	**1**	**1**	**1**	**0**	**0**

db	ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	3.8	3.6	4.2	1.8	0.8	0.5	0.3	0.2	0.1	0.1
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Domestic mains	**4**	**4**	**4**	**2**	**1**	**1**	**0**	**0**	**0**	**0**
	VC Cylinder Commercial mains	0.8	1.9	1.8	0.7	0.5	0.4	0.3	0.2	0.2	0.2
	VC Upright Commercial mains	0.1	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	VC Total Commercial mains	**1**	**2**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
	VC Total in scope of CR 666/2013	**5**	**6**	**6**	**3**	**1**	**1**	**1**	**0**	**0**	**0**
	VC Cordless - domestic - cleaning	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.3
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**4**	**4**	**5**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
	VC Total Commercial mains+cordless+robots	**1**	**2**	**2**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
	Total VC Vacuum Cleaner	**5**	**6**	**7**	**3**	**2**	**2**	**2**	**1**	**1**	**1**
	TOTAL CLEANING	**39**	**27**	**25**	**15**	**12**	**10**	**7**	**5**	**4**	**4**
0.5	FAN Axial<300Pa (all FAN types >125W)	8.2	14.7	16.1	11.8	10.2	8.3	6.3	4.4	3.6	3.5
0.5	FAN Axial>300Pa	14.1	26.9	29.3	20.9	17.3	13.7	10.4	7.2	5.8	5.8
0.5	FAN Centr.FC	3.5	4.8	5.4	3.8	3.1	2.5	1.9	1.3	1.1	1.0
0.5	FAN Centr.BC-free	9.1	12.3	13.7	10.0	8.8	7.5	6.0	4.3	3.6	3.6
0.5	FAN Centr.BC	9.5	13.9	15.4	11.3	9.9	8.4	6.9	5.2	4.6	4.9
0.5	FAN Cross-flow	0.6	0.7	0.6	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	Total FAN, industrial	**22**	**37**	**40**	**29**	**25**	**20**	**16**	**11**	**9**	**10**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	49	39	39	24	18	14	11	7	6	6
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	73	61	60	38	27	21	15	10	8	8
0.45	Medium (L) 3-ph 75-375 kW no VSD	149	121	117	76	56	39	28	18	14	14
0.45	**Total 3ph 0.75-375 kW no VSD**	**270**	**221**	**216**	**138**	**101**	**73**	**54**	**36**	**28**	**27**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	3	5	6	7	8	6	5	4	3	3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	6	9	12	14	15	13	11	8	7	7
0.45	Medium (L) 3-ph 75-375 kW with VSD	17	27	35	35	37	36	29	22	19	19
0.45	**Total 3-ph 0.75-375 kW with VSD**	**26**	**41**	**53**	**55**	**60**	**55**	**45**	**33**	**29**	**30**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**297**	**262**	**269**	**193**	**162**	**128**	**99**	**69**	**57**	**58**
0.45	Small 1 ph 0.12-0.75 kW no VSD	4	3	3	2	2	1	1	1	1	1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**4**	**3**	**3**	**2**	**2**	**2**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	5	4	4	3	3	2	2	1	1	1
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**5**	**5**	**5**	**4**	**3**	**2**	**2**	**1**	**1**	**1**
0.45	Large 3-ph LV 375-1000 kW no VSD	76	59	55	37	29	22	16	11	9	9
0.45	Large 3-ph LV 375-1000kW with VSD	4	13	19	18	19	17	14	10	9	9
0.45	**Total Large 3-ph LV 375-1000 kW**	**80**	**72**	**74**	**55**	**48**	**39**	**30**	**21**	**18**	**18**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	2	1	1	1	1	1	1	0	0	0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	4	4	3	2	2	2	1	1	1
0.45	Explosion motors (L) 3-ph 75-375 kW	7	7	7	6	5	4	3	2	2	2
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**13**	**12**	**13**	**10**	**8**	**7**	**5**	**4**	**3**	**3**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	1	1	1	1	0	0	0	0	0
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	2	3	2	2	1	1	1	1	1
0.45	Brake motors (L) 3-ph 75-375 kW	4	3	4	3	2	2	2	1	1	1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**7**	**7**	**7**	**5**	**5**	**4**	**3**	**2**	**2**	**2**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**20**	**17**	**18**	**14**	**12**	**10**	**7**	**5**	**4**	**4**
	Total MT Elec. Motors LV 0.12-1000 kW	**235**	**208**	**214**	**156**	**132**	**105**	**81**	**57**	**47**	**48**
	including also double counted amounts	426	379	390	284	240	191	148	104	86	87

db ECO Emissions GHG (in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	8.3	6.9	7.0	5.2	4.5	3.7	3.0	2.2	1.9	2.0
ESOB<45_CF	5.5	4.7	4.7	3.6	3.2	2.7	2.2	1.6	1.4	1.5
ESOB<45_VSD-VF	0.2	0.3	0.3	0.3	0.4	0.4	0.3	0.2	0.2	0.2
ESOB < 45 Total	**14**	**12**	**12**	**9**	**8**	**7**	**5**	**4**	**3**	**4**
ESOB_45-150_VF	2.8	2.3	2.3	1.7	1.5	1.2	0.9	0.7	0.6	0.6
ESOB_45-150_CF	4.7	4.0	4.1	3.1	2.8	2.3	1.9	1.4	1.2	1.3
ESOB_45-150_VSD-VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
ESOB 45-150 Total	**8**	**7**	**7**	**5**	**4**	**4**	**3**	**2**	**2**	**2**
ESOB < 150 Total	**22**	**18**	**19**	**14**	**13**	**10**	**9**	**6**	**5**	**6**
ESCC<45_VF	6.9	5.7	5.8	4.2	3.7	3.0	2.4	1.8	1.5	1.6
ESCC<45_CF	4.6	3.9	4.0	3.0	2.7	2.3	1.8	1.4	1.2	1.2
ESCC<45_VSD-VF	0.3	0.3	0.4	0.3	0.4	0.4	0.3	0.2	0.2	0.2
ESCC < 45 Total	**12**	**10**	**10**	**8**	**7**	**6**	**5**	**3**	**3**	**3**
ESCC_45-150_VF	2.5	2.1	2.1	1.6	1.3	1.1	0.9	0.7	0.6	0.6
ESCC_45-150_CF	1.7	1.5	1.5	1.2	1.0	0.9	0.7	0.5	0.5	0.5
ESCC_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ESCC 45-150 Total	**4**	**4**	**4**	**3**	**3**	**2**	**2**	**1**	**1**	**1**
ESCC < 150 Total	**16**	**14**	**14**	**10**	**9**	**8**	**6**	**5**	**4**	**4**
ESCCi<45_VF	3.5	2.6	2.6	1.7	1.3	0.9	0.7	0.5	0.4	0.5
ESCCi<45_CF	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
ESCCi<45_VSD-VF	0.5	0.6	0.7	0.6	0.7	0.7	0.6	0.4	0.4	0.4
ESCCi < 45 Total	**4**	**4**	**4**	**3**	**2**	**2**	**1**	**1**	**1**	**1**
ESCCi_45-150_VF	0.6	0.5	0.5	0.3	0.2	0.2	0.1	0.1	0.1	0.1
ESCCi_45-150_CF	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ESCCi 45-150 Total	**1**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
ESCCi < 150 Total	**5**	**4**	**4**	**3**	**3**	**2**	**2**	**1**	**1**	**1**
MSSB<6"_VF	1.2	0.9	0.9	0.6	0.5	0.4	0.3	0.2	0.2	0.2
MSSB<6"_CF	6.7	5.7	5.8	4.3	3.8	3.2	2.6	1.9	1.7	1.8
MSSB<6"_VSD-VF	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
MSSB <6" Total	**8**	**7**	**7**	**5**	**5**	**4**	**3**	**2**	**2**	**2**
MS-V<25bar_VF	5.1	4.1	4.1	3.0	2.5	2.0	1.6	1.2	1.0	1.1
MS-V<25bar_CF	3.2	2.7	2.8	2.1	1.9	1.6	1.3	0.9	0.8	0.9
MS-V<25bar_VSD-VF	0.3	0.4	0.5	0.4	0.5	0.5	0.4	0.3	0.3	0.3
MS_V <25 bar Total	**9**	**7**	**7**	**6**	**5**	**4**	**3**	**2**	**2**	**2**
WP Water pumps	**59**	**50**	**51**	**38**	**34**	**28**	**23**	**17**	**15**	**15**
WE arc-on-mode, from electricity	3.1	1.9	1.9	1.3	1.0	0.8	0.6	0.4	0.3	0.3
WE idle mode, from electricity	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Total WE Welding Equipment	**3**	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
TOTAL INDUSTRY COMPONENTS	**320**	**297**	**308**	**225**	**191**	**154**	**121**	**85**	**71**	**73**
TRAFO Distribution	5.2	5.6	5.8	4.3	3.7	3.1	2.4	1.7	1.4	1.5
TRAFO Industry oil	3.9	4.3	4.5	3.1	2.6	2.0	1.5	1.0	0.9	0.9
TRAFO Industry dry	1.2	1.4	1.4	1.0	0.9	0.7	0.6	0.4	0.3	0.4
TRAFO Power	15.0	14.8	16.0	12.4	11.5	10.0	8.3	6.1	5.4	5.7
TRAFO DER oil	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6
TRAFO DER dry	0.0	0.6	0.9	1.0	1.4	1.7	2.1	2.1	2.5	3.3
TRAFO Small	0.8	0.5	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1
Total TRAFO Utility Transformers	**26**	**27**	**29**	**23**	**21**	**18**	**15**	**12**	**11**	**12**
TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**0**	**-1**	**-2**	**-2**	**-3**	**-2**	**-3**	**-3**
(Emissions due to fuel losses due to RRC)										
Tyres C1, replacement for cars	99	74	60	61	59	57	55	53	52	50
Tyres C1, OEM for cars	30	22	21	20	19	18	17	17	16	15
Tyres C1, total	**128**	**96**	**81**	**81**	**78**	**75**	**73**	**70**	**68**	**65**
Tyres C2, replacement for vans	29	25	22	25	25	26	26	25	24	23
Tyres C2, OEM for vans	6	5	5	6	5	6	6	5	5	5
Tyres C2, total	**35**	**31**	**27**	**30**	**30**	**32**	**31**	**30**	**29**	**28**
Tyres C3, replacement for trucks/busses	46	34	29	38	40	43	44	43	43	42
Tyres C3, OEM for trucks/busses	10	8	8	9	9	10	10	10	10	10
Tyres C3, total	**56**	**42**	**37**	**46**	**49**	**53**	**54**	**53**	**53**	**52**
Tyres, total C1+C2+C3	**220**	**168**	**145**	**158**	**157**	**160**	**158**	**153**	**149**	**145**
TRANSPORT SECTOR	**220**	**168**	**145**	**158**	**157**	**160**	**158**	**153**	**149**	**145**
GENERAL TOTAL (in Mt CO_2)	**1769**	**1502**	**1402**	**1095**	**918**	**766**	**649**	**545**	**493**	**476**

	ECO Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	85	99	94	75	62	54	49	45	42	41
	SPACE HEATING	775	590	519	412	328	260	218	188	168	154
	SPACE COOLING	37	49	50	35	29	23	17	12	10	10
	VENTILATION	13	14	13	9	8	6	5	4	4	4
1	*VENTILATION (from heat saving vs. BAU; already included in EMIS for space heating)*	*0*	*0*	*-1*	*-3*	*-6*	*-8*	*-8*	*-7*	*-7*	*-7*
	LIGHTING	99	95	94	63	48	34	25	17	15	17
	ELECTRONICS	36	68	67	43	34	28	21	15	12	12
	FOOD PRESERVATION	113	67	61	41	32	24	18	12	10	11
	COOKING	33	28	27	21	18	15	13	10	9	9
	CLEANING	39	27	25	15	12	10	7	5	4	4
	INDUSTRY COMPONENTS	320	297	308	225	191	154	121	85	71	73
	ENERGY SECTOR	0	0	0	-1	-2	-2	-3	-2	-3	-3
	TRANSPORT SECTOR	220	168	145	158	157	160	158	153	149	145
	TOTAL in Mt CO_2	**1769**	**1502**	**1402**	**1095**	**918**	**766**	**649**	**545**	**493**	**476**
	For comparison: Total EU27 (2020) GHG emissions, excl. LULUCF, incl. indirect CO2, in MtCO2eq *.	4858	4188	3829							

* Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021



Sector subdivision for ECO GHG emissions

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard emissions due to electricity consumed by VUs; heat saving effects are included in Space Heating
Lighting: includes emissions due to energy consumption by control gears, and estimate for standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. Only emissions due to Distribution Losses considered. Assumed that these losses are already considered in GWP for electricity that is used when computing emissions for other sectors. Consequently only the decrease in emissions due to the decrease of the losses in the ECO scenario vs. the BAU scenario is reported. (reference for BAU = 0)

ECO GHG emission (ENERGY SECTOR, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR (only difference vs. BAU)	0	0	0	-1	-2	-2	-3	-2	-3	-3
ECO GHG emission, Energy Sector, MtCO2eq	**0**	**0**	**0**	**-1**	**-2**	**-2**	**-3**	**-2**	**-3**	**-3**

ECO GHG emission (INDUSTRY, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3	3	3	2	2	2	1	1	1	1
SPACE HEATING	42	33	29	23	18	15	12	11	10	9
SPACE & HT PROCESS COOLING	9	11	11	8	7	5	4	3	2	2
VENTILATION	2	2	1	1	1	1	1	0	0	0
LIGHTING	13	13	13	10	8	6	4	3	3	3
ELECTRONICS	1	3	3	2	2	2	1	1	1	1
FOOD PRESERVATION	10	11	12	10	9	8	6	5	4	4
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	214	192	198	145	123	98	76	54	45	46
ECO GHG emission, Industry, MtCO2eq	**293**	**268**	**272**	**201**	**169**	**136**	**106**	**78**	**66**	**66**

ECO GHG emission (TRANSPORT, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are emissions related to energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	37	29	26	30	31	33	33	32	31	31
TYRES for SERVICE-sector-related transport	74	58	50	58	59	62	62	61	59	58
TYRES for RESIDENTIAL-sector-related transport	103	77	65	65	62	60	58	56	54	52
TYRES for OTHER-sector-related transport	6	5	4	5	5	5	5	5	5	5
ECO GHG emission, Transport, MtCO2eq	220	168	145	158	157	160	158	153	149	145

ECO GHG emission (TERTIARY/SERVICES, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	20	21	20	15	12	10	9	8	8	7
SPACE HEATING	181	154	136	107	85	68	57	48	43	39
SPACE & HT PROCESS COOLING	23	31	32	23	19	15	11	8	6	6
VENTILATION	10	10	10	6	5	4	3	2	2	2
LIGHTING	51	56	57	43	34	24	17	12	11	12
ELECTRONICS	14	25	24	18	16	14	11	7	6	6
FOOD PRESERVATION	49	29	27	18	14	10	7	5	4	4
COOKING	4	3	3	3	2	2	2	1	1	1
CLEANING	2	3	3	1	1	1	1	0	0	0
INDUSTRY COMPONENTS	78	81	85	62	53	43	34	24	20	20
ECO GHG emission, Services, MtCO2eq	432	413	397	296	242	191	151	117	102	100

ECO GHG emission (RESIDENTIAL, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	62	74	71	57	48	42	38	35	33	32
SPACE HEATING	538	390	344	274	218	172	144	125	112	102
SPACE & HT PROCESS COOLING	1	4	4	2	2	1	1	1	1	1
VENTILATION	1	2	2	2	2	1	1	1	1	1
LIGHTING	35	26	22	9	5	4	3	2	2	2
ELECTRONICS	22	40	40	23	15	12	9	6	5	5
FOOD PRESERVATION	52	25	20	12	8	6	4	2	2	2
COOKING	29	24	24	18	16	14	11	9	8	8
CLEANING	37	24	22	14	11	9	7	5	4	4
INDUSTRY COMPONENTS	10	9	9	6	6	5	4	3	2	3
ECO GHG emission, Residential, MtCO2eq	786	620	557	418	330	265	221	188	169	159

ECO GHG emission (OTHER sectors, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	1	1	1	1	1	1	0	0	0	0
SPACE HEATING	14	12	10	8	7	5	5	4	4	3
SPACE & HT PROCESS COOLING	3	3	3	2	2	1	1	1	1	1
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	1	1	1	1	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	2	1	1	1	1	1	1	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	17	15	15	11	10	8	7	5	4	4
ECO GHG emission, Other sectors, MtCO2eq	38	33	32	24	21	17	14	11	9	9

ECO GHG emissions (per FUNCTION, MTCO2eq)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		85	99	94	75	62	54	49	45	42	41
	Residential	62	74	71	57	48	42	38	35	33	32
	Tertiary / Services	20	21	20	15	12	10	9	8	8	7
	Industry	3	3	3	2	2	2	1	1	1	1
	Other	1	1	1	1	1	1	0	0	0	0
SPACE HEATING. All sectors, TWh		775	590	519	412	328	260	218	188	168	154
	Residential	538	390	344	274	218	172	144	125	112	102
	Tertiary / Services	181	154	136	107	85	68	57	48	43	39
	Industry	42	33	29	23	18	15	12	11	10	9
	Other	14	12	10	8	7	5	5	4	4	3
SPACE COOLING. All sectors, TWh		37	49	50	35	29	23	17	12	10	10
& HT PROCESS	Residential	1	4	4	2	2	1	1	1	1	1
	Tertiary / Services	23	31	32	23	19	15	11	8	6	6
	Industry	9	11	11	8	7	5	4	3	2	2
	Other	3	3	3	2	2	1	1	1	1	1
VENTILATION.	All sectors, TWh	13	14	13	9	8	6	5	4	4	4
	Residential	1	2	2	2	2	1	1	1	1	1
	Tertiary / Services	10	10	10	6	5	4	3	2	2	2
	Industry	2	2	1	1	1	1	1	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	99	95	94	63	48	34	25	17	15	17
	Residential	35	26	22	9	5	4	3	2	2	2
	Tertiary / Services	51	56	57	43	34	24	17	12	11	12
	Industry	13	13	13	10	8	6	4	3	3	3
	Other	1	1	1	1	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	36	68	67	43	34	28	21	15	12	12
	Residential	22	40	40	23	15	12	9	6	5	5
	Tertiary / Services	14	25	24	18	16	14	11	7	6	6
	Industry	1	3	3	2	2	2	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	113	67	61	41	32	24	18	12	10	11
	Residential	52	25	20	12	8	6	4	2	2	2
	Tertiary / Services	49	29	27	18	14	10	7	5	4	4
	Industry	10	11	12	10	9	8	6	5	4	4
	Other	2	1	1	1	1	1	1	0	0	0
COOKING.	All sectors, TWh	33	28	27	21	18	15	13	10	9	9
	Residential	29	24	24	18	16	14	11	9	8	8
	Tertiary / Services	4	3	3	3	2	2	2	1	1	1
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	39	27	25	15	12	10	7	5	4	4
	Residential	37	24	22	14	11	9	7	5	4	4
	Tertiary / Services	2	3	3	1	1	1	1	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP. All sectors, TWh		320	297	308	225	191	154	121	85	71	73
	Residential	10	9	9	6	6	5	4	3	2	3
	Tertiary / Services	78	81	85	62	53	43	34	24	20	20
	Industry	214	192	198	145	123	98	76	54	45	46
	Other	17	15	15	11	10	8	7	5	4	4
TYRES. Transport sector, TWh		220	168	145	158	157	160	158	153	149	145
	Residential transport	103	77	65	65	62	60	58	56	54	52
	Tertiary / Services transport	74	58	50	58	59	62	62	61	59	58
	Industry transport	37	29	26	30	31	33	33	32	31	31
	Other transport	6	5	4	5	5	5	5	5	5	5
ALL PRODUCTS.	All sectors, TWh	1769	1502	1402	1095	918	766	649	545	493	476
	Residential	786	620	557	418	330	265	221	188	169	159
	Tertiary / Services	432	413	397	296	242	191	151	117	102	100
	Industry	293	268	272	201	169	136	106	78	66	66
	Other	38	33	32	24	21	17	14	11	9	9
	Transport	220	168	145	158	157	160	158	153	149	145

ECO GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	75%	75%	76%	77%	77%	77%	78%	78%	78%
	Tertiary / Services	23%	21%	21%	20%	20%	19%	19%	18%	18%	18%
	Industry	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential	69%	66%	66%	67%	66%	66%	66%	66%	67%	67%
	Tertiary / Services	23%	26%	26%	26%	26%	26%	26%	26%	26%	26%
	Industry	5%	6%	6%	6%	6%	6%	6%	6%	6%	6%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential	3%	9%	7%	5%	5%	6%	7%	7%	7%	8%
	Tertiary / Services	64%	63%	64%	65%	65%	64%	64%	64%	63%	63%
	Industry	26%	22%	23%	23%	23%	23%	23%	23%	23%	22%
	Other	8%	6%	6%	6%	6%	6%	7%	7%	7%	7%
VENTILATION (from electricity).											
	Residential	10%	16%	17%	18%	20%	23%	25%	28%	29%	31%
	Tertiary / Services	77%	72%	71%	71%	69%	67%	64%	62%	61%	59%
	Industry	12%	11%	11%	11%	10%	10%	10%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential	35%	27%	24%	15%	11%	11%	12%	11%	11%	10%
	Tertiary / Services	51%	58%	61%	68%	71%	71%	71%	71%	72%	73%
	Industry	13%	13%	14%	16%	17%	17%	16%	16%	16%	16%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential	61%	59%	59%	53%	45%	43%	42%	43%	43%	44%
	Tertiary / Services	37%	36%	36%	42%	48%	50%	51%	50%	50%	49%
	Industry	2%	4%	4%	5%	6%	6%	7%	7%	6%	6%
	Other	0%	0%	0%	0%	0%	0%	1%	1%	0%	0%
FOOD PRESERVE.											
	Residential	46%	37%	33%	30%	26%	23%	20%	17%	16%	14%
	Tertiary / Services	44%	44%	44%	44%	43%	42%	41%	41%	41%	41%
	Industry	9%	17%	21%	24%	28%	32%	36%	38%	40%	41%
	Other	2%	2%	2%	2%	3%	3%	3%	3%	4%	4%
COOKING.											
	Residential	86%	88%	88%	88%	88%	88%	88%	87%	87%	88%
	Tertiary / Services	14%	12%	12%	12%	12%	12%	12%	13%	13%	12%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential	94%	88%	88%	91%	91%	91%	91%	91%	91%	91%
	Tertiary / Services	5%	10%	10%	8%	9%	9%	9%	9%	9%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential	3%	3%	3%	3%	3%	3%	3%	3%	3%	4%
	Tertiary / Services	24%	27%	28%	28%	28%	28%	28%	28%	28%	28%
	Industry	67%	65%	64%	64%	64%	64%	63%	63%	63%	62%
	Other	5%	5%	5%	5%	5%	5%	6%	6%	6%	6%
TYRES.											
	Residential transport	47%	46%	45%	41%	40%	38%	37%	36%	36%	36%
	Tertiary / Services transport	34%	34%	35%	37%	38%	39%	39%	39%	40%	40%
	Industry transport	17%	17%	18%	19%	20%	20%	21%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential	44%	41%	40%	38%	36%	35%	34%	35%	34%	33%
	Tertiary / Services	24%	27%	28%	27%	26%	25%	23%	21%	21%	21%
	Industry	17%	18%	19%	18%	18%	18%	16%	14%	13%	14%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
	Transport	12%	11%	10%	14%	17%	21%	24%	28%	30%	30%

OTHER EMISSIONS

db ECO direct emissions NO_x (in kt NO_x/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	**9**	**9**	**7**	**4**	**2**	**1**	**1**	**1**	**1**	**1**
Total CH Central Heating combi, water heat	**31**	**48**	**43**	**29**	**18**	**13**	**12**	**12**	**11**	**10**
Total CH Central Heating boiler, space heat	**346**	**340**	**278**	**173**	**102**	**66**	**56**	**50**	**44**	**40**
LH open fire gas	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1
LH closed fire gas	3.4	1.6	1.2	0.7	0.5	0.3	0.2	0.2	0.2	0.1
LH flueless fuel heater	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH luminous heaters	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
LH tube heaters	0.9	0.7	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2
Local Space Heaters, total NOx-emission	**5**	**3**	**2**	**2**	**1**	**1**	**1**	**1**	**0**	**0**
CHF	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
ACF	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
ACF (rev)	0.0	0.2	0.3	0.3	0.2	0.1	0.1	0.1	0.1	0.1
AHF	53	39	33	22	13	6	4	3	3	3
Air Heaters & Coolers, total direct Nox emission	**53**	**39**	**33**	**23**	**13**	**6**	**4**	**4**	**3**	**3**
Total direct NO_x ECO in kt NOx	**444**	**439**	**364**	**230**	**137**	**87**	**75**	**67**	**60**	**54**
Direct NOx ECO in kt SO2 eq.(=0.7*NOx)	**311**	**307**	**255**	**161**	**96**	**61**	**52**	**47**	**42**	**38**
Ref. EU27 (2020) total NOx emissions (EEA) in kton	14851	8573	7197							
Share EIA Nox / ref. EU total	3.0%	5.1%	5.1%							

Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.8 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021. (Data for 2018/2019 seem to be without Poland ?)

NOx emission data in EIA are incomplete: insufficient data were available to quantify NOx emissions for Solid Fuel Boilers and for a part of the Local Space Heaters. Note that Ecodesign and Energy Labelling affects NOx emissions also through energy saving for product groups without explicit direct NOx emission-limits and indirectly through electricity savings (NOx from power plants).

ECO direct CO-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	8873	1287	923	585	311	115	25	13	11	9
SFB Wood Direct Draft	2	16	29	39	46	43	42	45	51	59
SFB Coal	459	87	81	62	43	25	17	15	13	11
SFB Pellets	0	11	18	24	29	31	31	30	31	33
SFB Wood chips	0	16	19	20	18	17	17	18	19	20
Solid Fuel Boilers, total CO-emission	**9334**	**1416**	**1069**	**731**	**447**	**231**	**132**	**122**	**126**	**133**
LH open fireplace	187	179	172	153	115	84	60	41	30	29
LH closed fireplace/inset	245	393	424	420	361	301	242	187	149	144
LH wood stove	535	374	339	296	233	182	143	111	88	85
LH coal stove	390	153	124	99	73	51	33	20	12	9
LH cooker	84	97	99	94	72	52	36	35	34	33
LH SHR stove	189	193	194	191	171	154	140	124	111	111
LH pellet stove	0	15	15	12	8	6	5	5	5	5
Local Space Heaters, total CO-emission	**1630**	**1403**	**1367**	**1265**	**1033**	**830**	**659**	**523**	**429**	**416**
Total direct CO-emissions, ECO, in kt/a	**10964**	**2819**	**2437**	**1997**	**1480**	**1061**	**791**	**645**	**555**	**549**
Ref. EU27 (2020) total CO emissions (EEA) in kton	57382	24964	20128							
Share EIA CO / ref. EU total	19.1%	11.3%	12.1%							

Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.9 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021. (Data for 2018/2019 seem to be without Poland ?)

ECO direct OGC-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	776	113	81	51	26	9	1	1	0	0
SFB Wood Direct Draft	0	1	1	2	2	2	2	2	3	3
SFB Coal	23	4	4	3	2	1	1	1	1	1
SFB Pellets	0	2	3	3	3	3	2	2	2	2
SFB Wood chips	0	0	1	1	1	0	0	1	1	1
Solid Fuel Boilers, total OGC-emission	**799**	**120**	**89**	**59**	**34**	**16**	**7**	**6**	**6**	**6**
LH open fireplace	18	13	11	8	6	4	2	1	1	1
LH closed fireplace/inset	23	27	25	22	17	12	8	5	4	3
LH wood stove	51	27	21	16	11	7	5	3	2	2
LH coal stove	38	11	8	6	4	2	1	1	0	0
LH cooker	8	6	5	4	3	2	1	1	1	1
LH SHR stove	18	14	12	10	8	6	4	3	2	2
LH pellet stove	0	3	4	4	4	3	2	2	2	2
Local Space Heaters, total OGC-emission	**155**	**100**	**86**	**70**	**52**	**36**	**24**	**17**	**12**	**11**
Total direct OGC-emissions, ECO, in kt/a	**955**	**219**	**176**	**130**	**86**	**52**	**31**	**22**	**18**	**17**
Ref. EU27 (2020) total NMVOC emissions (EEA) in ktoı	15095	7411	6434							
Share EIA OGC / ref. EU total NMVOC	6.3%	3.0%	2.7%							

Source: Annual European Union greenhouse gas inventory 1990–2019 and inventory report 2021 , Submission to the UNFCCC Secretariat, 27 May 2021, European Environment Agency, Table 2.10 (EU27+UK, subtracting UK), https://www.eea.europa.eu/publications/annual-european-union-greenhouse-gas-inventory-2021. (Data for 2018/2019 seem to be without Poland ?)

No statistical reference values for total OGC (organic gaseous carbon) emissions in Europe could be found. However such statistics are available for NMVOC (non-methane volatile organic compound), which is the same as OGC but without the methane contribution.

ECO direct PM-emissions (in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	399	58	42	27	15	6	2	1	1	1
SFB Wood Direct Draft	1	4	7	9	10	9	9	9	10	12
SFB Coal	115	22	20	16	11	6	3	3	3	2
SFB Pellets	0	2	3	3	4	4	4	3	4	4
SFB Wood chips	0	2	3	3	2	2	2	2	2	2
Solid Fuel Boilers, total PM-emission	**515**	**87**	**74**	**58**	**42**	**27**	**20**	**19**	**20**	**21**
LH open fireplace	39	42	40	33	23	15	8	3	1	1
LH closed fireplace/inset	17	25	26	24	19	14	10	6	4	4
LH wood stove	38	24	21	17	12	9	6	4	2	2
LH coal stove	28	10	8	6	4	3	1	1	0	0
LH cooker	6	7	6	5	3	2	1	1	1	1
LH SHR stove	12	10	9	9	7	6	5	4	3	3
LH pellet stove	0	2	2	2	1	1	1	1	1	0
Local Space Heaters, total PM-emission	**140**	**119**	**112**	**96**	**70**	**48**	**31**	**18**	**12**	**11**
Total direct PM-emissions, ECO, in kt/a	**654**	**206**	**186**	**153**	**112**	**75**	**50**	**37**	**32**	**32**
Ref. EU27 (2020) total PM10 emissions (EEA) in kton		2178	1884							
Share EIA PM / ref. EU total PM		9.5%	9.9%							

Source for Ref. EU27-total: European Union emission inventory report 1990-2018 under the UNECE Convention on Long-range Transboundary Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.7 (EU28 minus UK; adjusted data used).

db

ECO noise emissions by tyres (in dB(A))	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Tyres C1, replacement for cars		70.8	70.8	70.4	70.2	70.1				
Tyres C1, OEM for cars		70.8	70.8	70.4	70.2	70.1				
Tyres C2, replacement for vans		71.9	72.0	71.7	71.7	71.7				
Tyres C2, OEM for vans		71.9	71.9	71.7	71.7	71.7				
Tyres C3, replacement for trucks/busses		71.8	71.7	71.3	71.2	71.0				
Tyres C3, OEM for trucks/busses		71.8	71.8	71.3	71.2	71.0				

db Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
see also other emissions at bottom of Table										
EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	0	0	0	0	0	0	0	0	0	0
EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L (secondary)	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage > 30 L (primary)	0	0	0	1	1	1	1	1	1	1
GIWH Gas Instant. < 13 L/min (secondary)	0	0	0	0	1	1	0	0	0	0
GIWH Gas Instant. ≥ 13 L/min (primary)	0	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	0	0	0	0	0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	0	0	0	0	0	0
Dedicated WH Solar (3.5 m2)	0	0	0	0	0	0	0	0	0	0
WH dedicated Water Heater	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**2**	**2**	**2**
CHB Gas Combi Instant. WH	0	0	1	2	3	5	6	8	10	11
CHB Gas + Cyl. WH	0	0	0	1	2	3	3	4	4	5
CHB Jet Burner Gas + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	0	0	0	0	1	1	1	1	1	1
CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	-1	-1	-1
CHB Electric HP + Cyl. WH	0	0	0	0	0	0	-1	-1	-1	-1
CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	**0**	**0**	**1**	**3**	**5**	**8**	**9**	**11**	**13**	**14**
TOTAL WATER HEATING	**0**	**0**	**2**	**6**	**9**	**11**	**12**	**13**	**15**	**16**
CHB Gas non-condensing	0	2	8	23	36	45	47	42	37	32
CHB Gas condensing	0	1	4	1	1	3	9	21	31	41
CHB Gas Jet burner non-condensing	0	0	0	0	1	1	1	1	1	1
CHB Gas Jet burner condensing	0	0	0	0	0	0	0	0	0	0
CHB Oil Jet burner non-condensing	0	1	2	5	9	10	11	12	11	9
CHB Oil Jet burner condensing	0	0	0	-1	-2	-3	-4	-4	-4	-3
CHB Electric Joule-effect	0	0	0	0	0	0	0	0	0	0
CHB Hybrid (gas-electric)	0	0	0	0	0	-1	-1	-1	-1	-2
CHB Electric Heat Pump	0	0	0	0	0	-1	-2	-2	-2	-3
CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	0
CHB micro CHP	0	0	0	0	0	0	0	0	0	0
CHB Solar combi (16 m2)	0	0	0	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating	**0**	**5**	**15**	**29**	**43**	**55**	**62**	**67**	**71**	**75**
SFB Wood Manual	0.00	0.00	0.01	0.06	0.09	0.09	0.08	0.05	0.04	0.03
SFB Wood Direct Draft	0.00	0.00	0.00	0.00	0.02	0.04	0.05	0.07	0.08	0.10
SFB Coal	0.00	0.00	0.05	0.31	0.71	0.96	1.05	1.07	0.95	0.82
SFB Pellets	0.00	0.00	0.00	0.01	0.02	0.04	0.05	0.05	0.06	0.06
SFB Wood chips	0.00	0.00	0.00	0.01	0.01	0.02	0.03	0.03	0.03	0.03
Total Solid Fuel Boiler	**0.0**	**0.0**	**0.1**	**0.4**	**0.9**	**1.1**	**1.3**	**1.3**	**1.2**	**1.0**
CHAE-S (≤ 400 kW)	0.00	0.00	0.00	0.02	0.06	0.08	0.08	0.06	0.05	0.04
CHAE-L (> 400 kW)	0.00	0.00	0.00	0.05	0.11	0.12	0.10	0.07	0.06	0.04
CHWE-S (≤ 400 kW)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHWE-M (> 400 kW; ≤ 1500 kW)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
CHWE-L (> 1500 kW)	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
CHF	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
HT PCH-AE-S	0.00	0.00	0.01	0.21	0.43	0.50	0.41	0.26	0.18	0.15
HT PCH-AE-L	0.00	0.00	0.02	0.23	0.50	0.64	0.59	0.41	0.32	0.29
HT PCH-WE-S	0.00	0.00	0.00	0.02	0.05	0.05	0.04	0.02	0.01	0.00
HT PCH-WE-M	0.00	0.00	0.00	0.04	0.07	0.07	0.05	0.01	0.00	0.00
HT PCH-WE-L	0.00	0.00	0.00	0.01	0.02	0.03	0.02	0.02	0.01	0.01
AC rooftop	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.00	0.00	0.00
AC splits	0.00	0.00	0.01	0.08	0.13	0.14	0.10	0.05	0.04	0.03
AC VRF	0.00	0.00	0.00	0.03	0.07	0.10	0.11	0.08	0.06	0.06
ACF	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
SubTotal AHC central Air Cooling	**0.0**	**0.0**	**0.1**	**0.7**	**1.5**	**1.8**	**1.5**	**1.0**	**0.8**	**0.7**
AC rooftop (rev)	0.00	0.00	0.02	0.13	0.19	0.15	0.06	0.01	0.00	0.00
AC splits (rev)	0.00	0.00	0.04	0.21	0.34	0.36	0.26	0.15	0.10	0.08
AC VRF (rev)	0.00	0.00	0.02	0.08	0.20	0.31	0.32	0.24	0.18	0.16
ACF (rev)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
AHF	0.00	0.00	0.17	1.25	2.55	3.44	3.53	3.16	2.76	2.40
AHE	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01	0.01	0.01
SubTotal AHC central Air Heating	**0.0**	**0.0**	**0.3**	**1.7**	**3.3**	**4.3**	**4.2**	**3.6**	**3.1**	**2.7**
Total AHC central Air Heating & Cooling	**0.0**	**0.0**	**0.3**	**2.4**	**4.8**	**6.1**	**5.7**	**4.6**	**3.8**	**3.3**

db	Avoided Emissions GHG (BAU-ECO, in MtCO_2 eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.00	0.00	0.00	0.02	0.06	0.09	0.12	0.14	0.15	0.15
	LH closed fireplace/inset	0.00	0.00	0.00	0.02	0.08	0.13	0.17	0.20	0.21	0.21
	LH wood stove	0.00	0.00	0.00	0.01	0.05	0.08	0.10	0.12	0.13	0.12
	LH coal stove	0.00	0.00	0.00	0.06	0.17	0.23	0.26	0.28	0.26	0.21
	LH cooker	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.03	0.03	0.03
	LH SHR stove	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02
	LH pellet stove	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.02	0.03
	LH Solid fuel sum	**0.0**	**0.0**	**0.0**	**0.1**	**0.4**	**0.6**	**0.7**	**0.8**	**0.8**	**0.8**
	LH Electric portable	0.00	0.00	0.14	0.46	0.56	0.42	0.30	0.20	0.16	0.15
	LH Electric fixed > 250W	0.00	0.00	0.23	0.75	1.13	1.12	0.85	0.55	0.43	0.41
	LH Electric fixed ≤ 250W	0.00	0.00	0.01	0.05	0.07	0.07	0.06	0.04	0.03	0.03
	LH Electric storage	0.00	0.00	0.04	0.11	0.15	0.14	0.10	0.07	0.05	0.05
	LH Electric underfloor	0.00	0.00	0.02	0.05	0.09	0.10	0.09	0.06	0.05	0.05
	LH Electric visibly glowing > 1.2 kW	0.00	0.00	0.01	0.02	0.03	0.03	0.02	0.01	0.01	0.01
	LH Electric visibly glowing ≤ 1.2 kW	0.00	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00
	LH Electric Towel Heaters	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	LH Electric sum	**0.0**	**0.0**	**0.4**	**1.5**	**2.1**	**1.9**	**1.4**	**0.9**	**0.7**	**0.7**
	LH Gas luminous (commercial)	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	0.01
	LH Gaseous Tube (commercial < 120 kW)	0.00	0.00	0.01	0.03	0.04	0.05	0.06	0.05	0.04	0.04
	LH Gas open front	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
	LH Gas closed front	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.02	0.02
	LH Gas balanced flue	0.00	0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.02	0.02
	LH Gas flueless	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gaseous fuel sum	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Liquid tube (commercial < 120 kW)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01
	LH Liquid open front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid closed front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid balanced flue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid flueless	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**0.0**	**0.0**	**0.5**	**1.7**	**2.6**	**2.6**	**2.3**	**1.9**	**1.7**	**1.6**
	RAC fixed < 6 kW, cooling	0.0	1.3	1.4	0.8	0.7	0.5	0.4	0.3	0.3	0.3
	RAC fixed 6-12 kW, cooling	0.0	0.8	1.0	0.6	0.5	0.3	0.2	0.2	0.1	0.1
	RAC portable < 12 kW, cooling	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.0**	**2.1**	**2.5**	**1.5**	**1.2**	**0.9**	**0.6**	**0.4**	**0.4**	**0.5**
	RAC fixed < 6 kW, reversible, heating	0.0	1.2	1.8	1.4	1.3	1.1	0.8	0.6	0.5	0.5
	RAC fixed 6-12 kW, reversible, heating	0.0	0.8	1.3	1.1	1.0	0.8	0.6	0.4	0.3	0.3
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**2.1**	**3.1**	**2.4**	**2.3**	**1.9**	**1.4**	**1.0**	**0.8**	**0.9**
	RAC Room Air Conditioner	**0.0**	**4.2**	**5.6**	**4.0**	**3.5**	**2.8**	**2.1**	**1.4**	**1.2**	**1.3**
1	CIRC Integrated circulators	0.0	0.0	0.6	1.3	1.5	1.2	0.9	0.5	0.4	0.3
0.38	CIRC Large standalone circulators	0.0	0.0	0.4	0.6	0.6	0.4	0.2	0.1	0.1	0.1
0.38	CIRC Small standalone circulators	0.0	0.0	0.4	0.7	0.6	0.4	0.3	0.2	0.1	0.1
	CIRC Circulator pumps <2.5 kW, all	**0.0**	**0.0**	**1.4**	**2.7**	**2.7**	**2.0**	**1.4**	**0.8**	**0.6**	**0.5**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.0**	**0.0**	**0.5**	**0.8**	**0.7**	**0.5**	**0.3**	**0.2**	**0.1**	**0.1**
	TOTAL SPACE HEATING	**0**	**7**	**19**	**36**	**53**	**65**	**71**	**75**	**78**	**81**
	TOTAL SPACE COOLING	**0**	**2**	**3**	**2**	**3**	**3**	**2**	**1**	**1**	**1**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU 250-1000 m3/h	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1
	R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential, from VU own electricity	**0.0**	**0.0**	**0.0**	**0.2**	**0.3**	**0.4**	**0.4**	**0.3**	**0.3**	**0.4**
	NR-UVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
	NR-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-AHU-M 5500-14500 m3/h	0.0	0.0	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.2
	NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NRVU, Total non-residential, from VU own electricity	**0.0**	**0.0**	**0.1**	**0.4**	**0.6**	**0.8**	**0.8**	**0.6**	**0.5**	**0.6**
	VU Ventilation Units, res + non-res. from VU own elec.	**0.0**	**0.0**	**0.2**	**0.5**	**1.0**	**1.2**	**1.2**	**0.9**	**0.8**	**0.9**
	TOTAL VENTILATION (from VU own electricity)	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
1	***Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)***	*0*	*0*	*1*	*3*	*6*	*8*	*8*	*7*	*7*	*7*

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	0.0	0.4	1.6	3.1	7.4	10.2	8.6	5.3	3.6	2.9
	HID (HPM, HPS, MH)	0.0	0.4	3.8	4.5	4.1	2.9	1.5	0.6	0.3	0.2
	CFLni (all shapes)	0.0	0.1	0.3	0.5	0.7	0.5	0.2	0.1	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.0	-0.8	-0.9	0.3	1.4	1.3	0.7	0.3	0.2	0.1
	GLS (DLS & NDLS)	0.0	6.1	10.3	7.0	3.5	1.6	0.7	0.3	0.1	0.1
	HL (DLS & NDLS, LV & MV)	0.0	-1.2	-0.8	7.7	7.0	2.9	1.2	0.4	0.2	0.1
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.2	-0.8	-2.7	-3.5	-2.8	-1.5	-0.8	-0.4
	LED replacing HID (retrofit & luminaire)	0.0	0.0	-2.6	-2.6	-1.8	-0.8	-0.2	0.0	0.1	0.2
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	-0.1	-0.2	-0.2	-0.1	0.0	0.0	0.0	0.0
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	-0.3	-0.5	-0.5	-0.3	-0.1	-0.1	0.0	0.0
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-0.4	-1.6	-1.8	-1.1	-0.5	-0.2	-0.1	0.0
	Standby	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	TOTAL LIGHTING (incl. standby)	**0**	**5**	**11**	**17**	**17**	**14**	**9**	**5**	**4**	**3**
	DP TV on-mode, total all types	0.0	0.0	1.5	3.8	5.8	6.3	5.2	3.1	2.1	1.8
	DP TV standby, standard (NoNA)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, total all types	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP TV total on-mode + standby	**0**	**0**	**2**	**4**	**6**	**6**	**5**	**3**	**2**	**2**
	DP Monitor on-mode	0.0	0.0	0.3	0.6	0.5	0.4	0.3	0.2	0.1	0.1
	DP Monitor standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**	**0**	**0**
	DP Signage on-mode	0.0	0.0	0.0	0.0	0.1	0.5	0.7	0.4	0.2	0.1
	DP Signage standby	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
	DP Signage total	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**0**	**0**	**0**
	DP Electronic Displays, total on-mode	**0**	**0**	**2**	**4**	**6**	**7**	**6**	**4**	**2**	**2**
	DP Electronic Displays, total standby	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP Electronic Displays, total	**0**	**0**	**2**	**4**	**6**	**7**	**6**	**4**	**2**	**2**
	SSTB	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	0.0	0.0	0.4	0.7	0.5	0.4	0.2	0.2	0.1	0.1
	CSTB (other modes)	0.0	0.0	0.2	0.4	0.3	0.2	0.1	0.1	0.1	0.1
	CSTB (all covered modes)	0.0	0.0	0.6	1.1	0.8	0.5	0.4	0.3	0.2	0.2
	Total STB set top boxes (Complex & Simple)	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**	**0**
	Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.2	0.4	0.3	0.2	0.2	0.1	0.1	0.1
	Game consoles > 20 W Non-Active (CR)	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1
	Game consoles < 20 W Non-Active (CR)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes	0.0	0.0	0.2	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	Total Game consoles, non-active modes	0.0	0.0	0.2	0.4	0.4	0.3	0.3	0.2	0.1	0.1
	Total Game consoles > 20 W, all modes	0.0	0.0	0.4	0.8	0.6	0.5	0.4	0.3	0.2	0.2
	Total Game consoles < 20 W, all modes	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	Total Game consoles, all modes	**0.0**	**0.0**	**0.4**	**0.9**	**0.7**	**0.6**	**0.4**	**0.3**	**0.3**	**0.2**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket traditional	0	0	0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ES rack 2-socket cloud	0	0	0	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	ES rack 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket cloud	0	0	0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES total traditional	**0**	**0**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
	ES total cloud	**0**	**0**	**0**	**0.2**	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
	ES Enterprise Servers total	**0**	**0**	**0**	**0.4**	**0.4**	**0.3**	**0.3**	**0.2**	**0.1**	**0.1**
	DS Online 2	0	0	0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	DS Online 3	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Online 4	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Data Storage products total	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
	ES + DS total (excl. infrastructure)	**0**	**0**	**0**	**0.4**	**0.5**	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**

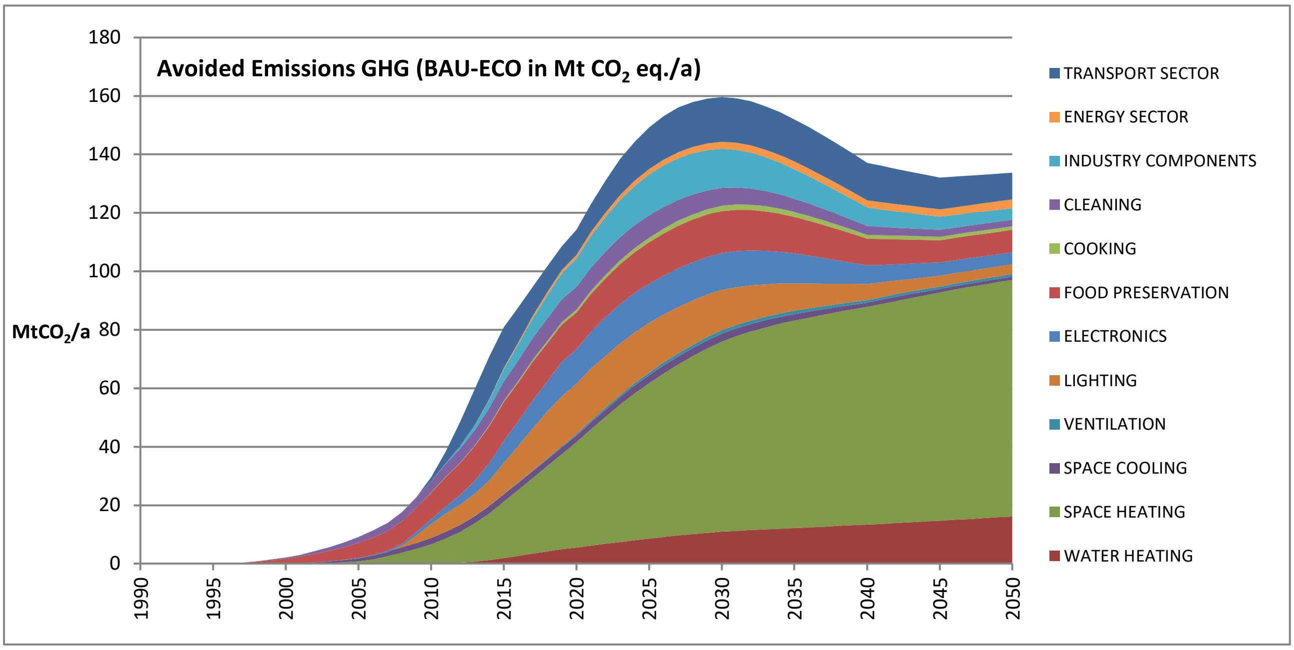
db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Desktop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Inkjet Printer	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	EP / Laser Printer mono	0.0	0.2	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
	EP / Laser Printer colour	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1
	EP / Laser Copier mono	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.2	0.4	0.4	0.3	0.3	0.2	0.1	0.1	0.1
	EP / Laser MFD colour	0.0	0.1	0.4	0.5	0.4	0.3	0.2	0.1	0.1	0.1
	Total IE Imaging Equipment, from electricity	**0.0**	**0.8**	**1.5**	**1.5**	**1.3**	**1.0**	**0.7**	**0.5**	**0.4**	**0.4**
	of which for modes under CR 1275/2008	*0.0*	*0.6*	*1.2*	*1.2*	*1.0*	*0.8*	*0.6*	*0.4*	*0.3*	*0.3*
	(see Resources for contributions from paper, toner)										
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.0	0.0	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0
	SB Electric toothbrushes (off mode)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wired) (sb & off modes)	0.0	0.2	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.4	0.6	0.5	0.3	0.2	0.2	0.2
	SB Small appliances (sb & off modes)	0.0	0.0	0.7	0.8	0.7	0.6	0.4	0.3	0.3	0.3
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	SB Media players and recorders (sb mode)	0.0	0.2	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.0	0.0	0.0
	SB Office phones (nsb mode)	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.0	0.0	0.3	0.3	0.3	0.2	0.2	0.1	0.1
	SB Home Network Equipment (nsb mode)	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.2
	SB Coffee makers (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.1	0.3	0.2	*0.2*	*0.2*	*0.1*	*0.1*	*0.1*	*0.1*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	*0.1*	*0.1*	*0.1*	*0.0*	*0.0*	*0.0*
1	SB Laundry Dryers (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	0.0	0.3	0.5	0.6	0.7	0.5	0.4	0.3	0.3
1	SB Electric Hobs (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.4	0.7	0.5	0.4	0.2	0.2	0.1	0.1
1	SB Game consoles (non-active modes)	0.0	0.0	0.2	0.4	0.4	0.3	0.3	0.2	0.1	0.1
1	SB IE Inkjet Printers (nsb mode)	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
1	SB IE Laser Printers (nsb mode)	0.0	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.1
1	SB IE Laser Copiers (nsb mode)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.2	0.6	0.7	0.6	0.4	0.3	0.2	0.2	0.1
	Total (networked) SB (incl. double)	0	1	5	6	6	5	4	2	2	2
	Total (networked) SB (excl. double)	**0**	**0**	**3**	**3**	**3**	**2**	**2**	**1**	**1**	**1**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.6	EPS 10–12 W	0.0	0.0	0.5	0.7	0.7	0.5	0.3	0.2	0.1	0.1
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for active mode	**0.0**	**0.0**	**0.6**	**0.9**	**0.9**	**0.6**	**0.4**	**0.2**	**0.2**	**0.1**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
0.0	EPS 10–12 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
	EPS, overall total (active + no-load)	**0.0**	**0.0**	**0.8**	**1.1**	**1.1**	**0.8**	**0.5**	**0.3**	**0.2**	**0.2**
	EPS, double counted subtracted	**0.0**	**0.0**	**0.4**	**0.6**	**0.6**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**
	TOTAL ELECTRONICS	**0**	**2**	**8**	**12**	**13**	**13**	**10**	**6**	**5**	**4**

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	**0**	**9**	**13**	**12**	**12**	**11**	**9**	**6**	**5**	**5**
	CF open vertical chilled multi deck (RVC2)	0	0	0.0	0.0	0.2	0.5	0.6	0.4	0.4	0.4
	CF open horizontal frozen island (RHF4)	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0	0	0.0	0.0	0.3	0.7	0.8	0.6	0.5	0.5
	CF Plug in one door beverage cooler	0	0	0.0	0.0	0.5	0.8	0.8	0.5	0.5	0.5
	CF Plug in horizontal ice cream freezer	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CF Spiral vending machine	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CF Commercial Refrigeration	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**2**	**1**	**1**
	PF Storage cabinet Chilled Vertical (CV)	0	0	0	0.1	0.2	0.2	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Vertical (FV)	0	0	0	0.1	0.2	0.2	0.1	0.1	0.1	0.1
	PF Storage cabinet Chilled Horizontal (CH)	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	0	0	0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	PF Storage cabinets All types	**0**	**0**	**0**	**0.2**	**0.5**	**0.5**	**0.4**	**0.3**	**0.3**	**0.3**
	PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC MT L > 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC LT L > 200 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller All MT&LT	**0**	**0**	**0**	**0.2**	**0.4**	**0.6**	**0.5**	**0.4**	**0.3**	**0.4**
	PF Condensing Unit MT S 0.2-1 kW	0	0	0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	PF Condensing Unit MT M 1-5 kW	0	0	0	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit MT L 5-20 kW	0	0	0	0.1	0.2	0.2	0.2	0.1	0.1	0.1
	PF Condensing Unit MT XL 20-50 kW	0	0	0	0.1	0.2	0.2	0.2	0.1	0.1	0.1
	PF Condensing Unit LT S 0.1-0.4 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT L 2-8 kW	0	0	0	0.1	0.1	0.1	0.1	0.1	0.0	0.1
	PF Condensing Unit LT XL 8-20 kW	0	0	0	0.1	0.2	0.2	0.1	0.1	0.1	0.1
0.6	**PF Condensing Unit, All MT&LT**	**0**	**0**	**0**	**0.7**	**1.1**	**0.9**	**0.8**	**0.6**	**0.5**	**0.5**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0.7**	**1.4**	**1.5**	**1.2**	**0.9**	**0.8**	**0.8**
	TOTAL FOOD PRESERVATION	**0**	**9**	**13**	**12**	**14**	**14**	**13**	**9**	**8**	**8**
	CA Electric Hobs (active modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CA Electric Hobs (low-power modes)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	CA Electric Hobs (sum all modes)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	CA Electric Ovens (active modes)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1
	CA Electric Ovens (low-power modes)	0.0	0.0	0.3	0.5	0.6	0.7	0.5	0.4	0.3	0.3
	CA Electric Ovens (sum all modes)	0.0	0.0	0.3	0.6	0.8	0.9	0.8	0.5	0.4	0.4
	CA Gas Hobs	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CA Gas Ovens	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3
	CA Range Hoods	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.3	0.3
	CA Elec. Hobs&Ovens low-power modes	0.0	0.0	0.4	0.7	0.9	0.9	0.7	0.5	0.4	0.4
	CA other products or modes	0.0	0.0	0.0	0.3	0.7	1.0	1.0	0.9	0.8	0.8
	TOTAL COOKING	**0**	**0**	**0**	**1**	**2**	**2**	**2**	**1**	**1**	**1**
	WM Washing Machines, active modes	0.0	2.3	3.2	2.4	2.0	1.4	0.9	0.5	0.3	0.2
	WM Washing Machines, low-power modes	0.0	0.1	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	WM Washing Machines, all modes	0.0	2.4	3.5	2.7	2.2	1.6	1.1	0.6	0.4	0.3
	WD Washer-Dryers, active modes	0.0	0.3	0.4	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers, all modes	0.0	0.3	0.4	0.3	0.3	0.2	0.1	0.0	0.0	0.0
	WM-WD Washing, sum active modes	0.0	2.6	3.6	2.8	2.2	1.6	1.0	0.5	0.3	0.2
	WM-WD Washing, sum low-power modes	0.0	0.1	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	Total WM-WD household Washing	**0**	**3**	**4**	**3**	**2**	**2**	**1**	**1**	**0**	**0**
	DW Dishwashers, active modes	0.0	1.2	1.7	1.5	1.5	1.4	1.2	0.9	0.8	0.8
	DW Dishwashers, low-power modes	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	Total DW household Dishwasher	**0**	**1**	**2**	**2**	**2**	**1**	**1**	**1**	**1**	**1**
	LD condensing heat pump	0.0	0.0	-0.3	-0.4	-0.5	-0.5	-0.4	-0.3	-0.2	-0.2
	LD condensing electric heat element	0.0	0.0	0.3	0.6	0.9	0.8	0.7	0.4	0.3	0.3
	LD vented electric	0.0	0.0	0.3	0.5	0.5	0.5	0.5	0.3	0.3	0.3
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	0.0	0.0	0.3	0.6	0.8	0.8	0.7	0.5	0.4	0.4
	LD Laundry Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**0**	**0**

db	Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	0.0	0.0	0.4	1.5	1.8	1.2	0.7	0.4	0.3	0.3
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
	VC Total Domestic mains	**0**	**0**	**0**	**2**	**2**	**1**	**1**	**0**	**0**	**0**
	VC Cylinder Commercial mains	0.0	0.0	0.3	0.9	0.8	0.7	0.6	0.4	0.3	0.3
	VC Upright Commercial mains	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	VC Total Commercial mains	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
	VC Total in scope of CR 666/2013	**0**	**0**	**1**	**3**	**3**	**2**	**1**	**1**	**1**	**1**
	VC Cordless - domestic - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**0**	**0**	**0**	**2**	**2**	**1**	**1**	**0**	**0**	**0**
	VC Total Commercial mains+cordless+robots	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
	Total VC Vacuum Cleaner	**0**	**0**	**1**	**3**	**3**	**2**	**1**	**1**	**1**	**1**
	TOTAL CLEANING	**-**	**4**	**7**	**8**	**8**	**6**	**5**	**3**	**2**	**2**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.6	1.4	2.0	2.0	1.7	1.1	0.9	0.9
0.5	FAN Axial>300Pa	0.0	0.0	0.6	1.4	2.2	2.3	1.9	1.3	1.1	1.1
0.5	FAN Centr.FC	0.0	0.0	0.2	0.6	0.9	1.0	0.8	0.5	0.4	0.4
0.5	FAN Centr.BC-free	0.0	0.0	0.5	1.0	1.4	1.4	1.1	0.8	0.7	0.7
0.5	FAN Centr.BC	0.0	0.0	0.7	1.3	1.8	1.7	1.4	1.1	0.9	1.0
0.5	FAN Cross-flow	0.0	0.0	0.1	0.3	0.4	0.3	0.3	0.2	0.2	0.2
	Total FAN, industrial	**0**	**0**	**1**	**3**	**4**	**4**	**4**	**3**	**2**	**2**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.1	1.6	4.8	6.4	5.0	3.4	2.0	1.2	0.7
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	2.3	7.5	10.6	8.5	5.8	3.3	1.9	1.0
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.1	4.2	11.4	16.1	15.9	10.3	4.9	2.1	0.8
0.45	**Total 3ph 0.75-375 kW no VSD**	**0**	**0**	**8**	**24**	**33**	**29**	**19**	**10**	**5**	**3**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.2	-1.8	-2.8	-2.0	-1.3	-0.7	-0.3	-0.1
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-1.2	-4.1	-5.9	-4.5	-3.0	-1.6	-0.9	-0.3
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-2.4	-6.6	-9.1	-8.8	-5.3	-2.2	-0.7	0.1
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0**	**0**	**-4**	**-13**	**-18**	**-15**	**-10**	**-5**	**-2**	**0**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0**	**0**	**4**	**11**	**15**	**14**	**10**	**6**	**3**	**2**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.1	0.2	0.1	0.1	0.1	0.0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Large 3-ph LV 375-1000 kW no VSD	0	0	0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
0.45	Large 3-ph LV 375-1000kW with VSD	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.1
0.45	**Total Large 3-ph LV 375-1000 kW**	**0**	**0**	**0**	**0.0**	**0.2**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.1**	**0.3**	**0.3**	**0.2**	**0.1**	**0.1**
	MT Elec. Motors LV 0.12-1000 kW	**0**	**0**	**2**	**6**	**9**	**8**	**6**	**3**	**2**	**2**
	including also double counted amounts	-	0	4	11	16	15	11	6	4	3

db Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
ESOB<45_CF	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
ESOB<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB < 45 Total	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESOB 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ESOB < 150 Total	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
ESCC<45_VF	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
ESCC<45_CF	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
ESCC<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCC < 45 Total	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
ESCC_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCC_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCC 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ESCC < 150 Total	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
ESCCi<45_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi<45_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi < 45 Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ESCCi < 150 Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
MSSB<6"_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MSSB<6"_CF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
MSSB<6"_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MSSB <6" Total	**0.0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**
MS-V<25bar_VF	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
MS-V<25bar_CF	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
MS-V<25bar_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MS_V <25 bar Total	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
WP Water pumps	**0.0**	**0.0**	**0.4**	**0.7**	**0.7**	**0.5**	**0.4**	**0.2**	**0.2**	**0.1**
WE arc-on-mode, from electricity	0	0	0	0.00	0.07	0.10	0.08	0.06	0.05	0.05
WE idle mode, from electricity	0	0	0	0.00	0.01	0.02	0.02	0.01	0.01	0.01
Total WE Welding Equipment	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
TOTAL INDUSTRY COMPONENTS	**0**	**0**	**4**	**10**	**14**	**13**	**10**	**6**	**5**	**4**
TRAFO Distribution	0.0	0.0	0.2	0.4	0.6	0.7	0.7	0.6	0.6	0.7
TRAFO Industry oil	0.0	0.0	0.2	0.5	0.8	0.9	0.9	0.7	0.6	0.7
TRAFO Industry dry	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1
TRAFO Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAFO DER oil	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4
TRAFO DER dry	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.8	1.1
TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total TRAFO Utility Transformers	**0**	**0**	**0**	**1**	**2**	**2**	**3**	**2**	**3**	**3**
TOTAL ENERGY SECTOR	**0**	**0**	**0**	**1**	**2**	**2**	**3**	**2**	**3**	**3**
(Emissions due to fuel losses due to RRC)										
Tyres C1, replacement for cars	0.0	0.7	9.2	5.9	7.8	7.9	7.3	6.3	5.0	3.7
Tyres C1, OEM for cars	0.0	0.0	0.0	0.2	1.4	1.6	1.4	1.2	1.0	0.9
Tyres C1, total	**0**	**1**	**9**	**6**	**9**	**10**	**9**	**8**	**6**	**5**
Tyres C2, replacement for vans	0.0	0.2	2.1	1.0	2.2	2.3	2.1	1.8	1.5	1.2
Tyres C2, OEM for vans	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.1
Tyres C2, total	**0**	**0**	**2**	**1**	**2**	**3**	**2**	**2**	**2**	**1**
Tyres C3, replacement for trucks/busses	0.0	0.3	2.7	1.5	2.3	2.8	2.9	2.9	2.8	2.8
Tyres C3, OEM for trucks/busses	0.0	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4
Tyres C3, total	**0**	**0**	**3**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
Tyres, total C1+C2+C3	**0**	**1**	**14**	**9**	**14**	**15**	**14**	**13**	**11**	**9**
TRANSPORT SECTOR	**0**	**1**	**14**	**9**	**14**	**15**	**14**	**13**	**11**	**9**
Avoided GENERAL TOTAL (GHG in Mt CO_2)	**0**	**30**	**81**	**114**	**149**	**160**	**152**	**137**	**132**	**134**

Avoided Emissions GHG (BAU-ECO, in $MtCO_2$ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	2	6	9	11	12	13	15	16
SPACE HEATING	0	7	19	36	53	65	71	75	78	81
SPACE COOLING	0	2	3	2	3	3	2	1	1	1
VENTILATION	0	0	0	1	1	1	1	1	1	1
1 *VENTILATION (from heat saving vs. BAU; already included in EMIS for space heating)*	*0*	*0*	*1*	*3*	*6*	*8*	*8*	*7*	*7*	*7*
LIGHTING	0	5	11	17	17	14	9	5	4	3
ELECTRONICS	0	2	8	12	13	13	10	6	5	4
FOOD PRESERVATION	0	9	13	12	14	14	13	9	8	8
COOKING	0	0	0	1	2	2	2	1	1	1
CLEANING	0	4	7	8	8	6	5	3	2	2
INDUSTRY COMPONENTS	0	0	4	10	14	13	10	6	5	4
ENERGY SECTOR	0	0	0	1	2	2	3	2	3	3
TRANSPORT SECTOR	0	1	14	9	14	15	14	13	11	9
TOTAL in Mt CO_2	**0**	**30**	**81**	**114**	**149**	**160**	**152**	**137**	**132**	**134**
Saving in % versus BAU (from 1990=0)	0.0%	1.9%	5.5%	9.4%	14.0%	17.2%	19.0%	20.1%	21.1%	21.9%
Saving In % versus BAU (from 2010=0)	-1.7%	0.0%	3.5%	7.0%	11.2%	14.0%	15.3%	15.8%	16.4%	17.1%



Sector subdivision for SAVED GHG emissions

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard emissions due to electricity consumed by VUs; heat saving effects are included in Space Heating
Lighting: includes emissions due to energy consumption by control gears, and estimate for standby
Transport Sector: see separate reporting below; not included in other sector totals
Energy Sector: see separate reporting below. Only emissions due to Distribution Losses considered. Assumed that these losses are already considered in GWP for electricity that is used when computing emissions for other sectors. Consequently only the decrease in emissions due to the decrease of the losses in the ECO scenario vs. the BAU scenario is reported. (reference for BAU = 0)

SAVED GHG emission (ENERGY SECTOR, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR	0	0	0	1	2	2	3	2	3	3
SAVED GHG emission, Energy Sector, MtCO2eq	**0**	**0**	**0**	**1**	**2**	**2**	**3**	**2**	**3**	**3**

SAVED GHG emission (INDUSTRY, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	0	0	0	0	0
SPACE HEATING	0	0	1	2	3	4	4	4	4	4
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	1	1	2	2	2	1	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	1	1	1	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	2	6	8	8	6	4	2	2
SAVED GHG emission, Industry, MtCO2eq	**0**	**1**	**4**	**10**	**15**	**16**	**13**	**10**	**8**	**8**

SAVED GHG emission (TRANSPORT, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are emissions related to energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	0	0	2	1	2	2	2	2	2	2
TYRES for SERVICE-sector-related transport	0	0	4	2	4	5	5	4	4	3
TYRES for RESIDENTIAL-sector-related transport	0	1	7	5	7	8	7	6	5	4
TYRES for OTHER-sector-related transport	0	0	0	0	0	0	0	0	0	0
SAVED GHG emission, Transport, MtCO2eq	**0**	**1**	**14**	**9**	**14**	**15**	**14**	**13**	**11**	**9**

SAVED GHG emission (TERTIARY/SERVICES, MtCO2e	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	1	2	2	2	2	2	3
SPACE HEATING	0	2	5	10	14	17	19	19	20	21
SPACE & HT PROCESS COOLING	0	1	1	1	1	1	1	1	1	1
VENTILATION	0	0	0	0	1	1	1	0	0	0
LIGHTING	0	1	4	6	8	8	6	4	3	2
ELECTRONICS	0	1	2	3	3	3	3	2	1	1
FOOD PRESERVATION	0	1	1	1	3	4	4	3	2	2
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	1	1	1	1	1	1	0	0
INDUSTRY COMPONENTS	0	0	2	4	5	5	4	3	2	2
SAVED GHG emission, Services, MtCO2eq	**0**	**5**	**15**	**27**	**38**	**43**	**40**	**34**	**32**	**32**

SAVED GHG emission (RESIDENTIAL, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	4	6	8	10	11	12	13
SPACE HEATING	0	4	13	24	35	43	47	50	53	55
SPACE & HT PROCESS COOLING	0	1	2	1	1	1	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	3	6	10	7	3	2	1	0	0
ELECTRONICS	0	1	5	9	10	9	7	5	3	3
FOOD PRESERVATION	0	8	12	11	11	10	8	6	5	5
COOKING	0	0	0	1	1	2	1	1	1	1
CLEANING	0	4	6	7	7	5	4	2	2	2
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED GHG emission, Residential, MtCO2eq	**0**	**22**	**46**	**66**	**78**	**81**	**80**	**76**	**77**	**80**

SAVED GHG emission (OTHER sectors, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	0	0	0	0	0	0	0	0
SPACE HEATING	0	0	0	1	1	1	2	2	2	2
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	0	0	0	0	0	0	0	0	0	0
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED GHG emission, Other sectors, MtCO2eq	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**

SAVED GHG emissions (per FUNCTION, MTCO2eq)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	2	6	9	11	12	13	15	16
	Residential	0	0	1	4	6	8	10	11	12	13
	Tertiary / Services	0	0	0	1	2	2	2	2	2	3
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
SPACE HEATING.	All sectors, TWh	0	7	19	36	53	65	71	75	78	81
	Residential	0	4	13	24	35	43	47	50	53	55
	Tertiary / Services	0	2	5	10	14	17	19	19	20	21
	Industry	0	0	1	2	3	4	4	4	4	4
	Other	0	0	0	1	1	1	2	2	2	2
SPACE COOLING.	All sectors, TWh	0	2	3	2	3	3	2	1	1	1
& HT PROCESS	Residential	0	1	2	1	1	1	0	0	0	0
	Tertiary / Services	0	1	1	1	1	1	1	1	1	1
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
VENTILATION.	All sectors, TWh	0	0	0	1	1	1	1	1	1	1
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	0	0	1	1	1	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	0	5	11	17	17	14	9	5	4	3
	Residential	0	3	6	10	7	3	2	1	0	0
	Tertiary / Services	0	1	4	6	8	8	6	4	3	2
	Industry	0	0	1	1	2	2	2	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	0	2	8	12	13	13	10	6	5	4
	Residential	0	1	5	9	10	9	7	5	3	3
	Tertiary / Services	0	1	2	3	3	3	3	2	1	1
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	0	9	13	12	14	14	13	9	8	8
	Residential	0	8	12	11	11	10	8	6	5	5
	Tertiary / Services	0	1	1	1	3	4	4	3	2	2
	Industry	0	0	0	0	1	1	1	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
COOKING.	All sectors, TWh	0	0	0	1	2	2	2	1	1	1
	Residential	0	0	0	0	1	1	2	1	1	1
	Tertiary / Services	0	0	0	0	0	0	0	0	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
CLEANING.	All sectors, TWh	0	4	7	8	8	6	5	3	2	2
	Residential	0	4	6	7	7	5	4	2	2	2
	Tertiary / Services	0	0	1	1	1	1	1	1	0	0
	Industry	0	0	0	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	0	0	4	10	14	13	10	6	5	4
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	2	4	5	5	4	3	2	2
	Industry	0	0	2	6	8	8	6	4	2	2
	Other	0	0	0	0	0	0	0	0	0	0
TYRES.	Transport sector, TWh	0	1	14	9	14	15	14	13	11	9
	Residential transport	0	1	7	5	7	8	7	6	5	4
	Tertiary / Services transport	0	0	4	2	4	5	5	4	4	3
	Industry transport	0	0	2	1	2	2	2	2	2	2
	Other transport	0	0	0	0	0	0	0	0	0	0
ALL PRODUCTS.	All sectors, TWh	0	30	81	114	149	160	152	137	132	134
	Residential	0	22	46	66	78	81	80	76	77	80
	Tertiary / Services	0	5	15	27	38	43	40	34	32	32
	Industry	0	1	4	10	15	16	13	10	8	8
	Other	0	0	1	1	2	2	2	2	2	2
	Transport	0	1	14	9	14	15	14	13	11	9

SAVED GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			74%	75%	76%	77%	78%	79%	80%	80%
	Tertiary / Services			22%	21%	20%	19%	18%	17%	16%	16%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential		67%	67%	66%	65%	65%	66%	67%	68%	68%
	Tertiary / Services		27%	27%	27%	27%	27%	26%	26%	26%	25%
	Industry		4%	4%	5%	6%	6%	5%	5%	5%	5%
	Other		1%	2%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential		62%	60%	42%	28%	21%	19%	19%	22%	26%
	Tertiary / Services		32%	34%	44%	51%	55%	57%	57%	55%	53%
	Industry		5%	5%	11%	16%	18%	19%	18%	18%	16%
	Other		1%	1%	3%	5%	5%	6%	5%	5%	5%
VENTILATION (from electricity).											
	Residential			28%	29%	33%	34%	35%	36%	37%	39%
	Tertiary / Services			62%	61%	58%	57%	56%	55%	54%	53%
	Industry			9%	9%	9%	9%	8%	8%	8%	8%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.											
	Residential		66%	56%	59%	43%	25%	17%	13%	11%	10%
	Tertiary / Services		26%	34%	32%	45%	59%	65%	68%	69%	71%
	Industry		7%	9%	8%	11%	15%	17%	18%	19%	19%
	Other		1%	2%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential		53%	73%	74%	75%	74%	72%	71%	72%	74%
	Tertiary / Services		47%	26%	25%	24%	25%	26%	27%	26%	24%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential		92%	92%	86%	76%	68%	66%	65%	65%	65%
	Tertiary / Services		6%	6%	10%	19%	26%	28%	29%	29%	29%
	Industry		1%	1%	3%	4%	5%	5%	5%	5%	5%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential			85%	84%	84%	84%	84%	84%	84%	84%
	Tertiary / Services			15%	16%	16%	16%	16%	16%	16%	16%
	Industry			0%	0%	0%	0%	0%	0%	0%	0%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential		96%	91%	85%	85%	84%	82%	80%	80%	79%
	Tertiary / Services		4%	8%	14%	13%	14%	16%	17%	18%	19%
	Industry		0%	1%	1%	1%	2%	2%	2%	2%	2%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential		0%	2%	1%	1%	1%	1%	1%	1%	1%
	Tertiary / Services		20%	39%	37%	37%	38%	40%	42%	46%	50%
	Industry		79%	56%	59%	60%	59%	58%	56%	52%	47%
	Other		1%	3%	3%	2%	2%	2%	2%	2%	2%
TYRES.											
	Residential transport			53%	56%	52%	50%	49%	47%	44%	40%
	Tertiary / Services transport			30%	28%	31%	32%	33%	34%	35%	37%
	Industry transport			15%	13%	15%	16%	16%	17%	18%	19%
	Other transport			2%	2%	2%	3%	3%	3%	3%	3%
ALL PRODUCTS.											
	Residential		74%	57%	58%	52%	51%	52%	55%	58%	60%
	Tertiary / Services		18%	19%	23%	25%	27%	26%	25%	24%	24%
	Industry		3%	6%	9%	10%	10%	9%	7%	6%	6%
	Other		1%	1%	1%	1%	1%	1%	1%	1%	1%
	Transport		4%	17%	8%	10%	10%	9%	9%	8%	7%

OTHER EMISSIONS

Avoided direct emissions NO_x (BAU-ECO, in kt NO_x/a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Total WH dedicated Water Heater	**0**	**0**	**1**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Total CH Central Heating combi, water heat	**0**	**0**	**3**	**15**	**23**	**27**	**28**	**29**	**30**	**30**
Total CH Central Heating boiler, space heat	**0**	**4**	**30**	**101**	**138**	**151**	**145**	**140**	**137**	**133**
LH open fire gas	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
LH closed fire gas	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LH flueless fuel heater	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH luminous heaters	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH tube heaters	0	0	0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
Local Space Heaters, avoided NOx-emission	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
CHF	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ACF	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ACF (rev)	0	0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.4
AHF	0	0	0.5	6.7	12.8	16.6	15.9	14.0	12.4	10.9
Air Heaters & Coolers, avoided NOx emission	**0**	**0**	**1**	**7**	**13**	**17**	**16**	**15**	**13**	**12**
Direct NO_x Avoided (BAU-ECO) in kt NOx	**0**	**4**	**34**	**119**	**165**	**182**	**177**	**172**	**169**	**166**
Direct NOx Avoided (BAU-ECO) in kt SO2 eq.	**0**	**3**	**24**	**83**	**115**	**128**	**124**	**120**	**119**	**116**

Avoided direct CO-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	7	81	133	145	130	95	77	64
SFB Wood Direct Draft	0	0	0	0	1	2	2	3	4	4
SFB Coal	0	0	0	1	1	2	2	2	2	2
SFB Pellets	0	0	0	0	1	1	2	2	2	3
SFB Wood chips	0	0	0	1	1	2	2	2	2	2
Solid Fuel Boilers, total avoided CO-emission	**0**	**0**	**7**	**83**	**137**	**151**	**139**	**104**	**87**	**75**
LH open fireplace	0	0	0	11	37	54	65	73	77	74
LH closed fireplace/inset	0	0	0	21	80	122	151	175	186	172
LH wood stove	0	0	0	13	48	72	89	103	110	102
LH coal stove	0	0	0	3	10	14	15	16	15	11
LH cooker	0	0	0	7	27	42	49	44	42	41
LH SHR stove	0	0	0	7	30	50	67	82	92	88
LH pellet stove	0	0	0	0	0	0	0	0	0	0
Local Space Heaters, total avoided CO-emission	**0**	**0**	**1**	**60**	**233**	**353**	**435**	**494**	**523**	**488**
Total avoided direct CO-emissions, BAU-ECO, in kt/a	**0**	**0**	**8**	**143**	**370**	**504**	**574**	**598**	**610**	**564**

Avoided direct OGC-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	1	8	12	14	12	9	7	6
SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0
SFB Coal	0	0	0	0	0	0	0	0	0	0
SFB Pellets	0	0	0	1	1	2	3	3	3	3
SFB Wood chips	0	0	0	0	0	0	0	0	0	0
Solid Fuel Boilers, total OGC-emission	**0**	**0**	**1**	**8**	**14**	**16**	**15**	**12**	**11**	**10**
LH open fireplace	0	0	0	0	1	1	1	1	0	0
LH closed fireplace/inset	0	0	0	0	1	1	1	1	1	1
LH wood stove	0	0	0	0	1	1	1	1	0	0
LH coal stove	0	0	0	0	0	0	0	0	0	0
LH cooker	0	0	0	0	0	0	0	0	0	0
LH SHR stove	0	0	0	0	0	0	0	0	0	0
LH pellet stove	0	0	0	0	1	2	3	3	3	3
Local Space Heaters, total OGC-emission	**0**	**0**	**0**	**2**	**5**	**6**	**6**	**6**	**5**	**5**
Total avoided direct OGC-emissions, BAU-ECO, in kt/	**0**	**0**	**1**	**10**	**18**	**22**	**21**	**18**	**16**	**14**

Avoided direct PM-emissions (BAU-ECO in kt/a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
SFB Wood Manual	0	0	0	3	5	6	5	4	3	3
SFB Wood Direct Draft	0	0	0	0	1	2	3	3	3	4
SFB Coal	0	0	0	0	1	1	1	1	1	1
SFB Pellets	0	0	0	0	0	1	1	1	1	1
SFB Wood chips	0	0	0	0	0	1	1	1	1	1
Solid Fuel Boilers, total PM-emission	**0**	**0**	**0**	**4**	**8**	**10**	**11**	**10**	**10**	**10**
LH open fireplace	0	0	0	2	8	12	14	15	17	17
LH closed fireplace/inset	0	0	0	1	5	7	9	10	11	10
LH wood stove	0	0	0	1	3	4	5	6	6	6
LH coal stove	0	0	0	0	1	1	1	1	1	1
LH cooker	0	0	0	0	2	3	3	3	3	3
LH SHR stove	0	0	0	0	1	2	2	2	2	2
LH pellet stove	0	0	0	0	0	0	0	0	0	0
Local Space Heaters, total PM-emission	**0**	**0**	**0**	**5**	**20**	**29**	**34**	**38**	**40**	**38**
Total avoided direct PM-emissions, BAU-ECO, in kt/a	**0**	**0**	**0**	**10**	**28**	**39**	**45**	**48**	**50**	**47**

	Avoided noise emissions by tyres (in dB(A))	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
db											
	Tyres C1, replacement for cars		0.35	0.28	0.63	0.78	0.92				
	Tyres C1, OEM for cars		0.35	0.27	0.63	0.78	0.92				
	Tyres C2, replacement for vans		0.54	0.36	0.55	0.58	0.62				
	Tyres C2, OEM for vans		0.54	0.45	0.55	0.58	0.62				
	Tyres C3, replacement for trucks/busses		0.19	0.17	0.47	0.62	0.76				
	Tyres C3, OEM for trucks/busses		0.19	0.10	0.47	0.62	0.76				

UNIT PRICE (in 2020-euros)	var	ref year	BC price €	BC EF	mid price €	mid EF	BAT price €	BAT EF	BC-mid slope €/EF	mid-BAT slope €/EF	PriceDec %
factor to convert 2015-euro to 2020-euro	1.06										
factor to convert 2010-euro to 2020-euro	1.14										
EIWH Electric Instant. < 12 kW (secondary)		2015	324		constant price						
EIWH Electric Instant. ≥ 12 kW (primary)		2015	512		constant price						
EIWHS Electric Instant. Shower (secondary)		2015	512		constant price						
ESWH Electric Storage ≤ 30 L (secondary)		2015	202		constant price						
ESWH Electric Storage > 30 L (primary)		2015	552		constant price						
GIWH Gas Instant. < 13 L/min (secondary)		2015	446		constant price						
GIWH Gas Instant. ≥ 13 L/min (primary)		2015	797		constant price						
GSWH Gas Storage, Condensing		2015	1195		constant price						
GSWH Gas Storage, Non-condensing		2015	1195		constant price						
Dedicated WH Heat Pump		2015	3210		constant price						
Dedicated WH Solar (3.5 m2)		2015	2577		constant price						
CHB Gas Combi Instant. WH		2015	428		constant price						
CHB Gas + Cyl. WH		2015	686		constant price						
CHB Jet Burner Gas + Cyl. WH		2015	2168		constant price						
CHB Jet Burner Oil + Cyl. WH		2015	2168		constant price						
CHB Electric (Joule) + Cyl. WH		2015	433		constant price						
CHB Hybrid Gas/Electric WH		2015	1663		constant price						
CHB Electric HP + Cyl. WH		2015	1979		constant price						
CHB Gas HP + Cyl. WH		2015	2756		constant price						
CHB Gas mCHP + Cyl. WH		2015	5633		constant price						
CHB Solar Combi (16 m2)		2015	2378		constant price						
CHB Gas non-condensing		2015	1898		constant price						
CHB Gas condensing		2015	2385		constant price from 2016 onwards, for prices 2004-2016, see PRICEBAU						
CHB Gas Jet burner non-condensing		2015	10634		constant price						
CHB Gas Jet burner condensing		2015	11647		constant price						
CHB Oil Jet burner non-condensing		2015	10634		constant price						
CHB Oil Jet burner condensing		2015	11647		constant price						
CHB Electric Joule-effect		2015	2223		constant price						
CHB Hybrid (gas-electric)		2015	8545		constant price						
CHB Electric Heat Pump		2015	10168		constant price						
CHB Gas Heat Pump		2015	14159		constant price						
CHB micro CHP		2015	28943		constant price						
CHB Solar combi (16 m2)		2015	12218		constant price						
			€	%	€	%	€	%	€ct/%	€ct/%	
SFB Wood Manual [18 kW]	%	2010	5116	51%	8874	63%	10593	75%	30933	14147	0.7%
SFB Wood Direct Draft [20 kW]	%	2010	7389	73%	7969	74%	8869	75%	50377	78264	0.8%
SFB Coal [25 kW]	%	2010	6253	67%	6253	70%	6253	72%	0	0	0.7%
SFB Pellets [25 kW]	%	2010	9095	73%	9892	76%	10591	78%	31892	27951	0.8%
SFB Wood chips [160 kW]	%	2010	38084	73%	43098	75%	44431	77%	250720	66647	0.9%
Air Cooling:			€	%	€	%	€	%	€ct/%	€ct/%	
CHAE-S (≤ 400 kW)	%	2010	19670	136%	20529	161%	21425	186%	3434	3584	1.0%
CHAE-L (> 400 kW)	%	2010	47873	140%	51810	180%	56071	219%	9968	10788	1.0%
CHWE-S (≤ 400 kW)	%	2010	15893	186%	16507	216%	17144	245%	2080	2160	1.0%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	2010	70060	217%	78581	288%	88138	358%	12086	13556	1.0%
CHWE-L (> 1500 kW)	%	2010	125437	217%	140693	288%	157804	358%	21639	24271	1.0%
CHF	%	2010	17164	103%	19823	139%	22893	175%	7385	8528	1.0%
HT PCH-AE-S	%	2010	21498	470%	23456	598%	25592	725%	1536	1675	1.0%
HT PCH-AE-L	%	2010	54413	510%	61110	655%	68630	800%	4618	5186	1.0%
HT PCH-WE-S	%	2010	18210	730%	19643	878%	21189	1025%	972	1048	1.0%
HT PCH-WE-M	%	2010	85593	850%	97499	1050%	111061	1250%	5953	6781	1.0%
HT PCH-WE-L	%	2010	182512	850%	211312	1075%	244656	1300%	12800	14820	1.0%
AC rooftop	%	2010	21829	120%	22142	153%	22461	185%	965	979	1.0%
AC splits	%	2010	3734	156%	4168	214%	4653	272%	749	836	1.0%
AC VRF	%	2010	34982	165%	35780	191%	36597	217%	3071	3141	1.0%
ACF	%	2010	17164	103%	19823	139%	22893	175%	7385	8528	1.0%
Air Heating:											
AC rooftop (rev)	%	2010	21626	99%	21909	128%	22196	158%	956	968	1.0%
AC splits (rev)	%	2010	3467	117%	3758	160%	4074	202%	685	743	1.0%
AC VRF (rev)	%	2010	33929	130%	34436	147%	34951	164%	2967	3011	1.0%
ACF (rev)	%	2010	19047	129%	20882	152%	22893	175%	7980	8749	1.0%
AHF	%	2010	5885	63%	6868	74%	8016	84%	9546	11141	1.0%
AHE	%	2010	568	30%	568	34%	568	38%	0	0	1.0%

UNIT PRICE (in 2020-euros)	var	ref	BC	BC	mid	mid	BAT	BAT	BC-mid	mid-BAT	PriceDec
		year	price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF	%
LH open fireplace [8 kW]	%	2010	3013	30%	4288	45%	6298	60%	8420	13264	0.7%
LH closed fireplace/inset [8 kW]	%	2010	3089	69%	3453	75%	3874	80%	6794	7871	0.7%
LH wood stove [8 kW]	%	2010	2862	69%	3225	75%	3646	80%	6794	7871	0.8%
LH coal stove [8 kW]	%	2010	2097	69%	2340	75%	2620	80%	4530	5248	0.7%
LH cooker [10 kW]	%	2010	3237	64%	3878	72%	4672	80%	8188	10154	0.8%
LH SHR stove [8 kW]	%	2010	9044	80%	9261	83%	9492	85%	8668	9227	0.4%
LH pellet stove [8 kW]	%	2010	3830	85%	3951	88%	4077	90%	4983	5168	0.9%
LH Electric portable	%	2015	31	74%	32	87%	34	100%	13	13	1.0%
LH Electric fixed > 250W	%	2015	276	74%	285	88%	294	100%	64	76	0.8%
LH Electric fixed ≤ 250W	%	2015	154	69%	159	82%	164	95%	38	39	0.8%
LH Electric storage	%	2015	653	74%	782	87%	940	100%	999	1227	0.9%
LH Electric underfloor	%	2015	298	74%	318	79%	339	95%	405	133	0.6%
LH Electric visibly glowing > 1.2 kW	%	2015	70	70%	70	86%	70	90%	0	0	0.0%
LH Electric visibly glowing ≤ 1.2 kW	%	2015	47	62%	47	78%	47	82%	0	0	0.0%
LH Electric Towel Heaters	%	2015	264	68%	264	79%	264	83%	0	0	0.0%
LH Gas luminous (commercial)	%	2015	1298	81%	1537	90%	1844	99%	2733	3515	0.8%
LH Gaseous Tube (commercial < 120 kW)	%	2015	1438	71%	1800	83%	2302	95%	3017	4174	0.8%
LH Gas open front	%	2015	1222	42%	1406	61%	1628	80%	954	1156	0.7%
LH Gas closed front	%	2015	2344	64%	2477	72%	2620	80%	1696	1834	0.7%
LH Gas balanced flue	%	2015	1641	68%	1734	76%	1834	84%	1187	1284	0.7%
LH Gas flueless	%	2015	357	100%	357	100%	357	100%	0	0	0.0%
LH Liquid tube (commercial < 120 kW)	%	2015	1438	68%	1800	80%	2302	92%	3017	4174	0.8%
LH Liquid open front	%	2015	880	42%	1012	61%	1172	80%	687	833	0.7%
LH Liquid closed front	%	2015	2344	64%	2477	72%	2620	80%	1696	1834	0.7%
LH Liquid balanced flue	%	2015	1562	68%	1650	76%	1746	84%	1130	1222	0.7%
LH Liquid flueless	%	2015	296	100%	296	100%	296	100%	0	0	0.0%
RAC fixed < 6 kW, cooling	SEER	2010	1271	2.16	1440	3.22	2289	8.50	161	161	2.0%
RAC fixed 6-12 kW, cooling	SEER	2010	1731	1.86	2133	2.84	3976	7.30	413	413	2.0%
RAC portable < 12 kW, cooling	SEER	2010	273	1.16	317	1.39	463	2.14	195	195	2.0%
RAC fixed < 6 kW, reversible, heating			1271	2.16	1440	3.22	2289	8.50	161	161	2.0%
RAC fixed 6-12 kW, reversible, heating			1731	1.86	2133	2.84	3976	7.30	413	413	2.0%
RAC portable < 12 kW, reversible, heating			273	1.16	317	1.39	463	2.14	195	195	2.0%
									€/EEI	€/EEI	
CIRC Integrated circulators	EEI	2015	312	0.48	345	0.26	352	0.21	-145	-145	1.0%
CIRC Large standalone circulators	EEI	2015	699	0.40	1649	0.22	1710	0.20	-5126	-5126	1.0%
CIRC Small standalone circulators	EEI	2015	312	0.57	415	0.22	420	0.20	-296	-296	1.0%
R-UVU ≤ 100 m3/h for Extract Spaces		2012									0.9%
R-UVU ≤ 100 m3/h for Habitable Spaces		2012									0.9%
R-BVU ≤ 100 m3/h for Habitable Spaces		2012									0.9%
R-UVU 100-250 m3/h		2012	For VUs, PRICEBAU and PRICEECO are taken as fixed values from								0.6%
R-BVU 100-250 m3/h		2012	the 2020 review study analyses.								0.7%
R-UVU 250-1000 m3/h		2012	Prices do not only depend on electric efficiency, but also on e.g.								0.6%
R-BVU 250-1000 m3/h		2012	motor controls, flow controls, sensors and ventilation performance.								0.7%
R-UVU > 1000 m3/h		2012	Review study applied the indicated annual price decrease from 2012.								0.4%
R-BVU 1000-2500 m3/h		2012									0.4%
NR-UVU 250-1000 m3/h		2012	The share of installation in overall acquisition varies with the years.								0.6%
NR-BVU 250-1000 m3/h		2012	Installation costs are therefore specified separately								0.7%
NR-UVU > 1000 m3/h		2012	Installation costs in EIA are the sum of installation materials and labour								0.4%
NR-BVU 1000-2500 m3/h		2012	Installation costs differ for replacement and new-built/renovation								0.4%
NR-AHU-S 2500-5500 m3/h		2012									0.4%
NR-AHU-M 5500-14500 m3/h		2012									0.4%
NR-AHU-L > 14500 m3/h		2012									0.4%
LFL (T12,T8h,T8t,T5,other)											
HID (HPM, HPS, MH)			For light sources, PRICEBAU and PRICEECO are taken as fixed values from								
CFLni (all shapes)			the MELISA model, computed as total EU acquisition costs divided by total EU sales units.								
CFLi (retrofit for GLS, HL)											
GLS (DLS & NDLS)											
HL (DLS & NDLS, LV & MV)											
LED replacing LFL (retrofit & luminaire)			For basic LED purchase cost vs. time curves, see sheets PRICEBAU and PRICEECO.								
LED replacing HID (retrofit & luminaire)											
LED replacing CFLni (retrofit & luminaire)											
LED replacing DLS (retrofit & luminaire)											
LED replacing NDLS (retrofit & luminaire)											

UNIT PRICE (in 2020-euros)	var	ref year	BC price €	BC EF	mid price €	mid EF	BAT price €	BAT EF	BC-mid slope €/EF	mid-BAT slope €/EF	PriceDec %
DP TV avg. all types			For Electronic Displays there is no relation between efficiency and price.								
DP Monitor			Direct input of annual prices used, same for BAU and ECO								
DP Signage											
SSTB	kWh	2010	57	19	59	17	67	4	0.68	0.68	1%
CSTB	kWh	2010	171	88	209	31	218	18	0.68	0.68	1%
Game consoles > 20 W		2015	418								1.7%
Game consoles < 20 W		2015	294								0.0%
ES tower 1-socket traditional			1263.2698								
ES rack 1-socket traditional			1052.7249								
ES rack 2-socket traditional			3158.1746								
ES rack 2-socket cloud			4211								
ES rack 4-socket traditional			29476.296								
ES rack 4-socket cloud			34739.92								
ES rack 2-socket resilient trad.			36845.37								
ES rack 2-socket resilient cloud			37898.095								
ES rack 4-socket resilient trad.			38950.82								
ES rack 4-socket resilient cloud			40003.545								
ES blade 1-socket traditional			368.4537								
ES blade 2-socket traditional			3158.1746								
ES blade 2-socket cloud			4211								
ES blade 4-socket traditional			6316								
ES blade 4-socket cloud			7369								
DS Online 2			21054.497								
DS Online 3			52635.58								
DS Online 4			168433.86								
PC Desktop		2015	782								
PC Integrated Desktop		2015	836								
PC Notebook		2015	1078								
PC Tablet/slate		2015	715								
PC Thin client		2015	636								
PC Integrated Thin Client		2015	497								
PC Small-scale Server		2015	1586								
PC Workstation		2015	2814								
			from EIA 2018			from review study					
			2010 and before			2018 and after					
Inkjet Printer			106			161					
Inkjet MFD			159			67					
EP / Laser Printer mono			228			482					
EP / Laser Printer colour			571			543					
EP / Laser Copier mono			1713			1713					
EP / Laser Copier colour			2855			2855					
EP / Laser MFD mono			801			801					
EP / Laser MFD colour			5076			5076					
paper			see rates								
ink and toner			see resources								
Products regulated only for (networked) standby											
SB Radios			26								
SB Electric toothbrushes			33								
SB Audio speakers (wired)			144								
SB Audio speakers (wireless)			126								
SB Small appliances			44								
SB Media boxes /sticks			53								
SB Media players and recorders			82								
SB Projectors			415								
SB Home phones			58								
SB Office phones			58								
SB Home NAS			276								
SB Home Network Equipment			125								
SB Office Network Equipment			125								
SB Coffee makers			44								
Products regulated also for (networked) standby											
(already accounted elsewhere; here for info only)					**not used for SB, see main accounting for the product group**						

UNIT PRICE (in 2020-euros)	var	ref year	BC price €	BC EF	mid price €	mid EF	BAT price €	BAT EF	BC-mid slope €/EF	mid-BAT slope €/EF	PriceDec %
EPS ≤ 6W, low-V	%	2010	4.05	66.3%	5.50	73.6%	6.02	74.1%	0.20	1.04	0.5%
EPS 6–10 W	%	2010	8.37	72.1%	8.80	81.9%	9.53	84.3%	0.04	0.30	0.5%
EPS 10–12 W	%	2010	12.49	73.6%	13.17	83.0%	13.79	85.9%	0.07	0.21	0.5%
EPS 15–20 W	%	2010	8.75	76.9%	9.99	85.0%	10.44	85.9%	0.15	0.51	0.5%
EPS 20–30 W	%	2010	14.68	81.0%	16.88	86.9%	17.92	88.5%	0.37	0.65	0.5%
EPS 30–65 W, multiple-V	%	2010	19.49	83.0%	19.49	83.1%	27.22	85.8%	0.00	2.86	0.5%
EPS 30-65 W	%	2010	27.91	85.5%	29.15	88.0%	33.67	90.2%	0.50	2.05	0.5%
EPS 65–120 W	%	2010	30.88	85.0%	32.15	88.0%	36.70	90.2%	0.42	2.07	0.5%
EPS 65–120 W, multiple-V	%	2010	41.74	86.0%	41.74	86.1%	49.85	87.3%	0.00	6.76	0.5%
EPS 12–15 W	%	2010	14.44	75.4%	14.89	84.1%	14.89	84.2%	0.05	0.00	0.5%
			€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
RF for BAU, and for ECO until 2015 *	kWh	2010	479	430	554	242	803	76	0.40	1.50	1%
RF for ECO from 2016 onwards *	kWh	2010	601	213	739	119	1044	81	1.46	8.02	1%
			€	BC EEI	€	MID EEI	€	BAT EEI	€/EEI	€/EEI	
CF open vertical chilled multi deck (RVC2)	EEI	2010	4377	116	5545	80	6714	45	33	33	1.0%
CF open horizontal frozen island (RHF4)	EEI	2010	5002	114	5351	85	5700	56	12	12	1.0%
CF other supermarket display (non-BCs)	EEI	2010	2709	97	2985	78	3262	60	15	15	1.0%
CF Plug in one door beverage cooler	EEI	2010	944	141	1063	101	1182	60	3	3	1.0%
CF Plug in horizontal ice cream freezer	EEI	2010	909	78	931	62	953	47	1	1	1.0%
CF Spiral vending machine	EEI	2010	3979	60	4253	54	4527	48	44	44	1.0%
PF Storage cabinet Chilled Vertical (CV)	EEI	2010	1660	96	1826	73	1992	57	7.1	10.4	1%
PF Storage cabinet Frozen Vertical (FV)	EEI	2010	1960	91	2156	75	2352	53	12.0	9.0	1%
PF Storage cabinet Chilled Horizontal (CH)	EEI	2010	796	109	875	72	955	65	2.2	11.8	1%
PF Storage cabinet Frozen Horizontal (FH)	EEI	2010	1364	106	1501	86	1637	61	6.8	5.4	1%
PF Storage cabinets All types	**EEI**	2010	**1517**	**98**	**1669**	**74**	**1821**	**58**	**6.4**	**9.4**	**1%**
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2010	31831	2.70	32786	2.76	36606	2.93	15916	22469	1%
PF Process Chiller AC MT L > 300 kW	SEPR	2010	102315	3.00	103339	3.03	112547	3.24	34105	43849	1%
PF Process Chiller AC LT S ≤ 200 kW	SEPR	2010	35242	1.59	36299	1.60	40528	1.71	105725.89	38446	1%
PF Process Chiller AC LT L > 200 kW	SEPR	2010	106863	1.70	107931	1.71	117549	1.83	106862.73	80147	1%
PF Process Chiller WC MT S ≤ 300 kW	SEPR	2010	47747	3.60	49180	3.69	54909	3.91	15916	26044	1%
PF Process Chiller WC MT L > 300 kW	SEPR	2010	153473	3.90	155008	3.91	168820	4.20	153473.07	47630	1%
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2010	52863	2.00	54449	2.02	60792	2.16	79294.421	45311	1%
PF Process Chiller WC LT L > 200 kW	SEPR	2010	160294	2.25	161897	2.27	176324	2.43	80147	90165	1%
PF Process Chiller All MT&LT	SEPR	2010	**58396**	**2.41**	**59540**	**2.44**	**65635.83**	**2.61**	**40958**	**36919**	**1%**
PF Condensing Unit MT S 0.2-1 kW	COP	2010	568	1.42	580	1.43	654	1.57	1137	528	1%
PF Condensing Unit MT M 1-5 kW	COP	2010	2046	1.64	2087	1.66	2333	1.76	2046	2456	1%
PF Condensing Unit MT L 5-20 kW	SEPR	2010	4206	2.64	4290	2.73	4963	2.88	935	4487	1%
PF Condensing Unit MT XL 20-50 kW	SEPR	2010	9663	2.71	9856	2.81	11402	2.94	1933	11893	1%
PF Condensing Unit LT S 0.1-0.4 kW	COP	2010	682	0.80	682	0.85	784	0.87	0	5116	1%
PF Condensing Unit LT M 0.4-2 kW	COP	2010	909	0.95	909	1.04	1037	1.07	0	4244	1%
PF Condensing Unit LT L 2-8 kW	SEPR	2010	4888	1.46	4888	1.68	5768	1.72	0	21998	1%
PF Condensing Unit LT XL 8-20 kW	SEPR	2010	8526	1.61	8526	1.73	10061	1.78	0	30695	1%
PF Condensing Unit, All MT&LT	comb	2010	**2087**	**2.05**	**2119**	**2.14**	**2432**	**2.24**	**376**	**2915**	**1%**
			€	eff	€	eff	€	eff	€/eff	€/eff	
CA Electric Hobs, Wh/ltr	Wh	2010	165	205	487	190	976	174	21.4	30.6	1%
CA Electric Ovens, kWh/a	kWh	2010	594	107	696	88.15	763	69	5.42	3.53	1%
CA Gas Hobs, % efficiency NCV	%	2010	289	58%	368	64%	494	73%	1424	1322	1%
CA Gas Ovens, kWh prim, NCV	kWh	2010	301	231	428	190	596	145	3.11	3.74	1%
CA Range Hoods, kWh elec	kWh	2010	241	130	294	120	333	110	5.30	3.86	1%
			€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
WM Washing Machines	kWh	2010	510	207	615	130	716	87	1.37	2.35	1%
WD Washer-Dryers	kWh	2015	940	1600	940	915	954	830	0.00	0.16	1%
DW Household Dishwasher	kWh	2010	615	269	741	224.5	867	180	2.84	2.84	1%
LD condensing heat pump	kWh	2016	598	241	805	124	900	101	1.78	4.06	1%
LD condensing electric heat element	kWh	2016	396	350	459	286	535	255	0.99	2.39	1%
LD vented electric	kWh	2016	346	310	381	284	396	251	1.36	0.46	1%
LD vented gas	kWh	2016	558	445	558	411	558	374	0.00	0.00	0%
Vacuum cleaners			For vacuum cleaners it was not feasible to define price-efficiency or price-power anchor points and interpolate between these points using efficiency or power. Prices have been taken from the 2019 review study and are defined directly on sheets PRICEBAU and PRICEECO.								

UNIT PRICE (in 2020-euros)	var	ref year	BC price €	BC EF	mid price €	mid EF	BAT price €	BAT EF	BC-mid slope €/EF	mid-BAT slope €/EF	PriceDec %
			€	%	€	%	€	%	€ct/%	€ct/%	
FAN Axial<300Pa [247 W flow out]	%	2010	284	31%	367	35%	451	40%	1821	1821	0.9%
FAN Axial>300Pa [489 W fluid-dyn out]	%	2010	369	37%	407	42%	444	47%	750	750	0.9%
FAN Centr.FC [141 W flow out]	%	2010	455	32%	578	37%	701	42%	2483	2483	0.9%
FAN Centr.BC-free [2120 W flow out]	%	2010	875	56%	1066	63%	1256	70%	2794	2794	0.9%
FAN Centr.BC [2052 W flow out]	%	2010	1876	54%	2502	60%	3128	67%	9423	9423	0.9%
FAN Cross-flow [31 W flow out]	%	2010	369	7%	469	9%	569	10%	7310	7310	0.9%
			BC €	Eff	IE2 €	Eff	IE4 €	Eff	€ct/%	€ct/%	
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	2010	136	71.8%	193	81.4%	281	87.2%	592	1509	1%
Medium (M) 3-ph 7.5-75 kW no VSD	%	2010	541	86.5%	773	89.8%	1005	93.5%	7028	6268	1%
Medium (L) 3-ph 75-375 kW no VSD	%	2010	4974	92.7%	7105	94.5%	8526	96.3%	118421	78947	1%
Medium (S) 3-ph 0.75-7.5 kW with VSD			(not used: price in year directly computed as motor price + VSD price)								
Medium (M) 3-ph 7.5-75 kW with VSD			(see VSD price information near bottom of sheet)								
Medium (L) 3-ph 75-375 kW with VSD											
Small 1 ph 0.12-0.75 kW no VSD	%	2010	38	62.4%	57	66.0%	95	77.3%	526	335	1%
Small 1 ph 0.12-0.75 kW with VSD			(not used: price in year directly computed as motor price + VSD price)								
Small 3 ph 0.12-0.75 kW no VSD	%	2010	77	62.4%	102	66.0%	153	77.3%	711	453	1%
Small 3 ph 0.12-0.75 kW with VSD			(not used: price in year directly computed as motor price + VSD price)								
Large 3-ph LV 375-1000 kW no VSD	%	2010	21088	93.5%	30126	95.1%	39164	96.8%	564866	531639	1%
Large 3-ph LV 375-1000kW with VSD			(not used: price in year directly computed as motor price + VSD price)								
Explosion motors (S) 3-ph 0.75-7.5 kW	%	2010	205	71.8%	290	81.4%	421	87.2%	888	2264	1%
Explosion motors (M) 3-ph 7.5-75 kW	%	2010	812	86.5%	1160	89.8%	1507	93.5%	10542	9402	1%
Explosion motors (L) 3-ph 75-375 kW	%	2010	7460	92.7%	10658	94.5%	12789	96.3%	177631	118421	1%
			Prices for explosion- and brake-motors are 1.5* normal motor prices								
Brake motors (S) 3-ph 0.75-7.5 kW	%	2010	205	71.8%	290	81.4%	421	87.2%	888	2264	1%
Brake motors (M) 3-ph 7.5-75 kW	%	2010	812	86.5%	1160	89.8%	1507	93.5%	10542	9402	1%
Brake motors (L) 3-ph 75-375 kW	%	2010	7460	92.7%	10658	94.5%	12789	96.3%	177631	118421	1%
			Prices for 8-pole taken 1.6 times prices for 4-pole								
8-pole motors (S) 3-ph 0.75-7.5 kW	%	2010	218	63.8%	309	73.4%	449	79.2%	947	2415	1%
8-pole motors (M) 3-ph 7.5-75 kW	%	2010	866	83.5%	1237	86.8%	1608	90.5%	11244	10029	1%
8-pole motors (L) 3-ph 75-375 kW	%	2010	7958	90.7%	11368	92.5%	13642	94.3%	189473	126315	1%
			Prices for 1-phase taken 1.1 times prices for 3-phase								
1-phase motors >0.75 kW (no VSD)	%	2010	150	71.8%	213	81.4%	309	87.2%	651	1660	1%
ESOB<45_VF	%	2012	3974	47.1%	3998	48.3%	4023	49.4%	1949	2360	0.1%
ESOB<45_CF	%	2012	3974	61.9%	3998	63.6%	4023	65.0%	1482	1794	0.1%
ESOB<45_VSD-VF	%	2012	4280	54.1%	4304	55.6%	4329	56.8%	1696	2053	0.1%
ESOB_45-150_VF	%	2012	9415	52.7%	9513	53.5%	9612	54.2%	12187	13124	0.1%
ESOB_45-150_CF	%	2012	9415	67.4%	9513	68.5%	9612	69.4%	9519	10251	0.1%
ESOB_45-150_VSD-VF	%	2012	10650	58.2%	10749	59.1%	10847	59.9%	11023	11871	0.1%
ESCC<45_VF	%	2012	4080	46.4%	4105	47.7%	4129	48.7%	1977	2393	0.1%
ESCC<45_CF	%	2012	4080	61.1%	4105	62.8%	4129	64.1%	1501	1817	0.1%
ESCC<45_VSD-VF	%	2012	4386	53.5%	4411	55.0%	4436	56.1%	1715	2076	0.1%
ESCC_45-150_VF	%	2012	14458	52.6%	14557	53.4%	14655	54.1%	12209	13148	0.1%
ESCC_45-150_CF	%	2012	14458	67.4%	14557	68.4%	14655	69.4%	9522	10255	0.1%
ESCC_45-150_VSD-VF	%	2012	15694	58.1%	15792	59.0%	15891	59.8%	11043	11893	0.1%
ESCCi<45_VF	%	2012	4493	45.5%	4517	46.8%	4542	47.9%	1831	2288	0.1%
ESCCi<45_CF	%	2012	4493	60.0%	4517	61.7%	4542	63.1%	1389	1736	0.1%
ESCCi<45_VSD-VF	%	2012	4799	52.7%	4824	54.3%	4848	55.5%	1580	1974	0.1%
ESCCi_45-150_VF	%	2012	14458	52.2%	14557	53.0%	14655	53.8%	12290	13235	0.1%
ESCCi_45-150_CF	%	2012	14458	67.4%	14557	68.4%	14655	69.4%	9526	10259	0.1%
ESCCi_45-150_VSD-VF	%	2012	15694	58.2%	15792	59.1%	15891	59.9%	11032	11881	0.1%
MSSB<6"_VF	%	2012	2915	34.8%	2981	36.0%	3046	37.0%	5292	6672	0.1%
MSSB<6"_CF	%	2012	2915	46.7%	2981	48.4%	3046	49.7%	3936	4963	0.1%
MSSB<6"_VSD-VF	%	2012	3221	36.7%	3287	38.0%	3352	39.1%	5008	6314	0.1%
MS-V<25bar_VF	%	2012	2721	44.3%	2745	45.6%	2770	46.6%	1880	2350	0.1%
MS-V<25bar_CF	%	2012	2721	61.5%	2745	63.3%	2770	64.8%	1354	1693	0.1%
MS-V<25bar_VSD-VF	%	2012	3027	46.1%	3052	47.5%	3076	48.6%	1806	2258	0.1%
WE Welding Equipment			1094	76%	not used for WE: direct input of unit prices for each year						
			€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a	
TRAFO Distribution, kWh/a	kWh	2010	8785	7859	9818	6457	10852	5056	0.74	0.74	0%
TRAFO Industry oil	kWh	2010	15154	27168	19170	21400	23186	15631	0.70	0.70	0%
TRAFO Industry dry	kWh	2010	37971	39727	44653	34178	51334	28629	1.20	1.20	0%
TRAFO Power	kWh	2010	1031727	724886	1031727	724886	1031727	724886	0.00	0.00	0%
TRAFO DER oil	kWh	2010	25309	59094	33915	47304	42520	35515	0.73	0.73	0%
TRAFO DER dry	kWh	2010	39099	62415	45160	54762	51221	47109	0.79	0.79	0%
TRAFO Small	kWh	2010	1599	2523	1599	2523	1599	2523	0.00	0.00	0%

UNIT PRICE (in 2020-euros)	var	ref year	BC price €	BC EF	mid price €	mid EF	BAT price €	BAT EF	BC-mid slope €/EF	mid-BAT slope €/EF	PriceDec %
Tyres C1, replacement for cars											
Tyres C1, OEM for cars			not used for tyres:								
Tyres C2, replacement for vans			direct input of unit prices for each year								
Tyres C2, OEM for vans			(because prices also depend on wet grip)								
Tyres C3, replacement for trucks/busses											
Tyres C3, OEM for trucks/busses											
VSD price information for calculation of prices for motor+VSD											
			BC: IE0V-level		MID: IE1V-level		BAT: IE3V-level				
			€	loss [W]	€	loss [W]	€	loss [W]	€/W	€/W	Dec
VSD - Very Small 0.12 - 0.75 kW 1-phase	W	2010	307	148	341	118	409	59	-1.16	-1.16	1%
VSD - Very Small 0.12 - 0.75 kW 3-phase	W	2010	307	148	341	118	409	59	-1.16	-1.16	1%
VSD - Small 0.75 - 7.5 kW 3-phase	W	2010	430	204	477	163	573	82	-1.17	-1.17	1%
VSD - Medium 7.5 - 75kW 3-phase	W	2010	1734	980	1927	784	2312	392	-0.98	-0.98	1%
VSD - Large 75 - 375kW 3-phase	W	2010	8165	6978	9072	5582	10886	2791	-0.65	-0.65	1%
VSD - Very Large 375 - 1,000kW 3-phase	W	2010	63221	34714	70245	27771	84294	13886	-1.01	-1.01	1%

* RF: the two rows represent the same efficiency-price curve, but different parts of it. The data in the first row is from the 2009 studies, while the data in the second row is from the 2018 studies. Awaiting further reflection on how to handle price data from review studies in EIA, the solution with two datasets has been used. Applying the first set to BAU and to ECO until 2015, and the second set to ECO from 2016 onwards, is the best solution, compatible with previous EIA data and taking into account the new data

UNIT PRICE SPLIT (in euro 2020)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
EIWH Electric Instant. < 12 kW (secondary)	0.75		0.25		16	65%	13%	0.12	0.15	0.15	0.58
EIWH Electric Instant. ≥ 12 kW (primary)	0.84		0.16		16	65%	13%	0.12	0.15	0.15	0.58
EIWHS Electric Instant. Shower (secondary)	0.84		0.16		16	65%	13%	0.12	0.15	0.15	0.58
ESWH Electric Storage ≤ 30 L (secondary)	0.61		0.39		38	65%	13%	0.12	0.15	0.15	0.58
ESWH Electric Storage > 30 L (primary)	0.62		0.38		38	65%	13%	0.12	0.15	0.15	0.58
GIWH Gas Instant. < 13 L/min (secondary)	0.63		0.38		61	65%	13%	0.12	0.15	0.15	0.58
GIWH Gas Instant. ≥ 13 L/min (primary)	0.63		0.38		61	65%	13%	0.12	0.15	0.15	0.58
GSWH Gas Storage, Condensing	0.63		0.38		68	65%	13%	0.12	0.15	0.15	0.58
GSWH Gas Storage, Non-condensing	0.63		0.38		68	65%	13%	0.12	0.15	0.15	0.58
Dedicated WH Heat Pump	0.88		0.12		90	65%	13%	0.12	0.15	0.15	0.58
Dedicated WH Solar (3.5 m2)	0.63		0.37		125	65%	13%	0.12	0.15	0.15	0.58
CHB Gas Combi Instant. WH	0.53		0.47		30	82%	16%	0.14	0.15	0.15	0.56
CHB Gas + Cyl. WH	0.48		0.52		30	82%	16%	0.14	0.15	0.15	0.56
CHB Jet Burner Gas + Cyl. WH	0.46		0.55		42	82%	16%	0.14	0.15	0.15	0.56
CHB Jet Burner Oil + Cyl. WH	0.46		0.55		42	82%	16%	0.14	0.15	0.15	0.56
CHB Electric (Joule) + Cyl. WH	0.57		0.43		9	82%	16%	0.14	0.15	0.15	0.56
CHB Hybrid Gas/Electric WH	0.44		0.56		30	82%	16%	0.14	0.15	0.15	0.56
CHB Electric HP + Cyl. WH	0.40		0.60		15	82%	16%	0.14	0.15	0.15	0.56
CHB Gas HP + Cyl. WH	0.49		0.51		34	82%	16%	0.14	0.15	0.15	0.56
CHB Gas mCHP + Cyl. WH	0.44		0.56		50	82%	16%	0.14	0.15	0.15	0.56
CHB Solar Combi (16 m2)	0.50		0.50		14	82%	16%	0.14	0.15	0.15	0.56
CHB Gas non-condensing	0.56		0.44		158	70%	14%	0.12	0.15	0.15	0.58
CHB Gas condensing	0.50		0.50		162	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Jet burner non-condensing	0.48		0.52		237	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Jet burner condensing	0.43		0.57		201	70%	14%	0.12	0.15	0.15	0.58
CHB Oil Jet burner non-condensing	0.48		0.52		237	70%	14%	0.12	0.15	0.15	0.58
CHB Oil Jet burner condensing	0.43		0.57		201	70%	14%	0.12	0.15	0.15	0.58
CHB Electric Joule-effect	0.57		0.43		47	70%	14%	0.12	0.15	0.15	0.58
CHB Hybrid (gas-electric)	0.44		0.56		157	70%	14%	0.12	0.15	0.15	0.58
CHB Electric Heat Pump	0.40		0.60		76	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Heat Pump	0.49		0.51		176	70%	14%	0.12	0.15	0.15	0.58
CHB micro CHP	0.44		0.56		260	70%	14%	0.12	0.15	0.15	0.58
CHB Solar combi (16 m2)	0.50		0.50		71	70%	14%	0.12	0.15	0.15	0.58
	unit	kit	install	store	maint/a						
SFB Wood Manual [18 kW]	0.67	excl.	0.33	excl.	55	90%	18%	0.15	0.03	0.03	0.79
SFB Wood Direct Draft [20 kW]	0.77		0.23		55	90%	18%	0.15	0.03	0.03	0.79
SFB Coal [25 kW]	0.73		0.27		48	90%	18%	0.15	0.03	0.03	0.79
SFB Pellets [25 kW]	0.75		0.25		48	70%	14%	0.12	0.03	0.03	0.81
SFB Wood chips [160 kW]	0.90		0.10		62	0%	0%	0.00	0.04	0.04	0.93
Cooling:	unit	kit	install	cooler	maint/a						
CHAE-S (≤ 400 kW)	0.60	0.14	0.27		858	5%	1%	0.01	0.10	0.10	0.79
CHAE-L (> 400 kW)	0.60	0.14	0.27		2119	0%	0%	0.00	0.10	0.10	0.80
CHWE-S (≤ 400 kW)	0.43	0.10	0.19	0.28	716	5%	1%	0.01	0.10	0.10	0.79
CHWE-M (> 400 kW; ≤ 1500 kW)	0.31	0.10	0.19	0.40	3338	0%	0%	0.00	0.10	0.10	0.80
CHWE-L (> 1500 kW)	0.28	0.06	0.13	0.53	5007	0%	0%	0.00	0.10	0.10	0.80
CHF	0.60	0.14	0.27		3274	5%	1%	0.01	0.10	0.10	0.79
HT PCH-AE-S	0.60	0.14	0.27		1144	0%	0%	0.00	0.10	0.10	0.80
HT PCH-AE-L	0.60	0.14	0.27		3532	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-S	0.60	0.14	0.27		955	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-M	0.71	0.10	0.19		5563	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-L	0.81	0.06	0.13		6258	0%	0%	0.00	0.10	0.10	0.80
AC rooftop	0.56	0.02	0.42		978	0%	0%	0.00	0.10	0.10	0.80
AC splits	0.66	0.04	0.30		243	5%	1%	0.01	0.10	0.10	0.79
AC VRF	0.54	0.09	0.38		1637	1%	0%	0.00	0.10	0.10	0.80
ACF	0.60	0.14	0.27		1144	3%	1%	0.01	0.10	0.10	0.79
Heating:											
AC rooftop (rev)	0.56	0.02	0.42		978	0%	0%	0.00	0.10	0.10	0.80
AC splits (rev)	0.66	0.04	0.30		243	5%	1%	0.01	0.10	0.10	0.79
AC VRF (rev)	0.54	0.09	0.38		1637	1%	0%	0.00	0.10	0.10	0.80
ACF (rev)	0.59	0.14	0.27		1144	3%	1%	0.01	0.10	0.10	0.79
AHF	0.60	0.00	0.40		72	2%	0%	0.00	0.10	0.10	0.80
AHE	0.86	0.00	0.14		23	2%	0%	0.00	0.10	0.10	0.80

UNIT PRICE SPLIT (in euro 2020)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
LH open fireplace [8 kW]	0.74	excl.	0.26	excl.	19.0	90%	18%	0.17	0.11	0.09	0.63
LH closed fireplace/inset [8 kW]	0.74		0.26		21.3	90%	18%	0.17	0.11	0.09	0.63
LH wood stove [8 kW]	0.80		0.20		18.3	90%	18%	0.17	0.11	0.09	0.63
LH coal stove [8 kW]	0.73		0.27		18.3	90%	18%	0.17	0.11	0.09	0.63
LH cooker [10 kW]	0.82		0.18		64.5	90%	18%	0.17	0.11	0.09	0.63
LH SHR stove [8 kW]	0.37		0.63		17.3	90%	18%	0.17	0.11	0.09	0.63
LH pellet stove [8 kW]	0.85		0.15		37.5	90%	18%	0.17	0.11	0.09	0.63
LH Electric portable	1.00		0.00		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric fixed > 250W	0.89		0.11		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric fixed ≤ 250W	0.80		0.20		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric storage	0.89		0.11		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric underfloor	0.48		0.52		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric visibly glowing > 1.2 kW	0.55		0.45		0.0	50%	10%	0.09	0.10	0.10	0.71
LH Electric visibly glowing ≤ 1.2 kW	0.55		0.45		0.0	66%	13%	0.12	0.11	0.09	0.68
LH Electric Towel Heaters	0.88		0.12		0.0	98%	20%	0.16	0.11	0.09	0.64
LH Gas luminous (commercial)	0.83		0.17		43.3	0%	0%	0.00	0.10	0.10	0.80
LH Gaseous Tube (commercial < 120 kW)	0.85		0.15		40.2	0%	0%	0.00	0.10	0.10	0.80
LH Gas open front	0.81		0.19		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Gas closed front	0.89		0.11		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Gas balanced flue	0.85		0.15		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Gas flueless	1.00		0.00		0.0	90%	18%	0.15	0.11	0.09	0.65
LH Liquid tube (commercial < 120 kW)	0.85		0.15		40.2	0%	0%	0.00	0.10	0.10	0.80
LH Liquid open front	0.74		0.26		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Liquid closed front	0.89		0.11		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Liquid balanced flue	0.84		0.16		69.0	90%	18%	0.15	0.11	0.09	0.65
LH Liquid flueless	1.00		0.00		0.0	90%	18%	0.15	0.11	0.09	0.65
RAC fixed < 6 kW, cooling	0.41		0.59		23.3	71%	14%	0.12	0.18	0.25	0.45
RAC fixed 6-12 kW, cooling	0.60		0.40		23.3	46%	9%	0.08	0.18	0.25	0.49
RAC portable < 12 kW, cooling	1.00		0.00		0.0	79%	16%	0.14	0.12	0.15	0.59
RAC fixed < 6 kW, reversible, heating	0.41		0.59		23.3	71%	14%	0.12	0.18	0.25	0.45
RAC fixed 6-12 kW, reversible, heating	0.60		0.40		23.3	46%	9%	0.08	0.18	0.25	0.49
RAC portable < 12 kW, reversible, heating	1.00		0.00		0.0	79%	16%	0.14	0.12	0.15	0.59
CIRC Integrated circulators	0.62		0.38		1.0	70%	14%	0.12	0.06	0.21	0.61
CIRC Large standalone circulators	0.92		0.08		7.3	47%	9%	0.09	0.00	0.22	0.69
CIRC Small standalone circulators	0.68		0.32		2.9	70%	14%	0.12	0.06	0.21	0.61
R-UVU ≤ 100 m3/h for Extract Spaces					2	100%	20%	0.17	0.17	0.16	0.50
R-UVU ≤ 100 m3/h for Habitable Spaces					2	100%	20%	0.17	0.17	0.16	0.50
R-BVU ≤ 100 m3/h for Habitable Spaces					23	100%	20%	0.17	0.17	0.16	0.50
R-UVU 100-250 m3/h	See sheets PRICEBAU				11	100%	20%	0.17	0.17	0.16	0.50
R-BVU 100-250 m3/h	and PRICEECO				55	100%	20%	0.17	0.17	0.16	0.50
R-UVU 250-1000 m3/h					43	100%	20%	0.17	0.17	0.16	0.50
R-BVU 250-1000 m3/h					99	100%	20%	0.17	0.17	0.16	0.50
R-UVU > 1000 m3/h					76	100%	20%	0.17	0.10	0.10	0.63
R-BVU 1000-2500 m3/h					143	100%	20%	0.17	0.10	0.10	0.63
NR-UVU 250-1000 m3/h					36	0%	0%	0.00	0.10	0.10	0.80
NR-BVU 250-1000 m3/h					82	0%	0%	0.00	0.10	0.10	0.80
NR-UVU > 1000 m3/h					63	0%	0%	0.00	0.10	0.10	0.80
NR-BVU 1000-2500 m3/h					119	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-S 2500-5500 m3/h					202	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-M 5500-14500 m3/h					690	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-L > 14500 m3/h					2897	0%	0%	0.00	0.10	0.10	0.80
LFL (T12,T8h,T8t,T5,other)	0.59		0.41		0.41	6%	1.3%	0.01	0.10	0.10	0.79
HID (HPM, HPS, MH)	0.74		0.26		6.52	0%	0.0%	0.00	0.10	0.10	0.80
CFLni (all shapes)	0.52		0.48		1.86	30%	6.0%	0.06	0.23	0.28	0.43
CFLi (retrofit for GLS, HL)	0.87		0.13		0.39	60%	12.0%	0.11	0.23	0.26	0.41
GLS (DLS & NDLS)	0.70		0.30		0.18	80%	16.0%	0.14	0.23	0.24	0.39
HL (DLS & NDLS, LV & MV)	0.87		0.13		0.31	71%	14.3%	0.13	0.23	0.25	0.40
LED replacing LFL (retrofit & luminaire)	0.93		0.07		0.40	6%	1.2%	0.01	0.10	0.10	0.79
LED replacing HID (retrofit & luminaire)	0.97		0.03		6.52	0%	0.0%	0.00	0.10	0.10	0.80
LED replacing CFLni (retrofit & luminaire)	0.76		0.24		2.46	18%	3.6%	0.04	0.09	0.10	0.77
LED replacing DLS (retrofit & luminaire)	0.95		0.05		0.28	68%	13.5%	0.12	0.08	0.10	0.70
LED replacing NDLS (retrofit & luminaire)	0.97		0.03		0.17	80%	16.0%	0.14	0.08	0.10	0.68

UNIT PRICE SPLIT (in euro 2020)	**unit**	**kit**	**install**	**ErP**	**maint**	**share**	**avg VAT**	**split-up materials price by party**			
	split up (price=100%)				€/a	**VAT20%**	**tariff**	**VAT**	**retail**	**whole**	**industry**
DP TV, standard (NoNA)	1.00		0.00			90%	18%	0.15	0.40	0.05	0.40
DP TV, LoNA	1.00		0.00			90%	18%	0.15	0.40	0.05	0.40
DP TV, HiNA ('Smart')	1.00		0.00			90%	18%	0.15	0.40	0.05	0.40
DP TV all types	1.00		0.00		0.94	90%	18%	0.15	0.40	0.05	0.40
DP Monitor	1.00		0.00		0.94	49%	10%	0.09	0.26	0.15	0.50
DP Signage	1.00		0.00		0.94	0%	0%	0.00	0.20	0.25	0.55
SSTB	1.00		0.00		0	90%	18%	0.15	0.05	0.25	0.55
CSTB	1.00		0.00		0	90%	18%	0.15	0.05	0.25	0.55
Game consoles > 20 W	1.00		0.00		0	100%	20%	0.17	0.39	0.05	0.39
Game consoles < 20 W	1.00		0.00		0	100%	20%	0.17	0.39	0.05	0.39
ES tower 1-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 1-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 2-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 2-socket cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 4-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 4-socket cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 2-socket resilient trad.	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 2-socket resilient cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 4-socket resilient trad.	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES rack 4-socket resilient cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES blade 1-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES blade 2-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES blade 2-socket cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES blade 4-socket traditional	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
ES blade 4-socket cloud	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
DS Online 2	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
DS Online 3	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
DS Online 4	1.00		0.00		0	0%	0%	0.00	0.00	0.00	1.00
PC Desktop	1.00		0.00		0	66%	13%	0.12	0.43	0.05	0.40
PC Integrated Desktop	1.00		0.00		0	66%	13%	0.12	0.43	0.05	0.40
PC Notebook	1.00		0.00		0	66%	13%	0.12	0.43	0.05	0.40
PC Tablet/slate	1.00		0.00		0	90%	18%	0.15	0.40	0.05	0.40
PC Thin client	1.00		0.00		0	0%	0%	0.00	0.20	0.25	0.55
PC Integrated Thin Client	1.00		0.00		0	0%	0%	0.00	0.20	0.25	0.55
PC Small-scale Server	1.00		0.00		0	0%	0%	0.00	0.20	0.25	0.55
PC Workstation	1.00		0.00		0	0%	0%	0.00	0.20	0.23	0.57
Inkjet Printer	1.00		0.00		0	50%	10%	0.09	0.36	0.10	0.45
Inkjet MFD	1.00		0.00		0	50%	10%	0.09	0.36	0.10	0.45
EP / Laser Printer mono	1.00		0.00		53	10%	2%	0.02	0.18	0.15	0.65
EP / Laser Printer colour	1.00		0.00		180	10%	2%	0.02	0.18	0.15	0.65
EP / Laser Copier mono	1.00		0.00		53	10%	2%	0.02	0.18	0.15	0.65
EP / Laser Copier colour	1.00		0.00		180	10%	2%	0.02	0.18	0.15	0.65
EP / Laser MFD mono	1.00		0.00		180	10%	2%	0.02	0.18	0.15	0.65
EP / Laser MFD colour	1.00		0.00		423	5%	1%	0.01	0.19	0.15	0.65
paper						see resources					
ink and toner						see resources					
Products regulated only for (networked) standby											
SB Radios	1.00		0.00		0	95%	19%	0.16	0.10	0.25	0.49
SB Electric toothbrushes	1.00		0.00		0	100%	20%	0.17	0.10	0.25	0.48
SB Audio speakers (wired)	1.00		0.00		0	95%	19%	0.16	0.10	0.25	0.49
SB Audio speakers (wireless)	1.00		0.00		0	95%	19%	0.16	0.10	0.25	0.49
SB Small appliances	1.00		0.00		0	95%	19%	0.16	0.10	0.25	0.49
SB Media boxes /sticks	1.00		0.00		0	95%	19%	0.16	0.10	0.25	0.49
SB Media players and recorders	1.00		0.00		0	90%	18%	0.15	0.10	0.25	0.50
SB Projectors	1.00		0.00		0	3%	1%	0.01	0.10	0.25	0.64
SB Home phones	1.00		0.00		0	100%	20%	0.17	0.40	0.03	0.40
SB Office phones	1.00		0.00		0	0%	0%	0.00	0.30	0.20	0.50
SB Home NAS	1.00		0.00		0	100%	20%	0.17	0.05	0.25	0.53
SB Home Network Equipment	1.00		0.00		0	100%	20%	0.17	0.10	0.25	0.48
SB Office Network Equipment	1.00		0.00		0	0%	0%	0.00	0.10	0.25	0.65
SB Coffee makers	1.00		0.00		0	95%	19%	0.16	0.40	0.03	0.41

Products regulated also for (networked) standby
(already accounted elsewhere; here for info only) **not used for SB, see main accounting for the product group**

UNIT PRICE SPLIT (in euro 2020)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
EPS Active mode (for electricity losses)											
EPS ≤ 6W, low-V	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 6–10 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 10–12 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 15–20 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 20–30 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 30–65 W, multiple-V	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 30-65 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 65–120 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 65–120 W, multiple-V	1.00		0.00		0	75%	15%	0.13		0.15	0.50
EPS 12–15 W	1.00		0.00		0	75%	15%	0.13		0.15	0.50
RF Household refrigerator and freezer	1.00		0.00		0	92%	18%	0.16	0.40	0.03	0.41
	unit		install+kit		maint						
CF open vertical chilled multi deck (RVC2)	0.91		0.09		273	0%	0%	0.00	0.00	0.30	0.70
CF open horizontal frozen island (RHF4)	0.91		0.09		296	0%	0%	0.00	0.00	0.30	0.70
CF other supermarket display (non-BCs)	0.87		0.13		227	0%	0%	0.00	0.00	0.30	0.70
CF Plug in one door beverage cooler	1.00		0.00		32	0%	0%	0.00	0.00	0.30	0.70
CF Plug in horizontal ice cream freezer	1.00		0.00		24	0%	0%	0.00	0.00	0.30	0.70
CF Spiral vending machine	1.00		0.00		53	0%	0%	0.00	0.00	0.30	0.70
PF Storage cabinet Chilled Vertical (CV)	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Frozen Vertical (FV)	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Chilled Horizontal (CH)	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinet Frozen Horizontal (FH)	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Storage cabinets All types	**1.00**		**0.00**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**
PF Process Chiller AC MT S ≤ 300 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC MT L > 300 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC LT S ≤ 200 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller AC LT L > 200 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC MT S ≤ 300 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC MT L > 300 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC LT S ≤ 200 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller WC LT L > 200 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Process Chiller All MT&LT	**1.00**		**0.00**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**
PF Condensing Unit MT S 0.2-1 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT M 1-5 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT L 5-20 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit MT XL 20-50 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT S 0.1-0.4 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT M 0.4-2 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT L 2-8 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit LT XL 8-20 kW	1.00		0.00		0	0%	0%	0.00	0.10	0.20	0.70
PF Condensing Unit, All MT&LT	**1.00**		**0.00**		**0**	**0%**	**0%**	**0.00**	**0.10**	**0.20**	**0.70**
CA Electric Hobs	1.00		0.00		0	100%	20%	0.17	0.40	0.03	0.40
CA Electric Ovens	1.00		0.00		0	80%	16%	0.14	0.40	0.03	0.43
CA Gas Hobs	1.00		0.00		0	80%	16%	0.14	0.40	0.03	0.43
CA Gas Ovens	1.00		0.00		0	90%	18%	0.15	0.40	0.03	0.42
CA Range Hoods	1.00		0.00		0	80%	16%	0.14	0.40	0.03	0.43
WM Washing Machines	1.00		0.00		3.8	97%	19%	0.16	0.40	0.03	0.41
WD Washer-Dryers	1.00		0.00		3.8	97%	19%	0.16	0.40	0.03	0.41
DW Household Dishwasher	1.00		0.00		0	93%	19%	0.16	0.40	0.03	0.41
LD condensing heat pump	0.97		0.03		5	95%	19%	0.16	0.40	0.03	0.41
LD condensing electric heat element	0.94		0.06		5	95%	19%	0.16	0.40	0.03	0.41
LD vented electric	0.79		0.21		5	95%	19%	0.16	0.40	0.03	0.41
LD vented gas	0.81		0.19		5	95%	19%	0.16	0.40	0.03	0.41
VC Cylinder Domestic mains	1.00		0.00		2.5	100%	20%	0.17	0.36	0.03	0.44
VC Upright Domestic mains	1.00		0.00		4.1	100%	20%	0.17	0.36	0.03	0.44
VC Handstick Domestic mains	1.00		0.00		1.6	100%	20%	0.17	0.36	0.03	0.44
VC Cylinder Commercial mains	1.00		0.00		5.9	0%	0%	0.00	0.27	0.20	0.53
VC Upright Commercial mains	1.00		0.00		5.9	0%	0%	0.00	0.27	0.20	0.53
VC Cordless - domestic	1.00		0.00		7.4	100%	20%	0.17	0.36	0.03	0.44
VC Cordless - commercial	1.00		0.00		7.4	0%	0%	0.00	0.27	0.20	0.53
VC Robot - domestic	1.00		0.00		12.1	100%	20%	0.17	0.36	0.03	0.44
VC Robot - commercial	1.00		0.00		12.1	0%	0%	0.00	0.27	0.20	0.53

UNIT PRICE SPLIT (in euro 2020)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
FAN Axial<300Pa [247 W flow out]	0.90		0.10		7	0%	0%	0.00	0.10	0.23	0.67
FAN Axial>300Pa [489 W fluid-dyn out]	0.92		0.08		9	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.FC [141 W flow out]	0.94		0.06		11	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.BC-free [2120 W flow out]	0.91		0.09		21	0%	0%	0.00	0.10	0.23	0.67
FAN Centr.BC [2052 W flow out]	0.91		0.09		38	0%	0%	0.00	0.10	0.23	0.67
FAN Cross-flow [31 W flow out]	0.92		0.08		9	0%	0%	0.00	0.10	0.23	0.67
Medium (S) 3-ph 0.75-7.5 kW no VSD	0.79		0.21		0	0%	0%	0.00	0.10	0.23	0.67
Medium (M) 3-ph 7.5-75 kW no VSD	0.88		0.12		73	0%	0%	0.00	0.10	0.23	0.67
Medium (L) 3-ph 75-375 kW no VSD	0.96		0.04		401	0%	0%	0.00	0.10	0.23	0.67
Medium (S) 3-ph 0.75-7.5 kW with VSD	0.70		0.30		0	0%	0%	0.00	0.10	0.23	0.67
Medium (M) 3-ph 7.5-75 kW with VSD	0.73		0.27		93	0%	0%	0.00	0.10	0.23	0.67
Medium (L) 3-ph 75-375 kW with VSD	0.80		0.20		525	0%	0%	0.00	0.10	0.23	0.67
Small 1 ph 0.12-0.75 kW no VSD	0.80		0.20		0	0%	0%	0.00	0.10	0.23	0.67
Small 1 ph 0.12-0.75 kW with VSD	0.69		0.31		0	0%	0%	0.00	0.10	0.23	0.67
Small 3 ph 0.12-0.75 kW no VSD	0.78		0.22		0	0%	0%	0.00	0.10	0.23	0.67
Small 3 ph 0.12-0.75 kW with VSD	0.69		0.31		0	0%	0%	0.00	0.10	0.23	0.67
Large 3-ph LV 375-1000 kW no VSD	0.94		0.06		1337	0%	0%	0.00	0.10	0.23	0.67
Large 3-ph LV 375-1000kW with VSD	0.76		0.24		1461	0%	0%	0.00	0.10	0.23	0.67
Explosion motors (S) 3-ph 0.75-7.5 kW	0.79		0.21		0	0%	0%	0.00	0.10	0.23	0.67
Explosion motors (M) 3-ph 7.5-75 kW	0.88		0.12		73	0%	0%	0.00	0.10	0.23	0.67
Explosion motors (L) 3-ph 75-375 kW	0.96		0.04		401	0%	0%	0.00	0.10	0.23	0.67
Brake motors (S) 3-ph 0.75-7.5 kW	0.79		0.21		0	0%	0%	0.00	0.10	0.23	0.67
Brake motors (M) 3-ph 7.5-75 kW	0.88		0.12		73	0%	0%	0.00	0.10	0.23	0.67
Brake motors (L) 3-ph 75-375 kW	0.96		0.04		401	0%	0%	0.00	0.10	0.23	0.67
8-pole motors (S) 3-ph 0.75-7.5 kW	0.87		0.13		0	0%	0%	0.00	0.10	0.23	0.67
8-pole motors (M) 3-ph 7.5-75 kW	0.93		0.07		73	0%	0%	0.00	0.10	0.23	0.67
8-pole motors (L) 3-ph 75-375 kW	0.98		0.03		401	0%	0%	0.00	0.10	0.23	0.67
1-phase motors >0.75 kW (no VSD)	0.81		0.19		0	0%	0%	0.00	0.10	0.23	0.67
ESOB<45_VF	0.82		0.18		317	17%	3%	0.03	0.10	0.20	0.67
ESOB<45_CF	0.82		0.18		317	17%	3%	0.03	0.10	0.20	0.67
ESOB<45_VSD-VF	0.83		0.17		317	17%	3%	0.03	0.10	0.20	0.67
ESOB_45-150_VF	0.92		0.08		317	17%	3%	0.03	0.10	0.20	0.67
ESOB_45-150_CF	0.92		0.08		317	17%	3%	0.03	0.10	0.20	0.67
ESOB_45-150_VSD-VF	0.93		0.07		317	17%	3%	0.03	0.10	0.20	0.67
ESCC<45_VF	0.49		0.51		846	17%	3%	0.03	0.10	0.20	0.67
ESCC<45_CF	0.49		0.51		846	17%	3%	0.03	0.10	0.20	0.67
ESCC<45_VSD-VF	0.53		0.47		846	17%	3%	0.03	0.10	0.20	0.67
ESCC_45-150_VF	0.86		0.14		846	17%	3%	0.03	0.10	0.20	0.67
ESCC_45-150_CF	0.86		0.14		846	17%	3%	0.03	0.10	0.20	0.67
ESCC_45-150_VSD-VF	0.87		0.13		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi<45_VF	0.54		0.46		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi<45_CF	0.54		0.46		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi<45_VSD-VF	0.57		0.43		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi_45-150_VF	0.86		0.14		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi_45-150_CF	0.86		0.14		846	17%	3%	0.03	0.10	0.20	0.67
ESCCi_45-150_VSD-VF	0.87		0.13		846	17%	3%	0.03	0.10	0.20	0.67
MSSB<6"_VF	0.68		0.32		793	17%	3%	0.03	0.10	0.20	0.67
MSSB<6"_CF	0.68		0.32		793	17%	3%	0.03	0.10	0.20	0.67
MSSB<6"_VSD-VF	0.71		0.29		793	17%	3%	0.03	0.10	0.20	0.67
MS-V<25bar_VF	0.64		0.36		555	17%	3%	0.03	0.10	0.20	0.67
MS-V<25bar_CF	0.64		0.36		555	17%	3%	0.03	0.10	0.20	0.67
MS-V<25bar_VSD-VF	0.67		0.33		555	17%	3%	0.03	0.10	0.20	0.67
WE Welding Equipment	0.65		0.35		37	0%	0%	0.00	0.10	0.16	0.74
TRAFO Distribution, kWh/a	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO Industry oil	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO Industry dry	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO Power	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO DER oil	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO DER dry	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
TRAFO Small	1.00		0.00		0	0%	0%	0.00	0.10	0.10	0.80
Tyres C1, replacement for cars	1.00		0.00		0	80%	16%	0.14	0.32	0.11	0.43
Tyres C1, OEM for cars	1.00		0.00		0	80%	16%	0.14	0.32	0.11	0.43
Tyres C2, replacement for vans	1.00		0.00		0	0%	0%	0.00	0.38	0.13	0.50
Tyres C2, OEM for vans	1.00		0.00		0	0%	0%	0.00	0.38	0.13	0.50
Tyres C3, replacement for trucks/busses	1.00		0.00		0	0%	0%	0.00	0.38	0.13	0.50
Tyres C3, OEM for trucks/busses	1.00		0.00		0	0%	0%	0.00	0.38	0.13	0.50

UNIT PRICE SPLIT (in euro 2020)	unit	kit	install	ErP	maint	share	avg VAT	split-up materials price by party			
	split up (price=100%)				€/a	VAT20%	tariff	VAT	retail	whole	industry
VSD price information for calculation of prices for motor+VSD											
VSD - Very Small 0.12 - 0.75 kW 1-phase	0.67		0.33		0	0%	0%	0.00	0.10	0.23	0.67
VSD - Very Small 0.12 - 0.75 kW 3-phase	0.67		0.33		0	0%	0%	0.00	0.10	0.23	0.67
VSD - Small 0.75 - 7.5 kW 3-phase	0.67		0.33		0	0%	0%	0.00	0.10	0.23	0.67
VSD - Medium 7.5 - 75kW 3-phase	0.67		0.33		20	0%	0%	0.00	0.10	0.23	0.67
VSD - Large 75 - 375kW 3-phase	0.67		0.33		124	0%	0%	0.00	0.10	0.23	0.67
VSD - Very Large 375 - 1,000kW 3-phase	0.68		0.32		124	0%	0%	0.00	0.10	0.23	0.67

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	324	324	324	324	324	324	324	324	324	324
EIWH Electric Instant. ≥ 12 kW (primary)	512	512	512	512	512	512	512	512	512	512
EIWHS Electric Instant. Shower (secondary)	512	512	512	512	512	512	512	512	512	512
ESWH Electric Storage ≤ 30 L (secondary)	202	202	202	202	202	202	202	202	202	202
ESWH Electric Storage > 30 L (primary)	552	552	552	552	552	552	552	552	552	552
GIWH Gas Instant. < 13 L/min (secondary)	446	446	446	446	446	446	446	446	446	446
GIWH Gas Instant. ≥ 13 L/min (primary)	797	797	797	797	797	797	797	797	797	797
GSWH Gas Storage, Condensing	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195
GSWH Gas Storage, Non-condensing	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195
Dedicated WH Heat Pump	3210	3210	3210	3210	3210	3210	3210	3210	3210	3210
Dedicated WH Solar (3.5 m2)	2577	2577	2577	2577	2577	2577	2577	2577	2577	2577
CHB Gas Combi Instant. WH	428	428	428	428	428	428	428	428	428	428
CHB Gas + Cyl. WH	686	686	686	686	686	686	686	686	686	686
CHB Jet Burner Gas + Cyl. WH	2168	2168	2168	2168	2168	2168	2168	2168	2168	2168
CHB Jet Burner Oil + Cyl. WH	2168	2168	2168	2168	2168	2168	2168	2168	2168	2168
CHB Electric (Joule) + Cyl. WH	433	433	433	433	433	433	433	433	433	433
CHB Hybrid Gas/Electric WH	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
CHB Electric HP + Cyl. WH	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979
CHB Gas HP + Cyl. WH	2756	2756	2756	2756	2756	2756	2756	2756	2756	2756
CHB Gas mCHP + Cyl. WH	5633	5633	5633	5633	5633	5633	5633	5633	5633	5633
CHB Solar Combi (16 m2)	2378	2378	2378	2378	2378	2378	2378	2378	2378	2378
CHB Gas non-condensing	1898	1898	1898	1898	1898	1898	1898	1898	1898	1898
CHB Gas condensing	4213	3299	2538	2385	2385	2385	2385	2385	2385	2385
CHB Gas Jet burner non-condensing	10634	10634	10634	10634	10634	10634	10634	10634	10634	10634
CHB Gas Jet burner condensing	11647	11647	11647	11647	11647	11647	11647	11647	11647	11647
CHB Oil Jet burner non-condensing	10634	10634	10634	10634	10634	10634	10634	10634	10634	10634
CHB Oil Jet burner condensing	11647	11647	11647	11647	11647	11647	11647	11647	11647	11647
CHB Electric Joule-effect	2223	2223	2223	2223	2223	2223	2223	2223	2223	2223
CHB Hybrid (gas-electric)	8545	8545	8545	8545	8545	8545	8545	8545	8545	8545
CHB Electric Heat Pump	10168	10168	10168	10168	10168	10168	10168	10168	10168	10168
CHB Gas Heat Pump	14159	14159	14159	14159	14159	14159	14159	14159	14159	14159
CHB micro CHP	28943	28943	28943	28943	28943	28943	28943	28943	28943	28943
CHB Solar combi (16 m2)	12218	12218	12218	12218	12218	12218	12218	12218	12218	12218
SFB Wood Manual [18 kW]	5116	5116	5334	5542	5740	5928	6107	6277	6439	6592
SFB Wood Direct Draft [20 kW]	7389	7389	7556	7885	8245	8446	8128	7823	7529	7389
SFB Coal [25 kW]	6253	6253	6253	6253	6253	6253	6253	6253	6253	6253
SFB Pellets [25 kW]	9095	9095	9100	9097	9095	9095	9095	9095	9095	9095
SFB Wood chips [160 kW]	38084	38084	38181	38214	38084	38084	38084	38084	38084	38084
Cooling:										
CHAE-S (≤ 400 kW)	19670	19677	19670	19670	19670	19670	19670	19670	19670	19670
CHAE-L (> 400 kW)	47873	47893	47873	47873	47873	47873	47873	47873	47873	47873
CHWE-S (≤ 400 kW)	15893	15893	15893	15893	15893	15893	15893	15893	15893	15893
CHWE-M (> 400 kW; ≤ 1500 kW)	70060	70109	70060	70060	70060	70060	70060	70060	70060	70060
CHWE-L (> 1500 kW)	125437	125524	125437	125437	125437	125437	125437	125437	125437	125437
CHF	17164	17164	17164	17164	17164	17164	17164	17164	17164	17164
HT PCH-AE-S	21498	21498	21498	21498	21498	21498	21498	21498	21498	21498
HT PCH-AE-L	54413	54413	54413	54413	54413	54413	54413	54413	54413	54413
HT PCH-WE-S	18210	18210	18210	18210	18210	18210	18210	18210	18210	18210
HT PCH-WE-M	85593	85593	85593	85593	85593	85593	85593	85593	85593	85593
HT PCH-WE-L	182512	182512	182512	182512	182512	182512	182512	182512	182512	182512
AC rooftop	21829	21829	21829	21829	21829	21829	21829	21829	21829	21829
AC splits	3734	3734	3734	3734	3734	3734	3734	3734	3734	3734
AC VRF	34982	34982	34982	34982	34982	34982	34982	34982	34982	34982
ACF	17164	17164	17164	17164	17164	17164	17164	17164	17164	17164
Heating:										
AC rooftop (rev)	21626	21626	21626	21626	21626	21626	21626	21626	21626	21626
AC splits (rev)	3467	3467	3467	3467	3467	3467	3467	3467	3467	3467
AC VRF (rev)	33929	33929	33929	33929	33929	33929	33929	33929	33929	33929
ACF (rev)	19047	19047	19047	19047	19047	19047	19047	19047	19047	19047
AHF	5885	5885	5885	5885	5885	5885	5885	5885	5885	5885
AHE	568	568	568	568	568	568	568	568	568	568
LH open fireplace [8 kW]	3013	3013	3013	3013	3013	3013	3013	3013	3013	3013
LH closed fireplace/inset [8 kW]	3089	3089	3089	3089	3089	3089	3089	3089	3089	3089
LH wood stove [8 kW]	2862	2862	2862	2862	2862	2862	2862	2862	2862	2862
LH coal stove [8 kW]	2097	2097	2097	2097	2097	2097	2097	2097	2097	2097
LH cooker [10 kW]	3237	3237	3237	3237	3237	3237	3237	3237	3237	3237
LH SHR stove [8 kW]	9044	9044	9044	9044	9044	9044	9044	9044	9044	9044
LH pellet stove [8 kW]	3830	3830	3830	3830	3830	3830	3830	3830	3830	3830

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	31	31	31	31	31	31	31	31	31	31
LH Electric fixed > 250W	276	278	279	276	276	276	276	276	276	276
LH Electric fixed ≤ 250W	154	155	156	154	154	154	154	154	154	154
LH Electric storage	653	653	669	655	653	653	653	653	653	653
LH Electric underfloor	298	298	305	302	298	298	298	298	298	298
LH Electric visibly glowing > 1.2 kW	70	70	70	70	70	70	70	70	70	70
LH Electric visibly glowing ≤ 1.2 kW	47	47	47	47	47	47	47	47	47	47
LH Electric Towel Heaters	264	264	264	264	264	264	264	264	264	264
LH Gas luminous (commercial)	1298	1350	1401	1392	1382	1375	1320	1298	1298	1298
LH Gaseous Tube (commercial < 120 kW)	1438	1488	1535	1513	1492	1470	1438	1438	1438	1438
LH Gas open front	1222	1222	1229	1222	1222	1222	1222	1222	1222	1222
LH Gas closed front	2344	2344	2366	2344	2344	2344	2344	2344	2344	2344
LH Gas balanced flue	1641	1641	1648	1641	1641	1641	1641	1641	1641	1641
LH Gas flueless	357	357	357	357	357	357	357	357	357	357
LH Liquid tube (commercial < 120 kW)	1438	1509	1553	1530	1507	1484	1438	1438	1438	1438
LH Liquid open front	880	880	885	880	880	880	880	880	880	880
LH Liquid closed front	2344	2344	2366	2344	2344	2344	2344	2344	2344	2344
LH Liquid balanced flue	1562	1562	1569	1562	1562	1562	1562	1562	1562	1562
LH Liquid flueless	296	296	296	296	296	296	296	296	296	296
RAC fixed < 6 kW, cooling	1271	1440	1371	1303	1271	1271	1271	1271	1271	1271
RAC fixed 6-12 kW, cooling	1731	2133	2090	2036	1974	1906	1833	1731	1731	1731
RAC portable < 12 kW, cooling	273	317	297	277	273	273	273	273	273	273
RAC fixed < 6 kW, reversible, heating	1271	1440	1371	1303	1271	1271	1271	1271	1271	1271
RAC fixed 6-12 kW, reversible, heating	1731	2133	2090	2036	1974	1906	1833	1731	1731	1731
RAC portable < 12 kW, reversible, heating	273	317	297	277	273	273	273	273	273	273
CIRC Integrated circulators	312	322	325	312	312	312	312	312	312	312
CIRC Large standalone circulators	699	934	1023	1054	1076	1090	1097	1098	1094	1077
CIRC Small standalone circulators	312	339	346	335	325	314	312	312	312	312
R-UVU ≤ 100 m3/h for Extract Spaces	224	224	246	246	246	246	246	246	246	246
o/w purchase price (excl. installation)	*150*	*150*	*170*	*170*	*170*	*170*	*170*	*170*	*170*	*170*
o/w installation material costs	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
o/w installation labour costs	*74*	*74*	*76*	*76*	*76*	*76*	*76*	*76*	*76*	*76*
R-UVU ≤ 100 m3/h for Habitable Spaces	224	224	246	246	246	246	246	246	246	246
o/w purchase price (excl. installation)	*150*	*150*	*170*	*170*	*170*	*170*	*170*	*170*	*170*	*170*
o/w installation material costs	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
o/w installation labour costs	*74*	*74*	*76*	*76*	*76*	*76*	*76*	*76*	*76*	*76*
R-BVU ≤ 100 m3/h for Habitable Spaces	791	766	789	789	807	806	797	753	737	736
o/w purchase price (excl. installation)	*511*	*511*	*537*	*537*	*537*	*537*	*537*	*537*	*537*	*537*
o/w installation material costs	*133*	*115*	*112*	*112*	*125*	*125*	*118*	*87*	*75*	*74*
o/w installation labour costs	*146*	*139*	*140*	*140*	*145*	*145*	*142*	*130*	*125*	*125*
R-UVU 100-250 m3/h	736	986	954	914	875	930	934	934	1017	1051
o/w purchase price (excl. installation)	*254*	*381*	*434*	*434*	*434*	*434*	*434*	*434*	*434*	*434*
o/w installation material costs	*260*	*321*	*250*	*220*	*184*	*206*	*205*	*201*	*239*	*254*
o/w installation labour costs	*222*	*284*	*270*	*260*	*256*	*290*	*296*	*299*	*344*	*363*
R-BVU 100-250 m3/h	3692	3556	3512	3539	3970	4067	4069	3476	3271	3289
o/w purchase price (excl. installation)	*1439*	*1566*	*1624*	*1624*	*1624*	*1624*	*1624*	*1624*	*1624*	*1624*
o/w installation material costs	*799*	*626*	*587*	*577*	*683*	*692*	*679*	*497*	*433*	*435*
o/w installation labour costs	*1454*	*1364*	*1301*	*1338*	*1662*	*1751*	*1766*	*1354*	*1214*	*1229*
R-UVU 250-1000 m3/h	1034	1220	1126	1066	1007	1089	1096	1096	1220	1272
o/w purchase price (excl. installation)	*315*	*315*	*350*	*350*	*350*	*350*	*350*	*350*	*350*	*350*
o/w installation material costs	*390*	*482*	*376*	*331*	*277*	*309*	*307*	*302*	*358*	*381*
o/w installation labour costs	*329*	*423*	*401*	*385*	*380*	*430*	*439*	*444*	*512*	*540*
R-BVU 250-1000 m3/h	5442	5040	4927	4967	5618	5765	5767	4869	4560	4586
o/w purchase price (excl. installation)	*2062*	*2062*	*2108*	*2108*	*2108*	*2108*	*2108*	*2108*	*2108*	*2108*
o/w installation material costs	*1198*	*939*	*880*	*865*	*1025*	*1038*	*1018*	*746*	*649*	*653*
o/w installation labour costs	*2182*	*2038*	*1939*	*1994*	*2485*	*2619*	*2641*	*2015*	*1802*	*1825*
R-UVU > 1000 m3/h	5906	3096	2684	2435	2061	2045	1934	1857	1778	1686
o/w purchase price (excl. installation)	*673*	*673*	*721*	*721*	*721*	*721*	*721*	*721*	*721*	*721*
o/w installation material costs	*1963*	*838*	*655*	*545*	*392*	*381*	*339*	*309*	*279*	*244*
o/w installation labour costs	*3270*	*1585*	*1308*	*1169*	*948*	*943*	*875*	*827*	*778*	*721*
R-BVU 1000-2500 m3/h	5711	27768	24684	22885	20339	19838	19056	18335	17422	17097
o/w purchase price (excl. installation)	*5711*	*5711*	*5788*	*5788*	*5788*	*5788*	*5788*	*5788*	*5788*	*5788*
o/w installation material costs	*0*	*8396*	*7026*	*6202*	*5083*	*4830*	*4496*	*4187*	*3796*	*3658*
o/w installation labour costs	*0*	*13661*	*11870*	*10895*	*9468*	*9220*	*8772*	*8360*	*7838*	*7651*
NR-UVU 250-1000 m3/h	1408	817	749	703	626	625	601	584	566	546
o/w purchase price (excl. installation)	*262*	*262*	*292*	*292*	*292*	*292*	*292*	*292*	*292*	*292*
o/w installation material costs	*588*	*251*	*196*	*163*	*117*	*114*	*101*	*93*	*84*	*73*
o/w installation labour costs	*558*	*304*	*261*	*247*	*217*	*219*	*207*	*199*	*191*	*181*

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
NR-BVU 250-1000 m3/h	1719	4529	4124	3899	3552	3503	3391	3288	3157	3110
o/w purchase price (excl. installation)	*1719*	*1719*	*1757*	*1757*	*1757*	*1757*	*1757*	*1757*	*1757*	*1757*
o/w installation material costs	*0*	*858*	*718*	*634*	*519*	*493*	*459*	*428*	*388*	*374*
o/w installation labour costs	*0*	*1952*	*1650*	*1509*	*1276*	*1253*	*1175*	*1103*	*1013*	*980*
NR-UVU > 1000 m3/h	4921	2580	2236	2029	1718	1704	1612	1548	1482	1405
o/w purchase price (excl. installation)	*561*	*561*	*601*	*601*	*601*	*601*	*601*	*601*	*601*	*601*
o/w installation material costs	*1636*	*699*	*546*	*454*	*327*	*317*	*282*	*258*	*233*	*203*
o/w installation labour costs	*2725*	*1321*	*1090*	*974*	*790*	*786*	*729*	*689*	*648*	*601*
NR-BVU 1000-2500 m3/h	4759	23140	20570	19071	16949	16532	15880	15279	14518	14248
o/w purchase price (excl. installation)	*4759*	*4759*	*4824*	*4824*	*4824*	*4824*	*4824*	*4824*	*4824*	*4824*
o/w installation material costs	*0*	*6997*	*5855*	*5169*	*4236*	*4025*	*3746*	*3489*	*3163*	*3048*
o/w installation labour costs	*0*	*11384*	*9891*	*9079*	*7890*	*7683*	*7310*	*6966*	*6531*	*6376*
NR-AHU-S 2500-5500 m3/h	91141	95074	87398	74642	61057	56012	51101	49766	46907	43485
o/w purchase price (excl. installation)	*7670*	*8358*	*9061*	*9061*	*9061*	*9061*	*9061*	*9061*	*9061*	*9061*
o/w installation material costs	*31602*	*32878*	*29613*	*24459*	*19084*	*16998*	*15098*	*14583*	*13478*	*12153*
o/w installation labour costs	*51870*	*53839*	*48724*	*41122*	*32912*	*29953*	*26943*	*26122*	*24369*	*22271*
NR-AHU-M 5500-14500 m3/h	59161	95495	98093	92690	78953	78968	76635	77236	74597	72041
o/w purchase price (excl. installation)	*9994*	*11587*	*12559*	*12559*	*12559*	*12559*	*12559*	*12559*	*12559*	*12559*
o/w installation material costs	*17152*	*30629*	*31291*	*29036*	*23661*	*23507*	*22619*	*22854*	*21849*	*20875*
o/w installation labour costs	*32014*	*53280*	*54243*	*51095*	*42733*	*42902*	*41457*	*41824*	*40190*	*38607*
NR-AHU-L > 14500 m3/h	167131	279894	287042	270019	226786	226812	219472	221365	213062	205020
o/w purchase price (excl. installation)	*18656*	*22090*	*24117*	*24117*	*24117*	*24117*	*24117*	*24117*	*24117*	*24117*
o/w installation material costs	*53592*	*95701*	*97769*	*90724*	*73930*	*73448*	*70672*	*71407*	*68266*	*65223*
o/w installation labour costs	*94883*	*162104*	*165155*	*155178*	*128739*	*129247*	*124682*	*125841*	*120679*	*115679*
LS, prices for light source and control gear, excl. additional luminaire costs										
LFL (T12,T8h,T8t,T5,other)	15	15	15	15	15	15	15	15	15	15
HID (HPM, HPS, MH)	33	37	38	38	38	38	38	38	38	38
CFLni (all shapes)	9	9	10	10	9	10	9	8	8	7
CFLi (retrofit for GLS, HL)	6	6	6	6	6	6	6	6	6	6
GLS (DLS & NDLS)	1	1	1	1	1	1	1	1	1	1
HL (DLS & NDLS, LV & MV)	4	5	4	4	4	4	4	4	4	5
LED replacing LFL (retrofit & luminaire)		188	112	63	36	29	29	29	29	29
LED replacing HID (retrofit & luminaire)		617	427	265	145	117	118	119	119	119
LED replacing CFLni (retrofit & luminaire)			29	17	11	10	10	10	11	11
LED replacing DLS (retrofit & luminaire)		23	22	8	5	4	4	4	4	4
LED replacing NDLS (retrofit & luminaire)		39	27	8	5	4	4	4	4	4
DP TV all types	842	474	474	474	474	474	474	474	474	474
DP Monitor	211	179	179	179	179	179	179	179	179	179
DP Signage	1684	947	947	947	947	947	947	947	947	947
SSTB	57	57	57	57	57	57	57	57	57	57
CSTB	171	171	171	171	171	171	171	171	171	171
Game consoles > 20 W	418	418	418	418	418	418	418	418	418	418
Game consoles < 20 W	294	294	294	294	294	294	294	294	294	294
ES tower 1-socket traditional	1263	1263	1263	1263	1263	1263	1263	1263	1263	1263
ES rack 1-socket traditional	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
ES rack 2-socket traditional	3158	3158	3158	3158	3158	3158	3158	3158	3158	3158
ES rack 2-socket cloud	4211	4211	4211	4211	4211	4211	4211	4211	4211	4211
ES rack 4-socket traditional	29476	29476	29476	29476	29476	29476	29476	29476	29476	29476
ES rack 4-socket cloud	34740	34740	34740	34740	34740	34740	34740	34740	34740	34740
ES rack 2-socket resilient trad.	36845	36845	36845	36845	36845	36845	36845	36845	36845	36845
ES rack 2-socket resilient cloud	37898	37898	37898	37898	37898	37898	37898	37898	37898	37898
ES rack 4-socket resilient trad.	38951	38951	38951	38951	38951	38951	38951	38951	38951	38951
ES rack 4-socket resilient cloud	40004	40004	40004	40004	40004	40004	40004	40004	40004	40004
ES blade 1-socket traditional	368	368	368	368	368	368	368	368	368	368
ES blade 2-socket traditional	3158	3158	3158	3158	3158	3158	3158	3158	3158	3158
ES blade 2-socket cloud	4211	4211	4211	4211	4211	4211	4211	4211	4211	4211
ES blade 4-socket traditional	6316	6316	6316	6316	6316	6316	6316	6316	6316	6316
ES blade 4-socket cloud	7369	7369	7369	7369	7369	7369	7369	7369	7369	7369
DS Online 2	21054	21054	21054	21054	21054	21054	21054	21054	21054	21054
DS Online 3	52636	52636	52636	52636	52636	52636	52636	52636	52636	52636
DS Online 4	168434	168434	168434	168434	168434	168434	168434	168434	168434	168434

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	782	782	782	782	782	782	782	782	782	782
PC Integrated Desktop	836	836	836	836	836	836	836	836	836	836
PC Notebook	1078	1078	1078	1078	1078	1078	1078	1078	1078	1078
PC Tablet/slate	715	715	715	715	715	715	715	715	715	715
PC Thin client	636	636	636	636	636	636	636	636	636	636
PC Integrated Thin Client	497	497	497	497	497	497	497	497	497	497
PC Small-scale Server	1586	1586	1586	1586	1586	1586	1586	1586	1586	1586
PC Workstation	2814	2814	2814	2814	2814	2814	2814	2814	2814	2814
Inkjet Printer	106	106	140	161	161	161	161	161	161	161
Inkjet MFD	159	159	102	67	67	67	67	67	67	67
EP / Laser Printer mono	228	228	387	482	482	482	482	482	482	482
EP / Laser Printer colour	571	571	553	543	543	543	543	543	543	543
EP / Laser Copier mono	1713	1713	1713	1713	1713	1713	1713	1713	1713	1713
EP / Laser Copier colour	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
EP / Laser MFD mono	801	801	801	801	801	801	801	801	801	801
EP / Laser MFD colour	5076	5076	5076	5076	5076	5076	5076	5076	5076	5076
Products regulated only for (networked) standby										
SB Radios	26	26	26	26	26	26	26	26	26	26
SB Electric toothbrushes	33	33	33	33	33	33	33	33	33	33
SB Audio speakers (wired)	144	144	144	144	144	144	144	144	144	144
SB Audio speakers (wireless)	126	126	126	126	126	126	126	126	126	126
SB Small appliances	44	44	44	44	44	44	44	44	44	44
SB Media boxes /sticks	53	53	53	53	53	53	53	53	53	53
SB Media players and recorders	82	82	82	82	82	82	82	82	82	82
SB Projectors	415	415	415	415	415	415	415	415	415	415
SB Home phones	58	58	58	58	58	58	58	58	58	58
SB Office phones	58	58	58	58	58	58	58	58	58	58
SB Home NAS	276	276	276	276	276	276	276	276	276	276
SB Home Network Equipment	125	125	125	125	125	125	125	125	125	125
SB Office Network Equipment	125	125	125	125	125	125	125	125	125	125
SB Coffee makers	44	44	44	44	44	44	44	44	44	44
Products regulated also for (networked) standby										
(already accounted elsewhere; here for info only)	**not used for SB, see main accounting for the product group**									
EPS ≤ 6W, low-V	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.0
EPS 6–10 W	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4	8.4
EPS 10–12 W	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5	12.5
EPS 15–20 W	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8	8.8
EPS 20–30 W	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7	14.7
EPS 30–65 W, multiple-V	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5	19.5
EPS 30-65 W	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9	27.9
EPS 65–120 W	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9	30.9
EPS 65–120 W, multiple-V	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7	41.7
EPS 12–15 W	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4	14.4
RF Household refrigerator and freezer	479	479	479	479	479	479	479	479	479	479
CF open vertical chilled multi deck (RCV2)	4377	4377	4377	4377	4377	4377	4377	4377	4377	4377
CF open horizontal frozen island (RHF4)	5002	5002	5002	5002	5002	5002	5002	5002	5002	5002
CF other supermarket display (non-BCs)	2709	2709	2709	2709	2709	2709	2709	2709	2709	2709
CF Plug in one door beverage cooler	944	944	944	944	944	944	944	944	944	944
CF Plug in horizontal ice cream freezer	909	909	909	909	909	909	909	909	909	909
CF Spiral vending machine	3979	3979	3979	3979	3979	3979	3979	3979	3979	3979
PF Storage cabinet Chilled Vertical (CV)	1660	1660	1660	1660	1660	1660	1660	1660	1660	1660
PF Storage cabinet Frozen Vertical (FV)	1960	1960	1960	1960	1960	1960	1960	1960	1960	1960
PF Storage cabinet Chilled Horizontal (CH)	796	796	796	796	796	796	796	796	796	796
PF Storage cabinet Frozen Horizontal (FH)	1364	1364	1364	1364	1364	1364	1364	1364	1364	1364
PF Storage cabinets All types	**1517**	**1517**	**1517**	**1517**	**1517**	**1517**	**1517**	**1517**	**1517**	**1517**
PF Process Chiller AC MT S ≤ 300 kW	31831	31831	31831	31831	31831	31831	31831	31831	31831	31831
PF Process Chiller AC MT L > 300 kW	102315	102315	102315	102315	102315	102315	102315	102315	102315	102315
PF Process Chiller AC LT S ≤ 200 kW	35242	35242	35242	35242	35242	35242	35242	35242	35242	35242
PF Process Chiller AC LT L > 200 kW	106863	106863	106863	106863	106863	106863	106863	106863	106863	106863
PF Process Chiller WC MT S ≤ 300 kW	47747	47747	47747	47747	47747	47747	47747	47747	47747	47747
PF Process Chiller WC MT L > 300 kW	153473	153473	153473	153473	153473	153473	153473	153473	153473	153473
PF Process Chiller WC LT S ≤ 200 kW	52863	52863	52863	52863	52863	52863	52863	52863	52863	52863
PF Process Chiller WC LT L > 200 kW	160294	160294	160294	160294	160294	160294	160294	160294	160294	160294
PF Process Chiller All MT&LT	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Condensing Unit MT S 0.2-1 kW	568	568	568	568	568	568	568	568	568	568
PF Condensing Unit MT M 1-5 kW	2046	2046	2046	2046	2046	2046	2046	2046	2046	2046
PF Condensing Unit MT L 5-20 kW	4206	4206	4206	4206	4206	4206	4206	4206	4206	4206
PF Condensing Unit MT XL 20-50 kW	9663	9663	9663	9663	9663	9663	9663	9663	9663	9663
PF Condensing Unit LT S 0.1-0.4 kW	682	682	682	682	682	682	682	682	682	682
PF Condensing Unit LT M 0.4-2 kW	909	909	909	909	909	909	909	909	909	909
PF Condensing Unit LT L 2-8 kW	4888	4888	4888	4888	4888	4888	4888	4888	4888	4888
PF Condensing Unit LT XL 8-20 kW	8526	8526	8526	8526	8526	8526	8526	8526	8526	8526
PF Condensing Unit, All MT&LT	**2087**	**2087**	**2087**	**2087**	**2087**	**2087**	**2087**	**2087**	**2087**	**2087**
CA Electric Hobs	400	575	567	566	563	560	555	550	544	537
CA Electric Ovens	594	648	654	625	597	594	594	594	594	594
CA Gas Hobs	316	325	311	298	289	289	289	289	289	289
CA Gas Ovens	301	390	394	386	379	372	366	358	351	344
CA Range Hoods	241	241	241	241	241	241	241	241	241	241
WM Washing Machines	510	512	512	510	510	510	510	510	510	510
WD Washer-Dryers	940	940	940	940	940	940	940	940	940	940
DW Household Dishwasher	615	615	615	615	615	615	615	615	615	615
LD condensing heat pump	955	955	847	746	710	676	643	612	598	598
LD condensing electric heat element	396	396	434	475	452	430	409	396	396	396
LD vented electric	346	346	352	374	356	346	346	346	346	346
LD vented gas	558	558	558	558	558	558	558	558	558	558
VC Cylinder Domestic mains	141	125	117	117	117	117	117	117	117	117
VC Upright Domestic mains	222	194	179	169	169	169	169	169	169	169
VC Handstick Domestic mains	120	105	94	90	90	90	90	90	90	90
VC Cylinder Commercial mains	320	285	265	265	265	265	265	265	265	265
VC Upright Commercial mains	320	285	265	265	265	265	265	265	265	265
VC Cordless - domestic	229	204	238	234	234	234	234	234	234	234
VC Cordless - commercial	191	170	198	195	195	195	195	195	195	195
VC Robot - domestic	341	305	335	365	365	365	365	365	365	365
VC Robot - commercial	284	254	279	304	304	304	304	304	304	304
FAN Axial<300Pa [247 W flow out]	284	284	284	284	284	284	284	284	284	284
FAN Axial>300Pa [489 W fluid-dyn out]	369	369	369	369	369	369	369	369	369	369
FAN Centr.FC [141 W flow out]	455	455	455	455	455	455	455	455	455	455
FAN Centr.BC-free [2120 W flow out]	875	875	875	875	875	875	875	875	875	875
FAN Centr.BC [2052 W flow out]	1876	1876	1876	1876	1876	1876	1876	1876	1876	1876
FAN Cross-flow [31 W flow out]	369	369	369	369	369	369	369	369	369	369
Medium (S) 3-ph 0.75-7.5 kW no VSD	136	161	156	152	149	145	141	137	136	136
Medium (M) 3-ph 7.5-75 kW no VSD	541	640	624	611	599	585	572	559	545	541
Medium (L) 3-ph 75-375 kW no VSD	4974	5881	5738	5620	5500	5379	5256	5133	5009	4974
Medium (S) 3-ph 0.75-7.5 kW with VSD	566	653	635	613	592	575	571	567	566	566
Medium (M) 3-ph 7.5-75 kW with VSD	2275	2626	2558	2471	2386	2320	2306	2293	2280	2275
Medium (L) 3-ph 75-375 kW with VSD	13138	15232	14842	14374	13917	13544	13421	13298	13174	13138
Small 1 ph 0.12-0.75 kW no VSD	38	53	54	54	53	53	52	51	51	50
Small 1 ph 0.12-0.75 kW with VSD	345	382	373	362	360	360	359	358	358	357
Small 3 ph 0.12-0.75 kW no VSD	77	97	97	96	94	92	90	88	87	85
Small 3 ph 0.12-0.75 kW with VSD	384	427	416	403	401	399	397	395	394	392
Large 3-ph LV 375-1000 kW no VSD	21088	25924	26262	26511	26635	26649	25851	25068	24301	23550
Large 3-ph LV 375-1000kW with VSD	84309	92910	90892	89732	89856	89869	89071	88289	87522	86771
Explosion motors (S) 3-ph 0.75-7.5 kW	205	241	234	229	223	217	212	206	205	205
Explosion motors (M) 3-ph 7.5-75 kW	812	960	936	917	898	878	858	838	818	812
Explosion motors (L) 3-ph 75-375 kW	7460	8822	8607	8430	8251	8069	7885	7700	7514	7460
Brake motors (S) 3-ph 0.75-7.5 kW	205	241	234	229	223	217	212	206	205	205
Brake motors (M) 3-ph 7.5-75 kW	812	960	936	917	898	878	858	838	818	812
Brake motors (L) 3-ph 75-375 kW	7460	8822	8607	8430	8251	8069	7885	7700	7514	7460
8-pole motors (S) 3-ph 0.75-7.5 kW	218	257	250	244	238	232	226	220	218	218
8-pole motors (M) 3-ph 7.5-75 kW	866	1024	999	978	958	937	915	894	873	866
8-pole motors (L) 3-ph 75-375 kW	7958	9410	9181	8992	8801	8606	8410	8213	8015	7958
1-phase motors >0.75 kW (no VSD)	150	177	172	168	164	159	155	151	150	150

UNIT PRICE BAU (in euro 2020, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	3974	3974	3974	3974	3974	3974	3974	3974	3974	3974
ESOB<45_CF	3974	3974	3974	3974	3974	3974	3974	3974	3974	3974
ESOB<45_VSD-VF	4280	4280	4280	4280	4280	4280	4280	4280	4280	4280
ESOB_45-150_VF	9415	9415	9415	9415	9415	9415	9415	9415	9415	9415
ESOB_45-150_CF	9415	9415	9415	9415	9415	9415	9415	9415	9415	9415
ESOB_45-150_VSD-VF	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650
ESCC<45_VF	4080	4080	4080	4080	4080	4080	4080	4080	4080	4080
ESCC<45_CF	4080	4080	4080	4080	4080	4080	4080	4080	4080	4080
ESCC<45_VSD-VF	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386
ESCC_45-150_VF	14458	14458	14458	14458	14458	14458	14458	14458	14458	14458
ESCC_45-150_CF	14458	14458	14458	14458	14458	14458	14458	14458	14458	14458
ESCC_45-150_VSD-VF	15694	15694	15694	15694	15694	15694	15694	15694	15694	15694
ESCCi<45_VF	4493	4493	4493	4493	4493	4493	4493	4493	4493	4493
ESCCi<45_CF	4493	4493	4493	4493	4493	4493	4493	4493	4493	4493
ESCCi<45_VSD-VF	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799
ESCCi_45-150_VF	14458	14458	14458	14458	14458	14458	14458	14458	14458	14458
ESCCi_45-150_CF	14458	14458	14458	14458	14458	14458	14458	14458	14458	14458
ESCCi_45-150_VSD-VF	15694	15694	15694	15694	15694	15694	15694	15694	15694	15694
MSSB<6"_VF	2915	2915	2915	2915	2915	2915	2915	2915	2915	2915
MSSB<6"_CF	2915	2915	2915	2915	2915	2915	2915	2915	2915	2915
MSSB<6"_VSD-VF	3221	3221	3221	3221	3221	3221	3221	3221	3221	3221
MS-V<25bar_VF	2721	2721	2721	2721	2721	2721	2721	2721	2721	2721
MS-V<25bar_CF	2721	2721	2721	2721	2721	2721	2721	2721	2721	2721
MS-V<25bar_VSD-VF	3027	3027	3027	3027	3027	3027	3027	3027	3027	3027
WE Welding Equipment	1094	1094	1094	1094	1094	1094	1094	1094	1094	1094
TRAFO Distribution, kWh/a	8785	8785	8785	8785	8785	8785	8785	8785	8785	8785
TRAFO Industry oil	15154	15154	15154	15154	15154	15154	15154	15154	15154	15154
TRAFO Industry dry	37971	37971	37971	37971	37971	37971	37971	37971	37971	37971
TRAFO Power	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727
TRAFO DER oil	25309	25309	25309	25309	25309	25309	25309	25309	25309	25309
TRAFO DER dry	39099	39099	39099	39099	39099	39099	39099	39099	39099	39099
TRAFO Small	1599	1599	1599	1599	1599	1599	1599	1599	1599	1599
Tyres C1, replacement for cars	70	78	88	90	92	94	94	94	94	94
Tyres C1, OEM for cars	70	78	88	90	92	94	94	94	94	94
Tyres C2, replacement for vans	94	98	102	103	104	105	105	105	105	105
Tyres C2, OEM for vans	94	98	102	103	104	105	105	105	105	105
Tyres C3, replacement for trucks/busses	322	322	347	396	409	422	422	422	422	422
Tyres C3, OEM for trucks/busses	322	322	347	396	409	422	422	422	422	422

LS, BAU, Basic LED price curves from MELISA in 2015 euros/klm (see LoadNotes for corresponding efficiency curves)										
replacing LFL, HID, CFLni in non-res. (High-End)		56.0	30.0	17.5	9.2	7.1	7.0	7.0	7.0	7.0
other NDLS LED light sources (Low-End)		56.0	30.0	9.4	5.6	4.2	4.0	4.0	4.0	4.0
other DLS LED light sources (Low-End)		70.0	37.5	11.8	7.0	5.3	5.0	5.0	5.0	5.0

VSD price information for calculation of prices for motor+VSD										
VSD - Very Small 0.12 - 0.75 kW 1-phase	307	329	319	308	307	307	307	307	307	307
VSD - Very Small 0.12 - 0.75 kW 3-phase	307	329	319	308	307	307	307	307	307	307
VSD - Small 0.75 - 7.5 kW 3-phase	430	492	479	461	443	430	430	430	430	430
VSD - Medium 7.5 - 75kW 3-phase	1734	1986	1934	1859	1788	1734	1734	1734	1734	1734
VSD - Large 75 - 375kW 3-phase	8165	9351	9104	8754	8417	8165	8165	8165	8165	8165
VSD - Very Large 375 - 1,000kW 3-phase	63221	66986	64630	63221	63221	63221	63221	63221	63221	63221

UNIT PRICE ECO (in euro 2020, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	324	324	324	324	324	324	324	324	324	324
EIWH Electric Instant. ≥ 12 kW (primary)	512	512	512	512	512	512	512	512	512	512
EIWHS Electric Instant. Shower (secondary)	512	512	512	512	512	512	512	512	512	512
ESWH Electric Storage ≤ 30 L (secondary)	202	202	202	202	202	202	202	202	202	202
ESWH Electric Storage > 30 L (primary)	552	552	552	552	552	552	552	552	552	552
GIWH Gas Instant. < 13 L/min (secondary)	446	446	446	446	446	446	446	446	446	446
GIWH Gas Instant. ≥ 13 L/min (primary)	797	797	797	797	797	797	797	797	797	797
GSWH Gas Storage, Condensing	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195
GSWH Gas Storage, Non-condensing	1195	1195	1195	1195	1195	1195	1195	1195	1195	1195
Dedicated WH Heat Pump	3210	3210	3210	3210	3210	3210	3210	3210	3210	3210
Dedicated WH Solar (3.5 m2)	2577	2577	2577	2577	2577	2577	2577	2577	2577	2577
CHB Gas Combi Instant. WH	428	428	428	428	428	428	428	428	428	428
CHB Gas + Cyl. WH	686	686	686	686	686	686	686	686	686	686
CHB Jet Burner Gas + Cyl. WH	2168	2168	2168	2168	2168	2168	2168	2168	2168	2168
CHB Jet Burner Oil + Cyl. WH	2168	2168	2168	2168	2168	2168	2168	2168	2168	2168
CHB Electric (Joule) + Cyl. WH	433	433	433	433	433	433	433	433	433	433
CHB Hybrid Gas/Electric WH	1663	1663	1663	1663	1663	1663	1663	1663	1663	1663
CHB Electric HP + Cyl. WH	1979	1979	1979	1979	1979	1979	1979	1979	1979	1979
CHB Gas HP + Cyl. WH	2756	2756	2756	2756	2756	2756	2756	2756	2756	2756
CHB Gas mCHP + Cyl. WH	5633	5633	5633	5633	5633	5633	5633	5633	5633	5633
CHB Solar Combi (16 m2)	2378	2378	2378	2378	2378	2378	2378	2378	2378	2378
CHB Gas non-condensing	1898	1898	1898	1898	1898	1898	1898	1898	1898	1898
CHB Gas condensing	4213	3299	2538	2385	2385	2385	2385	2385	2385	2385
CHB Gas Jet burner non-condensing	10634	10634	10634	10634	10634	10634	10634	10634	10634	10634
CHB Gas Jet burner condensing	11647	11647	11647	11647	11647	11647	11647	11647	11647	11647
CHB Oil Jet burner non-condensing	10634	10634	10634	10634	10634	10634	10634	10634	10634	10634
CHB Oil Jet burner condensing	11647	11647	11647	11647	11647	11647	11647	11647	11647	11647
CHB Electric Joule-effect	2223	2223	2223	2223	2223	2223	2223	2223	2223	2223
CHB Hybrid (gas-electric)	8545	8545	8545	8545	8545	8545	8545	8545	8545	8545
CHB Electric Heat Pump	10168	10168	10168	10168	10168	10168	10168	10168	10168	10168
CHB Gas Heat Pump	14159	14159	14159	14159	14159	14159	14159	14159	14159	14159
CHB micro CHP	28943	28943	28943	28943	28943	28943	28943	28943	28943	28943
CHB Solar combi (16 m2)	12218	12218	12218	12218	12218	12218	12218	12218	12218	12218
SFB Wood Manual [18 kW]	5116	5116	7165	9872	9934	9609	9295	8992	8698	8414
SFB Wood Direct Draft [20 kW]	7389	7389	7579	7997	9789	9421	9067	8727	8398	8083
SFB Coal [25 kW]	6253	6253	6253	6253	6253	6253	6253	6253	6253	6253
SFB Pellets [25 kW]	9095	9095	9100	9097	9468	9121	9095	9095	9095	9095
SFB Wood chips [160 kW]	38084	38084	39916	40642	38870	38084	38084	38084	38084	38084
Cooling:										
CHAE-S (≤ 400 kW)	19670	19677	19670	19670	19670	19670	19670	19670	19670	19670
CHAE-L (> 400 kW)	47873	47893	47873	47873	47873	47873	47873	47873	47873	47873
CHWE-S (≤ 400 kW)	15893	15893	15893	15893	15893	15893	15893	15893	15893	15893
CHWE-M (> 400 kW; ≤ 1500 kW)	70060	70109	70060	70060	70060	70060	70060	70060	70060	70060
CHWE-L (> 1500 kW)	125437	125524	125437	125437	125437	125437	125437	125437	125437	125437
CHF	17164	17164	17385	19850	19278	18517	17713	17164	17164	17164
HT PCH-AE-S	21498	21498	21498	21498	21498	21498	21498	21498	21498	21498
HT PCH-AE-L	54413	54413	54413	54413	54413	54413	54413	54413	54413	54413
HT PCH-WE-S	18210	18210	18210	18210	18210	18210	18210	18210	18210	18210
HT PCH-WE-M	85593	85593	85593	85593	85593	85593	85593	85593	85593	85593
HT PCH-WE-L	182512	182512	182512	182512	182512	182512	182512	182512	182512	182512
AC rooftop	21829	21829	21829	21829	21829	21829	21829	21829	21829	21829
AC splits	3734	3734	3734	3734	3734	3734	3734	3734	3734	3734
AC VRF	34982	34982	34982	34982	34982	34982	34982	34982	34982	34982
ACF	17164	17164	17385	19850	19441	18867	18046	17263	17164	17164
Heating:										
AC rooftop (rev)	21626	21626	21626	21626	21626	21626	21626	21626	21626	21626
AC splits (rev)	3467	3467	3467	3467	3467	3467	3467	3467	3467	3467
AC VRF (rev)	33929	33929	33929	33929	33929	33929	33929	33929	33929	33929
ACF (rev)	19047	19047	19047	19047	19047	19047	19047	19047	19047	19047
AHF	5885	5885	5885	6450	6499	6387	6106	5885	5885	5885
AHE	568	568	568	568	568	568	568	568	568	568
LH open fireplace [8 kW]	3013	3013	3013	3715	4097	3950	3807	3670	3538	3411
LH closed fireplace/inset [8 kW]	3089	3089	3089	3670	3890	3748	3612	3481	3355	3233
LH wood stove [8 kW]	2862	2862	2862	3439	3654	3511	3374	3242	3115	2993
LH coal stove [8 kW]	2097	2097	2097	2485	2632	2538	2448	2361	2276	2195
LH cooker [10 kW]	3237	3237	3237	3555	3682	3534	3392	3255	3237	3237
LH SHR stove [8 kW]	9044	9044	9044	9095	9065	9044	9044	9044	9044	9044
LH pellet stove [8 kW]	3830	3830	3830	3832	3830	3830	3830	3830	3830	3830

UNIT PRICE ECO (in euro 2020, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	31	31	32	31	31	31	31	31	31	31
LH Electric fixed > 250W	276	278	282	276	276	276	276	276	276	276
LH Electric fixed ≤ 250W	154	155	157	154	154	154	154	154	154	154
LH Electric storage	653	653	767	856	826	796	763	731	700	671
LH Electric underfloor	298	298	309	309	301	298	298	298	298	298
LH Electric visibly glowing > 1.2 kW	70	70	70	70	70	70	70	70	70	70
LH Electric visibly glowing ≤ 1.2 kW	47	47	47	47	47	47	47	47	47	47
LH Electric Towel Heaters	264	264	264	264	264	264	264	264	264	264
LH Gas luminous (commercial)	1298	1350	1501	1696	1629	1565	1504	1444	1388	1333
LH Gaseous Tube (commercial < 120 kW)	1438	1488	1673	1920	1845	1772	1703	1636	1571	1510
LH Gas open front	1222	1222	1236	1222	1222	1222	1222	1222	1222	1222
LH Gas closed front	2344	2344	2438	2496	2411	2344	2344	2344	2344	2344
LH Gas balanced flue	1641	1641	1701	1747	1687	1641	1641	1641	1641	1641
LH Gas flueless	357	357	357	357	357	357	357	357	357	357
LH Liquid tube (commercial < 120 kW)	1438	1509	1687	1928	1852	1779	1709	1642	1578	1516
LH Liquid open front	880	880	890	880	880	880	880	880	880	880
LH Liquid closed front	2344	2344	2438	2496	2411	2344	2344	2344	2344	2344
LH Liquid balanced flue	1562	1562	1620	1663	1606	1562	1562	1562	1562	1562
LH Liquid flueless	296	296	296	296	296	296	296	296	296	296
RAC fixed < 6 kW, cooling	1271	1697	1709	1595	1487	1386	1290	1271	1271	1271
RAC fixed 6-12 kW, cooling	1731	2854	3040	2826	2625	2437	2262	2097	1944	1801
RAC portable < 12 kW, cooling	273	368	364	337	312	288	273	273	273	273
RAC fixed < 6 kW, reversible, heating	1271	1697	1709	1595	1487	1386	1290	1271	1271	1271
RAC fixed 6-12 kW, reversible, heating	1731	2854	3040	2826	2625	2437	2262	2097	1944	1801
RAC portable < 12 kW, reversible, heating	273	368	364	337	312	288	273	273	273	273
CIRC Integrated circulators	312	322	345	333	318	312	312	312	312	312
CIRC Large standalone circulators	699	934	1649	1604	1535	1473	1402	1334	1269	1207
CIRC Small standalone circulators	312	339	415	398	379	362	344	327	312	312
R-UVU ≤ 100 m3/h for Extract Spaces	224	224	275	319	308	298	289	280	272	263
o/w purchase price (excl. installation)	*150*	*150*	*195*	*234*	*224*	*214*	*204*	*196*	*187*	*179*
o/w installation material costs	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
o/w installation labour costs	*74*	*74*	*79*	*85*	*85*	*85*	*85*	*85*	*85*	*85*
R-UVU ≤ 100 m3/h for Habitable Spaces	224	224	275	319	310	301	293	285	277	270
o/w purchase price (excl. installation)	*150*	*150*	*195*	*234*	*225*	*217*	*208*	*200*	*193*	*186*
o/w installation material costs	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
o/w installation labour costs	*74*	*74*	*79*	*85*	*85*	*85*	*85*	*85*	*85*	*85*
R-BVU ≤ 100 m3/h for Habitable Spaces	791	766	815	854	848	823	805	758	741	740
o/w purchase price (excl. installation)	*511*	*511*	*560*	*594*	*570*	*546*	*537*	*537*	*537*	*537*
o/w installation material costs	*133*	*115*	*112*	*112*	*125*	*125*	*118*	*87*	*75*	*74*
o/w installation labour costs	*146*	*139*	*142*	*147*	*153*	*153*	*150*	*135*	*130*	*129*
R-UVU 100-250 m3/h	736	986	1026	1100	1048	1091	1083	1072	1143	1167
o/w purchase price (excl. installation)	*254*	*381*	*505*	*617*	*605*	*593*	*581*	*569*	*557*	*546*
o/w installation material costs	*260*	*321*	*250*	*220*	*184*	*206*	*205*	*201*	*239*	*254*
o/w installation labour costs	*222*	*284*	*271*	*263*	*259*	*292*	*298*	*302*	*347*	*367*
R-BVU 100-250 m3/h	3692	3556	3566	3677	4059	4107	4077	3482	3277	3295
o/w purchase price (excl. installation)	*1439*	*1566*	*1677*	*1757*	*1706*	*1657*	*1624*	*1624*	*1624*	*1624*
o/w installation material costs	*799*	*626*	*587*	*577*	*683*	*692*	*679*	*497*	*433*	*435*
o/w installation labour costs	*1454*	*1364*	*1303*	*1344*	*1670*	*1759*	*1774*	*1360*	*1220*	*1235*
R-UVU 250-1000 m3/h	1034	1220	1172	1185	1123	1201	1215	1220	1350	1406
o/w purchase price (excl. installation)	*315*	*315*	*396*	*469*	*466*	*463*	*469*	*474*	*479*	*483*
o/w installation material costs	*390*	*482*	*376*	*331*	*277*	*309*	*307*	*302*	*358*	*381*
o/w installation labour costs	*329*	*423*	*401*	*385*	*380*	*430*	*439*	*444*	*512*	*541*
R-BVU 250-1000 m3/h	5442	5040	4950	5025	5618	5765	5768	4870	4561	4588
o/w purchase price (excl. installation)	*2062*	*2062*	*2131*	*2166*	*2108*	*2108*	*2108*	*2108*	*2108*	*2108*
o/w installation material costs	*1198*	*939*	*880*	*865*	*1025*	*1038*	*1018*	*746*	*649*	*653*
o/w installation labour costs	*2182*	*2038*	*1939*	*1994*	*2485*	*2619*	*2642*	*2016*	*1804*	*1827*
R-UVU > 1000 m3/h	5906	3096	2747	2599	2219	2196	2089	2015	1938	1848
o/w purchase price (excl. installation)	*673*	*673*	*784*	*885*	*878*	*872*	*875*	*878*	*881*	*883*
o/w installation material costs	*1963*	*838*	*655*	*545*	*392*	*381*	*339*	*309*	*279*	*244*
o/w installation labour costs	*3270*	*1585*	*1308*	*1169*	*948*	*943*	*875*	*827*	*778*	*721*
R-BVU 1000-2500 m3/h	5711	27768	24730	23002	20351	19838	19056	18336	17423	17098
o/w purchase price (excl. installation)	*5711*	*5711*	*5834*	*5905*	*5799*	*5788*	*5788*	*5788*	*5788*	*5788*
o/w installation material costs	*0*	*8396*	*7026*	*6202*	*5083*	*4830*	*4496*	*4187*	*3796*	*3658*
o/w installation labour costs	*0*	*13661*	*11870*	*10895*	*9468*	*9220*	*8773*	*8360*	*7838*	*7652*

UNIT PRICE ECO (in euro 2020, incl VAT & Install	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
NR-UVU 250-1000 m3/h	1408	817	788	802	723	719	700	687	674	657
o/w purchase price (excl. installation)	*262*	*262*	*330*	*391*	*388*	*386*	*391*	*395*	*399*	*403*
o/w installation material costs	*588*	*251*	*196*	*163*	*117*	*114*	*101*	*93*	*84*	*73*
o/w installation labour costs	*558*	*304*	*261*	*247*	*217*	*219*	*207*	*199*	*191*	*181*
NR-BVU 250-1000 m3/h	1719	4529	4144	3948	3552	3504	3392	3288	3158	3111
o/w purchase price (excl. installation)	*1719*	*1719*	*1776*	*1805*	*1757*	*1757*	*1757*	*1757*	*1757*	*1757*
o/w installation material costs	*0*	*858*	*718*	*634*	*519*	*493*	*459*	*428*	*388*	*374*
o/w installation labour costs	*0*	*1952*	*1650*	*1509*	*1276*	*1253*	*1176*	*1104*	*1013*	*981*
NR-UVU > 1000 m3/h	4921	2580	2289	2166	1849	1830	1740	1679	1615	1540
o/w purchase price (excl. installation)	*561*	*561*	*653*	*738*	*732*	*726*	*729*	*732*	*734*	*736*
o/w installation material costs	*1636*	*699*	*546*	*454*	*327*	*317*	*282*	*258*	*233*	*203*
o/w installation labour costs	*2725*	*1321*	*1090*	*974*	*790*	*786*	*729*	*689*	*649*	*601*
NR-BVU 1000-2500 m3/h	4759	23140	20608	19169	16959	16532	15880	15280	14519	14249
o/w purchase price (excl. installation)	*4759*	*4759*	*4861*	*4921*	*4833*	*4824*	*4824*	*4824*	*4824*	*4824*
o/w installation material costs	*0*	*6997*	*5855*	*5169*	*4236*	*4025*	*3746*	*3489*	*3163*	*3048*
o/w installation labour costs	*0*	*11384*	*9891*	*9079*	*7890*	*7683*	*7310*	*6967*	*6532*	*6377*
NR-AHU-S 2500-5500 m3/h	91141	95074	88331	77078	63294	58053	52962	51448	48414	44818
o/w purchase price (excl. installation)	*7670*	*8358*	*9994*	*11497*	*11298*	*11102*	*10921*	*10743*	*10567*	*10394*
o/w installation material costs	*31602*	*32878*	*29613*	*24459*	*19084*	*16998*	*15098*	*14583*	*13478*	*12153*
o/w installation labour costs	*51870*	*53839*	*48724*	*41122*	*32912*	*29953*	*26943*	*26122*	*24369*	*22271*
NR-AHU-M 5500-14500 m3/h	59161	95495	99385	96062	82054	81801	79226	79589	76714	73926
o/w purchase price (excl. installation)	*9994*	*11587*	*13851*	*15931*	*15659*	*15392*	*15150*	*14911*	*14676*	*14444*
o/w installation material costs	*17152*	*30629*	*31291*	*29036*	*23661*	*23507*	*22619*	*22854*	*21849*	*20875*
o/w installation labour costs	*32014*	*53280*	*54243*	*51095*	*42733*	*42902*	*41457*	*41824*	*40190*	*38607*
NR-AHU-L > 14500 m3/h	167131	279894	289760	277118	233336	232824	224981	226380	217591	209070
o/w purchase price (excl. installation)	*18656*	*22090*	*26836*	*31216*	*30668*	*30130*	*29627*	*29133*	*28646*	*28168*
o/w installation material costs	*53592*	*95701*	*97769*	*90724*	*73930*	*73448*	*70672*	*71407*	*68266*	*65223*
o/w installation labour costs	*94883*	*162104*	*165155*	*155178*	*128739*	*129247*	*124682*	*125841*	*120679*	*115679*
LS, prices for light source and control gear, excl. additional luminaire costs										
LFL (T12,T8h,T8t,T5,other)	15	15	15	15	15	15	15	14	14	15
HID (HPM, HPS, MH)	33	37	38	38	38	38	38	38	38	38
CFLni (all shapes)	9	9	10	10	9	9	8	6	6	6
CFLi (retrofit for GLS, HL)	6	6	6	6	6	6	6	6	6	6
GLS (DLS & NDLS)	1	1	1	1	1	1	1	1	1	1
HL (DLS & NDLS, LV & MV)	4	4	4	4	4	3	3	3	3	3
LED replacing LFL (retrofit & luminaire)		161	91	50	37	33	32	32	33	33
LED replacing HID (retrofit & luminaire)		530	305	197	146	134	136	136	136	136
LED replacing CFLni (retrofit & luminaire)			23	14	11	11	11	12	12	11
LED replacing DLS (retrofit & luminaire)		32	14	7	8	6	6	6	6	6
LED replacing NDLS (retrofit & luminaire)		42	16	6	7	6	6	6	6	6
DP TV all types	842	474	474	474	474	474	474	474	474	474
DP Monitor	211	179	179	179	179	179	179	179	179	179
DP Signage	1684	947	947	947	947	947	947	947	947	947
SSTB	57	57	57	57	57	57	57	57	57	57
CSTB	171	171	171	171	171	171	171	171	171	171
Game consoles > 20 W	418	418	418	418	418	418	418	418	418	418
Game consoles < 20 W	294	294	294	294	294	294	294	294	294	294
ES tower 1-socket traditional	1263	1263	1263	1263	1263	1263	1263	1263	1263	1263
ES rack 1-socket traditional	1053	1053	1053	1053	1053	1053	1053	1053	1053	1053
ES rack 2-socket traditional	3158	3158	3158	3158	3158	3158	3158	3158	3158	3158
ES rack 2-socket cloud	4211	4211	4211	4211	4211	4211	4211	4211	4211	4211
ES rack 4-socket traditional	29476	29476	29476	29476	29476	29476	29476	29476	29476	29476
ES rack 4-socket cloud	34740	34740	34740	34740	34740	34740	34740	34740	34740	34740
ES rack 2-socket resilient trad.	36845	36845	36845	36845	36845	36845	36845	36845	36845	36845
ES rack 2-socket resilient cloud	37898	37898	37898	37898	37898	37898	37898	37898	37898	37898
ES rack 4-socket resilient trad.	38951	38951	38951	38951	38951	38951	38951	38951	38951	38951
ES rack 4-socket resilient cloud	40004	40004	40004	40004	40004	40004	40004	40004	40004	40004
ES blade 1-socket traditional	368	368	368	368	368	368	368	368	368	368
ES blade 2-socket traditional	3158	3158	3158	3158	3158	3158	3158	3158	3158	3158
ES blade 2-socket cloud	4211	4211	4211	4211	4211	4211	4211	4211	4211	4211
ES blade 4-socket traditional	6316	6316	6316	6316	6316	6316	6316	6316	6316	6316
ES blade 4-socket cloud	7369	7369	7369	7369	7369	7369	7369	7369	7369	7369
DS Online 2	21054	21054	21054	21054	21054	21054	21054	21054	21054	21054
DS Online 3	52636	52636	52636	52636	52636	52636	52636	52636	52636	52636
DS Online 4	168434	168434	168434	168434	168434	168434	168434	168434	168434	168434

UNIT PRICE ECO (in euro 2020, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	782	782	782	782	782	782	782	782	782	782
PC Integrated Desktop	836	836	836	836	836	836	836	836	836	836
PC Notebook	1078	1078	1078	1078	1078	1078	1078	1078	1078	1078
PC Tablet/slate	715	715	715	715	715	715	715	715	715	715
PC Thin client	636	636	636	636	636	636	636	636	636	636
PC Integrated Thin Client	497	497	497	497	497	497	497	497	497	497
PC Small-scale Server	1586	1586	1586	1586	1586	1586	1586	1586	1586	1586
PC Workstation	2814	2814	2814	2814	2814	2814	2814	2814	2814	2814
Inkjet Printer	106	106	140	161	161	161	161	161	161	161
Inkjet MFD	159	159	102	67	67	67	67	67	67	67
EP / Laser Printer mono	228	228	387	482	482	482	482	482	482	482
EP / Laser Printer colour	571	571	553	543	543	543	543	543	543	543
EP / Laser Copier mono	1713	1713	1713	1713	1713	1713	1713	1713	1713	1713
EP / Laser Copier colour	2855	2855	2855	2855	2855	2855	2855	2855	2855	2855
EP / Laser MFD mono	801	801	801	801	801	801	801	801	801	801
EP / Laser MFD colour	5076	5076	5076	5076	5076	5076	5076	5076	5076	5076
Products regulated only for (networked) standby										
SB Radios	26	26	26	26	26	26	26	26	26	26
SB Electric toothbrushes	33	33	33	33	33	33	33	33	33	33
SB Audio speakers (wired)	144	144	144	144	144	144	144	144	144	144
SB Audio speakers (wireless)	126	126	126	126	126	126	126	126	126	126
SB Small appliances	44	44	44	44	44	44	44	44	44	44
SB Media boxes /sticks	53	53	53	53	53	53	53	53	53	53
SB Media players and recorders	82	82	82	82	82	82	82	82	82	82
SB Projectors	415	415	415	415	415	415	415	415	415	415
SB Home phones	58	58	58	58	58	58	58	58	58	58
SB Office phones	58	58	58	58	58	58	58	58	58	58
SB Home NAS	276	276	276	276	276	276	276	276	276	276
SB Home Network Equipment	125	125	125	125	125	125	125	125	125	125
SB Office Network Equipment	125	125	125	125	125	125	125	125	125	125
SB Coffee makers	44	44	44	44	44	44	44	44	44	44
Products regulated also for (networked) standby										
(already accounted elsewhere; here for info only)	**not used for SB, see main accounting for the product group**									
<u>EPS Active mode (for electricity losses)</u>										
EPS ≤ 6W, low-V	4.05	4.16	4.71	5.23	5.15	5.08	4.95	4.83	4.71	4.60
EPS 6–10 W	8.37	8.40	8.39	8.37	8.37	8.37	8.37	8.37	8.37	8.37
EPS 10–12 W	12.49	12.54	12.52	12.53	12.49	12.49	12.49	12.49	12.49	12.49
EPS 15–20 W	8.75	8.82	9.02	9.49	9.28	9.08	8.86	8.75	8.75	8.75
EPS 20–30 W	14.68	14.91	15.88	16.28	15.89	15.51	15.13	14.76	14.68	14.68
EPS 30–65 W, multiple-V	19.49	19.49	19.49	19.49	19.49	19.49	19.49	19.49	19.49	19.49
EPS 30-65 W	27.91	28.14	28.83	28.74	28.05	27.91	27.91	27.91	27.91	27.91
EPS 65–120 W	30.88	31.03	31.16	31.60	30.88	30.88	30.88	30.88	30.88	30.88
EPS 65–120 W, multiple-V	41.74	41.74	41.74	41.74	41.74	41.74	41.74	41.74	41.74	41.74
EPS 12–15 W	14.44	14.47	14.44	14.44	14.44	14.44	14.44	14.44	14.44	14.44
RF Household refrigerator and freezer	479	549	586	601	676	640	690	701	709	715
CF open vertical chilled multi deck (RCV2)	4377	4377	4377	4377	5131	5503	5250	5008	4778	4558
CF open horizontal frozen island (RHF4)	5002	5002	5002	5002	5002	5002	5002	5002	5002	5002
CF other supermarket display (non-BCs)	2709	2709	2709	2709	2709	2709	2709	2709	2709	2709
CF Plug in one door beverage cooler	944	944	944	944	983	968	944	944	944	944
CF Plug in horizontal ice cream freezer	909	909	909	909	909	909	909	909	909	909
CF Spiral vending machine	3979	3979	3979	3979	3979	3979	3979	3979	3979	3979
PF Storage cabinet Chilled Vertical (CV)	1660	1660	1660	1803	1716	1660	1660	1660	1660	1660
PF Storage cabinet Frozen Vertical (FV)	1960	1960	1960	2129	2026	1960	1960	1960	1960	1960
PF Storage cabinet Chilled Horizontal (CH)	796	796	796	864	823	796	796	796	796	796
PF Storage cabinet Frozen Horizontal (FH)	1364	1364	1364	1482	1410	1364	1364	1364	1364	1364
PF Storage cabinets All types	**1517**	**1517**	**1517**	**1648**	**1568**	**1517**	**1517**	**1517**	**1517**	**1517**
PF Process Chiller AC MT S ≤ 300 kW	31831	31831	31831	33139	31831	31831	31831	31831	31831	31831
PF Process Chiller AC MT L > 300 kW	102315	102315	102315	102315	102315	102315	102315	102315	102315	102315
PF Process Chiller AC LT S ≤ 200 kW	35242	35242	35242	36690	35242	35242	35242	35242	35242	35242
PF Process Chiller AC LT L > 200 kW	106863	106863	106863	106863	106863	106863	106863	106863	106863	106863
PF Process Chiller WC MT S ≤ 300 kW	47747	47747	47747	49709	47747	47747	47747	47747	47747	47747
PF Process Chiller WC MT L > 300 kW	153473	153473	153473	153473	153473	153473	153473	153473	153473	153473
PF Process Chiller WC LT S ≤ 200 kW	52863	52863	52863	55035	52863	52863	52863	52863	52863	52863
PF Process Chiller WC LT L > 200 kW	160294	160294	160294	160294	160294	160294	160294	160294	160294	160294
PF Process Chiller All MT&LT	**58396**	**58396**	**58396**	**59412**	**58396**	**58396**	**58396**	**58396**	**58396**	**58396**

UNIT PRICE ECO (in euro 2020, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Condensing Unit MT S 0.2-1 kW	568	568	568	592	568	568	568	568	568	568
PF Condensing Unit MT M 1-5 kW	2046	2046	2046	2112	2046	2046	2046	2046	2046	2046
PF Condensing Unit MT L 5-20 kW	4206	4206	4206	4493	4275	4206	4206	4206	4206	4206
PF Condensing Unit MT XL 20-50 kW	9663	9663	9663	10323	9822	9663	9663	9663	9663	9663
PF Condensing Unit LT S 0.1-0.4 kW	682	682	682	710	682	682	682	682	682	682
PF Condensing Unit LT M 0.4-2 kW	909	909	909	939	909	909	909	909	909	909
PF Condensing Unit LT L 2-8 kW	4888	4888	4888	5222	4969	4888	4888	4888	4888	4888
PF Condensing Unit LT XL 8-20 kW	8526	8526	8526	9108	8666	8526	8526	8526	8526	8526
PF Condensing Unit, All MT&LT	**2087**	**2087**	**2087**	**2205**	**2101**	**2087**	**2087**	**2087**	**2087**	**2087**
CA Electric Hobs	400	575	567	589	586	581	575	569	562	554
CA Electric Ovens	594	648	663	657	627	598	594	594	594	594
CA Gas Hobs	316	325	311	315	301	289	289	289	289	289
CA Gas Ovens	301	390	418	533	519	506	493	479	466	453
CA Range Hoods	241	241	241	300	332	319	306	294	282	270
WM Washing Machines	510	618	629	622	599	570	542	516	510	510
WD Washer-Dryers	940	940	940	940	940	940	940	940	940	940
DW Household Dishwasher	615	817	817	800	779	759	738	718	698	678
LD condensing heat pump	955	955	847	855	819	783	745	709	674	642
LD condensing electric heat element	396	396	445	514	489	465	443	421	401	396
LD vented electric	346	346	362	381	362	346	346	346	346	346
LD vented gas	558	558	558	558	558	558	558	558	558	558
VC Cylinder Domestic mains	141	125	128	119	119	119	119	119	119	119
VC Upright Domestic mains	222	194	207	169	169	169	169	169	169	169
VC Handstick Domestic mains	120	105	99	90	90	91	91	91	91	91
VC Cylinder Commercial mains	320	285	290	318	302	288	273	265	265	265
VC Upright Commercial mains	320	285	290	318	302	288	273	265	265	265
VC Cordless - domestic	229	204	238	234	234	234	234	234	234	234
VC Cordless - commercial	191	170	198	195	195	195	195	195	195	195
VC Robot - domestic	341	305	335	365	365	365	365	365	365	365
VC Robot - commercial	284	254	279	304	304	304	304	304	304	304
FAN Axial<300Pa [247 W flow out]	284	284	354	395	377	361	345	330	315	302
FAN Axial>300Pa [489 W fluid-dyn out]	369	369	369	384	369	369	369	369	369	369
FAN Centr.FC [141 W flow out]	455	455	586	716	683	652	622	594	567	541
FAN Centr.BC-free [2120 W flow out]	875	875	1069	1070	1023	978	935	893	875	875
FAN Centr.BC [2052 W flow out]	1876	1876	2620	2668	2550	2437	2329	2226	2128	2034
FAN Cross-flow [31 W flow out]	369	369	1060	1252	1196	1142	1091	1042	995	950
Medium (S) 3-ph 0.75-7.5 kW no VSD	136	163	179	199	205	199	191	184	176	169
Medium (M) 3-ph 7.5-75 kW no VSD	541	649	725	760	762	734	703	673	645	617
Medium (L) 3-ph 75-375 kW no VSD	4974	5965	6673	6856	7213	6915	6583	6267	5967	5680
Medium (S) 3-ph 0.75-7.5 kW with VSD	566	655	659	664	663	637	621	613	606	599
Medium (M) 3-ph 7.5-75 kW with VSD	2275	2635	2659	2637	2609	2502	2437	2407	2379	2352
Medium (L) 3-ph 75-375 kW with VSD	13138	15316	15776	15694	15908	15240	14748	14432	14131	13845
Small 1 ph 0.12-0.75 kW no VSD	38	53	54	54	68	66	64	62	60	58
Small 1 ph 0.12-0.75 kW with VSD	345	382	373	362	375	373	371	369	367	365
Small 3 ph 0.12-0.75 kW no VSD	77	97	97	100	115	111	107	103	99	96
Small 3 ph 0.12-0.75 kW with VSD	384	427	416	417	440	421	414	410	406	403
Large 3-ph LV 375-1000 kW no VSD	21088	25924	26262	26761	30114	28862	27660	26508	25401	24340
Large 3-ph LV 375-1000kW with VSD	84309	92910	90892	90989	96671	92188	90881	89728	88622	87561
Explosion motors (S) 3-ph 0.75-7.5 kW	205	241	234	237	278	270	260	251	242	233
Explosion motors (M) 3-ph 7.5-75 kW	812	960	936	957	1070	1030	989	950	912	874
Explosion motors (L) 3-ph 75-375 kW	7460	8822	8607	8795	9674	9283	8891	8514	8152	7802
Brake motors (S) 3-ph 0.75-7.5 kW	205	241	234	242	307	297	286	275	264	253
Brake motors (M) 3-ph 7.5-75 kW	812	960	936	984	1140	1098	1053	1008	966	924
Brake motors (L) 3-ph 75-375 kW	7460	8822	8607	9050	10167	9757	9329	8915	8520	8135
8-pole motors (S) 3-ph 0.75-7.5 kW	218	257	250	261	359	349	340	330	321	311
8-pole motors (M) 3-ph 7.5-75 kW	866	1024	999	1055	1225	1177	1130	1085	1042	999
8-pole motors (L) 3-ph 75-375 kW	7958	9410	9181	9793	11139	10695	10268	9858	9464	9068
1-phase motors >0.75 kW (no VSD)	150	177	172	168	183	180	176	173	169	166

UNIT PRICE ECO (in euro 2020, incl VAT & Install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ESOB<45_VF	3974	3974	3986	3974	3974	3974	3974	3974	3974	3974
ESOB<45_CF	3974	3974	3986	3974	3974	3974	3974	3974	3974	3974
ESOB<45_VSD-VF	4280	4280	4280	4280	4280	4280	4280	4280	4280	4280
ESOB_45-150_VF	9415	9415	9485	9437	9415	9415	9415	9415	9415	9415
ESOB_45-150_CF	9415	9415	9485	9437	9415	9415	9415	9415	9415	9415
ESOB_45-150_VSD-VF	10650	10650	10650	10650	10650	10650	10650	10650	10650	10650
ESCC<45_VF	4080	4080	4092	4080	4080	4080	4080	4080	4080	4080
ESCC<45_CF	4080	4080	4092	4080	4080	4080	4080	4080	4080	4080
ESCC<45_VSD-VF	4386	4386	4386	4386	4386	4386	4386	4386	4386	4386
ESCC_45-150_VF	14458	14458	14513	14458	14458	14458	14458	14458	14458	14458
ESCC_45-150_CF	14458	14458	14513	14458	14458	14458	14458	14458	14458	14458
ESCC_45-150_VSD-VF	15694	15694	15694	15694	15694	15694	15694	15694	15694	15694
ESCCi<45_VF	4493	4493	4504	4493	4493	4493	4493	4493	4493	4493
ESCCi<45_CF	4493	4493	4504	4493	4493	4493	4493	4493	4493	4493
ESCCi<45_VSD-VF	4799	4799	4799	4799	4799	4799	4799	4799	4799	4799
ESCCi_45-150_VF	14458	14458	14513	14458	14458	14458	14458	14458	14458	14458
ESCCi_45-150_CF	14458	14458	14513	14458	14458	14458	14458	14458	14458	14458
ESCCi_45-150_VSD-VF	15694	15694	15694	15694	15694	15694	15694	15694	15694	15694
MSSB<6"_VF	2915	2915	2972	2957	2942	2928	2915	2915	2915	2915
MSSB<6"_CF	2915	2915	2972	2969	2967	2952	2937	2923	2915	2915
MSSB<6"_VSD-VF	3221	3221	3221	3239	3222	3221	3221	3221	3221	3221
MS-V<25bar_VF	2721	2721	2737	2724	2721	2721	2721	2721	2721	2721
MS-V<25bar_CF	2721	2721	2737	2728	2721	2721	2721	2721	2721	2721
MS-V<25bar_VSD-VF	3027	3027	3027	3027	3027	3027	3027	3027	3027	3027
WE Welding Equipment	1094	1094	1094	1094	1116	1116	1094	1094	1094	1094
TRAFO Distribution, kWh/a	8785	8785	10852	10852	10852	10852	10852	10852	10852	10852
TRAFO Industry oil	15154	15154	23186	23186	23186	23186	23186	23186	23186	23186
TRAFO Industry dry	37971	37971	51334	51334	51334	51334	51334	51334	51334	51334
TRAFO Power	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727	1031727
TRAFO DER oil	25309	25309	42520	42520	42520	42520	42520	42520	42520	42520
TRAFO DER dry	39099	39099	51221	51221	51221	51221	51221	51221	51221	51221
TRAFO Small	1599	1599	1599	1599	1599	1599	1599	1599	1599	1599
Tyres C1, replacement for cars	70	81	101	110	112	113	113	113	113	113
Tyres C1, OEM for cars	70	78	88	107	112	113	113	113	113	113
Tyres C2, replacement for vans	94	98	106	119	124	125	125	125	125	125
Tyres C2, OEM for vans	94	98	102	107	122	125	125	125	125	125
Tyres C3, replacement for trucks/busses	322	322	505	524	544	546	546	546	546	546
Tyres C3, OEM for trucks/busses	322	322	347	411	544	546	546	546	546	546
LS, ECO, Basic LED price curves from MELISA in 2015 euros/klm (see LoadNotes for corresponding efficiency curves)										
replacing LFL, HID, CFLni in non-residential sector (High-End)		48.0	24.0	13.0	9.1	8.0	8.0	8.0	8.0	8.0
other NDLS LED light sources (Low-End)		48.0	20.0	7.3	7.2	6.2	6.2	6.2	6.2	6.2
other DLS LED light sources (Low-End)		60.0	25.0	9.1	9.4	7.9	7.9	7.9	7.9	7.9
VSD price information for calculation of prices for motor+VSD										
VSD - Very Small 0.12 - 0.75 kW 1-phase	307	329	319	308	307	307	307	307	307	307
VSD - Very Small 0.12 - 0.75 kW 3-phase	307	329	319	318	325	310	307	307	307	307
VSD - Small 0.75 - 7.5 kW 3-phase	430	492	479	465	458	438	430	430	430	430
VSD - Medium 7.5 - 75kW 3-phase	1734	1986	1934	1877	1847	1768	1734	1734	1734	1734
VSD - Large 75 - 375kW 3-phase	8165	9351	9104	8839	8695	8325	8165	8165	8165	8165
VSD - Very Large 375 - 1,000kW 3-phase	63221	66986	64630	64228	66556	63326	63221	63221	63221	63221

db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EIWH Electric Instant. ≥ 12 kW (primary)	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	EIWHS Electric Instant. Shower (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESWH Electric Storage ≤ 30 L (secondary)	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	ESWH Electric Storage > 30 L (primary)	1.9	2.2	2.1	2.1	2.3	2.4	2.6	2.7	2.9	3.0
	GIWH Gas Instant. < 13 L/min (secondary)	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	Dedicated WH Heat Pump	0.0	0.1	0.4	0.6	0.8	1.1	1.4	1.7	2.0	2.3
	Dedicated WH Solar (3.5 m2)	0.4	1.5	1.5	1.2	1.3	1.3	1.3	1.4	1.4	1.5
	WH dedicated Water Heater	**4**	**5**	**5**	**5**	**6**	**6**	**7**	**7**	**8**	**9**
	CHB Gas Combi Instant. WH	0.8	1.3	1.4	1.5	1.5	1.5	1.5	1.5	1.5	1.5
	CHB Gas + Cyl. WH	0.4	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	CHB Jet Burner Gas + Cyl. WH	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Jet Burner Oil + Cyl. WH	1.6	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
	CHB Electric HP + Cyl. WH	0.0	0.5	0.6	0.7	0.8	1.0	1.1	1.3	1.5	1.7
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHB Solar Combi (16 m2)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHC Central Heating combi, water heating	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**5**	**5**
	TOTAL WATER HEATING	**7**	**9**	**9**	**9**	**10**	**10**	**11**	**12**	**13**	**14**
	CHB Gas non-condensing	5.5	3.0	2.8	2.7	2.5	2.3	2.1	1.9	1.7	1.5
	CHB Gas condensing	0.4	9.0	7.5	8.0	8.5	8.9	9.3	9.6	9.8	9.9
	CHB Gas Jet burner non-condensing	1.4	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CHB Gas Jet burner condensing	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	CHB Oil Jet burner non-condensing	9.6	3.0	1.3	1.2	1.1	1.0	0.9	0.9	0.8	0.7
	CHB Oil Jet burner condensing	0.0	1.1	1.4	1.5	1.7	1.9	2.0	2.2	2.3	2.5
	CHB Electric Joule-effect	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.7	1.2
	CHB Electric Heat Pump	0.2	2.9	3.2	4.0	4.6	5.4	6.3	7.3	8.5	9.9
	CHB Gas Heat Pump	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.6
	CHB micro CHP	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.6	0.9	1.3
	CHB Solar combi (16 m2)	0.2	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	CHB Central Heating boiler < 400 kW, space heating	**17**	**20**	**17**	**19**	**20**	**21**	**23**	**24**	**26**	**29**
	SFB Wood Manual	1.1	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.1	0.1
	SFB Wood Direct Draft	0.0	1.6	1.6	1.7	1.6	2.0	2.4	2.8	3.2	3.9
	SFB Coal	0.3	1.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2
	SFB Pellets	0.0	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.9	1.0
	SFB Wood chips	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	Total Solid Fuel Boiler	**1**	**4**	**3**	**3**	**3**	**3**	**4**	**4**	**5**	**6**
	CHAE-S (≤ 400 kW)	0.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.8	3.0
	CHAE-L (> 400 kW)	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S (≤ 400 kW)	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L (> 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AC rooftop	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	0.3	1.1	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.9
	AC VRF	0.0	2.8	3.7	5.4	6.8	8.2	9.5	10.8	11.8	12.5
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**2**	**8**	**9**	**11**	**12**	**13**	**15**	**16**	**18**	**19**
	AC rooftop (rev)	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	0.0	2.4	3.0	4.6	5.6	6.4	7.1	7.6	7.9	8.0
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)	**1**	**4**	**5**	**6**	**7**	**8**	**8**	**9**	**9**	**9**
	Total AHC Heating & Cooling	**2**	**8**	**9**	**11**	**12**	**14**	**15**	**17**	**18**	**19**

db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	1.5	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	LH closed fireplace/inset	1.0	2.6	2.8	3.1	3.1	3.2	3.2	3.2	3.2	3.2
	LH wood stove	1.0	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4
	LH coal stove	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.8	1.6	1.9	2.2	2.2	2.3	2.3	2.3	2.3	2.3
	LH SHR stove	1.9	2.7	3.3	3.9	4.3	4.8	4.9	4.9	4.9	4.9
	LH pellet stove	0.0	0.9	1.1	1.3	1.4	1.5	1.5	1.5	1.5	1.5
	LH Solid fuel sum	**7**	**11**	**13**	**14**	**15**	**15**	**15**	**15**	**15**	**15**
	LH Electric portable	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric fixed > 250W	1.7	1.9	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	LH Electric fixed ≤ 250W	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric storage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric underfloor	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	LH Electric visibly glowing > 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric visibly glowing ≤ 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	LH Electric sum	**2.8**	**3.5**	**3.0**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.4**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**10**	**15**	**16**	**17**	**18**	**18**	**18**	**18**	**18**	**18**
	Acquisition partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	0.3	3.1	2.3	2.5	2.8	3.1	3.3	3.7	4.3	5.0
	RAC fixed 6-12 kW, cooling	0.1	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.5
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	RAC < 12 kW total, cooling mode	**0.4**	**4.3**	**3.5**	**3.7**	**4.0**	**4.3**	**4.7**	**5.1**	**5.7**	**6.6**
	RAC fixed < 6 kW, reversible, heating	0.0	1.2	1.1	1.5	2.0	2.4	3.0	3.7	4.3	5.0
	RAC fixed 6-12 kW, reversible, heating	0.0	0.4	0.5	0.7	0.8	0.9	1.1	1.2	1.3	1.5
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**1.6**	**1.6**	**2.2**	**2.7**	**3.4**	**4.1**	**4.9**	**5.6**	**6.4**
	RAC Room Air Conditioner	**0**	**6**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**13**
1	CIRC Integrated circulators	1.5	2.4	2.7	2.8	3.0	3.2	3.2	3.2	3.2	3.2
0.38	CIRC Large standalone circulators	0.4	0.8	0.8	0.8	0.8	0.7	0.7	0.7	0.7	0.7
0.38	CIRC Small standalone circulators	1.1	1.6	1.6	1.5	1.4	1.2	1.2	1.2	1.2	1.2
	CIRC Circulator pumps <2.5 kW, all	**3.0**	**4.8**	**5.1**	**5.1**	**5.2**	**5.1**	**5.1**	**5.1**	**5.1**	**5.1**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.9**	**1.5**	**1.5**	**1.4**	**1.3**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
	TOTAL SPACE HEATING (incl. rev AC)	**31**	**46**	**44**	**49**	**52**	**55**	**58**	**62**	**65**	**69**
	TOTAL SPACE COOLING	**2**	**12**	**12**	**14**	**16**	**18**	**20**	**21**	**23**	**25**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.1	0.3	1.4	1.6	1.7	2.4	2.9	3.1
	R-UVU 100-250 m3/h	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.8	0.9	1.0	1.2	1.4	1.5
	R-UVU 250-1000 m3/h	0.2	0.5	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7
	R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.3	1.5	1.7	1.8	2.3	2.6	2.8
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	RVU, Total residential	**0**	**1**	**1**	**2**	**5**	**5**	**6**	**7**	**8**	**9**
	NR-UVU 250-1000 m3/h	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
	NR-UVU > 1000 m3/h	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.2
	NR-AHU-S 2500-5500 m3/h	0.2	4.4	5.3	5.3	4.6	5.1	5.3	5.4	5.6	5.8
	NR-AHU-M 5500-14500 m3/h	2.7	7.4	8.3	8.0	6.9	7.6	7.7	7.8	8.0	8.1
	NR-AHU-L > 14500 m3/h	0.7	1.9	2.1	2.0	1.7	1.9	1.9	1.9	2.0	2.0
	NRVU, Total non-residential	**4**	**15**	**17**	**17**	**15**	**16**	**17**	**17**	**17**	**18**
	VU Ventilation Units, res + non-res.	**4**	**16**	**18**	**19**	**20**	**21**	**22**	**24**	**26**	**27**
	TOTAL VENTILATION	**4**	**16**	**18**	**19**	**20**	**21**	**22**	**24**	**26**	**27**

db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	3.5	5.2	4.7	3.6	2.4	1.8	1.5	1.2	0.9	0.7
	HID (HPM, HPS, MH)	0.5	1.3	1.2	0.8	0.6	0.4	0.2	0.1	0.0	0.0
	CFLni (all shapes)	0.2	0.7	0.6	0.6	0.5	0.2	0.1	0.1	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.1	1.8	1.2	1.4	0.8	0.6	0.3	0.2	0.1	0.1
	GLS (DLS & NDLS)	1.8	1.5	1.3	0.9	0.5	0.3	0.2	0.1	0.1	0.0
	HL (DLS & NDLS, LV & MV)	0.3	2.2	2.7	2.8	1.8	0.9	0.5	0.3	0.2	0.1
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.6	2.1	3.1	4.4	4.8	5.6	6.7	7.9
	LED replacing HID (retrofit & luminaire)	0.0	0.0	0.2	1.0	1.2	1.6	1.9	2.3	2.6	3.0
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.6	0.7	0.8
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.1	0.4	0.5	0.3	0.2	0.2	0.2	0.2
	LED replacing NDLS (retrofit & luminaire)	0.0	0.1	0.3	2.4	2.0	1.5	1.2	1.0	0.8	0.8
	SUBTOTAL non-LED	6.4	12.7	11.7	10.1	6.7	4.2	2.8	1.9	1.3	0.9
	SUBTOTAL LED	0.0	0.1	1.2	6.1	7.2	8.2	8.7	9.6	11.1	12.7
	TOTAL LIGHTING	**6.4**	**12.8**	**12.9**	**16.2**	**13.9**	**12.5**	**11.4**	**11.6**	**12.4**	**13.6**
	DP TV, standard (NoNA)	17.8	22.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV, LoNA	0.0	3.5	8.3	5.2	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV, HiNA ('Smart')	0.0	3.5	8.2	15.6	24.0	27.6	28.0	28.0	28.0	28.0
	DP TV all types	**18**	**29**	**17**	**21**	**24**	**28**	**28**	**28**	**28**	**28**
	DP Monitor	1.7	3.8	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	DP Signage	0.0	0.3	1.5	3.4	2.5	2.5	2.5	2.5	2.5	2.5
	DP Electronic Displays, total	**20**	**33**	**20**	**26**	**29**	**32**	**33**	**33**	**33**	**33**
	SSTB	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	4.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
	Total STB set top boxes (Complex & Simple)	**0.0**	**6.0**	**6.1**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
	Game consoles > 20 W	0.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
	Game consoles < 20 W	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	Total Game consoles	**0.2**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**
	ES tower 1-socket traditional	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES rack 1-socket traditional	0.0	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	ES rack 2-socket traditional	0.2	3.0	1.4	1.7	2.0	2.5	2.5	2.5	2.5	2.5
	ES rack 2-socket cloud	0.0	2.9	4.3	5.2	6.4	7.8	7.8	7.8	7.8	7.8
	ES rack 4-socket traditional	0.1	1.6	0.7	0.8	1.0	1.2	1.2	1.2	1.2	1.2
	ES rack 4-socket cloud	0.0	1.3	1.9	2.3	2.8	3.4	3.4	3.4	3.4	3.4
	ES rack 2-socket resilient trad.	0.0	0.6	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5
	ES rack 2-socket resilient cloud	0.0	0.4	0.7	0.8	1.0	1.2	1.2	1.2	1.2	1.2
	ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 2-socket traditional	0.1	1.0	0.4	0.5	0.6	0.8	0.8	0.8	0.8	0.8
	ES blade 2-socket cloud	0.0	0.9	1.3	1.6	2.0	2.4	2.4	2.4	2.4	2.4
	ES blade 4-socket traditional	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 4-socket cloud	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES total traditional	**0.5**	**7.1**	**3.6**	**4.2**	**5.0**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
	ES total cloud	**0.0**	**5.6**	**8.3**	**10.1**	**12.3**	**15.0**	**15.0**	**15.0**	**15.0**	**15.0**
	ES Enterprise Servers total	**0.5**	**12.7**	**11.9**	**14.4**	**17.3**	**20.9**	**20.9**	**20.9**	**20.9**	**20.9**
	DS Online 2	0.2	5.7	5.3	5.8	6.4	7.1	7.1	7.1	7.1	7.1
	DS Online 3	0.4	8.9	6.4	7.0	7.7	8.5	8.5	8.5	8.5	8.5
	DS Online 4	0.3	5.8	5.3	5.8	6.4	7.1	7.1	7.1	7.1	7.1
	DS Data Storage products total	**0.9**	**20.4**	**16.9**	**18.6**	**20.5**	**22.7**	**22.7**	**22.7**	**22.7**	**22.7**
	ES + DS total	**1.5**	**33.2**	**28.9**	**33.0**	**37.8**	**43.6**	**43.6**	**43.6**	**43.6**	**43.6**
	PC Desktop	12.1	18.8	10.0	11.1	15.4	16.4	17.0	17.2	17.2	17.3
	PC Integrated Desktop	0.5	0.8	0.4	0.5	0.7	0.8	0.9	0.9	0.9	1.0
	PC Notebook	0.0	52.0	45.9	45.8	60.4	76.2	87.5	91.6	92.9	93.4
	PC Tablet/slate	0.0	2.5	29.2	28.1	30.6	33.1	34.7	35.2	35.3	35.4
	PC Thin client	0.0	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	PC Integrated Thin Client	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Small-scale Server	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	PC Workstation	1.0	1.8	2.2	2.6	3.1	3.7	4.1	4.2	4.3	4.3
	Total PC, electricity	**13.8**	**77.2**	**88.8**	**89.3**	**111.3**	**131.4**	**145.3**	**150.3**	**152.0**	**152.5**
	Inkjet Printer	0.5	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Inkjet MFD	0.7	1.7	1.3	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	EP / Laser Printer mono	0.7	0.7	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
	EP / Laser Printer colour	0.0	0.7	0.7	0.9	1.0	1.0	1.1	1.1	1.1	1.1
	EP / Laser Copier mono	3.4	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	1.1	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.0
	EP / Laser MFD colour	0.0	7.0	9.4	8.9	8.5	8.1	7.7	7.3	6.9	6.5
	Total IE Imaging Equipment	**5.2**	**13.9**	**15.0**	**12.9**	**12.3**	**11.7**	**11.2**	**10.6**	**10.1**	**9.5**

db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios	1.6	1.3	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5
	SB Electric toothbrushes	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	SB Audio speakers (wired)	4.3	2.2	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless)	0.0	0.0	1.5	4.1	4.7	4.7	4.7	4.7	4.7	4.7
	SB Small appliances	5.0	8.0	8.3	8.5	8.6	8.7	8.8	8.9	8.9	9.0
	SB Media boxes /sticks	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	SB Media players and recorders	0.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors	0.0	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones	0.2	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8
	SB Office phones	0.3	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4
	SB Home NAS	0.0	1.4	2.2	3.0	3.8	4.6	5.3	5.8	6.0	6.0
	SB Home Network Equipment	0.0	2.9	3.3	3.5	3.7	3.9	4.2	4.2	4.2	4.2
	SB Office Network Equipment	0.0	0.3	0.9	1.7	2.5	3.3	3.7	3.7	3.7	3.7
	SB Coffee makers	0.8	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)										
1	SB Dishwashers (sb & off, until 2021)										
1	SB Laundry Dryers (sb & off modes)										
1	SB Electric Ovens (sb mode)										
1	SB Electric Hobs (sb mode)										
1	SB Complex Set-Top Boxes (low-power modes)										
1	SB Game consoles (non-active modes)										
1	SB IE Inkjet Printers (nsb mode)										
1	SB IE Inkjet MFDs (nsb mode)										
1	SB IE Laser Printers (nsb mode)										
1	SB IE Laser Copiers (nsb mode)										
1	SB IE Laser MFDs (nsb mode)										
	Total (networked) SB (incl. double)	12	22	25	26	27	29	31	31	32	32
	Total (networked) SB (excl. double)	**12**	**22**	**25**	**26**	**27**	**29**	**31**	**31**	**32**	**32**
0.0	EPS ≤ 6W, low-V	0.0	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.1	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.1	2.2
0.6	EPS 10–12 W	0.0	1.3	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
0.5	EPS 15–20 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 65–120 W	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 12–15 W	0.0	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	EPS, total	**0.1**	**4.4**	**4.4**	**4.4**	**4.5**	**4.6**	**4.6**	**4.7**	**4.7**	**4.8**
	EPS, double counted subtracted	**0.1**	**2.4**	**2.4**	**2.5**	**2.5**	**2.6**	**2.6**	**2.6**	**2.7**	**2.7**
	TOTAL ELECTRONICS	**53**	**192**	**190**	**200**	**230**	**261**	**276**	**281**	**283**	**283**
	Total RF household Refrigerators & Freezers	**6.9**	**7.7**	**7.8**	**8.0**	**8.1**	**8.3**	**8.4**	**8.5**	**8.6**	**8.7**
	CF open vertical chilled multi deck (RVC2)	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0.7	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2
	CF Plug in one door beverage cooler	0.5	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9
	CF Plug in horizontal ice cream freezer	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CF Spiral vending machine	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**2.2**	**2.5**	**2.5**	**2.6**	**2.7**	**2.8**	**2.9**	**3.0**	**3.1**	**3.2**
	PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Chilled Horizontal (CH)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	PF Process Chiller AC MT S ≤ 300 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT S ≤ 200 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	**0.2**	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.7**

db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT L 5-20 kW	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT XL 20-50 kW	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
0.6	**PF Condensing Unit, All MT&LT**	**1.4**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.8**	**1.9**	**2.1**
	PF Professional Refrigeration, Total	**1.1**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.9**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION	**10**	**12**	**12**	**12**	**12**	**13**	**13**	**13**	**14**	**14**
	CA Electric Hobs	2.4	5.6	6.0	6.5	6.8	7.2	7.5	7.7	8.0	8.3
	CA Electric Ovens	5.2	6.3	6.7	7.2	7.0	7.1	7.1	7.2	7.3	7.4
	CA Gas Hobs	2.0	1.8	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6
	CA Range Hoods	1.3	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2	2.3
	TOTAL COOKING	**12**	**16**	**17**	**18**	**18**	**18**	**18**	**19**	**19**	**20**
	WM Washing Machines	3.7	5.6	5.6	6.1	5.8	5.8	5.8	5.8	5.8	5.8
	WD Washer-Dryers	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Total WM-WD household Washing	**4.1**	**6.1**	**6.1**	**6.6**	**6.3**	**6.4**	**6.4**	**6.4**	**6.4**	**6.4**
	Total DW household Dishwasher	**1.6**	**3.6**	**4.2**	**4.8**	**5.4**	**6.0**	**6.6**	**7.1**	**7.7**	**8.3**
	LD condensing heat pump	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.5	0.6
	LD condensing electric heat element	0.3	0.7	1.1	1.4	1.3	1.2	1.1	1.0	0.9	0.9
	LD vented electric	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0.8**	**1.2**	**1.7**	**2.0**	**2.1**	**2.0**	**2.0**	**2.0**	**2.0**	**2.0**
	VC Cylinder Domestic mains	1.8	3.0	2.8	2.4	2.0	1.4	1.0	1.0	1.0	1.0
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4
	VC Total Domestic mains	**1.9**	**3.1**	**2.9**	**2.6**	**2.2**	**1.7**	**1.4**	**1.4**	**1.4**	**1.4**
	VC Cylinder Commercial mains	0.4	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	VC Upright Commercial mains	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.5**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	VC Total in scope of CR 666/2013	**2.4**	**3.9**	**3.7**	**3.4**	**2.9**	**2.4**	**2.2**	**2.1**	**2.1**	**2.1**
	VC Cordless - domestic	0.1	0.3	0.8	1.7	2.5	3.4	4.1	4.5	4.7	4.7
	VC Cordless - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	VC Robot - domestic	0.0	0.2	0.4	0.8	1.2	1.6	2.0	2.1	2.2	2.2
	VC Robot - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Total Domestic mains+cordless+robots	**2.0**	**3.6**	**4.2**	**5.2**	**5.9**	**6.7**	**7.5**	**8.0**	**8.2**	**8.3**
	VC Total Commercial mains+cordless+robots	**0.5**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**0.9**
	Total VC Vacuum Cleaner	**2.5**	**4.4**	**4.9**	**5.9**	**6.7**	**7.5**	**8.3**	**8.9**	**9.1**	**9.2**
	TOTAL CLEANING	**9**	**15**	**17**	**19**	**21**	**22**	**23**	**24**	**25**	**26**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.4	1.3	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
0.5	FAN Axial>300Pa	0.5	1.9	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	0.3	0.8	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
0.5	FAN Centr.BC-free	0.2	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	0.4	1.1	1.3	1.5	1.7	1.7	1.9	2.0	2.2	2.4
0.5	FAN Cross-flow	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4
	Total FAN, industrial (excl. box & roof fans)	**1.0**	**2.9**	**3.3**	**3.6**	**3.8**	**3.8**	**3.9**	**4.0**	**4.1**	**4.2**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.6	1.0	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.3	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.3	0.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
0.45	**Total 3ph 0.75-375 kW no VSD**	**1.2**	**1.9**	**1.9**	**1.9**	**1.8**	**1.7**	**1.5**	**1.4**	**1.3**	**1.2**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.3	0.8	1.0	1.1	1.3	1.5	1.7	2.0	2.3	2.8
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.2	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.7	1.9
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.4	0.5	0.6	0.6	0.7	0.9	1.0	1.0	1.1
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.6**	**1.8**	**2.2**	**2.5**	**2.9**	**3.3**	**3.8**	**4.4**	**5.1**	**5.7**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**1.8**	**3.7**	**4.1**	**4.4**	**4.6**	**4.9**	**5.3**	**5.8**	**6.3**	**6.8**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.4	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0.5**	**1.4**	**1.5**	**1.6**	**1.6**	**1.6**	**1.7**	**1.7**	**1.8**	**1.9**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0.2**	**0.6**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**

db	BAU Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Large 3-ph LV 375-1000 kW no VSD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0.0	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6
0.45	**Total Large 3-ph LV 375-1000 kW**	**0.2**	**0.4**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0.9**	**1.6**	**1.6**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
	MT Elec. Motors LV 0.12-1000 kW	**2.1**	**4.4**	**4.9**	**5.1**	**5.3**	**5.5**	**5.8**	**6.1**	**6.5**	**6.8**
	including double counted amounts	4	8	9	9	10	10	11	11	12	12
	ESOB<45_VF	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	ESOB<45_CF	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
	ESOB<45_VSD-VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESOB < 45 Total	**0.6**	**0.8**	**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**
	ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
	ESOB < 150 Total	**0.7**	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**
	ESCC<45_VF	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
	ESCC<45_CF	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	ESCC<45_VSD-VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC < 45 Total	**0.6**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**	**1.4**
	ESCC_45-150_VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC_45-150_CF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
	ESCC < 150 Total	**0.7**	**0.9**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**	**1.4**	**1.4**	**1.5**
	ESCCi<45_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ESCCi<45_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	ESCCi<45_VSD-VF	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	ESCCi < 45 Total	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**
	ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.7**
	MSSB<6"_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB<6"_CF	1.0	1.3	1.4	1.6	1.6	1.8	1.9	2.0	2.1	2.2
	MSSB<6"_VSD-VF	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB <6" Total	**1.2**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**	**2.4**	**2.5**	**2.7**	**2.8**
	MS-V<25bar_VF	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3
	MS-V<25bar_CF	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
	MS-V<25bar_VSD-VF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	MS_V <25 bar Total	**0.4**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**
	WP Water pumps	**3.3**	**4.4**	**4.8**	**5.2**	**5.4**	**5.8**	**6.2**	**6.6**	**7.0**	**7.4**
	Total WE Welding Equipment	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**
	TOTAL INDUSTRY COMPONENTS	**6.8**	**12.3**	**13.5**	**14.5**	**15.0**	**15.7**	**16.5**	**17.3**	**18.1**	**19.0**
	TRAFO Distribution	0.5	0.7	0.8	0.9	0.9	1.0	1.1	1.1	1.2	1.3
	TRAFO Industry oil	0.2	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	TRAFO Industry dry	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	TRAFO Power	1.9	3.0	3.3	3.6	3.8	4.1	4.4	4.7	5.0	5.3
	TRAFO DER oil	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.5
	TRAFO DER dry	0.0	0.1	0.2	0.4	0.6	1.0	1.5	2.0	2.4	2.9
	TRAFO Small	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers	**2.7**	**4.6**	**5.0**	**5.6**	**6.2**	**7.1**	**8.1**	**9.1**	**10.0**	**11.0**
	TOTAL ENERGY SECTOR (costs already assumed to be in electricity rates: use BAU=0 as reference)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

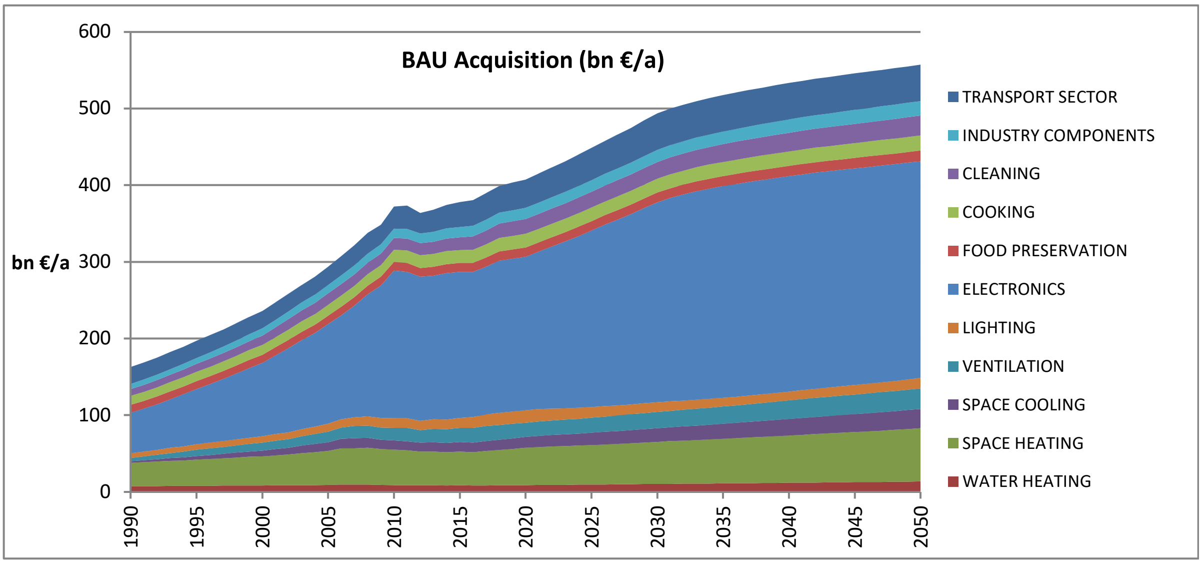
db	BAU Acquisition (in bn euros 2020, incl VAT & install	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	12	17	19	21	24	27	27	27	27	27
	Tyres C1, OEM for cars	4	5	6	6	7	8	8	8	8	8
	Tyres C1, total	**16**	**22**	**24**	**27**	**31**	**35**	**35**	**35**	**35**	**35**
	Tyres C2, replacement for vans	2	2	2	3	3	3	3	3	3	3
	Tyres C2, OEM for vans	0	0	1	1	1	1	1	1	1	1
	Tyres C2, total	**2**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**
	Tyres C3, replacement for trucks/busses	3	3	4	5	6	7	7	7	7	7
	Tyres C3, OEM for trucks/busses	1	1	1	1	2	2	2	2	2	2
	Tyres C3, total	**4**	**4**	**5**	**6**	**7**	**8**	**8**	**8**	**8**	**8**
	Tyres, total C1+C2+C3	**22**	**29**	**32**	**37**	**42**	**48**	**48**	**48**	**48**	**48**
	TRANSPORT SECTOR	22	29	32	37	42	48	48	48	48	48
	GENERAL TOTAL (in bn euros)	**163**	**372**	**378**	**407**	**448**	**494**	**518**	**533**	**546**	**557**

db	BAU Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	7	9	9	9	10	10	11	12	13	14
	SPACE HEATING	31	46	44	49	52	55	58	62	65	69
	SPACE COOLING	2	12	12	14	16	18	20	21	23	25
	VENTILATION	4	16	18	19	20	21	22	24	26	27
	LIGHTING	6	13	13	16	14	12	11	12	12	14
	ELECTRONICS	53	192	190	200	230	261	276	281	283	283
	FOOD PRESERVATION	10	12	12	12	12	13	13	13	14	14
	COOKING	12	16	17	18	18	18	18	19	19	20
	CLEANING	9	15	17	19	21	22	23	24	25	26
	INDUSTRY COMPONENTS	7	12	13	15	15	16	16	17	18	19
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	22	29	32	37	42	48	48	48	48	48
	TOTAL in bn euros	**163**	**372**	**378**	**407**	**448**	**494**	**518**	**533**	**546**	**557**

(in bn euros 2020, incl VAT & install)

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (reference BAU=0)	0	0	0	0	0	0	0	0	0	0
Total in bn euros, incl. energy Sector	**163**	**372**	**378**	**407**	**448**	**494**	**518**	**533**	**546**	**557**



Acquisition costs for VSDs only (without motor)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	0.1	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9
VSD - Very Small 0.12 - 0.75 kW 3-phase	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
VSD - Small 0.75 - 7.5 kW 3-phase	0.2	0.6	0.7	0.9	1.0	1.1	1.3	1.5	1.8	2.1
VSD - Medium 7.5 - 75kW 3-phase	0.2	0.4	0.5	0.6	0.7	0.8	0.9	1.1	1.3	1.4
VSD - Large 75 - 375kW 3-phase	0.1	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7
VSD - Very Large 375 - 1,000kW 3-phase	0.0	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Total Acquisition for VSDs only (BAU)	**0.6**	**2.2**	**2.7**	**3.0**	**3.3**	**3.7**	**4.2**	**4.8**	**5.4**	**6.0**

Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU Acquisition (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

BAU Acquisition (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	5	7	6	7	7	8	8	9	9	10
SPACE HEATING	23	34	32	34	36	38	40	42	45	48
SPACE & HT PROCESS COOLING	0	3	3	3	3	3	4	4	4	5
VENTILATION	0	1	1	2	5	5	6	7	8	9
LIGHTING	1	4	4	5	4	2	1	1	1	1
ELECTRONICS	39	115	118	122	141	160	171	175	176	177
FOOD PRESERVATION	6	7	7	7	8	8	8	8	8	8
COOKING	10	14	15	16	16	16	17	17	17	18
CLEANING	8	14	16	18	19	20	22	23	24	24
INDUSTRY COMPONENTS	1	1	1	1	1	1	1	1	1	1
BAU Acquisition, Residential, in bn euros	**95**	**200**	**203**	**215**	**239**	**262**	**277**	**287**	**294**	**300**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EIWH Electric Instant. ≥ 12 kW (primary)	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	EIWHS Electric Instant. Shower (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESWH Electric Storage ≤ 30 L (secondary)	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	ESWH Electric Storage > 30 L (primary)	1.9	2.2	2.1	2.1	2.3	2.4	2.6	2.7	2.9	3.0
	GIWH Gas Instant. < 13 L/min (secondary)	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.3	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	Dedicated WH Heat Pump	0.0	0.1	0.4	0.6	0.8	1.1	1.4	1.7	2.0	2.3
	Dedicated WH Solar (3.5 m2)	0.4	1.5	1.5	1.2	1.3	1.3	1.3	1.4	1.4	1.5
	WH dedicated Water Heater	**4**	**5**	**5**	**5**	**6**	**6**	**7**	**7**	**8**	**9**
	CHB Gas Combi Instant. WH	0.8	1.3	1.4	1.4	1.3	1.2	1.1	1.0	0.9	0.8
	CHB Gas + Cyl. WH	0.4	0.6	0.5	0.6	0.5	0.5	0.5	0.4	0.4	0.3
	CHB Jet Burner Gas + Cyl. WH	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Jet Burner Oil + Cyl. WH	1.6	0.6	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.5	0.6
	CHB Electric HP + Cyl. WH	0.0	0.5	0.6	1.1	1.9	2.7	3.5	4.3	5.2	6.0
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3
	CHB Solar Combi (16 m2)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHC Central Heating combi, water heating	**3**	**3**	**3**	**4**	**5**	**5**	**6**	**7**	**8**	**9**
	TOTAL WATER HEATING	**7**	**9**	**9**	**9**	**10**	**12**	**13**	**15**	**16**	**17**
	CHB Gas non-condensing	5.5	3.0	2.2	0.7	0.4	0.2	0.1	0.1	0.1	0.1
	CHB Gas condensing	0.4	9.0	8.2	10.1	9.7	9.3	8.6	7.8	6.9	6.1
	CHB Gas Jet burner non-condensing	1.4	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Gas Jet burner condensing	0.0	0.2	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5
	CHB Oil Jet burner non-condensing	9.6	3.0	1.0	0.3	0.3	0.2	0.2	0.1	0.1	0.1
	CHB Oil Jet burner condensing	0.0	1.1	1.8	2.4	2.6	2.7	2.8	3.0	3.1	3.2
	CHB Electric Joule-effect	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Hybrid (gas-electric)	0.0	0.0	0.1	0.2	0.6	1.0	1.5	2.0	2.6	3.3
	CHB Electric Heat Pump	0.2	2.9	3.0	5.6	9.8	13.9	18.1	22.2	26.6	31.0
	CHB Gas Heat Pump	0.0	0.0	0.1	0.2	0.4	0.5	0.7	0.9	1.1	1.3
	CHB micro CHP	0.0	0.1	0.2	0.4	0.6	0.7	0.9	1.1	1.3	1.5
	CHB Solar combi (16 m2)	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	CHB Central Heating boiler < 400 kW, space heating	**17**	**20**	**18**	**21**	**25**	**30**	**34**	**38**	**43**	**48**
	SFB Wood Manual	1.1	0.7	0.6	0.5	0.3	0.2	0.2	0.2	0.2	0.1
	SFB Wood Direct Draft	0.0	1.6	1.7	1.8	1.9	2.2	2.6	3.1	3.6	4.2
	SFB Coal	0.3	1.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2
	SFB Pellets	0.0	0.4	0.6	0.6	0.6	0.7	0.8	0.8	0.9	1.0
	SFB Wood chips	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	Total Solid Fuel Boiler	**1**	**4**	**3**	**3**	**3**	**4**	**4**	**5**	**5**	**6**
	CHAE-S (≤ 400 kW)	0.3	1.5	1.7	1.9	2.1	2.3	2.5	2.7	2.8	3.0
	CHAE-L (> 400 kW)	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S (≤ 400 kW)	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	CHWE-L (> 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	HT PCH-AE-L	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	AC rooftop	0.2	0.7	0.7	0.5	0.3	0.1	0.1	0.1	0.1	0.1
	AC splits	0.3	1.1	1.2	1.1	1.1	1.0	1.0	1.0	0.9	0.9
	AC VRF	0.0	2.8	3.7	5.4	6.8	8.2	9.5	10.8	11.8	12.5
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**2**	**8**	**9**	**11**	**12**	**13**	**15**	**16**	**18**	**19**
	AC rooftop (rev)	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	AC VRF (rev)	0.0	2.4	3.0	4.6	5.6	6.4	7.1	7.6	7.9	8.0
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.7	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)	**1**	**4**	**5**	**6**	**7**	**8**	**8**	**9**	**9**	**9**
	Total AHC Heating & Cooling	**2**	**8**	**9**	**11**	**12**	**14**	**15**	**17**	**18**	**19**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	1.5	2.2	2.2	2.7	3.0	2.8	2.7	2.6	2.5	2.4
	LH closed fireplace/inset	1.0	2.6	2.8	3.7	3.9	3.9	3.7	3.6	3.5	3.3
	LH wood stove	1.0	1.1	1.2	1.6	1.7	1.7	1.6	1.6	1.5	1.4
	LH coal stove	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.8	1.6	1.9	2.4	2.6	2.5	2.4	2.3	2.3	2.3
	LH SHR stove	1.9	2.7	3.3	3.9	4.3	4.8	4.9	4.9	4.9	4.9
	LH pellet stove	0.0	0.9	1.1	1.3	1.4	1.5	1.5	1.5	1.5	1.5
	LH Solid fuel sum	**7**	**11**	**13**	**16**	**17**	**17**	**17**	**17**	**16**	**16**
	LH Electric portable	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric fixed > 250W	1.7	1.9	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	LH Electric fixed ≤ 250W	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric storage	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric underfloor	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	LH Electric visibly glowing > 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric visibly glowing ≤ 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	LH Electric sum	**2.8**	**3.5**	**3.1**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.4**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**10**	**15**	**16**	**19**	**20**	**20**	**20**	**20**	**19**	**19**
	Acquisition partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	0.3	3.6	2.8	3.1	3.3	3.3	3.4	3.7	4.3	5.0
	RAC fixed 6-12 kW, cooling	0.1	1.5	1.6	1.5	1.5	1.5	1.5	1.4	1.5	1.5
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	RAC < 12 kW total, cooling mode	**0.4**	**5.3**	**4.6**	**4.7**	**4.9**	**4.9**	**5.0**	**5.3**	**5.9**	**6.6**
	RAC fixed < 6 kW, reversible, heating	0.0	1.4	1.4	1.9	2.3	2.7	3.1	3.7	4.3	5.0
	RAC fixed 6-12 kW, reversible, heating	0.0	0.6	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.5
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**1.9**	**2.1**	**2.8**	**3.3**	**3.9**	**4.4**	**5.2**	**5.8**	**6.5**
	RAC Room Air Conditioner	**0**	**7**	**7**	**7**	**8**	**9**	**9**	**10**	**12**	**13**
1	CIRC Integrated circulators	1.5	2.4	2.8	3.0	3.1	3.2	3.2	3.2	3.2	3.2
0.38	CIRC Large standalone circulators	0.4	0.8	1.3	1.3	1.1	1.0	0.9	0.9	0.8	0.8
0.38	CIRC Small standalone circulators	1.1	1.6	1.9	1.8	1.6	1.4	1.3	1.3	1.2	1.2
	CIRC Circulator pumps <2.5 kW, all	**3.0**	**4.8**	**6.1**	**6.0**	**5.8**	**5.5**	**5.4**	**5.3**	**5.2**	**5.2**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.9**	**1.5**	**2.0**	**1.9**	**1.7**	**1.5**	**1.4**	**1.3**	**1.3**	**1.2**
	TOTAL SPACE HEATING (incl. rev AC)	**31**	**47**	**46**	**54**	**61**	**66**	**72**	**78**	**83**	**89**
	TOTAL SPACE COOLING	**2**	**13**	**13**	**15**	**17**	**18**	**20**	**22**	**24**	**25**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.1	0.3	1.5	1.6	1.7	2.4	2.9	3.2
	R-UVU 100-250 m3/h	0.1	0.3	0.4	0.5	0.4	0.4	0.5	0.5	0.5	0.5
	R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.8	0.9	1.0	1.2	1.4	1.5
	R-UVU 250-1000 m3/h	0.2	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.8
	R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.3	1.5	1.7	1.8	2.3	2.6	2.8
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	RVU, Total residential	**0**	**1**	**1**	**2**	**5**	**5**	**6**	**7**	**8**	**9**
	NR-UVU 250-1000 m3/h	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
	NR-UVU > 1000 m3/h	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.7	0.7	0.8	0.8	0.9	1.0	1.1	1.2	1.2
	NR-AHU-S 2500-5500 m3/h	0.2	4.4	5.4	5.4	4.7	5.3	5.5	5.6	5.8	6.0
	NR-AHU-M 5500-14500 m3/h	2.7	7.4	8.4	8.3	7.2	7.8	8.0	8.0	8.2	8.4
	NR-AHU-L > 14500 m3/h	0.7	1.9	2.1	2.1	1.8	1.9	2.0	2.0	2.0	2.1
	NRVU, Total non-residential	**4**	**15**	**17**	**17**	**15**	**17**	**17**	**17**	**18**	**18**
	VU Ventilation Units, res + non-res.	**4**	**16**	**19**	**19**	**20**	**22**	**23**	**25**	**26**	**27**
	TOTAL VENTILATION	**4**	**16**	**19**	**19**	**20**	**22**	**23**	**25**	**26**	**27**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	3.5	5.2	3.8	3.1	1.0	0.5	0.3	0.2	0.1	0.1
	HID (HPM, HPS, MH)	0.5	1.3	1.0	0.6	0.4	0.1	0.0	0.0	0.0	0.0
	CFLni (all shapes)	0.2	0.7	0.6	0.4	0.2	0.1	0.0	0.0	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.1	2.4	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	GLS (DLS & NDLS)	1.8	0.8	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HL (DLS & NDLS, LV & MV)	0.3	2.5	2.9	0.7	0.0	0.0	0.0	0.0	0.0	0.0
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	1.0	2.3	6.6	6.9	6.4	6.9	8.2	9.4
	LED replacing HID (retrofit & luminaire)	0.0	0.0	1.7	1.1	1.7	2.0	2.3	2.7	3.0	3.4
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.2	0.4	0.5	0.6	0.6	0.7	0.8	0.9
	LED replacing DLS (retrofit & luminaire)	0.0	0.2	1.1	0.7	0.6	0.1	0.2	0.2	0.2	0.2
	LED replacing NDLS (retrofit & luminaire)	0.0	0.1	3.4	5.2	2.4	1.4	0.7	0.7	0.8	0.9
	SUBTOTAL non-LED	6.4	13.0	9.1	5.2	1.6	0.7	0.3	0.2	0.1	0.1
	SUBTOTAL LED	0.0	0.3	7.4	9.8	11.7	11.0	10.2	11.2	13.0	14.9
	TOTAL LIGHTING	**6.4**	**13.2**	**16.4**	**15.0**	**13.3**	**11.7**	**10.5**	**11.3**	**13.1**	**14.9**
	DP TV, standard (NoNA)	17.8	22.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV, LoNA	0.0	3.5	8.3	5.2	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV, HiNA ('Smart')	0.0	3.5	8.2	15.6	24.0	27.6	28.0	28.0	28.0	28.0
	DP TV all types	**18**	**29**	**17**	**21**	**24**	**28**	**28**	**28**	**28**	**28**
	DP Monitor	1.7	3.8	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
	DP Signage	0.0	0.3	1.5	3.4	2.5	2.5	2.5	2.5	2.5	2.5
	DP Electronic Displays, total	**20**	**33**	**20**	**26**	**29**	**32**	**33**	**33**	**33**	**33**
	SSTB	0.0	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB	0.0	4.8	5.9	5.9	5.9	5.9	5.9	5.9	5.9	5.9
	Total STB set top boxes (Complex & Simple)	**0.0**	**6.0**	**6.1**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
	Game consoles > 20 W	0.0	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3	3.3
	Game consoles < 20 W	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	Total Game consoles	**0.2**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**	**4.1**
	ES tower 1-socket traditional	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES rack 1-socket traditional	0.0	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	ES rack 2-socket traditional	0.2	3.0	1.4	1.7	2.0	2.5	2.5	2.5	2.5	2.5
	ES rack 2-socket cloud	0.0	2.9	4.3	5.2	6.4	7.8	7.8	7.8	7.8	7.8
	ES rack 4-socket traditional	0.1	1.6	0.7	0.8	1.0	1.2	1.2	1.2	1.2	1.2
	ES rack 4-socket cloud	0.0	1.3	1.9	2.3	2.8	3.4	3.4	3.4	3.4	3.4
	ES rack 2-socket resilient trad.	0.0	0.6	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5
	ES rack 2-socket resilient cloud	0.0	0.4	0.7	0.8	1.0	1.2	1.2	1.2	1.2	1.2
	ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 2-socket traditional	0.1	1.0	0.4	0.5	0.6	0.8	0.8	0.8	0.8	0.8
	ES blade 2-socket cloud	0.0	0.9	1.3	1.6	2.0	2.4	2.4	2.4	2.4	2.4
	ES blade 4-socket traditional	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 4-socket cloud	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES total traditional	**0.5**	**7.1**	**3.6**	**4.2**	**5.0**	**5.9**	**5.9**	**5.9**	**5.9**	**5.9**
	ES total cloud	**0.0**	**5.6**	**8.3**	**10.1**	**12.3**	**15.0**	**15.0**	**15.0**	**15.0**	**15.0**
	ES Enterprise Servers total	**0.5**	**12.7**	**11.9**	**14.4**	**17.3**	**20.9**	**20.9**	**20.9**	**20.9**	**20.9**
	DS Online 2	0.2	5.7	5.3	5.8	6.4	7.1	7.1	7.1	7.1	7.1
	DS Online 3	0.4	8.9	6.4	7.0	7.7	8.5	8.5	8.5	8.5	8.5
	DS Online 4	0.3	5.8	5.3	5.8	6.4	7.1	7.1	7.1	7.1	7.1
	DS Data Storage products total	**0.9**	**20.4**	**16.9**	**18.6**	**20.5**	**22.7**	**22.7**	**22.7**	**22.7**	**22.7**
	ES + DS total	**1.5**	**33.2**	**28.9**	**33.0**	**37.8**	**43.6**	**43.6**	**43.6**	**43.6**	**43.6**
	PC Desktop	12.1	18.8	10.0	11.1	15.4	16.4	17.0	17.2	17.2	17.3
	PC Integrated Desktop	0.5	0.8	0.4	0.5	0.7	0.8	0.9	0.9	0.9	1.0
	PC Notebook	0.0	52.0	45.9	45.8	60.4	76.2	87.5	91.6	92.9	93.4
	PC Tablet/slate	0.0	2.5	29.2	28.1	30.6	33.1	34.7	35.2	35.3	35.4
	PC Thin client	0.0	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	PC Integrated Thin Client	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Small-scale Server	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	PC Workstation	1.0	1.8	2.2	2.6	3.1	3.7	4.1	4.2	4.3	4.3
	Total PC, electricity	**13.8**	**77.2**	**88.8**	**89.3**	**111.3**	**131.4**	**145.3**	**150.3**	**152.0**	**152.5**
	Inkjet Printer	0.5	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Inkjet MFD	0.7	1.7	1.3	0.8	0.8	0.7	0.7	0.7	0.6	0.6
	EP / Laser Printer mono	0.7	0.7	0.8	0.7	0.6	0.5	0.4	0.3	0.2	0.1
	EP / Laser Printer colour	0.0	0.7	0.7	0.9	1.0	1.0	1.1	1.1	1.1	1.1
	EP / Laser Copier mono	3.4	1.4	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.5	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	1.1	1.5	1.4	1.3	1.3	1.2	1.2	1.1	1.0
	EP / Laser MFD colour	0.0	7.0	9.4	8.9	8.5	8.1	7.7	7.3	6.9	6.5
	Total IE Imaging Equipment	**5.2**	**13.9**	**15.0**	**12.9**	**12.3**	**11.7**	**11.2**	**10.6**	**10.1**	**9.5**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios	1.6	1.3	1.1	0.9	0.9	0.8	0.7	0.6	0.5	0.5
	SB Electric toothbrushes	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	SB Audio speakers (wired)	4.3	2.2	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless)	0.0	0.0	1.5	4.1	4.7	4.7	4.7	4.7	4.7	4.7
	SB Small appliances	5.0	8.0	8.3	8.5	8.6	8.7	8.8	8.9	8.9	9.0
	SB Media boxes /sticks	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	SB Media players and recorders	0.0	2.4	2.1	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors	0.0	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones	0.2	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.8	0.8
	SB Office phones	0.3	0.5	0.5	0.5	0.4	0.5	0.4	0.4	0.4	0.4
	SB Home NAS	0.0	1.4	2.2	3.0	3.8	4.6	5.3	5.8	6.0	6.0
	SB Home Network Equipment	0.0	2.9	3.3	3.5	3.7	3.9	4.2	4.2	4.2	4.2
	SB Office Network Equipment	0.0	0.3	0.9	1.7	2.5	3.3	3.7	3.7	3.7	3.7
	SB Coffee makers	0.8	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.2
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)										
1	SB Dishwashers (sb & off, until 2021)										
1	SB Laundry Dryers (sb & off modes)										
1	SB Electric Ovens (sb mode)										
1	SB Electric Hobs (sb mode)										
1	SB Complex Set-Top Boxes (low-power modes)										
1	SB Game consoles (non-active modes)										
1	SB IE Inkjet Printers (nsb mode)										
1	SB IE Inkjet MFDs (nsb mode)										
1	SB IE Laser Printers (nsb mode)										
1	SB IE Laser Copiers (nsb mode)										
1	SB IE Laser MFDs (nsb mode)										
	Total (networked) SB (incl. double)	12	22	25	26	27	29	31	31	32	32
	Total (networked) SB (excl. double)	**12**	**22**	**25**	**26**	**27**	**29**	**31**	**31**	**32**	**32**
0.0	EPS ≤ 6W, low-V	0.0	0.3	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.1	1.6	1.7	1.8	1.9	2.0	2.0	2.1	2.1	2.2
0.6	EPS 10–12 W	0.0	1.3	1.5	1.7	1.7	1.7	1.7	1.7	1.7	1.7
0.5	EPS 15–20 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 65–120 W	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.8	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 12–15 W	0.0	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	EPS, total	**0.1**	**4.4**	**4.4**	**4.5**	**4.5**	**4.6**	**4.6**	**4.7**	**4.7**	**4.8**
	EPS, double counted subtracted	**0.1**	**2.4**	**2.5**	**2.5**	**2.6**	**2.6**	**2.6**	**2.6**	**2.7**	**2.7**
	TOTAL ELECTRONICS	**53**	**192**	**191**	**200**	**230**	**261**	**276**	**281**	**283**	**283**
	Total RF household Refrigerators & Freezers	**6.9**	**8.8**	**9.6**	**10.1**	**11.5**	**11.0**	**12.1**	**12.4**	**12.8**	**13.1**
	CF open vertical chilled multi deck (RVC2)	0.3	0.3	0.3	0.3	0.4	0.5	0.4	0.4	0.4	0.4
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0.7	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2	1.2
	CF Plug in one door beverage cooler	0.5	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9
	CF Plug in horizontal ice cream freezer	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CF Spiral vending machine	0.4	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**2.2**	**2.5**	**2.5**	**2.6**	**2.8**	**2.9**	**3.0**	**3.0**	**3.1**	**3.2**
	PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Chilled Horizontal (CH)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinet Frozen Horizontal (FH)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	PF Process Chiller AC MT S ≤ 300 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT S ≤ 200 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	**0.2**	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.7**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT L 5-20 kW	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5
	PF Condensing Unit MT XL 20-50 kW	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
0.6	**PF Condensing Unit, All MT&LT**	**1.4**	**1.2**	**1.2**	**1.4**	**1.4**	**1.5**	**1.6**	**1.8**	**1.9**	**2.1**
	PF Professional Refrigeration, Total	**1.1**	**1.3**	**1.4**	**1.6**	**1.7**	**1.7**	**1.9**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION	**10**	**13**	**14**	**14**	**16**	**16**	**17**	**17**	**18**	**18**
	CA Electric Hobs	2.4	5.6	6.0	6.8	7.1	7.4	7.7	8.0	8.3	8.5
	CA Electric Ovens	5.2	6.3	6.7	7.6	7.3	7.1	7.1	7.2	7.3	7.4
	CA Gas Hobs	2.0	1.8	1.6	1.6	1.4	1.3	1.2	1.2	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.9	0.9	0.9	0.8	0.8	0.8	0.7
	CA Range Hoods	1.3	1.6	1.7	2.2	2.5	2.6	2.6	2.6	2.6	2.6
	TOTAL COOKING	**12**	**16**	**17**	**19**	**19**	**19**	**20**	**20**	**20**	**20**
	WM Washing Machines	3.7	6.7	6.9	7.4	6.9	6.5	6.2	5.9	5.8	5.8
	WD Washer-Dryers	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Total WM-WD household Washing	**4.1**	**7.2**	**7.4**	**7.9**	**7.4**	**7.0**	**6.7**	**6.4**	**6.4**	**6.4**
	Total DW household Dishwasher	**1.6**	**4.8**	**5.6**	**6.3**	**6.8**	**7.4**	**7.9**	**8.3**	**8.8**	**9.2**
	LD condensing heat pump	0.0	0.3	1.6	2.2	2.5	2.9	2.8	2.7	2.5	2.4
	LD condensing electric heat element	0.3	0.7	0.7	0.7	0.6	0.4	0.4	0.4	0.4	0.4
	LD vented electric	0.5	0.4	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0.8**	**1.4**	**2.5**	**3.1**	**3.2**	**3.4**	**3.2**	**3.1**	**2.9**	**2.8**
	VC Cylinder Domestic mains	1.8	3.0	3.0	2.5	2.0	1.4	1.1	1.0	1.0	1.0
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.4	0.4
	VC Total Domestic mains	**1.9**	**3.1**	**3.2**	**2.7**	**2.2**	**1.7**	**1.4**	**1.4**	**1.4**	**1.4**
	VC Cylinder Commercial mains	0.4	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.7
	VC Upright Commercial mains	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.5**	**0.8**	**0.8**	**0.9**	**0.8**	**0.8**	**0.8**	**0.7**	**0.7**	**0.7**
	VC Total in scope of CR 666/2013	**2.4**	**3.9**	**4.0**	**3.6**	**3.1**	**2.5**	**2.2**	**2.1**	**2.1**	**2.1**
	VC Cordless - domestic	0.1	0.3	0.8	1.7	2.5	3.4	4.1	4.5	4.7	4.7
	VC Cordless - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	VC Robot - domestic	0.0	0.2	0.4	0.8	1.2	1.6	2.0	2.1	2.2	2.2
	VC Robot - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Total Domestic mains+cordless+robots	**2.0**	**3.6**	**4.4**	**5.2**	**6.0**	**6.7**	**7.5**	**8.0**	**8.3**	**8.3**
	VC Total Commercial mains+cordless+robots	**0.5**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
	Total VC Vacuum Cleaner	**2.5**	**4.4**	**5.3**	**6.1**	**6.9**	**7.6**	**8.4**	**8.9**	**9.1**	**9.2**
	TOTAL CLEANING	**9**	**18**	**21**	**23**	**24**	**25**	**26**	**27**	**27**	**28**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.4	1.3	1.9	2.4	2.3	2.2	2.1	2.0	1.9	1.8
0.5	FAN Axial>300Pa	0.5	1.9	2.0	2.2	2.1	2.1	2.1	2.1	2.1	2.1
0.5	FAN Centr.FC	0.3	0.8	1.3	1.8	1.7	1.6	1.5	1.5	1.4	1.3
0.5	FAN Centr.BC-free	0.2	0.5	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.7
0.5	FAN Centr.BC	0.4	1.1	1.8	2.1	2.2	2.2	2.3	2.4	2.5	2.6
0.5	FAN Cross-flow	0.1	0.2	0.6	0.8	0.8	0.8	0.8	0.9	0.9	0.9
	Total FAN, industrial (excl. box & roof fans)	**1.0**	**2.9**	**4.1**	**5.0**	**5.0**	**4.8**	**4.8**	**4.8**	**4.8**	**4.7**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.6	1.0	1.1	1.0	1.1	1.0	1.0	0.9	0.9	0.9
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.2	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
0.45	**Total 3ph 0.75-375 kW no VSD**	**1.2**	**1.9**	**1.9**	**1.8**	**1.8**	**1.7**	**1.6**	**1.5**	**1.4**	**1.4**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.3	0.8	1.3	2.2	2.4	2.4	2.5	2.6	2.8	2.9
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.2	0.6	1.1	1.5	1.6	1.6	1.7	1.8	1.9	1.9
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.4	0.7	0.9	1.0	1.0	1.0	1.1	1.1	1.1
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.6**	**1.8**	**3.1**	**4.6**	**4.9**	**5.1**	**5.3**	**5.5**	**5.8**	**6.0**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**1.8**	**3.8**	**5.1**	**6.4**	**6.7**	**6.8**	**6.9**	**7.1**	**7.2**	**7.4**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.4	0.8	0.8	0.8	1.0	1.0	1.0	0.9	0.9	0.9
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.1
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0.5**	**1.4**	**1.5**	**1.6**	**1.9**	**1.9**	**1.9**	**1.9**	**2.0**	**2.0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.2	0.4	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0.2**	**0.6**	**0.7**	**0.7**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**	**1.0**

db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Large 3-ph LV 375-1000 kW no VSD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0.0	0.3	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6
0.45	**Total Large 3-ph LV 375-1000 kW**	**0.2**	**0.4**	**0.5**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0.9**	**1.6**	**1.6**	**1.7**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**
	MT Elec. Motors LV 0.12-1000 kW	**2.1**	**4.4**	**5.4**	**6.2**	**6.9**	**6.9**	**7.0**	**7.1**	**7.3**	**7.4**
	including double counted amounts	4	8	10	11	12	13	13	13	13	13
	ESOB<45_VF	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
	ESOB<45_CF	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6
	ESOB<45_VSD-VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESOB < 45 Total	**0.6**	**0.8**	**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**
	ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
	ESOB < 150 Total	**0.7**	**0.9**	**1.0**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.4**	**1.5**
	ESCC<45_VF	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6
	ESCC<45_CF	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	ESCC<45_VSD-VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC < 45 Total	**0.6**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**	**1.4**
	ESCC_45-150_VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC_45-150_CF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
	ESCC < 150 Total	**0.7**	**0.9**	**1.0**	**1.1**	**1.1**	**1.2**	**1.3**	**1.4**	**1.4**	**1.5**
	ESCCi<45_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ESCCi<45_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	ESCCi<45_VSD-VF	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	ESCCi < 45 Total	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**
	ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	**0.3**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.6**	**0.6**	**0.6**	**0.7**
	MSSB<6"_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB<6"_CF	1.0	1.3	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2
	MSSB<6"_VSD-VF	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB <6" Total	**1.2**	**1.7**	**1.9**	**2.0**	**2.1**	**2.2**	**2.4**	**2.5**	**2.7**	**2.8**
	MS-V<25bar_VF	0.2	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3
	MS-V<25bar_CF	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5
	MS-V<25bar_VSD-VF	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	MS_V <25 bar Total	**0.4**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**
	WP Water pumps	**3.3**	**4.4**	**4.8**	**5.3**	**5.5**	**5.9**	**6.2**	**6.6**	**7.0**	**7.4**
	Total WE Welding Equipment	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**	**0.5**	**0.6**	**0.6**	**0.6**
	TOTAL INDUSTRY COMPONENTS	**6.8**	**12.3**	**14.9**	**17.0**	**17.9**	**18.1**	**18.6**	**19.1**	**19.6**	**20.1**
	TRAFO Distribution	0.5	0.7	1.0	1.1	1.1	1.2	1.3	1.4	1.5	1.6
	TRAFO Industry oil	0.2	0.4	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0
	TRAFO Industry dry	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	TRAFO Power	1.9	3.0	3.3	3.6	3.8	4.1	4.4	4.7	5.0	5.3
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.8
	TRAFO DER dry	0.0	0.1	0.3	0.5	0.8	1.3	1.9	2.6	3.2	3.8
	TRAFO Small	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers	**2.7**	**4.6**	**5.6**	**6.3**	**7.1**	**8.1**	**9.4**	**10.6**	**11.8**	**13.0**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0.0**	**0.0**	**0.6**	**0.7**	**0.8**	**1.0**	**1.3**	**1.5**	**1.8**	**2.0**

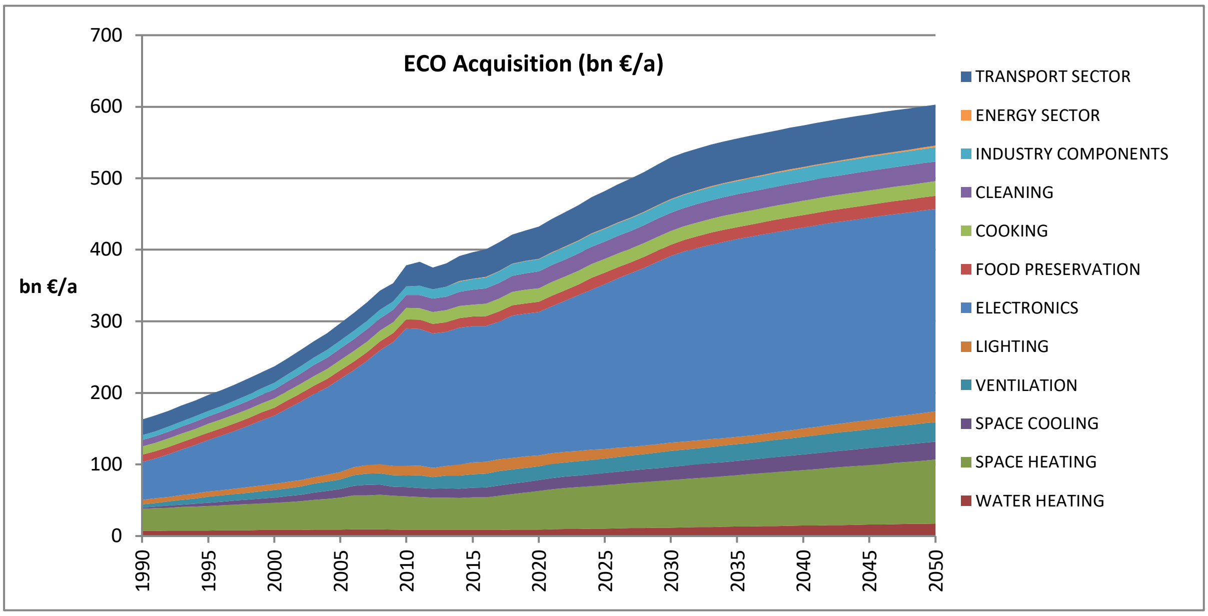
db	ECO Acquisition (in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	12	18	21	26	29	33	33	33	33	33
	Tyres C1, OEM for cars	4	5	6	8	9	10	10	10	10	10
	Tyres C1, total	**16**	**23**	**27**	**33**	**38**	**42**	**42**	**42**	**42**	**42**
	Tyres C2, replacement for vans	2	2	2	3	4	4	4	4	4	4
	Tyres C2, OEM for vans	0	0	1	1	1	1	1	1	1	1
	Tyres C2, total	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**5**	**5**	**5**
	Tyres C3, replacement for trucks/busses	3	3	6	7	8	8	8	8	8	8
	Tyres C3, OEM for trucks/busses	1	1	1	1	2	2	2	2	2	2
	Tyres C3, total	**4**	**4**	**7**	**8**	**10**	**11**	**11**	**11**	**11**	**11**
	Tyres, total C1+C2+C3	**22**	**29**	**37**	**45**	**52**	**58**	**58**	**58**	**58**	**58**
	TRANSPORT SECTOR	**22**	**29**	**37**	**45**	**52**	**58**	**58**	**58**	**58**	**58**
	GENERAL TOTAL (in bn euros)	**163**	**378**	**397**	**432**	**482**	**529**	**555**	**574**	**589**	**603**

db	ECO Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**7**	**9**	**9**	**9**	**10**	**12**	**13**	**15**	**16**	**17**
	SPACE HEATING	**31**	**47**	**46**	**54**	**61**	**66**	**72**	**78**	**83**	**89**
	SPACE COOLING	**2**	**13**	**13**	**15**	**17**	**18**	**20**	**22**	**24**	**25**
	VENTILATION	**4**	**16**	**19**	**19**	**20**	**22**	**23**	**25**	**26**	**27**
	LIGHTING	**6**	**13**	**16**	**15**	**13**	**12**	**11**	**11**	**13**	**15**
	ELECTRONICS	**53**	**192**	**191**	**200**	**230**	**261**	**276**	**281**	**283**	**283**
	FOOD PRESERVATION	**10**	**13**	**14**	**14**	**16**	**16**	**17**	**17**	**18**	**18**
	COOKING	**12**	**16**	**17**	**19**	**19**	**19**	**20**	**20**	**20**	**20**
	CLEANING	**9**	**18**	**21**	**23**	**24**	**25**	**26**	**27**	**27**	**28**
	INDUSTRY COMPONENTS	7	12	15	17	18	18	19	19	20	20
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	**22**	**29**	**37**	**45**	**52**	**58**	**58**	**58**	**58**	**58**
	TOTAL in bn euros	**163**	**378**	**396**	**432**	**481**	**528**	**554**	**572**	**588**	**601**

(in bn euros 2020, incl VAT & install)

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
Total in bn euros, incl. energy Sector	**163**	**378**	**397**	**432**	**482**	**529**	**555**	**574**	**589**	**603**



Acquisition costs for VSDs only (without motor)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	0.1	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9
VSD - Very Small 0.12 - 0.75 kW 3-phase	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
VSD - Small 0.75 - 7.5 kW 3-phase	0.2	0.6	0.9	1.5	1.6	1.7	1.7	1.9	2.0	2.1
VSD - Medium 7.5 - 75kW 3-phase	0.2	0.4	0.8	1.1	1.1	1.2	1.2	1.3	1.4	1.4
VSD - Large 75 - 375kW 3-phase	0.1	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.7
VSD - Very Large 375 - 1,000kW 3-phase	0.0	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Total Acquisition for VSDs only (ECO)	**0.6**	**2.2**	**3.3**	**4.3**	**4.6**	**4.7**	**5.0**	**5.3**	**5.7**	**6.0**

Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for ECO Acquisition (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

ECO Acquisition (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	5	7	6	7	8	9	10	11	12	13
SPACE HEATING	23	34	33	38	43	47	50	54	58	62
SPACE & HT PROCESS COOLING	0	4	3	3	4	4	4	4	4	5
VENTILATION	0	1	1	2	5	5	6	7	8	9
LIGHTING	1	4	6	5	2	1	1	1	1	1
ELECTRONICS	39	115	118	122	141	160	171	175	176	177
FOOD PRESERVATION	6	8	9	9	11	10	11	12	12	12
COOKING	10	14	15	17	17	17	18	18	18	18
CLEANING	8	16	19	22	23	24	25	25	26	26
INDUSTRY COMPONENTS	1	1	1	1	1	1	1	1	1	1
ECO Acquisition, Residential, in bn euros	**95**	**204**	**212**	**227**	**254**	**278**	**296**	**308**	**317**	**325**

db	ADDED Acquisition (ECO-BAU, in bn euros 2020, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WH dedicated Water Heater	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	CHB Gas Combi Instant. WH	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.5	-0.6	-0.7
	CHB Gas + Cyl. WH	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.3	-0.3	-0.3
	CHB Jet Burner Gas + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Jet Burner Oil + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.4
	CHB Electric HP + Cyl. WH	0.0	0.0	0.0	0.4	1.1	1.7	2.4	3.0	3.7	4.3
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
	CHB Solar Combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHC Central Heating combi, water heating	**0.0**	**0.0**	**0.0**	**0.3**	**1.0**	**1.6**	**2.2**	**2.8**	**3.4**	**3.9**
	TOTAL WATER HEATING	**0.0**	**0.0**	**0.0**	**0.3**	**1.0**	**1.6**	**2.2**	**2.8**	**3.4**	**3.9**
	CHB Gas non-condensing	0.0	0.0	-0.5	-2.0	-2.1	-2.1	-2.0	-1.8	-1.6	-1.5
	CHB Gas condensing	0.0	0.0	0.7	2.1	1.2	0.4	-0.7	-1.8	-2.9	-3.8
	CHB Gas Jet burner non-condensing	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	CHB Gas Jet burner condensing	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Oil Jet burner non-condensing	0.0	0.0	-0.3	-0.8	-0.8	-0.8	-0.8	-0.7	-0.7	-0.6
	CHB Oil Jet burner condensing	0.0	0.0	0.4	0.9	0.9	0.9	0.8	0.8	0.8	0.7
	CHB Electric Joule-effect	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.1	0.5	0.8	1.2	1.5	1.9	2.1
	CHB Electric Heat Pump	0.0	0.0	-0.2	1.6	5.1	8.5	11.8	14.9	18.1	21.1
	CHB Gas Heat Pump	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	CHB micro CHP	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.4	0.2
	CHB Solar combi (16 m2)	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Central Heating boiler < 400 kW, space heating	**0**	**0**	**0**	**2**	**5**	**8**	**11**	**14**	**17**	**19**
	SFB Wood Manual	0.00	0.00	0.15	0.21	0.11	0.09	0.07	0.05	0.04	0.03
	SFB Wood Direct Draft	0.00	0.00	0.00	0.02	0.30	0.23	0.27	0.32	0.37	0.36
	SFB Coal	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	SFB Pellets	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00	0.00
	SFB Wood chips	0.00	0.00	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00
	Total Solid Fuel Boiler	**0.0**	**0.0**	**0.2**	**0.2**	**0.4**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
	Total AHC Heating & Cooling	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH open fireplace	0.00	0.00	0.00	0.51	0.78	0.67	0.57	0.47	0.38	0.29
	LH closed fireplace/inset	0.00	0.00	0.00	0.58	0.81	0.68	0.54	0.40	0.27	0.15
	LH wood stove	0.00	0.00	0.00	0.27	0.37	0.31	0.25	0.18	0.12	0.06
	LH coal stove	0.00	0.00	0.00	0.04	0.04	0.02	0.02	0.01	0.01	0.00
	LH cooker	0.00	0.00	0.00	0.22	0.31	0.21	0.11	0.01	0.00	0.00
	LH SHR stove	0.00	0.00	0.00	0.02	0.01	0.00	0.00	0.00	0.00	0.00
	LH pellet stove	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Solid fuel sum	**0.0**	**0.0**	**0.0**	**1.6**	**2.3**	**1.9**	**1.5**	**1.1**	**0.8**	**0.5**
	LH Electric portable	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric fixed > 250W	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric fixed ≤ 250W	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric storage	0.00	0.00	0.03	0.05	0.05	0.04	0.03	0.02	0.01	0.00
	LH Electric underfloor	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric visibly glowing > 1.2 kW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric visibly glowing ≤ 1.2 kW	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric Towel Heaters	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Electric sum	**0.0**	**0.0**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Gas luminous (commercial)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gaseous Tube (commercial < 120 kW)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gas open front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gas closed front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gas balanced flue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gas flueless	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Gaseous fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Liquid tube (commercial < 120 kW)	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid open front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid closed front	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid balanced flue	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid flueless	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**0.0**	**0.0**	**0.1**	**1.7**	**2.4**	**1.9**	**1.5**	**1.1**	**0.8**	**0.5**

db	ADDED Acquisition (ECO-BAU, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Acquisition partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	0.0	0.5	0.6	0.6	0.5	0.3	0.0	0.0	0.0	0.0
	RAC fixed 6-12 kW, cooling	0.0	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.1
	RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.0**	**1.0**	**1.1**	**1.0**	**0.9**	**0.6**	**0.3**	**0.3**	**0.2**	**0.1**
	RAC fixed < 6 kW, reversible, heating	0.0	0.2	0.3	0.3	0.3	0.2	0.0	0.0	0.0	0.0
	RAC fixed 6-12 kW, reversible, heating	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.3	0.2	0.1
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**0.4**	**0.5**	**0.6**	**0.6**	**0.5**	**0.3**	**0.3**	**0.2**	**0.1**
	RAC Room Air Conditioner	**0.0**	**1.3**	**1.6**	**1.6**	**1.5**	**1.1**	**0.6**	**0.5**	**0.3**	**0.1**
1	CIRC Integrated circulators	0.0	0.0	0.2	0.2	0.1	0.0	0.0	0.0	0.0	0.0
0.38	CIRC Large standalone circulators	0.0	0.0	0.5	0.4	0.3	0.2	0.2	0.2	0.1	0.1
0.38	CIRC Small standalone circulators	0.0	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
	CIRC Circulator pumps <2.5 kW, all	**0.0**	**0.0**	**1.0**	**0.9**	**0.6**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.0**	**0.0**	**0.5**	**0.4**	**0.4**	**0.3**	**0.2**	**0.1**	**0.1**	**0.1**
	TOTAL SPACE HEATING (incl. rev AC)	**0.0**	**0.4**	**1.5**	**5.3**	**9.2**	**11.5**	**13.7**	**15.8**	**18.1**	**19.9**
	TOTAL SPACE COOLING	**0.0**	**1.0**	**1.1**	**1.0**	**0.9**	**0.6**	**0.3**	**0.3**	**0.2**	**0.1**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	R-UVU 100-250 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU 250-1000 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
	NR-UVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	NR-AHU-M 5500-14500 m3/h	0.0	0.0	0.1	0.3	0.3	0.3	0.3	0.2	0.2	0.2
	NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	NRVU, Total non-residential	**0.0**	**0.0**	**0.2**	**0.6**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**	**0.5**
	TOTAL VENTILATION	**0.0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**	**0.6**	**0.6**
	LFL (T12,T8h,T8t,T5,other)	0.0	0.0	-0.9	-0.4	-1.4	-1.3	-1.2	-1.0	-0.8	-0.6
	HID (HPM, HPS, MH)	0.0	0.0	-0.2	-0.2	-0.3	-0.2	-0.1	-0.1	0.0	0.0
	CFLni (all shapes)	0.0	0.0	-0.1	-0.2	-0.3	-0.2	-0.1	-0.1	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.0	0.7	-0.4	-1.0	-0.8	-0.6	-0.3	-0.2	-0.1	-0.1
	GLS (DLS & NDLS)	0.0	-0.7	-1.2	-0.9	-0.5	-0.3	-0.2	-0.1	-0.1	0.0
	HL (DLS & NDLS, LV & MV)	0.0	0.3	0.2	-2.2	-1.8	-0.9	-0.5	-0.3	-0.2	-0.1
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.4	0.2	3.4	2.5	1.5	1.3	1.4	1.5
	LED replacing HID (retrofit & luminaire)	0.0	0.0	1.5	0.1	0.5	0.4	0.4	0.4	0.4	0.5
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LED replacing DLS (retrofit & luminaire)	0.0	0.2	0.9	0.3	0.1	-0.2	-0.1	0.0	0.0	0.0
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	3.0	2.8	0.4	-0.1	-0.4	-0.2	0.0	0.1
	SUBTOTAL non-LED	0.0	0.2	-2.6	-4.9	-5.1	-3.5	-2.4	-1.7	-1.2	-0.9
	SUBTOTAL LED	0.0	0.2	6.1	3.7	4.5	2.7	1.6	1.5	1.9	2.2
	TOTAL LIGHTING	**0.0**	**0.4**	**3.5**	**-1.2**	**-0.6**	**-0.8**	**-0.9**	**-0.2**	**0.7**	**1.3**
	TOTAL ELECTRONICS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total RF household Refrigerators & Freezers	**0.0**	**1.1**	**1.8**	**2.1**	**3.4**	**2.8**	**3.7**	**4.0**	**4.2**	**4.3**
	CF open vertical chilled multi deck (RVC2)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF Plug in one door beverage cooler	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF Plug in horizontal ice cream freezer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF Spiral vending machine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CF Commercial Refrigeration	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**
	PF Storage cabinets All types	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller All MT&LT	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.6	PF Condensing Unit, All MT&LT	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	PF Professional Refrigeration, Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	TOTAL FOOD PRESERVATION	**0.0**	**1.1**	**1.8**	**2.1**	**3.5**	**2.9**	**3.8**	**4.0**	**4.2**	**4.3**

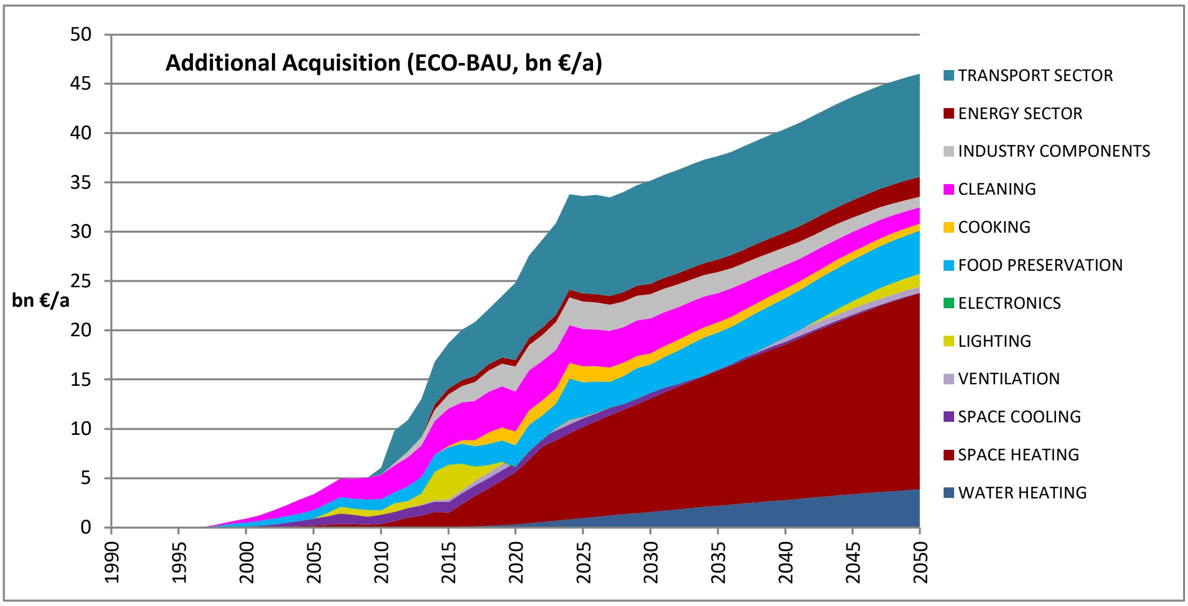
db	ADDED Acquisition (ECO-BAU, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	CA Electric Hobs	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CA Electric Ovens	0.0	0.0	0.1	0.4	0.3	0.0	0.0	0.0	0.0	0.0
	CA Gas Hobs	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	CA Gas Ovens	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.2	0.2	0.2
	CA Range Hoods	0.0	0.0	0.0	0.4	0.7	0.6	0.5	0.5	0.4	0.3
	TOTAL COOKING	**0.0**	**0.0**	**0.1**	**1.4**	**1.6**	**1.2**	**1.0**	**0.9**	**0.8**	**0.7**
	WM Washing Machines	0.0	1.2	1.3	1.3	1.0	0.7	0.4	0.1	0.0	0.0
	WD Washer-Dryers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total WM-WD household Washing	**0.0**	**1.2**	**1.3**	**1.3**	**1.0**	**0.7**	**0.4**	**0.1**	**0.0**	**0.0**
	Total DW household Dishwasher	**0.0**	**1.2**	**1.4**	**1.5**	**1.4**	**1.4**	**1.3**	**1.2**	**1.0**	**0.9**
	LD condensing heat pump	0.0	0.2	1.5	2.1	2.3	2.6	2.4	2.2	2.0	1.8
	LD condensing electric heat element	0.0	0.0	-0.4	-0.7	-0.7	-0.8	-0.7	-0.6	-0.6	-0.5
	LD vented electric	0.0	-0.1	-0.3	-0.3	-0.4	-0.5	-0.5	-0.5	-0.5	-0.5
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0.0**	**0.1**	**0.8**	**1.1**	**1.2**	**1.4**	**1.2**	**1.1**	**0.9**	**0.8**
	VC Cylinder Domestic mains	0.0	0.0	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains	**0.0**	**0.0**	**0.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	VC Cylinder Commercial mains	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	VC Upright Commercial mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Commercial mains	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	VC Total in scope of CR 666/2013	**0.0**	**0.0**	**0.3**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	VC Cordless - domestic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**0.0**	**0.0**	**0.3**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	VC Total Commercial mains+cordless+robots	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	Total VC Vacuum Cleaner	**0.0**	**0.0**	**0.3**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	TOTAL CLEANING	**0.0**	**2.5**	**3.8**	**4.1**	**3.8**	**3.5**	**3.0**	**2.4**	**2.0**	**1.7**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.4	0.7	0.6	0.5	0.4	0.3	0.2	0.1
0.5	FAN Axial>300Pa	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.5	FAN Centr.FC	0.0	0.0	0.3	0.6	0.6	0.5	0.4	0.3	0.3	0.2
0.5	FAN Centr.BC-free	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.5	FAN Centr.BC	0.0	0.0	0.5	0.6	0.6	0.5	0.4	0.4	0.3	0.2
0.5	FAN Cross-flow	0.0	0.0	0.4	0.5	0.6	0.5	0.5	0.5	0.6	0.6
	Total FAN, industrial (excl. box & roof fans)	**0.0**	**0.0**	**0.8**	**1.3**	**1.2**	**1.0**	**0.9**	**0.8**	**0.7**	**0.5**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.2
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 3ph 0.75-375 kW no VSD**	**0.0**	**0.0**	**0.0**	**-0.1**	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	0.3	1.1	1.1	0.9	0.8	0.6	0.4	0.2
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	0.4	0.7	0.7	0.6	0.5	0.4	0.2	0.1
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	0.2	0.3	0.3	0.3	0.2	0.1	0.1	0.1
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.0**	**0.0**	**1.0**	**2.1**	**2.1**	**1.8**	**1.4**	**1.1**	**0.7**	**0.3**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0.0**	**0.0**	**1.0**	**2.0**	**2.1**	**1.9**	**1.5**	**1.2**	**0.9**	**0.5**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.1	0.1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.3**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Large 3-ph LV 375-1000 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Large 3-ph LV 375-1000kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Large 3-ph LV 375-1000 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**

db	ADDED Acquisition (ECO-BAU, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
	MT Elec. Motors LV 0.12-1000 kW	**0.0**	**0.0**	**0.5**	**1.1**	**1.6**	**1.4**	**1.2**	**1.0**	**0.8**	**0.5**
	including double counted amounts	-	0.0	1.0	2.1	2.8	2.5	2.2	1.8	1.5	1.0
	ESOB < 45kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC < 45kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi < 45kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MSSB <6"	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MS_V <25 bar	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WP Water pumps	**0.00**	**0.00**	**0.04**	**0.03**	**0.03**	**0.02**	**0.01**	**0.01**	**0.00**	**0.00**
	Total WE Welding Equipment	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	TOTAL INDUSTRY COMPONENTS	0.0	0.0	1.4	2.5	2.8	2.5	2.1	1.8	1.5	1.1
	TRAFO Distribution	0.0	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	TRAFO Industry oil	0.0	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
	TRAFO Industry dry	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	TRAFO Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	TRAFO DER oil	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	TRAFO DER dry	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	0.9
	TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers	**0.0**	**0.0**	**0.6**	**0.7**	**0.8**	**1.0**	**1.3**	**1.5**	**1.8**	**2.0**
	TOTAL ENERGY SECTOR	**0.0**	**0.0**	**0.6**	**0.7**	**0.8**	**1.0**	**1.3**	**1.5**	**1.8**	**2.0**
	Tyres C1, replacement for cars	0.0	0.7	2.8	4.5	5.2	5.5	5.5	5.5	5.5	5.5
	Tyres C1, OEM for cars	0.0	0.0	0.0	1.2	1.6	1.7	1.7	1.7	1.7	1.7
	Tyres C1, total	**0.0**	**0.7**	**2.8**	**5.7**	**6.8**	**7.2**	**7.2**	**7.2**	**7.2**	**7.2**
	Tyres C2, replacement for vans	0.0	0.0	0.1	0.4	0.6	0.7	0.7	0.7	0.7	0.7
	Tyres C2, OEM for vans	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	Tyres C2, total	**0.0**	**0.0**	**0.1**	**0.4**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**
	Tyres C3, replacement for trucks/busses	0.0	0.0	1.8	1.6	1.9	1.9	1.9	1.9	1.9	1.9
	Tyres C3, OEM for trucks/busses	0.0	0.0	0.0	0.1	0.5	0.5	0.5	0.5	0.5	0.5
	Tyres C3, total	**0.0**	**0.0**	**1.8**	**1.7**	**2.4**	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**
	Tyres, total C1+C2+C3	**0.0**	**0.7**	**4.6**	**7.9**	**9.9**	**10.5**	**10.5**	**10.5**	**10.5**	**10.5**
	TRANSPORT SECTOR	**0.0**	**0.7**	**4.6**	**7.9**	**9.9**	**10.5**	**10.5**	**10.5**	**10.5**	**10.5**
	Total Added Acquisition (in bn euros)	**0**	**6**	**19**	**25**	**34**	**35**	**38**	**40**	**44**	**46**

ADDED Acquisition (ECO-BAU, summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.0**	**0.0**	**0.0**	**0.3**	**1.0**	**1.6**	**2.2**	**2.8**	**3.4**	**3.9**
SPACE HEATING	**0.0**	**0.4**	**1.5**	**5.3**	**9.2**	**11.5**	**13.7**	**15.8**	**18.1**	**19.9**
SPACE COOLING	**0.0**	**1.0**	**1.1**	**1.0**	**0.9**	**0.6**	**0.3**	**0.3**	**0.2**	**0.1**
VENTILATION	**0.0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.7**	**0.7**	**0.7**	**0.6**	**0.6**
LIGHTING	**0.0**	**0.4**	**3.5**	**-1.2**	**-0.6**	**-0.8**	**-0.9**	**-0.2**	**0.7**	**1.3**
ELECTRONICS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
FOOD PRESERVATION	**0.0**	**1.1**	**1.8**	**2.1**	**3.5**	**2.9**	**3.8**	**4.0**	**4.2**	**4.3**
COOKING	**0.0**	**0.0**	**0.1**	**1.4**	**1.6**	**1.2**	**1.0**	**0.9**	**0.8**	**0.7**
CLEANING	**0.0**	**2.5**	**3.8**	**4.1**	**3.8**	**3.5**	**3.0**	**2.4**	**2.0**	**1.7**
INDUSTRY COMPONENTS	0.0	0.0	1.4	2.5	2.8	2.5	2.1	1.8	1.5	1.1
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0.0	0.7	4.6	7.9	9.9	10.5	10.5	10.5	10.5	10.5
Added Acquisition TOTAL in bn euros	**0**	**6**	**18**	**24**	**33**	**34**	**36**	**39**	**42**	**44**
(in bn euros 2020, incl VAT & install)										
Increase in % versus BAU (from 1990=0)	0.0%	1.6%	4.8%	5.9%	7.3%	6.9%	7.0%	7.3%	7.7%	7.9%
Increase in % versus BAU (from 2010=0)	-3.7%	0.0%	3.2%	4.4%	6.0%	5.7%	5.9%	6.2%	6.6%	6.8%

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR	**0.0**	**0.0**	**0.6**	**0.7**	**0.8**	**1.0**	**1.3**	**1.5**	**1.8**	**2.0**
Total in bn euros, incl. energy Sector	**0**	**6**	**19**	**25**	**34**	**35**	**38**	**40**	**44**	**46**



Additional Acquisition costs for VSDs only (without motor)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VSD - Very Small 0.12 - 0.75 kW 3-phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
VSD - Small 0.75 - 7.5 kW 3-phase	0.0	0.0	0.2	0.7	0.7	0.6	0.4	0.3	0.2	0.0
VSD - Medium 7.5 - 75kW 3-phase	0.0	0.0	0.3	0.5	0.4	0.4	0.3	0.2	0.1	0.0
VSD - Large 75 - 375kW 3-phase	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.0	0.0	0.0
VSD - Very Large 375 - 1,000kW 3-phase	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Additional Acquisition, VSDs only (ECO-BAU)	**0.0**	**0.0**	**0.6**	**1.3**	**1.3**	**1.0**	**0.8**	**0.5**	**0.3**	**0.0**

Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for ECO-BAU Additional Acquisition (sector definitions and order as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

Added Acquisition (summary RESIDENTIAL, bn euros	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.0**	**0.0**	**0.0**	**0.3**	**0.8**	**1.4**	**1.9**	**2.4**	**2.9**	**3.3**
SPACE HEATING	**0.0**	**0.2**	**1.0**	**4.1**	**7.1**	**8.7**	**10.3**	**11.8**	**13.5**	**14.8**
SPACE & HT PROCESS COOLING	**0.0**	**0.6**	**0.7**	**0.7**	**0.6**	**0.4**	**0.2**	**0.1**	**0.1**	**0.0**
VENTILATION (from electricity)	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
LIGHTING	**0.0**	**0.3**	**2.2**	**-0.6**	**-1.8**	**-1.1**	**-0.7**	**-0.4**	**-0.3**	**-0.1**
ELECTRONICS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
FOOD PRESERVATION	**0.0**	**1.1**	**1.6**	**1.9**	**3.1**	**2.6**	**3.5**	**3.7**	**3.9**	**4.0**
COOKING	**0.0**	**0.0**	**0.1**	**1.2**	**1.4**	**1.0**	**0.9**	**0.8**	**0.8**	**0.7**
CLEANING	**0.0**	**2.4**	**3.6**	**3.7**	**3.5**	**3.3**	**2.8**	**2.3**	**1.9**	**1.6**
INDUSTRY COMPONENTS	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
Added Acquisition, Residential, in bn euros	**0.0**	**4.6**	**9.3**	**11.5**	**15.1**	**16.5**	**19.0**	**20.9**	**22.8**	**24.5**

REAL Energy & consumables rates			1990	2010	2015	2020	2025	2030	2035	2040	2045	2050

Data are a linked copy of those on GENERAL_1, see additional info and user settings on sheets General_1 and _2.
RES=residential (incl. VAT); IND=industry, TER=tertiary/services, OTH=other sector (all excl. VAT)
REAL rates (in Euro 2020, inflation corrected)

			1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
electricity												
Rel1	electricity RES	€ /kwh elec	0.219	0.178	0.186	0.204	0.212	0.221	0.219	0.220	0.221	0.224
Rel2	electricity IND	€ /kwh elec	0.127	0.101	0.098	0.097	0.101	0.106	0.106	0.107	0.107	0.108
Rel3	electricity TER	€ /kwh elec	0.175	0.155	0.166	0.188	0.195	0.203	0.202	0.201	0.201	0.204
Rel4	electricity OTH	€ /kwh elec	0.175	0.155	0.166	0.188	0.195	0.203	0.202	0.201	0.201	0.204
natural gas (heating fuel)												
Rgas1	natural gas RES	€ /kWh NCV	0.052	0.072	0.078	0.054	0.067	0.078	0.081	0.085	0.087	0.088
Rgas2	natural gas IND	€ /kWh NCV	0.027	0.040	0.038	0.024	0.030	0.037	0.039	0.043	0.046	0.046
Rgas3	natural gas TER	€ /kWh NCV	0.043	0.058	0.065	0.044	0.054	0.063	0.066	0.070	0.072	0.072
Rgas4	natural gas OTH	€ /kWh NCV	0.040	0.055	0.056	0.045	0.053	0.062	0.065	0.069	0.071	0.072
gas oil (heating fuel)												
Roil1	gas oil heating RES	€ /kWh NCV	0.044	0.087	0.073	0.060	0.088	0.106	0.114	0.119	0.124	0.132
Roil2	gas oil heating IND	€ /kWh NCV	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100
Roil3	gas oil heating TER	€ /kWh NCV	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100
Roil4	gas oil heating OTH	€ /kWh NCV	0.038	0.074	0.068	0.056	0.070	0.084	0.090	0.092	0.095	0.100
fossil fuel (heating fuel) (mix of gas and oil)												
Rfossil1	oil-gas mix RES	€ /kWh NCV	0.051	0.075	0.077	0.055	0.072	0.083	0.088	0.092	0.095	0.096
Rfossil2	oil-gas mix IND	€ /kWh NCV	0.029	0.047	0.044	0.030	0.038	0.046	0.049	0.053	0.056	0.057
Rfossil3	oil-gas mix TER	€ /kWh NCV	0.042	0.061	0.065	0.046	0.057	0.067	0.071	0.074	0.077	0.078
Rfossil4	oil-gas mix OTH	€ /kWh NCV	0.040	0.059	0.058	0.047	0.057	0.067	0.070	0.074	0.076	0.078
LPG (heating fuel)												
RLPG1	LPG/propane RES	€ /kWh NCV	0.055	0.091	0.081	0.076	0.090	0.101	0.109	0.119	0.131	0.131
RLPG2	LPG/propane IND	€ /kWh NCV	0.055	0.089	0.075	0.076	0.095	0.106	0.109	0.110	0.110	0.108
RLPG3	LPG/propane TER	€ /kWh NCV	0.048	0.077	0.066	0.064	0.082	0.094	0.097	0.098	0.110	0.109
RLPG4	LPG/propane OTH	€ /kWh NCV	0.048	0.077	0.066	0.064	0.082	0.094	0.097	0.098	0.110	0.109
Firewood, logs (heating fuel)												
Rwood1	firewood logs RES	€ /kWh NCV	0.030	0.034	0.052	0.040	0.040	0.042	0.044	0.046	0.048	0.050
Rwood2	firewood logs IND	€ /kWh NCV	0.025	0.029	0.043	0.033	0.034	0.035	0.037	0.038	0.040	0.042
Rwood3	firewood logs TER	€ /kWh NCV	0.025	0.029	0.043	0.033	0.034	0.035	0.037	0.038	0.040	0.042
Rwood4	firewood logs OTH	€ /kWh NCV	0.025	0.029	0.043	0.033	0.034	0.035	0.037	0.038	0.040	0.042
Wood pellets (heating fuel)												
Rpellets1	pellets RES	€ /kWh NCV	0.046	0.053	0.057	0.053	0.053	0.055	0.058	0.061	0.063	0.066
Rpellets2	pellets IND	€ /kWh NCV	0.039	0.044	0.047	0.045	0.044	0.046	0.048	0.051	0.053	0.055
Rpellets3	pellets TER	€ /kWh NCV	0.039	0.044	0.047	0.045	0.044	0.046	0.048	0.051	0.053	0.055
Rpellets4	pellets OTH	€ /kWh NCV	0.039	0.044	0.047	0.045	0.044	0.046	0.048	0.051	0.053	0.055
Coal (heating fuel)												
Rcoal1	coal RES	€ /kWh NCV	0.024	0.033	0.019	0.016	0.016	0.017	0.018	0.019	0.020	0.021
Rcoal2	coal IND	€ /kWh NCV	0.020	0.027	0.016	0.013	0.014	0.014	0.015	0.016	0.017	0.018
Rcoal3	coal TER	€ /kWh NCV	0.020	0.027	0.016	0.013	0.014	0.014	0.015	0.016	0.017	0.018
Rcoal4	coal OTH	€ /kWh NCV	0.020	0.027	0.016	0.013	0.014	0.014	0.015	0.016	0.017	0.018
Wood chips (heating fuel)												
Rwoodchip1	wood chips RES	€ /kWh NCV	0.022	0.032	0.036	0.029	0.028	0.029	0.031	0.032	0.034	0.035
Rwoodchip2	wood chips IND	€ /kWh NCV	0.019	0.027	0.030	0.024	0.024	0.025	0.026	0.027	0.028	0.029
Rwoodchip3	wood chips TER	€ /kWh NCV	0.019	0.027	0.030	0.024	0.024	0.025	0.026	0.027	0.028	0.029
Rwoodchip4	wood chips OTH	€ /kWh NCV	0.019	0.027	0.030	0.024	0.024	0.025	0.026	0.027	0.028	0.029
Petrol (automotive)												
Rpetrol1	petrol RES	€ /kWh NCV	0.126	0.165	0.159	0.140	0.175	0.193	0.213	0.235	0.259	0.287
Rpetrol2	petrol IND	€ /kWh NCV	0.107	0.138	0.132	0.117	0.146	0.161	0.177	0.196	0.216	0.239
Rpetrol3	petrol TER	€ /kWh NCV	0.107	0.138	0.132	0.117	0.146	0.161	0.177	0.196	0.216	0.239
Rpetrol4	petrol OTH	€ /kWh NCV	0.107	0.138	0.132	0.117	0.146	0.161	0.177	0.196	0.216	0.239
Diesel (automotive)												
Rdiesel1	diesel RES	€ /kWh NCV	0.082	0.133	0.129	0.118	0.146	0.162	0.178	0.197	0.217	0.240
Rdiesel2	diesel IND	€ /kWh NCV	0.070	0.111	0.108	0.099	0.122	0.135	0.149	0.164	0.181	0.200
Rdiesel3	diesel TER	€ /kWh NCV	0.070	0.111	0.108	0.099	0.122	0.135	0.149	0.164	0.181	0.200
Rdiesel4	diesel OTH	€ /kWh NCV	0.070	0.111	0.108	0.099	0.122	0.135	0.149	0.164	0.181	0.200
Non-energy consumables												
other												
Rwater1	water & sewage R	€/m³	3.19	3.96	4.33	4.37	4.53	4.76	5.00	5.25	5.52	5.80
Rpaper	copier/printer R& NR	€/page	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Rdishw1	dishwasher det. R	€/cycle	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10	0.10
Rwash1	washing mach. det. R	€/cycle	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17	0.17
Rargon	weld shielding gas	€/kg Ar	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30	2.30
Rfiller	weld wire/electrodes	€/kg Steel	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44	0.44

Prices for Vacuum Cleaner bags and filters

Source: 2019 review study; assumed valid in 2015, for indicated usage hours

VC bags (5-pack)	8.6	2015 euros/pack (incl. 20% VAT)
VC bags domestic mains @ 50 h/a	3.23	2015 euros/year, cylindrical and upright, 3 packs over 8 years lifetime
VC bags commercial mains @ 300 h/a	12.90	2015 euros/year, cylindrical and upright, 7.5 packs over 5 years lifetime
VC filter (except for robots)	20.11	2015 euros/filter (incl. 20% VAT)
VC filters domestic mains @ 50 h/a	5.03	2015 euros/year, 2 filters over 8 years lifetime
VC filters commer. mains @ 300 h/a	8.04	2015 euros/year, 2 filters over 5 years lifetime
VC filters for cordless @ 63 h/a	6.70	2015 euros/year, 2 filters over 6 years lifetime
VC filter for robots	24.10	2015 euros/filter (incl. 20% VAT)
VC filters for robots @ 104 h/a	8.03	2015 euros/year, 2 filters over 6 years lifetime

Annual costs for Bags and filters (in 2020 euros)

(average per unit, scaled for real-life h/a from LOAD sheet and with indicated price increase of x%/a after 2015)

(for commercial subtracted 20% VAT in table below)

(converted to 2020 euros in table below)

			x%/a	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Rvccyldom	Cylinder domestic	€/year	0%	8.73	7.22	6.95	6.60	6.54	6.58	6.60	6.48	6.30	6.18
Rvcuprdom	Upright Domestic	€/year	0%	8.73	7.22	6.95	6.60	6.54	6.58	6.60	6.48	6.30	6.18
Rvcstkdom	Handstick Mains	€/year	0%	5.32	4.40	4.24	4.02	3.98	4.01	4.02	3.95	3.84	3.77
Rvccylcom	Cylinder commercial	€/year	0%	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46
Rvcuprcom	Upright Commercial	€/year	0%	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46	18.46
Rvccrddom	Cordless-domestic	€/year	0%	7.09	5.86	5.65	5.36	5.31	5.34	5.36	5.26	5.11	5.02
Rvccrdcom	Cordless-commercial	€/year	0%	28.13	28.13	28.13	28.13	28.13	28.13	28.13	28.13	28.13	28.13
Rvcrobdom	Robot-domestic	€/year	0%	8.50	7.03	6.77	6.42	6.36	6.40	6.43	6.31	6.13	6.02
Rvcrobcom	Robot-commercial	€/year	0%	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42	20.42

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	1	1	1	1	1	1	2	2	2	2
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	1	1	2	2	2	2	2	2	2	2
	ESWH Electric Storage > 30 L (primary)	12	13	14	16	16	17	18	19	20	21
	GIWH Gas Instant. < 13 L/min (secondary)	1	1	1	1	1	1	1	1	1	1
	GIWH Gas Instant. ≥ 13 L/min (primary)	0	1	1	0	0	0	0	0	0	0
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	1	1	1	1	1	0	0	0	0	0
	Dedicated WH Heat Pump	0	0	0	0	1	1	2	2	2	3
	Dedicated WH Solar (3.5 m2)	0	1	1	1	2	1	1	1	1	1
	WH dedicated Water Heater	**17**	**20**	**22**	**22**	**23**	**25**	**26**	**28**	**30**	**32**
	CHB Gas Combi Instant. WH	3	10	11	8	9	11	11	12	12	12
	CHB Gas + Cyl. WH	2	4	4	3	4	4	4	5	5	5
	CHB Jet Burner Gas + Cyl. WH	0	1	0	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	3	5	4	2	2	2	2	2	2	2
	CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	0	0
	CHB Electric HP + Cyl. WH	0	0	1	1	1	1	1	2	2	2
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**9**	**20**	**20**	**14**	**17**	**19**	**20**	**21**	**22**	**22**
	TOTAL WATER HEATING	**26**	**40**	**42**	**37**	**40**	**44**	**46**	**49**	**51**	**54**
	CHB Gas non-condensing	39	59	52	28	24	24	22	19	17	14
	CHB Gas condensing	0	19	30	28	41	49	51	53	54	53
	CHB Gas Jet burner non-condensing	4	4	3	2	1	1	0	0	0	0
	CHB Gas Jet burner condensing	0	0	0	0	0	0	1	1	1	1
	CHB Oil Jet burner non-condensing	46	55	36	21	19	12	7	6	6	5
	CHB Oil Jet burner condensing	0	1	2	2	4	6	7	7	8	8
	CHB Electric Joule-effect	3	2	3	3	3	3	3	2	2	2
	CHB Hybrid (gas-electric)	0	0	0	0	0	0	0	0	1	1
	CHB Electric Heat Pump	0	2	3	4	5	6	7	7	8	9
	CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	0
	CHB micro CHP	0	0	0	0	0	0	0	0	0	0
	CHB Solar combi (16 m2)	0	0	0	0	0	1	1	0	0	0
	CHB Central Heating boiler < 400 kW, space heating	**94**	**142**	**129**	**89**	**99**	**102**	**99**	**98**	**97**	**95**
	SFB Wood Manual	10.1	3.0	3.5	2.0	1.4	0.8	0.5	0.4	0.3	0.3
	SFB Wood Direct Draft	0.1	0.8	2.2	2.4	2.8	2.8	3.0	3.3	4.0	4.9
	SFB Coal	8.4	3.4	1.9	1.3	1.0	0.6	0.5	0.5	0.4	0.4
	SFB Pellets	0.0	0.5	0.9	1.1	1.4	1.6	1.6	1.7	1.9	2.1
	SFB Wood chips	0.0	0.4	0.5	0.5	0.4	0.4	0.5	0.5	0.6	0.6
	Total Solid Fuel Boiler	**19**	**8**	**9**	**7**	**7**	**6**	**6**	**6**	**7**	**8**
	CHAE-S (≤ 400 kW)	0.6	1.4	1.7	2.1	2.2	2.3	2.3	2.3	2.3	2.3
	CHAE-L (> 400 kW)	0.8	1.8	2.0	2.3	2.4	2.3	2.2	2.0	1.9	1.9
	CHWE-S (≤ 400 kW)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4
	CHWE-L (> 1500 kW)	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	3.2	4.4	5.1	6.1	6.6	7.0	7.1	7.2	7.3	7.4
	HT PCH-AE-L	3.1	4.2	4.9	5.8	6.2	6.6	6.6	6.7	6.8	6.9
	HT PCH-WE-S	0.7	0.9	1.1	1.3	1.4	1.5	1.5	1.5	1.5	1.6
	HT PCH-WE-M	1.3	1.8	2.1	2.5	2.7	2.9	2.9	3.0	3.0	3.1
	HT PCH-WE-L	0.2	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	AC rooftop	0.5	1.0	1.0	1.0	0.8	0.5	0.3	0.1	0.1	0.1
	AC splits	0.7	1.7	1.8	1.9	1.8	1.7	1.5	1.3	1.2	1.1
	AC VRF	0.0	0.4	0.7	1.0	1.3	1.7	1.9	2.1	2.2	2.3
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**11**	**19**	**22**	**26**	**27**	**28**	**28**	**28**	**28**	**28**
	AC rooftop (rev)	0.6	1.7	1.8	1.8	1.4	0.9	0.4	0.1	0.0	0.0
	AC splits (rev)	1.2	3.2	3.6	3.9	3.8	3.6	3.2	2.8	2.5	2.3
	AC VRF (rev)	0.0	1.1	1.7	2.6	3.4	4.3	4.8	5.0	5.0	5.0
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	AHF	7.7	8.1	7.0	4.5	4.9	5.0	4.7	4.4	4.0	3.6
	AHE	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
	SubTotal AHC Heating	**10**	**14**	**14**	**13**	**14**	**14**	**13**	**13**	**12**	**11**
	Total AHC Heating & Cooling	**21**	**33**	**36**	**39**	**41**	**42**	**41**	**40**	**40**	**39**

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.4	0.6	1.0	0.8	0.8	0.8	0.9	0.9	0.9	1.0
	LH closed fireplace/inset	0.5	1.4	2.4	2.1	2.4	2.6	2.8	2.9	2.9	3.0
	LH wood stove	1.1	1.3	1.9	1.5	1.5	1.6	1.6	1.7	1.7	1.8
	LH coal stove	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.2	0.4	0.6	0.5	0.6	0.6	0.7	0.7	0.7	0.7
	LH SHR stove	0.5	0.7	1.1	1.0	1.1	1.2	1.4	1.5	1.6	1.7
	LH pellet stove	0.0	0.4	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.1
	LH Solid fuel sum	**3**	**5**	**8**	**7**	**7**	**8**	**8**	**9**	**9**	**9**
	LH Electric portable	4.7	3.6	3.7	4.0	4.0	3.9	3.6	3.5	3.3	3.3
	LH Electric fixed > 250W	25.1	18.6	18.0	17.2	15.1	13.9	13.0	12.3	11.8	11.5
	LH Electric fixed ≤ 250W	1.7	1.3	1.2	1.2	1.0	0.9	0.9	0.8	0.8	0.8
	LH Electric storage	1.4	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.8
	LH Electric underfloor	4.3	3.5	3.6	3.9	3.9	3.9	3.8	3.6	3.4	3.3
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.4	1.6	1.8	1.9	1.8	1.7	1.6	1.6	1.5	1.5
	LH Electric sum	**39**	**30**	**30**	**30**	**27**	**26**	**24**	**23**	**22**	**21**
	LH Gas luminous (commercial)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	LH Gas closed front	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	LH Gas balanced flue	0.5	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0					
	LH Gaseous fuel sum	**0.9**	**0.7**	**0.7**	**0.4**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.3**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0					
	LH Liquid fuel sum	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**43**	**36**	**38**	**37**	**35**	**34**	**33**	**32**	**31**	**31**
	RAC fixed < 6 kW, cooling	0.4	2.8	2.6	2.1	2.2	2.5	2.6	2.8	3.2	3.6
	RAC fixed 6-12 kW, cooling	0.2	1.4	1.5	1.4	1.4	1.4	1.5	1.5	1.6	1.8
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode	**0.6**	**4.4**	**4.3**	**3.7**	**3.8**	**4.1**	**4.3**	**4.6**	**5.0**	**5.7**
	RAC fixed < 6 kW, reversible, heating	0.2	3.4	4.1	4.4	5.6	7.2	8.4	10.0	11.7	13.2
	RAC fixed 6-12 kW, reversible, heating	0.1	1.7	2.3	2.6	3.2	3.9	4.4	5.0	5.5	6.0
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.2**	**5.1**	**6.4**	**7.0**	**8.7**	**11.0**	**12.8**	**15.0**	**17.2**	**19.2**
	RAC Room Air Conditioner	**1**	**10**	**11**	**11**	**13**	**15**	**17**	**20**	**22**	**25**
1	CIRC Integrated circulators	2.6	3.2	3.4	3.9	4.2	4.4	4.4	4.2	4.0	3.9
0.38	CIRC Large standalone circulators	1.6	1.9	1.9	1.9	1.8	1.6	1.4	1.3	1.2	1.2
0.38	CIRC Small standalone circulators	1.3	1.5	1.4	1.4	1.3	1.2	1.1	1.0	1.0	0.9
	CIRC Circulator pumps <2.5 kW, all	**5.5**	**6.5**	**6.7**	**7.1**	**7.3**	**7.3**	**6.9**	**6.5**	**6.2**	**6.0**
	CIRC Circulator pumps <2.5 kW, excl. double	**1.8**	**2.1**	**2.0**	**2.0**	**1.9**	**1.8**	**1.6**	**1.4**	**1.4**	**1.3**
	TOTAL SPACE HEATING	**167**	**208**	**200**	**155**	**165**	**169**	**166**	**165**	**166**	**166**
	TOTAL SPACE COOLING	**12**	**23**	**26**	**29**	**31**	**32**	**32**	**32**	**33**	**34**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.8	1.1
	R-UVU 100-250 m3/h	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4
	R-UVU 250-1000 m3/h	0.5	0.9	1.0	1.2	1.3	1.4	1.4	1.5	1.5	1.5
	R-BVU 250-1000 m3/h	0.0	0.1	0.1	0.2	0.4	0.7	1.1	1.4	1.8	2.2
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	RVU, Total residential, from VU own electricity	**0.6**	**1.2**	**1.4**	**1.7**	**2.2**	**2.9**	**3.5**	**4.1**	**4.8**	**5.6**
	NR-UVU 250-1000 m3/h	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	NR-BVU 250-1000 m3/h	0.0	0.1	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7
	NR-UVU > 1000 m3/h	0.1	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5
	NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.5	0.8	0.9	1.1	1.3	1.4	1.6	1.8
	NR-AHU-M 5500-14500 m3/h	2.9	3.4	3.4	3.7	3.8	4.2	4.3	4.5	4.7	5.0
	NR-AHU-L > 14500 m3/h	0.8	1.0	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.4
	NRVU, Total non-residential, from VU own electricity	**4.0**	**5.4**	**5.8**	**6.5**	**6.9**	**7.7**	**8.2**	**8.7**	**9.2**	**9.8**
	VU Ventilation Units, res + non-res., from VU own elec.	**4.6**	**6.6**	**7.2**	**8.2**	**9.1**	**10.6**	**11.7**	**12.8**	**14.0**	**15.4**
	TOTAL VENTILATION (from VU own electricity)	**5**	**7**	**7**	**8**	**9**	**11**	**12**	**13**	**14**	**15**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	-	-	-	-	-	-	-	-	-	-

db BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	12.9	17.6	22.2	27.8	28.6	25.6	19.9	15.6	12.2	9.7
HID (HPM, HPS, MH)	4.9	9.4	10.5	12.0	10.6	7.4	3.9	2.1	1.2	0.7
CFLni (all shapes)	0.4	1.3	1.6	1.8	1.7	1.2	0.6	0.3	0.2	0.1
CFLi (retrofit for GLS, HL)	0.2	1.8	2.5	2.9	2.6	2.2	1.4	0.9	0.6	0.4
GLS (DLS & NDLS)	15.3	10.5	8.1	6.5	4.0	2.4	1.4	0.8	0.5	0.3
HL (DLS & NDLS, LV & MV)	1.2	6.0	8.3	10.8	8.0	4.2	2.2	1.2	0.7	0.4
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.1	1.4	4.3	8.9	13.4	17.6	21.7	26.3
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	1.2	3.5	6.4	8.7	10.6	12.5	14.6
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.2	0.5	0.7	0.9	1.1	1.2
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.4	0.7	0.9	1.1	1.2	1.4
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.6	1.8	3.0	3.9	4.6	5.3	5.9
Standby	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
TOTAL LIGHTING (incl. standby)	**36**	**49**	**55**	**67**	**67**	**64**	**59**	**57**	**58**	**62**
DP TV on-mode, total all types	5.0	10.8	13.0	15.0	14.3	16.8	16.5	15.5	15.1	15.7
DP TV standby, standard (NoNA)	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, LoNA	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0
DP TV standby, HiNA ('Smart')	0.0	0.0	0.3	0.8	1.3	1.7	1.8	1.6	1.4	1.2
DP TV standby, total all types	**1**	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**1**	**1**
DP TV total on-mode + standby	**6**	**11**	**14**	**16**	**16**	**19**	**18**	**17**	**16**	**17**
DP Monitor on-mode	0.1	2.0	1.3	1.0	1.0	1.0	0.8	0.6	0.6	0.6
DP Monitor standby	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP Monitor total	**0**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
DP Signage on-mode	0.0	0.1	1.3	3.2	4.0	4.1	3.7	3.6	3.4	3.4
DP Signage standby	0.0	0.0	0.2	0.5	0.6	0.6	0.6	0.5	0.5	0.5
DP Signage total	**0**	**0**	**1**	**4**	**5**	**5**	**4**	**4**	**4**	**4**
DP Electronic Displays, total on-mode	**5**	**13**	**16**	**19**	**19**	**22**	**21**	**20**	**19**	**20**
DP Electronic Displays, total standby	**1**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
DP Electronic Displays, total	**6**	**13**	**16**	**21**	**21**	**24**	**23**	**22**	**21**	**21**
SSTB	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (low-power modes)	0.0	0.9	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2
CSTB (other modes)	0.0	0.5	1.2	1.3	1.3	1.2	1.2	1.2	1.2	1.2
CSTB (all covered modes)	0.0	1.4	3.4	3.7	3.6	3.5	3.3	3.3	3.3	3.4
Total STB set top boxes (Complex & Simple)	**0**	**2**	**4**	**4**	**4**	**3**	**3**	**3**	**3**	**3**
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.8	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Game consoles, active modes	0.0	0.5	0.9	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total Game consoles > 20 W, all modes	0.0	0.7	1.2	1.6	1.6	1.7	1.6	1.6	1.6	1.7
Total Game consoles < 20 W, all modes	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total Game consoles, all modes	**0**	**1**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
ES&DS only, without effects on infrastructure										
ES tower 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 1-socket traditional	0.0	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket traditional	0.1	1.9	1.1	0.7	0.9	1.1	1.2	1.2	1.2	1.2
ES rack 2-socket cloud	0.0	1.1	1.8	2.2	2.7	3.3	3.6	3.6	3.6	3.6
ES rack 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
ES rack 4-socket cloud	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.6
ES rack 2-socket resilient trad.	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
ES rack 2-socket resilient cloud	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 2-socket traditional	0.1	0.9	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.6
ES blade 2-socket cloud	0.0	0.5	0.8	1.1	1.3	1.6	1.7	1.7	1.7	1.8
ES blade 4-socket traditional	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 4-socket cloud	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
ES total traditional	**0**	**4**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
ES total cloud	**0**	**2**	**3**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
ES Enterprise Servers total	**0**	**6**	**5**	**6**	**7**	**8**	**9**	**9**	**9**	**9**
DS Online 2	0.1	0.8	1.2	1.9	2.4	3.0	3.2	3.2	3.2	3.2
DS Online 3	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.7	1.7	1.7	1.7	1.8
DS Data Storage products total	**0**	**1**	**2**	**3**	**4**	**5**	**5**	**5**	**5**	**5**
ES + DS total (excl. infrastructure)	**0**	**7**	**7**	**9**	**11**	**13**	**14**	**14**	**14**	**14**

db	**BAU Energy costs (in bn euros)**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	PC Desktop	3.2	3.5	2.5	1.7	2.0	2.3	2.2	2.1	2.0	1.9
	PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	PC Notebook	0.0	1.2	1.5	1.3	1.5	1.6	1.6	1.7	1.7	1.6
	PC Tablet/slate	0.0	0.0	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3
	PC Thin client	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3
	Total PC, electricity	**3.4**	**5.2**	**4.8**	**3.9**	**4.3**	**4.8**	**4.8**	**4.8**	**4.6**	**4.5**
	Inkjet Printer	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	EP / Laser Printer mono	1.4	0.4	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.1
	EP / Laser Printer colour	0.0	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.7
	EP / Laser Copier mono	1.6	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4
	EP / Laser MFD colour	0.0	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.5	0.5
	Total IE Imaging Equipment	**3.4**	**1.7**	**2.0**	**2.2**	**2.2**	**2.2**	**2.1**	**2.0**	**1.9**	**1.9**
	of which for modes under CR 1275/2008	*2.6*	*1.3*	*1.5*	*1.7*	*1.6*	*1.7*	*1.6*	*1.5*	*1.5*	*1.4*
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.4	1.0	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	SB Audio speakers (wired) (sb & off modes)	0.4	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.7	1.1	1.1	1.1	1.1	1.1	1.2
	SB Small appliances (sb & off modes)	0.3	1.2	1.3	1.5	1.6	1.7	1.7	1.7	1.7	1.8
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	SB Media players and recorders (sb mode)	0.0	0.6	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.9	1.0
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.4	0.7	1.0	1.2	1.2	1.2	1.2
	SB Coffee makers (off mode)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.3	0.4	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	*0.2*	*0.2*	*0.3*	*0.3*	*0.3*	*0.3*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.5	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3
1	SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2
1	SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
1	SB IE Inkjet Printers (nsb mode)	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Printers (nsb mode)	1.1	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5
1	SB IE Laser Copiers (nsb mode)	1.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.5	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7
	Total (networked) SB (incl. double)	4	9	12	13	13	14	14	14	14	14
	Total (networked) SB (excl. double)	**1**	**5**	**6**	**6**	**7**	**7**	**8**	**8**	**8**	**8**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.6	EPS 10–12 W	0.0	1.2	2.0	2.4	2.4	2.4	2.3	2.2	2.1	2.1
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	EPS, total for active mode	**0.0**	**1.8**	**2.7**	**3.0**	**3.1**	**3.1**	**2.9**	**2.8**	**2.7**	**2.7**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.0	EPS 10–12 W	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**	**0.2**
	EPS, overall total (active + no-load)	**0.0**	**2.1**	**3.0**	**3.3**	**3.3**	**3.3**	**3.2**	**3.0**	**2.9**	**2.9**
	EPS, double counted subtracted	**0.0**	**1.1**	**1.5**	**1.7**	**1.7**	**1.7**	**1.6**	**1.5**	**1.5**	**1.4**
	TOTAL ELECTRONICS	**15**	**37**	**43**	**49**	**53**	**59**	**59**	**57**	**56**	**56**

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	**24**	**20**	**21**	**23**	**25**	**26**	**25**	**25**	**25**	**26**
	CF open vertical chilled multi deck (RVC2)	2.4	2.0	2.0	2.1	2.1	2.1	2.1	2.1	2.1	2.2
	CF open horizontal frozen island (RHF4)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF other supermarket display (non-BCs)	4.2	3.6	3.8	4.2	4.4	4.7	4.8	4.9	5.1	5.2
	CF Plug in one door beverage cooler	2.7	2.4	2.5	2.6	2.7	2.8	2.8	2.9	2.9	3.0
	CF Plug in horizontal ice cream freezer	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7
	CF Spiral vending machine	0.6	0.4	0.3	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**11**	**9**	**9**	**10**	**10**	**11**	**11**	**11**	**11**	**12**
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	PF Storage cabinets All types	**0.9**	**1.1**	**1.3**	**1.5**	**1.7**	**1.8**	**1.9**	**2.0**	**2.1**	**2.2**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC MT L > 300 kW	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.4	1.5	1.7
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.8	0.9	1.1	1.3	1.4	1.5	1.7	1.8
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8
	PF Process Chiller All MT&LT	**2**	**4**	**4**	**5**	**6**	**7**	**7**	**8**	**9**	**9**
	PF Condensing Unit MT S 0.2-1 kW	0.9	0.7	0.7	0.8	0.9	1.1	1.1	1.2	1.3	1.4
	PF Condensing Unit MT M 1-5 kW	2.4	1.7	1.8	2.1	2.4	2.7	2.9	3.1	3.3	3.6
	PF Condensing Unit MT L 5-20 kW	3.0	2.1	2.2	2.6	2.9	3.3	3.5	3.8	4.1	4.4
	PF Condensing Unit MT XL 20-50 kW	2.9	2.1	2.2	2.6	2.9	3.3	3.5	3.7	4.0	4.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Condensing Unit LT L 2-8 kW	0.7	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1
	PF Condensing Unit LT XL 8-20 kW	2.3	1.7	1.7	2.0	2.3	2.5	2.7	2.9	3.1	3.4
0.6	**PF Condensing Unit, All MT&LT**	**13**	**9**	**10**	**11**	**13**	**14**	**15**	**16**	**18**	**19**
	PF Professional Refrigeration, Total	**8**	**9**	**9**	**11**	**12**	**14**	**15**	**16**	**18**	**19**
	TOTAL FOOD PRESERVATION	**43**	**38**	**40**	**44**	**47**	**51**	**51**	**53**	**54**	**57**
	CA Electric Hobs (active modes)	4.1	5.2	6.0	7.2	8.1	8.9	9.3	9.8	10.2	10.9
	CA Electric Hobs (low-power modes)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
	CA Electric Hobs (sum all modes)	4	5	6	8	8	9	10	10	11	11
	CA Electric Ovens (active modes)	4.5	3.7	3.7	3.9	3.9	4.2	4.3	4.3	4.3	4.4
	CA Electric Ovens (low-power modes)	0.0	0.5	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3
	CA Electric Ovens (sum all modes)	4	4	4	5	5	5	6	6	6	6
	CA Gas Hobs	1.5	1.8	1.9	1.2	1.5	1.6	1.6	1.6	1.5	1.5
	CA Gas Ovens	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	CA Range Hoods	1.9	2.0	2.2	2.5	2.8	3.0	3.2	3.3	3.5	3.7
	CA Elec. Hobs&Ovens low-power modes	0.0	0.8	1.1	1.4	1.5	1.7	1.7	1.8	1.8	1.9
	CA other products or modes	13	13	14	15	17	18	19	19	20	21
	TOTAL COOKING	**13**	**14**	**15**	**17**	**18**	**20**	**21**	**21**	**22**	**23**
	WM Washing Machines, active modes	9.3	6.1	6.1	6.3	6.0	5.8	5.3	4.9	4.5	4.2
	WM Washing Machines, low-power modes	0.0	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	WM Washing Machines	9.3	6.4	6.4	6.6	6.4	6.3	5.8	5.3	4.9	4.6
	WD Washer-Dryers, active modes	1.6	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.4
	WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers	1.6	1.5	1.5	1.6	1.6	1.6	1.5	1.4	1.4	1.4
	WM-WD Washing, sum active modes	11	8	8	8	8	7	7	6	6	6
	WM-WD Washing, sum low-power modes	0	0	0	0	0	0	0	0	0	0
	Total WM-WD household Washing	**11**	**8**	**8**	**8**	**8**	**8**	**7**	**7**	**6**	**6**
	Total DW household Dishwasher	**2**	**3**	**4**	**5**	**6**	**7**	**7**	**8**	**8**	**9**
	LD condensing heat pump	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	LD condensing electric heat element	0.3	1.6	1.7	1.8	2.0	2.1	2.0	1.9	1.8	1.7
	LD vented electric	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	1.7	2.8	2.7	2.8	2.9	3.1	3.1	3.0	3.0	3.0
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	**1.7**	**2.8**	**2.8**	**2.9**	**3.0**	**3.2**	**3.2**	**3.1**	**3.1**	**3.1**

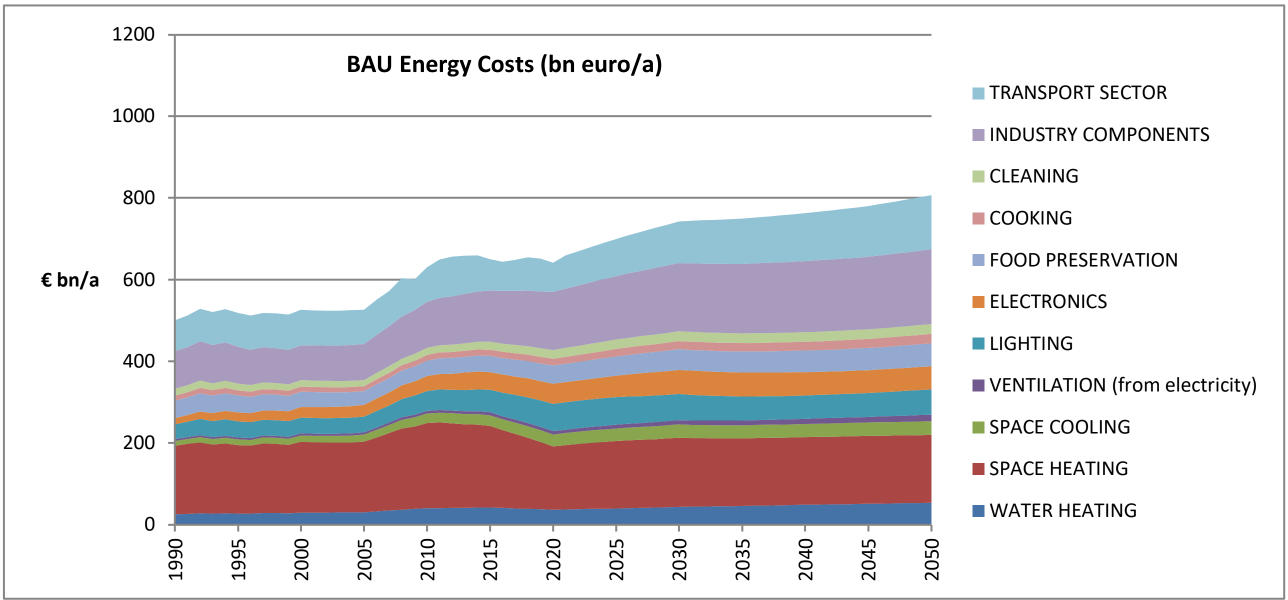
db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1.6	2.0	2.8	3.2	3.1	2.7	2.0	1.5	1.4	1.4
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.4
	VC Total Domestic mains	**1.7**	**2.1**	**2.8**	**3.3**	**3.2**	**3.0**	**2.3**	**1.9**	**1.8**	**1.8**
	VC Cylinder Commercial mains	0.3	0.9	1.1	1.3	1.4	1.5	1.6	1.6	1.6	1.6
	VC Upright Commercial mains	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	VC Total Commercial mains	**0.3**	**1.0**	**1.2**	**1.4**	**1.5**	**1.7**	**1.8**	**1.8**	**1.8**	**1.8**
	VC Total in scope of CR 666/2013	**2.0**	**3.1**	**4.1**	**4.7**	**4.8**	**4.6**	**4.1**	**3.7**	**3.6**	**3.6**
	VC Cordless - domestic - cleaning	0.0	0.0	0.0	0.2	0.4	0.6	0.8	1.0	1.0	1.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**1.7**	**2.1**	**3.0**	**3.7**	**4.1**	**4.2**	**4.0**	**3.8**	**3.8**	**3.9**
	VC Total Commercial mains+cordless+robots	**0.3**	**1.0**	**1.2**	**1.4**	**1.6**	**1.8**	**1.8**	**1.9**	**1.9**	**1.9**
	Total VC Vacuum Cleaner	**2.0**	**3.2**	**4.2**	**5.1**	**5.6**	**6.0**	**5.8**	**5.7**	**5.7**	**5.8**
	TOTAL CLEANING	**17**	**17**	**19**	**21**	**23**	**24**	**24**	**23**	**24**	**24**
0.5	FAN Axial<300Pa (all FAN types >125W)	3	7	8	10	12	13	13	13	13	13
0.5	FAN Axial>300Pa	5	12	15	17	19	20	20	20	20	20
0.5	FAN Centr.FC	1	2	3	3	4	4	4	4	4	4
0.5	FAN Centr.BC-free	3	6	7	9	10	11	12	12	12	13
0.5	FAN Centr.BC	3	6	8	10	11	13	14	15	16	18
0.5	FAN Cross-flow	0	0	0	0	1	1	1	1	1	1
	Total FAN, industrial (excl. box & roof fans)	**7**	**16**	**20**	**25**	**28**	**31**	**32**	**33**	**33**	**35**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13	14	15	16	16	17	16	16	15	14
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20	22	23	24	25	26	24	23	21	19
0.45	Medium (L) 3-ph 75-375 kW no VSD	41	43	45	47	49	48	44	39	34	31
0.45	**Total 3ph 0.75-375 kW no VSD**	**74**	**78**	**83**	**88**	**91**	**91**	**84**	**77**	**69**	**63**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	2	2	3	3	4	5	5	6	7
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	2	3	4	5	6	8	9	11	13	15
0.45	Medium (L) 3-ph 75-375 kW with VSD	5	9	12	15	19	24	28	33	37	41
0.45	**Total 3-ph 0.75-375 kW with VSD**	**7**	**14**	**18**	**23**	**29**	**35**	**41**	**49**	**56**	**63**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**81**	**93**	**101**	**111**	**120**	**126**	**126**	**126**	**125**	**126**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	1	1	1	1	1	1	1	1	1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	2	2	2	2	2	2	2	2	2
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
0.45	Large 3-ph LV 375-1000 kW no VSD	21	21	20	20	20	19	19	19	19	19
0.45	Large 3-ph LV 375-1000kW with VSD	1	5	7	10	13	15	16	17	18	19
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**25**	**27**	**30**	**32**	**35**	**35**	**36**	**37**	**38**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	1	1	1	1	1	1	1	1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	1	1	2	2	2	2	2	2	2
0.45	Explosion motors (L) 3-ph 75-375 kW	2	2	3	3	3	4	4	4	4	4
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**6**	**7**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	1	1
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	1	1	1	1	1	1	1	1	1
0.45	Brake motors (L) 3-ph 75-375 kW	1	1	1	2	2	2	2	2	2	2
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**2**	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**5**	**6**	**7**	**7**	**8**	**9**	**9**	**9**	**9**	**9**
	MT Elec. Motors LV 0.12-1000 kW	**64**	**74**	**80**	**88**	**95**	**101**	**101**	**102**	**102**	**104**
	including double counted amounts	117	134	145	160	173	183	184	185	186	188

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	2.7	3.1	3.4	3.9	4.2	4.6	4.8	5.1	5.4	5.8
	ESOB<45_CF	1.8	2.1	2.3	2.7	3.0	3.3	3.5	3.7	4.0	4.2
	ESOB<45_VSD-VF	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6
	ESOB < 45 Total	**4.6**	**5.3**	**5.8**	**6.9**	**7.6**	**8.3**	**8.8**	**9.3**	**9.9**	**10.6**
	ESOB_45-150_VF	0.9	1.0	1.1	1.3	1.4	1.4	1.5	1.6	1.7	1.8
	ESOB_45-150_CF	1.6	1.8	2.0	2.3	2.6	2.9	3.0	3.2	3.4	3.7
	ESOB_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	ESOB 45-150 Total	**2.5**	**2.9**	**3.2**	**3.8**	**4.2**	**4.6**	**4.8**	**5.1**	**5.5**	**5.8**
	ESOB < 150 Total	**7.2**	**8.2**	**9.0**	**10.7**	**11.8**	**12.9**	**13.6**	**14.5**	**15.4**	**16.4**
	ESCC<45_VF	2.3	2.5	2.8	3.2	3.5	3.7	3.9	4.1	4.4	4.7
	ESCC<45_CF	1.5	1.7	1.9	2.3	2.5	2.8	2.9	3.1	3.3	3.6
	ESCC<45_VSD-VF	0.1	0.1	0.2	0.2	0.4	0.5	0.5	0.5	0.6	0.6
	ESCC < 45 Total	**3.9**	**4.4**	**4.9**	**5.8**	**6.4**	**7.0**	**7.3**	**7.8**	**8.3**	**8.8**
	ESCC_45-150_VF	0.8	0.9	1.0	1.2	1.3	1.3	1.4	1.5	1.6	1.7
	ESCC_45-150_CF	0.6	0.7	0.7	0.9	1.0	1.1	1.1	1.2	1.3	1.4
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCC 45-150 Total	**1.4**	**1.6**	**1.8**	**2.1**	**2.4**	**2.6**	**2.7**	**2.9**	**3.1**	**3.3**
	ESCC < 150 Total	**5.3**	**6.1**	**6.7**	**7.9**	**8.7**	**9.5**	**10.0**	**10.7**	**11.3**	**12.1**
	ESCCi<45_VF	1.2	1.2	1.2	1.3	1.2	1.1	1.1	1.2	1.3	1.3
	ESCCi<45_CF	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ESCCi<45_VSD-VF	0.2	0.3	0.3	0.5	0.7	0.9	1.0	1.0	1.1	1.2
	ESCCi < 45 Total	**1.4**	**1.6**	**1.7**	**2.0**	**2.1**	**2.2**	**2.3**	**2.4**	**2.6**	**2.8**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**
	ESCCi < 150 Total	**1.7**	**1.8**	**2.0**	**2.3**	**2.5**	**2.6**	**2.7**	**2.9**	**3.1**	**3.3**
	MSSB<6"_VF	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6
	MSSB<6"_CF	2.2	2.5	2.8	3.3	3.7	4.1	4.3	4.6	4.8	5.2
	MSSB<6"_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB <6" Total	**2.6**	**3.0**	**3.3**	**3.9**	**4.3**	**4.8**	**5.0**	**5.3**	**5.7**	**6.0**
	MS-V<25bar_VF	1.7	1.8	2.0	2.3	2.4	2.5	2.6	2.7	2.9	3.1
	MS-V<25bar_CF	1.1	1.2	1.4	1.6	1.8	2.0	2.1	2.2	2.3	2.5
	MS-V<25bar_VSD-VF	0.1	0.2	0.2	0.3	0.5	0.6	0.7	0.7	0.8	0.8
	MS_V <25 bar Total	**2.9**	**3.2**	**3.6**	**4.2**	**4.6**	**5.0**	**5.3**	**5.6**	**6.0**	**6.4**
	WP Water pumps	**20**	**22**	**25**	**29**	**32**	**35**	**37**	**39**	**41**	**44**
	Total WE Welding Equipment	**0.8**	**0.6**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	TOTAL INDUSTRY COMPONENTS	**92**	**113**	**126**	**142**	**156**	**167**	**170**	**174**	**178**	**183**
1	TRAFO Distribution	1	2	2	2	2	3	3	3	4	4
1	TRAFO Industry oil	1	1	2	2	2	2	2	2	3	3
1	TRAFO Industry dry	0	0	0	1	1	1	1	1	1	1
1	TRAFO Power	4	5	5	6	7	7	8	9	9	10
1	TRAFO DER oil	0	0	0	0	0	0	1	1	1	2
1	TRAFO DER dry	0	0	0	1	1	2	3	4	6	8
1	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	Total TRAFO Utility Transformers	**7**	**9**	**10**	**11**	**13**	**15**	**18**	**21**	**24**	**28**
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	(costs for fuel consumption due to rolling resistance)										
	Tyres C1, replacement for cars	39	41	37	32	40	43	45	48	50	52
	Tyres C1, OEM for cars	12	12	11	10	12	13	14	14	15	16
	Tyres C1, total	**51**	**53**	**48**	**42**	**52**	**56**	**59**	**62**	**65**	**68**
	Tyres C2, replacement for vans	8	11	10	10	13	15	16	17	17	18
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	4	4	4
	Tyres C2, total	**10**	**13**	**12**	**12**	**15**	**18**	**19**	**20**	**21**	**22**
	Tyres C3, replacement for trucks/busses	12	14	13	15	19	23	26	29	31	34
	Tyres C3, OEM for trucks/busses	3	3	3	3	4	5	6	6	7	8
	Tyres C3, total	**15**	**18**	**16**	**18**	**24**	**29**	**32**	**35**	**38**	**42**
	Tyres, total C1+C2+C3	**75**	**84**	**76**	**71**	**91**	**102**	**111**	**117**	**124**	**132**
	TOTAL TRANSPORT SECTOR	**75**	**84**	**76**	**71**	**91**	**102**	**111**	**117**	**124**	**132**
	GENERAL TOTAL in bn euros	**500**	**630**	**650**	**641**	**699**	**743**	**749**	**763**	**780**	**806**

db BAU Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	26	40	42	37	40	44	46	49	51	54
SPACE HEATING	167	208	200	155	165	169	166	165	166	166
SPACE COOLING	12	23	26	29	31	32	32	32	33	34
VENTILATION (from electricity)	5	7	7	8	9	11	12	13	14	15
LIGHTING	36	49	55	67	67	64	59	57	58	62
ELECTRONICS	15	37	43	49	53	59	59	57	56	56
FOOD PRESERVATION	43	38	40	44	47	51	51	53	54	57
COOKING	13	14	15	17	18	20	21	21	22	23
CLEANING	17	17	19	21	23	24	24	23	24	24
INDUSTRY COMPONENTS	92	113	126	142	156	167	170	174	178	183
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	75	84	76	71	91	102	111	117	124	132
TOTAL in bn euros 2020, excl. energy sector	**500**	**630**	**650**	**641**	**699**	**743**	**749**	**763**	**780**	**806**

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (reference BAU=0)	0	0	0	0	0	0	0	0	0	0
Total in bn euros, incl. energy Sector	**500**	**630**	**650**	**641**	**699**	**743**	**749**	**763**	**780**	**806**



Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU Energy Cost (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

BAU Energy Cost (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	19	31	32	28	30	33	35	37	39	41
SPACE HEATING	120	145	138	105	113	116	113	114	115	115
SPACE & HT PROCESS COOLING	0	3	3	3	3	3	3	3	4	4
VENTILATION (from electricity)	1	1	1	2	2	3	3	4	5	6
LIGHTING	15	16	16	18	15	12	10	9	9	9
ELECTRONICS	10	23	27	30	30	33	33	31	31	31
FOOD PRESERVATION	23	19	20	22	23	24	24	24	24	24
COOKING	11	13	14	15	16	18	19	19	20	21
CLEANING	16	16	17	19	20	21	21	21	21	21
INDUSTRY COMPONENTS	4	5	5	6	7	8	8	8	9	10
BAU Energy Cost, Residential, in bn euros	**220**	**271**	**275**	**247**	**260**	**271**	**268**	**270**	**274**	**281**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	1	1	1	1	1	1	1	1	1	2
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	1	1	2	2	2	2	2	2	2	2
	ESWH Electric Storage > 30 L (primary)	12	13	14	15	14	15	16	17	18	19
	GIWH Gas Instant. < 13 L/min (secondary)	1	1	1	0	0	0	0	0	0	0
	GIWH Gas Instant. ≥ 13 L/min (primary)	0	1	1	0	0	0	0	0	0	0
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	1	1	1	1	0	0	0	0	0	0
	Dedicated WH Heat Pump	0	0	0	0	0	1	1	1	1	2
	Dedicated WH Solar (3.5 m2)	0	1	1	1	1	1	1	1	1	1
	WH dedicated Water Heater	**17**	**20**	**22**	**21**	**20**	**21**	**23**	**24**	**26**	**28**
	CHB Gas Combi Instant. WH	3	10	11	7	8	9	9	8	8	7
	CHB Gas + Cyl. WH	2	4	4	3	3	3	3	3	3	3
	CHB Jet Burner Gas + Cyl. WH	0	1	0	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	3	5	3	2	2	2	2	2	2	2
	CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	1	1
	CHB Electric HP + Cyl. WH	0	0	1	1	1	2	3	4	4	5
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**9**	**20**	**20**	**14**	**15**	**16**	**17**	**18**	**18**	**19**
	TOTAL WATER HEATING	**26**	**40**	**41**	**35**	**36**	**38**	**39**	**42**	**44**	**46**
	CHB Gas non-condensing	39	58	49	21	13	7	3	2	1	1
	CHB Gas condensing	0	18	29	28	40	48	48	44	40	35
	CHB Gas Jet burner non-condensing	4	4	3	1	1	1	0	0	0	0
	CHB Gas Jet burner condensing	0	0	0	0	0	1	1	1	1	1
	CHB Oil Jet burner non-condensing	46	55	36	20	17	8	3	1	1	1
	CHB Oil Jet burner condensing	0	1	2	2	5	7	8	9	10	10
	CHB Electric Joule-effect	3	2	2	3	3	3	2	2	2	2
	CHB Hybrid (gas-electric)	0	0	0	0	0	1	1	1	2	3
	CHB Electric Heat Pump	0	2	3	4	6	8	11	14	17	20
	CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	0
	CHB micro CHP	0	0	0	0	0	0	0	0	0	0
	CHB Solar combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHB Central Heating boiler < 400 kW, space heating	**94**	**141**	**124**	**81**	**85**	**83**	**78**	**76**	**74**	**72**
	SFB Wood Manual	10.1	3.0	3.5	1.9	1.2	0.7	0.4	0.3	0.2	0.2
	SFB Wood Direct Draft	0.1	0.8	2.2	2.4	2.8	2.8	2.9	3.2	3.8	4.6
	SFB Coal	8.4	3.4	1.9	1.3	1.0	0.6	0.4	0.4	0.4	0.3
	SFB Pellets	0.0	0.5	0.9	1.1	1.3	1.5	1.6	1.7	1.8	2.0
	SFB Wood chips	0.0	0.4	0.5	0.5	0.4	0.4	0.4	0.5	0.5	0.6
	Total Solid Fuel Boiler	**19**	**8**	**9**	**7**	**7**	**6**	**6**	**6**	**7**	**8**
	CHAE-S (≤ 400 kW)	0.6	1.4	1.7	2.1	2.1	2.1	2.1	2.1	2.1	2.1
	CHAE-L (> 400 kW)	0.8	1.8	2.0	2.3	2.3	2.2	2.0	1.9	1.8	1.7
	CHWE-S (≤ 400 kW)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4
	CHWE-L (> 1500 kW)	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	3.2	4.4	5.1	5.9	6.2	6.4	6.4	6.6	6.7	7.0
	HT PCH-AE-L	3.1	4.2	4.9	5.6	5.8	5.8	5.7	5.8	5.9	6.1
	HT PCH-WE-S	0.7	0.9	1.1	1.3	1.4	1.4	1.4	1.5	1.5	1.5
	HT PCH-WE-M	1.3	1.8	2.1	2.5	2.7	2.8	2.9	2.9	3.0	3.1
	HT PCH-WE-L	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	AC rooftop	0.5	1.0	1.0	1.0	0.8	0.5	0.2	0.1	0.1	0.1
	AC splits	0.7	1.7	1.8	1.8	1.7	1.5	1.3	1.2	1.1	1.0
	AC VRF	0.0	0.4	0.7	1.0	1.2	1.5	1.7	1.9	2.0	2.1
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**11**	**19**	**22**	**25**	**26**	**26**	**25**	**25**	**26**	**26**
	AC rooftop (rev)	0.6	1.7	1.8	1.7	1.3	0.8	0.3	0.1	0.0	0.0
	AC splits (rev)	1.2	3.2	3.5	3.7	3.5	3.1	2.7	2.4	2.2	2.0
	AC VRF (rev)	0.0	1.1	1.7	2.5	3.1	3.8	4.2	4.4	4.4	4.5
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	7.7	8.1	7.0	4.3	4.2	4.1	3.6	3.4	3.1	2.8
	AHE	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	SubTotal AHC Heating	**10**	**14**	**14**	**12**	**12**	**12**	**11**	**10**	**10**	**9**
	Total AHC Heating & Cooling	**21**	**33**	**36**	**37**	**38**	**38**	**36**	**36**	**36**	**36**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.4	0.6	1.0	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	LH closed fireplace/inset	0.5	1.4	2.4	2.1	2.2	2.4	2.4	2.4	2.5	2.5
	LH wood stove	1.1	1.3	1.9	1.4	1.4	1.4	1.4	1.4	1.5	1.5
	LH coal stove	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH cooker	0.2	0.4	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	LH SHR stove	0.5	0.7	1.1	1.0	1.0	1.2	1.3	1.5	1.6	1.6
	LH pellet stove	0.0	0.4	0.6	0.7	0.8	0.9	0.9	1.0	1.0	1.0
	LH Solid fuel sum	**3**	**5**	**8**	**7**	**7**	**7**	**7**	**8**	**8**	**8**
	LH Electric portable	4.7	3.6	3.6	3.6	3.3	3.2	3.1	2.9	2.8	2.7
	LH Electric fixed > 250W	25.1	18.6	17.8	16.5	13.9	12.2	11.3	10.8	10.4	10.1
	LH Electric fixed ≤ 250W	1.7	1.3	1.2	1.1	0.9	0.8	0.8	0.7	0.7	0.7
	LH Electric storage	1.4	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.7
	LH Electric underfloor	4.3	3.5	3.6	3.8	3.8	3.8	3.6	3.4	3.3	3.2
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.4	1.6	1.8	1.9	1.8	1.7	1.6	1.5	1.5	1.4
	LH Electric sum	**39**	**30**	**30**	**28**	**25**	**23**	**21**	**20**	**20**	**19**
	LH Gas luminous (commercial)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	LH Gas balanced flue	0.5	0.3	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.9**	**0.7**	**0.7**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**	**0.2**	**0.2**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**43**	**36**	**38**	**35**	**32**	**30**	**29**	**28**	**28**	**27**
	RAC fixed < 6 kW, cooling	0.4	2.1	1.8	1.4	1.4	1.7	1.9	2.1	2.3	2.6
	RAC fixed 6-12 kW, cooling	0.2	1.0	1.0	0.8	0.8	1.0	1.0	1.1	1.2	1.3
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode	**0.6**	**3.3**	**2.9**	**2.3**	**2.4**	**2.8**	**3.1**	**3.4**	**3.7**	**4.1**
	RAC fixed < 6 kW, reversible, heating	0.2	2.8	3.1	3.2	4.1	5.6	6.9	8.5	10.0	11.4
	RAC fixed 6-12 kW, reversible, heating	0.1	1.2	1.5	1.6	2.1	2.7	3.2	3.9	4.4	4.9
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.2**	**4.0**	**4.6**	**4.8**	**6.2**	**8.2**	**10.1**	**12.4**	**14.4**	**16.2**
	RAC Room Air Conditioner	**1**	**7**	**8**	**7**	**9**	**11**	**13**	**16**	**18**	**20**
1	CIRC Integrated circulators	2.6	3.2	3.1	2.7	2.4	2.6	2.7	2.7	2.7	2.8
0.38	CIRC Large standalone circulators	1.6	1.9	1.6	1.3	1.1	1.1	1.0	1.0	1.0	1.0
0.38	CIRC Small standalone circulators	1.3	1.5	1.2	0.8	0.6	0.6	0.6	0.6	0.6	0.6
	CIRC Circulator pumps <2.5 kW, all	**5.5**	**6.5**	**5.9**	**4.7**	**4.2**	**4.4**	**4.3**	**4.3**	**4.3**	**4.3**
	CIRC Circulator pumps <2.5 kW, excl. double	**1.8**	**2.1**	**1.7**	**1.3**	**1.1**	**1.1**	**1.0**	**1.0**	**1.0**	**1.0**
	TOTAL SPACE HEATING	**167**	**206**	**192**	**142**	**143**	**140**	**135**	**134**	**134**	**134**
	TOTAL SPACE COOLING	**12**	**22**	**25**	**27**	**28**	**29**	**28**	**29**	**29**	**30**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.1	0.3	0.4	0.6	0.7	0.9
	R-UVU 100-250 m3/h	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3
	R-UVU 250-1000 m3/h	0.5	0.9	1.0	1.1	1.0	1.0	1.0	1.0	1.0	1.0
	R-BVU 250-1000 m3/h	0.0	0.1	0.1	0.2	0.3	0.6	0.9	1.2	1.5	1.9
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	RVU, Total residential, from VU own electricity	**0.6**	**1.2**	**1.4**	**1.6**	**1.8**	**2.3**	**2.7**	**3.2**	**3.7**	**4.3**
	NR-UVU 250-1000 m3/h	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	NR-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	NR-UVU > 1000 m3/h	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
	NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.5	0.7	0.8	1.0	1.0	1.2	1.3	1.4
	NR-AHU-M 5500-14500 m3/h	2.9	3.4	3.4	3.5	3.5	3.7	3.7	3.9	4.0	4.2
	NR-AHU-L > 14500 m3/h	0.8	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.2
	NRVU, Total non-residential, from VU own electricity	**4.0**	**5.4**	**5.7**	**6.1**	**6.3**	**6.6**	**6.9**	**7.2**	**7.6**	**8.1**
	VU Ventilation Units, res + non-res., from VU own elec.	**4.6**	**6.6**	**7.1**	**7.7**	**8.1**	**8.9**	**9.5**	**10.4**	**11.3**	**12.4**
	TOTAL VENTILATION (from VU own electricity)	**5**	**7**	**7**	**8**	**8**	**9**	**10**	**10**	**11**	**12**
1	*Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)*	-	-	-0	-1	-3	-4	-5	-5	-6	-6

db ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	12.9	17.4	21.4	25.4	21.3	12.5	5.6	2.7	1.6	1.0
HID (HPM, HPS, MH)	4.9	9.2	8.5	8.2	6.3	3.4	1.3	0.5	0.2	0.1
CFLni (all shapes)	0.4	1.3	1.4	1.3	0.9	0.5	0.2	0.1	0.0	0.0
CFLi (retrofit for GLS, HL)	0.2	2.2	3.1	2.7	1.0	0.3	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	15.3	7.2	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	1.2	6.7	8.7	4.0	0.3	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.3	2.0	6.9	13.4	18.1	21.3	24.0	27.4
LED replacing HID (retrofit & luminaire)	0.0	0.0	1.4	3.4	5.4	7.5	9.0	10.5	12.1	13.9
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.5	0.7	0.8	0.9	1.0	1.1
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.2	0.6	1.0	1.1	1.2	1.2	1.3	1.4
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.3	2.1	3.8	4.6	4.9	5.2	5.5	5.9
Standby	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
TOTAL LIGHTING (incl. standby)	**36**	**46**	**49**	**52**	**49**	**45**	**42**	**44**	**47**	**52**
DP TV on-mode, total all types	5.0	10.8	12.1	11.4	7.5	7.0	6.1	6.6	7.7	9.1
DP TV standby, standard (NoNA)	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV standby, LoNA	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0
DP TV standby, HiNA ('Smart')	0.0	0.0	0.3	0.8	1.3	1.7	1.8	1.6	1.4	1.2
DP TV standby, total all types	**1**	**0**	**0**	**1**	**1**	**2**	**2**	**2**	**1**	**1**
DP TV total on-mode + standby	**6**	**11**	**13**	**13**	**9**	**9**	**8**	**8**	**9**	**10**
DP Monitor on-mode	0.1	2.0	1.2	0.5	0.5	0.3	0.2	0.2	0.3	0.3
DP Monitor standby	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP Monitor total	**0**	**2**	**1**	**1**	**0**	**0**	**0**	**0**	**0**	**0**
DP Signage on-mode	0.0	0.1	1.3	3.2	3.9	3.4	2.6	2.5	2.8	3.2
DP Signage standby	0.0	0.0	0.2	0.5	0.6	0.5	0.4	0.4	0.4	0.5
DP Signage total	**0**	**0**	**1**	**4**	**5**	**4**	**3**	**3**	**3**	**4**
DP Electronic Displays, total on-mode	**5**	**13**	**15**	**15**	**12**	**11**	**9**	**9**	**11**	**13**
DP Electronic Displays, total standby	**1**	**0**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
DP Electronic Displays, total	**6**	**13**	**15**	**17**	**14**	**13**	**11**	**11**	**13**	**14**
SSTB	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (low-power modes)	0.0	0.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7
CSTB (other modes)	0.0	0.5	1.1	0.9	0.9	0.9	0.9	0.9	0.9	0.9
CSTB (all covered modes)	0.0	1.4	3.0	2.7	2.6	2.6	2.6	2.6	2.6	2.6
Total STB set top boxes (Complex & Simple)	**0**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Game consoles, active modes	0.0	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles, non-active modes	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Total Game consoles > 20 W, all modes	0.0	0.7	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Total Game consoles < 20 W, all modes	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Game consoles, all modes	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
ES&DS only, without effects on infrastructure										
ES tower 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 1-socket traditional	0.0	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket traditional	0.1	1.9	1.1	0.7	0.8	1.0	1.1	1.1	1.1	1.1
ES rack 2-socket cloud	0.0	1.1	1.8	2.1	2.5	3.2	3.4	3.4	3.4	3.4
ES rack 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
ES rack 4-socket cloud	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5
ES rack 2-socket resilient trad.	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 2-socket resilient cloud	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 2-socket traditional	0.1	0.9	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.5
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.6	1.7	1.7	1.7	1.7
ES blade 4-socket traditional	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ES blade 4-socket cloud	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
ES total traditional	**0**	**4**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
ES total cloud	**0**	**2**	**3**	**4**	**4**	**5**	**6**	**6**	**6**	**6**
ES Enterprise Servers total	**0**	**6**	**5**	**5**	**6**	**8**	**8**	**8**	**8**	**8**
DS Online 2	0.1	0.8	1.2	1.8	2.4	3.0	3.1	3.1	3.1	3.1
DS Online 3	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.6	1.7	1.7	1.7	1.7
DS Data Storage products total	**0**	**1**	**2**	**3**	**4**	**5**	**5**	**5**	**5**	**5**
ES + DS total (excl. infrastructure)	**0**	**7**	**7**	**8**	**10**	**13**	**14**	**14**	**14**	**14**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	3.2	3.5	2.5	1.7	2.0	2.3	2.2	2.1	2.0	1.9
	PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	PC Notebook	0.0	1.2	1.5	1.3	1.5	1.6	1.6	1.7	1.7	1.6
	PC Tablet/slate	0.0	0.0	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3
	PC Thin client	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3
	Total PC, electricity	**3.4**	**5.2**	**4.8**	**3.9**	**4.3**	**4.8**	**4.8**	**4.8**	**4.6**	**4.5**
	Inkjet Printer	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EP / Laser Printer mono	1.4	0.3	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	EP / Laser Printer colour	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	EP / Laser Copier mono	1.6	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	EP / Laser MFD colour	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
	Total IE Imaging Equipment	**3.4**	**1.3**	**1.2**	**0.9**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.6**
	of which for modes under CR 1275/2008	*2.6*	*1.0*	*0.9*	*0.7*	*0.6*	*0.6*	*0.5*	*0.5*	*0.5*	*0.5*
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.4	1.0	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.3
	SB Electric toothbrushes (off mode)	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SB Audio speakers (wired) (sb & off modes)	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.5
	SB Small appliances (sb & off modes)	0.3	1.2	0.9	0.7	0.7	0.8	0.8	0.8	0.8	0.8
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Media players and recorders (sb mode)	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.2	0.4	0.5	0.6	0.6	0.6	0.6
	SB Coffee makers (off mode)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.2	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.2
1	SB Electric Hobs (sb mode)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1	SB Game consoles (non-active modes)	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Inkjet Printers (nsb mode)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Laser Printers (nsb mode)	1.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Copiers (nsb mode)	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	Total (networked) SB (incl. double)	4	8	9	7	7	7	7	7	7	7
	Total (networked) SB (excl. double)	**1**	**5**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
0.6	EPS 10–12 W	0.0	1.2	1.7	1.7	1.5	1.6	1.6	1.6	1.6	1.6
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EPS, total for active mode	**0.0**	**1.8**	**2.3**	**2.2**	**2.0**	**2.1**	**2.1**	**2.1**	**2.1**	**2.2**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 10–12 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.3**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	EPS, overall total (active + no-load)	**0.0**	**2.0**	**2.5**	**2.3**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.3**
	EPS, double counted subtracted	**0.0**	**1.1**	**1.2**	**1.1**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.1**
	TOTAL ELECTRONICS	**15**	**36**	**38**	**38**	**37**	**40**	**39**	**39**	**40**	**42**

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	**24**	**15**	**13**	**12**	**11**	**9**	**8**	**7**	**6**	**6**
	CF open vertical chilled multi deck (RVC2)	2.4	2.0	2.0	2.1	1.8	1.4	1.0	0.9	0.9	0.9
	CF open horizontal frozen island (RHF4)	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	4.2	3.6	3.8	4.2	4.1	3.8	3.3	3.3	3.4	3.5
	CF Plug in one door beverage cooler	2.7	2.4	2.5	2.6	2.1	1.6	1.4	1.4	1.4	1.5
	CF Plug in horizontal ice cream freezer	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5
	CF Spiral vending machine	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total CF Commercial Refrigeration	**11**	**9**	**9**	**10**	**9**	**8**	**7**	**6**	**6**	**7**
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
	PF Storage cabinets All types	**0.9**	**1.1**	**1.3**	**1.3**	**1.1**	**1.1**	**1.1**	**1.2**	**1.2**	**1.3**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6
	PF Process Chiller AC MT L > 300 kW	0.4	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.7
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	PF Process Chiller All MT&LT	**2**	**4**	**4**	**5**	**5**	**6**	**7**	**7**	**8**	**9**
	PF Condensing Unit MT S 0.2-1 kW	0.9	0.7	0.7	0.8	0.8	1.0	1.0	1.1	1.2	1.3
	PF Condensing Unit MT M 1-5 kW	2.4	1.7	1.8	2.0	2.2	2.5	2.7	2.9	3.1	3.4
	PF Condensing Unit MT L 5-20 kW	3.0	2.1	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.1
	PF Condensing Unit MT XL 20-50 kW	2.9	2.1	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.1
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
	PF Condensing Unit LT L 2-8 kW	0.7	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9
	PF Condensing Unit LT XL 8-20 kW	2.3	1.7	1.7	1.9	2.0	2.3	2.5	2.6	2.8	3.1
0.6	**PF Condensing Unit, All MT&LT**	**13**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**18**
	PF Professional Refrigeration, Total	**8**	**9**	**9**	**10**	**11**	**12**	**13**	**15**	**16**	**17**
	TOTAL FOOD PRESERVATION	**43**	**33**	**32**	**33**	**31**	**29**	**27**	**28**	**28**	**30**
	CA Electric Hobs (active modes)	4.1	5.2	6.0	7.2	8.0	8.9	9.3	9.7	10.2	10.8
	CA Electric Hobs (low-power modes)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CA Electric Hobs (sum all modes)	4	5	6	7	8	9	9	10	10	11
	CA Electric Ovens (active modes)	4.5	3.7	3.7	3.8	3.7	3.9	3.8	3.8	3.9	4.0
	CA Electric Ovens (low-power modes)	0.0	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.2
	CA Electric Ovens (sum all modes)	4	4	4	4	4	4	4	4	4	4
	CA Gas Hobs	2	2	2	1	1	2	2	2	2	1
	CA Gas Ovens	1	1	1	0	0	0	0	0	0	0
	CA Range Hoods	2	2	2	2	2	2	2	2	2	3
	CA Elec. Hobs&Ovens low-power modes	0.0	0.7	0.8	0.8	0.5	0.4	0.4	0.4	0.4	0.4
	CA other products or modes	13	13	14	15	16	17	17	18	18	19
	TOTAL COOKING	**13**	**14**	**15**	**16**	**17**	**17**	**18**	**18**	**19**	**20**
	WM Washing Machines, active modes	9.3	4.8	4.2	3.9	3.7	3.7	3.5	3.5	3.5	3.6
	WM Washing Machines, low-power modes	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	WM Washing Machines	9.3	5.0	4.3	4.1	3.8	3.8	3.6	3.6	3.6	3.7
	WD Washer-Dryers, active modes	1.6	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
	WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers	1.6	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.4
	WM-WD Washing, sum active modes	11	6	5	5	5	5	5	5	5	5
	WM-WD Washing, sum low-power modes	0	0	0	0	0	0	0	0	0	0
	Total WM-WD household Washing	**11**	**6**	**6**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
	Total DW household Dishwasher	**2**	**3**	**3**	**4**	**4**	**5**	**5**	**5**	**5**	**6**
	LD condensing heat pump		0.0	0.2	0.5	0.7	0.8	0.9	1.0	1.0	1.0
	LD condensing electric heat element	0.3	1.6	1.5	1.2	1.0	0.8	0.7	0.6	0.6	0.6
	LD vented electric	1.4	1.2	0.9	0.6	0.3	0.2	0.1	0.0		
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	1.7	2.7	2.6	2.2	2.0	1.8	1.7	1.6	1.6	1.6
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**1.7**	**2.8**	**2.6**	**2.3**	**2.0**	**1.9**	**1.7**	**1.6**	**1.6**	**1.7**

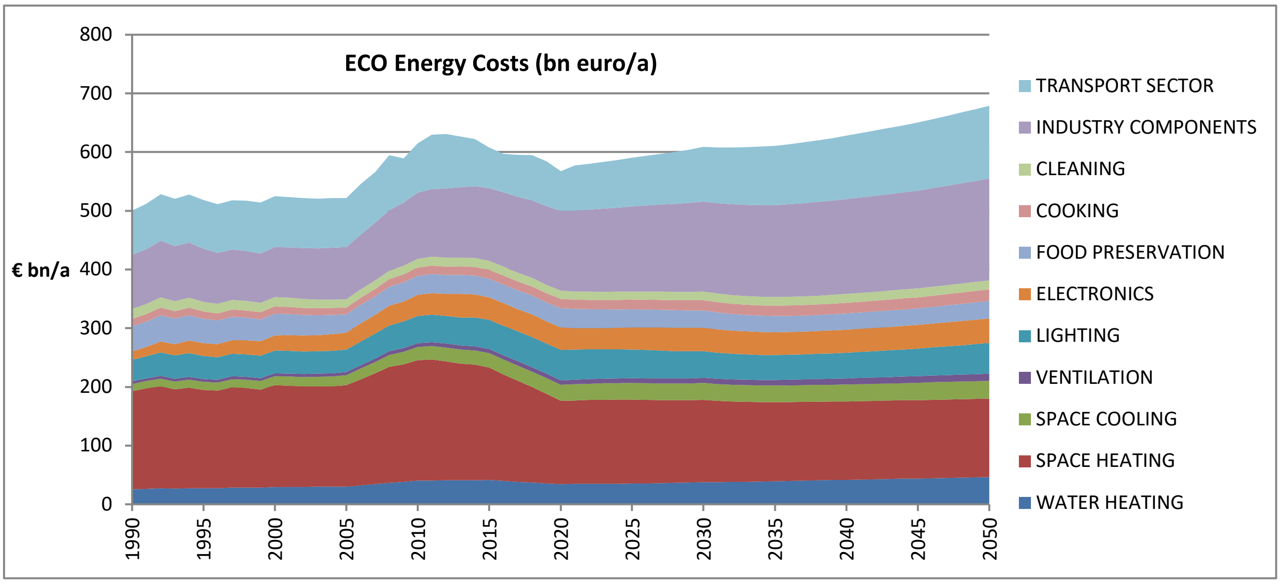
db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	VC Cylinder Domestic mains	1.6	2.0	2.5	1.7	1.0	0.8	0.6	0.5	0.4	0.4
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	VC Total Domestic mains	**1.7**	**2.1**	**2.6**	**1.8**	**1.1**	**1.0**	**0.8**	**0.7**	**0.6**	**0.6**
	VC Cylinder Commercial mains	0.3	0.9	0.9	0.5	0.5	0.6	0.5	0.5	0.5	0.6
	VC Upright Commercial mains	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.3**	**1.0**	**1.1**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
	VC Total in scope of CR 666/2013	**2.0**	**3.1**	**3.7**	**2.4**	**1.7**	**1.6**	**1.4**	**1.3**	**1.2**	**1.2**
	VC Cordless - domestic - cleaning	0.0	0.0	0.0	0.2	0.4	0.6	0.8	1.0	1.0	1.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**1.7**	**2.1**	**2.8**	**2.2**	**1.9**	**2.2**	**2.4**	**2.6**	**2.6**	**2.7**
	VC Total Commercial mains+cordless+robots	**0.3**	**1.0**	**1.1**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	Total VC Vacuum Cleaner	**2.0**	**3.2**	**3.8**	**2.9**	**2.5**	**2.9**	**3.1**	**3.3**	**3.3**	**3.4**
	TOTAL CLEANING	**17**	**15**	**15**	**14**	**14**	**15**	**15**	**15**	**15**	**16**
0.5	FAN Axial<300Pa (all FAN types >125W)	3	7	8	9	10	10	10	10	10	10
0.5	FAN Axial>300Pa	5	12	14	16	17	17	17	17	17	17
0.5	FAN Centr.FC	1	2	3	3	3	3	3	3	3	3
0.5	FAN Centr.BC-free	3	6	7	8	8	9	10	10	10	11
0.5	FAN Centr.BC	3	6	8	9	9	11	11	12	13	15
0.5	FAN Cross-flow	0	0	0	0	0	0	0	0	0	0
	Total FAN, industrial (excl. box & roof fans)	**7**	**16**	**20**	**23**	**24**	**26**	**26**	**27**	**27**	**28**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13	14	14	13	12	12	12	12	12	12
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20	21	22	20	18	18	18	17	17	17
0.45	Medium (L) 3-ph 75-375 kW no VSD	41	43	43	41	38	34	32	30	29	29
0.45	**Total 3ph 0.75-375 kW no VSD**	**74**	**78**	**80**	**75**	**68**	**65**	**62**	**60**	**58**	**58**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	2	2	4	5	6	6	6	7	7
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	2	3	4	7	10	12	13	13	14	15
0.45	Medium (L) 3-ph 75-375 kW with VSD	5	9	13	19	25	31	34	36	39	41
0.45	**Total 3-ph 0.75-375 kW with VSD**	**7**	**14**	**19**	**30**	**41**	**49**	**52**	**56**	**60**	**64**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**81**	**93**	**99**	**105**	**109**	**114**	**114**	**116**	**118**	**121**
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	1	1	1	1	1	1	1	1	1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	2	2	2	2	2	2	2	2	2
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
0.45	Large 3-ph LV 375-1000 kW no VSD	21	21	20	20	19	19	19	19	19	19
0.45	Large 3-ph LV 375-1000kW with VSD	1	5	7	10	13	15	16	17	18	19
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**25**	**27**	**30**	**32**	**34**	**35**	**36**	**37**	**38**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	1	1	1	1	1	1	1	1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	1	1	2	2	2	2	2	2	2
0.45	Explosion motors (L) 3-ph 75-375 kW	2	2	3	3	3	4	4	4	4	4
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**6**	**6**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	1	1	1	1	1	1	1	1	1
0.45	Brake motors (L) 3-ph 75-375 kW	1	1	1	2	2	2	2	2	2	2
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**5**	**6**	**7**	**7**	**8**	**8**	**8**	**9**	**9**	**9**
	MT Elec. Motors LV 0.12-1000 kW	**64**	**74**	**79**	**84**	**89**	**93**	**94**	**96**	**98**	**100**
	including double counted amounts	117	134	144	154	162	170	171	175	178	182

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	ESOB<45_VF	2.7	3.1	3.3	3.8	4.2	4.5	4.7	5.0	5.3	5.7
	ESOB<45_CF	1.8	2.1	2.3	2.7	3.0	3.3	3.5	3.7	3.9	4.2
	ESOB<45_VSD-VF	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6
	ESOB < 45 Total	**4.6**	**5.3**	**5.8**	**6.7**	**7.5**	**8.2**	**8.6**	**9.2**	**9.8**	**10.5**
	ESOB_45-150_VF	0.9	1.0	1.1	1.3	1.4	1.4	1.5	1.6	1.7	1.8
	ESOB_45-150_CF	1.6	1.8	2.0	2.3	2.6	2.8	3.0	3.2	3.4	3.7
	ESOB_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	ESOB 45-150 Total	**2.5**	**2.9**	**3.2**	**3.7**	**4.1**	**4.6**	**4.8**	**5.1**	**5.5**	**5.8**
	ESOB < 150 Total	**7.2**	**8.2**	**9.0**	**10.5**	**11.6**	**12.7**	**13.4**	**14.4**	**15.3**	**16.4**
	ESCC<45_VF	2.3	2.5	2.8	3.2	3.4	3.6	3.8	4.1	4.3	4.6
	ESCC<45_CF	1.5	1.7	1.9	2.2	2.5	2.8	2.9	3.1	3.3	3.5
	ESCC<45_VSD-VF	0.1	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6
	ESCC < 45 Total	**3.9**	**4.4**	**4.9**	**5.6**	**6.2**	**6.8**	**7.2**	**7.7**	**8.2**	**8.8**
	ESCC_45-150_VF	0.8	0.9	1.0	1.2	1.2	1.3	1.4	1.5	1.6	1.7
	ESCC_45-150_CF	0.6	0.7	0.7	0.9	1.0	1.1	1.1	1.2	1.3	1.4
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCC 45-150 Total	**1.4**	**1.6**	**1.8**	**2.1**	**2.3**	**2.6**	**2.7**	**2.9**	**3.1**	**3.3**
	ESCC < 150 Total	**5.3**	**6.1**	**6.7**	**7.8**	**8.6**	**9.4**	**9.9**	**10.6**	**11.3**	**12.1**
	ESCCi<45_VF	1.2	1.2	1.2	1.3	1.2	1.1	1.1	1.2	1.2	1.3
	ESCCi<45_CF	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ESCCi<45_VSD-VF	0.2	0.3	0.3	0.5	0.7	0.9	1.0	1.0	1.1	1.2
	ESCCi < 45 Total	**1.4**	**1.6**	**1.7**	**1.9**	**2.0**	**2.1**	**2.2**	**2.4**	**2.6**	**2.7**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**
	ESCCi < 150 Total	**1.7**	**1.8**	**2.0**	**2.3**	**2.4**	**2.6**	**2.7**	**2.9**	**3.0**	**3.3**
	MSSB<6"_VF	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.6
	MSSB<6"_CF	2.2	2.5	2.8	3.2	3.6	3.9	4.1	4.4	4.7	5.0
	MSSB<6"_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3
	MSSB <6" Total	**2.6**	**3.0**	**3.3**	**3.8**	**4.2**	**4.6**	**4.8**	**5.2**	**5.5**	**5.9**
	MS-V<25bar_VF	1.7	1.8	2.0	2.2	2.3	2.4	2.5	2.7	2.9	3.1
	MS-V<25bar_CF	1.1	1.2	1.3	1.6	1.7	1.9	2.0	2.1	2.3	2.4
	MS-V<25bar_VSD-VF	0.1	0.2	0.2	0.3	0.5	0.6	0.7	0.7	0.7	0.8
	MS_V <25 bar Total	**2.9**	**3.2**	**3.6**	**4.1**	**4.5**	**4.9**	**5.2**	**5.5**	**5.9**	**6.3**
	WP Water pumps	**20**	**22**	**25**	**28**	**31**	**34**	**36**	**39**	**41**	**44**
	Total WE Welding Equipment	**0.8**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
	TOTAL INDUSTRY COMPONENTS	**92**	**113**	**124**	**136**	**145**	**154**	**157**	**162**	**166**	**173**
1	TRAFO Distribution	1	2	2	2	2	2	2	2	3	3
1	TRAFO Industry oil	1	1	1	1	1	1	1	1	2	2
1	TRAFO Industry dry	0	0	0	0	1	1	1	1	1	1
1	TRAFO Power	4	5	5	6	7	7	8	9	9	10
1	TRAFO DER oil	0	0	0	0	0	0	0	1	1	1
1	TRAFO DER dry	0	0	0	0	1	1	2	3	4	6
1	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	Total TRAFO Utility Transformers	**7**	**9**	**9**	**10**	**12**	**13**	**15**	**17**	**19**	**22**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-3**	**-4**	**-4**	**-5**
	(costs for fuel consumption due to rolling resistance)										
	Tyres C1, replacement for cars	39	41	32	29	35	38	40	43	46	49
	Tyres C1, OEM for cars	12	12	11	10	11	12	13	13	14	15
	Tyres C1, total	**51**	**53**	**43**	**39**	**46**	**49**	**53**	**56**	**60**	**64**
	Tyres C2, replacement for vans	8	11	9	9	12	13	15	16	16	17
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	**10**	**13**	**11**	**11**	**14**	**16**	**18**	**19**	**20**	**21**
	Tyres C3, replacement for trucks/busses	12	14	12	14	18	22	25	27	29	32
	Tyres C3, OEM for trucks/busses	3	3	3	3	4	5	6	6	7	7
	Tyres C3, total	**15**	**18**	**15**	**17**	**22**	**27**	**30**	**33**	**36**	**39**
	Tyres, total C1+C2+C3	**75**	**84**	**69**	**68**	**83**	**93**	**101**	**108**	**116**	**124**
	TOTAL TRANSPORT SECTOR	**75**	**84**	**69**	**68**	**83**	**93**	**101**	**108**	**116**	**124**
	GENERAL TOTAL in bn euros	**500**	**615**	**608**	**567**	**589**	**607**	**608**	**625**	**646**	**674**

ECO Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	26	40	41	35	36	38	39	42	44	46
SPACE HEATING	167	206	192	142	143	140	135	134	134	134
SPACE COOLING	12	22	25	27	28	29	28	29	29	30
VENTILATION	5	7	7	8	8	9	10	10	11	12
1 *VENTILATION (from heat saving vs. BAU; already included in COST for space heating)*	*0*	*0*	*0*	*-1*	*-3*	*-4*	*-5*	*-5*	*-6*	*-6*
LIGHTING	36	46	49	52	49	45	42	44	47	52
ELECTRONICS	15	36	38	38	37	40	39	39	40	42
FOOD PRESERVATION	43	33	32	33	31	29	27	28	28	30
COOKING	13	14	15	16	17	17	18	18	19	20
CLEANING	17	15	15	14	14	15	15	15	15	16
INDUSTRY COMPONENTS	92	113	124	136	145	154	157	162	166	173
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	75	84	69	68	83	93	101	108	116	124
TOTAL in bn euros 2020, excl. energy sector	**500**	**615**	**608**	**567**	**590**	**609**	**611**	**628**	**650**	**679**

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (reference BAU=0)	0	0	0	-1	-1	-2	-3	-4	-4	-5
Total in bn euros, incl. energy Sector	**500**	**615**	**608**	**567**	**589**	**607**	**608**	**625**	**646**	**674**



Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU Energy Cost (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

ECO Energy Cost (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	19	31	32	26	27	29	30	32	33	35
SPACE HEATING	120	143	132	96	98	96	92	92	92	92
SPACE & HT PROCESS COOLING	0	2	2	2	2	2	2	2	3	3
VENTILATION (from electricity)	1	1	1	2	2	2	3	3	4	4
LIGHTING	15	14	12	9	7	7	7	7	7	8
ELECTRONICS	10	23	24	22	18	19	18	18	19	20
FOOD PRESERVATION	23	14	12	12	10	9	7	6	6	6
COOKING	11	13	14	14	15	16	16	17	17	18
CLEANING	16	14	14	13	13	13	14	14	14	14
INDUSTRY COMPONENTS	4	5	5	6	7	7	8	8	9	10
ECO Energy Cost, Residential, in bn euros	**220**	**259**	**249**	**201**	**198**	**200**	**196**	**199**	**204**	**210**

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EIWH Electric Instant. ≥ 12 kW (primary)	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ESWH Electric Storage ≤ 30 L (secondary)	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ESWH Electric Storage > 30 L (primary)	0.0	0.0	0.1	0.7	1.2	1.7	1.8	1.8	1.8	1.9
	GIWH Gas Instant. < 13 L/min (secondary)	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
	Dedicated WH Heat Pump	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.0	1.2
	Dedicated WH Solar (3.5 m2)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	WH dedicated Water Heater	**0.0**	**0.0**	**0.5**	**1.5**	**2.6**	**3.5**	**3.6**	**3.8**	**3.9**	**4.1**
	CHB Gas Combi Instant. WH	0.0	0.0	0.2	0.5	1.1	1.9	2.7	3.5	4.2	4.9
	CHB Gas + Cyl. WH	0.0	0.0	0.1	0.3	0.6	1.1	1.3	1.7	1.9	2.2
	CHB Jet Burner Gas + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Jet Burner Oil + Cyl. WH	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.4
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.5	-0.6
	CHB Electric HP + Cyl. WH	0.0	0.0	0.0	-0.1	-0.2	-0.7	-1.2	-2.0	-2.6	-3.3
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Solar Combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHC Central Heating combi, water heating	**0.0**	**0.0**	**0.3**	**0.8**	**1.6**	**2.5**	**2.9**	**3.1**	**3.3**	**3.4**
	TOTAL WATER HEATING	**0**	**0**	**1**	**2**	**4**	**6**	**6**	**7**	**7**	**8**
	CHB Gas non-condensing	0.0	0.7	3.0	6.2	11.9	17.4	19.0	17.7	16.1	13.9
	CHB Gas condensing	0.0	0.5	1.5	0.1	0.3	1.1	3.7	8.7	13.5	17.9
	CHB Gas Jet burner non-condensing	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	CHB Gas Jet burner condensing	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1
	CHB Oil Jet burner non-condensing	0.0	0.3	0.6	1.2	2.7	4.0	4.6	4.9	4.7	4.4
	CHB Oil Jet burner condensing	0.0	0.0	0.0	-0.2	-0.6	-1.1	-1.5	-1.8	-1.8	-1.6
	CHB Electric Joule-effect	0.0	0.0	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.2
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.7	-1.1	-1.4	-1.7
	CHB Electric Heat Pump	0.0	0.0	0.2	0.3	-0.3	-1.8	-4.0	-6.4	-8.4	-10.2
	CHB Gas Heat Pump	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.2
	CHB micro CHP	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	0.0
	CHB Solar combi (16 m2)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Central Heating boiler < 400 kW, space heating	**0**	**2**	**5**	**8**	**14**	**20**	**21**	**22**	**23**	**23**
	SFB Wood Manual	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1
	SFB Wood Direct Draft	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	SFB Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	SFB Pellets	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SFB Wood chips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Total Solid Fuel Boiler	**0.0**	**0.0**	**0.0**	**0.1**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**
	CHAE-S (≤ 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1
	CHAE-L (> 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1
	CHWE-S (≤ 400 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-L (> 1500 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.6	0.5	0.4
	HT PCH-AE-L	0.0	0.0	0.0	0.2	0.5	0.8	0.9	1.0	0.9	0.8
	HT PCH-WE-S	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
	HT PCH-WE-M	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC splits	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1
	AC VRF	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**0.0**	**0.0**	**0.0**	**0.5**	**1.4**	**2.2**	**2.5**	**2.4**	**2.1**	**1.9**
	AC rooftop (rev)	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	0.0	0.0	0.0	0.2	0.4	0.5	0.5	0.4	0.3	0.3
	AC VRF (rev)	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.6	0.6	0.5
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.0	0.0	0.0	0.2	0.6	1.0	1.1	1.0	0.9	0.8
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating	**0.0**	**0.0**	**0.1**	**0.6**	**1.4**	**2.1**	**2.3**	**2.1**	**1.9**	**1.6**
	Total AHC Heating & Cooling	**0.0**	**0.0**	**0.1**	**1.1**	**2.8**	**4.3**	**4.7**	**4.5**	**4.0**	**3.5**

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.4
	LH closed fireplace/inset	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5
	LH wood stove	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	LH coal stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	LH SHR stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	LH pellet stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Solid fuel sum	**0.0**	**0.0**	**0.0**	**0.1**	**0.4**	**0.7**	**0.9**	**1.1**	**1.3**	**1.3**
	LH Electric portable	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.6	0.5	0.5
	LH Electric fixed > 250W	0.0	0.0	0.1	0.7	1.3	1.7	1.6	1.5	1.5	1.4
	LH Electric fixed ≤ 250W	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric storage	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH Electric underfloor	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
	LH Electric visibly glowing > 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric visibly glowing ≤ 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric sum	**0.0**	**0.0**	**0.3**	**1.3**	**2.3**	**2.8**	**2.8**	**2.6**	**2.5**	**2.5**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**0.0**	**0.0**	**0.3**	**1.5**	**2.8**	**3.6**	**3.7**	**3.8**	**3.8**	**3.8**
	RAC fixed < 6 kW, cooling	0.0	0.7	0.8	0.8	0.8	0.8	0.7	0.8	0.9	1.0
	RAC fixed 6-12 kW, cooling	0.0	0.4	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.5
	RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.0**	**1.1**	**1.4**	**1.4**	**1.3**	**1.3**	**1.2**	**1.2**	**1.3**	**1.6**
	RAC fixed < 6 kW, reversible, heating	0.0	0.7	1.0	1.3	1.5	1.6	1.6	1.5	1.6	1.8
	RAC fixed 6-12 kW, reversible, heating	0.0	0.4	0.7	0.9	1.1	1.2	1.1	1.1	1.1	1.1
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**1.1**	**1.8**	**2.2**	**2.6**	**2.8**	**2.7**	**2.6**	**2.8**	**3.0**
	RAC Room Air Conditioner	**0**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**5**
1	CIRC Integrated circulators	0.0	0.0	0.3	1.2	1.7	1.8	1.7	1.5	1.3	1.1
0.38	CIRC Large standalone circulators	0.0	0.0	0.2	0.6	0.6	0.5	0.4	0.3	0.3	0.2
0.38	CIRC Small standalone circulators	0.0	0.0	0.2	0.6	0.7	0.6	0.5	0.5	0.4	0.4
	CIRC Circulator pumps <2.5 kW, all	**0.0**	**0.0**	**0.8**	**2.4**	**3.0**	**2.9**	**2.6**	**2.3**	**2.0**	**1.7**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.0**	**0.0**	**0.3**	**0.7**	**0.8**	**0.7**	**0.6**	**0.5**	**0.4**	**0.4**
	TOTAL SPACE HEATING	**0**	**3**	**8**	**13**	**22**	**29**	**31**	**32**	**32**	**32**
	TOTAL SPACE COOLING	**0**	**1**	**1**	**2**	**3**	**4**	**4**	**4**	**3**	**3**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2
	R-UVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	R-UVU 250-1000 m3/h	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.5	0.5
	R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential, from VU own electricity	**0.0**	**0.0**	**0.0**	**0.1**	**0.4**	**0.6**	**0.8**	**1.0**	**1.1**	**1.3**
	NR-UVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	NR-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.4
	NR-AHU-M 5500-14500 m3/h	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.6	0.7	0.8
	NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	NRVU, Total non-residential, from VU own electricity	**0.0**	**0.0**	**0.1**	**0.3**	**0.7**	**1.1**	**1.3**	**1.4**	**1.6**	**1.7**
	VU Ventilation Units, res + non-res., from VU own elec.	**0.0**	**0.0**	**0.1**	**0.5**	**1.0**	**1.7**	**2.1**	**2.4**	**2.7**	**3.0**
	TOTAL VENTILATION (from VU own electricity)	**0**	**0**	**0**	**0**	**1**	**2**	**2**	**2**	**3**	**3**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	*0*	*0*	*0*	*1*	*3*	*4*	*5*	*5*	*6*	*6*

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	0.0	0.2	0.8	2.4	7.3	13.1	14.3	12.8	10.6	8.7
	HID (HPM, HPS, MH)	0.0	0.2	2.0	3.8	4.3	4.0	2.6	1.7	1.0	0.6
	CFLni (all shapes)	0.0	0.0	0.2	0.5	0.7	0.7	0.4	0.3	0.2	0.1
	CFLi (retrofit for GLS, HL)	0.0	-0.4	-0.5	0.2	1.6	1.9	1.4	0.9	0.6	0.4
	GLS (DLS & NDLS)	0.0	3.3	6.0	6.4	4.0	2.4	1.4	0.8	0.5	0.3
	HL (DLS & NDLS, LV & MV)	0.0	-0.6	-0.5	6.8	7.8	4.2	2.2	1.2	0.7	0.4
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.1	-0.6	-2.6	-4.5	-4.7	-3.7	-2.3	-1.1
	LED replacing HID (retrofit & luminaire)	0.0	0.0	-1.4	-2.2	-1.9	-1.0	-0.3	0.1	0.4	0.7
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	-0.2	-0.3	-0.2	0.0	0.0	0.1	0.1
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	-0.2	-0.5	-0.6	-0.4	-0.2	-0.1	-0.1	0.0
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-0.2	-1.5	-2.1	-1.7	-1.0	-0.6	-0.2	0.0
	Standby	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	TOTAL LIGHTING (incl. standby)	**0**	**3**	**6**	**15**	**18**	**19**	**16**	**13**	**11**	**10**
	DP TV on-mode, total all types	0.0	0.0	0.9	3.6	6.8	9.7	10.4	8.8	7.4	6.7
	DP TV standby, standard (NoNA)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, LoNA	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, HiNA ('Smart')	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP TV standby, total all types	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP TV total on-mode + standby	**0**	**0**	**1**	**4**	**7**	**10**	**10**	**9**	**7**	**7**
	DP Monitor on-mode	0.0	0.0	0.1	0.5	0.6	0.6	0.5	0.4	0.4	0.3
	DP Monitor standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DP Monitor total	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**0**	**0**
	DP Signage on-mode	0.0	0.0	0.0	0.0	0.1	0.7	1.2	1.1	0.6	0.2
	DP Signage standby	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0
	DP Signage total	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**0**
	DP Electronic Displays, total on-mode	**0**	**0**	**1**	**4**	**7**	**11**	**12**	**10**	**8**	**7**
	DP Electronic Displays, total standby	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DP Electronic Displays, total	**0**	**0**	**1**	**4**	**8**	**11**	**12**	**10**	**8**	**7**
	SSTB	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (low-power modes)	0.0	0.0	0.2	0.7	0.6	0.5	0.5	0.5	0.5	0.5
	CSTB (other modes)	0.0	0.0	0.1	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	CSTB (all covered modes)	0.0	0.0	0.4	1.0	1.0	0.8	0.8	0.8	0.8	0.8
	Total STB set top boxes (Complex & Simple)	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Game consoles > 20 W Non-Active (CR)	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	Game consoles < 20 W Non-Active (CR)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Total Game consoles, non-active modes	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	Total Game consoles > 20 W, all modes	0.0	0.0	0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.8
	Total Game consoles < 20 W, all modes	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Total Game consoles, all modes	**0**	**0**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket traditional	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 2-socket cloud	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ES rack 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket cloud	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES total traditional	**0**	**0**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ES total cloud	**0**	**0**	**0**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	ES Enterprise Servers total	**0**	**0**	**0**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
	DS Online 2	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	DS Online 3	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Online 4	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Data Storage products total	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ES + DS total (excl. infrastructure)	**0**	**0**	**0**	**0.3**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
	Total PC Personal computers	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Inkjet Printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EP / Laser Printer mono	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	EP / Laser Printer colour	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4
	EP / Laser Copier mono	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.1	0.2	0.4	0.4	0.4	0.4	0.3	0.3	0.3
	EP / Laser MFD colour	0.0	0.1	0.2	0.4	0.5	0.4	0.4	0.4	0.4	0.4
	Total IE Imaging Equipment	**0.0**	**0.4**	**0.9**	**1.3**	**1.4**	**1.4**	**1.4**	**1.3**	**1.2**	**1.2**
	of which for modes under CR 1275/2008	*0.0*	*0.3*	*0.7*	*1.0*	*1.1*	*1.1*	*1.0*	*1.0*	*1.0*	*0.9*
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	SB Electric toothbrushes (off mode)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SB Audio speakers (wired) (sb & off modes)	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.0	0.4	0.7	0.7	0.7	0.7	0.7	0.7
	SB Small appliances (sb & off modes)	0.0	0.0	0.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	SB Media players and recorders (sb mode)	0.0	0.1	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0
	SB Office phones (nsb mode)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.4
	SB Home Network Equipment (nsb mode)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.5	0.6
	SB Coffee makers (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
1	SB Laundry Dryers (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.0	0.2	0.4	0.7	1.0	1.1	1.1	1.1	1.1
1	SB Electric Hobs (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.2	0.7	0.6	0.5	0.5	0.5	0.5	0.5
1	SB Game consoles (non-active modes)	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.5	0.5	0.5
1	SB IE Inkjet Printers (nsb mode)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Laser Printers (nsb mode)	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	SB IE Laser Copiers (nsb mode)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.1	0.3	0.6	0.6	0.6	0.6	0.6	0.5	0.5
	Total (networked) SB (incl. double)	0	1	3	6	7	7	7	7	7	7
	Total (networked) SB (excl. double)	**0**	**0**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
db	*EPS Active mode (for electricity losses)*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
0.6	EPS 10–12 W	0.0	0.0	0.3	0.7	0.9	0.8	0.7	0.6	0.5	0.4
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	EPS, total for active mode	**0.0**	**0.0**	**0.4**	**0.8**	**1.1**	**1.0**	**0.8**	**0.7**	**0.6**	**0.5**
db	*EPS No-load mode*										
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 6–10 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 10–12 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EPS, total for no-load mode	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**
	EPS, overall total (active + no-load)	**0.0**	**0.0**	**0.5**	**1.0**	**1.3**	**1.2**	**1.0**	**0.9**	**0.7**	**0.6**
	EPS, double counted subtracted	**0.0**	**0.0**	**0.3**	**0.6**	**0.7**	**0.7**	**0.6**	**0.5**	**0.4**	**0.4**
	TOTAL ELECTRONICS	**0**	**1**	**4**	**11**	**15**	**19**	**20**	**18**	**16**	**14**
	Total RF household Refrigerators & Freezers	**0**	**5**	**8**	**11**	**14**	**16**	**18**	**19**	**19**	**20**
	CF open vertical chilled multi deck (RVC2)	0.0	0.0	0.0	0.0	0.2	0.8	1.1	1.2	1.2	1.2
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	0.0	0.0	0.0	0.0	0.3	1.0	1.5	1.7	1.7	1.8
	CF Plug in one door beverage cooler	0.0	0.0	0.0	0.0	0.5	1.2	1.4	1.5	1.5	1.5
	CF Plug in horizontal ice cream freezer	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	CF Spiral vending machine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	Total CF Commercial Refrigeration	**0.0**	**0.0**	**0.0**	**0.1**	**1.2**	**3.2**	**4.3**	**4.7**	**4.7**	**4.9**

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	PF Storage cabinet Frozen Vertical (FV)	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Storage cabinet Chilled Horizontal (CH)	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Frozen Horizontal (FH)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**0.0**	**0.0**	**0.0**	**0.2**	**0.6**	**0.7**	**0.8**	**0.8**	**0.8**	**0.9**
	PF Process Chiller AC MT S ≤ 300 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC MT L > 300 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	PF Process Chiller WC LT S ≤ 200 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC LT L > 200 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller All MT&LT	**0.0**	**0.0**	**0.0**	**0.1**	**0.3**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**
	PF Condensing Unit MT S 0.2-1 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit MT M 1-5 kW	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT L 5-20 kW	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	PF Condensing Unit MT XL 20-50 kW	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Condensing Unit LT S 0.1-0.4 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
0.6	**PF Condensing Unit, All MT&LT**	**0.0**	**0.0**	**0.0**	**0.5**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.7**
	PF Professional Refrigeration, Total	**0.0**	**0.0**	**0.0**	**0.5**	**1.3**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION	**0**	**5**	**8**	**12**	**16**	**21**	**24**	**25**	**26**	**27**
	CA Electric Hobs (active modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	CA Electric Hobs (low-power modes)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	CA Electric Hobs (sum all modes)	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5
	CA Electric Ovens (active modes)	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5
	CA Electric Ovens (low-power modes)	0.0	0.0	0.2	0.4	0.7	1.0	1.1	1.1	1.1	1.1
	CA Electric Ovens (sum all modes)	0.0	0.0	0.2	0.5	0.9	1.3	1.5	1.5	1.6	1.6
	CA Gas Hobs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CA Gas Ovens	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CA Range Hoods	0.0	0.0	0.0	0.1	0.4	0.7	0.9	0.9	1.0	1.1
	CA Elec. Hobs&Ovens low-power modes	0.0	0.0	0.3	0.6	1.0	1.3	1.4	1.4	1.5	1.5
	CA other products or modes	0.0	0.0	0.0	0.2	0.7	1.2	1.5	1.6	1.7	1.8
	TOTAL COOKING	**0.0**	**0.0**	**0.3**	**0.9**	**1.7**	**2.5**	**2.9**	**3.0**	**3.2**	**3.3**
	WM Washing Machines, active modes	0.0	1.3	1.9	2.3	2.3	2.2	1.8	1.4	1.0	0.6
	WM Washing Machines, low-power modes	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	WM Washing Machines	0.0	1.4	2.1	2.6	2.6	2.5	2.1	1.7	1.3	0.9
	WD Washer-Dryers, active modes	0.0	0.1	0.2	0.3	0.3	0.2	0.2	0.1	0.0	0.0
	WD Washer-Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	WD Washer-Dryers	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	0.0
	WM-WD Washing, sum active modes	0.0	1.4	2.2	2.6	2.6	2.4	2.0	1.5	1.1	0.7
	WM-WD Washing, sum low-power modes	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	Total WM-WD household Washing	**0.0**	**1.5**	**2.4**	**2.9**	**2.9**	**2.7**	**2.3**	**1.8**	**1.4**	**1.0**
	Total DW household Dishwasher	**0.0**	**0.7**	**1.0**	**1.5**	**1.9**	**2.2**	**2.4**	**2.7**	**3.0**	**3.3**
	LD condensing heat pump		0.0	-0.2	-0.4	-0.6	-0.7	-0.8	-0.8	-0.7	-0.7
	LD condensing electric heat element	0.0	0.0	0.2	0.6	1.0	1.3	1.3	1.3	1.2	1.1
	LD vented electric	0.0	0.0	0.2	0.4	0.6	0.8	0.9	1.0		
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	0.0	0.0	0.2	0.6	1.0	1.3	1.4	1.4	1.4	1.4
	LD Laundry Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	**0.0**	**0.0**	**0.2**	**0.6**	**1.0**	**1.3**	**1.4**	**1.5**	**1.5**	**1.4**
	VC Cylinder Domestic mains	0.0	0.0	0.2	1.4	2.1	1.9	1.4	1.1	1.0	1.0
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
	VC Total Domestic mains	**0.0**	**0.0**	**0.2**	**1.5**	**2.2**	**2.0**	**1.6**	**1.3**	**1.2**	**1.2**
	VC Cylinder Commercial mains	0.0	0.0	0.1	0.7	0.8	1.0	1.0	1.1	1.1	1.1
	VC Upright Commercial mains	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.0**	**0.0**	**0.2**	**0.8**	**0.9**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**
	VC Total in scope of CR 666/2013	**0.0**	**0.0**	**0.4**	**2.3**	**3.1**	**3.1**	**2.7**	**2.5**	**2.4**	**2.4**
	VC Cordless - all - cleaning + standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - all - cleaning + standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total VC Vacuum Cleaner	**0.0**	**0.0**	**0.4**	**2.3**	**3.1**	**3.1**	**2.7**	**2.5**	**2.4**	**2.4**
	TOTAL CLEANING	**-**	**2**	**4**	**7**	**9**	**9**	**9**	**8**	**8**	**8**

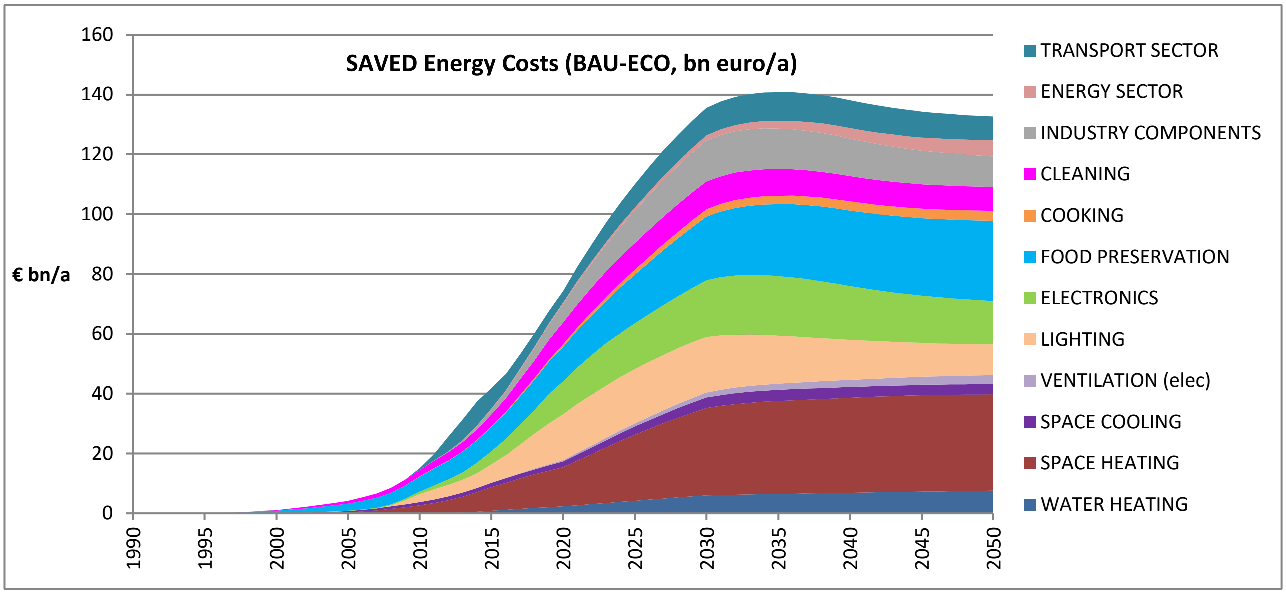
db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.3	1.1	1.9	2.6	2.7	2.7	2.7	2.7
0.5	FAN Axial>300Pa	0.0	0.0	0.3	1.1	2.1	2.9	3.2	3.2	3.2	3.2
0.5	FAN Centr.FC	0.0	0.0	0.1	0.5	0.9	1.2	1.3	1.3	1.3	1.3
0.5	FAN Centr.BC-free	0.0	0.0	0.3	0.8	1.3	1.7	1.9	1.9	2.0	2.0
0.5	FAN Centr.BC	0.0	0.0	0.3	1.0	1.7	2.2	2.3	2.5	2.7	3.0
0.5	FAN Cross-flow	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.6
	Total FAN, industrial (excl. box & roof fans)	**0.0**	**0.0**	**0.7**	**2.3**	**4.2**	**5.5**	**5.9**	**6.1**	**6.2**	**6.4**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.6	2.6	4.3	4.4	3.9	3.3	2.5	1.6
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	0.9	4.0	7.2	7.6	6.7	5.5	4.0	2.1
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.0	1.6	6.2	10.9	14.1	11.9	8.3	4.4	1.8
0.45	**Total 3ph 0.75-375 kW no VSD**	**0.0**	**0.1**	**3.0**	**12.8**	**22.4**	**26.1**	**22.5**	**17.1**	**11.0**	**5.4**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.1	-1.0	-1.9	-1.8	-1.5	-1.2	-0.7	-0.2
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-0.4	-2.2	-4.0	-4.0	-3.4	-2.7	-1.8	-0.6
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-0.9	-3.6	-6.2	-7.8	-6.1	-3.7	-1.4	0.3
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.0**	**0.0**	**-1.4**	**-6.8**	**-12.0**	**-13.6**	**-11.0**	**-7.6**	**-3.9**	**-0.5**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0.0**	**0.0**	**1.6**	**6.0**	**10.4**	**12.5**	**11.5**	**9.5**	**7.1**	**4.9**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**
0.45	Large 3-ph LV 375-1000 kW no VSD	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0	0	0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
0.45	**Total Large 3-ph LV 375-1000 kW**	**0**	**0**	**0**	**0.0**	**0.1**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.1**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**
	MT Elec. Motors LV 0.12-1000 kW	**0.0**	**0.0**	**0.9**	**3.3**	**6.0**	**7.4**	**7.0**	**5.9**	**4.5**	**3.3**
	including double counted amounts	-	0	2	6	11	13	13	11	8	6
	ESOB < 45kW	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1	0.1
	ESOB 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC < 45kW	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCC 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi < 45kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MSSB <6"	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1	0.1
	MS_V <25 bar	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	WP Water pumps	**0.0**	**0.0**	**0.2**	**0.5**	**0.7**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**
	Total WE Welding Equipment	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	TOTAL INDUSTRY COMPONENTS	**0**	**0**	**2**	**6**	**11**	**14**	**14**	**13**	**11**	**10**
1	TRAFO Distribution	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.1	1.3
1	TRAFO Industry oil	0.0	0.0	0.1	0.2	0.4	0.7	0.9	1.1	1.1	1.2
1	TRAFO Industry dry	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3
1	TRAFO Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	TRAFO DER oil	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.5	0.7
1	TRAFO DER dry	0.0	0.0	0.0	0.1	0.2	0.4	0.6	1.0	1.4	1.9
1	TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total TRAFO Utility Transformers	**0.0**	**0.0**	**0.1**	**0.5**	**1.1**	**1.8**	**2.6**	**3.5**	**4.4**	**5.4**
	TOTAL ENERGY SECTOR	**0.0**	**0.0**	**0.1**	**0.5**	**1.1**	**1.8**	**2.6**	**3.5**	**4.4**	**5.4**
	(costs for fuel consumption due to rolling resistance)										
	Tyres C1, replacement for cars	0.0	0.4	4.9	2.8	4.6	5.2	5.3	5.0	4.4	3.6
	Tyres C1, OEM for cars	0.0	0.0	0.0	0.1	0.9	1.1	1.0	1.0	0.9	0.9
	Tyres C1, total	**0.0**	**0.4**	**4.9**	**2.9**	**5.5**	**6.2**	**6.3**	**6.0**	**5.3**	**4.5**
	Tyres C2, replacement for vans	0.0	0.1	0.9	0.4	1.0	1.2	1.2	1.1	1.0	0.9
	Tyres C2, OEM for vans	0.0	0.0	0.0	0.0	0.1	0.2	0.1	0.1	0.1	0.1
	Tyres C2, total	**0.0**	**0.1**	**0.9**	**0.4**	**1.1**	**1.3**	**1.3**	**1.3**	**1.2**	**1.0**

db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C3, replacement for trucks/busses	0.0	0.1	1.1	0.6	1.1	1.4	1.6	1.8	1.9	2.1
	Tyres C3, OEM for trucks/busses	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.3	0.3
	Tyres C3, total	**0.0**	**0.1**	**1.1**	**0.6**	**1.2**	**1.6**	**1.9**	**2.0**	**2.2**	**2.4**
	Tyres, total C1+C2+C3	**0.0**	**0.6**	**6.9**	**3.8**	**7.8**	**9.2**	**9.5**	**9.3**	**8.7**	**7.9**
	TOTAL TRANSPORT SECTOR	0.0	0.6	6.9	3.8	7.8	9.2	9.5	9.3	8.7	7.9
	SAVED GENERAL TOTAL in bn euros 2020	**0**	**15**	**42**	**74**	**110**	**136**	**141**	**138**	**134**	**133**

	SAVED Energy costs (BAU-ECO, in bn euros, Summar	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	0	0	1	2	4	6	6	7	7	8
	SPACE HEATING	0	3	8	13	22	29	31	32	32	32
	SPACE COOLING	0	1	1	2	3	4	4	4	3	3
	VENTILATION (elec)	0	0	0	0	1	1.7	2	2	3	3
1	*VENTILATION (from heat saving vs. BAU; already included in COST for space heating)*	*0*	*0*	*0*	*1*	*3*	*4.2*	*5*	*5*	*6*	*6*
	LIGHTING	0	3	6	15	18	19	16	13	11	10
	ELECTRONICS	0	1	4	11	15	19	20	18	16	14
	FOOD PRESERVATION	0	5	8	12	16	21	24	25	26	27
	COOKING	0	0	0	1	2	2	3	3	3	3
	CLEANING	-	2	4	7	9	9	9	8	8	8
	INDUSTRY COMPONENTS	0	0	2	6	11	14	14	13	11	10
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	0	1	7	4	8	9	10	9	9	8
	TOTAL in bn euros	**0**	**15**	**42**	**74**	**109**	**134**	**138**	**135**	**130**	**127**
	% saving versus BAU (from 1990=0%)	0%	2%	6%	11%	16%	18%	18%	18%	17%	16%
	% saving versus BAU (from 2010=0%)	-3%	0%	4%	9%	13%	16%	16%	16%	15%	14%

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR	0	0	0	1	1	2	3	4	4	5
Total in bn euros, incl. energy Sector	**0**	**15**	**42**	**74**	**110**	**136**	**141**	**138**	**134**	**133**



Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU-ECO Energy Cost savings (same sector definitions and same order of presentation as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units

Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating

Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

Energy Cost Saving (summary RESIDENTIAL, bn euro	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.0	0.0	0.6	1.7	3.1	4.5	4.9	5.3	5.5	5.8
SPACE HEATING	0.0	1.9	5.6	9.0	15.1	19.9	21.4	22.1	22.7	22.8
SPACE & HT PROCESS COOLING	0.0	0.7	0.9	0.9	0.9	0.9	0.8	0.8	0.9	1.1
VENTILATION (from electricity)	0.0	0.0	0.0	0.1	0.4	0.6	0.8	1.0	1.1	1.3
LIGHTING	0.0	2.0	4.2	9.0	8.1	5.3	3.3	2.2	1.5	1.2
ELECTRONICS	0.0	0.5	3.3	8.4	11.8	14.4	14.8	13.2	11.7	11.0
FOOD PRESERVATION	0.0	4.7	7.4	10.2	12.8	15.2	16.6	17.4	17.8	18.4
COOKING	0.0	0.0	0.2	0.7	1.4	2.1	2.4	2.6	2.7	2.8
CLEANING	0.0	2.1	3.7	6.2	7.7	8.0	7.5	7.0	6.7	6.5
INDUSTRY COMPONENTS	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Energy Cost Saving, Residential, in bn euros	**0**	**12**	**26**	**46**	**62**	**71**	**73**	**71**	**71**	**71**

db	Maintenance BAU incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EIWH Electric Instant. ≥ 12 kW (primary)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESWH Electric Storage ≤ 30 L (secondary)	0.8	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.4	1.4
	ESWH Electric Storage > 30 L (primary)	1.8	2.4	2.3	2.3	2.2	2.3	2.5	2.6	2.8	2.9
	GIWH Gas Instant. < 13 L/min (secondary)	1.1	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.6
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	Dedicated WH Heat Pump	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.8
	Dedicated WH Solar (3.5 m2)	0.1	0.8	1.1	1.1	1.2	1.1	1.1	1.1	1.2	1.2
	WH dedicated Water Heater	**4.5**	**6.0**	**6.1**	**6.0**	**5.9**	**6.1**	**6.4**	**6.8**	**7.2**	**7.6**
	CHB Gas Combi Instant. WH	0.6	1.5	1.6	1.7	1.8	1.8	1.9	1.9	1.9	1.9
	CHB Gas + Cyl. WH	0.3	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	CHB Jet Burner Gas + Cyl. WH	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Jet Burner Oil + Cyl. WH	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Electric HP + Cyl. WH	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Solar Combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHC Central Heating combi, water heating	**1.7**	**2.7**	**2.8**	**2.8**	**2.7**	**2.7**	**2.8**	**2.9**	**2.9**	**2.9**
	TOTAL WATER HEATING	**6.2**	**8.8**	**8.9**	**8.8**	**8.7**	**8.9**	**9.2**	**9.7**	**10.1**	**10.6**
	CHB Gas non-condensing	5.6	8.3	7.1	5.7	4.4	4.0	3.7	3.3	3.0	2.8
	CHB Gas condensing	0.1	3.4	5.4	7.4	9.1	10.0	10.7	11.0	11.4	11.8
	CHB Gas Jet burner non-condensing	0.7	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.1	0.1
	CHB Gas Jet burner condensing	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CHB Oil Jet burner non-condensing	4.9	4.2	3.4	2.5	1.8	1.0	0.6	0.5	0.5	0.5
	CHB Oil Jet burner condensing	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.8	0.8	0.9
	CHB Electric Joule-effect	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2
	CHB Electric Heat Pump	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	CHB Gas Heat Pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	CHB micro CHP	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	CHB Solar combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	CHB Central Heating boiler < 400 kW, space heating	**11**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**17**	**18**
	SFB Wood Manual [18 kW]	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SFB Wood Direct Draft [20 kW]	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4
	SFB Coal [25 kW]	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	SFB Pellets [25 kW]	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Wood chips [160 kW]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Solid Fuel Boiler	**0.7**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**
	CHAE-S (≤ 400 kW)	0.2	0.9	1.1	1.3	1.5	1.7	1.8	2.0	2.2	2.3
	CHAE-L (> 400 kW)	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S (≤ 400 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	CHWE-L (> 1500 kW)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-AE-L	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	0.1	0.4	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.1
	AC splits	0.2	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	0.9
	AC VRF	0.0	1.0	1.6	2.5	3.3	4.3	5.4	6.3	7.2	7.9
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
	AC rooftop (rev)	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.6
	AC VRF (rev)	0.0	0.9	1.4	2.1	2.8	3.6	4.4	4.9	5.3	5.6
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)	**0**	**2**	**3**	**3**	**4**	**5**	**5**	**6**	**6**	**6**
	Total AHC Heating & Cooling	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

db	Maintenance BAU incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH closed fireplace/inset [8 kW]	0.1	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	LH wood stove [8 kW]	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH coal stove [8 kW]	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker [10 kW]	0.2	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7
	LH SHR stove [8 kW]	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH pellet stove [8 kW]	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH Solid fuel sum	**0.8**	**1.3**	**1.6**	**1.8**	**2.0**	**2.1**	**2.2**	**2.2**	**2.3**	**2.3**
	LH Electric sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**1.1**	**1.6**	**1.7**	**1.9**	**2.1**	**2.2**	**2.3**	**2.3**	**2.3**	**2.3**
	Maintenance partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	0.1	0.7	0.6	0.5	0.5	0.6	0.7	0.7	0.8	0.9
	RAC fixed 6-12 kW, cooling	0.0	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.1**	**0.8**	**0.8**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.1**
	RAC fixed < 6 kW, reversible, heating	0.0	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.8	0.9
	RAC fixed 6-12 kW, reversible, heating	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**0.2**	**0.3**	**0.3**	**0.4**	**0.5**	**0.7**	**0.8**	**1.0**	**1.1**
	RAC Room Air Conditioner	**0.1**	**1.1**	**1.1**	**1.0**	**1.1**	**1.3**	**1.5**	**1.7**	**2.0**	**2.3**
1	CIRC Integrated circulators	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.38	CIRC Large standalone circulators	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.38	CIRC Small standalone circulators	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CIRC Circulator pumps <2.5 kW, all	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	TOTAL SPACE HEATING	**13.6**	**21.1**	**22.1**	**23.0**	**23.7**	**24.5**	**25.5**	**26.2**	**27.2**	**28.1**
	TOTAL SPACE COOLING	**1.1**	**5.1**	**6.3**	**7.4**	**8.5**	**9.7**	**10.9**	**12.0**	**13.2**	**14**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.3
	R-UVU 100-250 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	R-UVU 250-1000 m3/h	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	R-BVU 250-1000 m3/h	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.5	0.7	0.8
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential	**0.1**	**0.4**	**0.5**	**0.6**	**0.9**	**1.3**	**1.7**	**2.1**	**2.6**	**3.0**
	NR-UVU 250-1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	NR-UVU > 1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-AHU-S 2500-5500 m3/h	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	NR-AHU-M 5500-14500 m3/h	0.5	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2
	NR-AHU-L > 14500 m3/h	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	NRVU, Total non-residential	**0.7**	**1.3**	**1.6**	**1.8**	**1.9**	**2.1**	**2.2**	**2.4**	**2.5**	**2.6**
	VU Ventilation Units, res + non-res.	**0.9**	**1.8**	**2.1**	**2.4**	**2.8**	**3.3**	**3.9**	**4.5**	**5.1**	**5.7**
	TOTAL VENTILATION	**0.9**	**1.8**	**2.1**	**2.4**	**2.8**	**3.3**	**3.9**	**4.5**	**5.1**	**5.7**
	LFL (T12,T8h,T8t,T5,other)	0.4	0.7	0.8	0.8	0.8	0.7	0.5	0.4	0.3	0.3
	HID (HPM, HPS, MH)	0.2	0.5	0.6	0.6	0.5	0.3	0.2	0.1	0.0	0.0
	CFLni (all shapes)	0.2	0.9	0.9	1.0	0.8	0.5	0.2	0.1	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.1	0.8	1.0	1.1	0.9	0.8	0.5	0.3	0.2	0.1
	GLS (DLS & NDLS)	0.6	0.5	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0
	HL (DLS & NDLS, LV & MV)	0.1	0.5	0.6	0.7	0.5	0.3	0.2	0.1	0.1	0.0
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.0	0.0	0.2	0.4	0.7	1.0	1.3	1.6
	LED replacing HID (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.3	0.5	0.8	1.0	1.2	1.4
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.3	0.8	1.3	1.6	1.9	2.2
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.6	0.8	0.9
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.8	1.4	2.0	2.6	3.2	3.7
	TOTAL LIGHTING	**1.5**	**3.9**	**4.4**	**4.9**	**5.5**	**6.2**	**7.0**	**8.0**	**9.0**	**10.2**

db	Maintenance BAU incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV total all types	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6
	DP Monitor	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	DP Signage	0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03
	DP Electronic Displays, total	**0.2**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	Total STB set top boxes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total GC Game consoles	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total ES&DS Servers and Data Storage	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total PC Personal computers	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Inkjet Printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Printer mono	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1
	EP / Laser Printer colour	0.0	0.7	1.1	1.6	1.9	2.0	2.1	2.2	2.2	2.3
	EP / Laser Copier mono	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	1.2	1.7	1.9	1.9	1.8	1.7	1.6	1.5	1.4
	EP / Laser MFD colour	0.0	2.9	4.1	4.6	4.4	4.1	3.9	3.8	3.6	3.4
	Total IE Imaging Equipment	**1.1**	**5.8**	**7.9**	**8.8**	**8.5**	**8.2**	**8.0**	**7.7**	**7.4**	**7.1**
	Total (networked) SB (excl. double)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total EPS External power Supplies	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**1.2**	**6.2**	**8.3**	**9.3**	**9.0**	**8.8**	**8.6**	**8.4**	**8.1**	**7.8**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0
	CF Plug in one door beverage cooler	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	CF Plug in horizontal ice cream freezer	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CF Spiral vending machine	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CF Commercial Refrigeration	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Washing Machines	0.4	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7
	WD Washer-Dryers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total WM-WD household Washing	**0.4**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	LD condensing electric heat element	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LD vented electric	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	VC Cylinder Domestic mains	0.3	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	VC Total Domestic mains	**0.3**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**
	VC Cylinder Commercial mains	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Upright Commercial mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Commercial mains	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	VC Total in scope of CR 666/2013	**0.3**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.4**	**0.3**	**0.3**	**0.3**
	VC Cordless - domestic	0.0	0.0	0.1	0.3	0.4	0.6	0.8	0.9	0.9	1.0
	VC Cordless - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5
	VC Robot - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**0.3**	**0.6**	**0.7**	**0.9**	**1.1**	**1.3**	**1.4**	**1.6**	**1.6**	**1.7**
	VC Total Commercial mains+cordless+robots	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	Total VC Vacuum Cleaner	**0.3**	**0.7**	**0.8**	**1.0**	**1.2**	**1.4**	**1.6**	**1.7**	**1.8**	**1.8**
	TOTAL CLEANING	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
0.5	FAN Axial<300Pa [247 W flow out]	0.1	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	0.2	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
0.5	FAN Centr.FC [141 W flow out]	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	FAN Centr.BC-free [2120 W flow out]	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
0.5	FAN Centr.BC [2052 W flow out]	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
0.5	FAN Cross-flow [31 W flow out]	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total FAN, industrial (excl. box & roof fans)	**0.3**	**0.9**	**1.0**	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.4**

db	Maintenance BAU incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.5	0.6	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.2	0.2
0.45	**Total 3ph 0.75-375 kW no VSD**	**0.7**	**1.0**	**1.0**	**1.1**	**1.1**	**1.0**	**1.0**	**0.9**	**0.8**	**0.7**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.6	0.6	0.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.1**	**0.3**	**0.4**	**0.5**	**0.6**	**0.8**	**0.9**	**1.1**	**1.2**	**1.4**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0.9**	**1.3**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**	**1.9**	**2.0**	**2.1**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Large 3-ph LV 375-1000 kW no VSD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
0.45	**Total Large 3-ph LV 375-1000 kW**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	MT Elec. Motors LV 0.12-1000 kW	**0.6**	**0.9**	**1.0**	**1.1**	**1.2**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**
	ESOB<45_VF	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	ESOB<45_CF	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5
	ESOB<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	ESOB < 45 Total	**0.4**	**0.6**	**0.6**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.0**
	ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESOB < 150 Total	**0.5**	**0.6**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**
	ESCC<45_VF	0.6	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.1
	ESCC<45_CF	0.6	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4
	ESCC<45_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ESCC < 45 Total	**1.2**	**1.6**	**1.8**	**1.9**	**2.1**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**
	ESCC_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESCC < 150 Total	**1.2**	**1.7**	**1.8**	**2.0**	**2.1**	**2.3**	**2.4**	**2.6**	**2.7**	**2.9**
	ESCCi<45_VF	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
	ESCCi<45_CF	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCCi<45_VSD-VF	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.6
	ESCCi < 45 Total	**0.5**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.1**
	ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	**0.5**	**0.7**	**0.7**	**0.8**	**0.9**	**0.9**	**1.0**	**1.0**	**1.1**	**1.1**
	MSSB<6"_VF	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.8
	MSSB<6"_CF	2.6	3.6	3.8	4.2	4.5	4.7	5.0	5.4	5.7	6.0
	MSSB<6"_VSD-VF	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	MSSB <6" Total	**3.2**	**4.5**	**4.8**	**5.2**	**5.6**	**5.9**	**6.3**	**6.7**	**7.1**	**7.5**
	MS-V<25bar_VF	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	MS-V<25bar_CF	0.4	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9
	MS-V<25bar_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	MS_V <25 bar Total	**0.8**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**
	WP Water pumps	**6**	**9**	**9**	**10**	**11**	**11**	**12**	**13**	**14**	**15**
	Total WE Welding Equipment	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	TOTAL INDUSTRY COMPONENTS	**7.3**	**10.5**	**11.3**	**12.4**	**13.3**	**14.0**	**14.8**	**15.7**	**16.6**	**17.5**

db Maintenance BAU incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution, kWh/a	0	0	0	0	0	0	0	0	0	0
TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0
TRAFO Industry dry	0	0	0	0	0	0	0	0	0	0
TRAFO Power	0	0	0	0	0	0	0	0	0	0
TRAFO DER oil	0	0	0	0	0	0	0	0	0	0
TRAFO DER dry	0	0	0	0	0	0	0	0	0	0
TRAFO Small	0	0	0	0	0	0	0	0	0	0
TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
GENERAL TOTAL (in bn euro 2015)	**34**	**60**	**66**	**71**	**75**	**79**	**84**	**89**	**94**	**98**

SUMMARY

Maintenance BAU incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**6**	**9**	**9**	**9**	**9**	**9**	**9**	**10**	**10**	**11**
SPACE HEATING	**14**	**21**	**22**	**23**	**24**	**25**	**25**	**26**	**27**	**28**
SPACE COOLING	**1**	**5**	**6**	**7**	**9**	**10**	**11**	**12**	**13**	**14**
VENTILATION	**1**	**2**	**2**	**2**	**3**	**3**	**4**	**4**	**5**	**6**
LIGHTING	**2**	**4**	**4**	**5**	**6**	**6**	**7**	**8**	**9**	**10**
ELECTRONICS	**1**	**6**	**8**	**9**	**9**	**9**	**9**	**8**	**8**	**8**
FOOD PRESERVATION	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**2**	**2**	**2**
COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CLEANING	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
INDUSTRY COMPONENTS	**7**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**17**
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
TOTAL in bn euro 2015	**34**	**60**	**66**	**71**	**75**	**79**	**84**	**89**	**94**	**98**

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total in bn euros, incl. energy Sector	**34**	**60**	**66**	**71**	**75**	**79**	**84**	**89**	**94**	**98**

Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU Maintenance Cost (sector definitions and order as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

BAU Maint Cost (summary RESIDENTIAL, bn eu	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**4.5**	**6.5**	**6.6**	**6.5**	**6.4**	**6.6**	**6.8**	**7.1**	**7.4**	**7.8**
SPACE HEATING	**10.1**	**14.6**	**14.9**	**15.1**	**15.2**	**15.3**	**15.6**	**15.9**	**16.4**	**16.9**
SPACE & HT PROCESS COOLING	**0.1**	**0.8**	**0.8**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.1**	**1.2**
VENTILATION (from electricity)	**0.1**	**0.4**	**0.5**	**0.6**	**0.9**	**1.3**	**1.7**	**2.1**	**2.6**	**3.0**
LIGHTING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
ELECTRONICS	**0.3**	**0.8**	**1.1**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**	**1.2**
FOOD PRESERVATION	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COOKING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CLEANING	**0.8**	**1.4**	**1.5**	**1.8**	**2.0**	**2.2**	**2.4**	**2.5**	**2.6**	**2.6**
INDUSTRY COMPONENTS	**1.2**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**	**2.4**	**2.5**	**2.7**	**2.9**
BAU Maint Cost, Residential, in bn euros	**17.1**	**26.2**	**27.2**	**27.8**	**28.5**	**29.7**	**31.0**	**32.5**	**34.0**	**35.6**

db	Maintenance ECO incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EIWH Electric Instant. ≥ 12 kW (primary)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESWH Electric Storage ≤ 30 L (secondary)	0.8	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.4	1.4
	ESWH Electric Storage > 30 L (primary)	1.8	2.4	2.3	2.3	2.2	2.3	2.5	2.6	2.8	2.9
	GIWH Gas Instant. < 13 L/min (secondary)	1.1	1.1	0.9	0.8	0.7	0.7	0.7	0.7	0.7	0.6
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.2	0.2	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	Dedicated WH Heat Pump	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.8
	Dedicated WH Solar (3.5 m2)	0.1	0.8	1.1	1.1	1.2	1.1	1.1	1.1	1.2	1.2
	WH dedicated Water Heater	**4.5**	**6.0**	**6.1**	**6.0**	**5.9**	**6.1**	**6.4**	**6.8**	**7.2**	**7.6**
	CHB Gas Combi Instant. WH	0.6	1.5	1.6	1.7	1.7	1.7	1.6	1.5	1.4	1.3
	CHB Gas + Cyl. WH	0.3	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3
	CHB Jet Burner Gas + Cyl. WH	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Jet Burner Oil + Cyl. WH	0.7	0.6	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	CHB Electric HP + Cyl. WH	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.5	0.6
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Solar Combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHC Central Heating combi, water heating	**1.7**	**2.7**	**2.7**	**2.7**	**2.7**	**2.6**	**2.7**	**2.7**	**2.7**	**2.6**
	TOTAL WATER HEATING	**6.2**	**8.8**	**8.9**	**8.7**	**8.6**	**8.8**	**9.1**	**9.5**	**9.9**	**10.3**
	CHB Gas non-condensing	5.6	8.3	7.0	4.8	2.6	1.4	0.6	0.3	0.2	0.1
	CHB Gas condensing	0.1	3.4	5.5	8.3	10.5	11.6	11.8	11.0	10.1	9.2
	CHB Gas Jet burner non-condensing	0.7	0.6	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0
	CHB Gas Jet burner condensing	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	CHB Oil Jet burner non-condensing	4.9	4.2	3.3	2.5	1.6	0.7	0.3	0.1	0.1	0.1
	CHB Oil Jet burner condensing	0.0	0.1	0.2	0.4	0.6	0.8	1.0	1.1	1.2	1.2
	CHB Electric Joule-effect	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.4	0.5	0.7
	CHB Electric Heat Pump	0.0	0.2	0.3	0.4	0.7	1.0	1.5	2.0	2.6	3.2
	CHB Gas Heat Pump	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHB micro CHP	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2
	CHB Solar combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CHB Central Heating boiler < 400 kW, space heating	**11**	**17**	**17**	**17**	**17**	**16**	**16**	**15**	**15**	**15**
	SFB Wood Manual [18 kW]	0.4	0.2	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	SFB Wood Direct Draft [20 kW]	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.4
	SFB Coal [25 kW]	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	SFB Pellets [25 kW]	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	SFB Wood chips [160 kW]	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Solid Fuel Boiler	**0.7**	**0.4**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**
	CHAE-S (≤ 400 kW)	0.2	0.9	1.1	1.3	1.5	1.7	1.8	2.0	2.2	2.3
	CHAE-L (> 400 kW)	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	CHWE-S (≤ 400 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	CHWE-L (> 1500 kW)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-AE-L	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-S	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	HT PCH-WE-M	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	0.1	0.4	0.5	0.5	0.4	0.3	0.1	0.1	0.1	0.1
	AC splits	0.2	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	0.9
	AC VRF	0.0	1.0	1.6	2.5	3.3	4.3	5.4	6.3	7.2	7.9
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Cooling	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**
	AC rooftop (rev)	0.1	0.3	0.3	0.3	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	0.2	0.7	0.7	0.8	0.8	0.7	0.7	0.7	0.7	0.6
	AC VRF (rev)	0.0	0.9	1.4	2.1	2.8	3.6	4.4	4.9	5.3	5.6
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Heating (rev double)	**0**	**2**	**3**	**3**	**4**	**5**	**5**	**6**	**6**	**6**
	Total AHC Heating & Cooling	**1**	**4**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**

db	Maintenance ECO incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH closed fireplace/inset [8 kW]	0.1	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	LH wood stove [8 kW]	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	LH coal stove [8 kW]	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker [10 kW]	0.2	0.4	0.5	0.5	0.6	0.7	0.7	0.7	0.7	0.7
	LH SHR stove [8 kW]	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH pellet stove [8 kW]	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LH Solid fuel sum	**0.8**	**1.3**	**1.6**	**1.8**	**2.0**	**2.1**	**2.2**	**2.2**	**2.3**	**2.3**
	LH Electric sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.2	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.3**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
	Maintenance partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	0.1	0.7	0.6	0.5	0.5	0.6	0.7	0.7	0.8	0.9
	RAC fixed 6-12 kW, cooling	0.0	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.1**	**0.8**	**0.8**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.1**
	RAC fixed < 6 kW, reversible, heating	0.0	0.2	0.2	0.2	0.3	0.4	0.5	0.7	0.8	0.9
	RAC fixed 6-12 kW, reversible, heating	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**0.2**	**0.3**	**0.3**	**0.4**	**0.5**	**0.7**	**0.8**	**1.0**	**1.1**
	RAC Room Air Conditioner	**0.1**	**1.1**	**1.1**	**1.0**	**1.1**	**1.3**	**1.5**	**1.7**	**2.0**	**2.3**
1	CIRC Integrated circulators	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.38	CIRC Large standalone circulators	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
0.38	CIRC Small standalone circulators	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CIRC Circulator pumps <2.5 kW, all	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	TOTAL SPACE HEATING	**13.6**	**21.1**	**22.1**	**23.0**	**23.5**	**24.1**	**24.6**	**24.8**	**25.3**	**25.7**
	TOTAL SPACE COOLING	**1.1**	**5.1**	**6.3**	**7.4**	**8.5**	**9.7**	**10.9**	**12.0**	**13.2**	**14**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.8	1.1	1.3
	R-UVU 100-250 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3
	R-UVU 250-1000 m3/h	0.1	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	R-BVU 250-1000 m3/h	0.0	0.0	0.1	0.1	0.1	0.3	0.4	0.5	0.7	0.8
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential	**0.1**	**0.4**	**0.5**	**0.6**	**0.9**	**1.3**	**1.7**	**2.1**	**2.6**	**3.0**
	NR-UVU 250-1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
	NR-UVU > 1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	NR-AHU-S 2500-5500 m3/h	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	NR-AHU-M 5500-14500 m3/h	0.5	0.8	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.2
	NR-AHU-L > 14500 m3/h	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	NRVU, Total non-residential	**0.7**	**1.3**	**1.6**	**1.8**	**1.9**	**2.1**	**2.2**	**2.4**	**2.5**	**2.6**
	VU Ventilation Units, res + non-res.	**0.9**	**1.8**	**2.1**	**2.4**	**2.8**	**3.3**	**3.9**	**4.5**	**5.1**	**5.7**
	TOTAL VENTILATION	**0.9**	**1.8**	**2.1**	**2.4**	**2.8**	**3.3**	**3.9**	**4.5**	**5.1**	**5.7**
	LFL (T12,T8h,T8t,T5,other)	0.4	0.7	0.8	0.8	0.7	0.4	0.2	0.1	0.1	0.0
	HID (HPM, HPS, MH)	0.2	0.5	0.5	0.4	0.3	0.2	0.1	0.0	0.0	0.0
	CFLni (all shapes)	0.2	0.9	0.9	0.7	0.5	0.2	0.0	0.0	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.1	1.0	1.3	1.0	0.4	0.1	0.0	0.0	0.0	0.0
	GLS (DLS & NDLS)	0.6	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HL (DLS & NDLS, LV & MV)	0.1	0.5	0.6	0.4	0.0	0.0	0.0	0.0	0.0	0.0
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.3	0.7	1.1	1.3	1.6	1.8
	LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	0.2	0.4	0.7	0.9	1.1	1.2	1.4
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.3	0.7	1.1	1.4	1.7	1.9	2.2
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.1	0.2	0.5	0.6	0.7	0.7	0.8	0.9
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.7	1.7	2.3	2.7	3.1	3.5	3.9
	TOTAL LIGHTING	**1.5**	**3.9**	**4.3**	**4.9**	**5.5**	**6.3**	**7.1**	**8.0**	**9.1**	**10.3**

db	Maintenance ECO incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	DP TV total all types	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6
	DP Monitor	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	DP Signage	0.00	0.00	0.01	0.02	0.03	0.03	0.03	0.03	0.03	0.03
	DP Electronic Displays, total	**0.2**	**0.4**	**0.4**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.7**	**0.7**
	Total STB set top boxes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total GC Game consoles	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total ES&DS Servers and Data Storage	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total PC	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Inkjet Printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Printer mono	0.6	0.6	0.6	0.5	0.4	0.3	0.2	0.2	0.1	0.1
	EP / Laser Printer colour	0.0	0.7	1.1	1.6	1.9	2.0	2.1	2.2	2.2	2.3
	EP / Laser Copier mono	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	1.2	1.7	1.9	1.9	1.8	1.7	1.6	1.5	1.4
	EP / Laser MFD colour	0.0	2.9	4.1	4.6	4.4	4.1	3.9	3.8	3.6	3.4
	Total IE Imaging Equipment	**1.1**	**5.8**	**7.9**	**8.8**	**8.5**	**8.2**	**8.0**	**7.7**	**7.4**	**7.1**
	Total (networked) SB (incl. double)	0	0	0	0	0	0	0	0	0	0
	Total (networked) SB (excl. double)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total EPS External power Supplies	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**1.2**	**6.2**	**8.3**	**9.3**	**9.0**	**8.8**	**8.6**	**8.4**	**8.1**	**7.8**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CF other supermarket display (non-BCs)	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0
	CF Plug in one door beverage cooler	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
	CF Plug in horizontal ice cream freezer	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	CF Spiral vending machine	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CF Commercial Refrigeration	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Washing Machines	0	1	1	1	1	1	1	1	1	1
	WD Washer-Dryers	0	0	0	0	0	0	0	0	0	0
	Total WM-WD household Washing	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	LD condensing electric heat element	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LD vented electric	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**0.1**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	VC Cylinder Domestic mains	0.3	0.5	0.5	0.5	0.4	0.3	0.2	0.2	0.2	0.2
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	VC Total Domestic mains	**0.3**	**0.5**	**0.5**	**0.5**	**0.5**	**0.4**	**0.3**	**0.2**	**0.2**	**0.2**
	VC Cylinder Commercial mains	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Upright Commercial mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Commercial mains	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	VC Total in scope of CR 666/2013	**0.3**	**0.6**	**0.6**	**0.6**	**0.5**	**0.5**	**0.4**	**0.3**	**0.3**	**0.3**
	VC Cordless - domestic	0.0	0.0	0.1	0.3	0.4	0.6	0.8	0.9	0.9	1.0
	VC Cordless - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.5
	VC Robot - commercial	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**0.3**	**0.6**	**0.7**	**0.9**	**1.1**	**1.3**	**1.4**	**1.6**	**1.6**	**1.7**
	VC Total Commercial mains+cordless+robots	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	VC Total All mains+cordless+robots	**0.3**	**0.7**	**0.8**	**1.0**	**1.2**	**1.4**	**1.6**	**1.7**	**1.8**	**1.8**
	Total VC Vacuum Cleaner	**0.3**	**0.7**	**0.8**	**1.0**	**1.2**	**1.4**	**1.6**	**1.7**	**1.8**	**1.8**
	TOTAL CLEANING	**1**	**2**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
0.5	FAN Axial<300Pa [247 W flow out]	0.1	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	0.2	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
0.5	FAN Centr.FC [141 W flow out]	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.5	FAN Centr.BC-free [2120 W flow out]	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
0.5	FAN Centr.BC [2052 W flow out]	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
0.5	FAN Cross-flow [31 W flow out]	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total FAN, industrial (excl. box & roof fans)	**0.3**	**0.9**	**1.0**	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.4**

db	Maintenance ECO incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.5	0.6	0.6	0.6	0.5	0.5	0.5	0.5	0.4	0.4
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.3	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
0.45	**Total 3ph 0.75-375 kW no VSD**	**0.7**	**1.0**	**1.0**	**0.9**	**0.8**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.1	0.2	0.3	0.4	0.6	0.6	0.7	0.7	0.8	0.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.1**	**0.3**	**0.5**	**0.7**	**1.0**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0.9**	**1.3**	**1.5**	**1.6**	**1.8**	**1.9**	**1.9**	**2.0**	**2.0**	**2.1**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	Large 3-ph LV 375-1000 kW no VSD	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
0.45	**Total Large 3-ph LV 375-1000 kW**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Explosion motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Brake motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	MT Elec. Motors LV 0.12-1000 kW	**0.6**	**0.9**	**1.0**	**1.1**	**1.2**	**1.3**	**1.3**	**1.3**	**1.4**	**1.4**
	ESOB<45_VF	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	ESOB<45_CF	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.5
	ESOB<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	ESOB < 45 Total	**0.4**	**0.6**	**0.6**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.0**
	ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESOB < 150 Total	**0.5**	**0.6**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**1.0**	**1.0**	**1.1**
	ESCC<45_VF	0.6	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.1	1.1
	ESCC<45_CF	0.6	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.4
	ESCC<45_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ESCC < 45 Total	**1.2**	**1.6**	**1.8**	**1.9**	**2.1**	**2.2**	**2.3**	**2.5**	**2.6**	**2.8**
	ESCC_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESCC < 150 Total	**1.2**	**1.7**	**1.8**	**2.0**	**2.1**	**2.3**	**2.4**	**2.6**	**2.7**	**2.9**
	ESCCi<45_VF	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.4	0.4	0.4
	ESCCi<45_CF	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ESCCi<45_VSD-VF	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.6	0.6
	ESCCi < 45 Total	**0.5**	**0.7**	**0.7**	**0.8**	**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.1**
	ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	**0.5**	**0.7**	**0.7**	**0.8**	**0.9**	**0.9**	**1.0**	**1.0**	**1.1**	**1.1**
	MSSB<6"_VF	0.5	0.6	0.7	0.7	0.7	0.6	0.7	0.7	0.7	0.8
	MSSB<6"_CF	2.6	3.6	3.8	4.2	4.5	4.7	5.0	5.4	5.7	6.0
	MSSB<6"_VSD-VF	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	MSSB <6" Total	**3.2**	**4.5**	**4.8**	**5.2**	**5.6**	**5.9**	**6.3**	**6.7**	**7.1**	**7.5**
	MS-V<25bar_VF	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	MS-V<25bar_CF	0.4	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.9	0.9
	MS-V<25bar_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	MS_V <25 bar Total	**0.8**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.6**	**1.7**	**1.8**	**1.9**
	WP Water pumps	**6**	**9**	**9**	**10**	**11**	**11**	**12**	**13**	**14**	**15**
	Total WE Welding Equipment	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	TOTAL INDUSTRY COMPONENTS	7.3	10.5	11.4	12.4	13.3	14.1	14.9	15.7	16.6	17.5
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in bn euro 2020)	**34**	**60**	**66**	**71**	**75**	**79**	**83**	**87**	**92**	**96**

SUMMARY

Maintenance ECO incl. VAT (bn euro 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	6	9	9	9	9	9	9	9	10	10
SPACE HEATING	14	21	22	23	24	24	25	25	25	26
SPACE COOLING	1	5	6	7	9	10	11	12	13	14
VENTILATION	1	2	2	2	3	3	4	4	5	6
LIGHTING	2	4	4	5	6	6	7	8	9	10
ELECTRONICS	1	6	8	9	9	9	9	8	8	8
FOOD PRESERVATION	1	1	1	1	1	1	1	2	2	2
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	1	2	2	2	2	2	3	3	3	3
INDUSTRY COMPONENTS	7	10	11	12	13	14	15	16	17	17
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euro 2020	34	60	66	71	75	79	83	87	92	96

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0
Total in bn euros, incl. energy Sector	34	60	66	71	75	79	83	87	92	96

Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for ECO Maintenance Cost (sector definitions and order as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

ECO Maint Cost (summary RESIDENTIAL, bn eur	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4.5	6.5	6.5	6.5	6.4	6.5	6.7	7.0	7.2	7.5
SPACE HEATING	10.1	14.6	14.9	15.1	15.0	15.0	15.0	14.9	15.0	15.1
SPACE & HT PROCESS COOLING	0.1	0.8	0.8	0.7	0.8	0.8	0.9	1.0	1.1	1.2
VENTILATION (from electricity)	0.1	0.4	0.5	0.6	0.9	1.3	1.7	2.1	2.6	3.0
LIGHTING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ELECTRONICS	0.3	0.8	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2
FOOD PRESERVATION	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
COOKING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CLEANING	0.8	1.4	1.5	1.8	2.0	2.2	2.4	2.5	2.6	2.6
INDUSTRY COMPONENTS	1.2	1.7	1.8	2.0	2.1	2.2	2.4	2.5	2.7	2.9
ECO Maint Cost, Residential, in bn euros	17.1	26.2	27.2	27.8	28.3	29.2	30.3	31.3	32.4	33.6

CONSUMABLE RESOURCES prices incl. VAT in 2020 euros	**unit**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
IE Imaging equipment											
IE, Images printed per year by stock											
share printed B&W by colour devices		*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*	*35%*
inkjet (IJ) images printed, all types	bn ipy	33	61	40	28	21	18	16	15	14	13
EP/Laser images printed, black/white	bn ipy	562	603	459	319	226	189	168	152	138	127
EP/Laser images printed, colour	bn ipy	0	168	182	159	125	115	110	106	103	102
IE Total images printed	**bn ipy**	**595**	**832**	**682**	**505**	**372**	**322**	**295**	**273**	**256**	**242**
IJ share of images in total		*5.6%*	*7.4%*	*5.9%*	*5.5%*	*5.6%*	*5.6%*	*5.5%*	*5.5%*	*5.5%*	*5.5%*
IE, Paper											
share N print (all scenarios)		*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*	*15%*
share duplexing print, BAU		*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*	*65%*
share duplexing print, ECO		*65%*	*69%*	*80%*	*85%*	*85%*	*85%*	*85%*	*85%*	*85%*	*85%*
duplexing is addressed in VA and impact assessment											
EU IE paper sheets per year, BAU	bn A4	372	520	426	315	232	201	184	171	160	151
EU IE paper sheets per year, ECO	bn A4	372	503	377	269	198	171	157	145	136	129
A4 sheets per kg paper (all scenarios)		*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*	*200*
EU IE Paper weight, BAU	Mt/a	1.9	2.6	2.1	1.6	1.2	1.0	0.9	0.9	0.8	0.8
EU IE Paper weight, ECO	Mt/a	1.9	2.5	1.9	1.3	1.0	0.9	0.8	0.7	0.7	0.6
EU IE Paper weight, SAVE	Mt/a	0.0	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
Paper cost per sheet	*€/sheet*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*	*0.014*
EU IE Paper cost, BAU	bn€	5.1	7.1	5.8	4.3	3.2	2.7	2.5	2.3	2.2	2.1
EU IE Paper cost, ECO	bn€	5.1	6.9	5.1	3.7	2.7	2.3	2.1	2.0	1.9	1.8
EU IE Paper cost, SAVE	bn€	0.0	0.2	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3
Paper Primary Energy content (40 MJ/kg)	*kWh/kg*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*	*11.1*
EU IE Paper Primary Energy, BAU	TWh	20.6	28.9	23.6	17.5	12.9	11.2	10.2	9.5	8.9	8.4
EU IE Paper Primary Energy, ECO	TWh	20.6	28.0	21.0	14.9	11.0	9.5	8.7	8.1	7.6	7.1
EU IE Paper Primary Energy, SAVE	TWh	0.0	0.9	2.7	2.6	1.9	1.7	1.5	1.4	1.3	1.2
Paper GHG emission (kgCO2eq/kg)	*kgCO2/kg*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*	*0.6*
EU IE Paper GHG emission, BAU	MtCO2eq	1.1	1.6	1.3	0.9	0.7	0.6	0.6	0.5	0.5	0.5
EU IE Paper GHG emission, ECO	MtCO2eq	1.1	1.5	1.1	0.8	0.6	0.5	0.5	0.4	0.4	0.4
EU IE Paper GHG emission, SAVE	MtCO2eq	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
IE, Ink and Toner											
Masses per image are intended to be net quantities of ink/toner used for printing an image											
Ink use per IJ image B&W or Colour (net)	*mg/image*	*70*	*70*	*70*	*70*	*70*	*70*	*70*	*70*	*70*	*70*
Toner use per EP image B&W (net)	*mg/image*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*	*20*
Toner use per EP image Colour (net)	*mg/image*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*	*30*
EU IE totals reported below consider the N-printing reported above and include additional ink/toner not used for the image, e.g. remaining in the discarded cartridge											
Additional IJ Ink (not used for image)		*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*	*20%*
Additional EP Toner (not used for image)		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
EU IE Ink use by IJ, B&W or colour	kt/a	2.6	4.8	3.1	2.1	1.6	1.4	1.3	1.2	1.1	1.0
EU IE Toner use by EP for B&W	kt/a	10.9	11.7	8.9	6.2	4.4	3.7	3.3	3.0	2.7	2.5
EU IE Toner use by EP for Colour	kt/a	0.0	4.9	5.3	4.6	3.7	3.3	3.2	3.1	3.0	3.0
IE Total ink/toner use (gross)	**kt/a**	**13.5**	**21.4**	**17.3**	**13.0**	**9.7**	**8.4**	**7.8**	**7.2**	**6.8**	**6.5**
IJ share of ink/toner		*19%*	*22%*	*18%*	*17%*	*17%*	*17%*	*16%*	*16%*	*16%*	*16%*
Sales Ink cartridges (avg. 16.6 g ink)	000 units	42481	78533	50944	35156	26554	22824	20801	19196	17913	16880
Sales Ink containers (avg. 11.1 g ink)	000 units	169926	314131	203778	140625	106217	91294	83203	76784	71653	67519
Sales Toner cartridges (avg. 166 g toner)	000 units	54797	83943	71748	54417	40414	35293	32581	30398	28643	27279
Sales Toner containers (avg. 130 g toner)	000 units	13699	20986	17937	13604	10103	8823	8145	7599	7161	6820
Ink cartridge / container price, BAU	*€/unit*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*
Ink cartridge / container price, ECO	*€/unit*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*	*18*
Toner cartridge / container price, BAU	*€/unit*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*
Toner cartridge / container price, ECO	*€/unit*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*	*116*
EU IE Ink/Toner cost, BAU	bn€	11.9	19.4	15.1	11.1	8.3	7.2	6.6	6.2	5.8	5.5
EU IE Ink/Toner cost, ECO	bn€	11.9	19.4	15.1	11.1	8.3	7.2	6.6	6.2	5.8	5.5
EU IE Ink/Toner cost, SAVE	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ink cost per IJ image	*€/image*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*	*0.117*
Toner cost per EP image	*€/image*	*0.014*	*0.016*	*0.016*	*0.017*	*0.017*	*0.017*	*0.017*	*0.017*	*0.017*	*0.017*
Overall cost per image	*€/image*	*0.020*	*0.023*	*0.022*	*0.022*	*0.022*	*0.022*	*0.022*	*0.023*	*0.023*	*0.023*
Data below for primary energy content and GHG emissions are for the ink and toner itself. Cartridge or container 'housing' not included.											
Ink/Toner Prim. Energy content (50 MJ/kg)	*kWh/kg*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*	*13.9*
EU IE Ink/Toner Primary Energy, BAU	TWh	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
EU IE Ink/Toner Primary Energy, ECO	TWh	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
EU IE Ink/Toner Primary Energy, SAVE	TWh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ink/Toner GHG emission (kgCO2eq/kg)	*kgCO2/kg*	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2	2.2
EU IE Ink/Toner GHG emission, BAU	MtCO2eq	0.03	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01
EU IE Ink/Toner GHG emission, ECO	MtCO2eq	0.03	0.05	0.04	0.03	0.02	0.02	0.02	0.02	0.01	0.01
EU IE Ink/Toner GHG emission, SAVE	MtCO2eq	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
IE consumable costs (paper, ink, toner)											
BAU	bn€	17	26	21	15	11	10	9	9	8	8
ECO	bn€	17	26	20	15	11	10	9	8	8	7
SAVE (BAU-ECO)	bn€	0.0	0.2	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3

CONSUMABLE RESOURCES, continued	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
IE indirect primary energy (paper, ink, toner)											
BAU	TWh	21	29	24	18	13	11	10	10	9	8
ECO	TWh	21	28	21	15	11	10	9	8	8	7
SAVE (BAU-ECO)	TWh	0.0	0.9	2.7	2.6	1.9	1.7	1.5	1.4	1.3	1.2
IE indirect GHG emissions (paper, ink, toner)											
BAU	MtCO2eq	1.1	1.6	1.3	1.0	0.7	0.6	0.6	0.5	0.5	0.5
ECO	MtCO2eq	1.1	1.6	1.2	0.8	0.6	0.5	0.5	0.5	0.4	0.4
SAVE (BAU-ECO)	MtCO2eq	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
WM Household Washing Machine (water is addressed in legislation; detergent costs are added to complete the economics)											
WM detergent (€ 0.17/cycle)	bn€	4.0	4.8	5.0	5.0	5.1	5.1	5.1	5.1	5.1	5.1
WD detergent (€ 0.17/cycle)	bn€	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
BAU water consumption											
WM Water stock average ltr./cycle	ltr/cyc	94	75	75	75	75	75	75	75	75	75
WM Water stock average m³/a per unit	m³/a	22	14	13	13	13	13	13	13	13	13
WM Water stock total M m³/a	M m³/a	2196	2133	2189	2187	2227	2257	2249	2236	2236	2236
WM Water costs	bn€	7.0	8.4	9.5	9.6	10.1	10.7	11.2	11.8	12.4	13.0
WD Water stock average ltr./cycle	ltr/cyc	130	122	122	122	122	122	122	122	122	122
WD Water stock average m³/a per unit	m³/a	29	27	27	27	27	27	27	27	27	27
WD Water stock total M m³/a	M m³/a	127	168	178	185	190	192	193	194	195	196
WD Water costs	bn€	0.4	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1	1.1
ECO water consumption											
WM Water stock average ltr./cycle	ltr/cyc	94	49	41	36	32	30	30	30	30	30
WM Water stock average m³/a per unit	m³/a	22	9	7	6	6	5	5	5	5	5
WM Water stock total M m³/a	M m³/a	2196	1397	1211	1051	956	912	909	904	904	904
WM Water costs	bn€	7.0	5.5	5.2	4.6	4.3	4.3	4.5	4.7	5.0	5.2
WD Water stock average ltr./cycle	ltr/cyc	130	106	91	73	51	47	46	46	46	46
WD Water stock average m³/a per unit	m³/a	29	23	20	16	11	10	10	10	10	10
WD Water stock total M m³/a	M m³/a	127	146	132	110	79	73	73	74	74	74
WD Water costs	bn€	0.4	0.6	0.6	0.5	0.4	0.3	0.4	0.4	0.4	0.4
WM-WD water consumption											
BAU	M m³/a	2323	2301	2367	2373	2416	2449	2442	2430	2431	2432
ECO	M m³/a	2323	1543	1343	1161	1035	986	982	977	978	978
SAVE (BAU-ECO)	M m³/a	0	758	1024	1212	1381	1464	1460	1453	1454	1454
WM-WD detergent & water costs											
BAU	bn€	12	14	15	16	16	17	18	18	19	19
ECO	bn€	12	11	11	10	10	10	10	10	11	11
SAVE (BAU-ECO)	bn€	0.0	3.0	4.4	5.3	6.3	7.0	7.3	7.6	8.0	8.4
DW Household Dishwasher (water is addressed in legislation; detergent costs are added to complete the economics)											
DW detergent (€ 0.10/cycle)	bn€	0.7	1.5	1.8	2.2	2.5	2.8	3.2	3.5	3.8	4.1
BAU water consumption											
Water stock average ltr./cycle	ltr/cyc	30	24	24	24	24	24	24	24	24	24
Water stock average m³/a per unit	m³/a	6.7	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3	5.3
Water stock total M m³/a	M m³/a	201	359	431	510	588	665	740	815	890	965
Water costs	bn€	0.6	1.4	1.9	2.2	2.7	3.2	3.7	4.3	4.9	5.6
ECO water consumption											
Water stock average ltr./cycle	ltr/cyc	30	15	12	10	9	9	9	9	9	9
Water stock average m³/a per unit	m³/a	6.7	3.2	2.6	2.2	2.0	1.9	1.9	1.9	1.9	1.9
Water stock total M m³/a	M m³/a	201	217	210	214	224	244	272	299	327	354
Water costs	bn€	0.6	0.9	0.9	0.9	1.0	1.2	1.4	1.6	1.8	2.1
DW water consumption											
BAU	M m³/a	201	359	431	510	588	665	740	815	890	965
ECO	M m³/a	201	217	210	214	224	244	272	299	327	354
SAVE (BAU-ECO)	M m³/a	0	141	220	295	364	421	469	516	564	611
DW consumable costs (detergent & water)											
BAU	bn€	1.3	3.0	3.7	4.4	5.2	6.0	6.9	7.8	8.7	9.7
ECO	bn€	1.3	2.4	2.7	3.1	3.5	4.0	4.5	5.0	5.6	6.2
SAVE (BAU-ECO)	bn€	0.0	0.6	1.0	1.3	1.6	2.0	2.3	2.7	3.1	3.5
VC Vacuum Cleaners, Bags and Filters (not regulated, no difference BAU-ECO; costs added to complete the economics)											
VC Total Domestic mains	bn€	1.0	1.5	1.5	1.4	1.2	1.0	0.8	0.6	0.6	0.6
VC Total Commercial mains	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
VC Total in scope of CR 666/2013	**bn€**	**1.1**	**1.8**	**1.8**	**1.6**	**1.5**	**1.3**	**1.0**	**0.9**	**0.9**	**0.9**
VC Cordless - all	bn€	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.7	0.7	0.7
VC Robot - all	bn€	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3
VC Total Domestic mains+cordless+robots	**bn€**	**1.0**	**1.6**	**1.6**	**1.6**	**1.6**	**1.6**	**1.5**	**1.5**	**1.5**	**1.5**
VC Total Commercial mains+cordless+robots	**bn€**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**
Total VC Vacuum Cleaner	**bn€**	**1.1**	**1.8**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**	**1.8**	**1.8**	**1.8**
WE Welding Equipment											
WE, Shielding Gas											
Stock share (TIG, MIG, MAG), BAU (000)	*49%*	*1269*	*1443*	*1481*	*1482*	*1496*	*1512*	*1526*	*1537*	*1549*	*1560*
Stock share (TIG, MIG, MAG), ECO (000)	*49%*	*1269*	*1443*	*1481*	*1482*	*1496*	*1512*	*1526*	*1537*	*1549*	*1560*
Shielding Gas, BAU, 1kg/h (kg/a/unit)	*1*	*440*	*440*	*440*	*440*	*440*	*440*	*440*	*440*	*440*	*440*
Shielding Gas, ECO, -10% (kg/a/unit)	*-10%*	*440*	*440*	*440*	*440*	*418*	*396*	*396*	*396*	*396*	*396*
EU Shielding Gas for WE, BAU	kton/a	558	635	652	652	658	665	671	676	681	686
EU Shielding Gas for WE, ECO	kton/a	558	635	652	652	625	599	604	609	613	618
EU Shielding Gas for WE, SAVE	kton/a	0	0	0	0	33	67	67	68	68	69

CONSUMABLE RESOURCES, continued	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Shielding Gas cost per kg Argon	*€/kg*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*	*2.30*
EU Cost Shielding Gas, BAU	Meuros	1283	1459	1497	1498	1513	1529	1543	1554	1566	1577
EU Cost Shielding Gas, ECO	Meuros	1283	1459	1497	1498	1437	1376	1388	1399	1409	1420
EU Cost Shielding Gas, SAVE	Meuros	0	0	0	0	76	153	154	155	157	158
Argon prim. nrg. 1.44 MJ/kg (=>Wh/kg)	*1.44*	*400*	*400*	*400*	*400*	*400*	*400*	*400*	*400*	*400*	*400*
EU Shielding Gas Prim. Nrg., BAU	TWh/a	0.22	0.25	0.26	0.26	0.26	0.27	0.27	0.27	0.27	0.27
EU Shielding Gas Prim. Nrg., ECO	TWh/a	0.22	0.25	0.26	0.26	0.25	0.24	0.24	0.24	0.25	0.25
EU Shielding Gas Prim. Nrg., SAVE	TWh/a	0.00	0.00	0.00	0.00	0.01	0.03	0.03	0.03	0.03	0.03
Argon GHG emiss. 0.069 kgCO2eq/kgAr	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*	*0.069*
EU Shielding Gas GHG emis., BAU	MtCO2eq	0.04	0.04	0.04	0.04	0.05	0.05	0.05	0.05	0.05	0.05
EU Shielding Gas GHG emis., ECO	MtCO2eq	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04	0.04
EU Shielding Gas GHG emis., SAVE	MtCO2eq	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
WE, Electrodes and Filler wire											
Stock share (all except Plasma), BAU (000)	*96%*	*2502*	*2845*	*2919*	*2922*	*2950*	*2981*	*3009*	*3031*	*3054*	*3076*
Stock share (all except Plasma), ECO (000)	*96%*	*2502*	*2845*	*2919*	*2922*	*2950*	*2981*	*3009*	*3031*	*3054*	*3076*
Wire / Electrodes, BAU (kg/a/unit)	*552*	*552*	*552*	*552*	*552*	*552*	*552*	*552*	*552*	*552*	*552*
Wire / Electrodes, ECO(kg/a/unit)	*-5%*	*552*	*552*	*552*	*552*	*539*	*525*	*525*	*525*	*525*	*525*
EU Wire / Electrodes for WE, BAU	kton/a	1382	1572	1613	1614	1630	1647	1662	1674	1687	1699
EU Wire / Electrodes for WE, ECO	kton/a	1382	1572	1613	1614	1589	1565	1579	1591	1602	1614
EU Wire / Electrodes for WE, SAVE	kton/a	0	0	0	0	41	82	83	84	84	85
Filler wire cost per kg (steel)	*€/kg*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*	*0.44*
EU Cost Wire/Electrode, BAU	Meuros	615	699	718	718	725	733	739	745	751	756
EU Cost Wire/Electrode, ECO	Meuros	615	699	718	718	707	696	702	708	713	718
EU Cost Wire/Electrode, SAVE	Meuros	0	0	0	0	18	37	37	37	38	38
Wire / Electr. prim. nrg. 20 MJ/kg (=>Wh/kg)	*20*	*5556*	*5556*	*5556*	*5556*	*5556*	*5556*	*5556*	*5556*	*5556*	*5556*
EU Wire/Electrode Prim. Nrg., BAU	TWh/a	7.7	8.7	9.0	9.0	9.1	9.1	9.2	9.3	9.4	9.4
EU Wire/Electrode Prim. Nrg., ECO	TWh/a	7.7	8.7	9.0	9.0	8.8	8.7	8.8	8.8	8.9	9.0
EU Wire/Electrode Prim. Nrg., SAVE	TWh/a	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.5	0.5	0.5
Wire/Electr. GHG emiss. 1.5 kgCO2eq/kg St.	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*	*1.5*
EU Wire/Electr. GHG emis., BAU	MtCO2eq	2.1	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5
EU Wire/Electr. GHG emis., ECO	MtCO2eq	2.1	2.4	2.4	2.4	2.4	2.3	2.4	2.4	2.4	2.4
EU Wire/Electr. GHG emis., SAVE	MtCO2eq	0.00	0.00	0.00	0.00	0.06	0.12	0.12	0.13	0.13	0.13
WE consumable costs (gas, wire, electrodes)											
BAU	bn€	1.9	2.2	2.2	2.2	2.2	2.3	2.3	2.3	2.3	2.3
ECO	bn€	1.9	2.2	2.2	2.2	2.1	2.1	2.1	2.1	2.1	2.1
SAVE (BAU-ECO)	bn€	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
WE indirect primary energy (gas, wire, electrodes)											
BAU	TWh/a	7.9	9.0	9.2	9.2	9.3	9.4	9.5	9.6	9.6	9.7
ECO	TWh/a	7.9	9.0	9.2	9.2	9.1	8.9	9.0	9.1	9.1	9.2
SAVE (BAU-ECO)	TWh/a	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.5	0.5	0.5
WE indirect GHG emissions (gas, wire, electrodes)											
BAU	MtCO2eq	2.1	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6
ECO	MtCO2eq	2.1	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5
SAVE (BAU-ECO)	MtCO2eq	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1

SUMMARY USER EXPENSES for CONSUMABLE RESOURCES (incl. VAT, bn euros 2020)

Consumable cost data are included in RUN and EXPENSE data
They are not considered for Business revenues and Jobs

BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS (paper, ink, toner)	17	26	21	15	11	10	9	9	8	8
CLEANING (water, detergents, VC bags)	14	19	21	22	23	25	26	28	29	31
INDUSTRY COMP. (welding gas, wire, electrodes)	2	2	2	2	2	2	2	2	2	2
TOTAL in bn euro 2020	33	48	44	40	37	37	38	39	40	41
ECO										
ELECTRONICS (paper, ink, toner)	17	26	20	15	11	10	9	8	8	7
CLEANING (water, detergents, VC bags)	14	15	16	15	15	16	17	17	18	19
INDUSTRY COMP. (welding gas, wire, electrodes)	2	2	2	2	2	2	2	2	2	2
TOTAL in bn euro 2020	33	44	38	32	29	28	28	28	28	28
SAVE										
ELECTRONICS (paper, ink, toner)	0.0	0.2	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3
CLEANING (water, detergents, VC bags)	0.0	3.6	5.4	6.6	7.9	9.0	9.6	10.3	11.1	12.0
INDUSTRY COMP. (welding gas, wire, electrodes)	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
TOTAL in bn euro 2020	0.0	3.8	6.1	7.2	8.5	9.6	10.2	10.9	11.7	12.5

SUMMARY INDIRECT PRIMARY ENERGY for CONSUMABLE RESOURCES (TWh/a)

Consumable primary energy data are NOT included in NRG data

BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS (paper, ink, toner)	21	29	24	18	13	11	10	10	9	8
INDUSTRY COMP. (welding gas, wire, electrodes)	8	9	9	9	9	9	10	10	10	10
TOTAL in TWh/a	29	38	33	27	22	21	20	19	19	18
ECO										
ELECTRONICS (paper, ink, toner)	21	28	21	15	11	10	9	8	8	7
INDUSTRY COMP. (welding gas, wire, electrodes)	8	9	9	9	9	9	9	9	9	9
TOTAL in TWh/a	29	37	30	24	20	19	18	17	17	16
SAVE										
ELECTRONICS (paper, ink, toner)	0.0	0.9	2.7	2.6	1.9	1.7	1.5	1.4	1.3	1.2
INDUSTRY COMP. (welding gas, wire, electrodes)	0.0	0.0	0.0	0.0	0.2	0.5	0.5	0.5	0.5	0.5
TOTAL in TWh/a	0.0	0.9	2.7	2.6	2.2	2.1	2.0	1.9	1.8	1.7

SUMMARY GHG EMISSIONS for CONSUMABLE RESOURCES (MtCO2eq/a)

Consumable GHG emission data are NOT included in EMISS data

BAU		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS (paper, ink, toner)		**1.1**	**1.6**	**1.3**	**1.0**	**0.7**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**
INDUSTRY COMP. (welding gas, wire, electrodes)		2.1	2.4	2.5	2.5	2.5	2.5	2.5	2.6	2.6	2.6
TOTAL in MtCO2eq/a		**3.3**	**4.0**	**3.8**	**3.4**	**3.2**	**3.1**	**3.1**	**3.1**	**3.1**	**3.1**
ECO											
ELECTRONICS (paper, ink, toner)		**1.1**	**1.6**	**1.2**	**0.8**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**
INDUSTRY COMP. (welding gas, wire, electrodes)		2.1	2.4	2.5	2.5	2.4	2.4	2.4	2.4	2.4	2.5
TOTAL in MtCO2eq/a		**3.3**	**4.0**	**3.6**	**3.3**	**3.0**	**2.9**	**2.9**	**2.9**	**2.9**	**2.9**
SAVE											
ELECTRONICS (paper, ink, toner)		**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
INDUSTRY COMP. (welding gas, wire, electrodes)		0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL in MtCO2eq/a		**0.0**	**0.0**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**

Sector subdivision for BAU and ECO Resources		**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Imaging Equipment, Paper Cost											
BAU, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Tertiary	bn€	4.5	6.2	5.1	3.8	2.8	2.4	2.2	2.1	1.9	1.8
BAU, Residential	bn€	0.6	0.9	0.7	0.5	0.4	0.3	0.3	0.3	0.2	0.2
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Tertiary	bn€	4.5	6.0	4.6	3.2	2.4	2.1	1.9	1.8	1.6	1.6
ECO, Residential	bn€	0.6	0.8	0.6	0.4	0.3	0.3	0.2	0.2	0.2	0.2
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Imaging Equipment, Ink & Toner Cost											
BAU, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Tertiary	bn€	9.2	14.7	11.8	8.8	6.5	5.7	5.3	4.9	4.6	4.4
BAU, Residential	bn€	2.7	4.7	3.3	2.3	1.8	1.5	1.4	1.3	1.2	1.1
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Tertiary	bn€	9.2	14.7	11.8	8.8	6.5	5.7	5.3	4.9	4.6	4.4
ECO, Residential	bn€	2.7	4.7	3.3	2.3	1.8	1.5	1.4	1.3	1.2	1.1
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Washing Machines, Detergent Cost											
BAU and ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU and ECO, Tertiary	bn€	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
BAU and ECO, Residential	bn€	4.0	4.9	5.1	5.1	5.2	5.2	5.2	5.2	5.2	5.2
BAU and ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Washing Machines, Water Cost											
BAU, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Tertiary	bn€	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
BAU, Residential	bn€	7.2	8.8	9.9	10.1	10.6	11.3	11.8	12.4	13.0	13.7
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Tertiary	bn€	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
ECO, Residential	bn€	7.2	5.9	5.6	4.9	4.5	4.5	4.8	5.0	5.2	5.5
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dish Washers, Detergent Cost											
BAU and ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU and ECO, Tertiary	bn€	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
BAU and ECO, Residential	bn€	0.6	1.4	1.7	2.0	2.3	2.6	2.9	3.2	3.5	3.8
BAU and ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dish Washers, Water Cost											
BAU, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Tertiary	bn€	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4
BAU, Residential	bn€	0.6	1.3	1.7	2.1	2.5	2.9	3.4	4.0	4.6	5.2
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Tertiary	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
ECO, Residential	bn€	0.6	0.8	0.9	0.9	1.0	1.1	1.3	1.5	1.8	2.0
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Vacuum Cleaner, Bags Cost											
BAU and ECO, Industry	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU and ECO, Tertiary	bn€	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
BAU and ECO, Residential	bn€	1.0	1.6	1.6	1.6	1.6	1.6	1.5	1.5	1.5	1.5
BAU and ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

Sector subdivision for BAU and ECO Resources		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Welding Equipment, Shielding Gas Cost											
BAU, Industry	bn€	1.3	1.5	1.5	1.5	1.5	1.5	1.5	1.6	1.6	1.6
BAU, Tertiary	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Residential	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	1.3	1.5	1.5	1.5	1.4	1.4	1.4	1.4	1.4	1.4
ECO, Tertiary	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Residential	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Welding Equipment, Electrode/filler Cost											
BAU, Industry	bn€	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8
BAU, Tertiary	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Residential	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Industry	bn€	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.7
ECO, Tertiary	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Residential	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO, Other sectors	bn€	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

db	BAU Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	1	2	2	2	2	2	2	2	2	2
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	2	3	3	3	3	3	3	3	3	4
	ESWH Electric Storage > 30 L (primary)	13	16	17	18	18	19	20	21	23	24
	GIWH Gas Instant. < 13 L/min (secondary)	2	2	2	1	1	1	1	1	1	1
	GIWH Gas Instant. ≥ 13 L/min (primary)	1	1	1	1	1	1	1	1	1	1
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	1	2	1	1	1	1	0	0	0	0
	Dedicated WH Heat Pump	0	0	0	1	1	1	2	3	3	4
	Dedicated WH Solar (3.5 m2)	0	2	2	3	3	3	2	3	3	3
	WH dedicated Water Heater	**21**	**27**	**28**	**28**	**29**	**31**	**33**	**35**	**37**	**39**
	CHB Gas Combi Instant. WH	4	11	12	9	11	12	13	14	14	14
	CHB Gas + Cyl. WH	2	5	5	4	4	5	5	5	5	5
	CHB Jet Burner Gas + Cyl. WH	1	1	1	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	4	6	4	3	3	2	2	2	2	2
	CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	0	0
	CHB Electric HP + Cyl. WH	0	0	1	1	1	1	1	2	2	2
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**11**	**23**	**23**	**17**	**20**	**21**	**23**	**24**	**25**	**25**
	TOTAL WATER HEATING	**32**	**49**	**51**	**46**	**48**	**53**	**55**	**58**	**61**	**64**
	CHB Gas non-condensing	45	67	59	33	29	28	25	23	20	17
	CHB Gas condensing	0	22	36	35	50	59	62	64	65	65
	CHB Gas Jet burner non-condensing	5	4	4	2	1	1	1	0	0	0
	CHB Gas Jet burner condensing	0	0	0	0	0	1	1	1	1	1
	CHB Oil Jet burner non-condensing	51	60	40	24	21	13	8	7	6	6
	CHB Oil Jet burner condensing	0	1	2	2	4	6	7	8	9	9
	CHB Electric Joule-effect	3	2	3	3	3	3	3	2	2	2
	CHB Hybrid (gas-electric)	0	0	0	0	0	0	0	0	1	1
	CHB Electric Heat Pump	0	2	3	5	6	7	7	8	9	10
	CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	0
	CHB micro CHP	0	0	0	0	0	0	0	0	0	0
	CHB Solar combi (16 m2)	0	0	1	0	1	1	1	1	1	1
	CHB Central Heating boiler < 400 kW, space heating	**105**	**159**	**146**	**105**	**116**	**119**	**116**	**115**	**114**	**113**
	SFB Wood Manual	11	3	4	2	1	1	1	0	0	0
	SFB Wood Direct Draft	0	1	2	3	3	3	3	4	4	5
	SFB Coal	9	4	2	1	1	1	1	1	0	0
	SFB Pellets	0	0	1	1	1	2	2	2	2	2
	SFB Wood chips	0	0	1	0	0	0	0	1	1	1
	Total Solid Fuel Boiler	**19**	**9**	**9**	**8**	**7**	**7**	**6**	**7**	**8**	**9**
	CHAE-S (≤ 400 kW)	0.8	2.3	2.9	3.4	3.7	3.9	4.1	4.3	4.4	4.6
	CHAE-L (> 400 kW)	0.9	1.9	2.3	2.6	2.7	2.6	2.5	2.4	2.3	2.2
	CHWE-S (≤ 400 kW)	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
	CHWE-L (> 1500 kW)	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.3	0.3
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	HT PCH-AE-S	3.3	4.6	5.4	6.3	6.9	7.3	7.4	7.5	7.6	7.7
	HT PCH-AE-L	3.2	4.4	5.1	6.0	6.5	6.9	6.9	7.0	7.1	7.3
	HT PCH-WE-S	0.7	1.0	1.1	1.3	1.4	1.5	1.5	1.6	1.6	1.6
	HT PCH-WE-M	1.4	2.0	2.3	2.8	3.0	3.2	3.2	3.3	3.3	3.4
	HT PCH-WE-L	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7
	AC rooftop	0.6	1.4	1.5	1.5	1.2	0.8	0.4	0.2	0.1	0.1
	AC splits	0.9	2.6	2.8	3.0	2.9	2.8	2.5	2.3	2.1	2.0
	AC VRF	0.0	1.4	2.3	3.5	4.6	6.0	7.3	8.4	9.4	10.2
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Cooling	**12**	**23**	**27**	**32**	**35**	**37**	**38**	**39**	**40**	**41**
	AC rooftop (rev)	0.7	1.9	2.1	2.0	1.7	1.1	0.5	0.2	0.0	0.0
	AC splits (rev)	1.3	3.9	4.3	4.7	4.6	4.4	3.9	3.5	3.2	2.9
	AC VRF (rev)	0.0	2.0	3.1	4.7	6.2	7.9	9.2	9.9	10.4	10.6
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	AHF	7.8	8.2	7.1	4.6	4.9	5.1	4.8	4.5	4.1	3.7
	AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.1
	SubTotal AHC Air Heating	**10**	**16**	**17**	**16**	**18**	**19**	**19**	**18**	**18**	**17**
	Total AHC Air Heating & Cooling	**22**	**38**	**42**	**45**	**49**	**51**	**51**	**52**	**52**	**52**

db	BAU Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.6	0.9	1.3	1.1	1.1	1.2	1.2	1.2	1.3	1.3
	LH closed fireplace/inset	0.6	1.6	2.8	2.5	2.8	3.1	3.3	3.4	3.5	3.5
	LH wood stove	1.3	1.4	2.1	1.6	1.7	1.8	1.8	1.9	1.9	2.0
	LH coal stove	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH cooker	0.4	0.7	1.1	1.1	1.2	1.3	1.3	1.4	1.4	1.4
	LH SHR stove	0.6	0.8	1.3	1.1	1.2	1.4	1.6	1.7	1.8	1.9
	LH pellet stove	0.0	0.5	0.7	0.9	1.0	1.1	1.2	1.2	1.3	1.3
	LH Solid fuel sum	**4**	**6**	**9**	**9**	**9**	**10**	**11**	**11**	**11**	**12**
	LH Electric portable	4.7	3.6	3.7	4.0	4.0	3.9	3.6	3.5	3.3	3.3
	LH Electric fixed > 250W	25.1	18.6	18.0	17.2	15.1	13.9	13.0	12.3	11.8	11.5
	LH Electric fixed ≤ 250W	1.7	1.3	1.2	1.2	1.0	0.9	0.9	0.8	0.8	0.8
	LH Electric storage	1.4	1.1	1.1	1.1	1.1	1.0	0.9	0.9	0.9	0.8
	LH Electric underfloor	4.3	3.5	3.6	3.9	3.9	3.9	3.8	3.6	3.4	3.3
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.4	1.6	1.8	1.9	1.8	1.7	1.6	1.6	1.5	1.5
	LH Electric sum	**39**	**30**	**30**	**30**	**27**	**26**	**24**	**23**	**22**	**21**
	LH Gas luminous (commercial)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0
	LH Gas closed front	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0					
	LH Gaseous fuel sum	**1.1**	**0.9**	**0.8**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0					
	LH Liquid fuel sum	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**44**	**38**	**40**	**39**	**37**	**36**	**35**	**34**	**34**	**33**
	RAC fixed < 6 kW, cooling	0.4	3.5	3.2	2.7	2.7	3.1	3.3	3.6	4.0	4.6
	RAC fixed 6-12 kW, cooling	0.2	1.6	1.7	1.5	1.5	1.6	1.6	1.7	1.8	2.0
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode	**0.7**	**5.3**	**5.1**	**4.4**	**4.5**	**4.9**	**5.1**	**5.5**	**6.1**	**6.8**
	RAC fixed < 6 kW, reversible, heating	0.2	3.6	4.3	4.7	5.9	7.6	9.0	10.7	12.5	14.1
	RAC fixed 6-12 kW, reversible, heating	0.1	1.7	2.3	2.7	3.3	4.0	4.5	5.1	5.7	6.2
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.2**	**5.3**	**6.7**	**7.3**	**9.1**	**11.6**	**13.5**	**15.8**	**18.2**	**20.3**
	RAC Room Air Conditioner	**1**	**11**	**12**	**12**	**14**	**16**	**19**	**21**	**24**	**27**
1	CIRC Integrated circulators	2.7	3.2	3.5	4.0	4.3	4.5	4.5	4.3	4.1	4.0
0.38	CIRC Large standalone circulators	1.6	2.0	1.9	1.9	1.8	1.7	1.5	1.4	1.3	1.3
0.38	CIRC Small standalone circulators	1.4	1.6	1.5	1.5	1.5	1.4	1.2	1.1	1.1	1.1
	CIRC Circulator pumps <2.5 kW, all	**5.7**	**6.8**	**6.9**	**7.4**	**7.5**	**7.6**	**7.1**	**6.8**	**6.5**	**6.3**
	CIRC Circulator pumps <2.5 kW, excl. double	**1.9**	**2.2**	**2.1**	**2.1**	**2.0**	**1.9**	**1.7**	**1.5**	**1.5**	**1.4**
	TOTAL SPACE HEATING	**181**	**229**	**222**	**178**	**189**	**194**	**191**	**192**	**193**	**194**
	TOTAL SPACE COOLING	**13**	**29**	**33**	**37**	**39**	**42**	**43**	**44**	**46**	**48**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.1	0.1	0.3	0.7	1.1	1.5	1.9	2.4
	R-UVU 100-250 m3/h	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.7
	R-UVU 250-1000 m3/h	0.6	1.2	1.3	1.5	1.7	1.8	1.8	1.9	1.9	1.9
	R-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.5	1.0	1.4	2.0	2.5	3.1
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	RVU, Total residential	**0.7**	**1.6**	**1.9**	**2.3**	**3.0**	**4.1**	**5.2**	**6.3**	**7.4**	**8.6**
	NR-UVU 250-1000 m3/h	0.2	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	NR-BVU 250-1000 m3/h	0.0	0.2	0.3	0.3	0.4	0.5	0.6	0.7	0.8	0.9
	NR-UVU > 1000 m3/h	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	NR-BVU 1000-2500 m3/h	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6
	NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.7	1.0	1.2	1.4	1.6	1.8	2.0	2.2
	NR-AHU-M 5500-14500 m3/h	3.4	4.1	4.3	4.6	4.8	5.2	5.4	5.6	5.9	6.2
	NR-AHU-L > 14500 m3/h	1.0	1.2	1.3	1.4	1.4	1.5	1.6	1.7	1.8	1.8
	NRVU, Total non-residential	**4.8**	**6.7**	**7.3**	**8.2**	**8.8**	**9.8**	**10.4**	**11.0**	**11.7**	**12.4**
	VU Ventilation Units, res + non-res.	**5.5**	**8.4**	**9.2**	**10.5**	**11.9**	**13.9**	**15.6**	**17.3**	**19.1**	**21.0**
	TOTAL VENTILATION (VU own electricity & maint)	**5**	**8**	**9**	**11**	**12**	**14**	**16**	**17**	**19**	**21**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	-	-	-	-	-	-	-	-	-	-

db BAU Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.3	18.3	23.0	28.6	29.4	26.3	20.4	16.0	12.5	10.0
HID (HPM, HPS, MH)	5.1	9.9	11.1	12.6	11.1	7.7	4.1	2.2	1.2	0.7
CFLni (all shapes)	0.6	2.2	2.5	2.7	2.5	1.8	0.9	0.4	0.2	0.1
CFLi (retrofit for GLS, HL)	0.2	2.6	3.6	3.9	3.5	2.9	1.9	1.2	0.8	0.5
GLS (DLS & NDLS)	15.9	11.0	8.5	6.8	4.1	2.5	1.5	0.9	0.5	0.3
HL (DLS & NDLS, LV & MV)	1.3	6.5	8.9	11.5	8.6	4.5	2.4	1.3	0.7	0.4
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.1	1.4	4.5	9.4	14.2	18.6	23.0	27.9
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	1.2	3.8	7.0	9.5	11.6	13.6	16.0
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.5	1.3	2.0	2.5	2.9	3.4
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.6	1.1	1.4	1.7	2.0	2.2
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.8	2.5	4.3	5.9	7.3	8.5	9.6
Standby (nrgcost only)	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
TOTAL LIGHTING (incl. standby)	**36**	**51**	**58**	**70**	**71**	**69**	**64**	**64**	**66**	**71**
DP TV total all types	5.9	11.5	13.8	16.5	16.1	19.0	18.8	17.6	17.0	17.5
DP Monitor	0.2	2.2	1.4	1.1	1.1	1.0	0.9	0.7	0.7	0.7
DP Signage	0.0	0.2	1.4	3.7	4.7	4.7	4.3	4.1	3.9	3.9
DP Electronic Displays, total	**6.0**	**13.9**	**16.7**	**21.3**	**21.9**	**24.8**	**24.0**	**22.5**	**21.7**	**22.1**
SSTB	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (all covered modes)	0.0	1.4	3.4	3.7	3.6	3.5	3.3	3.3	3.3	3.4
Total STB set top boxes (Complex & Simple)	**0.0**	**1.8**	**3.6**	**3.7**	**3.6**	**3.5**	**3.3**	**3.3**	**3.3**	**3.4**
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.8	1.1	1.1	1.2	1.2	1.2	1.2	1.2
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Game consoles, active modes	0.0	0.5	0.9	1.2	1.2	1.2	1.2	1.2	1.2	1.2
Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Total Game consoles > 20 W, all modes	0.0	0.7	1.2	1.6	1.6	1.7	1.6	1.6	1.6	1.7
Total Game consoles < 20 W, all modes	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total Game consoles, all modes	**0.0**	**0.9**	**1.4**	**1.9**	**1.8**	**1.9**	**1.9**	**1.9**	**1.9**	**1.9**
ES&DS only, without effects on infrastructure										
ES tower 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 1-socket traditional	0.0	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket traditional	0.1	1.9	1.1	0.7	0.9	1.1	1.2	1.2	1.2	1.2
ES rack 2-socket cloud	0.0	1.1	1.8	2.2	2.7	3.3	3.6	3.6	3.6	3.6
ES rack 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
ES rack 4-socket cloud	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.6	0.6
ES rack 2-socket resilient trad.	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
ES rack 2-socket resilient cloud	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 2-socket traditional	0.1	0.9	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.6
ES blade 2-socket cloud	0.0	0.5	0.8	1.1	1.3	1.6	1.7	1.7	1.7	1.8
ES blade 4-socket traditional	0.0	0.1	0.1	0.0	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 4-socket cloud	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
ES total traditional	**0**	**4**	**2**	**2**	**2**	**2**	**3**	**3**	**3**	**3**
ES total cloud	**0**	**2**	**3**	**4**	**5**	**6**	**6**	**6**	**6**	**6**
ES Enterprise Servers total	**0**	**6**	**5**	**6**	**7**	**8**	**9**	**9**	**9**	**9**
DS Online 2	0.1	0.8	1.2	1.9	2.4	3.0	3.2	3.2	3.2	3.2
DS Online 3	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.5
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.7	1.7	1.7	1.7	1.8
DS Data Storage products total	**0**	**1**	**2**	**3**	**4**	**5**	**5**	**5**	**5**	**5**
ES + DS total (excl. infrastructure)	**0**	**7**	**7**	**9**	**11**	**13**	**14**	**14**	**14**	**14**
PC Desktop	3.2	3.5	2.5	1.7	2.0	2.3	2.2	2.1	2.0	1.9
PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
PC Notebook	0.0	1.2	1.5	1.3	1.5	1.6	1.6	1.7	1.7	1.6
PC Tablet/slate	0.0	0.0	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3
PC Thin client	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Workstation	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3
Total PC, electricity	**3.4**	**5.2**	**4.8**	**3.9**	**4.3**	**4.8**	**4.8**	**4.8**	**4.6**	**4.5**
Inkjet Printer	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inkjet MFD	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
EP / Laser Printer mono	2.0	1.0	0.9	0.7	0.6	0.5	0.4	0.3	0.2	0.1
EP / Laser Printer colour	0.0	0.9	1.4	2.1	2.4	2.6	2.7	2.8	2.9	2.9
EP / Laser Copier mono	2.0	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser Copier colour	0.0	0.1	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser MFD mono	0.0	1.6	2.2	2.5	2.4	2.3	2.2	2.1	2.0	1.9
EP / Laser MFD colour	0.0	3.3	4.6	5.2	5.0	4.8	4.5	4.3	4.1	3.9
Consumables, paper, ink, toner	16.9	26.5	20.9	15.4	11.5	10.0	9.2	8.5	8.0	7.6
Total IE Imaging Equipment	**21**	**34**	**31**	**26**	**22**	**20**	**19**	**18**	**17**	**17**

db	BAU Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.4	1.0	1.0	0.9	0.8	0.8	0.7	0.6	0.5	0.5
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
	SB Audio speakers (wired) (sb & off modes)	0.4	0.5	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.7	1.1	1.1	1.1	1.1	1.1	1.2
	SB Small appliances (sb & off modes)	0.3	1.2	1.3	1.5	1.6	1.7	1.7	1.7	1.7	1.8
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	SB Media players and recorders (sb mode)	0.0	0.6	0.8	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.6	0.6	0.6	0.6	0.5	0.5	0.4	0.4
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.7	0.7
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.6	0.7	0.8	0.9	0.9	0.9	0.9	1.0
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.4	0.7	1.0	1.2	1.2	1.2	1.2
	SB Coffee makers (off mode)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.3	0.4	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	*0.2*	*0.2*	*0.3*	*0.3*	*0.3*	*0.3*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.5	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3
1	SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2
1	SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
1	SB IE Inkjet Printers (nsb mode)	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Printers (nsb mode)	1.1	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5
1	SB IE Laser Copiers (nsb mode)	1.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.5	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7
	Total (networked) SB (incl. double)	4	9	12	13	13	14	14	14	14	14
	Total (networked) SB (excl. double)	**1**	**5**	**6**	**6**	**7**	**7**	**8**	**8**	**8**	**8**
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
0.6	EPS 10–12 W	0.0	1.2	2.0	2.4	2.4	2.4	2.3	2.2	2.1	2.1
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	EPS, total	**0.0**	**2.1**	**3.0**	**3.3**	**3.3**	**3.3**	**3.2**	**3.0**	**2.9**	**2.9**
	EPS, double counted subtracted	**0.0**	**1.1**	**1.5**	**1.7**	**1.7**	**1.7**	**1.6**	**1.5**	**1.5**	**1.4**
	TOTAL ELECTRONICS	**33**	**69**	**72**	**74**	**73**	**78**	**77**	**74**	**72**	**72**
	Total RF household Refrigerators & Freezers	**24**	**20**	**21**	**23**	**25**	**26**	**25**	**25**	**25**	**26**
	CF open vertical chilled multi deck (RVC2)	2.6	2.2	2.2	2.3	2.3	2.4	2.3	2.3	2.4	2.4
	CF open horizontal frozen island (RHF4)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF other supermarket display (non-BCs)	4.8	4.3	4.5	5.0	5.2	5.6	5.7	5.9	6.0	6.2
	CF Plug in one door beverage cooler	2.8	2.6	2.7	2.8	2.9	3.0	3.0	3.1	3.2	3.3
	CF Plug in horizontal ice cream freezer	0.7	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.8	0.8
	CF Spiral vending machine	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**12**	**10**	**11**	**11**	**12**	**12**	**12**	**13**	**13**	**13**
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	PF Storage cabinets All types	**0.9**	**1.1**	**1.3**	**1.5**	**1.7**	**1.8**	**1.9**	**2.0**	**2.1**	**2.2**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC MT L > 300 kW	0.4	0.6	0.7	0.9	1.0	1.2	1.3	1.4	1.5	1.7
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.8	0.9	1.1	1.3	1.4	1.5	1.7	1.8
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8
	PF Process Chiller All MT&LT	**2**	**4**	**4**	**5**	**6**	**7**	**7**	**8**	**9**	**9**

db	BAU Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.9	0.7	0.7	0.8	0.9	1.1	1.1	1.2	1.3	1.4
	PF Condensing Unit MT M 1-5 kW	2.4	1.7	1.8	2.1	2.4	2.7	2.9	3.1	3.3	3.6
	PF Condensing Unit MT L 5-20 kW	3.0	2.1	2.2	2.6	2.9	3.3	3.5	3.8	4.1	4.4
	PF Condensing Unit MT XL 20-50 kW	2.9	2.1	2.2	2.6	2.9	3.3	3.5	3.7	4.0	4.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Condensing Unit LT L 2-8 kW	0.7	0.5	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.1
	PF Condensing Unit LT XL 8-20 kW	2.3	1.7	1.7	2.0	2.3	2.5	2.7	2.9	3.1	3.4
0.6	**PF Condensing Unit, All MT&LT**	**13**	**9**	**10**	**11**	**13**	**14**	**15**	**16**	**18**	**19**
	PF Professional Refrigeration, Total	**8**	**9**	**9**	**11**	**12**	**14**	**15**	**16**	**18**	**19**
	TOTAL FOOD PRESERVATION	**44**	**39**	**41**	**46**	**49**	**52**	**53**	**54**	**56**	**58**
	CA Electric Hobs (sum all modes)	4.1	5.4	6.3	7.6	8.5	9.4	9.8	10.3	10.8	11.4
	CA Electric Ovens (sum all modes)	4.5	4.3	4.5	4.9	5.0	5.4	5.5	5.6	5.6	5.8
	CA Gas Hobs	1.5	1.8	1.9	1.2	1.5	1.6	1.6	1.6	1.5	1.5
	CA Gas Ovens	0.6	0.6	0.6	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	CA Range Hoods	1.9	2.0	2.2	2.5	2.8	3.0	3.2	3.3	3.5	3.7
	TOTAL COOKING	**13**	**14**	**15**	**17**	**18**	**20**	**21**	**21**	**22**	**23**
	WM Washing Machines	21	20	22	22	22	23	23	23	23	23
	WD Washer-Dryers	2	2	3	3	3	3	3	3	3	3
	Total WM-WD household Washing	**23**	**23**	**24**	**25**	**25**	**26**	**26**	**26**	**26**	**26**
	including detergent and water costs	*12*	*14*	*15*	*16*	*16*	*17*	*18*	*18*	*19*	*19*
	Total DW household Dishwasher	**4**	**6**	**8**	**10**	**11**	**13**	**14**	**16**	**17**	**19**
	including detergent and water costs	*1*	*3*	*4*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	LD condensing heat pump	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4
	LD condensing electric heat element	0.3	1.7	1.8	2.0	2.2	2.3	2.2	2.1	2.0	1.9
	LD vented electric	1.5	1.3	1.2	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	1.8	3.0	3.0	3.1	3.2	3.4	3.4	3.3	3.3	3.3
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	VC Cylinder Domestic mains	1.9	2.5	3.3	3.7	3.5	3.1	2.3	1.7	1.6	1.6
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.4	0.4	0.4
	VC Total Domestic mains	**2.0**	**2.6**	**3.4**	**3.8**	**3.7**	**3.3**	**2.6**	**2.2**	**2.0**	**2.0**
	VC Cylinder Commercial mains	0.3	1.0	1.2	1.3	1.5	1.6	1.7	1.7	1.7	1.7
	VC Upright Commercial mains	0.1	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	VC Total Commercial mains	**0.4**	**1.1**	**1.3**	**1.5**	**1.6**	**1.8**	**1.8**	**1.9**	**1.9**	**1.9**
	VC Total in scope of CR 666/2013	**2.3**	**3.7**	**4.7**	**5.3**	**5.3**	**5.1**	**4.5**	**4.1**	**3.9**	**3.9**
	VC Cordless - domestic - cleaning	0.0	0.1	0.1	0.4	0.8	1.2	1.6	1.8	1.9	2.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.6
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**2.0**	**2.7**	**3.7**	**4.6**	**5.1**	**5.5**	**5.4**	**5.4**	**5.4**	**5.5**
	VC Total Commercial mains+cordless+robots	**0.4**	**1.1**	**1.3**	**1.5**	**1.7**	**1.9**	**2.0**	**2.0**	**2.0**	**2.0**
	VC Total All mains+cordless+robots	**2.3**	**3.9**	**5.0**	**6.1**	**6.8**	**7.4**	**7.4**	**7.4**	**7.5**	**7.6**
	Total VC Vacuum Cleaner incl. bags and filters	**3.5**	**5.7**	**6.9**	**8.0**	**8.7**	**9.3**	**9.3**	**9.3**	**9.3**	**9.4**
	including costs of bags & filters	*1.1*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
	TOTAL CLEANING	**32**	**38**	**42**	**45**	**48**	**51**	**52**	**54**	**56**	**58**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.8	7.0	8.7	10.7	12.3	13.6	13.7	13.7	13.7	13.9
0.5	FAN Axial>300Pa	4.8	12.6	15.3	18.0	19.6	20.9	20.9	20.9	20.9	21.2
0.5	FAN Centr.FC	1.3	2.4	3.1	3.8	4.3	4.7	4.8	4.8	4.8	4.8
0.5	FAN Centr.BC-free	3.1	5.7	7.1	8.7	10.0	11.4	12.0	12.3	12.6	13.0
0.5	FAN Centr.BC	3.2	6.5	8.3	10.1	11.6	13.3	14.2	15.3	16.6	18.2
0.5	FAN Cross-flow	0.2	0.4	0.4	0.6	0.7	0.8	0.8	0.9	0.9	1.0
	Total FAN, industrial (excl. box & roof fans)	**8**	**17**	**21**	**26**	**29**	**32**	**33**	**34**	**35**	**36**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.3	13.9	14.9	15.8	16.5	16.7	16.1	15.5	14.6	13.6
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20.5	22.1	23.6	25.2	26.2	26.4	25.1	23.6	21.6	19.5
0.45	Medium (L) 3-ph 75-375 kW no VSD	40.9	43.1	45.2	47.8	49.2	48.6	44.2	38.9	33.8	30.7
0.45	**Total 3ph 0.75-375 kW no VSD**	**75**	**79**	**84**	**89**	**92**	**92**	**85**	**78**	**70**	**64**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.9	1.7	2.1	2.6	3.2	3.9	4.5	5.3	6.1	7.2
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.7	3.4	4.3	5.4	6.7	8.2	9.6	11.3	13.2	15.5
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.7	9.6	12.1	15.4	19.4	24.0	28.1	33.2	37.9	41.7
0.45	**Total 3-ph 0.75-375 kW with VSD**	**7**	**15**	**18**	**23**	**29**	**36**	**42**	**50**	**57**	**64**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**82**	**94**	**102**	**112**	**121**	**128**	**128**	**128**	**127**	**128**

db	BAU Running costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.4	1.5	1.6	1.7	1.8	1.9	1.9	1.9	1.9	1.9
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4
0.45	**Total Small 3-ph 0.12-0.75 kW**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
0.45	Large 3-ph LV 375-1000 kW no VSD	20.9	20.9	20.4	20.0	19.6	19.5	19.1	19.1	19.0	19.0
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	4.7	7.1	10.1	13.1	15.5	16.5	17.4	18.2	19.3
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**26**	**28**	**30**	**33**	**35**	**36**	**36**	**37**	**38**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.3	1.4	1.6	1.7	1.9	1.9	1.9	2.0	2.1
0.45	Explosion motors (L) 3-ph 75-375 kW	2.0	2.5	2.7	3.1	3.4	3.7	3.8	3.9	4.0	4.1
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**7**	**7**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.7	0.9	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.4
0.45	Brake motors (L) 3-ph 75-375 kW	1.0	1.3	1.4	1.5	1.7	1.9	1.9	2.0	2.0	2.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**2**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	8-pole motors (L) 3-ph 75-375 kW	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**5**	**6**	**7**	**7**	**8**	**9**	**9**	**9**	**9**	**9**
	MT Elec. Motors LV 0.12-1000 kW	**65**	**74**	**81**	**89**	**96**	**102**	**102**	**103**	**104**	**105**
	ESOB<45_VF	3.0	3.3	3.7	4.2	4.6	4.9	5.1	5.5	5.8	6.2
	ESOB<45_CF	2.0	2.4	2.6	3.1	3.4	3.7	3.9	4.2	4.4	4.7
	ESOB<45_VSD-VF	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6
	ESOB < 45 Total	**5.1**	**5.9**	**6.5**	**7.6**	**8.4**	**9.1**	**9.6**	**10.2**	**10.8**	**11.6**
	ESOB_45-150_VF	0.9	1.0	1.1	1.3	1.4	1.5	1.5	1.6	1.7	1.8
	ESOB_45-150_CF	1.6	1.8	2.0	2.4	2.6	2.9	3.1	3.3	3.5	3.7
	ESOB_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	ESOB 45-150 Total	**2.6**	**2.9**	**3.3**	**3.8**	**4.2**	**4.6**	**4.9**	**5.2**	**5.5**	**5.9**
	ESOB < 150 Total	**7.6**	**8.8**	**9.7**	**11.4**	**12.6**	**13.8**	**14.5**	**15.4**	**16.4**	**17.5**
	ESCC<45_VF	2.8	3.3	3.6	4.1	4.3	4.6	4.8	5.1	5.4	5.8
	ESCC<45_CF	2.1	2.6	2.8	3.2	3.6	3.9	4.1	4.4	4.6	4.9
	ESCC<45_VSD-VF	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.8	0.9
	ESCC < 45 Total	**5.1**	**6.1**	**6.7**	**7.7**	**8.4**	**9.1**	**9.6**	**10.3**	**10.9**	**11.6**
	ESCC_45-150_VF	0.9	0.9	1.0	1.2	1.3	1.4	1.4	1.5	1.6	1.7
	ESCC_45-150_CF	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.4
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCC 45-150 Total	**1.5**	**1.7**	**1.9**	**2.2**	**2.4**	**2.7**	**2.8**	**3.0**	**3.2**	**3.4**
	ESCC < 150 Total	**6.6**	**7.7**	**8.5**	**9.9**	**10.9**	**11.8**	**12.4**	**13.2**	**14.0**	**15.0**
	ESCCi<45_VF	1.5	1.6	1.7	1.8	1.6	1.5	1.5	1.6	1.6	1.8
	ESCCi<45_CF	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	ESCCi<45_VSD-VF	0.3	0.4	0.5	0.7	1.1	1.3	1.5	1.6	1.7	1.8
	ESCCi < 45 Total	**1.9**	**2.2**	**2.4**	**2.7**	**2.9**	**3.1**	**3.2**	**3.4**	**3.7**	**3.9**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**
	ESCCi < 150 Total	**2.2**	**2.5**	**2.8**	**3.1**	**3.3**	**3.5**	**3.7**	**3.9**	**4.2**	**4.4**
	MSSB<6"_VF	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.4
	MSSB<6"_CF	4.8	6.1	6.6	7.5	8.2	8.8	9.3	9.9	10.5	11.2
	MSSB<6"_VSD-VF	0.2	0.3	0.4	0.5	0.6	0.8	0.9	0.9	1.0	1.0
	MSSB <6" Total	**5.9**	**7.5**	**8.1**	**9.1**	**9.9**	**10.7**	**11.3**	**12.0**	**12.8**	**13.6**
	MS-V<25bar_VF	2.1	2.3	2.5	2.8	2.9	3.0	3.1	3.3	3.5	3.8
	MS-V<25bar_CF	1.5	1.8	1.9	2.2	2.5	2.7	2.8	3.0	3.2	3.4
	MS-V<25bar_VSD-VF	0.2	0.3	0.3	0.4	0.6	0.8	0.9	0.9	1.0	1.1
	MS_V <25 bar Total	**3.7**	**4.4**	**4.8**	**5.5**	**6.0**	**6.5**	**6.9**	**7.3**	**7.8**	**8.3**
	WP Water pumps	**26**	**31**	**34**	**39**	**43**	**46**	**49**	**52**	**55**	**59**
	Total WE Welding Equipment	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL INDUSTRY COMPONENTS	**101**	**126**	**139**	**157**	**171**	**184**	**187**	**192**	**197**	**203**

db	BAU Running costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	1.3	1.8	1.9	2.1	2.5	2.8	3.1	3.4	3.6	3.9
	TRAFO Industry oil	1.0	1.4	1.5	1.6	1.9	2.1	2.3	2.5	2.7	2.9
	TRAFO Industry dry	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9
	TRAFO Power	3.8	4.7	5.1	5.6	6.5	7.4	8.0	8.7	9.4	10.1
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.4	0.6	0.9	1.3	1.8
	TRAFO DER dry	0.0	0.2	0.3	0.5	0.9	1.6	2.6	4.0	5.7	7.7
	TRAFO Small	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total TRAFO Utility Transformers	**7**	**9**	**10**	**11**	**13**	**15**	**18**	**21**	**24**	**28**
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Tyres C1, replacement for cars	39	41	37	32	40	43	45	48	50	52
	Tyres C1, OEM for cars	12	12	11	10	12	13	14	14	15	16
	Tyres C1, total	**51**	**53**	**48**	**42**	**52**	**56**	**59**	**62**	**65**	**68**
	Tyres C2, replacement for vans	8	11	10	10	13	15	16	17	17	18
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	4	4	4
	Tyres C2, total	**10**	**13**	**12**	**12**	**15**	**18**	**19**	**20**	**21**	**22**
	Tyres C3, replacement for trucks/busses	12	14	13	15	19	23	26	29	31	34
	Tyres C3, OEM for trucks/busses	3	3	3	3	4	5	6	6	7	8
	Tyres C3, total	**15**	**18**	**16**	**18**	**24**	**29**	**32**	**35**	**38**	**42**
	Tyres, total C1+C2+C3	**75**	**84**	**76**	**71**	**91**	**102**	**111**	**117**	**124**	**132**
	TRANSPORT SECTOR	**75**	**84**	**76**	**71**	**91**	**102**	**111**	**117**	**124**	**132**
	GENERAL TOTAL (in bn euros 2020)	**565**	**735**	**758**	**750**	**810**	**858**	**869**	**888**	**912**	**944**

	BAU Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**32**	**49**	**51**	**46**	**48**	**53**	**55**	**58**	**61**	**64**
	SPACE HEATING	**181**	**229**	**222**	**178**	**189**	**194**	**191**	**192**	**193**	**194**
	SPACE COOLING	**13**	**29**	**33**	**37**	**39**	**42**	**43**	**44**	**46**	**48**
	VENTILATION (elec. & maint.)	**5**	**8**	**9**	**11**	**12**	**14**	**16**	**17**	**19**	**21**
1	***VENTILATION (from heat saving vs. BAU; already included in COST for space heating)***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
	LIGHTING	**36**	**51**	**58**	**70**	**71**	**69**	**64**	**64**	**66**	**71**
	ELECTRONICS	**33**	**69**	**72**	**74**	**73**	**78**	**77**	**74**	**72**	**72**
	FOOD PRESERVATION	**44**	**39**	**41**	**46**	**49**	**52**	**53**	**54**	**56**	**58**
	COOKING	**13**	**14**	**15**	**17**	**18**	**20**	**21**	**21**	**22**	**23**
	CLEANING	**32**	**38**	**42**	**45**	**48**	**51**	**52**	**54**	**56**	**58**
	INDUSTRY COMPONENTS	**101**	**126**	**139**	**157**	**171**	**184**	**187**	**192**	**197**	**203**
	ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**75**	**84**	**76**	**71**	**91**	**102**	**111**	**117**	**124**	**132**
	TOTAL in bn euros 2020	**565**	**735**	**758**	**750**	**810**	**858**	**869**	**888**	**912**	**944**

db **ECO Running costs (in bn euros 2020)**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	1	2	1	1	1	1	1	2	2	2
EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L (secondary)	2	3	3	3	3	3	3	3	3	4
ESWH Electric Storage > 30 L (primary)	13	16	17	17	17	18	18	20	21	22
GIWH Gas Instant. < 13 L/min (secondary)	2	2	2	1	1	1	1	1	1	1
GIWH Gas Instant. ≥ 13 L/min (primary)	1	1	1	0	0	0	0	0	0	0
GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	1	2	1	1	0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	1	1	1	2	2	2
Dedicated WH Solar (3.5 m2)	0	2	2	2	2	2	2	2	2	2
WH dedicated Water Heater	**21**	**27**	**28**	**27**	**26**	**28**	**29**	**31**	**33**	**35**
CHB Gas Combi Instant. WH	4	11	12	9	10	10	10	10	9	8
CHB Gas + Cyl. WH	2	5	5	3	3	4	3	3	3	3
CHB Jet Burner Gas + Cyl. WH	1	1	1	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	4	6	4	3	2	2	2	2	2	2
CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	1	1
CHB Electric HP + Cyl. WH	0	0	1	1	1	2	3	4	5	6
CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	**11**	**23**	**23**	**16**	**18**	**19**	**19**	**20**	**21**	**21**
TOTAL WATER HEATING	**32**	**49**	**50**	**43**	**44**	**46**	**48**	**51**	**54**	**57**
CHB Gas non-condensing	45	67	56	26	15	8	3	2	1	1
CHB Gas condensing	0	22	34	36	51	59	59	55	50	44
CHB Gas Jet burner non-condensing	5	4	3	2	1	1	0	0	0	0
CHB Gas Jet burner condensing	0	0	0	0	0	1	1	1	1	1
CHB Oil Jet burner non-condensing	51	59	39	23	18	9	3	2	1	1
CHB Oil Jet burner condensing	0	1	2	3	5	8	9	10	11	11
CHB Electric Joule-effect	3	2	2	3	3	3	3	2	2	2
CHB Hybrid (gas-electric)	0	0	0	0	0	1	1	2	3	3
CHB Electric Heat Pump	0	2	3	4	6	9	12	16	19	23
CHB Gas Heat Pump	0	0	0	0	0	0	0	0	1	1
CHB micro CHP	0	0	0	0	0	0	0	0	0	1
CHB Solar combi (16 m2)	0	0	1	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating	**105**	**158**	**141**	**98**	**101**	**99**	**93**	**91**	**89**	**87**
SFB Wood Manual	11	3	4	2	1	1	0	0	0	0
SFB Wood Direct Draft	0	1	2	3	3	3	3	3	4	5
SFB Coal	9	4	2	1	1	1	0	0	0	0
SFB Pellets	0	0	1	1	1	2	2	2	2	2
SFB Wood chips	0	0	1	0	0	0	0	0	1	1
Total Solid Fuel Boiler	**19**	**9**	**9**	**8**	**7**	**6**	**6**	**6**	**7**	**8**
CHAE-S (≤ 400 kW)	0.8	2.3	2.9	3.4	3.6	3.8	3.9	4.1	4.3	4.5
CHAE-L (> 400 kW)	0.9	1.9	2.3	2.6	2.6	2.5	2.3	2.2	2.1	2.1
CHWE-S (≤ 400 kW)	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.5	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6
CHWE-L (> 1500 kW)	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.3
CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
HT PCH-AE-S	3.3	4.6	5.4	6.2	6.5	6.7	6.7	6.9	7.0	7.3
HT PCH-AE-L	3.2	4.4	5.1	5.8	6.0	6.1	6.0	6.0	6.2	6.4
HT PCH-WE-S	0.7	1.0	1.1	1.3	1.4	1.5	1.5	1.5	1.6	1.6
HT PCH-WE-M	1.4	2.0	2.3	2.7	2.9	3.1	3.1	3.2	3.3	3.4
HT PCH-WE-L	0.3	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.7
AC rooftop	0.6	1.4	1.5	1.5	1.2	0.8	0.4	0.2	0.1	0.1
AC splits	0.9	2.6	2.8	2.9	2.8	2.6	2.4	2.2	2.0	1.9
AC VRF	0.0	1.4	2.3	3.5	4.5	5.9	7.1	8.2	9.2	10.0
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SubTotal AHC Air Cooling	**12**	**23**	**27**	**32**	**33**	**35**	**35**	**37**	**38**	**39**
AC rooftop (rev)	0.7	1.9	2.1	1.9	1.5	0.9	0.4	0.1	0.0	0.0
AC splits (rev)	1.3	3.9	4.3	4.5	4.2	3.9	3.4	3.1	2.9	2.6
AC VRF (rev)	0.0	2.0	3.1	4.7	6.0	7.5	8.6	9.3	9.8	10.1
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
AHF	7.8	8.2	7.1	4.4	4.3	4.1	3.7	3.4	3.2	2.9
AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
SubTotal AHC Air Heating	**10**	**16**	**17**	**16**	**16**	**17**	**16**	**16**	**16**	**16**
Total AHC Air Heating & Cooling	**22**	**38**	**42**	**44**	**46**	**47**	**47**	**47**	**48**	**49**

db	ECO Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.6	0.9	1.3	1.1	1.0	1.0	1.0	0.9	0.9	1.0
	LH closed fireplace/inset	0.6	1.6	2.8	2.5	2.7	2.8	2.9	3.0	3.0	3.1
	LH wood stove	1.3	1.4	2.1	1.6	1.6	1.6	1.6	1.7	1.7	1.7
	LH coal stove	0.6	0.5	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH cooker	0.4	0.7	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.3
	LH SHR stove	0.6	0.8	1.3	1.1	1.2	1.4	1.5	1.7	1.8	1.9
	LH pellet stove	0.0	0.5	0.7	0.9	1.0	1.1	1.1	1.2	1.2	1.3
	LH Solid fuel sum	**4**	**6**	**9**	**8**	**9**	**9**	**10**	**10**	**10**	**10**
	LH Electric portable	4.7	3.6	3.6	3.6	3.3	3.2	3.1	2.9	2.8	2.7
	LH Electric fixed > 250W	25.1	18.6	17.8	16.5	13.9	12.2	11.3	10.8	10.4	10.1
	LH Electric fixed ≤ 250W	1.7	1.3	1.2	1.1	0.9	0.8	0.8	0.7	0.7	0.7
	LH Electric storage	1.4	1.1	1.1	1.0	0.9	0.8	0.7	0.7	0.7	0.7
	LH Electric underfloor	4.3	3.5	3.6	3.8	3.8	3.8	3.6	3.4	3.3	3.2
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.4	1.6	1.8	1.9	1.8	1.7	1.6	1.5	1.5	1.4
	LH Electric sum	**39**	**30**	**30**	**28**	**25**	**23**	**21**	**20**	**20**	**19**
	LH Gas luminous (commercial)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	LH Gas closed front	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0.6	0.5	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**1.1**	**0.9**	**0.8**	**0.5**	**0.5**	**0.4**	**0.4**	**0.3**	**0.3**	**0.3**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**44**	**38**	**40**	**37**	**34**	**33**	**31**	**31**	**30**	**30**
	RAC fixed < 6 kW, cooling	0.4	2.8	2.4	1.9	2.0	2.3	2.5	2.8	3.1	3.5
	RAC fixed 6-12 kW, cooling	0.2	1.2	1.1	0.9	1.0	1.1	1.2	1.3	1.4	1.5
	RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	RAC < 12 kW total, cooling mode	**0.7**	**4.2**	**3.7**	**3.0**	**3.1**	**3.6**	**3.9**	**4.3**	**4.7**	**5.2**
	RAC fixed < 6 kW, reversible, heating	0.2	3.0	3.3	3.4	4.4	6.0	7.4	9.2	10.8	12.3
	RAC fixed 6-12 kW, reversible, heating	0.1	1.3	1.6	1.7	2.2	2.8	3.4	4.0	4.6	5.1
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.2**	**4.3**	**4.9**	**5.1**	**6.6**	**8.8**	**10.8**	**13.2**	**15.4**	**17.4**
	RAC Room Air Conditioner	**1**	**8**	**9**	**8**	**10**	**12**	**15**	**17**	**20**	**23**
1	CIRC Integrated circulators	2.7	3.2	3.1	2.7	2.5	2.7	2.8	2.8	2.8	2.9
0.38	CIRC Large standalone circulators	1.6	2.0	1.7	1.3	1.2	1.1	1.0	1.0	1.0	1.0
0.38	CIRC Small standalone circulators	1.4	1.6	1.3	0.9	0.8	0.7	0.7	0.7	0.7	0.7
	CIRC Circulator pumps <2.5 kW, all	**5.7**	**6.8**	**6.1**	**5.0**	**4.5**	**4.6**	**4.5**	**4.5**	**4.5**	**4.6**
	CIRC Circulator pumps <2.5 kW, excl. double	**1.9**	**2.2**	**1.9**	**1.4**	**1.2**	**1.2**	**1.1**	**1.1**	**1.1**	**1.1**
	TOTAL SPACE HEATING	**181**	**227**	**214**	**165**	**167**	**164**	**159**	**159**	**159**	**159**
	TOTAL SPACE COOLING	**13**	**27**	**31**	**35**	**37**	**38**	**39**	**41**	**43**	**45**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.1	0.1	0.3	0.7	1.0	1.4	1.8	2.2
	R-UVU 100-250 m3/h	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6
	R-UVU 250-1000 m3/h	0.6	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4
	R-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.5	0.9	1.3	1.7	2.2	2.7
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	RVU, Total residential	**0.7**	**1.6**	**1.9**	**2.2**	**2.7**	**3.5**	**4.4**	**5.3**	**6.3**	**7.3**
	NR-UVU 250-1000 m3/h	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	NR-BVU 250-1000 m3/h	0.0	0.2	0.3	0.3	0.4	0.5	0.5	0.6	0.7	0.8
	NR-UVU > 1000 m3/h	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	NR-BVU 1000-2500 m3/h	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.8
	NR-AHU-M 5500-14500 m3/h	3.4	4.1	4.3	4.5	4.5	4.7	4.8	5.0	5.2	5.4
	NR-AHU-L > 14500 m3/h	1.0	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5	1.6
	NRVU, Total non-residential	**4.8**	**6.7**	**7.3**	**7.9**	**8.2**	**8.7**	**9.1**	**9.6**	**10.1**	**10.7**
	VU Ventilation Units, res + non-res.	**5.5**	**8.4**	**9.2**	**10.1**	**10.9**	**12.2**	**13.4**	**14.9**	**16.4**	**18.0**
	TOTAL VENTILATION (VU own electricity & maint)	**5**	**8**	**9**	**10**	**11**	**12**	**13**	**15**	**16**	**18**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	**-**	**-**	**-0**	**-1**	**-3**	**-4**	**-5**	**-5**	**-6**	**-6**

db ECO Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.3	18.1	22.2	26.2	22.0	12.8	5.8	2.8	1.6	1.0
HID (HPM, HPS, MH)	5.1	9.7	9.0	8.6	6.6	3.6	1.4	0.5	0.2	0.1
CFLni (all shapes)	0.6	2.2	2.3	2.0	1.4	0.7	0.3	0.1	0.0	0.0
CFLi (retrofit for GLS, HL)	0.2	3.2	4.3	3.6	1.3	0.4	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	15.9	7.5	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	1.3	7.2	9.3	4.3	0.3	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.3	2.1	7.2	14.2	19.2	22.6	25.6	29.2
LED replacing HID (retrofit & luminaire)	0.0	0.0	1.5	3.6	5.8	8.2	9.9	11.6	13.3	15.3
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.1	0.5	1.2	1.8	2.2	2.6	2.9	3.3
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.2	0.8	1.5	1.7	1.8	2.0	2.1	2.3
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.3	2.8	5.6	6.9	7.6	8.3	9.0	9.9
Standby (nrgcost only)	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
TOTAL LIGHTING (incl. standby)	**38**	**50**	**54**	**57**	**55**	**52**	**50**	**52**	**56**	**62**
DP TV total all types	5.9	11.5	12.9	12.9	9.3	9.3	8.4	8.8	9.7	10.8
DP Monitor	0.2	2.2	1.3	0.6	0.6	0.4	0.3	0.3	0.3	0.4
DP Signage	0.0	0.2	1.4	3.7	4.5	3.9	3.0	2.9	3.2	3.7
DP Electronic Displays, total	**6.0**	**13.9**	**15.7**	**17.2**	**14.4**	**13.6**	**11.8**	**12.0**	**13.2**	**14.9**
SSTB	0.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (all covered modes)	0.0	1.4	3.0	2.7	2.6	2.6	2.6	2.6	2.6	2.6
Total STB set top boxes (Complex & Simple)	**0.0**	**1.6**	**3.2**	**2.7**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**	**2.6**
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total Game consoles, active modes	0.0	0.5	0.7	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles, non-active modes	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Total Game consoles > 20 W, all modes	0.0	0.7	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Total Game consoles < 20 W, all modes	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total Game consoles, all modes	**0.0**	**0.8**	**1.2**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**
ES&DS only, without effects on infrastructure										
ES tower 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 1-socket traditional	0.0	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket traditional	0.1	1.9	1.1	0.7	0.8	1.0	1.1	1.1	1.1	1.1
ES rack 2-socket cloud	0.0	1.1	1.8	2.1	2.5	3.2	3.4	3.4	3.4	3.4
ES rack 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
ES rack 4-socket cloud	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.5	0.5
ES rack 2-socket resilient trad.	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 2-socket resilient cloud	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES blade 1-socket traditional	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 2-socket traditional	0.1	0.9	0.5	0.3	0.4	0.5	0.5	0.5	0.5	0.5
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.6	1.7	1.7	1.7	1.7
ES blade 4-socket traditional	0.0	0.1	0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ES blade 4-socket cloud	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
ES total traditional	**0**	**4**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
ES total cloud	**0**	**2**	**3**	**4**	**4**	**5**	**6**	**6**	**6**	**6**
ES Enterprise Servers total	**0**	**6**	**5**	**5**	**6**	**8**	**8**	**8**	**8**	**8**
DS Online 2	0.1	0.8	1.2	1.8	2.4	3.0	3.1	3.1	3.1	3.1
DS Online 3	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.6	1.7	1.7	1.7	1.7
DS Data Storage products total	**0**	**1**	**2**	**3**	**4**	**5**	**5**	**5**	**5**	**5**
ES + DS total (excl. infrastructure)	**0**	**7**	**7**	**8**	**10**	**13**	**14**	**14**	**14**	**14**
PC Desktop	3.2	3.5	2.5	1.7	2.0	2.3	2.2	2.1	2.0	1.9
PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
PC Notebook	0.0	1.2	1.5	1.3	1.5	1.6	1.6	1.7	1.7	1.6
PC Tablet/slate	0.0	0.0	0.4	0.5	0.3	0.3	0.3	0.3	0.3	0.3
PC Thin client	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PC Workstation	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.3
Total PC, electricity	**3.4**	**5.2**	**4.8**	**3.9**	**4.3**	**4.8**	**4.8**	**4.8**	**4.6**	**4.5**
Inkjet Printer	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Inkjet MFD	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EP / Laser Printer mono	2.0	0.9	0.8	0.6	0.5	0.4	0.3	0.2	0.2	0.1
EP / Laser Printer colour	0.0	0.9	1.3	1.8	2.1	2.3	2.4	2.4	2.5	2.5
EP / Laser Copier mono	2.0	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser Copier colour	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser MFD mono	0.0	1.5	2.0	2.1	2.0	1.9	1.8	1.7	1.6	1.6
EP / Laser MFD colour	0.0	3.2	4.4	4.8	4.5	4.3	4.1	3.9	3.7	3.5
Consumables, paper, ink, toner	16.9	26.3	20.2	14.8	11.0	9.6	8.8	8.2	7.7	7.3
Total IE Imaging Equipment	**21**	**33**	**29**	**24**	**20**	**19**	**17**	**17**	**16**	**15**

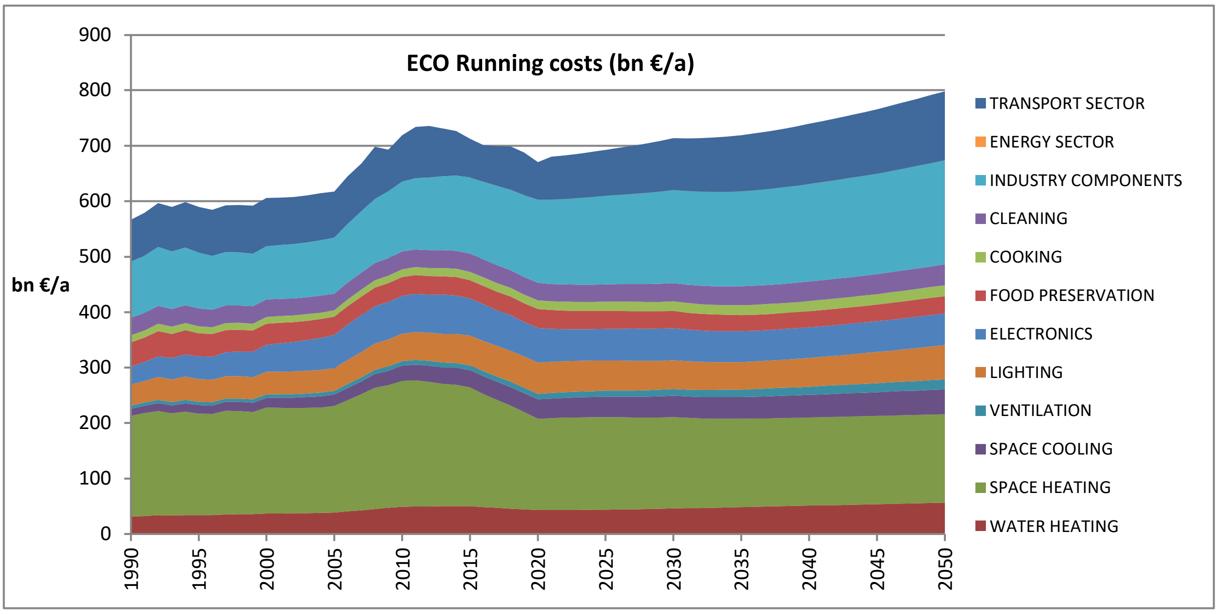
db	ECO Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.4	1.0	0.8	0.6	0.5	0.5	0.5	0.4	0.4	0.3
	SB Electric toothbrushes (off mode)	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SB Audio speakers (wired) (sb & off modes)	0.4	0.4	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.5
	SB Small appliances (sb & off modes)	0.3	1.2	0.9	0.7	0.7	0.8	0.8	0.8	0.8	0.8
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Media players and recorders (sb mode)	0.0	0.5	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.2	0.1	0.2	0.2	0.1	0.1	0.1
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.6	0.6	0.7	0.8	0.8	0.8	0.8	0.8
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.2	0.4	0.5	0.6	0.6	0.6	0.6
	SB Coffee makers (off mode)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.2	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.2
1	SB Electric Hobs (sb mode)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1	SB Game consoles (non-active modes)	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Inkjet Printers (nsb mode)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Laser Printers (nsb mode)	1.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Copiers (nsb mode)	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	Total (networked) SB (incl. double)	4	8	9	7	7	7	7	7	7	7
	Total (networked) SB (excl. double)	**1**	**5**	**4**	**4**	**4**	**4**	**4**	**4**	**4**	**4**
0.0	EPS ≤ 6W, low-V	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.6	EPS 10–12 W	0.0	1.2	1.7	1.7	1.5	1.6	1.6	1.6	1.6	1.7
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EPS, total	**0.0**	**2.0**	**2.5**	**2.3**	**2.1**	**2.2**	**2.2**	**2.2**	**2.2**	**2.3**
	EPS, double counted subtracted	**0.0**	**1.1**	**1.2**	**1.1**	**1.0**	**1.0**	**1.0**	**1.0**	**1.0**	**1.1**
	TOTAL ELECTRONICS	**33**	**68**	**67**	**63**	**57**	**58**	**56**	**56**	**56**	**57**
	Total RF household Refrigerators & Freezers	**24**	**15**	**13**	**12**	**11**	**9**	**8**	**7**	**6**	**6**
	CF open vertical chilled multi deck (RVC2)	2.6	2.2	2.2	2.3	2.1	1.6	1.2	1.2	1.2	1.2
	CF open horizontal frozen island (RHF4)	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	4.8	4.3	4.5	5.0	4.9	4.6	4.2	4.2	4.3	4.5
	CF Plug in one door beverage cooler	2.8	2.6	2.7	2.8	2.4	1.8	1.6	1.6	1.7	1.7
	CF Plug in horizontal ice cream freezer	0.7	0.6	0.6	0.7	0.6	0.5	0.5	0.5	0.5	0.6
	CF Spiral vending machine	0.6	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	Total CF Commercial Refrigeration	**11.8**	**10.3**	**10.5**	**11.2**	**10.4**	**9.0**	**8.0**	**7.9**	**8.1**	**8.3**
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.3	0.2	0.2	0.3	0.3	0.3	0.3
	PF Storage cabinet Frozen Horizontal (FH)	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.2	0.2	0.2
	PF Storage cabinets All types	**0.9**	**1.1**	**1.3**	**1.3**	**1.1**	**1.1**	**1.1**	**1.2**	**1.2**	**1.3**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6
	PF Process Chiller AC MT L > 300 kW	0.4	0.6	0.7	0.9	1.0	1.1	1.2	1.3	1.4	1.5
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.7
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	PF Process Chiller All MT&LT	**2**	**4**	**4**	**5**	**5**	**6**	**7**	**7**	**8**	**9**

db	ECO Running costs (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.9	0.7	0.7	0.8	0.8	1.0	1.0	1.1	1.2	1.3
	PF Condensing Unit MT M 1-5 kW	2.4	1.7	1.8	2.0	2.2	2.5	2.7	2.9	3.1	3.4
	PF Condensing Unit MT L 5-20 kW	3.0	2.1	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.1
	PF Condensing Unit MT XL 20-50 kW	2.9	2.1	2.2	2.5	2.7	3.0	3.2	3.5	3.7	4.1
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
	PF Condensing Unit LT L 2-8 kW	0.7	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9	0.9
	PF Condensing Unit LT XL 8-20 kW	2.3	1.7	1.7	1.9	2.0	2.3	2.5	2.6	2.8	3.1
0.6	**PF Condensing Unit, All MT&LT**	**13**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**18**
	PF Professional Refrigeration, Total	**8**	**9**	**9**	**10**	**11**	**12**	**13**	**15**	**16**	**17**
	TOTAL FOOD PRESERVATION	**44**	**34**	**33**	**34**	**32**	**31**	**29**	**29**	**30**	**31**
	CA Electric Hobs (sum all modes)	4.1	5.4	6.2	7.4	8.2	9.1	9.4	9.9	10.4	11.0
	CA Electric Ovens (sum all modes)	4.5	4.3	4.3	4.3	4.1	4.1	4.0	4.0	4.1	4.2
	CA Gas Hobs	1.5	1.8	1.9	1.2	1.4	1.6	1.6	1.6	1.5	1.4
	CA Gas Ovens	0.6	0.6	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	CA Range Hoods	1.9	2.0	2.2	2.4	2.4	2.4	2.3	2.4	2.5	2.6
	TOTAL COOKING	**13**	**14**	**15**	**16**	**17**	**17**	**18**	**18**	**19**	**20**
	WM Washing Machines	21	16	15	14	14	14	14	14	14	15
	WD Washer-Dryers	2	2	2	2	2	2	2	2	2	2
	Total WM-WD household Washing	**23**	**18**	**17**	**16**	**16**	**16**	**16**	**16**	**16**	**17**
	including detergent and water costs	*12*	*11*	*11*	*10*	*10*	*10*	*10*	*10*	*11*	*11*
	Total DW household Dishwasher	**4**	**5**	**6**	**7**	**8**	**9**	**9**	**10**	**11**	**12**
	including detergent and water costs	*1*	*2*	*3*	*3*	*4*	*4*	*5*	*5*	*6*	*6*
	LD condensing heat pump		0.0	0.2	0.6	0.8	1.0	1.2	1.2	1.2	1.3
	LD condensing electric heat element	0.3	1.7	1.6	1.3	1.1	0.9	0.8	0.7	0.7	0.7
	LD vented electric	1.5	1.3	1.0	0.6	0.4	0.2	0.1	0.0		
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	1.8	3.0	2.8	2.5	2.2	2.1	2.0	1.9	1.9	1.9
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**2**	**3**	**3**	**3**	**2**	**2**	**2**	**2**	**2**	**2**
	VC Cylinder Domestic mains	1.9	2.5	3.1	2.2	1.4	1.2	0.8	0.7	0.6	0.6
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.3	0.3
	VC Total Domestic mains	**2.0**	**2.6**	**3.2**	**2.3**	**1.5**	**1.3**	**1.1**	**0.9**	**0.9**	**0.9**
	VC Cylinder Commercial mains	0.3	1.0	1.0	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	VC Upright Commercial mains	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.4**	**1.1**	**1.2**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**	**0.7**
	VC Total in scope of CR 666/2013	**2.3**	**3.7**	**4.3**	**3.0**	**2.2**	**2.0**	**1.8**	**1.6**	**1.6**	**1.6**
	VC Cordless - domestic - cleaning	0.0	0.1	0.1	0.4	0.8	1.2	1.6	1.8	1.9	2.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.6	0.6	0.6
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**2.0**	**2.7**	**3.5**	**3.1**	**3.0**	**3.5**	**3.9**	**4.1**	**4.3**	**4.4**
	VC Total Commercial mains+cordless+robots	**0.4**	**1.1**	**1.2**	**0.7**	**0.7**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**
	VC Total All mains+cordless+robots	**2.3**	**3.9**	**4.6**	**3.9**	**3.7**	**4.3**	**4.7**	**5.0**	**5.1**	**5.2**
	Total VC Vacuum Cleaner incl. bags and filters	**3.5**	**5.7**	**6.5**	**5.8**	**5.6**	**6.2**	**6.6**	**6.8**	**6.9**	**7.0**
	including costs of bags & filters	*1.1*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
	TOTAL CLEANING	**32**	**32**	**32**	**31**	**31**	**33**	**34**	**35**	**36**	**38**
0.5	FAN Axial<300Pa (all FAN types >125W)	2.8	7.0	8.4	9.7	10.4	11.0	11.0	11.0	11.0	11.1
0.5	FAN Axial>300Pa	4.8	12.6	15.1	16.9	17.4	18.0	17.8	17.8	17.8	18.0
0.5	FAN Centr.FC	1.3	2.4	3.0	3.3	3.4	3.5	3.5	3.5	3.5	3.5
0.5	FAN Centr.BC-free	3.1	5.7	6.9	8.0	8.6	9.7	10.1	10.4	10.6	11.0
0.5	FAN Centr.BC	3.2	6.5	7.9	9.1	9.9	11.1	11.9	12.8	13.9	15.2
0.5	FAN Cross-flow	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	Total FAN, industrial (excl. box & roof fans)	**7.7**	**17.3**	**20.8**	**23.7**	**25.0**	**26.8**	**27.3**	**27.9**	**28.6**	**29.6**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.3	13.9	14.3	13.2	12.2	12.3	12.2	12.2	12.1	12.1
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20.5	22.1	22.7	21.0	18.8	18.6	18.2	18.0	17.5	17.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	40.9	43.1	43.7	41.6	38.2	34.4	32.2	30.6	29.3	29.0
0.45	**Total 3ph 0.75-375 kW no VSD**	**75**	**79**	**81**	**76**	**69**	**65**	**63**	**61**	**59**	**58**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.9	1.7	2.2	3.6	5.1	5.7	6.0	6.4	6.9	7.4
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.7	3.4	4.7	7.8	10.9	12.5	13.2	14.2	15.1	16.1
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.7	9.6	13.0	19.1	25.7	31.9	34.4	37.0	39.3	41.5
0.45	**Total 3-ph 0.75-375 kW with VSD**	**7**	**15**	**20**	**30**	**42**	**50**	**54**	**58**	**61**	**65**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**82**	**94**	**101**	**106**	**111**	**115**	**116**	**118**	**120**	**123**

db	ECO Running costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.2
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.4	1.5	1.6	1.7	1.7	1.7	1.8	1.8	1.8	1.8
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4
0.45	**Total Small 3-ph 0.12-0.75 kW**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
0.45	Large 3-ph LV 375-1000 kW no VSD	20.9	20.9	20.4	20.0	19.6	19.4	19.0	19.0	18.9	18.9
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	4.7	7.1	10.1	13.0	15.3	16.2	17.0	17.9	19.0
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**26**	**28**	**30**	**33**	**35**	**35**	**36**	**37**	**38**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.3	1.4	1.6	1.7	1.8	1.9	1.9	2.0	2.0
0.45	Explosion motors (L) 3-ph 75-375 kW	2.0	2.5	2.7	3.1	3.4	3.6	3.7	3.8	3.9	4.1
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**6**	**7**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.7	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.4
0.45	Brake motors (L) 3-ph 75-375 kW	1.0	1.3	1.4	1.5	1.7	1.8	1.9	1.9	2.0	2.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**2**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	8-pole motors (L) 3-ph 75-375 kW	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**5**	**6**	**7**	**7**	**8**	**8**	**8**	**9**	**9**	**9**
	MT Elec. Motors LV 0.12-1000 kW	**65**	**74**	**80**	**86**	**90**	**94**	**95**	**97**	**99**	**102**
	ESOB<45_VF	3.0	3.3	3.6	4.2	4.5	4.8	5.1	5.4	5.8	6.2
	ESOB<45_CF	2.0	2.4	2.6	3.0	3.3	3.7	3.9	4.1	4.4	4.7
	ESOB<45_VSD-VF	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.6	0.6	0.6
	ESOB < 45 Total	**5.1**	**5.9**	**6.4**	**7.4**	**8.2**	**9.0**	**9.5**	**10.1**	**10.8**	**11.5**
	ESOB_45-150_VF	0.9	1.0	1.1	1.3	1.4	1.4	1.5	1.6	1.7	1.8
	ESOB_45-150_CF	1.6	1.8	2.0	2.3	2.6	2.9	3.0	3.3	3.5	3.7
	ESOB_45-150_VSD-VF	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	ESOB 45-150 Total	**2.6**	**2.9**	**3.2**	**3.8**	**4.2**	**4.6**	**4.9**	**5.2**	**5.5**	**5.9**
	ESOB < 150 Total	**7.6**	**8.8**	**9.7**	**11.2**	**12.4**	**13.6**	**14.3**	**15.3**	**16.3**	**17.4**
	ESCC<45_VF	2.8	3.3	3.6	4.0	4.3	4.5	4.7	5.1	5.4	5.8
	ESCC<45_CF	2.1	2.6	2.8	3.2	3.5	3.8	4.1	4.3	4.6	4.9
	ESCC<45_VSD-VF	0.1	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.8	0.8
	ESCC < 45 Total	**5.1**	**6.1**	**6.6**	**7.6**	**8.3**	**9.0**	**9.5**	**10.2**	**10.8**	**11.6**
	ESCC_45-150_VF	0.9	0.9	1.0	1.2	1.3	1.4	1.4	1.5	1.6	1.7
	ESCC_45-150_CF	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.4
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCC 45-150 Total	**1.5**	**1.7**	**1.9**	**2.2**	**2.4**	**2.6**	**2.8**	**3.0**	**3.2**	**3.4**
	ESCC < 150 Total	**6.6**	**7.7**	**8.5**	**9.7**	**10.7**	**11.7**	**12.3**	**13.1**	**14.0**	**14.9**
	ESCCi<45_VF	1.5	1.6	1.7	1.7	1.6	1.4	1.4	1.5	1.6	1.7
	ESCCi<45_CF	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	ESCCi<45_VSD-VF	0.3	0.4	0.5	0.7	1.0	1.3	1.5	1.6	1.7	1.8
	ESCCi < 45 Total	**1.9**	**2.2**	**2.4**	**2.7**	**2.9**	**3.0**	**3.2**	**3.4**	**3.6**	**3.9**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**
	ESCCi < 150 Total	**2.2**	**2.5**	**2.7**	**3.1**	**3.3**	**3.5**	**3.6**	**3.9**	**4.1**	**4.4**
	MSSB<6"_VF	0.9	1.0	1.1	1.1	1.1	1.1	1.1	1.2	1.3	1.4
	MSSB<6"_CF	4.8	6.1	6.6	7.4	8.0	8.7	9.2	9.8	10.4	11.1
	MSSB<6"_VSD-VF	0.2	0.3	0.4	0.5	0.6	0.8	0.8	0.9	1.0	1.0
	MSSB <6" Total	**5.9**	**7.5**	**8.1**	**9.0**	**9.8**	**10.5**	**11.1**	**11.9**	**12.6**	**13.4**
	MS-V<25bar_VF	2.1	2.3	2.5	2.8	2.9	3.0	3.1	3.3	3.5	3.8
	MS-V<25bar_CF	1.5	1.8	1.9	2.2	2.4	2.6	2.8	3.0	3.2	3.4
	MS-V<25bar_VSD-VF	0.2	0.3	0.3	0.4	0.6	0.8	0.9	0.9	1.0	1.1
	MS_V <25 bar Total	**3.7**	**4.4**	**4.7**	**5.4**	**5.9**	**6.4**	**6.8**	**7.2**	**7.7**	**8.2**
	WP Water pumps	**26**	**31**	**34**	**39**	**42**	**46**	**48**	**51**	**55**	**58**
	Total WE Welding Equipment	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL INDUSTRY COMPONENTS	**101**	**126**	**138**	**151**	**160**	**170**	**174**	**180**	**185**	**193**

db	ECO Running costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	1.3	1.8	1.9	1.9	2.1	2.3	2.4	2.5	2.5	2.6
	TRAFO Industry oil	1.0	1.4	1.4	1.4	1.5	1.5	1.4	1.4	1.5	1.7
	TRAFO Industry dry	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
	TRAFO Power	3.8	4.7	5.1	5.6	6.5	7.4	8.0	8.7	9.4	10.1
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.2	0.4	0.6	0.8	1.1
	TRAFO DER dry	0.0	0.2	0.3	0.5	0.8	1.3	2.0	3.0	4.3	5.8
	TRAFO Small	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total TRAFO Utility Transformers	**6.7**	**8.7**	**9.4**	**10.2**	**11.7**	**13.4**	**15.0**	**17.0**	**19.4**	**22.1**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-3**	**-4**	**-4**	**-5**
	Tyres C1, replacement for cars	39	41	32	29	35	38	40	43	46	49
	Tyres C1, OEM for cars	12	12	11	10	11	12	13	13	14	15
	Tyres C1, total	**51**	**53**	**43**	**39**	**46**	**49**	**53**	**56**	**60**	**64**
	Tyres C2, replacement for vans	8	11	9	9	12	13	15	16	16	17
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	**10**	**13**	**11**	**11**	**14**	**16**	**18**	**19**	**20**	**21**
	Tyres C3, replacement for trucks/busses	12	14	12	14	18	22	25	27	29	32
	Tyres C3, OEM for trucks/busses	3	3	3	3	4	5	6	6	7	7
	Tyres C3, total	**15**	**18**	**15**	**17**	**22**	**27**	**30**	**33**	**36**	**39**
	Tyres, total C1+C2+C3	**75**	**84**	**69**	**68**	**83**	**93**	**101**	**108**	**116**	**124**
	TRANSPORT SECTOR	**75**	**84**	**69**	**68**	**83**	**93**	**101**	**108**	**116**	**124**
	GENERAL TOTAL (in bn euros)	**567**	**719**	**712**	**671**	**693**	**713**	**719**	**739**	**765**	**798**

	ECO Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**32**	**49**	**50**	**43**	**44**	**46**	**48**	**51**	**54**	**57**
	SPACE HEATING	**181**	**227**	**214**	**165**	**167**	**164**	**159**	**159**	**159**	**159**
	SPACE COOLING	**13**	**27**	**31**	**35**	**37**	**38**	**39**	**41**	**43**	**45**
	VENTILATION	**5**	**8**	**9**	**10**	**11**	**12**	**13**	**15**	**16**	**18**
1	*VENTILATION (from heat saving vs. BAU; already included in COST for space heating)*	*0*	*0*	*0*	*-1*	*-3*	*-4*	*-5*	*-5*	*-6*	*-6*
	LIGHTING	**38**	**50**	**54**	**57**	**55**	**52**	**50**	**52**	**56**	**62**
	ELECTRONICS	**33**	**68**	**67**	**63**	**57**	**58**	**56**	**56**	**56**	**57**
	FOOD PRESERVATION	**44**	**34**	**33**	**34**	**32**	**31**	**29**	**29**	**30**	**31**
	COOKING	**13**	**14**	**15**	**16**	**17**	**17**	**18**	**18**	**19**	**20**
	CLEANING	**32**	**32**	**32**	**31**	**31**	**33**	**34**	**35**	**36**	**38**
	INDUSTRY COMPONENTS	**101**	**126**	**138**	**151**	**160**	**170**	**174**	**180**	**185**	**193**
	ENERGY SECTOR	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-3**	**-4**	**-4**	**-5**
	TRANSPORT SECTOR	**75**	**84**	**69**	**68**	**83**	**93**	**101**	**108**	**116**	**124**
	TOTAL in bn euros	**567**	**719**	**712**	**671**	**693**	**713**	**719**	**739**	**765**	**798**



Running costs saving ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	2	4	6	7	7	7	8
SPACE HEATING	0	3	8	13	22	30	32	33	34	35
SPACE COOLING	0	1	1	2	3	4	4	4	3	3
VENTILATION (elec. & maint.)	0	0	0	0	1	2	2	2	3	3
VENTILATION (from heat saving vs. BAU; already included in COST for space heating)	*0*	*0*	*0*	*1*	*3*	*4*	*5*	*5*	*6*	*6*
LIGHTING (incl. SPL, ctrl, sb)	-2	0	4	13	17	17	15	12	10	9
ELECTRONICS	0	1	5	12	16	19	20	18	16	15
FOOD PRESERVATION	0	5	8	12	16	21	24	25	26	27
COOKING	0	0	0	1	2	2	3	3	3	3
CLEANING	0	6	9	14	17	18	19	19	19	20
INDUSTRY COMPONENTS	0	0	2	6	11	14	14	13	11	10
ENERGY SECTOR	0	0	0	1	1	2	3	4	4	5
TRANSPORT SECTOR	0	1	7	4	8	9	10	9	9	8
TOTAL in bn euros	**-2**	**17**	**46**	**80**	**117**	**144**	**151**	**149**	**147**	**146**
Saving in % versus BAU (from 1990=0)	-0.3%	2.3%	6.1%	10.6%	14.5%	16.8%	17.3%	16.8%	16.1%	15.5%
Saving In % versus BAU (from 2010=0)	-3.2%	0.0%	3.9%	8.4%	12.4%	14.9%	15.4%	14.9%	14.3%	13.7%

db BAU Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	2	2	2	2	2	2	2	2	3	3
EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L (secondary)	3	3	3	3	3	3	4	4	4	4
ESWH Electric Storage > 30 L (primary)	15	18	19	20	20	22	23	24	26	27
GIWH Gas Instant. < 13 L/min (secondary)	2	2	2	2	2	2	2	2	2	2
GIWH Gas Instant. ≥ 13 L/min (primary)	1	1	1	1	1	1	1	1	1	1
GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	2	2	2	1	1	1	0	0	0	0
Dedicated WH Heat Pump	0	0	1	1	2	3	3	4	5	6
Dedicated WH Solar (3.5 m2)	1	3	4	4	4	4	4	4	4	4
WH dedicated Water Heater	**26**	**32**	**33**	**34**	**35**	**37**	**40**	**42**	**45**	**48**
CHB Gas Combi Instant. WH	4	12	14	11	12	14	15	15	15	15
CHB Gas + Cyl. WH	3	5	6	4	5	5	6	6	6	6
CHB Jet Burner Gas + Cyl. WH	1	1	1	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	5	6	4	3	3	3	3	3	3	3
CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	0	0
CHB Electric HP + Cyl. WH	0	1	1	2	2	2	3	3	3	4
CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	**14**	**26**	**26**	**21**	**23**	**25**	**27**	**28**	**29**	**30**
TOTAL WATER HEATING	**39**	**58**	**60**	**54**	**58**	**63**	**66**	**70**	**74**	**78**
CHB Gas non-condensing	51	70	62	36	31	30	28	25	22	19
CHB Gas condensing	1	31	43	43	58	68	71	74	75	75
CHB Gas Jet burner non-condensing	6	5	4	2	2	1	1	1	1	0
CHB Gas Jet burner condensing	0	0	0	0	1	1	1	1	1	1
CHB Oil Jet burner non-condensing	61	63	41	25	22	14	9	8	7	6
CHB Oil Jet burner condensing	0	2	3	4	6	8	10	10	11	12
CHB Electric Joule-effect	3	2	3	3	3	3	3	3	2	2
CHB Hybrid (gas-electric)	0	0	0	0	0	0	1	1	1	2
CHB Electric Heat Pump	1	5	6	9	11	12	14	16	18	20
CHB Gas Heat Pump	0	0	0	0	0	0	0	0	1	1
CHB micro CHP	0	0	0	0	0	0	1	1	1	2
CHB Solar combi (16 m2)	1	1	1	1	1	1	1	1	1	1
CHB Central Heating boiler < 400 kW, space heating	**122**	**179**	**164**	**124**	**135**	**140**	**138**	**139**	**141**	**141**
SFB Wood Manual	12	4	4	2	2	1	1	1	0	0
SFB Wood Direct Draft	0	2	4	4	5	5	6	6	8	9
SFB Coal	9	5	2	2	1	1	1	1	1	1
SFB Pellets	0	1	2	2	2	2	2	3	3	3
SFB Wood chips	0	1	1	1	1	1	1	1	1	1
Total Solid Fuel Boiler	**21**	**13**	**13**	**11**	**10**	**10**	**10**	**11**	**13**	**14**
CHAE-S (≤ 400 kW)	1.1	3.8	4.6	5.3	5.7	6.2	6.5	6.9	7.3	7.6
CHAE-L (> 400 kW)	1.0	2.2	2.5	2.9	3.0	3.0	2.8	2.7	2.6	2.6
CHWE-S (≤ 400 kW)	0.1	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7
CHWE-L (> 1500 kW)	0.1	0.4	0.4	0.5	0.5	0.5	0.5	0.4	0.4	0.4
CHF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
HT PCH-AE-S	3.5	4.9	5.7	6.7	7.2	7.7	7.7	7.9	8.0	8.2
HT PCH-AE-L	3.3	4.7	5.4	6.3	6.8	7.2	7.2	7.3	7.4	7.6
HT PCH-WE-S	0.7	1.0	1.2	1.4	1.5	1.6	1.6	1.7	1.7	1.7
HT PCH-WE-M	1.5	2.2	2.6	3.0	3.3	3.5	3.5	3.6	3.6	3.7
HT PCH-WE-L	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
AC rooftop	0.8	2.1	2.2	2.0	1.5	0.9	0.5	0.3	0.2	0.2
AC splits	1.2	3.7	4.0	4.1	4.0	3.8	3.5	3.3	3.1	2.9
AC VRF	0.0	4.3	6.0	8.9	11.4	14.2	16.8	19.1	21.2	22.8
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
SubTotal AHC Air Cooling	**14**	**31**	**36**	**43**	**47**	**50**	**53**	**55**	**58**	**60**
AC rooftop (rev)	0.8	2.4	2.5	2.4	1.9	1.1	0.5	0.2	0.0	0.0
AC splits (rev)	1.5	4.6	5.0	5.4	5.3	5.0	4.5	4.1	3.8	3.5
AC VRF (rev)	0.0	4.4	6.1	9.3	11.7	14.3	16.3	17.5	18.3	18.6
ACF (rev)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
AHF	8.5	8.7	7.6	5.0	5.3	5.5	5.1	4.8	4.4	3.9
AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Air Heating	**11**	**20**	**22**	**22**	**24**	**26**	**27**	**27**	**27**	**26**
Total AHC Air Heating & Cooling	**24**	**46**	**51**	**56**	**61**	**65**	**67**	**68**	**70**	**71**

db	BAU Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	2.1	3.1	3.5	3.3	3.3	3.3	3.4	3.4	3.4	3.5
	LH closed fireplace/inset	1.6	4.2	5.6	5.6	6.0	6.3	6.5	6.6	6.7	6.7
	LH wood stove	2.3	2.6	3.3	3.0	3.0	3.1	3.2	3.3	3.3	3.4
	LH coal stove	0.9	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2
	LH cooker	1.2	2.3	3.0	3.3	3.4	3.6	3.7	3.7	3.7	3.7
	LH SHR stove	2.5	3.5	4.5	4.9	5.5	6.1	6.4	6.6	6.7	6.8
	LH pellet stove	0.0	1.3	1.8	2.1	2.4	2.6	2.7	2.7	2.8	2.8
	LH Solid fuel sum	**11**	**18**	**22**	**23**	**24**	**25**	**26**	**26**	**27**	**27**
	LH Electric portable	4.9	3.8	3.9	4.2	4.2	4.1	3.9	3.7	3.6	3.5
	LH Electric fixed > 250W	26.7	20.6	19.5	18.5	16.5	15.3	14.4	13.7	13.2	12.9
	LH Electric fixed ≤ 250W	1.9	1.5	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.0
	LH Electric storage	1.6	1.3	1.3	1.3	1.2	1.2	1.1	1.1	1.0	1.0
	LH Electric underfloor	4.6	3.9	4.0	4.3	4.3	4.3	4.1	4.0	3.8	3.7
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.7	2.1	2.3	2.4	2.3	2.2	2.1	2.1	2.0	2.0
	LH Electric sum	**42**	**34**	**33**	**32**	**30**	**29**	**27**	**26**	**25**	**24**
	LH Gas luminous (commercial)	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas closed front	0.4	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0.8	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0					
	LH Gaseous fuel sum	**1.5**	**1.1**	**1.0**	**0.6**	**0.6**	**0.5**	**0.5**	**0.5**	**0.4**	**0.4**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0					
	LH Liquid fuel sum	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**54**	**53**	**56**	**56**	**55**	**55**	**54**	**53**	**52**	**52**
	RAC fixed < 6 kW, cooling	0.8	6.5	5.5	5.2	5.5	6.1	6.6	7.3	8.3	9.5
	RAC fixed 6-12 kW, cooling	0.3	2.7	2.8	2.6	2.7	2.8	2.8	2.9	3.1	3.5
	RAC portable < 12 kW, cooling	0.0	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	RAC < 12 kW total, cooling mode	**1.1**	**9.6**	**8.7**	**8.1**	**8.5**	**9.2**	**9.8**	**10.6**	**11.8**	**13.4**
	RAC fixed < 6 kW, reversible, heating	0.2	4.8	5.4	6.2	7.8	10.0	12.0	14.4	16.7	19.1
	RAC fixed 6-12 kW, reversible, heating	0.1	2.1	2.9	3.3	4.1	4.9	5.6	6.3	7.0	7.7
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.3**	**6.9**	**8.3**	**9.5**	**11.9**	**14.9**	**17.6**	**20.8**	**23.8**	**26.7**
	RAC Room Air Conditioner	**1**	**17**	**17**	**18**	**20**	**24**	**27**	**31**	**36**	**40**
1	CIRC Integrated circulators	4.1	5.6	6.1	6.7	7.3	7.7	7.6	7.5	7.3	7.1
0.38	CIRC Large standalone circulators	2.1	2.8	2.8	2.8	2.6	2.4	2.2	2.1	2.0	2.0
0.38	CIRC Small standalone circulators	2.4	3.2	3.1	3.0	2.8	2.6	2.4	2.3	2.3	2.3
	CIRC Circulator pumps <2.5 kW, all	**9**	**12**	**12**	**13**	**13**	**13**	**12**	**12**	**12**	**11**
	CIRC Circulator pumps <2.5 kW, excl. double	**2.8**	**3.7**	**3.7**	**3.6**	**3.4**	**3.1**	**2.8**	**2.7**	**2.7**	**2.6**
	TOTAL SPACE HEATING	**211**	**276**	**266**	**226**	**240**	**249**	**249**	**253**	**259**	**263**
	TOTAL SPACE COOLING	**15**	**40**	**45**	**51**	**55**	**60**	**63**	**66**	**69**	**73**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.2	0.4	1.8	2.3	2.8	3.9	4.8	5.5
	R-UVU 100-250 m3/h	0.2	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
	R-BVU 100-250 m3/h	0.0	0.1	0.2	0.2	1.0	1.1	1.3	1.7	2.0	2.3
	R-UVU 250-1000 m3/h	0.8	1.7	1.9	2.1	2.2	2.4	2.5	2.5	2.6	2.6
	R-BVU 250-1000 m3/h	0.0	0.3	0.4	0.6	2.1	2.7	3.3	4.2	5.1	5.9
	R-UVU > 1000 m3/h	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3
	RVU, Total residential	**1**	**3**	**3**	**4**	**8**	**9**	**11**	**13**	**16**	**17**
	NR-UVU 250-1000 m3/h	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	NR-BVU 250-1000 m3/h	0.0	0.5	0.6	0.7	0.8	1.0	1.1	1.2	1.4	1.5
	NR-UVU > 1000 m3/h	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3
	NR-BVU 1000-2500 m3/h	0.0	0.8	0.9	1.0	1.1	1.3	1.4	1.6	1.7	1.9
	NR-AHU-S 2500-5500 m3/h	0.3	4.8	6.0	6.2	5.7	6.5	6.9	7.2	7.5	8.0
	NR-AHU-M 5500-14500 m3/h	6.1	11.5	12.5	12.6	11.7	12.8	13.1	13.4	13.9	14.3
	NR-AHU-L > 14500 m3/h	1.7	3.1	3.4	3.4	3.2	3.4	3.5	3.6	3.7	3.9
	NRVU, Total non-residential	**9**	**22**	**24**	**25**	**24**	**26**	**27**	**28**	**29**	**30**
	VU Ventilation Units, res + non-res.	**10**	**25**	**28**	**29**	**31**	**35**	**38**	**41**	**45**	**48**
	TOTAL VENTILATION (VU own electricity & acq & maint)	**10**	**25**	**28**	**29**	**31**	**35**	**38**	**41**	**45**	**48**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	-	-	-	-	-	-	-	-	-	-

db	BAU Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	16.7	23.5	27.7	32.2	31.8	28.1	21.9	17.1	13.4	10.7
	HID (HPM, HPS, MH)	5.6	11.3	12.3	13.4	11.7	8.1	4.3	2.3	1.3	0.7
	CFLni (all shapes)	0.7	2.9	3.2	3.3	3.0	2.0	1.0	0.5	0.3	0.2
	CFLi (retrofit for GLS, HL)	0.3	4.4	4.7	5.4	4.3	3.5	2.2	1.5	0.9	0.6
	GLS (DLS & NDLS)	17.7	12.5	9.7	7.6	4.6	2.8	1.6	1.0	0.6	0.3
	HL (DLS & NDLS, LV & MV)	1.6	8.7	11.6	14.3	10.3	5.5	2.9	1.5	0.9	0.5
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.7	3.5	7.6	13.7	19.0	24.2	29.8	35.9
	LED replacing HID (retrofit & luminaire)	0.0	0.0	0.2	2.3	5.0	8.6	11.4	13.8	16.2	19.0
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.3	0.9	1.8	2.6	3.1	3.7	4.1
	LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.1	0.6	1.1	1.4	1.7	1.9	2.2	2.4
	LED replacing NDLS (retrofit & luminaire)	0.0	0.1	0.4	3.2	4.5	5.8	7.1	8.2	9.3	10.4
	Standby (nrgcost only)	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
	TOTAL LIGHTING (incl. standby)	**44**	**65**	**73**	**88**	**87**	**83**	**77**	**77**	**80**	**86**
	DP TV total all types	23.7	40.7	30.5	37.3	40.2	46.6	46.9	45.7	45.1	45.5
	DP Monitor	1.9	6.1	3.6	3.3	3.3	3.2	3.0	2.9	2.9	2.9
	DP Signage	0.0	0.5	2.9	7.1	7.2	7.2	6.9	6.7	6.5	6.5
	DP Electronic Displays, total	**26**	**47**	**37**	**48**	**51**	**57**	**57**	**55**	**54**	**55**
	SSTB	0.0	1.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (all covered modes)	0.0	6.1	9.2	9.6	9.5	9.4	9.2	9.2	9.2	9.3
	Total STB set top boxes (Complex & Simple)	**0**	**8**	**10**	**10**	**9**	**9**	**9**	**9**	**9**	**9**
	Game consoles > 20 W Active modes (SRI)	0.0	3.7	4.1	4.4	4.4	4.4	4.4	4.4	4.4	4.4
	Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Game consoles < 20 W Active (no reg.)	0.1	0.8	0.9	0.9	0.8	0.9	0.8	0.8	0.9	0.9
	Total Game consoles, active modes	0.2	4.5	4.9	5.3	5.2	5.3	5.3	5.3	5.3	5.3
	Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	Total Game consoles > 20 W, all modes	0.0	3.9	4.5	4.9	4.9	4.9	4.9	4.9	4.9	4.9
	Total Game consoles < 20 W, all modes	0.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	Total Game consoles, all modes	**0**	**5**	**5**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0.0	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
	ES rack 1-socket traditional	0.0	0.9	0.8	0.9	0.9	1.0	1.0	1.0	1.0	1.0
	ES rack 2-socket traditional	0.3	4.9	2.5	2.4	2.9	3.6	3.6	3.6	3.6	3.7
	ES rack 2-socket cloud	0.0	3.9	6.1	7.5	9.1	11.1	11.3	11.3	11.3	11.4
	ES rack 4-socket traditional	0.1	1.8	0.8	0.9	1.1	1.4	1.4	1.4	1.4	1.4
	ES rack 4-socket cloud	0.0	1.4	2.1	2.6	3.2	3.9	3.9	3.9	3.9	3.9
	ES rack 2-socket resilient trad.	0.0	0.7	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
	ES rack 2-socket resilient cloud	0.0	0.5	0.7	0.9	1.1	1.3	1.3	1.3	1.3	1.3
	ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 1-socket traditional	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	ES blade 2-socket traditional	0.2	1.9	0.9	0.9	1.0	1.3	1.3	1.3	1.3	1.3
	ES blade 2-socket cloud	0.0	1.4	2.1	2.7	3.3	4.0	4.2	4.2	4.2	4.2
	ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	ES blade 4-socket cloud	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	ES total traditional	**1**	**11**	**6**	**6**	**7**	**8**	**8**	**8**	**8**	**8**
	ES total cloud	**0**	**7**	**11**	**14**	**17**	**21**	**21**	**21**	**21**	**21**
	ES Enterprise Servers total	**1**	**18**	**17**	**20**	**24**	**29**	**30**	**30**	**30**	**30**
	DS Online 2	0.3	6.5	6.5	7.7	8.8	10.1	10.2	10.3	10.2	10.3
	DS Online 3	0.4	9.0	6.5	7.2	8.0	8.9	8.9	8.9	8.9	9.0
	DS Online 4	0.3	6.3	6.0	6.8	7.8	8.8	8.8	8.8	8.8	8.9
	DS Data Storage products total	**1**	**22**	**19**	**22**	**25**	**28**	**28**	**28**	**28**	**28**
	ES + DS total (excl. infrastructure)	**2**	**40**	**36**	**42**	**49**	**57**	**58**	**58**	**58**	**58**
	PC Desktop	15.3	22.3	12.4	12.9	17.4	18.7	19.2	19.3	19.3	19.2
	PC Integrated Desktop	0.6	1.0	0.5	0.6	0.8	0.9	1.1	1.1	1.1	1.1
	PC Notebook	0.0	53.3	47.3	47.1	61.9	77.8	89.1	93.3	94.6	95.0
	PC Tablet/slate	0.0	2.6	29.6	28.6	30.9	33.4	35.0	35.5	35.7	35.7
	PC Thin client	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
	PC Integrated Thin Client	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	PC Small-scale Server	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	PC Workstation	1.1	2.0	2.5	2.8	3.4	4.0	4.5	4.6	4.6	4.6
	Total PC, electricity	**17**	**82**	**94**	**93**	**116**	**136**	**150**	**155**	**157**	**157**
	Inkjet Printer	0.7	1.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Inkjet MFD	0.9	1.8	1.5	1.0	1.0	1.0	0.9	0.9	0.8	0.8
	EP / Laser Printer mono	2.7	1.7	1.7	1.5	1.2	0.9	0.7	0.6	0.4	0.2
	EP / Laser Printer colour	0.0	1.6	2.1	3.0	3.4	3.7	3.8	3.9	4.0	4.1
	EP / Laser Copier mono	5.4	1.8	0.6	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.6	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	2.7	3.7	3.9	3.7	3.6	3.4	3.2	3.1	2.9
	EP / Laser MFD colour	0.0	10.3	14.0	14.2	13.5	12.9	12.2	11.6	11.0	10.4
	Consumables, paper, ink, toner	16.9	26.5	20.9	15.4	11.5	10.0	9.2	8.5	8.0	7.6
	Total IE Imaging Equipment	**27**	**48**	**46**	**39**	**34**	**32**	**30**	**29**	**27**	**26**

db	BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	2.1	2.4	2.0	1.8	1.7	1.6	1.4	1.2	1.1	0.9
	SB Electric toothbrushes (off mode)	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8
	SB Audio speakers (wired) (sb & off modes)	4.7	2.7	1.9	0.8	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	1.7	4.8	5.7	5.8	5.8	5.8	5.8	5.9
	SB Small appliances (sb & off modes)	5.2	9.3	9.6	10.0	10.2	10.3	10.4	10.6	10.7	10.8
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7
	SB Media players and recorders (sb mode)	0.0	3.0	2.9	0.5	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.3	1.6	1.7	1.6	1.5	1.5	1.4	1.3	1.3	1.2
	SB Office phones (nsb mode)	0.4	0.9	0.8	0.7	0.7	0.6	0.6	0.6	0.6	0.6
	SB Home NAS (nsb mode)	0.0	1.6	2.5	3.4	4.3	5.2	6.0	6.5	6.7	6.7
	SB Home Network Equipment (nsb mode)	0.0	3.4	3.9	4.2	4.5	4.8	5.1	5.2	5.2	5.2
	SB Office Network Equipment (nsb mode)	0.0	0.4	1.1	2.1	3.2	4.2	4.8	4.9	4.9	4.9
	SB Coffee makers (off mode)	1.0	1.2	1.2	1.3	1.3	1.3	1.4	1.4	1.5	1.5
	Products regulated also for (networked) standby (already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.3	0.4	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*	*0.4*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	*0.2*	*0.2*	*0.3*	*0.3*	*0.3*	*0.3*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.5	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3
1	SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.2	2.4	2.3	2.2	2.2	2.2	2.2	2.2
1	SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
1	SB IE Inkjet Printers (nsb mode)	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Printers (nsb mode)	1.1	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.5	0.5
1	SB IE Laser Copiers (nsb mode)	1.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.5	0.8	0.9	0.9	0.9	0.8	0.8	0.7	0.7
	Total (networked) SB (incl. double)	17	31	37	39	41	43	45	45	45	45
	Total (networked) SB (excl. double)	**14**	**27**	**31**	**33**	**34**	**37**	**38**	**39**	**39**	**39**
0.0	EPS ≤ 6W, low-V	0.0	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.1	1.9	2.0	2.2	2.3	2.4	2.4	2.5	2.5	2.6
0.6	EPS 10–12 W	0.0	2.5	3.5	4.1	4.1	4.1	4.0	3.9	3.8	3.8
0.5	EPS 15–20 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	0.0	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.2	0.2
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	1.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 12–15 W	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	EPS, total	**0.2**	**6.5**	**7.3**	**7.7**	**7.8**	**7.9**	**7.8**	**7.7**	**7.7**	**7.7**
	EPS, double counted subtracted	**0.1**	**3.5**	**3.9**	**4.2**	**4.2**	**4.2**	**4.2**	**4.1**	**4.1**	**4.1**
	TOTAL ELECTRONICS	**85**	**262**	**263**	**274**	**303**	**339**	**353**	**355**	**355**	**354**
	Total RF household Refrigerators & Freezers	**31**	**28**	**29**	**31**	**33**	**34**	**34**	**34**	**34**	**34**
	CF open vertical chilled multi deck (RVC2)	2.9	2.5	2.5	2.6	2.7	2.7	2.7	2.7	2.7	2.8
	CF open horizontal frozen island (RHF4)	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
	CF other supermarket display (non-BCs)	5.6	5.1	5.5	6.0	6.2	6.6	6.8	7.0	7.2	7.4
	CF Plug in one door beverage cooler	3.4	3.3	3.4	3.5	3.6	3.8	3.8	3.9	4.0	4.1
	CF Plug in horizontal ice cream freezer	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1
	CF Spiral vending machine	1.0	0.7	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	Total CF Commercial Refrigeration	**14**	**13**	**13**	**14**	**14**	**15**	**15**	**16**	**16**	**16**
	PF Storage cabinet Chilled Vertical (CV)	0.5	0.6	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0
	PF Storage cabinet Frozen Vertical (FV)	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	0.9
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6
	PF Storage cabinet Frozen Horizontal (FH)	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
	PF Storage cabinets All types	**1.3**	**1.7**	**1.8**	**2.1**	**2.3**	**2.4**	**2.5**	**2.6**	**2.8**	**2.9**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	1.0	1.1	1.3	1.4	1.6	1.7	1.9
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.8	0.9	1.1	1.3	1.4	1.5	1.6	1.8
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	1.0	1.1	1.3	1.4	1.6	1.7	1.8
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.9	1.0	1.2	1.3	1.5	1.6	1.7	1.9
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.5
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9
	PF Process Chiller All MT&LT	**2**	**4**	**5**	**5**	**6**	**7**	**8**	**9**	**9**	**10**

db	BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.1	0.8	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	PF Condensing Unit MT M 1-5 kW	2.7	2.0	2.1	2.4	2.7	3.0	3.2	3.5	3.8	4.1
	PF Condensing Unit MT L 5-20 kW	3.3	2.4	2.5	2.9	3.3	3.7	3.9	4.2	4.5	4.9
	PF Condensing Unit MT XL 20-50 kW	3.2	2.4	2.4	2.8	3.2	3.5	3.8	4.1	4.4	4.8
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.4	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7
	PF Condensing Unit LT L 2-8 kW	0.9	0.6	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.3
	PF Condensing Unit LT XL 8-20 kW	2.4	1.8	1.8	2.1	2.4	2.7	2.8	3.1	3.3	3.6
0.6	**PF Condensing Unit, All MT&LT**	**14**	**11**	**11**	**13**	**14**	**16**	**17**	**18**	**20**	**21**
	PF Professional Refrigeration, Total	**9**	**10**	**11**	**12**	**14**	**16**	**17**	**18**	**20**	**21**
	TOTAL FOOD PRESERVATION	**54**	**50**	**53**	**58**	**61**	**65**	**66**	**68**	**70**	**72**
	CA Electric Hobs	6.5	11.0	12.3	14.1	15.3	16.6	17.3	18.0	18.8	19.7
	CA Electric Ovens	9.7	10.6	11.1	12.1	12.0	12.5	12.7	12.8	13.0	13.2
	CA Gas Hobs	3.6	3.5	3.5	2.7	2.8	2.9	2.8	2.8	2.6	2.5
	CA Gas Ovens	1.3	1.3	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.0
	CA Range Hoods	3.2	3.5	3.8	4.3	4.6	5.0	5.2	5.4	5.7	6.0
	TOTAL COOKING	**24**	**30**	**32**	**34**	**36**	**38**	**39**	**40**	**41**	**42**
	WM Washing Machines	24	26	27	28	28	29	29	29	29	29
	WD Washer-Dryers	2	3	3	3	3	3	3	3	3	3
	Total WM-WD household Washing	**27**	**29**	**30**	**31**	**31**	**32**	**32**	**32**	**32**	**33**
	including detergent and water costs	*12*	*14*	*15*	*16*	*16*	*17*	*18*	*18*	*19*	*19*
	Total DW household Dishwasher	**5**	**10**	**12**	**14**	**17**	**19**	**21**	**23**	**25**	**27**
	including detergent and water costs	*1*	*3*	*4*	*4*	*5*	*6*	*7*	*8*	*9*	*10*
	LD condensing heat pump	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.0
	LD condensing electric heat element	0.6	2.4	2.9	3.4	3.5	3.5	3.3	3.1	2.9	2.8
	LD vented electric	2.0	1.8	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.6
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	2.6	4.2	4.6	5.1	5.3	5.4	5.3	5.3	5.3	5.3
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	**3**	**4**	**5**	**5**	**5**	**6**	**5**	**5**	**5**	**5**
	VC Cylinder Domestic mains	3.8	5.5	6.1	6.1	5.5	4.5	3.3	2.7	2.5	2.5
	VC Upright Domestic mains	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.1	0.1	0.2	0.3	0.4	0.5	0.7	0.8	0.8	0.8
	VC Total Domestic mains	**3.8**	**5.7**	**6.3**	**6.4**	**5.9**	**5.0**	**4.0**	**3.5**	**3.4**	**3.4**
	VC Cylinder Commercial mains	0.7	1.7	1.9	2.0	2.1	2.3	2.3	2.4	2.4	2.4
	VC Upright Commercial mains	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	VC Total Commercial mains	**0.9**	**1.9**	**2.1**	**2.2**	**2.4**	**2.5**	**2.6**	**2.6**	**2.6**	**2.6**
	VC Total in scope of CR 666/2013	**4.7**	**7.6**	**8.4**	**8.6**	**8.3**	**7.6**	**6.6**	**6.1**	**6.0**	**6.0**
	VC Cordless - domestic - cleaning	0.1	0.3	0.9	2.1	3.3	4.6	5.7	6.4	6.6	6.7
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.3	0.5	1.0	1.5	2.0	2.5	2.7	2.8	2.9
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**3.9**	**6.3**	**7.9**	**9.8**	**11.1**	**12.2**	**12.9**	**13.4**	**13.7**	**13.8**
	VC Total Commercial mains+cordless+robots	**0.9**	**1.9**	**2.1**	**2.3**	**2.5**	**2.7**	**2.8**	**2.9**	**2.9**	**2.9**
	VC Total All mains+cordless+robots	**4.8**	**8.3**	**10.0**	**12.1**	**13.6**	**14.9**	**15.7**	**16.3**	**16.6**	**16.8**
	Total VC Vacuum Cleaner incl. bags and filters	**6.0**	**10.1**	**11.9**	**14.0**	**15.5**	**16.8**	**17.6**	**18.1**	**18.4**	**18.6**
	including costs of bags & filters	*1.1*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
	TOTAL CLEANING	**41**	**53**	**59**	**65**	**69**	**73**	**76**	**78**	**81**	**83**
0.5	FAN Axial<300Pa (all FAN types >125W)	3.2	8.3	10.2	12.5	14.0	15.3	15.4	15.4	15.4	15.6
0.5	FAN Axial>300Pa	5.3	14.5	17.3	20.1	21.7	23.0	23.0	23.0	23.0	23.3
0.5	FAN Centr.FC	1.6	3.2	4.1	4.9	5.4	5.8	5.9	5.9	5.9	5.9
0.5	FAN Centr.BC-free	3.2	6.1	7.7	9.3	10.7	12.1	12.7	13.1	13.3	13.7
0.5	FAN Centr.BC	3.6	7.6	9.6	11.6	13.3	15.0	16.1	17.3	18.8	20.6
0.5	FAN Cross-flow	0.3	0.5	0.6	0.8	0.9	1.0	1.1	1.2	1.3	1.4
	Total FAN, industrial (excl. box & roof fans)	**9**	**20**	**25**	**30**	**33**	**36**	**37**	**38**	**39**	**40**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.9	14.9	15.9	16.8	17.5	17.7	17.0	16.3	15.4	14.3
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20.8	22.7	24.2	25.7	26.7	26.8	25.5	24.0	21.9	19.7
0.45	Medium (L) 3-ph 75-375 kW no VSD	41.2	43.5	45.6	48.1	49.5	48.8	44.4	39.1	33.9	30.9
0.45	**Total 3ph 0.75-375 kW no VSD**	**76**	**81**	**86**	**91**	**94**	**93**	**87**	**79**	**71**	**65**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1.2	2.5	3.1	3.8	4.5	5.4	6.2	7.3	8.5	10.0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.9	4.0	5.0	6.2	7.7	9.3	10.8	12.7	14.9	17.3
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.8	10.0	12.6	16.0	20.1	24.8	29.0	34.2	38.9	42.8
0.45	**Total 3-ph 0.75-375 kW with VSD**	**8**	**17**	**21**	**26**	**32**	**39**	**46**	**54**	**62**	**70**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**84**	**98**	**106**	**117**	**126**	**133**	**133**	**134**	**134**	**135**

EXPENSBAU

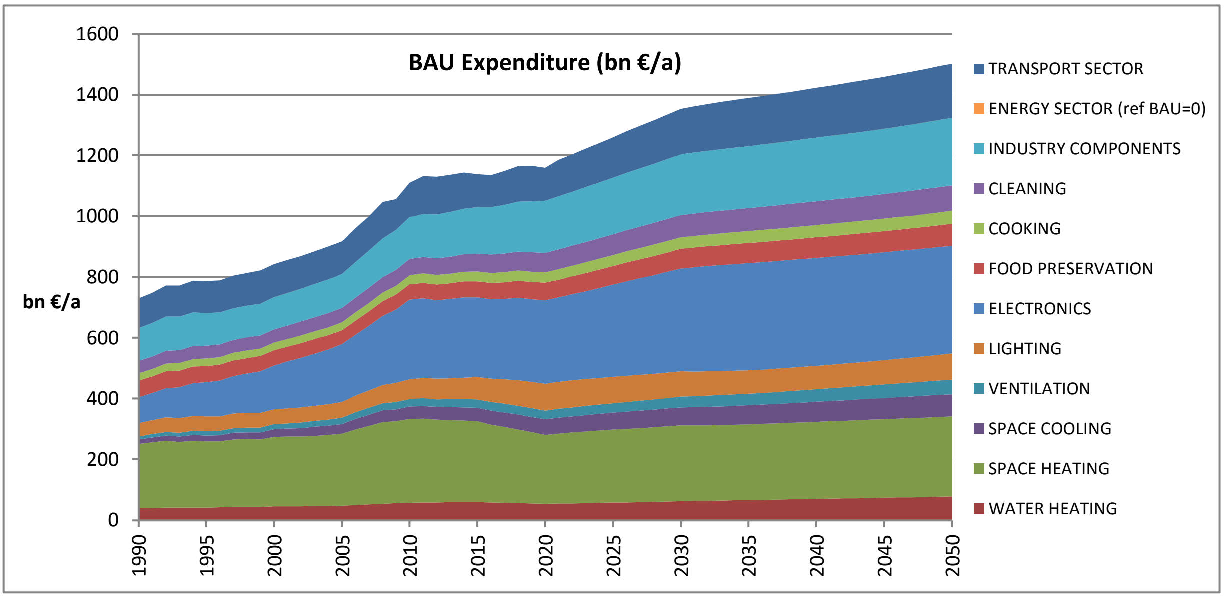
db	BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.4	1.8	1.9	2.0	2.0	2.1	2.1	2.1	2.1	2.0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.7	0.8	0.9	1.0	1.0	1.1	1.1	1.2	1.3
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.6	1.9	2.0	2.1	2.2	2.3	2.3	2.3	2.3	2.3
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9
0.45	**Total Small 3-ph 0.12-0.75 kW**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
0.45	Large 3-ph LV 375-1000 kW no VSD	21.0	21.0	20.6	20.1	19.8	19.6	19.2	19.2	19.1	19.1
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.0	7.5	10.5	13.5	16.0	17.0	17.9	18.8	19.9
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**26**	**28**	**31**	**33**	**36**	**36**	**37**	**38**	**39**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.4	1.5	1.6	1.8	1.9	2.0	2.0	2.1	2.1
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.5	2.8	3.1	3.4	3.7	3.8	3.9	4.0	4.1
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**7**	**7**	**7**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.1	1.2	1.3	1.3	1.4	1.4	1.4	1.5
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.3	1.4	1.6	1.8	1.9	2.0	2.0	2.1	2.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	8-pole motors (L) 3-ph 75-375 kW	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**6**	**8**	**8**	**9**	**10**	**10**	**10**	**11**	**11**	**11**
	MT Elec. Motors LV 0.12-1000 kW	**67**	**79**	**86**	**94**	**102**	**107**	**108**	**109**	**110**	**112**
	including double counted amounts	122	143	156	171	185	195	197	199	200	203
	ESOB<45_VF	3.2	3.7	4.0	4.6	5.0	5.3	5.6	6.0	6.3	6.7
	ESOB<45_CF	2.3	2.7	3.0	3.5	3.9	4.2	4.5	4.8	5.0	5.4
	ESOB<45_VSD-VF	0.1	0.2	0.2	0.3	0.5	0.6	0.6	0.7	0.7	0.7
	ESOB < 45 Total	**5.6**	**6.6**	**7.3**	**8.5**	**9.3**	**10.1**	**10.7**	**11.4**	**12.1**	**12.9**
	ESOB_45-150_VF	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
	ESOB_45-150_CF	1.6	1.9	2.1	2.5	2.7	3.0	3.2	3.4	3.6	3.9
	ESOB_45-150_VSD-VF	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	ESOB 45-150 Total	**2.7**	**3.1**	**3.4**	**4.0**	**4.4**	**4.8**	**5.0**	**5.4**	**5.7**	**6.1**
	ESOB < 150 Total	**8.3**	**9.7**	**10.7**	**12.4**	**13.7**	**14.9**	**15.7**	**16.7**	**17.8**	**19.0**
	ESCC<45_VF	3.1	3.6	4.0	4.5	4.8	5.0	5.3	5.6	6.0	6.4
	ESCC<45_CF	2.4	3.0	3.2	3.7	4.1	4.4	4.7	5.0	5.3	5.6
	ESCC<45_VSD-VF	0.1	0.3	0.3	0.4	0.6	0.7	0.8	0.9	0.9	1.0
	ESCC < 45 Total	**5.7**	**6.9**	**7.5**	**8.6**	**9.4**	**10.2**	**10.8**	**11.5**	**12.2**	**13.0**
	ESCC_45-150_VF	0.9	1.0	1.1	1.3	1.3	1.4	1.5	1.6	1.7	1.8
	ESCC_45-150_CF	0.6	0.7	0.8	1.0	1.1	1.2	1.2	1.3	1.4	1.5
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	ESCC 45-150 Total	**1.6**	**1.8**	**2.0**	**2.3**	**2.6**	**2.8**	**2.9**	**3.1**	**3.3**	**3.6**
	ESCC < 150 Total	**7.2**	**8.7**	**9.5**	**10.9**	**12.0**	**13.0**	**13.7**	**14.6**	**15.5**	**16.5**
	ESCCi<45_VF	1.7	1.8	1.9	2.0	1.8	1.6	1.6	1.8	1.9	2.0
	ESCCi<45_CF	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	ESCCi<45_VSD-VF	0.3	0.6	0.7	0.9	1.3	1.6	1.8	1.9	2.0	2.1
	ESCCi < 45 Total	**2.2**	**2.6**	**2.8**	**3.2**	**3.4**	**3.6**	**3.8**	**4.0**	**4.2**	**4.5**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**
	ESCCi < 150 Total	**2.5**	**2.9**	**3.2**	**3.6**	**3.8**	**4.0**	**4.2**	**4.5**	**4.8**	**5.1**
	MSSB<6"_VF	1.1	1.3	1.3	1.4	1.3	1.3	1.4	1.5	1.6	1.7
	MSSB<6"_CF	5.8	7.4	8.1	9.0	9.8	10.5	11.2	11.9	12.6	13.4
	MSSB<6"_VSD-VF	0.2	0.4	0.5	0.7	0.9	1.0	1.1	1.2	1.2	1.3
	MSSB <6" Total	**7.1**	**9.1**	**9.9**	**11.1**	**12.0**	**12.9**	**13.6**	**14.5**	**15.4**	**16.4**
	MS-V<25bar_VF	2.2	2.5	2.8	3.1	3.2	3.3	3.4	3.6	3.9	4.1
	MS-V<25bar_CF	1.7	2.0	2.2	2.6	2.8	3.1	3.2	3.4	3.7	3.9
	MS-V<25bar_VSD-VF	0.2	0.3	0.4	0.5	0.7	0.9	1.0	1.1	1.1	1.2
	MS_V <25 bar Total	**4.1**	**4.9**	**5.4**	**6.2**	**6.7**	**7.3**	**7.7**	**8.2**	**8.7**	**9.2**
	WP Water pumps	**29**	**35**	**39**	**44**	**48**	**52**	**55**	**59**	**62**	**66**
	Total WE Welding Equipment	**3**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**
	TOTAL INDUSTRY COMPONENTS	**108**	**138**	**153**	**171**	**186**	**199**	**204**	**209**	**215**	**222**

db	BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	1.8	2.5	2.7	3.0	3.4	3.8	4.1	4.5	4.8	5.2
	TRAFO Industry oil	1.2	1.8	1.9	2.1	2.4	2.7	2.9	3.1	3.3	3.6
	TRAFO Industry dry	0.4	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.1	1.2
	TRAFO Power	5.7	7.7	8.4	9.2	10.3	11.5	12.4	13.4	14.4	15.4
	TRAFO DER oil	0.0	0.1	0.1	0.2	0.3	0.5	0.9	1.3	1.7	2.3
	TRAFO DER dry	0.0	0.3	0.5	0.9	1.5	2.6	4.1	6.0	8.1	10.6
	TRAFO Small	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total TRAFO Utility Transformers	**9**	**13**	**15**	**16**	**19**	**22**	**26**	**30**	**34**	**39**
	TOTAL ENERGY SECTOR (BAU=0 as reference)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	(incl. costs for fuel due to rolling resistance)										
	Tyres C1, replacement for cars	51	58	55	53	64	70	72	75	77	79
	Tyres C1, OEM for cars	15	17	17	16	19	21	22	22	23	24
	Tyres C1, total	**66**	**75**	**73**	**69**	**83**	**91**	**94**	**97**	**100**	**103**
	Tyres C2, replacement for vans	10	13	12	12	16	18	19	20	21	22
	Tyres C2, OEM for vans	2	3	3	3	3	4	4	4	4	5
	Tyres C2, total	**12**	**16**	**15**	**15**	**19**	**22**	**23**	**24**	**25**	**26**
	Tyres C3, replacement for trucks/busses	16	18	17	20	25	30	33	35	38	41
	Tyres C3, OEM for trucks/busses	4	4	4	5	6	7	8	8	9	9
	Tyres C3, total	**19**	**22**	**21**	**24**	**31**	**37**	**41**	**43**	**47**	**50**
	Tyres, total C1+C2+C3	**98**	**113**	**109**	**108**	**133**	**150**	**158**	**165**	**172**	**180**
	TRANSPORT SECTOR	98	113	109	108	133	150	158	165	172	180
	GENERAL TOTAL (in bn euros 2020)	**730**	**1110**	**1138**	**1160**	**1260**	**1353**	**1388**	**1423**	**1459**	**1503**

	BAU Expenditure (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**39**	**58**	**60**	**54**	**58**	**63**	**66**	**70**	**74**	**78**
	SPACE HEATING	**211**	**276**	**266**	**226**	**240**	**249**	**249**	**253**	**259**	**263**
	SPACE COOLING	**15**	**40**	**45**	**51**	**55**	**60**	**63**	**66**	**69**	**73**
	VENTILATION	**10**	**25**	**28**	**29**	**31**	**35**	**38**	**41**	**45**	**48**
1	***VENTILATION (from heat saving vs. BAU; already included in COST for space heating)***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***	***0***
	LIGHTING	**44**	**65**	**73**	**88**	**87**	**83**	**77**	**77**	**80**	**86**
	ELECTRONICS	**85**	**262**	**263**	**274**	**303**	**339**	**353**	**355**	**355**	**354**
	FOOD PRESERVATION	**54**	**50**	**53**	**58**	**61**	**65**	**66**	**68**	**70**	**72**
	COOKING	**24**	**30**	**32**	**34**	**36**	**38**	**39**	**40**	**41**	**42**
	CLEANING	**41**	**53**	**59**	**65**	**69**	**73**	**76**	**78**	**81**	**83**
	INDUSTRY COMPONENTS	108	138	153	171	186	199	204	209	215	222
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	98	113	109	108	133	150	158	165	172	180
	TOTAL in bn euros 2020, excl. energy sector	**730**	**1110**	**1138**	**1160**	**1260**	**1353**	**1388**	**1423**	**1459**	**1503**

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (ref BAU=0)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
Total in bn euros, incl. energy sector	**730**	**1110**	**1138**	**1160**	**1260**	**1353**	**1388**	**1423**	**1459**	**1503**



Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for BAU Expense (sector definitions and order as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

BAU Expense (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	29	44	45	41	44	47	50	53	56	58
SPACE HEATING	153	193	184	154	164	169	169	172	176	180
SPACE & HT PROCESS COOLING	1	7	6	6	7	7	8	8	9	10
VENTILATION (acq, elec, maint)	1	3	3	4	8	9	11	13	16	17
LIGHTING	17	20	20	23	19	14	11	10	10	10
ELECTRONICS	52	144	150	156	175	196	206	209	210	210
FOOD PRESERVATION	29	26	27	29	30	32	31	32	32	32
COOKING	21	27	29	31	32	34	35	36	37	38
CLEANING	38	49	55	60	64	68	70	72	75	77
INDUSTRY COMPONENTS	6	7	8	9	10	11	12	12	13	14
BAU Expense, Residential, in bn euros 2020	**349**	**520**	**529**	**514**	**552**	**587**	**603**	**618**	**632**	**648**

db	ECO Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0
	EIWH Electric Instant. ≥ 12 kW (primary)	2	2	2	2	2	2	2	2	2	2
	EIWHS Electric Instant. Shower (secondary)	0	0	0	0	0	0	0	0	0	0
	ESWH Electric Storage ≤ 30 L (secondary)	3	3	3	3	3	3	3	4	4	4
	ESWH Electric Storage > 30 L (primary)	15	18	19	19	19	20	21	22	24	25
	GIWH Gas Instant. < 13 L/min (secondary)	2	2	2	2	1	1	1	1	1	1
	GIWH Gas Instant. ≥ 13 L/min (primary)	1	1	1	1	1	1	1	1	1	1
	GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0
	GSWH Gas Storage, Non-condensing	2	2	1	1	1	0	0	0	0	0
	Dedicated WH Heat Pump	0	0	1	1	1	2	3	3	4	5
	Dedicated WH Solar (3.5 m2)	1	3	4	4	4	4	4	4	4	4
	WH dedicated Water Heater	**26**	**32**	**33**	**32**	**32**	**34**	**36**	**38**	**41**	**44**
	CHB Gas Combi Instant. WH	4	12	14	10	11	12	11	11	10	9
	CHB Gas + Cyl. WH	3	5	5	4	4	4	4	4	4	3
	CHB Jet Burner Gas + Cyl. WH	1	1	1	0	0	0	0	0	0	0
	CHB Jet Burner Oil + Cyl. WH	5	6	4	3	3	2	2	2	2	3
	CHB Electric (Joule) + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	1	1	1	2
	CHB Electric HP + Cyl. WH	0	1	1	2	3	5	6	8	10	12
	CHB Gas HP + Cyl. WH	0	0	0	0	0	0	0	0	0	1
	CHB Gas mCHP + Cyl. WH	0	0	0	0	0	0	0	0	0	0
	CHB Solar Combi (16 m2)	0	0	0	0	0	0	0	0	0	0
	CHC Central Heating combi, water heating	**14**	**26**	**26**	**20**	**23**	**24**	**26**	**28**	**29**	**30**
	TOTAL WATER HEATING	**39**	**58**	**59**	**52**	**55**	**58**	**62**	**66**	**70**	**74**
	CHB Gas non-condensing	51	70	58	27	16	8	3	2	1	1
	CHB Gas condensing	1	31	43	46	60	69	68	63	57	50
	CHB Gas Jet burner non-condensing	6	5	4	2	1	1	0	0	0	0
	CHB Gas Jet burner condensing	0	0	0	1	1	1	1	1	1	1
	CHB Oil Jet burner non-condensing	61	62	40	23	18	9	3	2	1	1
	CHB Oil Jet burner condensing	0	2	4	5	8	10	12	13	14	14
	CHB Electric Joule-effect	3	2	3	3	3	3	3	2	2	2
	CHB Hybrid (gas-electric)	0	0	0	0	1	2	3	4	5	7
	CHB Electric Heat Pump	1	5	6	10	16	23	30	38	46	54
	CHB Gas Heat Pump	0	0	0	0	0	1	1	1	2	2
	CHB micro CHP	0	0	0	0	1	1	1	2	2	2
	CHB Solar combi (16 m2)	1	1	1	1	1	1	1	1	1	1
	CHB Central Heating boiler < 400 kW, space heating	**122**	**178**	**159**	**118**	**126**	**128**	**127**	**129**	**132**	**135**
	SFB Wood Manual	12	4	4	2	2	1	1	0	0	0
	SFB Wood Direct Draft	0	2	4	4	5	5	6	7	8	9
	SFB Coal	9	5	2	2	1	1	1	1	1	1
	SFB Pellets	0	1	2	2	2	2	2	3	3	3
	SFB Wood chips	0	1	1	1	1	1	1	1	1	1
	Total Solid Fuel Boiler	**21**	**13**	**13**	**11**	**11**	**10**	**10**	**11**	**13**	**14**
	CHAE-S (≤ 400 kW)	1.1	3.8	4.6	5.3	5.7	6.1	6.4	6.7	7.1	7.5
	CHAE-L (> 400 kW)	1.0	2.2	2.5	2.9	2.9	2.8	2.6	2.5	2.5	2.5
	CHWE-S (≤ 400 kW)	0.1	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.6	0.7	0.8	0.8	0.8	0.7	0.7	0.7	0.7
	CHWE-L (> 1500 kW)	0.1	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.4
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	HT PCH-AE-S	3.5	4.9	5.7	6.5	6.8	7.0	7.1	7.3	7.4	7.7
	HT PCH-AE-L	3.3	4.7	5.4	6.1	6.3	6.4	6.3	6.4	6.5	6.8
	HT PCH-WE-S	0.7	1.0	1.2	1.4	1.5	1.6	1.6	1.6	1.7	1.7
	HT PCH-WE-M	1.5	2.2	2.6	3.0	3.2	3.4	3.4	3.5	3.6	3.7
	HT PCH-WE-L	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	0.7
	AC rooftop	0.8	2.1	2.2	2.0	1.5	0.9	0.5	0.3	0.2	0.2
	AC splits	1.2	3.7	4.0	4.0	3.8	3.6	3.4	3.1	3.0	2.8
	AC VRF	0.0	4.3	6.0	8.9	11.3	14.1	16.6	18.9	21.0	22.6
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Cooling	**14**	**31**	**36**	**42**	**45**	**48**	**50**	**53**	**56**	**58**
	AC rooftop (rev)	0.8	2.4	2.5	2.3	1.7	1.0	0.4	0.1	0.0	0.0
	AC splits (rev)	1.5	4.6	5.0	5.2	4.9	4.5	4.1	3.8	3.5	3.2
	AC VRF (rev)	0.0	4.4	6.1	9.2	11.5	13.9	15.7	16.9	17.7	18.1
	ACF (rev)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	AHF	8.5	8.7	7.5	4.8	4.7	4.5	4.1	3.8	3.5	3.1
	AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.1	0.1	0.1
	SubTotal AHC Air Heating	**11**	**20**	**21**	**22**	**23**	**24**	**24**	**25**	**25**	**25**
	Total AHC Air Heating & Cooling	**24**	**46**	**51**	**55**	**58**	**61**	**62**	**64**	**66**	**68**

db	ECO Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	2.1	3.1	3.5	3.8	4.0	3.8	3.7	3.6	3.5	3.4
	LH closed fireplace/inset	1.6	4.2	5.6	6.2	6.6	6.7	6.7	6.6	6.5	6.4
	LH wood stove	2.3	2.6	3.3	3.2	3.3	3.3	3.3	3.2	3.2	3.1
	LH coal stove	0.9	0.7	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.2
	LH cooker	1.2	2.3	3.0	3.5	3.7	3.7	3.7	3.6	3.6	3.6
	LH SHR stove	2.5	3.5	4.5	5.0	5.5	6.1	6.4	6.5	6.6	6.7
	LH pellet stove	0.0	1.3	1.8	2.1	2.3	2.5	2.6	2.7	2.7	2.7
	LH Solid fuel sum	**11**	**18**	**22**	**24**	**26**	**27**	**27**	**26**	**26**	**26**
	LH Electric portable	4.9	3.8	3.9	3.8	3.5	3.5	3.3	3.1	3.0	2.9
	LH Electric fixed > 250W	26.7	20.6	19.3	17.9	15.2	13.6	12.7	12.2	11.7	11.4
	LH Electric fixed ≤ 250W	1.9	1.5	1.4	1.3	1.1	1.0	1.0	0.9	0.9	0.9
	LH Electric storage	1.6	1.3	1.3	1.3	1.1	1.0	0.9	0.9	0.9	0.8
	LH Electric underfloor	4.6	3.9	4.0	4.2	4.2	4.2	4.0	3.8	3.6	3.5
	LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.2
	LH Electric visibly glowing ≤ 1.2 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric Towel Heaters	1.7	2.1	2.3	2.4	2.3	2.2	2.1	2.0	2.0	1.9
	LH Electric sum	**42**	**34**	**33**	**31**	**28**	**26**	**24**	**23**	**22**	**22**
	LH Gas luminous (commercial)	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas open front	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas closed front	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	LH Gas balanced flue	0.8	0.5	0.4	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**1.5**	**1.1**	**1.0**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**54**	**53**	**56**	**56**	**54**	**53**	**51**	**50**	**49**	**48**
	RAC fixed < 6 kW, cooling	0.8	6.4	5.3	5.0	5.2	5.6	5.9	6.6	7.4	8.5
	RAC fixed 6-12 kW, cooling	0.3	2.7	2.7	2.5	2.5	2.6	2.7	2.7	2.9	3.0
	RAC portable < 12 kW, cooling	0.0	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	RAC < 12 kW total, cooling mode	**1.1**	**9.5**	**8.4**	**7.7**	**8.0**	**8.5**	**8.9**	**9.6**	**10.6**	**11.9**
	RAC fixed < 6 kW, reversible, heating	0.2	4.3	4.7	5.3	6.7	8.6	10.5	12.9	15.1	17.3
	RAC fixed 6-12 kW, reversible, heating	0.1	1.9	2.4	2.6	3.2	4.0	4.7	5.5	6.1	6.6
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.3**	**6.2**	**7.0**	**7.9**	**9.9**	**12.6**	**15.2**	**18.4**	**21.2**	**23.9**
	RAC Room Air Conditioner	**1**	**16**	**15**	**16**	**18**	**21**	**24**	**28**	**32**	**36**
1	CIRC Integrated circulators	4.1	5.6	6.0	5.7	5.6	5.9	6.0	6.0	6.0	6.0
0.38	CIRC Large standalone circulators	2.1	2.8	3.0	2.6	2.3	2.1	2.0	1.9	1.8	1.8
0.38	CIRC Small standalone circulators	2.4	3.2	3.2	2.7	2.4	2.1	2.0	1.9	1.9	1.9
	CIRC Circulator pumps <2.5 kW, all	**9**	**12**	**12**	**11**	**10**	**10**	**10**	**10**	**10**	**10**
	CIRC Circulator pumps <2.5 kW, excl. double	**2.8**	**3.7**	**3.9**	**3.3**	**2.9**	**2.6**	**2.5**	**2.4**	**2.3**	**2.3**
	TOTAL SPACE HEATING	**211**	**273**	**259**	**218**	**227**	**231**	**231**	**236**	**242**	**249**
	TOTAL SPACE COOLING	**15**	**40**	**44**	**50**	**53**	**57**	**59**	**63**	**66**	**70**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.2	0.4	1.8	2.3	2.8	3.8	4.7	5.4
	R-UVU 100-250 m3/h	0.2	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	R-BVU 100-250 m3/h	0.0	0.1	0.2	0.2	1.0	1.1	1.3	1.6	1.9	2.1
	R-UVU 250-1000 m3/h	0.8	1.7	1.9	2.1	2.0	2.0	2.1	2.1	2.1	2.2
	R-BVU 250-1000 m3/h	0.0	0.3	0.4	0.6	2.0	2.6	3.1	4.0	4.8	5.5
	R-UVU > 1000 m3/h	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	R-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	RVU, Total residential	**1**	**3**	**3**	**4**	**8**	**9**	**10**	**13**	**15**	**16**
	NR-UVU 250-1000 m3/h	0.3	0.5	0.5	0.6	0.5	0.5	0.5	0.5	0.5	0.5
	NR-BVU 250-1000 m3/h	0.0	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.3	1.4
	NR-UVU > 1000 m3/h	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3
	NR-BVU 1000-2500 m3/h	0.0	0.8	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8
	NR-AHU-S 2500-5500 m3/h	0.3	4.8	6.1	6.3	5.8	6.5	6.8	7.1	7.4	7.8
	NR-AHU-M 5500-14500 m3/h	6.1	11.5	12.6	12.8	11.7	12.5	12.8	13.0	13.4	13.8
	NR-AHU-L > 14500 m3/h	1.7	3.1	3.4	3.4	3.1	3.3	3.4	3.5	3.6	3.7
	NRVU, Total non-residential	**9**	**22**	**24**	**25**	**23**	**25**	**26**	**27**	**28**	**29**
	VU Ventilation Units, res + non-res.	**10**	**25**	**28**	**29**	**31**	**34**	**37**	**40**	**43**	**45**
	TOTAL VENTILATION (VU own electricity & acq & maint)	**10**	**25**	**28**	**29**	**31**	**34**	**37**	**40**	**43**	**45**
1	***Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)***	*-*	*-*	*-0*	*-1*	*-3*	*-4*	*-5*	*-5*	*-6*	*-6*

db ECO Expenditure (in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	16.7	23.3	26.0	29.3	23.0	13.3	6.1	3.0	1.7	1.1
HID (HPM, HPS, MH)	5.6	11.1	9.9	9.2	7.0	3.7	1.4	0.5	0.2	0.1
CFLni (all shapes)	0.7	2.9	2.9	2.4	1.6	0.7	0.3	0.1	0.0	0.0
CFLi (retrofit for GLS, HL)	0.3	5.6	5.1	4.1	1.3	0.4	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	17.7	8.3	2.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	1.6	9.7	12.3	5.0	0.3	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	0.0	0.0	1.3	4.4	13.8	21.0	25.5	29.5	33.8	38.6
LED replacing HID (retrofit & luminaire)	0.0	0.0	3.2	4.7	7.5	10.2	12.3	14.3	16.3	18.7
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.3	0.9	1.7	2.4	2.9	3.3	3.7	4.1
LED replacing DLS (retrofit & luminaire)	0.0	0.2	1.3	1.6	2.1	1.8	2.0	2.1	2.3	2.5
LED replacing NDLS (retrofit & luminaire)	0.0	0.1	3.7	8.0	8.0	8.3	8.3	9.0	9.8	10.8
Standby (nrgcost only)	*1.6*	*2.2*	*2.0*	*1.9*	*1.6*	*1.4*	*1.4*	*1.4*	*1.4*	*1.4*
TOTAL LIGHTING (incl. standby)	**44**	**63**	**70**	**72**	**68**	**63**	**60**	**63**	**69**	**77**
DP TV total all types	23.7	40.7	29.6	33.7	33.4	36.9	36.5	36.9	37.7	38.8
DP Monitor	1.9	6.1	3.5	2.8	2.7	2.6	2.5	2.5	2.5	2.5
DP Signage	0.0	0.5	2.9	7.1	7.1	6.5	5.5	5.4	5.7	6.3
DP Electronic Displays, total	**26**	**47**	**36**	**44**	**43**	**46**	**45**	**45**	**46**	**48**
SSTB	0.0	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB (all covered modes)	0.0	6.1	8.9	8.6	8.5	8.5	8.5	8.5	8.5	8.5
Total STB set top boxes (Complex & Simple)	**0**	**8**	**9**	**9**	**9**	**9**	**8**	**8**	**8**	**9**
Game consoles > 20 W Active modes (SRI)	0.0	3.7	4.0	4.0	4.0	4.0	4.0	4.0	4.0	4.1
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Game consoles < 20 W Active (no reg.)	0.1	0.8	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles, active modes	0.2	4.5	4.8	4.8	4.9	4.9	4.9	4.9	4.9	4.9
Total Game consoles, non-active modes	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Total Game consoles > 20 W, all modes	0.0	3.9	4.2	4.2	4.1	4.2	4.2	4.2	4.2	4.2
Total Game consoles < 20 W, all modes	0.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9
Total Game consoles, all modes	**0**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**	**5**
ES&DS only, without effects on infrastructure										
ES tower 1-socket traditional	0.0	0.4	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2
ES rack 1-socket traditional	0.0	0.9	0.8	0.8	0.9	1.0	1.0	1.0	1.0	1.0
ES rack 2-socket traditional	0.3	4.9	2.5	2.4	2.9	3.5	3.6	3.6	3.6	3.6
ES rack 2-socket cloud	0.0	3.9	6.1	7.3	8.9	10.9	11.2	11.2	11.2	11.2
ES rack 4-socket traditional	0.1	1.8	0.8	0.9	1.1	1.4	1.4	1.4	1.4	1.4
ES rack 4-socket cloud	0.0	1.4	2.1	2.6	3.1	3.8	3.9	3.9	3.9	3.9
ES rack 2-socket resilient trad.	0.0	0.7	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
ES rack 2-socket resilient cloud	0.0	0.5	0.7	0.9	1.1	1.3	1.3	1.3	1.3	1.3
ES rack 4-socket resilient trad.	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ES rack 4-socket resilient cloud	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 1-socket traditional	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ES blade 2-socket traditional	0.2	1.9	0.9	0.9	1.0	1.3	1.3	1.3	1.3	1.3
ES blade 2-socket cloud	0.0	1.4	2.1	2.7	3.2	4.0	4.1	4.1	4.1	4.1
ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
ES blade 4-socket cloud	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4
ES total traditional	**1**	**11**	**6**	**6**	**7**	**8**	**8**	**8**	**8**	**8**
ES total cloud	**0**	**7**	**11**	**14**	**17**	**21**	**21**	**21**	**21**	**21**
ES Enterprise Servers total	**1**	**18**	**17**	**20**	**24**	**29**	**29**	**29**	**29**	**29**
DS Online 2	0.3	6.5	6.5	7.6	8.8	10.0	10.2	10.2	10.2	10.2
DS Online 3	0.4	9.0	6.5	7.2	8.0	8.9	8.9	8.9	8.9	8.9
DS Online 4	0.3	6.3	6.0	6.8	7.7	8.7	8.8	8.8	8.8	8.8
DS Data Storage products total	**1**	**22**	**19**	**22**	**25**	**28**	**28**	**28**	**28**	**28**
ES + DS total (excl. infrastructure)	**2**	**40**	**36**	**41**	**48**	**56**	**57**	**57**	**57**	**57**
PC Desktop	15.3	22.3	12.4	12.9	17.4	18.7	19.2	19.3	19.3	19.2
PC Integrated Desktop	0.6	1.0	0.5	0.6	0.8	0.9	1.1	1.1	1.1	1.1
PC Notebook	0.0	53.3	47.3	47.1	61.9	77.8	89.1	93.3	94.6	95.0
PC Tablet/slate	0.0	2.6	29.6	28.6	30.9	33.4	35.0	35.5	35.7	35.7
PC Thin client	0.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
PC Integrated Thin Client	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
PC Small-scale Server	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
PC Workstation	1.1	2.0	2.5	2.8	3.4	4.0	4.5	4.6	4.6	4.6
Total PC, electricity	**17**	**82**	**94**	**93**	**116**	**136**	**150**	**155**	**157**	**157**
Inkjet Printer	0.7	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Inkjet MFD	0.9	1.8	1.4	0.9	0.9	0.8	0.8	0.7	0.7	0.7
EP / Laser Printer mono	2.7	1.6	1.5	1.3	1.0	0.8	0.7	0.5	0.4	0.2
EP / Laser Printer colour	0.0	1.5	2.1	2.8	3.1	3.3	3.5	3.6	3.6	3.7
EP / Laser Copier mono	5.4	1.7	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser Copier colour	0.0	0.6	1.2	0.2	0.0	0.0	0.0	0.0	0.0	0.0
EP / Laser MFD mono	0.0	2.6	3.4	3.5	3.4	3.2	3.0	2.9	2.7	2.6
EP / Laser MFD colour	0.0	10.2	13.8	13.7	13.0	12.4	11.8	11.2	10.6	10.1
Consumables, paper, ink, toner	16.9	26.3	20.2	14.8	11.0	9.6	8.8	8.2	7.7	7.3
Total IE Imaging Equipment	**27**	**47**	**44**	**37**	**33**	**30**	**29**	**27**	**26**	**25**

db	ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	2.1	2.4	1.9	1.5	1.4	1.3	1.1	1.0	0.9	0.8
	SB Electric toothbrushes (off mode)	0.2	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	SB Audio speakers (wired) (sb & off modes)	4.7	2.6	1.6	0.6	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	1.6	4.4	5.1	5.1	5.1	5.1	5.1	5.1
	SB Small appliances (sb & off modes)	5.2	9.3	9.2	9.2	9.3	9.5	9.5	9.7	9.8	9.9
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	SB Media players and recorders (sb mode)	0.0	2.9	2.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.8	0.7	0.3	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.3	1.6	1.7	1.6	1.3	1.3	1.3	1.2	1.2	1.2
	SB Office phones (nsb mode)	0.4	0.9	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6
	SB Home NAS (nsb mode)	0.0	1.6	2.5	3.2	4.0	4.8	5.5	6.0	6.3	6.3
	SB Home Network Equipment (nsb mode)	0.0	3.4	3.9	4.2	4.4	4.7	5.0	5.1	5.1	5.1
	SB Office Network Equipment (nsb mode)	0.0	0.4	1.1	1.9	2.8	3.8	4.3	4.3	4.3	4.3
	SB Coffee makers (off mode)	1.0	1.2	1.1	1.1	1.2	1.2	1.3	1.3	1.3	1.4
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.2	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*	*0.1*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*
1	SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB Electric Ovens (sb mode)	0.0	0.5	0.6	0.5	0.4	0.2	0.2	0.2	0.2	0.2
1	SB Electric Hobs (sb mode)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.0	1.7	1.7	1.7	1.7	1.7	1.7	1.7
1	SB Game consoles (non-active modes)	0.0	0.4	0.5	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Inkjet Printers (nsb mode)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Laser Printers (nsb mode)	1.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2
1	SB IE Laser Copiers (nsb mode)	1.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	Total (networked) SB (incl. double)	17	31	33	33	34	36	38	38	38	39
	Total (networked) SB (excl. double)	**14**	**27**	**29**	**30**	**31**	**33**	**35**	**35**	**36**	**36**
0.0	EPS ≤ 6W, low-V	0.0	0.4	0.3	0.2	0.1	0.1	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.1	1.9	2.0	2.0	2.1	2.2	2.2	2.3	2.4	2.4
0.6	EPS 10–12 W	0.0	2.5	3.2	3.4	3.2	3.3	3.3	3.3	3.3	3.4
0.5	EPS 15–20 W	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1.0	EPS 20–30 W	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
1.0	EPS 65–120 W	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	1.1	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.0	EPS 12–15 W	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5
	EPS, total	**0.2**	**6.5**	**6.9**	**6.8**	**6.6**	**6.8**	**6.8**	**6.9**	**6.9**	**7.1**
	EPS, double counted subtracted	**0.1**	**3.5**	**3.7**	**3.7**	**3.5**	**3.6**	**3.6**	**3.6**	**3.7**	**3.8**
	TOTAL ELECTRONICS	**85**	**261**	**258**	**263**	**288**	**319**	**332**	**337**	**338**	**340**
	Total RF household Refrigerators & Freezers	**31**	**24**	**23**	**22**	**22**	**20**	**20**	**19**	**19**	**19**
	CF open vertical chilled multi deck (RVC2)	2.9	2.5	2.5	2.6	2.5	2.1	1.7	1.6	1.6	1.6
	CF open horizontal frozen island (RHF4)	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF other supermarket display (non-BCs)	5.6	5.1	5.5	5.9	5.9	5.7	5.3	5.3	5.5	5.7
	CF Plug in one door beverage cooler	3.4	3.3	3.4	3.5	3.1	2.6	2.4	2.4	2.5	2.6
	CF Plug in horizontal ice cream freezer	0.9	0.9	0.9	0.9	0.9	0.8	0.8	0.9	0.9	0.9
	CF Spiral vending machine	1.0	0.7	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6
	Total CF Commercial Refrigeration	**14**	**13**	**13**	**14**	**13**	**12**	**11**	**11**	**11**	**12**
	PF Storage cabinet Chilled Vertical (CV)	0.5	0.6	0.7	0.7	0.6	0.6	0.7	0.7	0.7	0.8
	PF Storage cabinet Frozen Vertical (FV)	0.4	0.5	0.6	0.6	0.5	0.5	0.6	0.6	0.6	0.6
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4
	PF Storage cabinet Frozen Horizontal (FH)	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinets All types	**1.3**	**1.7**	**1.8**	**1.9**	**1.7**	**1.7**	**1.8**	**1.8**	**1.9**	**2.0**
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.8	1.0	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.8	0.9	1.1	1.2	1.3	1.4	1.5	1.7
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.8	1.0	1.1	1.2	1.3	1.5	1.6	1.7
	PF Process Chiller AC LT L > 200 kW	0.4	0.7	0.9	1.0	1.1	1.3	1.4	1.5	1.6	1.8
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7	0.7
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8
	PF Process Chiller All MT&LT	**2**	**4**	**5**	**5**	**6**	**7**	**7**	**8**	**9**	**9**

db	ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.1	0.8	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.5
	PF Condensing Unit MT M 1-5 kW	2.7	2.0	2.1	2.4	2.5	2.8	3.0	3.3	3.5	3.8
	PF Condensing Unit MT L 5-20 kW	3.3	2.4	2.5	2.8	3.0	3.4	3.6	3.9	4.2	4.6
	PF Condensing Unit MT XL 20-50 kW	3.2	2.4	2.4	2.7	2.9	3.3	3.5	3.8	4.1	4.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.4	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	PF Condensing Unit LT L 2-8 kW	0.9	0.6	0.7	0.7	0.7	0.8	0.9	1.0	1.0	1.1
	PF Condensing Unit LT XL 8-20 kW	2.4	1.8	1.8	2.0	2.2	2.4	2.6	2.8	3.0	3.3
0.6	**PF Condensing Unit, All MT&LT**	**14**	**11**	**11**	**12**	**13**	**15**	**16**	**17**	**18**	**20**
	PF Professional Refrigeration, Total	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**17**	**18**	**19**
	TOTAL FOOD PRESERVATION	**54**	**46**	**47**	**48**	**48**	**46**	**46**	**47**	**48**	**50**
	CA Electric Hobs	6.5	11.0	12.2	14.1	15.3	16.5	17.2	17.9	18.7	19.5
	CA Electric Ovens	9.7	10.5	11.0	11.9	11.5	11.2	11.2	11.3	11.4	11.6
	CA Gas Hobs	3.6	3.5	3.5	2.8	2.9	2.9	2.8	2.7	2.6	2.5
	CA Gas Ovens	1.3	1.3	1.4	1.3	1.3	1.3	1.2	1.2	1.1	1.1
	CA Range Hoods	3.2	3.5	3.8	4.6	4.9	4.9	4.9	4.9	5.0	5.2
	TOTAL COOKING	**24**	**30**	**32**	**35**	**36**	**37**	**37**	**38**	**39**	**40**
	WM Washing Machines	24	23	22	22	21	20	20	20	20	20
	WD Washer-Dryers	2	3	3	3	2	3	2	3	3	3
	Total WM-WD household Washing	**27**	**25**	**25**	**24**	**23**	**23**	**23**	**23**	**23**	**23**
	including detergent and water costs	*12*	*11*	*11*	*10*	*10*	*10*	*10*	*10*	*11*	*11*
	Total DW household Dishwasher	**5.1**	**9.8**	**11.4**	**13.1**	**14.5**	**16.1**	**17.3**	**18.6**	**19.8**	**21.0**
	including detergent and water costs	*1.3*	*2.4*	*2.7*	*3.1*	*3.5*	*4.0*	*4.5*	*5.0*	*5.6*	*6.2*
	LD condensing heat pump		0.3	1.8	2.8	3.3	4.0	4.0	3.9	3.8	3.7
	LD condensing electric heat element	0.6	2.4	2.3	2.1	1.7	1.4	1.2	1.1	1.1	1.1
	LD vented electric	2.0	1.7	1.2	0.8	0.5	0.2	0.1	0.0	0.0	0.0
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	2.6	4.3	5.3	5.6	5.5	5.5	5.2	5.0	4.8	4.7
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total LD household Laundry Dryer	**3**	**4**	**5**	**6**	**6**	**6**	**5**	**5**	**5**	**5**
	VC Cylinder Domestic mains	3.8	5.5	6.1	4.7	3.4	2.6	1.9	1.6	1.6	1.6
	VC Upright Domestic mains	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.1	0.1	0.2	0.2	0.3	0.4	0.6	0.6	0.6	0.6
	VC Total Domestic mains	**3.8**	**5.7**	**6.3**	**5.0**	**3.8**	**3.1**	**2.5**	**2.3**	**2.2**	**2.2**
	VC Cylinder Commercial mains	0.7	1.7	1.8	1.4	1.4	1.4	1.3	1.3	1.3	1.3
	VC Upright Commercial mains	0.1	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.9**	**1.9**	**2.0**	**1.6**	**1.5**	**1.5**	**1.5**	**1.4**	**1.4**	**1.4**
	VC Total in scope of CR 666/2013	**4.7**	**7.6**	**8.3**	**6.6**	**5.3**	**4.6**	**4.0**	**3.7**	**3.7**	**3.7**
	VC Cordless - domestic - cleaning	0.1	0.3	0.9	2.1	3.3	4.6	5.7	6.4	6.6	6.7
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.1	0.3	0.4	0.5	0.6	0.6	0.6
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.3	0.5	1.0	1.5	2.0	2.5	2.7	2.8	2.9
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	VC Robot - domestic -standby	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.3	0.3
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**3.9**	**6.3**	**7.9**	**8.3**	**8.9**	**10.3**	**11.4**	**12.2**	**12.5**	**12.7**
	VC Total Commercial mains+cordless+robots	**0.9**	**1.9**	**2.0**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**	**1.7**
	VC Total All mains+cordless+robots	**4.8**	**8.3**	**9.9**	**10.0**	**10.6**	**11.9**	**13.1**	**13.8**	**14.2**	**14.4**
	Total VC Vacuum Cleaner incl. bags and filters	**6.0**	**10.1**	**11.8**	**11.9**	**12.5**	**13.8**	**14.9**	**15.7**	**16.1**	**16.2**
	including costs of bags & filters	*1.1*	*1.8*	*1.9*	*1.9*	*1.9*	*1.9*	*1.9*	*1.8*	*1.8*	*1.8*
	TOTAL CLEANING	**41**	**50**	**53**	**55**	**56**	**58**	**60**	**62**	**63**	**65**
0.5	FAN Axial<300Pa (all FAN types >125W)	3.2	8.3	10.3	12.1	12.7	13.2	13.1	13.0	12.9	12.9
0.5	FAN Axial>300Pa	5.3	14.5	17.0	19.1	19.6	20.1	19.9	19.9	19.9	20.1
0.5	FAN Centr.FC	1.6	3.2	4.2	5.1	5.1	5.1	5.0	4.9	4.9	4.8
0.5	FAN Centr.BC-free	3.2	6.1	7.6	8.7	9.4	10.4	10.9	11.2	11.4	11.7
0.5	FAN Centr.BC	3.6	7.6	9.8	11.2	12.2	13.3	14.2	15.2	16.3	17.8
0.5	FAN Cross-flow	0.3	0.5	0.9	1.1	1.1	1.1	1.2	1.2	1.3	1.3
	Total FAN, industrial (excl. box & roof fans)	**8.6**	**20.2**	**24.9**	**28.7**	**30.0**	**31.6**	**32.1**	**32.7**	**33.3**	**34.3**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.9	14.9	15.4	14.3	13.2	13.4	13.2	13.2	13.0	12.9
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	20.8	22.6	23.3	21.5	19.3	19.1	18.6	18.3	17.9	17.6
0.45	Medium (L) 3-ph 75-375 kW no VSD	41.2	43.5	44.0	41.8	38.5	34.6	32.4	30.8	29.5	29.1
0.45	**Total 3ph 0.75-375 kW no VSD**	**76**	**81**	**83**	**78**	**71**	**67**	**64**	**62**	**60**	**60**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1.2	2.5	3.5	5.8	7.4	8.1	8.5	9.1	9.6	10.3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.9	4.0	5.9	9.3	12.5	14.1	14.9	16.0	17.0	18.1
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.8	10.0	13.7	20.0	26.7	32.9	35.4	38.0	40.4	42.6
0.45	**Total 3-ph 0.75-375 kW with VSD**	**8**	**17**	**23**	**35**	**47**	**55**	**59**	**63**	**67**	**71**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**84**	**98**	**106**	**113**	**118**	**122**	**123**	**125**	**127**	**131**

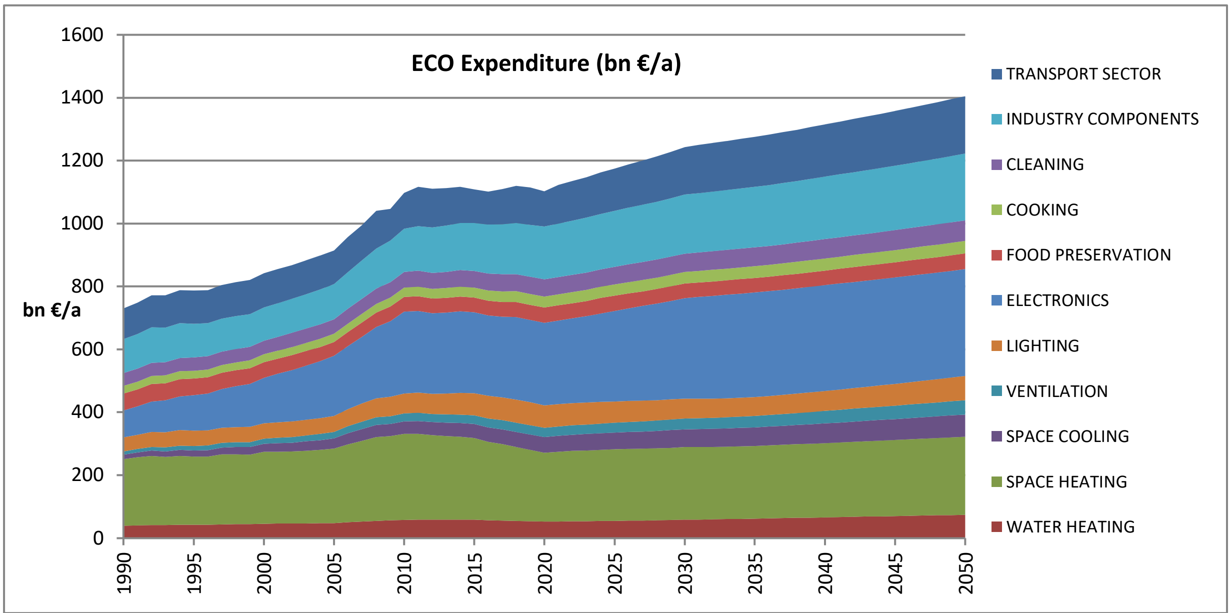
db	ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.4	1.8	1.9	2.0	2.2	2.2	2.2	2.1	2.1	2.1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.7	0.8	0.9	1.0	1.0	1.1	1.2	1.2	1.3
0.45	**Total Small 1-ph 0.12-0.75 kW**	**1**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.6	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.2	2.2
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.8	0.9
0.45	**Total Small 3-ph 0.12-0.75 kW**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
0.45	Large 3-ph LV 375-1000 kW no VSD	21.0	21.0	20.6	20.1	19.7	19.5	19.2	19.1	19.0	19.0
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.0	7.5	10.5	13.5	15.8	16.7	17.6	18.5	19.6
0.45	**Total Large 3-ph LV 375-1000 kW**	**22**	**26**	**28**	**31**	**33**	**35**	**36**	**37**	**38**	**39**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.8
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.4	1.5	1.6	1.8	1.9	1.9	2.0	2.0	2.1
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.5	2.8	3.1	3.4	3.7	3.8	3.9	4.0	4.1
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**4**	**4**	**5**	**5**	**6**	**6**	**6**	**7**	**7**	**7**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.1	1.2	1.3	1.3	1.3	1.4	1.4	1.5
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.3	1.4	1.6	1.8	1.9	1.9	2.0	2.0	2.1
0.45	**Total Brake 0.75-375 kW (no VSD)**	**2**	**3**	**3**	**3**	**4**	**4**	**4**	**4**	**4**	**4**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
0.45	8-pole motors (L) 3-ph 75-375 kW	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**6**	**8**	**8**	**9**	**10**	**10**	**10**	**11**	**11**	**11**
	MT Elec. Motors LV 0.12-1000 kW	**67**	**79**	**85**	**92**	**97**	**101**	**102**	**104**	**106**	**109**
	ESOB<45_VF	3.2	3.7	4.0	4.6	4.9	5.3	5.5	5.9	6.3	6.7
	ESOB<45_CF	2.3	2.7	3.0	3.5	3.8	4.2	4.4	4.7	5.0	5.4
	ESOB<45_VSD-VF	0.1	0.2	0.2	0.3	0.4	0.6	0.6	0.7	0.7	0.7
	ESOB < 45 Total	**5.6**	**6.6**	**7.3**	**8.3**	**9.1**	**10.0**	**10.5**	**11.3**	**12.0**	**12.8**
	ESOB_45-150_VF	1.0	1.1	1.2	1.3	1.4	1.5	1.5	1.7	1.8	1.9
	ESOB_45-150_CF	1.6	1.9	2.1	2.4	2.7	3.0	3.2	3.4	3.6	3.9
	ESOB_45-150_VSD-VF	0.1	0.1	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4
	ESOB 45-150 Total	**2.7**	**3.1**	**3.4**	**3.9**	**4.3**	**4.8**	**5.0**	**5.4**	**5.7**	**6.1**
	ESOB < 150 Total	**8.3**	**9.7**	**10.6**	**12.3**	**13.5**	**14.7**	**15.6**	**16.6**	**17.7**	**18.9**
	ESCC<45_VF	3.1	3.6	4.0	4.4	4.7	5.0	5.2	5.6	5.9	6.3
	ESCC<45_CF	2.4	3.0	3.2	3.7	4.0	4.4	4.6	4.9	5.2	5.6
	ESCC<45_VSD-VF	0.1	0.3	0.3	0.4	0.6	0.7	0.8	0.9	0.9	1.0
	ESCC < 45 Total	**5.7**	**6.9**	**7.5**	**8.5**	**9.3**	**10.1**	**10.6**	**11.4**	**12.1**	**12.9**
	ESCC_45-150_VF	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
	ESCC_45-150_CF	0.6	0.7	0.8	1.0	1.1	1.2	1.2	1.3	1.4	1.5
	ESCC_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	ESCC 45-150 Total	**1.6**	**1.8**	**2.0**	**2.3**	**2.5**	**2.8**	**2.9**	**3.1**	**3.3**	**3.6**
	ESCC < 150 Total	**7.2**	**8.7**	**9.5**	**10.8**	**11.8**	**12.8**	**13.6**	**14.5**	**15.4**	**16.5**
	ESCCi<45_VF	1.7	1.8	1.9	1.9	1.7	1.6	1.6	1.7	1.8	2.0
	ESCCi<45_CF	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	ESCCi<45_VSD-VF	0.3	0.6	0.7	0.9	1.3	1.6	1.8	1.9	2.0	2.1
	ESCCi < 45 Total	**2.2**	**2.6**	**2.8**	**3.1**	**3.3**	**3.5**	**3.7**	**4.0**	**4.2**	**4.5**
	ESCCi_45-150_VF	0.2	0.2	0.2	0.3	0.2	0.2	0.2	0.2	0.3	0.3
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	ESCCi 45-150 Total	**0.3**	**0.3**	**0.4**	**0.4**	**0.4**	**0.5**	**0.5**	**0.5**	**0.5**	**0.6**
	ESCCi < 150 Total	**2.5**	**2.9**	**3.2**	**3.5**	**3.8**	**4.0**	**4.2**	**4.5**	**4.8**	**5.1**
	MSSB<6"_VF	1.1	1.3	1.3	1.4	1.3	1.3	1.4	1.5	1.5	1.6
	MSSB<6"_CF	5.8	7.4	8.1	9.0	9.7	10.4	11.0	11.8	12.5	13.3
	MSSB<6"_VSD-VF	0.2	0.4	0.5	0.7	0.9	1.0	1.1	1.2	1.2	1.3
	MSSB <6" Total	**7.1**	**9.1**	**9.9**	**11.0**	**11.9**	**12.8**	**13.5**	**14.4**	**15.3**	**16.3**
	MS-V<25bar_VF	2.2	2.5	2.7	3.0	3.1	3.2	3.4	3.6	3.8	4.1
	MS-V<25bar_CF	1.7	2.0	2.2	2.5	2.8	3.0	3.2	3.4	3.6	3.9
	MS-V<25bar_VSD-VF	0.2	0.3	0.4	0.5	0.7	0.9	1.0	1.1	1.1	1.2
	MS_V <25 bar Total	**4.1**	**4.9**	**5.4**	**6.1**	**6.6**	**7.2**	**7.6**	**8.1**	**8.6**	**9.2**
	WP Water pumps	**29**	**35**	**39**	**44**	**48**	**51**	**54**	**58**	**62**	**66**
	Total WE Welding Equipment	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
	TOTAL INDUSTRY COMPONENTS	**108**	**138**	**152**	**168**	**178**	**188**	**192**	**199**	**205**	**213**

db	ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	TRAFO Distribution	1.8	2.5	2.9	3.0	3.3	3.5	3.7	3.9	4.0	4.2
	TRAFO Industry oil	1.2	1.8	2.1	2.1	2.2	2.3	2.3	2.4	2.5	2.7
	TRAFO Industry dry	0.4	0.6	0.7	0.8	0.8	0.9	0.9	1.0	1.0	1.1
	TRAFO Power	5.7	7.7	8.4	9.2	10.3	11.5	12.4	13.4	14.4	15.4
	TRAFO DER oil	0.0	0.1	0.1	0.2	0.3	0.5	0.8	1.1	1.5	1.9
	TRAFO DER dry	0.0	0.3	0.6	0.9	1.6	2.6	3.9	5.6	7.5	9.6
	TRAFO Small	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total TRAFO Utility Transformers	**9.4**	**13.2**	**15.1**	**16.4**	**18.8**	**21.6**	**24.3**	**27.6**	**31.2**	**35.1**
	TOTAL ENERGY SECTOR (only improvement over BAU)	**0**	**0**	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-3**	**-3**
	(incl. costs for fuel due to rolling resistance)										
	Tyres C1, replacement for cars	51	59	53	55	64	70	73	75	78	81
	Tyres C1, OEM for cars	15	17	17	17	20	22	22	23	24	25
	Tyres C1, total	**66**	**76**	**71**	**72**	**84**	**92**	**95**	**98**	**102**	**106**
	Tyres C2, replacement for vans	10	13	12	12	15	18	19	20	20	21
	Tyres C2, OEM for vans	2	3	3	3	3	4	4	4	4	5
	Tyres C2, total	**12**	**16**	**14**	**15**	**18**	**21**	**23**	**24**	**25**	**26**
	Tyres C3, replacement for trucks/busses	16	18	17	21	26	30	33	35	38	40
	Tyres C3, OEM for trucks/busses	4	4	4	5	6	7	8	9	9	10
	Tyres C3, total	**19**	**22**	**22**	**25**	**32**	**38**	**41**	**44**	**47**	**50**
	Tyres, total C1+C2+C3	**98**	**113**	**106**	**112**	**135**	**151**	**159**	**166**	**174**	**182**
	TRANSPORT SECTOR	**98**	**113**	**106**	**112**	**135**	**151**	**159**	**166**	**174**	**182**
	GENERAL TOTAL (in bn euros)	**730**	**1097**	**1109**	**1103**	**1175**	**1242**	**1274**	**1313**	**1355**	**1401**

	ECO Expenditure (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	**39**	**58**	**59**	**52**	**55**	**58**	**62**	**66**	**70**	**74**
	SPACE HEATING	**211**	**273**	**259**	**218**	**227**	**231**	**231**	**236**	**242**	**249**
	SPACE COOLING	**15**	**40**	**44**	**50**	**53**	**57**	**59**	**63**	**66**	**70**
	VENTILATION	**10**	**25**	**28**	**29**	**31**	**34**	**37**	**40**	**43**	**45**
1	***VENTILATION (from heat saving vs. BAU; already included in COST for space heating)***	***0***	***0***	***0***	***-1***	***-3***	***-4***	***-5***	***-5***	***-6***	***-6***
	LIGHTING	**44**	**63**	**70**	**72**	**68**	**63**	**60**	**63**	**69**	**77**
	ELECTRONICS	**85**	**261**	**258**	**263**	**288**	**319**	**332**	**337**	**338**	**340**
	FOOD PRESERVATION	**54**	**46**	**47**	**48**	**48**	**46**	**46**	**47**	**48**	**50**
	COOKING	**24**	**30**	**32**	**35**	**36**	**37**	**37**	**38**	**39**	**40**
	CLEANING	**41**	**50**	**53**	**55**	**56**	**58**	**60**	**62**	**63**	**65**
	INDUSTRY COMPONENTS	108	138	152	168	178	188	192	199	205	213
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	**98**	**113**	**106**	**112**	**135**	**151**	**159**	**166**	**174**	**182**
	TOTAL in bn euros 2020	**730**	**1097**	**1108**	**1103**	**1175**	**1243**	**1275**	**1315**	**1357**	**1405**

In Eurostat, energy consumed in Energy Sector and Distribution losses not counted as Final energy, hence Energy Sector separately reported:

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ENERGY SECTOR (ref BAU=0)	**0**	**0**	**0**	**0**	**0**	**-1**	**-1**	**-2**	**-3**	**-3**
Total in bn euros, incl. energy Sector	**730**	**1097**	**1109**	**1103**	**1175**	**1242**	**1274**	**1313**	**1355**	**1401**



Sector subdivision data for monetary sheets are currently available only for the Residential sector

Sector subdivision for ECO Expense (sector definitions and order as in Eurostat Energy Balances)

Space Heating: includes effects of heat load reduction due to heat savings by Ventilation Units
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating
Lighting: includes energy consumption by control gears and standby, but excludes Special Purpose Lamps and lighting controls

ECO Expense (summary RESIDENTIAL, bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	29	44	45	39	41	44	47	50	53	56
SPACE HEATING	153	191	180	149	156	157	157	161	165	170
SPACE & HT PROCESS COOLING	1	7	6	6	6	7	7	7	8	9
VENTILATION (acq, elec, maint)	1	3	3	4	8	9	10	13	15	16
LIGHTING	17	18	18	14	9	8	7	7	8	8
ELECTRONICS	52	144	147	148	163	181	192	196	198	199
FOOD PRESERVATION	29	22	21	21	21	19	18	18	18	18
COOKING	21	27	29	31	32	33	34	35	35	36
CLEANING	38	46	49	51	52	55	56	58	59	61
INDUSTRY COMPONENTS	6	7	8	9	10	11	11	12	13	14
ECO Expense, Residential, in bn euros 2020	**349**	**510**	**507**	**473**	**498**	**524**	**539**	**556**	**572**	**588**

db	SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EIWH Electric Instant. ≥ 12 kW (primary)	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ESWH Electric Storage ≤ 30 L (secondary)	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0
	ESWH Electric Storage > 30 L (primary)	0.0	0.0	0.1	0.7	1.2	1.7	1.8	1.8	1.8	1.9
	GIWH Gas Instant. < 13 L/min (secondary)	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
	GIWH Gas Instant. ≥ 13 L/min (primary)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	GSWH Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	GSWH Gas Storage, Non-condensing	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
	Dedicated WH Heat Pump	0.0	0.0	0.0	0.2	0.3	0.5	0.7	0.9	1.0	1.2
	Dedicated WH Solar (3.5 m2)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	WH dedicated Water Heater	**0.0**	**0.0**	**0.5**	**1.5**	**2.6**	**3.5**	**3.6**	**3.8**	**3.9**	**4.1**
	CHB Gas Combi Instant. WH	0.0	0.0	0.2	0.6	1.3	2.3	3.3	4.3	5.3	6.2
	CHB Gas + Cyl. WH	0.0	0.0	0.2	0.4	0.8	1.3	1.7	2.1	2.4	2.7
	CHB Jet Burner Gas + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Jet Burner Oil + Cyl. WH	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.4	0.4
	CHB Electric (Joule) + Cyl. WH	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	-0.1	-0.3	-0.4	-0.7	-0.9	-1.1
	CHB Electric HP + Cyl. WH	0.0	0.0	-0.1	-0.4	-1.3	-2.5	-3.8	-5.2	-6.7	-8.1
	CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.3
	CHB Gas mCHP + Cyl. WH	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	-0.1
	CHB Solar Combi (16 m2)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHC Central Heating combi, water heating	**0.0**	**0.0**	**0.4**	**0.5**	**0.7**	**1.0**	**0.8**	**0.5**	**0.2**	**-0.2**
	TOTAL WATER HEATING	**0.0**	**0.0**	**0.8**	**2.0**	**3.3**	**4.5**	**4.4**	**4.3**	**4.1**	**3.9**
	CHB Gas non-condensing	0.0	0.7	3.6	9.2	15.8	22.2	24.1	22.5	20.6	18.0
	CHB Gas condensing	0.0	0.5	0.7	-2.8	-2.3	-0.9	3.3	10.6	17.7	24.3
	CHB Gas Jet burner non-condensing	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.4	0.4
	CHB Gas Jet burner condensing	0.0	0.0	-0.1	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3
	CHB Oil Jet burner non-condensing	0.0	0.3	1.0	2.2	3.7	5.0	5.7	6.1	5.8	5.5
	CHB Oil Jet burner condensing	0.0	0.0	-0.3	-1.2	-1.7	-2.2	-2.6	-3.0	-2.9	-2.7
	CHB Electric Joule-effect	0.0	0.0	0.1	0.2	0.3	0.4	0.3	0.3	0.2	0.2
	CHB Hybrid (gas-electric)	0.0	0.0	0.0	-0.1	-0.6	-1.3	-2.1	-2.9	-3.8	-4.3
	CHB Electric Heat Pump	0.0	0.0	0.4	-1.4	-5.6	-10.8	-16.6	-22.6	-28.3	-33.5
	CHB Gas Heat Pump	0.0	0.0	0.0	-0.1	-0.3	-0.5	-0.7	-0.9	-1.0	-1.0
	CHB micro CHP	0.0	0.0	-0.1	-0.2	-0.4	-0.6	-0.6	-0.7	-0.5	-0.3
	CHB Solar combi (16 m2)	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CHB Central Heating boiler < 400 kW, space heating	**0**	**2**	**5**	**6**	**9**	**12**	**11**	**10**	**8**	**6**
	SFB Wood Manual	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1	0.0	0.0
	SFB Wood Direct Draft	0.0	0.0	0.0	0.0	-0.3	-0.2	-0.2	-0.2	-0.2	-0.1
	SFB Coal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0
	SFB Pellets	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	SFB Wood chips	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	Total Solid Fuel Boiler	**0.0**	**0.0**	**-0.1**	**-0.1**	**-0.2**	**0.1**	**0.1**	**0.1**	**0.0**	**0.1**
	CHAE-S (≤ 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1
	CHAE-L (> 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.1
	CHWE-S (≤ 400 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-M (> 400 kW; ≤ 1500 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHWE-L (> 1500 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CHF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	HT PCH-AE-S	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.6	0.5	0.4
	HT PCH-AE-L	0.0	0.0	0.0	0.2	0.5	0.8	0.9	1.0	0.9	0.8
	HT PCH-WE-S	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0
	HT PCH-WE-M	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0
	HT PCH-WE-L	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC rooftop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AC splits	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.1	0.1	0.1
	AC VRF	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
	ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Cooling	**0.0**	**0.0**	**0.0**	**0.5**	**1.4**	**2.2**	**2.5**	**2.4**	**2.1**	**1.9**
	AC rooftop (rev)	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.0	0.0	0.0
	AC splits (rev)	0.0	0.0	0.0	0.2	0.4	0.5	0.5	0.4	0.3	0.3
	AC VRF (rev)	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.6	0.6	0.5
	ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	AHF	0.0	0.0	0.0	0.2	0.6	1.0	1.1	1.0	0.9	0.8
	AHE	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SubTotal AHC Air Heating	**0.0**	**0.0**	**0.1**	**0.6**	**1.4**	**2.1**	**2.3**	**2.1**	**1.9**	**1.6**
	Total AHC Air Heating & Cooling	**0.0**	**0.0**	**0.1**	**1.1**	**2.8**	**4.3**	**4.7**	**4.5**	**4.0**	**3.5**

db	SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0.0	0.0	0.0	-0.5	-0.7	-0.5	-0.3	-0.2	0.0	0.1
	LH closed fireplace/inset	0.0	0.0	0.0	-0.5	-0.7	-0.4	-0.2	0.0	0.2	0.3
	LH wood stove	0.0	0.0	0.0	-0.2	-0.3	-0.2	0.0	0.1	0.2	0.2
	LH coal stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker	0.0	0.0	0.0	-0.2	-0.3	-0.2	0.0	0.1	0.1	0.1
	LH SHR stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	LH pellet stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Solid fuel sum	**0.0**	**0.0**	**0.0**	**-1.5**	**-1.9**	**-1.2**	**-0.5**	**0.0**	**0.5**	**0.8**
	LH Electric portable	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.6	0.5	0.5
	LH Electric fixed > 250W	0.0	0.0	0.1	0.7	1.3	1.7	1.6	1.5	1.5	1.4
	LH Electric fixed ≤ 250W	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	LH Electric storage	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	LH Electric underfloor	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2
	LH Electric visibly glowing > 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric visibly glowing ≤ 1.2 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric Towel Heaters	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Electric sum	**0.0**	**0.0**	**0.2**	**1.3**	**2.3**	**2.8**	**2.7**	**2.6**	**2.5**	**2.5**
	LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous Tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gas flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Gaseous fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Liquid tube (commercial < 120 kW)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid open front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH Liquid fuel sum	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	LH Local Space Heaters total	**0.0**	**0.0**	**0.2**	**-0.2**	**0.4**	**1.6**	**2.2**	**2.7**	**3.0**	**3.3**
	RAC fixed < 6 kW, cooling	0.0	0.1	0.3	0.2	0.3	0.5	0.7	0.8	0.9	1.0
	RAC fixed 6-12 kW, cooling	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.4
	RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, cooling mode	**0.0**	**0.2**	**0.3**	**0.4**	**0.5**	**0.7**	**0.9**	**1.0**	**1.2**	**1.5**
	RAC fixed < 6 kW, reversible, heating	0.0	0.4	0.8	0.9	1.1	1.4	1.5	1.5	1.6	1.8
	RAC fixed 6-12 kW, reversible, heating	0.0	0.3	0.5	0.7	0.8	0.9	0.9	0.9	1.0	1.1
	RAC portable < 12 kW, reversible, heating	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RAC < 12 kW total, heating mode	**0.0**	**0.7**	**1.3**	**1.6**	**2.0**	**2.3**	**2.4**	**2.4**	**2.6**	**2.9**
	RAC Room Air Conditioner	**0.0**	**0.9**	**1.6**	**2.0**	**2.5**	**3.0**	**3.3**	**3.4**	**3.8**	**4.4**
1	CIRC Integrated circulators	0.0	0.0	0.2	1.0	1.7	1.8	1.7	1.5	1.3	1.1
0.38	CIRC Large standalone circulators	0.0	0.0	-0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.1
0.38	CIRC Small standalone circulators	0.0	0.0	-0.1	0.3	0.5	0.4	0.4	0.4	0.4	0.4
	CIRC Circulator pumps <2.5 kW, all	**0.0**	**0.0**	**-0.2**	**1.5**	**2.4**	**2.5**	**2.3**	**2.1**	**1.8**	**1.6**
	CIRC Circulator pumps <2.5 kW, excl. double	**0.0**	**0.0**	**-0.2**	**0.3**	**0.5**	**0.4**	**0.4**	**0.4**	**0.4**	**0.3**
	TOTAL SPACE HEATING	**0**	**2**	**6**	**8**	**13**	**18**	**18**	**17**	**16**	**15**
	TOTAL SPACE COOLING	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
	R-UVU ≤ 100 m3/h for Extract Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-UVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.1
	R-UVU 100-250 m3/h	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	R-UVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.2	0.3	0.4	0.4	0.4	0.4
	R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4
	R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	RVU, Total residential	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.5**	**0.7**	**0.8**	**1.0**	**1.1**
	NR-UVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	NR-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	NR-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	NR-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.0	-0.1	-0.1	0.0	0.1	0.1	0.1	0.2
	NR-AHU-M 5500-14500 m3/h	0.0	0.0	-0.1	-0.2	0.0	0.2	0.3	0.4	0.5	0.5
	NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2
	NRVU, Total non-residential	**0.0**	**0.0**	**-0.1**	**-0.2**	**0.1**	**0.5**	**0.8**	**1.0**	**1.1**	**1.3**
	VU Ventilation Units, res + non-res.	**0.0**	**0.0**	**-0.2**	**-0.3**	**0.3**	**1.0**	**1.4**	**1.7**	**2.1**	**2.4**
	TOTAL VENTILATION (VU own electricity & acq & maint)	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**	**2**
1	*Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)*	*0*	*0*	*0*	*1*	*3*	*4*	*5*	*5*	*6*	*6*

db	SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	0.0	0.2	1.7	2.9	8.9	14.7	15.9	14.1	11.7	9.6
	HID (HPM, HPS, MH)	0.0	0.2	2.3	4.2	4.7	4.4	2.9	1.8	1.1	0.6
	CFLni (all shapes)	0.0	0.0	0.3	0.9	1.4	1.2	0.7	0.4	0.2	0.1
	CFLi (retrofit for GLS, HL)	0.0	-1.3	-0.4	1.3	3.0	3.2	2.2	1.5	0.9	0.6
	GLS (DLS & NDLS)	0.0	4.2	7.6	7.6	4.6	2.8	1.6	1.0	0.6	0.3
	HL (DLS & NDLS, LV & MV)	0.0	-1.0	-0.6	9.3	10.0	5.5	2.9	1.5	0.9	0.5
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.6	-0.9	-6.2	-7.3	-6.5	-5.2	-4.0	-2.8
	LED replacing HID (retrofit & luminaire)	0.0	0.0	-2.9	-2.4	-2.5	-1.6	-0.9	-0.4	-0.1	0.2
	LED replacing CFLni (retrofit & luminaire)	0.0	0.0	-0.3	-0.6	-0.8	-0.6	-0.3	-0.1	-0.1	0.0
	LED replacing DLS (retrofit & luminaire)	0.0	-0.2	-1.2	-1.0	-0.9	-0.4	-0.3	-0.2	-0.2	-0.1
	LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-3.3	-4.8	-3.4	-2.5	-1.2	-0.8	-0.5	-0.3
	Standby (nrgcost only)	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	TOTAL LIGHTING (incl. standby)	**0**	**2**	**3**	**16**	**19**	**19**	**17**	**14**	**11**	**9**
	DP TV total all types	0.0	0.0	0.9	3.6	6.8	9.7	10.4	8.8	7.4	6.7
	DP Monitor	0.0	0.0	0.1	0.5	0.6	0.6	0.5	0.4	0.4	0.3
	DP Signage	0.0	0.0	0.0	0.0	0.1	0.8	1.3	1.2	0.7	0.2
	DP Electronic Displays, total	**0**	**0**	**1**	**4**	**8**	**11**	**12**	**10**	**8**	**7**
	SSTB	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	CSTB (all covered modes)	0.0	0.0	0.4	1.0	1.0	0.8	0.8	0.8	0.8	0.8
	Total STB set top boxes (Complex & Simple)	**0.0**	**0.2**	**0.4**	**1.0**	**1.0**	**0.8**	**0.8**	**0.8**	**0.8**	**0.8**
	Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Game consoles > 20 W Non-Active (CR)	0.0	0.0	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	Game consoles < 20 W Non-Active (CR)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Game consoles < 20 W Active (no reg.)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total Game consoles, active modes	0.0	0.0	0.1	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Total Game consoles, non-active modes	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.5	0.5	0.5
	Total Game consoles > 20 W, all modes	0.0	0.0	0.2	0.7	0.7	0.7	0.7	0.7	0.7	0.8
	Total Game consoles < 20 W, all modes	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Total Game consoles, all modes	**0.0**	**0.0**	**0.2**	**0.8**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**	**0.9**
	ES&DS only, without effects on infrastructure										
	ES tower 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket traditional	0	0	0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	ES rack 2-socket cloud	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	ES rack 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 2-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient trad.	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES rack 4-socket resilient cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 1-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 2-socket cloud	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	ES blade 4-socket traditional	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES blade 4-socket cloud	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ES total traditional	**0**	**0**	**0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ES total cloud	**0**	**0**	**0**	**0.2**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	ES Enterprise Servers total	**0**	**0**	**0**	**0.3**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**	**0.4**
	DS Online 2	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	DS Online 3	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Online 4	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	DS Data Storage products total	**0**	**0**	**0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ES + DS total (excl. infrastructure)	**0**	**0**	**0**	**0.3**	**0.5**	**0.6**	**0.6**	**0.6**	**0.6**	**0.6**
	PC Desktop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Desktop	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Notebook	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Tablet/slate	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Thin client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Integrated Thin Client	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Small-scale Server	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PC Workstation	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total PC, electricity	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	Inkjet Printer	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Inkjet MFD	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	EP / Laser Printer mono	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	EP / Laser Printer colour	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4
	EP / Laser Copier mono	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser Copier colour	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EP / Laser MFD mono	0.0	0.1	0.2	0.4	0.4	0.4	0.4	0.3	0.3	0.3
	EP / Laser MFD colour	0.0	0.1	0.2	0.4	0.5	0.4	0.4	0.4	0.4	0.4
	Consumables, paper, ink, toner	0.0	0.2	0.7	0.6	0.5	0.4	0.4	0.3	0.3	0.3
	Total IE Imaging Equipment	**0.0**	**0.6**	**1.5**	**2.0**	**1.9**	**1.8**	**1.7**	**1.6**	**1.6**	**1.5**

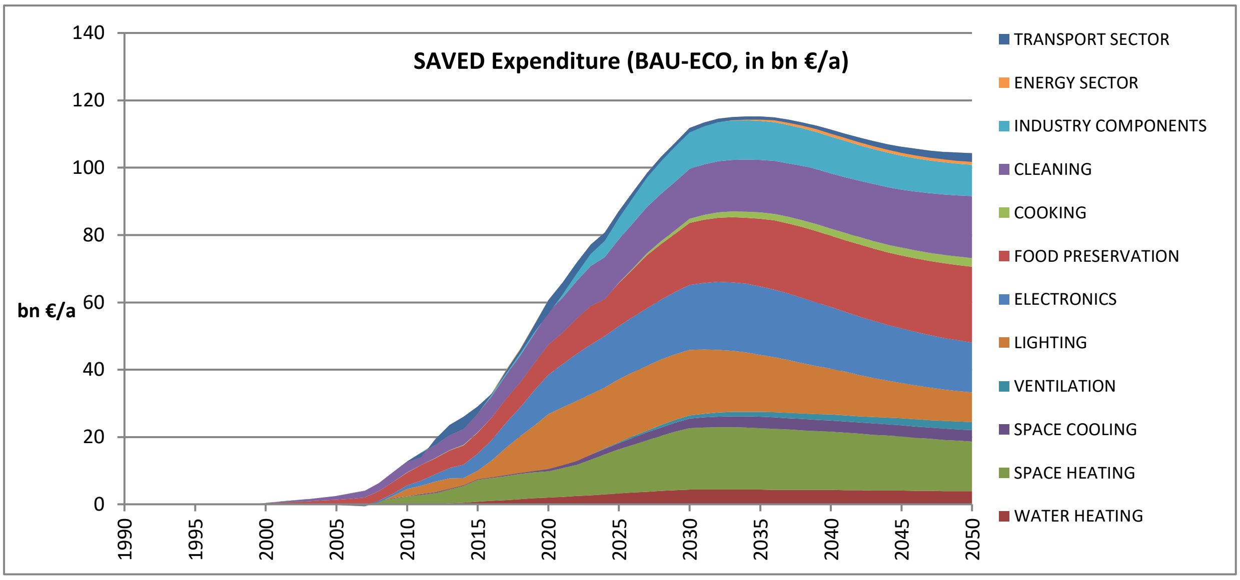
db	**SAVED Expenditure (BAU-ECO, in bn euros 2020)**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
	Products regulated only for (networked) standby										
	SB Radios (sb & off modes)	0.0	0.0	0.1	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	SB Electric toothbrushes (off mode)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	SB Audio speakers (wired) (sb & off modes)	0.0	0.1	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.0	0.4	0.7	0.7	0.7	0.7	0.7	0.7
	SB Small appliances (sb & off modes)	0.0	0.0	0.4	0.8	0.8	0.9	0.9	0.9	0.9	0.9
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	SB Media players and recorders (sb mode)	0.0	0.1	0.6	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.0	0.0	0.0	0.1	0.2	0.2	0.1	0.1	0.0	0.0
	SB Office phones (nsb mode)	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.0	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.4
	SB Home Network Equipment (nsb mode)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.5	0.5	0.6
	SB Coffee makers (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Products regulated also for (networked) standby										
	(already accounted elsewhere; here for info only)										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.1	0.2	0.2	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*	*0.3*
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	*0.1*	*0.1*	*0.1*	*0.1*	*0.2*	*0.2*
1	SB Laundry Dryers (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.0	0.2	0.4	0.7	1.0	1.1	1.1	1.1	1.1
1	SB Electric Hobs (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.4
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.2	0.7	0.6	0.5	0.5	0.5	0.5	0.5
1	SB Game consoles (non-active modes)	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.5	0.5	0.5
1	SB IE Inkjet Printers (nsb mode)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Inkjet MFDs (nsb mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB IE Laser Printers (nsb mode)	0.0	0.1	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3
1	SB IE Laser Copiers (nsb mode)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.1	0.3	0.6	0.6	0.6	0.6	0.6	0.5	0.5
	Total (networked) SB (incl. double)	0	1	3	6	7	7	7	7	7	7
	Total (networked) SB (excl. double)	**0**	**0**	**2**	**3**	**3**	**3**	**3**	**3**	**3**	**3**
0.0	EPS ≤ 6W, low-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.3	EPS 6–10 W	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	0.1
0.6	EPS 10–12 W	0.0	0.0	0.3	0.7	0.9	0.8	0.7	0.6	0.5	0.4
0.5	EPS 15–20 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 20–30 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.8	EPS 30–65 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 30-65 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1.0	EPS 65–120 W	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.5	EPS 65–120 W, multiple-V	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.0	EPS 12–15 W	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	EPS, total	**0.0**	**0.0**	**0.4**	**0.9**	**1.2**	**1.2**	**1.0**	**0.9**	**0.7**	**0.6**
	EPS, double counted subtracted	**0.0**	**0.0**	**0.2**	**0.5**	**0.7**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**
	TOTAL ELECTRONICS	**0**	**1**	**5**	**12**	**16**	**19**	**20**	**18**	**16**	**15**
	Total RF household Refrigerators & Freezers	**0**	**4**	**6**	**9**	**10**	**14**	**14**	**15**	**15**	**15**
	CF open vertical chilled multi deck (RVC2)	0.0	0.0	0.0	0.0	0.2	0.7	1.0	1.1	1.2	1.2
	CF open horizontal frozen island (RHF4)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CF other supermarket display (non-BCs)	0.0	0.0	0.0	0.0	0.3	1.0	1.5	1.7	1.7	1.8
	CF Plug in one door beverage cooler	0.0	0.0	0.0	0.0	0.5	1.2	1.4	1.5	1.5	1.5
	CF Plug in horizontal ice cream freezer	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	CF Spiral vending machine	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	Total CF Commercial Refrigeration	**0.0**	**0.0**	**0.0**	**0.1**	**1.1**	**3.1**	**4.3**	**4.6**	**4.7**	**4.9**
	PF Storage cabinet Chilled Vertical (CV)	0	0	0	0.0	0.2	0.2	0.2	0.2	0.2	0.3
	PF Storage cabinet Frozen Vertical (FV)	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Storage cabinet Chilled Horizontal (CH)	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinet Frozen Horizontal (FH)	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Storage cabinets All types	**0**	**0**	**0**	**0.2**	**0.6**	**0.7**	**0.8**	**0.8**	**0.8**	**0.9**
	PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC MT L > 300 kW	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller AC LT L > 200 kW	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC MT L > 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Process Chiller WC LT L > 200 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
	PF Process Chiller All MT&LT	**0**	**0**	**0**	**0.1**	**0.3**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**

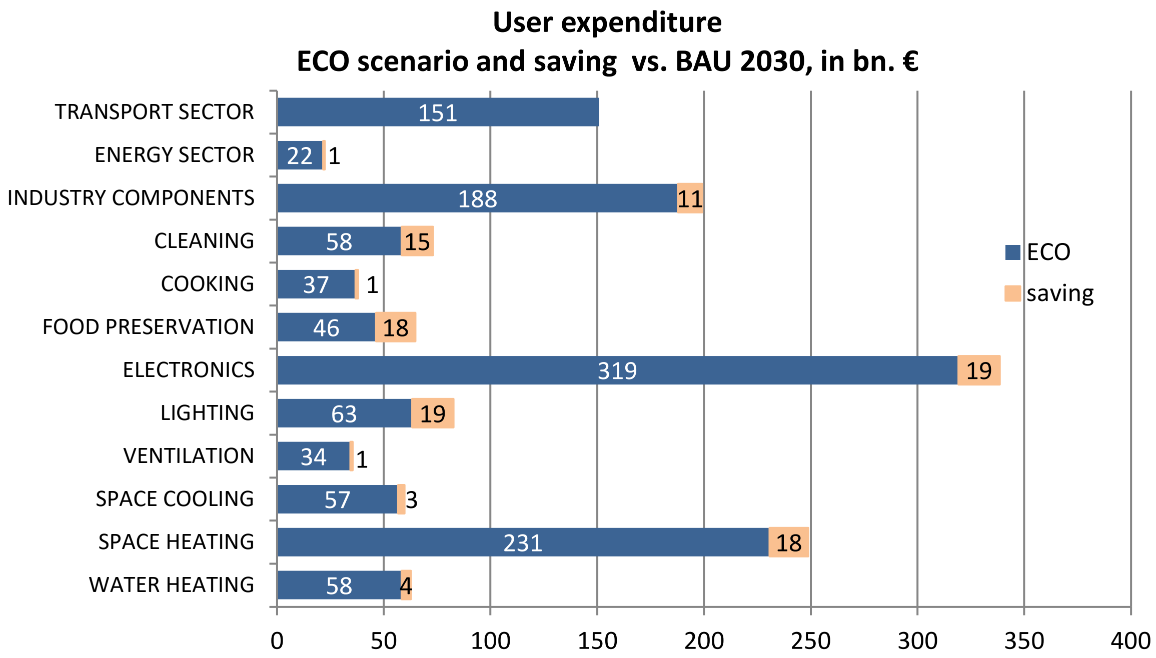
db	SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit MT M 1-5 kW	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT L 5-20 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.4
	PF Condensing Unit MT XL 20-50 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Condensing Unit LT S 0.1-0.4 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	PF Condensing Unit LT M 0.4-2 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Condensing Unit LT L 2-8 kW	0	0	0	0.1	0.1	0.1	0.1	0.1	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
0.6	**PF Condensing Unit, All MT&LT**	**0**	**0**	**0**	**0.5**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.7**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0.5**	**1.3**	**1.7**	**1.8**	**2.0**	**2.1**	**2.2**
	TOTAL FOOD PRESERVATION	**0**	**4**	**6**	**9**	**13**	**18**	**20**	**21**	**22**	**23**
	CA Electric Hobs	0.0	0.0	0.1	-0.1	0.0	0.1	0.1	0.1	0.2	0.2
	CA Electric Ovens	0.0	0.0	0.1	0.2	0.6	1.3	1.5	1.5	1.6	1.6
	CA Gas Hobs	0.0	0.0	0.0	-0.1	0.0	0.0	0.0	0.0	0.0	0.0
	CA Gas Ovens	0.0	0.0	0.0	-0.2	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
	CA Range Hoods	0.0	0.0	0.0	-0.3	-0.3	0.0	0.3	0.5	0.6	0.8
	TOTAL COOKING	**0.0**	**0.0**	**0.1**	**-0.5**	**0.0**	**1.3**	**1.8**	**2.1**	**2.3**	**2.6**
	WM Washing Machines	0.0	3.1	5.1	6.2	7.3	8.2	8.5	8.7	8.7	8.7
	WD Washer-Dryers	0.0	0.2	0.5	0.6	0.8	0.8	0.8	0.7	0.7	0.7
	Total WM-WD household Washing	**0.0**	**3.4**	**5.5**	**6.8**	**8.1**	**9.0**	**9.2**	**9.4**	**9.4**	**9.4**
	including detergent and water savings	*0.0*	*3.0*	*4.4*	*5.3*	*6.3*	*7.0*	*7.3*	*7.6*	*8.0*	*8.4*
	Total DW household Dishwasher	**0.0**	**0.0**	**0.6**	**1.3**	**2.1**	**2.8**	**3.5**	**4.2**	**5.0**	**6.0**
	including detergent and water savings	*0.0*	*0.6*	*1.0*	*1.3*	*1.6*	*2.0*	*2.3*	*2.7*	*3.1*	*3.5*
	LD condensing heat pump		-0.2	-1.7	-2.6	-3.0	-3.5	-3.4	-3.2	-2.9	-2.6
	LD condensing electric heat element	0.0	0.0	0.6	1.3	1.8	2.1	2.1	2.0	1.9	1.7
	LD vented electric	0.0	0.1	0.5	0.8	1.1	1.3	1.5	1.6	1.6	1.6
	LD vented gas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LD Laundry Dryers, sum active modes	0.0	-0.1	-0.6	-0.5	-0.2	-0.1	0.1	0.3	0.4	0.6
	LD Laundry Dryers, low-power modes	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	**0.0**	**-0.1**	**-0.6**	**-0.5**	**-0.1**	**-0.1**	**0.2**	**0.4**	**0.5**	**0.6**
	VC Cylinder Domestic mains	0.0	0.0	0.0	1.4	2.1	1.9	1.4	1.1	1.0	1.0
	VC Upright Domestic mains	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Handstick Domestic mains	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
	VC Total Domestic mains	**0.0**	**0.0**	**0.0**	**1.4**	**2.1**	**2.0**	**1.5**	**1.2**	**1.2**	**1.1**
	VC Cylinder Commercial mains	0.0	0.0	0.1	0.6	0.7	0.9	1.0	1.1	1.1	1.1
	VC Upright Commercial mains	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	VC Total Commercial mains	**0.0**	**0.0**	**0.1**	**0.6**	**0.8**	**1.0**	**1.1**	**1.2**	**1.2**	**1.2**
	VC Total in scope of CR 666/2013	**0.0**	**0.0**	**0.1**	**2.1**	**3.0**	**3.0**	**2.7**	**2.4**	**2.3**	**2.3**
	VC Cordless - domestic - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - domestic - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Cordless - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - cleaning	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - domestic -standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Robot - commercial - standby	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	VC Total Domestic mains+cordless+robots	**0.0**	**0.0**	**0.0**	**1.4**	**2.1**	**2.0**	**1.5**	**1.2**	**1.2**	**1.1**
	VC Total Commercial mains+cordless+robots	**0.0**	**0.0**	**0.1**	**0.6**	**0.8**	**1.0**	**1.1**	**1.2**	**1.2**	**1.2**
	VC Total All mains+cordless+robots	**0.0**	**0.0**	**0.1**	**2.1**	**3.0**	**3.0**	**2.7**	**2.4**	**2.3**	**2.3**
	Total VC Vacuum Cleaner incl. bags and filters	**0.0**	**0.0**	**0.1**	**2.1**	**3.0**	**3.0**	**2.7**	**2.4**	**2.3**	**2.3**
	including costs of bags & filters	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*	*0.0*
	TOTAL CLEANING	**-**	**3**	**6**	**10**	**13**	**15**	**16**	**16**	**17**	**18**
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	-0.1	0.4	1.4	2.1	2.3	2.4	2.5	2.6
0.5	FAN Axial>300Pa	0.0	0.0	0.3	1.0	2.1	2.9	3.2	3.2	3.2	3.2
0.5	FAN Centr.FC	0.0	0.0	-0.2	-0.2	0.3	0.7	0.9	0.9	1.0	1.1
0.5	FAN Centr.BC-free	0.0	0.0	0.1	0.6	1.2	1.7	1.8	1.9	2.0	2.0
0.5	FAN Centr.BC	0.0	0.0	-0.2	0.3	1.1	1.7	1.9	2.1	2.4	2.8
0.5	FAN Cross-flow	0.0	0.0	-0.3	-0.3	-0.2	-0.1	-0.1	0.0	0.0	0.0
	Total FAN, industrial (excl. box & roof fans)	**0.0**	**0.0**	**-0.1**	**0.9**	**3.0**	**4.5**	**5.0**	**5.3**	**5.5**	**5.9**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.5	2.6	4.2	4.3	3.8	3.2	2.4	1.4
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	0.9	4.2	7.4	7.8	6.9	5.7	4.1	2.1
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.0	1.6	6.3	11.0	14.2	12.0	8.3	4.4	1.8
0.45	**Total 3ph 0.75-375 kW no VSD**	**0.0**	**0.0**	**3.0**	**13.0**	**22.6**	**26.3**	**22.7**	**17.1**	**10.9**	**5.3**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.4	-2.0	-2.9	-2.7	-2.3	-1.8	-1.2	-0.3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-0.9	-3.1	-4.9	-4.8	-4.1	-3.2	-2.1	-0.7
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-1.1	-4.0	-6.6	-8.2	-6.4	-3.9	-1.5	0.2
0.45	**Total 3-ph 0.75-375 kW with VSD**	**0.0**	**0.0**	**-2.4**	**-9.1**	**-14.4**	**-15.7**	**-12.8**	**-8.9**	**-4.7**	**-0.9**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**0.0**	**0.0**	**0.6**	**3.9**	**8.2**	**10.6**	**9.9**	**8.2**	**6.1**	**4.4**

db	SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0.0	-0.2	-0.1	-0.1	-0.1	-0.1	-0.1
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**-0.2**	**-0.1**	**-0.1**	**-0.1**	**-0.1**	**-0.1**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Large 3-ph LV 375-1000 kW no VSD	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0	0	0	0.0	0.1	0.2	0.3	0.3	0.3	0.3
0.45	**Total Large 3-ph LV 375-1000 kW**	**0**	**0**	**0**	**0.0**	**0.1**	**0.2**	**0.4**	**0.4**	**0.4**	**0.4**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Explosion motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	Brake motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total Brake 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0**	**0**	**0**	**0.0**	**-0.1**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**
	MT Elec. Motors LV 0.12-1000 kW	**0**	**0**	**0**	**2**	**4**	**6**	**6**	**5**	**4**	**3**
	including double counted amounts	-	-0	1	4	8	11	10	9	7	5
	ESOB<45_VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	ESOB<45_CF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ESOB<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB < 45 Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESOB_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESOB 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESOB < 150 Total	**0.0**	**0.0**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
	ESCC<45_VF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0
	ESCC<45_CF	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0
	ESCC<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC < 45 Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESCC_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCC 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCC < 150 Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	ESCCi<45_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi<45_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi<45_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi < 45 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi_45-150_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_CF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi_45-150_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	ESCCi 45-150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	ESCCi < 150 Total	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
	MSSB<6"_VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MSSB<6"_CF	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	MSSB<6"_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MSSB <6" Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	MS-V<25bar_VF	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
	MS-V<25bar_CF	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.0	0.0
	MS-V<25bar_VSD-VF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	MS_V <25 bar Total	**0.0**	**0.0**	**0.0**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
	WP Water pumps	**0.0**	**0.0**	**0.1**	**0.5**	**0.6**	**0.6**	**0.6**	**0.5**	**0.4**	**0.4**
	Total WE Welding Equipment	**0.0**	**0.0**	**0.0**	**0.0**	**0.1**	**0.3**	**0.3**	**0.3**	**0.3**	**0.3**
	TOTAL INDUSTRY COMPONENTS	**0**	**0**	**0**	**4**	**8**	**11**	**12**	**11**	**10**	**9**

db SAVED Expenditure (BAU-ECO, in bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution	0.0	0.0	-0.1	0.0	0.1	0.3	0.4	0.6	0.8	1.0
TRAFO Industry oil	0.0	0.0	-0.2	0.0	0.2	0.4	0.6	0.7	0.8	0.9
TRAFO Industry dry	0.0	0.0	-0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
TRAFO Power	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TRAFO DER oil	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4
TRAFO DER dry	0.0	0.0	-0.1	0.0	0.0	0.0	0.2	0.4	0.6	1.0
TRAFO Small	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total TRAFO Utility Transformers	**0.0**	**0.0**	**-0.4**	**-0.1**	**0.3**	**0.7**	**1.3**	**2.0**	**2.6**	**3.4**
TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**3**	**3**
(incl. costs for fuel due to rolling resistance)										
Tyres C1, replacement for cars	0.0	-0.3	2.2	-1.7	-0.6	-0.4	-0.2	-0.5	-1.2	-1.9
Tyres C1, OEM for cars	0.0	0.0	0.0	-1.1	-0.7	-0.6	-0.6	-0.7	-0.7	-0.8
Tyres C1, total	**0.0**	**-0.3**	**2.2**	**-2.9**	**-1.3**	**-1.0**	**-0.9**	**-1.2**	**-1.9**	**-2.7**
Tyres C2, replacement for vans	0.0	0.1	0.8	-0.1	0.4	0.5	0.5	0.5	0.4	0.2
Tyres C2, OEM for vans	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Tyres C2, total	**0.0**	**0.1**	**0.8**	**-0.1**	**0.4**	**0.5**	**0.5**	**0.5**	**0.3**	**0.2**
Tyres C3, replacement for trucks/busses	0.0	0.1	-0.7	-1.0	-0.8	-0.5	-0.3	-0.1	0.0	0.2
Tyres C3, OEM for trucks/busses	0.0	0.0	0.0	0.0	-0.4	-0.4	-0.3	-0.3	-0.3	-0.2
Tyres C3, total	**0.0**	**0.1**	**-0.7**	**-1.1**	**-1.2**	**-0.8**	**-0.6**	**-0.4**	**-0.2**	**-0.1**
Tyres, total C1+C2+C3	**0.0**	**-0.1**	**2.2**	**-4.0**	**-2.1**	**-1.3**	**-0.9**	**-1.1**	**-1.8**	**-2.5**
TRANSPORT SECTOR	0.0	-0.1	2.2	-4.0	-2.1	-1.3	-0.9	-1.1	-1.8	-2.5
SAVED GENERAL TOTAL (in bn euros 2020)	**0**	**13**	**29**	**57**	**85**	**110**	**114**	**110**	**104**	**102**

SAVED Expenditure (BAU-ECO, in bn €), summary	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0**	**0**	**1**	**2**	**3**	**4**	**4**	**4**	**4**	**4**
SPACE HEATING	**0**	**2**	**6**	**8**	**13**	**18**	**18**	**17**	**16**	**15**
SPACE COOLING	**0**	**0**	**0**	**1**	**2**	**3**	**3**	**3**	**3**	**3**
VENTILATION	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**2**	**2**
1 *VENTILATION (from heat saving vs. BAU; already included in COST for space heating)*	*0*	*0*	*0*	*1*	*3*	*4*	*5*	*5*	*6*	*6*
LIGHTING	**0**	**2**	**3**	**16**	**19**	**19**	**17**	**14**	**11**	**9**
ELECTRONICS	**0**	**1**	**5**	**12**	**16**	**19**	**20**	**18**	**16**	**15**
FOOD PRESERVATION	**0**	**4**	**6**	**9**	**13**	**18**	**20**	**21**	**22**	**23**
COOKING	**0**	**0**	**0**	**-1**	**0**	**1**	**2**	**2**	**2**	**3**
CLEANING	**0**	**3**	**6**	**10**	**13**	**15**	**16**	**16**	**17**	**18**
INDUSTRY COMPONENTS	0	0	0	4	8	11	12	11	10	9
ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**1**	**1**	**2**	**3**	**3**
TRANSPORT SECTOR	0	0	2	-4	-2	-1	-1	-1	-2	-3
TOTAL in bn euros 2020	**0**	**13**	**29**	**57**	**85**	**110**	**114**	**110**	**104**	**102**
Saving in % versus BAU (from 1990=0)	0.0%	1.1%	2.6%	4.9%	6.8%	8.2%	8.2%	7.7%	7.2%	6.8%
Saving In % versus BAU (from 2010=0)	-1.7%	0.0%	1.4%	3.8%	5.7%	7.2%	7.3%	6.8%	6.3%	5.9%





Data for graph above:

	2030	
	ECO	saving
WATER HEATING	58	4
SPACE HEATING	231	18
SPACE COOLING	57	3
VENTILATION	34	1
LIGHTING	63	19
ELECTRONICS	319	19
FOOD PRESERVATION	46	18
COOKING	37	1
CLEANING	58	15
INDUSTRY COMPONENTS	188	11
ENERGY SECTOR	22	1
TRANSPORT SECTOR	151	-1

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	35	51	56	62	62	62	62	62	62	62
	EIWH Electric Instant. ≥ 12 kW (primary)	179	152	149	156	172	189	205	222	238	255
	EIWHS Electric Instant. Shower (secondary)	26	34	33	33	35	37	39	41	43	45
	ESWH Electric Storage ≤ 30 L (secondary)	114	126	127	133	142	151	160	169	178	187
	ESWH Electric Storage > 30 L (primary)	701	817	751	784	838	891	945	999	1053	1107
	GIWH Gas Instant. < 13 L/min (secondary)	204	142	116	118	117	115	113	112	110	109
	GIWH Gas Instant. ≥ 13 L/min (primary)	59	56	47	48	48	47	46	46	45	44
	GSWH Gas Storage, Condensing	0	2	3	4	5	6	6	7	8	9
	GSWH Gas Storage, Non-condensing	92	54	40	25	22	19	17	14	11	8
	Dedicated WH Heat Pump	0	71	198	285	434	582	730	878	1026	1174
	Dedicated WH Solar (3.5 m2)	151	543	549	447	464	480	497	514	531	547
	WH dedicated Water Heater	**1562**	**2048**	**2071**	**2094**	**2337**	**2579**	**2821**	**3063**	**3306**	**3548**
	CHB Gas Combi Instant. WH	231	389	403	432	437	441	442	442	438	431
	CHB Gas + Cyl. WH	118	161	167	179	181	183	183	183	182	179
	CHB Jet Burner Gas + Cyl. WH	52	23	16	16	16	17	17	18	18	18
	CHB Jet Burner Oil + Cyl. WH	398	160	107	105	108	111	114	117	120	122
	CHB Electric (Joule) + Cyl. WH	5	9	8	9	8	8	7	6	6	5
	CHB Hybrid Gas/Electric WH	0	1	2	3	4	7	12	19	31	51
	CHB Electric HP + Cyl. WH	8	118	134	163	189	218	251	289	332	382
	CHB Gas HP + Cyl. WH	1	2	2	4	5	8	11	15	22	31
	CHB Gas mCHP + Cyl. WH	2	3	4	7	10	14	20	28	40	58
	CHB Solar Combi (16 m2)	13	22	22	24	24	25	25	25	26	26
	CHC Central Heating combi, water heating	**828**	**887**	**867**	**942**	**983**	**1030**	**1082**	**1143**	**1215**	**1303**
	TOTAL WATER HEATING	**2390**	**2935**	**2938**	**3036**	**3320**	**3609**	**3903**	**4206**	**4520**	**4851**
	CHB Gas non-condensing	1776	955	885	866	799	734	671	609	550	491
	CHB Gas condensing	118	2596	2160	2302	2445	2575	2682	2769	2829	2854
	CHB Gas Jet burner non-condensing	375	121	54	48	44	41	38	35	33	30
	CHB Gas Jet burner condensing	0	40	55	62	69	75	81	87	93	98
	CHB Oil Jet burner non-condensing	2635	812	360	317	295	274	254	236	218	202
	CHB Oil Jet burner condensing	0	271	364	385	427	467	507	546	581	615
	CHB Electric Joule-effect	25	42	40	44	41	38	35	31	28	25
	CHB Hybrid (gas-electric)	2	5	9	15	25	42	70	116	191	316
	CHB Electric Heat Pump	47	661	748	920	1075	1254	1458	1694	1967	2282
	CHB Gas Heat Pump	3	10	13	21	30	43	62	89	128	185
	CHB micro CHP	11	18	25	38	55	79	114	164	236	339
	CHB Solar combi (16 m2)	67	115	115	125	129	133	137	141	145	148
	CHB Central Heating boiler < 400 kW, space heating	**5059**	**5644**	**4829**	**5143**	**5433**	**5756**	**6109**	**6518**	**6999**	**7586**
	SFB Wood Manual [18 kW]	602	357	236	138	81	76	71	66	61	56
	SFB Wood Direct Draft [20 kW]	22	975	998	1052	979	1220	1428	1672	1958	2338
	SFB Coal [25 kW]	161	746	165	210	228	206	187	169	152	138
	SFB Pellets [25 kW]	0	250	382	377	377	416	459	507	560	618
	SFB Wood chips [160 kW]	0	155	154	182	212	234	258	285	314	347
	Total Solid Fuel Boiler	**785**	**2483**	**1935**	**1959**	**1876**	**2151**	**2402**	**2698**	**3045**	**3497**
	CHAE-S (≤ 400 kW)	201	885	975	1081	1196	1309	1423	1535	1642	1743
	CHAE-L (> 400 kW)	46	155	161	166	174	180	187	194	201	207
	CHWE-S (≤ 400 kW)	18	79	87	96	106	117	127	137	146	155
	CHWE-M (> 400 kW; ≤ 1500 kW)	20	73	76	79	82	86	89	92	96	99
	CHWE-L (> 1500 kW)	13	47	49	51	53	55	57	60	62	64
	CHF	0	3	4	5	6	7	8	9	10	11
	HT PCH-AE-S	102	171	184	195	203	212	220	229	237	245
	HT PCH-AE-L	82	137	147	156	163	170	176	183	190	196
	HT PCH-WE-S	22	37	40	43	44	46	48	50	52	54
	HT PCH-WE-M	88	148	159	169	176	183	190	198	205	212
	HT PCH-WE-L	17	28	30	32	33	34	36	37	38	40
	AC rooftop	94	318	322	248	144	38	38	38	38	38
	AC splits	161	609	639	619	597	574	552	531	509	488
	AC VRF	1	1397	1828	2673	3381	4081	4747	5360	5874	6246
	ACF	0	3	4	5	6	7	8	9	10	11
	SubTotal AHC Air Cooling	**865**	**4091**	**4707**	**5618**	**6365**	**7100**	**7908**	**8661**	**9310**	**9808**
	AC rooftop (rev)	58	196	188	152	85	21	0	0	0	0
	AC splits (rev)	108	391	409	398	384	369	355	341	327	313
	AC VRF (rev)	0	1193	1485	2282	2773	3185	3525	3787	3948	3995
	ACF (rev)	0	7	10	11	14	16	19	21	23	24
	AHF	339	221	207	194	184	173	163	153	143	133
	AHE	1	2	2	2	2	2	2	2	2	2
	SubTotal AHC Air Heating (rev double)	**506**	**2008**	**2301**	**3039**	**3441**	**3767**	**4063**	**4303**	**4443**	**4467**
	Total AHC Air Heating & Cooling	**1205**	**4314**	**4917**	**5815**	**6552**	**7276**	**8075**	**8818**	**9456**	**9945**

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	720	1034	1024	1021	1014	1008	1006	1006	1006	1006
	LH closed fireplace/inset [8 kW]	455	1212	1331	1455	1474	1493	1496	1496	1496	1496
	LH wood stove [8 kW]	492	571	622	677	686	695	697	697	697	697
	LH coal stove [8 kW]	134	110	101	92	69	46	42	42	42	42
	LH cooker [10 kW]	420	830	986	1145	1174	1203	1209	1209	1209	1209
	LH SHR stove [8 kW]	456	627	766	906	1013	1120	1142	1142	1142	1142
	LH pellet stove [8 kW]	0	467	579	692	741	791	801	801	801	801
	LH Solid fuel sum	**2677**	**4851**	**5408**	**5987**	**6171**	**6355**	**6392**	**6392**	**6392**	**6392**
	LH Electric portable	117	143	150	150	150	150	150	150	150	150
	LH Electric fixed > 250W	1003	1166	905	841	841	841	841	841	841	841
	LH Electric fixed ≤ 250W	126	146	114	106	106	106	106	106	106	106
	LH Electric storage	102	124	112	107	107	107	107	107	107	107
	LH Electric underfloor	99	121	127	127	126	126	126	126	126	126
	LH Electric visibly glowing > 1.2 kW	3	4	4	4	4	4	4	4	4	4
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	167	279	279	279	279	279	279	279	279	279
	LH Electric sum	**1618**	**1984**	**1692**	**1615**	**1614**	**1614**	**1614**	**1614**	**1614**	**1614**
	LH Gas luminous (commercial)	3	4	4	4	4	3	3	3	3	3
	LH Gaseous Tube (commercial < 120 kW)	4	5	5	5	4	3	3	3	3	3
	LH Gas open front	7	7	7	6	5	5	5	5	5	5
	LH Gas closed front	71	38	31	26	23	20	20	20	20	20
	LH Gas balanced flue	110	46	31	25	22	19	19	19	19	19
	LH Gas flueless	4	1	1	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**198**	**102**	**78**	**66**	**58**	**50**	**50**	**50**	**50**	**50**
	LH Liquid tube (commercial < 120 kW)	0	0	1	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	7	4	3	3	2	2	2	2	2	2
	LH Liquid balanced flue	10	4	3	2	2	2	2	2	2	2
	LH Liquid flueless	41	14	7	0	0	0	0	0	0	0
	LH Liquid fuel sum	**59**	**23**	**14**	**6**	**5**	**4**	**4**	**4**	**4**	**4**
	LH Local Space Heaters total	**4553**	**6959**	**7193**	**7675**	**7848**	**8023**	**8061**	**8061**	**8061**	**8061**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	58	562	419	464	514	562	616	688	789	913
	RAC fixed 6-12 kW, cooling	27	328	323	318	331	341	347	348	385	426
	RAC portable < 12 kW, cooling	8	104	93	70	71	73	76	79	81	84
	RAC < 12 kW total, cooling mode	**92**	**993**	**835**	**852**	**916**	**976**	**1039**	**1114**	**1255**	**1423**
	RAC fixed < 6 kW, reversible, heating	5	214	201	279	359	449	554	688	789	913
	RAC fixed 6-12 kW, reversible, heating	2	125	155	191	232	273	313	348	385	426
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**7**	**339**	**356**	**469**	**591**	**722**	**867**	**1036**	**1174**	**1339**
	RAC Room Air Conditioner	**100**	**1332**	**1192**	**1321**	**1507**	**1698**	**1905**	**2150**	**2429**	**2762**
1	CIRC Integrated circulators	546	894	994	1040	1121	1186	1186	1186	1186	1186
0.38	CIRC Large standalone circulators	278	514	532	527	502	453	456	457	455	448
0.38	CIRC Small standalone circulators	441	668	661	622	564	498	495	495	495	495
	CIRC Circulator pumps <2.5 kW, all	**1265**	**2077**	**2187**	**2189**	**2188**	**2138**	**2138**	**2138**	**2137**	**2129**
	CIRC Circulator pumps <2.5 kW, excl. double	**446**	**733**	**740**	**712**	**661**	**590**	**590**	**590**	**589**	**585**
	TOTAL SPACE HEATING (incl. rev.AC)	**11356**	**18168**	**17354**	**18997**	**19852**	**21009**	**22092**	**23206**	**24310**	**25534**
	TOTAL SPACE COOLING	**958**	**5084**	**5542**	**6470**	**7281**	**8076**	**8947**	**9776**	**10564**	**11231**
	R-UVU ≤ 100 m3/h for Extract Spaces	2	6	7	9	9	9	10	10	10	10
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	1	1	2	2	2
	R-BVU ≤ 100 m3/h for Habitable Spaces	2	32	52	117	591	650	716	1001	1210	1313
	R-UVU 100-250 m3/h	36	117	124	141	132	130	139	149	140	144
	R-BVU 100-250 m3/h	5	30	35	53	242	262	281	378	449	483
	R-UVU 250-1000 m3/h	65	174	172	192	175	176	187	200	193	201
	R-BVU 250-1000 m3/h	9	53	62	93	431	466	499	666	788	848
	R-UVU > 1000 m3/h	8	8	7	7	6	6	6	5	5	5
	R-BVU 1000-2500 m3/h	0	29	29	33	36	41	44	48	53	56
	RVU, Total residential (incl. instal.mat.)	**127**	**449**	**487**	**644**	**1623**	**1741**	**1883**	**2459**	**2849**	**3060**
	NR-UVU 250-1000 m3/h	65	68	66	65	57	57	56	52	49	45
	NR-BVU 250-1000 m3/h	0	141	147	173	199	229	252	276	310	331
	NR-UVU > 1000 m3/h	75	74	69	67	57	57	55	52	48	44
	NR-BVU 1000-2500 m3/h	0	284	281	321	350	399	431	466	511	542
	NR-AHU-S 2500-5500 m3/h	81	1512	1890	1889	1686	1894	2002	2053	2142	2263
	NR-AHU-M 5500-14500 m3/h	979	2609	2954	2876	2549	2761	2834	2858	2939	3024
	NR-AHU-L > 14500 m3/h	226	633	714	691	600	649	664	670	686	703
	NRVU, Total non-residential (incl. instal.mat.)	**1426**	**5320**	**6120**	**6081**	**5498**	**6047**	**6294**	**6427**	**6685**	**6952**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**1554**	**5769**	**6607**	**6725**	**7121**	**7788**	**8177**	**8885**	**9534**	**10012**
	TOTAL VENTILATION	**1554**	**5769**	**6607**	**6725**	**7121**	**7788**	**8177**	**8885**	**9534**	**10012**

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1626	2424	2187	1656	1140	835	696	548	423	323
	HID (HPM, HPS, MH)	264	794	709	491	378	209	103	52	27	14
	CFLni (all shapes)	41	160	141	136	110	54	29	16	7	5
	CFLi (retrofit for GLS, HL)	48	633	413	497	297	220	120	82	51	33
	GLS (DLS & NDLS)	498	409	345	240	141	83	48	28	17	10
	HL (DLS & NDLS, LV & MV)	97	769	959	981	606	313	165	90	51	30
	LED replacing LFL (retrofit & luminaire)	0	3	415	1518	2057	2751	3018	3507	4216	4968
	LED replacing HID (retrofit & luminaire)	0	0	129	790	917	1160	1384	1653	1917	2188
	LED replacing CFLni (retrofit & luminaire)	0	0	25	96	151	193	218	248	270	294
	LED replacing DLS (retrofit & luminaire)	0	0	91	277	312	186	131	108	98	96
	LED replacing NDLS (retrofit & luminaire)	0	35	223	1529	1227	835	644	523	450	423
	SUBTOTAL non-LED	2575	5190	4754	4002	2671	1715	1161	817	576	415
	SUBTOTAL LED	0	39	884	4210	4665	5124	5395	6038	6951	7969
	TOTAL LIGHTING	**2575**	**5228**	**5638**	**8212**	**7336**	**6839**	**6556**	**6855**	**7527**	**8384**
	DP TV all types	7081	11615	6637	8278	9552	10985	11144	11144	11144	11144
	DP Monitor	874	1919	1080	1086	1086	1086	1086	1086	1086	1086
	DP Signage	0	185	810	1857	1393	1393	1393	1393	1393	1393
	DP Electronic Displays, total	**7955**	**13719**	**8526**	**11222**	**12031**	**13464**	**13623**	**13623**	**13623**	**13623**
	SSTB	0	691	157	0	0	0	0	0	0	0
	CSTB	0	2601	3208	3236	3236	3236	3236	3236	3236	3236
	Total STB set top boxes (Complex & Simple)	**0**	**3292**	**3365**	**3236**	**3236**	**3236**	**3236**	**3236**	**3236**	**3236**
	Game consoles > 20 W	16	1282	1282	1282	1282	1282	1282	1282	1282	1282
	Game consoles < 20 W	58	324	324	324	324	324	324	324	324	324
	Total Game consoles	**74**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**
	ES tower 1-socket traditional	9	249	260	224	192	165	165	165	165	165
	ES rack 1-socket traditional	19	522	508	536	563	592	592	592	592	592
	ES rack 2-socket traditional	187	3003	1367	1669	2030	2470	2470	2470	2470	2470
	ES rack 2-socket cloud	0	2851	4292	5240	6376	7757	7757	7757	7757	7757
	ES rack 4-socket traditional	98	1574	670	818	995	1211	1211	1211	1211	1211
	ES rack 4-socket cloud	0	1320	1859	2270	2762	3361	3361	3361	3361	3361
	ES rack 2-socket resilient trad.	36	581	269	328	399	485	485	485	485	485
	ES rack 2-socket resilient cloud	0	426	651	794	967	1176	1176	1176	1176	1176
	ES rack 4-socket resilient trad.	2	34	16	19	23	28	28	28	28	28
	ES rack 4-socket resilient cloud	0	25	38	46	56	68	68	68	68	68
	ES blade 1-socket traditional	5	59	56	59	62	65	65	65	65	65
	ES blade 2-socket traditional	143	974	428	523	636	774	774	774	774	774
	ES blade 2-socket cloud	0	925	1345	1642	1998	2431	2431	2431	2431	2431
	ES blade 4-socket traditional	16	108	46	56	68	83	83	83	83	83
	ES blade 4-socket cloud	0	90	126	154	187	228	228	228	228	228
	ES total traditional	**515**	**7104**	**3619**	**4231**	**4969**	**5874**	**5874**	**5874**	**5874**	**5874**
	ES total cloud	**0**	**5636**	**8311**	**10147**	**12346**	**15020**	**15020**	**15020**	**15020**	**15020**
	ES Enterprise Servers total	**515**	**12740**	**11929**	**14378**	**17315**	**20894**	**20894**	**20894**	**20894**	**20894**
	DS Online 2	237	5698	5289	5803	6407	7074	7074	7074	7074	7074
	DS Online 3	415	8878	6353	6970	7696	8497	8497	8497	8497	8497
	DS Online 4	284	5835	5303	5819	6424	7093	7093	7093	7093	7093
	DS Data Storage products total	**936**	**20410**	**16946**	**18592**	**20528**	**22664**	**22664**	**22664**	**22664**	**22664**
	ES + DS total	**1451**	**33150**	**28875**	**32971**	**37843**	**43558**	**43558**	**43558**	**43558**	**43558**
	PC Desktop	4890	7595	4018	4494	6201	6611	6849	6930	6956	6965
	PC Integrated Desktop	209	325	172	192	265	324	364	378	383	384
	PC Notebook	0	20988	18507	18461	24359	30721	35279	36932	37492	37678
	PC Tablet/slate	0	1012	11593	11177	12151	13170	13775	13980	14048	14070
	PC Thin client	0	471	457	483	487	490	492	493	493	493
	PC Integrated Thin Client	0	37	36	38	38	38	38	38	38	38
	PC Small-scale Server	59	116	147	149	149	150	151	151	151	151
	PC Workstation	582	1036	1275	1457	1744	2087	2317	2399	2426	2435
	Total PC, electricity	**5741**	**31580**	**36204**	**36450**	**45395**	**53591**	**59265**	**61300**	**61987**	**62215**
	Inkjet Printer	240	395	52	57	54	52	49	46	44	41
	Inkjet MFD	295	762	582	369	351	334	317	302	286	271
	EP / Laser Printer mono	442	439	512	484	381	306	241	184	127	71
	EP / Laser Printer colour	0	424	479	589	649	680	705	719	733	747
	EP / Laser Copier mono	2191	922	227	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	308	552	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	718	959	916	871	828	787	748	709	669
	EP / Laser MFD colour	0	4555	6085	5810	5526	5255	5001	4753	4504	4255
	Total IE Imaging Equipment	**3167**	**8523**	**9449**	**8225**	**7832**	**7455**	**7100**	**6751**	**6403**	**6055**

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios	807	654	526	463	423	383	343	302	262	222
	SB Electric toothbrushes	92	149	164	184	206	227	249	271	293	314
	SB Audio speakers (wired)	2108	1085	767	274	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	12	757	2012	2280	2292	2294	2296	2298	2300
	SB Small appliances	2441	3945	4047	4154	4200	4247	4293	4340	4386	4432
	SB Media boxes /sticks	0	0	158	193	194	194	194	194	194	194
	SB Media players and recorders	1	1211	1051	139	0	0	0	0	0	0
	SB Projectors	7	495	421	172	74	0	0	0	0	0
	SB Home phones	88	406	422	401	377	363	356	348	341	334
	SB Office phones	145	263	241	227	225	228	224	219	214	210
	SB Home NAS	0	748	1182	1613	2030	2447	2810	3072	3198	3204
	SB Home Network Equipment	0	1406	1596	1703	1797	1891	2042	2042	2042	2042
	SB Office Network Equipment	0	199	586	1101	1614	2127	2395	2395	2395	2395
	SB Coffee makers	328	398	409	421	433	446	459	472	485	498
	Total (networked) SB (excl. double)	**6017**	**10972**	**12326**	**13058**	**13854**	**14846**	**15659**	**15952**	**16109**	**16146**
db											
0.0	EPS ≤ 6W, low-V	10	130	92	63	45	24	11	5	2	1
0.3	EPS 6–10 W	55	770	832	889	932	979	1004	1029	1055	1082
0.6	EPS 10–12 W	0	637	761	820	828	833	838	843	849	854
0.5	EPS 15–20 W	0	3	17	33	36	40	42	45	47	49
1.0	EPS 20–30 W	2	91	95	87	84	79	73	66	60	54
0.8	EPS 30–65 W, multiple-V	0	0	0	13	19	26	34	43	51	59
1.0	EPS 30-65 W	0	0	0	15	36	62	62	62	62	62
1.0	EPS 65–120 W	1	70	68	52	29	1	0	0	0	0
0.5	EPS 65–120 W, multiple-V	0	421	153	45	45	46	46	46	46	46
0.0	EPS 12–15 W	2	69	140	171	173	174	174	174	174	174
	EPS, total for active mode	**70**	**2190**	**2158**	**2188**	**2227**	**2263**	**2284**	**2312**	**2345**	**2381**
	EPS, double counted subtracted	**48**	**1207**	**1210**	**1233**	**1252**	**1270**	**1278**	**1295**	**1315**	**1338**
	TOTAL ELECTRONICS	**24452**	**104048**	**101562**	**108001**	**123049**	**139026**	**145326**	**147322**	**147838**	**147776**
	RF Household refrigerator and freezer	**2842**	**3173**	**3245**	**3320**	**3371**	**3421**	**3472**	**3522**	**3573**	**3624**
	CF open vertical chilled multi deck (RVC2)	191	219	217	222	225	229	232	236	240	244
	CF open horizontal frozen island (RHF4)	23	26	26	26	27	27	28	28	29	29
	CF other supermarket display (non-BCs)	438	545	577	601	623	645	668	692	716	741
	CF Plug in one door beverage cooler	375	480	479	498	515	532	550	568	587	606
	CF Plug in horizontal ice cream freezer	155	198	198	206	213	220	227	235	242	250
	CF Spiral vending machine	251	197	161	168	174	181	188	195	203	211
	Total CF Commercial Refrigeration	**1432**	**1666**	**1657**	**1720**	**1777**	**1835**	**1893**	**1954**	**2016**	**2081**
	PF Storage cabinet Chilled Vertical (CV)	141	192	201	209	219	229	239	250	260	270
	PF Storage cabinet Frozen Vertical (FV)	74	100	105	109	115	120	125	131	136	141
	PF Storage cabinet Chilled Horizontal (CH)	29	39	41	43	45	47	49	51	53	55
	PF Storage cabinet Frozen Horizontal (FH)	22	30	31	33	34	36	37	39	41	42
	PF Storage cabinets All types	**265**	**362**	**379**	**394**	**413**	**432**	**451**	**470**	**489**	**508**
	PF Process Chiller AC MT S ≤ 300 kW	22	44	49	54	59	65	70	76	81	87
	PF Process Chiller AC MT L > 300 kW	20	41	46	51	56	61	67	72	77	83
	PF Process Chiller AC LT S ≤ 200 kW	17	35	39	43	48	52	57	61	66	71
	PF Process Chiller AC LT L > 200 kW	16	33	37	41	45	49	54	58	62	66
	PF Process Chiller WC MT S ≤ 300 kW	10	19	22	24	26	29	31	34	36	39
	PF Process Chiller WC MT L > 300 kW	14	29	32	36	39	43	47	51	54	58
	PF Process Chiller WC LT S ≤ 200 kW	9	19	21	23	26	28	31	33	35	38
	PF Process Chiller WC LT L > 200 kW	12	24	26	29	32	35	38	41	44	47
	PF Process Chiller All MT&LT	**121**	**244**	**272**	**301**	**332**	**363**	**395**	**426**	**457**	**489**
	PF Condensing Unit MT S 0.2-1 kW	110	92	94	101	109	118	127	137	147	159
	PF Condensing Unit MT M 1-5 kW	238	198	203	219	236	254	274	295	318	342
	PF Condensing Unit MT L 5-20 kW	244	203	208	225	243	261	281	303	327	352
	PF Condensing Unit MT XL 20-50 kW	187	156	159	172	186	200	216	232	250	269
	PF Condensing Unit LT S 0.1-0.4 kW	19	16	16	18	19	20	22	24	25	27
	PF Condensing Unit LT M 0.4-2 kW	34	28	29	31	34	36	39	42	45	49
	PF Condensing Unit LT L 2-8 kW	91	76	77	84	90	97	105	113	121	131
	PF Condensing Unit LT XL 8-20 kW	79	66	68	73	79	85	91	98	106	114
0.6	**PF Condensing Unit, All MT&LT**	**1002**	**833**	**854**	**923**	**995**	**1071**	**1154**	**1243**	**1340**	**1443**
	PF Professional Refrigeration, Total	**787**	**940**	**993**	**1064**	**1143**	**1224**	**1308**	**1394**	**1482**	**1574**
	TOTAL FOOD PRESERVATION	**5061**	**5779**	**5896**	**6105**	**6291**	**6480**	**6673**	**6870**	**7072**	**7278**
	CA Electric Hobs	982	2248	2416	2615	2759	2888	3011	3126	3233	3333
	CA Electric Ovens	2253	2719	2874	3128	3025	3047	3086	3124	3164	3203
	CA Gas Hobs	875	766	703	641	592	564	535	507	478	450
	CA Gas Ovens	291	304	291	284	275	267	259	250	242	234
	CA Range Hoods	547	679	716	754	793	833	874	914	955	995
	TOTAL COOKING	**4947**	**6716**	**7000**	**7422**	**7444**	**7600**	**7764**	**7922**	**8072**	**8216**
	WM Washing Machines	1525	2280	2296	2476	2377	2377	2377	2377	2377	2377
	WD Washer-Dryers	141	199	204	209	210	211	213	214	215	216
	Total WM-WD household Washing	**1666**	**2478**	**2500**	**2686**	**2588**	**2589**	**2590**	**2591**	**2592**	**2593**
	DW Household Dishwasher	**664**	**1488**	**1736**	**1990**	**2231**	**2472**	**2712**	**2953**	**3194**	**3434**

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LD condensing heat pump	0	24	36	57	85	122	155	184	215	251
	LD condensing electric heat element	104	282	415	542	517	471	424	388	365	342
	LD vented electric	177	142	159	164	162	159	159	159	159	159
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**282**	**450**	**610**	**763**	**765**	**752**	**738**	**731**	**739**	**752**
	VC Domestic mains	835	1386	1288	1160	974	755	626	599	599	599
	VC Commercial mains	277	417	401	390	390	390	390	390	390	390
	VC Total in scope of CR 666/2013	**1112**	**1803**	**1690**	**1550**	**1364**	**1146**	**1016**	**989**	**989**	**989**
	VC Cordless	28	115	364	768	1138	1525	1846	2021	2092	2113
	VC Robot	0	101	203	373	546	737	895	981	1016	1026
	Total VC Vacuum Cleaner	**1140**	**2019**	**2257**	**2691**	**3048**	**3407**	**3757**	**3991**	**4098**	**4129**
	TOTAL CLEANING	**3753**	**6435**	**7103**	**8130**	**8631**	**9219**	**9797**	**10266**	**10622**	**10908**
0.5	FAN Axial<300Pa [247 W flow out]	235	800	922	1045	1045	1045	1045	1045	1045	1045
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	325	1165	1234	1303	1303	1303	1303	1303	1303	1303
0.5	FAN Centr.FC [141 W flow out]	201	531	616	700	700	700	700	700	700	700
0.5	FAN Centr.BC-free [2120 W flow out]	115	292	333	374	414	422	430	438	446	454
0.5	FAN Centr.BC [2052 W flow out]	252	695	799	904	1006	1027	1129	1231	1333	1435
0.5	FAN Cross-flow [31 W flow out]	46	108	123	139	154	157	172	187	202	217
	Total FAN, industrial (excl. box & roof fans)	**587**	**1795**	**2014**	**2232**	**2311**	**2327**	**2389**	**2452**	**2514**	**2577**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	332	537	547	540	518	492	463	430	400	365
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	197	311	314	307	291	272	249	223	194	175
0.45	Medium (L) 3-ph 75-375 kW no VSD	154	228	224	212	192	168	141	110	108	110
0.45	**Total 3ph 0.75-375 kW no VSD**	**682**	**1076**	**1085**	**1059**	**1000**	**932**	**853**	**763**	**701**	**650**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	131	385	463	536	608	693	808	943	1105	1298
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	97	285	343	398	451	515	601	702	819	913
0.45	Medium (L) 3-ph 75-375 kW with VSD	73	217	262	304	346	395	460	535	547	560
0.45	**Total 3-ph 0.75-375 kW with VSD**	**300**	**888**	**1068**	**1238**	**1404**	**1603**	**1869**	**2179**	**2472**	**2770**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**982**	**1964**	**2153**	**2297**	**2405**	**2535**	**2722**	**2942**	**3172**	**3420**
0.45	Small 1 ph 0.12-0.75 kW no VSD	211	402	423	423	422	420	417	413	409	404
0.45	Small 1 ph 0.12-0.75 kW with VSD	33	276	335	352	373	397	421	448	476	505
0.45	**Total Small 1-ph 0.12-0.75 kW**	**244**	**678**	**758**	**776**	**795**	**816**	**838**	**861**	**885**	**909**
0.45	Small 3 ph 0.12-0.75 kW no VSD	116	198	208	210	208	206	204	201	198	195
0.45	Small 3 ph 0.12-0.75 kW with VSD	12	102	126	138	151	166	183	201	221	243
0.45	**Total Small 3-ph 0.12-0.75 kW**	**129**	**300**	**334**	**348**	**359**	**373**	**387**	**402**	**419**	**438**
0.45	Large 3-ph LV 375-1000 kW no VSD	70	90	80	78	78	78	75	72	70	67
0.45	Large 3-ph LV 375-1000kW with VSD	25	152	210	231	243	256	267	278	289	302
0.45	**Total Large 3-ph LV 375-1000 kW**	**96**	**242**	**290**	**310**	**322**	**334**	**342**	**350**	**359**	**368**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	21	37	38	39	39	39	39	39	40	41
0.45	Explosion motors (M) 3-ph 7.5-75 kW	19	33	34	35	36	36	36	36	36	36
0.45	Explosion motors (L) 3-ph 75-375 kW	14	24	26	26	26	27	27	27	27	27
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**53**	**94**	**99**	**101**	**101**	**101**	**101**	**101**	**102**	**104**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	26	46	48	49	49	49	49	49	50	51
0.45	Brake motors (M) 3-ph 7.5-75 kW	23	41	43	44	44	45	45	45	45	45
0.45	Brake motors (L) 3-ph 75-375 kW	17	31	32	33	33	33	33	33	33	34
0.45	**Total Brake 0.75-375 kW (no VSD)**	**67**	**117**	**123**	**126**	**127**	**127**	**127**	**127**	**128**	**130**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	2	2	2	2	2	2	2	2	2
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	2	2	2	2	2	2	2	2	2
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	1	1	1	1	1
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**3**	**5**	**6**	**6**	**6**	**6**	**6**	**6**	**6**	**6**
0.45	**1-phase motors >0.75 kW (no VSD)**	**480**	**841**	**882**	**901**	**901**	**900**	**898**	**896**	**913**	**937**
	MT Elec. Motors LV 0.12-1000 kW	**1129**	**2333**	**2553**	**2675**	**2759**	**2855**	**2982**	**3127**	**3291**	**3472**
	WP ESOB < 45kW	308	416	454	494	515	551	589	625	662	699
	WP ESOB 45-150kW	55	74	81	88	92	99	105	112	118	125
	WP ESCC < 45kW	195	264	288	314	328	351	375	398	422	445
	WP ESCC 45-150kW	42	57	62	68	71	76	81	86	91	96
	WP ESCCi < 45kW	98	134	146	161	170	182	194	206	219	231
	WP ESCCi 45-150kW	8	10	11	12	13	14	15	16	17	18
	WP MSSB <6"	563	761	830	904	943	1011	1079	1146	1214	1282
	WP MS_V <25 bar	176	238	260	284	297	319	340	361	383	404
	WP Water pumps	**1445**	**1955**	**2133**	**2326**	**2428**	**2602**	**2777**	**2951**	**3125**	**3300**
	Total WE Welding Equipment	**221**	**251**	**253**	**255**	**258**	**260**	**262**	**264**	**266**	**268**
	TOTAL INDUSTRY COMPONENTS	3383	6335	6953	7488	7755	8044	8411	8794	9197	9617
	TRAFO Distribution, kWh/a	373	594	642	692	743	798	855	912	968	1025
	TRAFO Industry oil	194	317	343	370	397	426	456	487	517	547
	TRAFO Industry dry	92	149	161	173	186	199	213	226	240	254
	TRAFO Power	1498	2433	2633	2843	3057	3287	3524	3760	3997	4234
	TRAFO DER oil	0	17	29	48	79	130	192	254	315	377
	TRAFO DER dry	0	107	177	294	486	802	1184	1567	1949	2332
	TRAFO Small	42	43	43	43	43	43	43	43	43	43
	TOTAL ENERGY SECTOR	**2199**	**3660**	**4028**	**4463**	**4990**	**5685**	**6467**	**7248**	**8030**	**8812**

db	REVENUE INDUSTRY BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	5262	7265	8003	9108	10307	11641	11641	11641	11641	11641
	Tyres C1, OEM for cars	1585	2171	2554	2743	3104	3505	3505	3505	3505	3505
	Tyres C1, total	**6847**	**9436**	**10557**	**11851**	**13411**	**15146**	**15146**	**15146**	**15146**	**15146**
	Tyres C2, replacement for vans	913	1189	1187	1336	1499	1678	1678	1678	1678	1678
	Tyres C2, OEM for vans	193	213	266	282	316	354	354	354	354	354
	Tyres C2, total	**1106**	**1403**	**1454**	**1618**	**1815**	**2032**	**2032**	**2032**	**2032**	**2032**
	Tyres C3, replacement for trucks/busses	1600	1617	1948	2485	2850	3263	3263	3263	3263	3263
	Tyres C3, OEM for trucks/busses	446	381	532	693	794	910	910	910	910	910
	Tyres C3, total	**2045**	**1998**	**2480**	**3178**	**3644**	**4173**	**4173**	**4173**	**4173**	**4173**
	Tyres, total C1+C2+C3	**9998**	**12837**	**14490**	**16647**	**18870**	**21351**	**21351**	**21351**	**21351**	**21351**
	TRANSPORT SECTOR	9998	12837	14490	16647	18870	21351	21351	21351	21351	21351
	GENERAL TOTAL (in m euros 2020)	**72626**	**182994**	**185110**	**201696**	**221941**	**244727**	**255464**	**262702**	**268638**	**273971**
	GENERAL TOTAL (in bn euros 2020)	73	183	185	202	222	245	255	263	269	274

SUMMARY BAU

Industry revenue (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**2.4**	**2.9**	**2.9**	**3.0**	**3.3**	**3.6**	**3.9**	**4.2**	**4.5**	**4.9**
SPACE HEATING	**11.4**	**18.2**	**17.4**	**19.0**	**19.9**	**21.0**	**22.1**	**23.2**	**24.3**	**25.5**
SPACE COOLING	**1.0**	**5.1**	**5.5**	**6.5**	**7.3**	**8.1**	**8.9**	**9.8**	**10.6**	**11.2**
VENTILATION	**1.6**	**5.8**	**6.6**	**6.7**	**7.1**	**7.8**	**8.2**	**8.9**	**9.5**	**10.0**
LIGHTING	**2.6**	**5.2**	**5.6**	**8.2**	**7.3**	**6.8**	**6.6**	**6.9**	**7.5**	**8.4**
ELECTRONICS	**24.5**	**104.0**	**101.6**	**108.0**	**123.0**	**139.0**	**145.3**	**147.3**	**147.8**	**147.8**
FOOD PRESERVATION	**5.1**	**5.8**	**5.9**	**6.1**	**6.3**	**6.5**	**6.7**	**6.9**	**7.1**	**7.3**
COOKING	**4.9**	**6.7**	**7.0**	**7.4**	**7.4**	**7.6**	**7.8**	**7.9**	**8.1**	**8.2**
CLEANING	**3.8**	**6.4**	**7.1**	**8.1**	**8.6**	**9.2**	**9.8**	**10.3**	**10.6**	**10.9**
INDUSTRY COMPONENTS	3.4	6.3	7.0	7.5	7.8	8.0	8.4	8.8	9.2	9.6
ENERGY SECTOR	**2.2**	**3.7**	**4.0**	**4.5**	**5.0**	**5.7**	**6.5**	**7.2**	**8.0**	**8.8**
TRANSPORT SECTOR	10.0	12.8	14.5	16.6	18.9	21.4	21.4	21.4	21.4	21.4
TOTAL in bn euros 2020	**73**	**183**	**185**	**202**	**222**	**245**	**255**	**263**	**269**	**274**

Revenues for VSDs only (without motor, m euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VSD - Very Small 0.12 - 0.75 kW 1-phase	29	231	278	292	309	329	350	373	397	422
VSD - Very Small 0.12 - 0.75 kW 3-phase	10	76	93	101	112	123	136	150	166	183
VSD - Small 0.75 - 7.5 kW 3-phase	94	276	332	383	432	492	578	678	797	935
VSD - Medium 7.5 - 75kW 3-phase	67	197	237	274	309	352	414	486	570	637
VSD - Large 75 - 375kW 3-phase	38	112	134	155	175	200	234	275	284	291
VSD - Very Large 375 - 1,000kW 3-phase	17	98	133	146	153	161	169	178	187	196
Total revenues, VSDs only (BAU)	**255**	**990**	**1208**	**1350**	**1490**	**1657**	**1881**	**2140**	**2401**	**2666**

db REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	35	51	56	62	62	62	62	62	62	62
EIWH Electric Instant. ≥ 12 kW (primary)	179	152	149	156	172	189	205	222	238	255
EIWHS Electric Instant. Shower (secondary)	26	34	33	33	35	37	39	41	43	45
ESWH Electric Storage ≤ 30 L (secondary)	114	126	127	133	142	151	160	169	178	187
ESWH Electric Storage > 30 L (primary)	701	817	751	784	838	891	945	999	1053	1107
GIWH Gas Instant. < 13 L/min (secondary)	204	142	116	118	117	115	113	112	110	109
GIWH Gas Instant. ≥ 13 L/min (primary)	59	56	47	48	48	47	46	46	45	44
GSWH Gas Storage, Condensing	0	2	3	4	5	6	6	7	8	9
GSWH Gas Storage, Non-condensing	92	54	40	25	22	19	17	14	11	8
Dedicated WH Heat Pump	0	71	198	285	434	582	730	878	1026	1174
Dedicated WH Solar (3.5 m2)	151	543	549	447	464	480	497	514	531	547
WH dedicated Water Heater	**1562**	**2048**	**2071**	**2094**	**2337**	**2579**	**2821**	**3063**	**3306**	**3548**
CHB Gas Combi Instant. WH	231	389	402	414	387	360	331	301	267	233
CHB Gas + Cyl. WH	118	161	142	156	146	136	124	113	101	88
CHB Jet Burner Gas + Cyl. WH	52	23	16	16	16	17	17	18	18	18
CHB Jet Burner Oil + Cyl. WH	398	160	107	105	108	111	114	117	120	122
CHB Electric (Joule) + Cyl. WH	5	9	8	9	8	8	7	6	6	5
CHB Hybrid Gas/Electric WH	0	1	3	7	25	43	64	86	117	147
CHB Electric HP + Cyl. WH	8	118	144	245	426	608	788	969	1161	1354
CHB Gas HP + Cyl. WH	1	2	5	10	19	27	36	46	56	66
CHB Gas mCHP + Cyl. WH	2	3	9	16	25	34	43	51	60	68
CHB Solar Combi (16 m2)	13	22	26	25	25	26	27	27	28	29
CHC Central Heating combi, water heating	**828**	**887**	**862**	**1004**	**1186**	**1369**	**1552**	**1736**	**1934**	**2131**
TOTAL WATER HEATING	**2390**	**2935**	**2933**	**3098**	**3523**	**3948**	**4373**	**4799**	**5239**	**5679**
CHB Gas non-condensing	1776	955	719	220	135	49	39	29	23	17
CHB Gas condensing	118	2596	2364	2902	2791	2680	2468	2256	2005	1753
CHB Gas Jet burner non-condensing	375	121	41	14	11	9	7	6	5	4
CHB Gas Jet burner condensing	0	40	69	96	102	107	112	117	121	124
CHB Oil Jet burner non-condensing	2635	812	272	89	73	57	47	36	29	23
CHB Oil Jet burner condensing	0	271	452	613	648	683	715	746	770	794
CHB Electric Joule-effect	25	42	40	44	41	38	35	31	28	25
CHB Hybrid (gas-electric)	2	5	17	40	144	247	375	502	679	856
CHB Electric Heat Pump	47	661	697	1299	2260	3221	4179	5136	6156	7175
CHB Gas Heat Pump	3	10	26	57	104	151	203	255	313	370
CHB micro CHP	11	18	48	92	141	191	238	286	334	381
CHB Solar combi (16 m2)	67	115	136	130	134	137	141	145	148	151
CHB Central Heating boiler < 400 kW, space heating	**5059**	**5644**	**4881**	**5596**	**6584**	**7572**	**8558**	**9545**	**10610**	**11674**
SFB Wood Manual [18 kW]	602	357	317	246	141	123	107	94	82	72
SFB Wood Direct Draft [20 kW]	22	975	1001	1067	1162	1361	1593	1865	2184	2558
SFB Coal [25 kW]	161	746	165	210	228	206	187	169	152	138
SFB Pellets [25 kW]	0	250	382	377	392	417	459	507	560	618
SFB Wood chips [160 kW]	0	155	161	193	216	234	258	285	314	347
Total Solid Fuel Boiler	**785**	**2483**	**2026**	**2093**	**2139**	**2341**	**2604**	**2920**	**3293**	**3732**
CHAE-S (≤ 400 kW)	201	885	975	1081	1196	1309	1423	1535	1642	1743
CHAE-L (> 400 kW)	46	155	161	166	174	180	187	194	201	207
CHWE-S (≤ 400 kW)	18	79	87	96	106	117	127	137	146	155
CHWE-M (> 400 kW; ≤ 1500 kW)	20	73	76	79	82	86	89	92	96	99
CHWE-L (> 1500 kW)	13	47	49	51	53	55	57	60	62	64
CHF	0	3	4	6	7	8	9	9	10	11
HT PCH-AE-S	102	171	184	195	203	212	220	229	237	245
HT PCH-AE-L	82	137	147	156	163	170	176	183	190	196
HT PCH-WE-S	22	37	40	43	44	46	48	50	52	54
HT PCH-WE-M	88	148	159	169	176	183	190	198	205	212
HT PCH-WE-L	17	28	30	32	33	34	36	37	38	40
AC rooftop	94	318	322	248	144	38	38	38	38	38
AC splits	161	609	639	619	597	574	552	531	509	488
AC VRF	1	1397	1828	2673	3381	4081	4747	5360	5874	6246
ACF	0	3	4	6	7	8	9	9	10	11
SubTotal AHC Air Cooling	**865**	**4091**	**4707**	**5620**	**6367**	**7101**	**7909**	**8661**	**9310**	**9808**
AC rooftop (rev)	58	196	188	152	85	21	0	0	0	0
AC splits (rev)	108	391	409	398	384	369	355	341	327	313
AC VRF (rev)	0	1193	1485	2282	2773	3185	3525	3787	3948	3995
ACF (rev)	0	7	10	11	14	16	19	21	23	24
AHF	339	221	207	212	203	188	169	153	143	133
AHE	1	2	2	2	2	2	2	2	2	2
SubTotal AHC Air Heating (rev double)	**506**	**2008**	**2301**	**3057**	**3461**	**3781**	**4070**	**4303**	**4443**	**4467**
Total AHC Air Heating & Cooling	**1205**	**4314**	**4917**	**5834**	**6571**	**7291**	**8081**	**8818**	**9456**	**9945**

db	REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	720	1034	1024	1259	1379	1321	1272	1226	1182	1139
	LH closed fireplace/inset [8 kW]	455	1212	1331	1729	1856	1811	1750	1686	1625	1566
	LH wood stove [8 kW]	492	571	622	813	876	853	821	789	758	729
	LH coal stove [8 kW]	134	110	101	109	86	55	49	47	45	44
	LH cooker [10 kW]	420	830	986	1257	1335	1314	1267	1216	1209	1209
	LH SHR stove [8 kW]	456	627	766	911	1015	1120	1142	1142	1142	1142
	LH pellet stove [8 kW]	0	467	579	692	741	791	801	801	801	801
	LH Solid fuel sum	**2677**	**4851**	**5408**	**6771**	**7289**	**7264**	**7101**	**6906**	**6762**	**6629**
	LH Electric portable	117	143	154	153	150	150	150	150	150	150
	LH Electric fixed > 250W	1003	1166	913	841	841	841	841	841	841	841
	LH Electric fixed ≤ 250W	126	146	115	106	106	106	106	106	106	106
	LH Electric storage	102	124	129	140	135	130	125	120	115	110
	LH Electric underfloor	99	121	129	130	126	126	126	126	126	126
	LH Electric visibly glowing > 1.2 kW	3	4	4	4	4	4	4	4	4	4
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	167	279	279	279	279	279	279	279	279	279
	LH Electric sum	**1618**	**1984**	**1723**	**1654**	**1643**	**1637**	**1632**	**1626**	**1621**	**1617**
	LH Gas luminous (commercial)	3	4	5	5	4	3	3	3	3	3
	LH Gaseous Tube (commercial < 120 kW)	4	5	5	6	5	4	4	4	4	3
	LH Gas open front	7	7	7	6	5	5	5	5	5	5
	LH Gas closed front	71	38	31	28	24	20	20	20	20	20
	LH Gas balanced flue	110	46	32	27	23	19	19	19	19	19
	LH Gas flueless	4	1	1	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**198**	**102**	**81**	**71**	**61**	**51**	**51**	**51**	**51**	**50**
	LH Liquid tube (commercial < 120 kW)	0	0	1	1	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	7	4	3	3	2	2	2	2	2	2
	LH Liquid balanced flue	10	4	3	3	2	2	2	2	2	2
	LH Liquid flueless	41	14	7	0	0	0	0	0	0	0
	LH Liquid fuel sum	**59**	**23**	**14**	**6**	**5**	**5**	**5**	**4**	**4**	**4**
	LH Local Space Heaters total	**4553**	**6959**	**7226**	**8502**	**8998**	**8957**	**8788**	**8588**	**8438**	**8300**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	58	662	522	569	601	612	625	688	789	913
	RAC fixed 6-12 kW, cooling	27	438	470	441	440	436	428	421	432	443
	RAC portable < 12 kW, cooling	8	120	114	85	81	77	76	79	81	84
	RAC < 12 kW total, cooling mode	**92**	**1220**	**1107**	**1094**	**1122**	**1126**	**1129**	**1188**	**1302**	**1440**
	RAC fixed < 6 kW, reversible, heating	5	253	251	341	421	490	562	688	789	913
	RAC fixed 6-12 kW, reversible, heating	2	167	226	265	308	349	386	421	432	443
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**7**	**420**	**476**	**606**	**729**	**839**	**948**	**1110**	**1221**	**1356**
	RAC Room Air Conditioner	**100**	**1640**	**1583**	**1700**	**1851**	**1965**	**2077**	**2298**	**2523**	**2796**
1	CIRC Integrated circulators	546	894	1055	1111	1144	1186	1186	1186	1186	1186
0.38	CIRC Large standalone circulators	278	514	858	802	716	613	583	555	528	502
0.38	CIRC Small standalone circulators	441	668	793	738	660	574	546	519	495	495
	CIRC Circulator pumps <2.5 kW, all	**1265**	**2077**	**2706**	**2651**	**2519**	**2373**	**2315**	**2260**	**2209**	**2184**
	CIRC Circulator pumps <2.5 kW, excl. double	**446**	**733**	**1023**	**955**	**853**	**736**	**700**	**666**	**634**	**618**
	TOTAL SPACE HEATING (incl. rev.AC)	**11356**	**18248**	**17934**	**20810**	**22764**	**24225**	**25668**	**27132**	**28639**	**30148**
	TOTAL SPACE COOLING	**958**	**5312**	**5813**	**6714**	**7489**	**8227**	**9038**	**9850**	**10612**	**11248**
	R-UVU ≤ 100 m3/h for Extract Spaces	2	6	8	12	11	11	11	12	11	11
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	1	1	1	2	2	2
	R-BVU ≤ 100 m3/h for Habitable Spaces	2	32	54	128	621	659	716	1001	1210	1313
	R-UVU 100-250 m3/h	36	117	136	180	169	163	171	180	165	167
	R-BVU 100-250 m3/h	5	30	36	56	251	266	281	378	449	483
	R-UVU 250-1000 m3/h	65	174	183	225	208	206	221	238	228	237
	R-BVU 250-1000 m3/h	9	53	62	95	431	466	499	666	788	848
	R-UVU > 1000 m3/h	8	8	7	8	7	7	7	6	6	5
	R-BVU 1000-2500 m3/h	0	29	29	33	36	41	44	48	53	56
	RVU, Total residential (incl. instal.mat.)	**127**	**449**	**516**	**737**	**1733**	**1820**	**1952**	**2531**	**2911**	**3122**
	NR-UVU 250-1000 m3/h	65	68	71	79	71	71	70	67	63	59
	NR-BVU 250-1000 m3/h	0	141	148	177	199	229	252	276	310	331
	NR-UVU > 1000 m3/h	75	74	72	75	65	65	64	60	56	52
	NR-BVU 1000-2500 m3/h	0	284	282	324	351	399	431	466	511	542
	NR-AHU-S 2500-5500 m3/h	81	1512	1935	2026	1820	2042	2156	2199	2286	2405
	NR-AHU-M 5500-14500 m3/h	979	2609	3041	3109	2767	2978	3043	3047	3120	3195
	NR-AHU-L > 14500 m3/h	226	633	730	733	640	689	703	705	720	735
	NRVU, Total non-residential (incl. instal.mat.)	**1426**	**5320**	**6279**	**6524**	**5912**	**6473**	**6718**	**6820**	**7065**	**7318**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**1554**	**5769**	**6794**	**7260**	**7646**	**8293**	**8670**	**9350**	**9976**	**10440**
	TOTAL VENTILATION	**1554**	**5769**	**6794**	**7260**	**7646**	**8293**	**8670**	**9350**	**9976**	**10440**

db	REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1626	2422	1767	1468	453	231	126	83	48	28
	HID (HPM, HPS, MH)	264	794	565	349	215	84	26	8	3	1
	CFLni (all shapes)	41	160	122	88	53	15	4	2	1	0
	CFLi (retrofit for GLS, HL)	48	869	282	152	0	0	0	0	0	0
	GLS (DLS & NDLS)	498	211	18	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	97	876	1022	222	2	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	4	743	1625	4348	4430	4097	4412	5260	6081
	LED replacing HID (retrofit & luminaire)	0	0	1286	851	1273	1497	1734	1991	2260	2560
	LED replacing CFLni (retrofit & luminaire)	0	0	146	211	226	255	272	288	323	358
	LED replacing DLS (retrofit & luminaire)	0	107	721	468	375	84	93	103	113	126
	LED replacing NDLS (retrofit & luminaire)	0	62	2253	3282	1476	818	420	440	482	532
	SUBTOTAL non-LED	2575	5332	3775	2280	724	330	156	93	52	29
	SUBTOTAL LED	0	173	5149	6437	7699	7085	6615	7234	8438	9656
	TOTAL LIGHTING	**2575**	**5504**	**8925**	**8717**	**8423**	**7415**	**6771**	**7327**	**8489**	**9685**
	DP TV all types	7081	11615	6637	8278	9552	10985	11144	11144	11144	11144
	DP Monitor	874	1919	1080	1086	1086	1086	1086	1086	1086	1086
	DP Signage	0	185	810	1857	1393	1393	1393	1393	1393	1393
	DP Electronic Displays, total	**7955**	**13719**	**8526**	**11222**	**12031**	**13464**	**13623**	**13623**	**13623**	**13623**
	SSTB	0	691	157	0	0	0	0	0	0	0
	CSTB	0	2601	3208	3236	3236	3236	3236	3236	3236	3236
	Total STB set top boxes (Complex & Simple)	**0**	**3292**	**3365**	**3236**	**3236**	**3236**	**3236**	**3236**	**3236**	**3236**
	Game consoles > 20 W	16	1282	1282	1282	1282	1282	1282	1282	1282	1282
	Game consoles < 20 W	58	324	324	324	324	324	324	324	324	324
	Total Game consoles	**74**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**	**1606**
	ES tower 1-socket traditional	9	249	260	224	192	165	165	165	165	165
	ES rack 1-socket traditional	19	522	508	536	563	592	592	592	592	592
	ES rack 2-socket traditional	187	3003	1367	1669	2030	2470	2470	2470	2470	2470
	ES rack 2-socket cloud	0	2851	4292	5240	6376	7757	7757	7757	7757	7757
	ES rack 4-socket traditional	98	1574	670	818	995	1211	1211	1211	1211	1211
	ES rack 4-socket cloud	0	1320	1859	2270	2762	3361	3361	3361	3361	3361
	ES rack 2-socket resilient trad.	36	581	269	328	399	485	485	485	485	485
	ES rack 2-socket resilient cloud	0	426	651	794	967	1176	1176	1176	1176	1176
	ES rack 4-socket resilient trad.	2	34	16	19	23	28	28	28	28	28
	ES rack 4-socket resilient cloud	0	25	38	46	56	68	68	68	68	68
	ES blade 1-socket traditional	5	59	56	59	62	65	65	65	65	65
	ES blade 2-socket traditional	143	974	428	523	636	774	774	774	774	774
	ES blade 2-socket cloud	0	925	1345	1642	1998	2431	2431	2431	2431	2431
	ES blade 4-socket traditional	16	108	46	56	68	83	83	83	83	83
	ES blade 4-socket cloud	0	90	126	154	187	228	228	228	228	228
	ES total traditional	**515**	**7104**	**3619**	**4231**	**4969**	**5874**	**5874**	**5874**	**5874**	**5874**
	ES total cloud	**0**	**5636**	**8311**	**10147**	**12346**	**15020**	**15020**	**15020**	**15020**	**15020**
	ES Enterprise Servers total	**515**	**12740**	**11929**	**14378**	**17315**	**20894**	**20894**	**20894**	**20894**	**20894**
	DS Online 2	237	5698	5289	5803	6407	7074	7074	7074	7074	7074
	DS Online 3	415	8878	6353	6970	7696	8497	8497	8497	8497	8497
	DS Online 4	284	5835	5303	5819	6424	7093	7093	7093	7093	7093
	DS Data Storage products total	**936**	**20410**	**16946**	**18592**	**20528**	**22664**	**22664**	**22664**	**22664**	**22664**
	ES + DS total	**1451**	**33150**	**28875**	**32971**	**37843**	**43558**	**43558**	**43558**	**43558**	**43558**
	PC Desktop	4890	7595	4018	4494	6201	6611	6849	6930	6956	6965
	PC Integrated Desktop	209	325	172	192	265	324	364	378	383	384
	PC Notebook	0	20988	18507	18461	24359	30721	35279	36932	37492	37678
	PC Tablet/slate	0	1012	11593	11177	12151	13170	13775	13980	14048	14070
	PC Thin client	0	471	457	483	487	490	492	493	493	493
	PC Integrated Thin Client	0	37	36	38	38	38	38	38	38	38
	PC Small-scale Server	59	116	147	149	149	150	151	151	151	151
	PC Workstation	582	1036	1275	1457	1744	2087	2317	2399	2426	2435
	Total PC, electricity	**5741**	**31580**	**36204**	**36450**	**45395**	**53591**	**59265**	**61300**	**61987**	**62215**
	Inkjet Printer	240	395	52	57	54	52	49	46	44	41
	Inkjet MFD	295	762	582	369	351	334	317	302	286	271
	EP / Laser Printer mono	442	439	512	484	381	306	241	184	127	71
	EP / Laser Printer colour	0	424	479	589	649	680	705	719	733	747
	EP / Laser Copier mono	2191	922	227	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	308	552	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	718	959	916	871	828	787	748	709	669
	EP / Laser MFD colour	0	4555	6085	5810	5526	5255	5001	4753	4504	4255
	Total IE Imaging Equipment	**3167**	**8523**	**9449**	**8225**	**7832**	**7455**	**7100**	**6751**	**6403**	**6055**

db	REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Products regulated only for (networked) standby										
	SB Radios	807	654	526	463	423	383	343	302	262	222
	SB Electric toothbrushes	92	149	164	184	206	227	249	271	293	314
	SB Audio speakers (wired)	2108	1085	767	274	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	12	757	2012	2280	2292	2294	2296	2298	2300
	SB Small appliances	2441	3945	4047	4154	4200	4247	4293	4340	4386	4432
	SB Media boxes /sticks	0	0	158	193	194	194	194	194	194	194
	SB Media players and recorders	1	1211	1051	139	0	0	0	0	0	0
	SB Projectors	7	495	421	172	74	0	0	0	0	0
	SB Home phones	88	406	422	401	377	363	356	348	341	334
	SB Office phones	145	263	241	227	225	228	224	219	214	210
	SB Home NAS	0	748	1182	1613	2030	2447	2810	3072	3198	3204
	SB Home Network Equipment	0	1406	1596	1703	1797	1891	2042	2042	2042	2042
	SB Office Network Equipment	0	199	586	1101	1614	2127	2395	2395	2395	2395
	SB Coffee makers	328	398	409	421	433	446	459	472	485	498
	Total (networked) SB (excl. double)	**6017**	**10972**	**12326**	**13058**	**13854**	**14846**	**15659**	**15952**	**16109**	**16146**
db											
0.0	EPS ≤ 6W, low-V	10	133	107	81	58	30	13	6	2	1
0.3	EPS 6–10 W	55	773	834	889	932	979	1004	1029	1055	1082
0.6	EPS 10–12 W	0	639	762	823	828	833	838	843	849	854
0.5	EPS 15–20 W	0	3	17	35	38	42	43	45	47	49
1.0	EPS 20–30 W	2	93	102	97	91	83	75	67	60	54
0.8	EPS 30–65 W, multiple-V	0	0	0	13	19	26	34	43	51	59
1.0	EPS 30-65 W	0	0	0	15	36	62	62	62	62	62
1.0	EPS 65–120 W	1	70	69	53	29	1	0	0	0	0
0.5	EPS 65–120 W, multiple-V	0	421	153	45	45	46	46	46	46	46
0.0	EPS 12–15 W	2	69	140	171	173	174	174	174	174	174
	EPS, total	**70**	**2201**	**2185**	**2223**	**2249**	**2276**	**2289**	**2314**	**2346**	**2381**
	EPS, double counted subtracted	**48**	**1214**	**1227**	**1254**	**1266**	**1277**	**1281**	**1296**	**1316**	**1338**
	TOTAL ELECTRONICS	**24452**	**104055**	**101579**	**108022**	**123062**	**139033**	**145329**	**147323**	**147838**	**147776**
	RF Household refrigerator and freezer	**2842**	**3642**	**3971**	**4172**	**4762**	**4572**	**5007**	**5160**	**5296**	**5416**
	CF open vertical chilled multi deck (RVC2)	191	219	217	222	264	288	279	270	262	254
	CF open horizontal frozen island (RHF4)	23	26	26	26	27	27	28	28	29	29
	CF other supermarket display (non-BCs)	438	545	577	601	623	645	668	692	716	741
	CF Plug in one door beverage cooler	375	480	479	498	537	546	550	568	587	606
	CF Plug in horizontal ice cream freezer	155	198	198	206	213	220	227	235	242	250
	CF Spiral vending machine	251	197	161	168	174	181	188	195	203	211
	Total CF Commercial Refrigeration	**1432**	**1666**	**1657**	**1720**	**1838**	**1907**	**1940**	**1988**	**2038**	**2091**
	PF Storage cabinet Chilled Vertical (CV)	141	192	201	227	227	229	239	250	260	270
	PF Storage cabinet Frozen Vertical (FV)	74	100	105	119	119	120	125	131	136	141
	PF Storage cabinet Chilled Horizontal (CH)	29	39	41	47	47	47	49	51	53	55
	PF Storage cabinet Frozen Horizontal (FH)	22	30	31	35	35	36	37	39	41	42
	PF Storage cabinets All types	**265**	**362**	**379**	**429**	**427**	**432**	**451**	**470**	**489**	**508**
	PF Process Chiller AC MT S ≤ 300 kW	22	44	49	56	59	65	70	76	81	87
	PF Process Chiller AC MT L > 300 kW	20	41	46	51	56	61	67	72	77	83
	PF Process Chiller AC LT S ≤ 200 kW	17	35	39	45	48	52	57	61	66	71
	PF Process Chiller AC LT L > 200 kW	16	33	37	41	45	49	54	58	62	66
	PF Process Chiller WC MT S ≤ 300 kW	10	19	22	25	26	29	31	34	36	39
	PF Process Chiller WC MT L > 300 kW	14	29	32	36	39	43	47	51	54	58
	PF Process Chiller WC LT S ≤ 200 kW	9	19	21	24	26	28	31	33	35	38
	PF Process Chiller WC LT L > 200 kW	12	24	26	29	32	35	38	41	44	47
	PF Process Chiller All MT&LT	**121**	**244**	**272**	**306**	**332**	**363**	**395**	**426**	**457**	**489**
	PF Condensing Unit MT S 0.2-1 kW	110	92	94	106	109	118	127	137	147	159
	PF Condensing Unit MT M 1-5 kW	238	198	203	226	236	254	274	295	318	342
	PF Condensing Unit MT L 5-20 kW	244	203	208	240	246	261	281	303	327	352
	PF Condensing Unit MT XL 20-50 kW	187	156	159	184	189	200	216	232	250	269
	PF Condensing Unit LT S 0.1-0.4 kW	19	16	16	18	19	20	22	24	25	27
	PF Condensing Unit LT M 0.4-2 kW	34	28	29	32	34	36	39	42	45	49
	PF Condensing Unit LT L 2-8 kW	91	76	77	89	92	97	105	113	121	131
	PF Condensing Unit LT XL 8-20 kW	79	66	68	78	80	85	91	98	106	114
0.6	**PF Condensing Unit, All MT&LT**	**1002**	**833**	**854**	**975**	**1001**	**1071**	**1154**	**1243**	**1340**	**1443**
	PF Professional Refrigeration, Total	**787**	**940**	**993**	**1125**	**1160**	**1224**	**1308**	**1394**	**1482**	**1574**
	TOTAL FOOD PRESERVATION	**5061**	**6247**	**6622**	**7017**	**7759**	**7704**	**8254**	**8542**	**8817**	**9081**
	CA Electric Hobs	982	2248	2416	2725	2869	2999	3121	3236	3343	3442
	CA Electric Ovens	2253	2719	2912	3287	3174	3066	3086	3124	3164	3203
	CA Gas Hobs	875	766	703	677	617	564	535	507	478	450
	CA Gas Ovens	291	304	309	392	377	363	349	335	322	309
	CA Range Hoods	547	679	716	938	1093	1103	1109	1113	1115	1115
	TOTAL COOKING	**4947**	**6716**	**7056**	**8018**	**8130**	**8093**	**8200**	**8315**	**8422**	**8519**
	WM Washing Machines	1525	2750	2821	3021	2794	2658	2529	2407	2377	2377
	WD Washer-Dryers	141	199	204	209	210	211	213	214	215	216
	Total WM-WD household Washing	**1666**	**2948**	**3025**	**3230**	**3004**	**2870**	**2742**	**2620**	**2592**	**2593**
	DW Household Dishwasher	**664**	**1974**	**2307**	**2590**	**2828**	**3049**	**3256**	**3447**	**3624**	**3786**

db	REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LD condensing heat pump	0	107	625	873	986	1168	1111	1057	1006	957
	LD condensing electric heat element	104	274	256	282	247	169	161	153	146	144
	LD vented electric	177	123	73	61	38	0	0	0	0	0
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**282**	**506**	**955**	**1217**	**1271**	**1337**	**1272**	**1211**	**1152**	**1101**
	VC Domestic mains	835	1386	1409	1182	993	770	637	610	610	610
	VC Commercial mains	277	417	439	468	445	423	403	390	390	390
	VC Total in scope of CR 666/2013	**1112**	**1803**	**1848**	**1650**	**1438**	**1193**	**1040**	**1000**	**1000**	**1000**
	VC Cordless	28	115	364	768	1138	1525	1846	2021	2092	2113
	VC Robot	0	101	203	373	546	737	895	981	1016	1026
	Total VC Vacuum Cleaner	**1140**	**2019**	**2415**	**2791**	**3121**	**3454**	**3781**	**4002**	**4108**	**4139**
	TOTAL CLEANING	**3753**	**7448**	**8702**	**9829**	**10225**	**10711**	**11051**	**11279**	**11476**	**11620**
0.5	FAN Axial<300Pa [247 W flow out]	235	800	1150	1451	1387	1326	1268	1213	1159	1109
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	325	1165	1234	1356	1303	1303	1303	1303	1303	1303
0.5	FAN Centr.FC [141 W flow out]	201	531	794	1102	1052	1004	958	914	873	833
0.5	FAN Centr.BC-free [2120 W flow out]	115	292	406	457	484	471	459	447	446	454
0.5	FAN Centr.BC [2052 W flow out]	252	695	1116	1286	1368	1334	1401	1461	1512	1555
0.5	FAN Cross-flow [31 W flow out]	46	108	353	470	497	484	507	527	544	558
	Total FAN, industrial (excl. box & roof fans)	**587**	**1795**	**2527**	**3060**	**3045**	**2961**	**2948**	**2932**	**2918**	**2906**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	332	543	589	554	567	547	523	499	474	450
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	197	314	303	273	269	255	239	223	207	200
0.45	Medium (L) 3-ph 75-375 kW no VSD	154	230	202	179	181	165	148	133	128	125
0.45	**Total 3ph 0.75-375 kW no VSD**	**682**	**1087**	**1093**	**1006**	**1017**	**967**	**910**	**855**	**810**	**775**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	131	390	606	1031	1107	1135	1180	1244	1311	1383
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	97	290	544	737	779	797	828	873	920	943
0.45	Medium (L) 3-ph 75-375 kW with VSD	73	222	394	482	524	538	559	581	587	590
0.45	**Total 3-ph 0.75-375 kW with VSD**	**300**	**903**	**1544**	**2249**	**2410**	**2470**	**2567**	**2697**	**2819**	**2916**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**982**	**1989**	**2638**	**3255**	**3427**	**3437**	**3476**	**3553**	**3628**	**3691**
0.45	Small 1 ph 0.12-0.75 kW no VSD	211	402	423	423	542	527	512	497	482	467
0.45	Small 1 ph 0.12-0.75 kW with VSD	33	276	335	352	389	411	435	461	488	516
0.45	**Total Small 1-ph 0.12-0.75 kW**	**244**	**678**	**758**	**776**	**931**	**938**	**947**	**957**	**969**	**983**
0.45	Small 3 ph 0.12-0.75 kW no VSD	116	198	208	219	255	248	241	234	227	220
0.45	Small 3 ph 0.12-0.75 kW with VSD	12	102	126	143	166	176	191	209	228	250
0.45	**Total Small 3-ph 0.12-0.75 kW**	**129**	**300**	**334**	**361**	**421**	**424**	**432**	**443**	**455**	**470**
0.45	Large 3-ph LV 375-1000 kW no VSD	70	90	80	79	89	85	81	77	73	69
0.45	Large 3-ph LV 375-1000kW with VSD	25	152	210	234	262	263	272	282	293	304
0.45	**Total Large 3-ph LV 375-1000 kW**	**96**	**242**	**290**	**314**	**351**	**347**	**353**	**359**	**366**	**373**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	21	37	38	41	49	49	48	48	47	46
0.45	Explosion motors (M) 3-ph 7.5-75 kW	19	33	34	37	42	42	41	40	40	39
0.45	Explosion motors (L) 3-ph 75-375 kW	14	24	26	28	31	31	30	29	29	28
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**53**	**94**	**99**	**105**	**122**	**121**	**119**	**118**	**116**	**114**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	26	46	48	52	68	67	66	65	64	63
0.45	Brake motors (M) 3-ph 7.5-75 kW	23	41	43	47	56	56	55	54	53	52
0.45	Brake motors (L) 3-ph 75-375 kW	17	31	32	35	41	40	39	39	38	37
0.45	**Total Brake 0.75-375 kW (no VSD)**	**67**	**117**	**123**	**135**	**165**	**163**	**160**	**157**	**155**	**152**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	1	2	2	2	3	3	3	3	3	3
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	2	2	2	3	3	2	2	2	2
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	2	2	2	2	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**3**	**5**	**6**	**6**	**8**	**8**	**8**	**8**	**8**	**7**
0.45	**1-phase motors >0.75 kW (no VSD)**	**480**	**841**	**882**	**901**	**1009**	**1015**	**1021**	**1026**	**1031**	**1034**
	MT Elec. Motors LV 0.12-1000 kW	**1129**	**2347**	**2820**	**3219**	**3538**	**3549**	**3584**	**3641**	**3700**	**3754**
	WP ESOB < 45kW	308	416	455	494	515	551	589	625	662	699
	WP ESOB 45-150kW	55	74	82	88	92	99	105	112	118	125
	WP ESCC < 45kW	195	264	289	314	328	351	375	398	422	445
	WP ESCC 45-150kW	42	57	63	68	71	76	81	86	91	96
	WP ESCCi < 45kW	98	134	146	161	170	182	194	206	219	231
	WP ESCCi 45-150kW	8	10	11	12	13	14	15	16	17	18
	WP MSSB <6"	563	761	845	919	957	1021	1085	1149	1214	1282
	WP MS_V <25 bar	176	238	262	285	297	319	340	361	383	404
	WP Water pumps	**1445**	**1955**	**2152**	**2342**	**2442**	**2613**	**2784**	**2954**	**3125**	**3300**
	Total WE Welding Equipment	**221**	**251**	**253**	**255**	**263**	**266**	**262**	**264**	**266**	**268**
	TOTAL INDUSTRY COMPONENTS	**3383**	**6349**	**7752**	**8876**	**9288**	**9389**	**9578**	**9791**	**10010**	**10227**
	TRAFO Distribution, kWh/a	373	594	793	855	918	986	1056	1126	1196	1266
	TRAFO Industry oil	194	317	524	565	607	652	698	745	791	837
	TRAFO Industry dry	92	149	217	234	251	269	287	306	325	343
	TRAFO Power	1498	2433	2633	2843	3057	3287	3524	3760	3997	4234
	TRAFO DER oil	0	17	48	80	132	218	322	426	530	634
	TRAFO DER dry	0	107	232	385	636	1050	1551	2052	2553	3055
	TRAFO Small	42	43	43	43	43	43	43	43	43	43
	TOTAL ENERGY SECTOR	**2199**	**3660**	**4492**	**5006**	**5645**	**6506**	**7482**	**8458**	**9435**	**10411**

db	REVENUE INDUSTRY ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	5262	7565	9190	11069	12552	14027	14027	14027	14027	14027
	Tyres C1, OEM for cars	1585	2171	2554	3258	3780	4224	4224	4224	4224	4224
	Tyres C1, total	**6847**	**9737**	**11744**	**14327**	**16332**	**18252**	**18252**	**18252**	**18252**	**18252**
	Tyres C2, replacement for vans	913	1189	1238	1546	1790	2011	2011	2011	2011	2011
	Tyres C2, OEM for vans	193	213	266	293	371	424	424	424	424	424
	Tyres C2, total	**1106**	**1403**	**1505**	**1839**	**2160**	**2435**	**2435**	**2435**	**2435**	**2435**
	Tyres C3, replacement for trucks/busses	1600	1617	2836	3291	3789	4223	4223	4223	4223	4223
	Tyres C3, OEM for trucks/busses	446	381	532	720	1056	1177	1177	1177	1177	1177
	Tyres C3, total	**2045**	**1998**	**3367**	**4011**	**4845**	**5401**	**5401**	**5401**	**5401**	**5401**
	Tyres, total C1+C2+C3	**9998**	**13137**	**16616**	**20177**	**23337**	**26087**	**26087**	**26087**	**26087**	**26087**
	TRANSPORT SECTOR	9998	13137	16616	20177	23337	26087	26087	26087	26087	26087
	GENERAL TOTAL (in m euros 2020)	**72626**	**185380**	**195218**	**213545**	**237290**	**259629**	**270500**	**278255**	**285040**	**290922**
	GENERAL TOTAL (in bn euros 2020)	73	185	195	214	237	260	271	278	285	291

SUMMARY ECO

Industry revenue (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**2.4**	**2.9**	**2.9**	**3.1**	**3.5**	**3.9**	**4.4**	**4.8**	**5.2**	**5.7**
SPACE HEATING	**11.4**	**18.2**	**17.9**	**20.8**	**22.8**	**24.2**	**25.7**	**27.1**	**28.6**	**30.1**
SPACE COOLING	**1.0**	**5.3**	**5.8**	**6.7**	**7.5**	**8.2**	**9.0**	**9.8**	**10.6**	**11.2**
VENTILATION	1.6	5.8	6.8	7.3	7.6	8.3	8.7	9.4	10.0	10.4
LIGHTING	2.6	5.5	8.9	8.7	8.4	7.4	6.8	7.3	8.5	9.7
ELECTRONICS	**24.5**	**104.1**	**101.6**	**108.0**	**123.1**	**139.0**	**145.3**	**147.3**	**147.8**	**147.8**
FOOD PRESERVATION	5.1	6.2	6.6	7.0	7.8	7.7	8.3	8.5	8.8	9.1
COOKING	4.9	6.7	7.1	8.0	8.1	8.1	8.2	8.3	8.4	8.5
CLEANING	**3.8**	**7.4**	**8.7**	**9.8**	**10.2**	**10.7**	**11.1**	**11.3**	**11.5**	**11.6**
INDUSTRY COMPONENTS	3.4	6.3	7.8	8.9	9.3	9.4	9.6	9.8	10.0	10.2
ENERGY SECTOR	2.2	3.7	4.5	5.0	5.6	6.5	7.5	8.5	9.4	10.4
TRANSPORT SECTOR	10.0	13.1	16.6	20.2	23.3	26.1	26.1	26.1	26.1	26.1
TOTAL in bn euro 2020	**73**	**185**	**195**	**214**	**237**	**260**	**271**	**278**	**285**	**291**

Industry revenue ECO-BAU (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.0**	**- -**	**0.0**	**0.1**	**0.2**	**0.3**	**0.5**	**0.6**	**0.7**	**0.8**
SPACE HEATING	**-**	**0.1**	**0.6**	**1.8**	**2.9**	**3.2**	**3.6**	**3.9**	**4.3**	**4.6**
SPACE COOLING	-	**0.2**	**0.3**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.0**	**0.0**
VENTILATION	-	-	0.2	0.5	0.5	0.5	0.5	0.5	0.4	0.4
LIGHTING	-	0.3	3.3	0.5	1.1	0.6	0.2	0.5	1.0	1.3
ELECTRONICS	-	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
FOOD PRESERVATION	-	0.5	0.7	0.9	1.5	1.2	1.6	1.7	1.7	1.8
COOKING	-	-	0.1	0.6	0.7	0.5	0.4	0.4	0.3	0.3
CLEANING	-	**1.0**	**1.6**	**1.7**	**1.6**	**1.5**	**1.3**	**1.0**	**0.9**	**0.7**
INDUSTRY COMPONENTS	-	0.0	0.8	1.4	1.5	1.3	1.2	1.0	0.8	0.6
ENERGY SECTOR	-	-	0.5	0.5	0.7	0.8	1.0	1.2	1.4	1.6
TRANSPORT SECTOR	-	0.3	2.1	3.5	4.5	4.7	4.7	4.7	4.7	4.7
TOTAL in bn euros 2020	**0**	**2**	**10**	**12**	**15**	**15**	**15**	**16**	**16**	**17**

Revenues for VSDs only (without motor, m euros)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	29	231	278	292	309	329	350	373	397	422
VSD - Very Small 0.12 - 0.75 kW 3-phase	10	76	93	105	118	125	136	150	166	183
VSD - Small 0.75 - 7.5 kW 3-phase	94	279	419	685	726	741	776	828	883	942
VSD - Medium 7.5 - 75kW 3-phase	67	200	362	480	505	516	539	576	614	637
VSD - Large 75 - 375kW 3-phase	38	114	190	228	240	246	259	275	284	291
VSD - Very Large 375 - 1,000kW 3-phase	17	98	133	148	161	161	169	178	187	196
Total revenues, VSDs only (ECO)	**255**	**997**	**1476**	**1937**	**2059**	**2118**	**2230**	**2379**	**2531**	**2672**

db REVENUE RETAIL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	9	13	14	16	16	16	16	16	16	16
EIWH Electric Instant. ≥ 12 kW (primary)	46	39	38	40	44	48	53	57	61	65
EIWHS Electric Instant. Shower (secondary)	7	9	9	8	9	9	10	11	11	12
ESWH Electric Storage ≤ 30 L (secondary)	29	32	33	34	36	39	41	43	46	48
ESWH Electric Storage > 30 L (primary)	180	210	192	201	215	229	242	256	270	284
GIWH Gas Instant. < 13 L/min (secondary)	52	36	30	30	30	30	29	29	28	28
GIWH Gas Instant. ≥ 13 L/min (primary)	15	14	12	12	12	12	12	12	12	11
GSWH Gas Storage, Condensing	0	1	1	1	1	1	2	2	2	2
GSWH Gas Storage, Non-condensing	24	14	10	6	6	5	4	4	3	2
Dedicated WH Heat Pump	0	18	51	73	111	149	187	225	263	301
Dedicated WH Solar (3.5 m2)	39	139	141	115	119	123	127	132	136	140
WH dedicated Water Heater	**401**	**525**	**531**	**537**	**599**	**661**	**723**	**786**	**848**	**910**
CHB Gas Combi Instant. WH	62	104	108	116	117	118	119	119	118	116
CHB Gas + Cyl. WH	32	43	45	48	49	49	49	49	49	48
CHB Jet Burner Gas + Cyl. WH	14	6	4	4	4	4	5	5	5	5
CHB Jet Burner Oil + Cyl. WH	107	43	29	28	29	30	31	31	32	33
CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	2	1
CHB Hybrid Gas/Electric WH	0	0	0	1	1	2	3	5	8	14
CHB Electric HP + Cyl. WH	2	32	36	44	51	58	67	78	89	102
CHB Gas HP + Cyl. WH	0	0	1	1	1	2	3	4	6	8
CHB Gas mCHP + Cyl. WH	1	1	1	2	3	4	5	8	11	15
CHB Solar Combi (16 m2)	3	6	6	6	6	7	7	7	7	7
CHC Central Heating combi, water heating	**222**	**238**	**233**	**253**	**264**	**277**	**291**	**307**	**326**	**350**
TOTAL WATER HEATING	**623**	**763**	**764**	**790**	**863**	**938**	**1014**	**1093**	**1174**	**1260**
CHB Gas non-condensing	462	248	230	225	208	191	174	158	143	128
CHB Gas condensing	31	675	561	598	635	669	697	719	735	742
CHB Gas Jet burner non-condensing	97	31	14	12	12	11	10	9	9	8
CHB Gas Jet burner condensing	0	10	14	16	18	19	21	23	24	25
CHB Oil Jet burner non-condensing	685	211	94	82	77	71	66	61	57	52
CHB Oil Jet burner condensing	0	70	94	100	111	121	132	142	151	160
CHB Electric Joule-effect	7	11	10	11	11	10	9	8	7	7
CHB Hybrid (gas-electric)	0	1	2	4	7	11	18	30	50	82
CHB Electric Heat Pump	12	172	194	239	279	326	379	440	511	593
CHB Gas Heat Pump	1	2	3	5	8	11	16	23	33	48
CHB micro CHP	3	5	6	10	14	21	30	43	61	88
CHB Solar combi (16 m2)	17	30	30	33	34	35	36	37	38	39
CHB Central Heating boiler < 400 kW, space heating	**1315**	**1467**	**1255**	**1337**	**1412**	**1496**	**1588**	**1694**	**1819**	**1971**
SFB Wood Manual [18 kW]	23	14	9	5	3	3	3	3	2	2
SFB Wood Direct Draft [20 kW]	1	38	39	41	38	47	55	65	76	90
SFB Coal [25 kW]	6	29	6	8	9	8	7	7	6	5
SFB Pellets [25 kW]	0	10	15	15	15	16	18	20	22	24
SFB Wood chips [160 kW]	0	6	6	7	8	9	10	11	12	13
Total Solid Fuel Boiler	**30**	**96**	**75**	**76**	**73**	**83**	**93**	**104**	**118**	**135**
CHAE-S (≤ 400 kW)	25	112	123	137	151	166	180	194	208	221
CHAE-L (> 400 kW)	6	19	20	21	22	23	23	24	25	26
CHWE-S (≤ 400 kW)	2	10	11	12	13	15	16	17	19	20
CHWE-M (> 400 kW; ≤ 1500 kW)	3	9	9	10	10	11	11	12	12	12
CHWE-L (> 1500 kW)	2	6	6	6	7	7	7	7	8	8
CHF	0	0	1	1	1	1	1	1	1	1
HT PCH-AE-S	13	21	23	24	25	26	28	29	30	31
HT PCH-AE-L	10	17	18	19	20	21	22	23	24	25
HT PCH-WE-S	3	5	5	5	6	6	6	6	6	7
HT PCH-WE-M	11	19	20	21	22	23	24	25	26	26
HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
AC rooftop	12	40	40	31	18	5	5	5	5	5
AC splits	20	77	81	78	76	73	70	67	64	62
AC VRF	0	175	229	335	424	511	595	672	736	783
ACF	0	0	1	1	1	1	1	1	1	1
SubTotal AHC Air Cooling	**109**	**514**	**592**	**706**	**800**	**892**	**993**	**1088**	**1169**	**1232**
AC rooftop (rev)	7	24	24	19	11	3	0	0	0	0
AC splits (rev)	14	49	52	50	49	47	45	43	41	40
AC VRF (rev)	0	149	186	286	348	399	442	475	495	501
ACF (rev)	0	1	1	1	2	2	2	3	3	3
AHF	43	28	26	24	23	22	20	19	18	17
AHE	0	0	0	0	0	0	0	0	0	0
SubTotal AHC Air Heating (rev double)	**64**	**252**	**289**	**381**	**432**	**473**	**510**	**540**	**557**	**560**
Total AHC Air Heating & Cooling	**151**	**542**	**618**	**731**	**823**	**914**	**1014**	**1107**	**1188**	**1249**

db	REVENUE RETAIL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	123	177	175	175	173	172	172	172	172	172
	LH closed fireplace/inset [8 kW]	78	207	228	249	252	255	256	256	256	256
	LH wood stove [8 kW]	84	98	106	116	117	119	119	119	119	119
	LH coal stove [8 kW]	23	19	17	16	12	8	7	7	7	7
	LH cooker [10 kW]	72	142	169	196	201	206	207	207	207	207
	LH SHR stove [8 kW]	78	107	131	155	173	192	195	195	195	195
	LH pellet stove [8 kW]	0	80	99	118	127	135	137	137	137	137
	LH Solid fuel sum	**458**	**830**	**925**	**1024**	**1056**	**1087**	**1093**	**1093**	**1093**	**1093**
	LH Electric portable	19	23	24	24	24	24	24	24	24	24
	LH Electric fixed > 250W	159	185	143	133	133	133	133	133	133	133
	LH Electric fixed ≤ 250W	20	23	18	17	17	17	17	17	17	17
	LH Electric storage	16	20	18	17	17	17	17	17	17	17
	LH Electric underfloor	16	19	20	20	20	20	20	20	20	20
	LH Electric visibly glowing > 1.2 kW	0	1	1	1	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	29	48	48	48	48	48	48	48	48	48
	LH Electric sum	**258**	**318**	**271**	**259**	**259**	**259**	**259**	**259**	**259**	**259**
	LH Gas luminous (commercial)	0	1	1	1	0	0	0	0	0	0
	LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	0	0	0	0	0	0
	LH Gas open front	1	1	1	1	1	1	1	1	1	1
	LH Gas closed front	12	6	5	4	4	3	3	3	3	3
	LH Gas balanced flue	18	8	5	4	4	3	3	3	3	3
	LH Gas flueless	1	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**33**	**17**	**13**	**11**	**9**	**8**	**8**	**8**	**8**	**8**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	1	0	0	0	0	0	0	0
	LH Liquid balanced flue	2	1	0	0	0	0	0	0	0	0
	LH Liquid flueless	7	2	1	0	0	0	0	0	0	0
	LH Liquid fuel sum	**10**	**4**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**759**	**1168**	**1212**	**1295**	**1325**	**1355**	**1361**	**1361**	**1361**	**1361**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	23	227	169	188	207	227	249	278	319	369
	RAC fixed 6-12 kW, cooling	10	121	120	118	123	126	129	129	143	158
	RAC portable < 12 kW, cooling	2	21	19	14	14	15	15	16	16	17
	RAC < 12 kW total, cooling mode	**35**	**369**	**308**	**319**	**344**	**368**	**393**	**423**	**478**	**544**
	RAC fixed < 6 kW, reversible, heating	2	87	81	113	145	182	224	278	319	369
	RAC fixed 6-12 kW, reversible, heating	1	46	58	71	86	101	116	129	143	158
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**3**	**133**	**139**	**183**	**231**	**283**	**340**	**407**	**461**	**527**
	RAC Room Air Conditioner	**38**	**502**	**447**	**503**	**576**	**651**	**732**	**830**	**939**	**1070**
1	CIRC Integrated circulators	54	88	98	103	111	117	117	117	117	117
0.38	CIRC Large standalone circulators	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Small standalone circulators	44	66	65	61	56	49	49	49	49	49
	CIRC Circulator pumps <2.5 kW, all	**97**	**154**	**163**	**164**	**166**	**166**	**166**	**166**	**166**	**166**
	CIRC Circulator pumps <2.5 kW, excl. double	**27**	**41**	**40**	**38**	**35**	**30**	**30**	**30**	**30**	**30**
	TOTAL SPACE HEATING (incl. rev.AC)	**2198**	**3157**	**3010**	**3310**	**3507**	**3719**	**3921**	**4136**	**4347**	**4585**
	TOTAL SPACE COOLING	**144**	**884**	**899**	**1025**	**1144**	**1260**	**1386**	**1511**	**1647**	**1775**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	3	3	3	4	3	3
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	1	1	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	11	18	40	200	220	242	338	409	443
	R-UVU 100-250 m3/h	12	40	42	47	45	44	47	50	47	49
	R-BVU 100-250 m3/h	2	10	12	18	82	88	95	128	152	163
	R-UVU 250-1000 m3/h	22	59	58	65	59	59	63	68	65	68
	R-BVU 250-1000 m3/h	3	18	21	32	146	157	169	225	266	286
	R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1
	R-BVU 1000-2500 m3/h	0	5	5	5	6	6	7	8	8	9
	RVU, Total residential (incl. instal.mat.)	**42**	**145**	**158**	**210**	**541**	**580**	**627**	**821**	**952**	**1023**
	NR-UVU 250-1000 m3/h	8	9	8	8	7	7	7	7	6	6
	NR-BVU 250-1000 m3/h	0	18	18	22	25	29	31	35	39	41
	NR-UVU > 1000 m3/h	9	9	9	8	7	7	7	6	6	6
	NR-BVU 1000-2500 m3/h	0	36	35	40	44	50	54	58	64	68
	NR-AHU-S 2500-5500 m3/h	10	189	236	236	211	237	250	257	268	283
	NR-AHU-M 5500-14500 m3/h	122	326	369	360	319	345	354	357	367	378
	NR-AHU-L > 14500 m3/h	28	79	89	86	75	81	83	84	86	88
	NRVU, Total non-residential (incl. instal.mat.)	**178**	**665**	**765**	**760**	**687**	**756**	**787**	**803**	**836**	**869**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**220**	**810**	**923**	**971**	**1228**	**1336**	**1414**	**1624**	**1787**	**1892**
	TOTAL VENTILATION	**220**	**810**	**923**	**971**	**1228**	**1336**	**1414**	**1624**	**1787**	**1892**

db	REVENUE RETAIL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	202	301	271	206	141	104	86	68	52	40
	HID (HPM, HPS, MH)	33	99	89	61	47	26	13	7	3	2
	CFLni (all shapes)	22	87	76	74	59	29	16	9	4	3
	CFLi (retrofit for GLS, HL)	27	355	232	278	166	123	67	46	29	18
	GLS (DLS & NDLS)	286	235	198	138	81	48	28	16	10	6
	HL (DLS & NDLS, LV & MV)	54	437	546	558	344	177	93	51	29	17
	LED replacing LFL (retrofit & luminaire)	0	0	51	189	256	343	376	437	526	620
	LED replacing HID (retrofit & luminaire)	0	0	16	99	115	145	173	207	240	273
	LED replacing CFLni (retrofit & luminaire)	0	0	3	12	19	24	27	31	34	36
	LED replacing DLS (retrofit & luminaire)	0	0	11	32	37	22	16	13	12	12
	LED replacing NDLS (retrofit & luminaire)	0	4	25	177	142	97	76	62	54	51
	SUBTOTAL non-LED	625	1514	1412	1315	838	507	303	196	126	85
	SUBTOTAL LED	0	4	106	508	568	631	667	749	864	992
	TOTAL LIGHTING	**625**	**1518**	**1518**	**1823**	**1406**	**1138**	**970**	**945**	**990**	**1077**
	DP TV all types	7126	11690	6679	8331	9613	11055	11215	11215	11215	11215
	DP Monitor	456	1001	563	566	566	566	566	566	566	566
	DP Signage	0	67	294	675	507	507	507	507	507	507
	DP Electronic Displays, total	**7582**	**12758**	**7537**	**9573**	**10686**	**12128**	**12288**	**12288**	**12288**	**12288**
	SSTB	0	63	14	0	0	0	0	0	0	0
	CSTB	0	238	293	296	296	296	296	296	296	296
	Total STB set top boxes (Complex & Simple)	**0**	**301**	**307**	**296**	**296**	**296**	**296**	**296**	**296**	**296**
	Game consoles > 20 W	16	1272	1272	1272	1272	1272	1272	1272	1272	1272
	Game consoles < 20 W	57	321	321	321	321	321	321	321	321	321
	Total GC Game consoles	**74**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**
	ES Enterprise Servers total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DS Data Storage products total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PC Desktop	5213	8096	4283	4791	6610	7047	7301	7387	7415	7424
	PC Integrated Desktop	223	346	183	205	283	345	388	403	408	410
	PC Notebook	0	22372	19727	19678	25966	32747	37606	39368	39965	40163
	PC Tablet/slate	0	1018	11667	11249	12228	13254	13863	14069	14137	14160
	PC Thin client	0	171	166	176	177	178	179	179	179	179
	PC Integrated Thin Client	0	13	13	14	14	14	14	14	14	14
	PC Small-scale Server	22	42	53	54	54	55	55	55	55	55
	PC Workstation	204	364	447	511	612	732	813	842	851	854
	Total PC, electricity	**5661**	**32424**	**36541**	**36677**	**45945**	**54373**	**60218**	**62316**	**63025**	**63260**
	Inkjet Printer	191	315	41	45	43	41	39	37	35	33
	Inkjet MFD	235	608	465	294	280	266	253	241	229	216
	EP / Laser Printer mono	123	122	142	134	106	85	67	51	35	20
	EP / Laser Printer colour	0	118	133	163	180	189	196	199	203	207
	EP / Laser Copier mono	608	256	63	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	86	153	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	199	266	254	242	230	218	207	197	186
	EP / Laser MFD colour	0	1332	1780	1699	1616	1537	1463	1390	1317	1245
	Total IE Imaging Equipment	**1157**	**3035**	**3043**	**2591**	**2467**	**2348**	**2236**	**2126**	**2016**	**1906**
	Products regulated only for (networked) standby										
	SB Radios	165	133	107	95	86	78	70	62	53	45
	SB Electric toothbrushes	19	31	34	38	43	47	52	56	61	65
	SB Audio speakers (wired)	430	221	156	56	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	2	154	410	465	467	468	468	469	469
	SB Small appliances	498	805	825	847	857	866	876	885	894	904
	SB Media boxes /sticks	0	0	32	39	40	40	40	40	40	40
	SB Media players and recorders	0	243	211	28	0	0	0	0	0	0
	SB Projectors	1	77	65	27	12	0	0	0	0	0
	SB Home phones	87	403	419	398	374	360	353	346	338	331
	SB Office phones	87	158	145	136	135	137	134	131	129	126
	SB Home NAS	0	70	111	151	190	229	263	288	300	300
	SB Home Network Equipment	0	291	330	352	372	391	423	423	423	423
	SB Office Network Equipment	0	31	90	169	248	327	369	369	369	369
	SB Coffee makers	319	388	399	410	422	435	448	460	473	485
	Total (networked) SB (excl. double)	**1606**	**2853**	**3079**	**3157**	**3243**	**3378**	**3494**	**3527**	**3547**	**3556**
	Total EPS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**16080**	**52963**	**52100**	**53886**	**64229**	**74115**	**80124**	**82145**	**82764**	**82898**
	RF Household refrigerator and freezer	**2742**	**3061**	**3131**	**3203**	**3252**	**3301**	**3350**	**3398**	**3447**	**3496**
	Total CF Commercial Refrigeration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	REVENUE RETAIL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	20	27	29	30	31	33	34	36	37	39
	PF Storage cabinet Frozen Vertical (FV)	11	14	15	16	16	17	18	19	19	20
	PF Storage cabinet Chilled Horizontal (CH)	4	6	6	6	6	7	7	7	8	8
	PF Storage cabinet Frozen Horizontal (FH)	3	4	4	5	5	5	5	6	6	6
	PF Storage cabinets All types	**38**	**52**	**54**	**56**	**59**	**62**	**64**	**67**	**70**	**73**
	PF Process Chiller AC MT S ≤ 300 kW	3	6	7	8	8	9	10	11	12	12
	PF Process Chiller AC MT L > 300 kW	3	6	7	7	8	9	10	10	11	12
	PF Process Chiller AC LT S ≤ 200 kW	2	5	6	6	7	7	8	9	9	10
	PF Process Chiller AC LT L > 200 kW	2	5	5	6	6	7	8	8	9	9
	PF Process Chiller WC MT S ≤ 300 kW	1	3	3	3	4	4	4	5	5	6
	PF Process Chiller WC MT L > 300 kW	2	4	5	5	6	6	7	7	8	8
	PF Process Chiller WC LT S ≤ 200 kW	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC LT L > 200 kW	2	3	4	4	5	5	5	6	6	7
	PF Process Chiller All MT&LT	**17**	**35**	**39**	**43**	**47**	**52**	**56**	**61**	**65**	**70**
	PF Condensing Unit MT S 0.2-1 kW	16	13	13	14	16	17	18	20	21	23
	PF Condensing Unit MT M 1-5 kW	34	28	29	31	34	36	39	42	45	49
	PF Condensing Unit MT L 5-20 kW	35	29	30	32	35	37	40	43	47	50
	PF Condensing Unit MT XL 20-50 kW	27	22	23	25	27	29	31	33	36	38
	PF Condensing Unit LT S 0.1-0.4 kW	3	2	2	3	3	3	3	3	4	4
	PF Condensing Unit LT M 0.4-2 kW	5	4	4	4	5	5	6	6	6	7
	PF Condensing Unit LT L 2-8 kW	13	11	11	12	13	14	15	16	17	19
	PF Condensing Unit LT XL 8-20 kW	11	9	10	10	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	**143**	**119**	**122**	**132**	**142**	**153**	**165**	**178**	**191**	**206**
	PF Professional Refrigeration, Total	**112**	**134**	**142**	**152**	**163**	**175**	**187**	**199**	**212**	**225**
	TOTAL FOOD PRESERVATION	**2855**	**3196**	**3273**	**3355**	**3415**	**3476**	**3536**	**3598**	**3659**	**3721**
	CA Electric Hobs	973	2230	2397	2594	2736	2864	2986	3100	3207	3306
	CA Electric Ovens	2086	2517	2660	2895	2801	2821	2857	2892	2929	2966
	CA Gas Hobs	810	709	651	593	548	522	496	469	443	417
	CA Gas Ovens	279	291	279	272	264	256	248	240	232	224
	CA Range Hoods	506	629	662	698	734	771	809	846	884	921
	TOTAL COOKING	**4654**	**6376**	**6649**	**7052**	**7082**	**7235**	**7395**	**7548**	**7694**	**7834**
	WM Washing Machines	1497	2238	2254	2431	2333	2333	2333	2333	2333	2333
	WD Washer-Dryers	138	195	200	206	207	208	209	210	211	212
	Total WM-WD household Washing	**1635**	**2433**	**2454**	**2636**	**2540**	**2541**	**2542**	**2543**	**2544**	**2545**
	DW Household Dishwasher	**643**	**1440**	**1681**	**1927**	**2160**	**2393**	**2626**	**2859**	**3092**	**3325**
	LD condensing heat pump	0	23	35	56	83	119	151	179	210	245
	LD condensing electric heat element	101	275	405	528	504	459	414	379	356	334
	LD vented electric	173	138	155	160	158	155	155	155	155	155
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**275**	**439**	**595**	**743**	**746**	**733**	**719**	**712**	**720**	**733**
	VC Domestic mains	683	1132	1053	948	796	617	512	490	490	490
	VC Commercial mains	140	212	204	198	198	198	198	198	198	198
	VC Total in scope of CR 666/2013	**823**	**1344**	**1257**	**1146**	**994**	**815**	**710**	**688**	**688**	**688**
	VC Cordless	23	94	296	624	925	1240	1501	1643	1701	1718
	VC Robot	0	81	164	301	440	594	722	791	819	827
	Total VC Vacuum Cleaner	**846**	**1519**	**1716**	**2071**	**2359**	**2649**	**2932**	**3122**	**3208**	**3233**
	TOTAL CLEANING	**3399**	**5831**	**6446**	**7378**	**7805**	**8316**	**8819**	**9236**	**9564**	**9836**
0.5	FAN Axial<300Pa [247 W flow out]	35	119	138	156	156	156	156	156	156	156
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	48	174	184	194	194	194	194	194	194	194
0.5	FAN Centr.FC [141 W flow out]	30	79	92	104	104	104	104	104	104	104
0.5	FAN Centr.BC-free [2120 W flow out]	17	44	50	56	62	63	64	65	67	68
0.5	FAN Centr.BC [2052 W flow out]	38	104	119	135	150	153	168	184	199	214
0.5	FAN Cross-flow [31 W flow out]	7	16	18	21	23	23	26	28	30	32
	Total FAN, industrial (excl. box & roof fans)	**88**	**268**	**301**	**333**	**345**	**347**	**357**	**366**	**375**	**385**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	50	80	82	81	77	73	69	64	60	54
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	29	46	47	46	43	41	37	33	29	26
0.45	Medium (L) 3-ph 75-375 kW no VSD	23	34	33	32	29	25	21	16	16	16
0.45	**Total 3ph 0.75-375 kW no VSD**	**102**	**161**	**162**	**158**	**149**	**139**	**127**	**114**	**105**	**97**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	19	58	69	80	91	103	121	141	165	194
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	14	43	51	59	67	77	90	105	122	136
0.45	Medium (L) 3-ph 75-375 kW with VSD	11	32	39	45	52	59	69	80	82	84
0.45	**Total 3-ph 0.75-375 kW with VSD**	**45**	**133**	**159**	**185**	**210**	**239**	**279**	**325**	**369**	**413**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**147**	**293**	**321**	**343**	**359**	**378**	**406**	**439**	**473**	**511**
0.45	Small 1 ph 0.12-0.75 kW no VSD	31	60	63	63	63	63	62	62	61	60
0.45	Small 1 ph 0.12-0.75 kW with VSD	5	41	50	53	56	59	63	67	71	75
0.45	**Total Small 1-ph 0.12-0.75 kW**	**36**	**101**	**113**	**116**	**119**	**122**	**125**	**128**	**132**	**136**
0.45	Small 3 ph 0.12-0.75 kW no VSD	17	30	31	31	31	31	30	30	30	29
0.45	Small 3 ph 0.12-0.75 kW with VSD	2	15	19	21	23	25	27	30	33	36
0.45	**Total Small 3-ph 0.12-0.75 kW**	**19**	**45**	**50**	**52**	**54**	**56**	**58**	**60**	**63**	**65**

db	REVENUE RETAIL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Large 3-ph LV 375-1000 kW no VSD	10	13	12	12	12	12	11	11	10	10
0.45	Large 3-ph LV 375-1000kW with VSD	4	23	31	35	36	38	40	41	43	45
0.45	**Total Large 3-ph LV 375-1000 kW**	**14**	**36**	**43**	**46**	**48**	**50**	**51**	**52**	**54**	**55**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	3	5	6	6	6	6	6	6	6	6
0.45	Explosion motors (M) 3-ph 7.5-75 kW	3	5	5	5	5	5	5	5	5	5
0.45	Explosion motors (L) 3-ph 75-375 kW	2	4	4	4	4	4	4	4	4	4
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**8**	**14**	**15**	**15**	**15**	**15**	**15**	**15**	**15**	**16**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	4	7	7	7	7	7	7	7	7	8
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	6	6	7	7	7	7	7	7	7
0.45	Brake motors (L) 3-ph 75-375 kW	3	5	5	5	5	5	5	5	5	5
0.45	**Total Brake 0.75-375 kW (no VSD)**	**10**	**18**	**18**	**19**	**19**	**19**	**19**	**19**	**19**	**19**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	**1-phase motors >0.75 kW (no VSD)**	**72**	**126**	**132**	**135**	**134**	**134**	**134**	**134**	**136**	**140**
	MT Elec. Motors LV 0.12-1000 kW	**169**	**348**	**381**	**399**	**412**	**426**	**445**	**467**	**491**	**518**
	WP ESOB < 45kW	46	62	68	74	77	83	88	94	99	105
	WP ESOB 45-150kW	8	11	12	13	14	15	16	17	18	19
	WP ESCC < 45kW	29	40	43	47	49	53	56	60	63	67
	WP ESCC 45-150kW	6	9	9	10	11	11	12	13	14	14
	WP ESCCi < 45kW	15	20	22	24	25	27	29	31	33	35
	WP ESCCi 45-150kW	1	2	2	2	2	2	2	2	2	3
	WP MSSB <6"	84	114	124	136	141	151	162	172	182	192
	WP MS_V <25 bar	26	36	39	43	45	48	51	54	57	61
	WP Water pumps	**217**	**293**	**320**	**349**	**364**	**390**	**416**	**442**	**469**	**495**
	Total WE Welding Equipment	**30**	**34**	**34**	**35**	**35**	**35**	**36**	**36**	**36**	**36**
	TOTAL INDUSTRY COMPONENTS	503	943	1036	1116	1156	1199	1254	1311	1371	1434
	TRAFO Distribution, kWh/a	47	74	80	87	93	100	107	114	121	128
	TRAFO Industry oil	24	40	43	46	50	53	57	61	65	68
	TRAFO Industry dry	12	19	20	22	23	25	27	28	30	32
	TRAFO Power	187	304	329	355	382	411	440	470	500	529
	TRAFO DER oil	0	2	4	6	10	16	24	32	39	47
	TRAFO DER dry	0	13	22	37	61	100	148	196	244	291
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**275**	**457**	**504**	**558**	**624**	**711**	**808**	**906**	**1004**	**1101**
	Tyres C1, replacement for cars	3947	5449	6002	6831	7731	8730	8730	8730	8730	8730
	Tyres C1, OEM for cars	1189	1629	1915	2057	2328	2629	2629	2629	2629	2629
	Tyres C1, total	**5135**	**7077**	**7917**	**8888**	**10058**	**11359**	**11359**	**11359**	**11359**	**11359**
	Tyres C2, replacement for vans	685	892	890	1002	1124	1259	1259	1259	1259	1259
	Tyres C2, OEM for vans	144	160	200	211	237	265	265	265	265	265
	Tyres C2, total	**829**	**1052**	**1090**	**1214**	**1361**	**1524**	**1524**	**1524**	**1524**	**1524**
	Tyres C3, replacement for trucks/busses	1200	1213	1461	1864	2137	2448	2448	2448	2448	2448
	Tyres C3, OEM for trucks/busses	334	286	399	520	596	682	682	682	682	682
	Tyres C3, total	**1534**	**1498**	**1860**	**2384**	**2733**	**3130**	**3130**	**3130**	**3130**	**3130**
	Tyres, total C1+C2+C3	**7499**	**9628**	**10867**	**12486**	**14153**	**16013**	**16013**	**16013**	**16013**	**16013**
	TRANSPORT SECTOR	**7499**	**9628**	**10867**	**12486**	**14153**	**16013**	**16013**	**16013**	**16013**	**16013**
	GENERAL TOTAL (in m euros 2020)	**39073**	**86525**	**87988**	**93750**	**106611**	**119455**	**126654**	**130065**	**132015**	**133427**
	GENERAL TOTAL (in bn euros 2020)	39	87	88	94	107	119	127	130	132	133

SUMMARY BAU

retail revenue (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.6**	**0.8**	**0.8**	**0.8**	**0.9**	**0.9**	**1.0**	**1.1**	**1.2**	**1.3**
SPACE HEATING	**2.2**	**3.2**	**3.0**	**3.3**	**3.5**	**3.7**	**3.9**	**4.1**	**4.3**	**4.6**
SPACE COOLING	**0.1**	**0.9**	**0.9**	**1.0**	**1.1**	**1.3**	**1.4**	**1.5**	**1.6**	**1.8**
VENTILATION	**0.2**	**0.8**	**0.9**	**1.0**	**1.2**	**1.3**	**1.4**	**1.6**	**1.8**	**1.9**
LIGHTING	**0.6**	**1.5**	**1.5**	**1.8**	**1.4**	**1.1**	**1.0**	**0.9**	**1.0**	**1.1**
ELECTRONICS	**16.1**	**53.0**	**52.1**	**53.9**	**64.2**	**74.1**	**80.1**	**82.1**	**82.8**	**82.9**
FOOD PRESERVATION	**2.9**	**3.2**	**3.3**	**3.4**	**3.4**	**3.5**	**3.5**	**3.6**	**3.7**	**3.7**
COOKING	**4.7**	**6.4**	**6.6**	**7.1**	**7.1**	**7.2**	**7.4**	**7.5**	**7.7**	**7.8**
CLEANING	**3.4**	**5.8**	**6.4**	**7.4**	**7.8**	**8.3**	**8.8**	**9.2**	**9.6**	**9.8**
INDUSTRY COMPONENTS	0.5	0.9	1.0	1.1	1.2	1.2	1.3	1.3	1.4	1.4
ENERGY SECTOR	**0.3**	**0.5**	**0.5**	**0.6**	**0.6**	**0.7**	**0.8**	**0.9**	**1.0**	**1.1**
TRANSPORT SECTOR	7.5	9.6	10.9	12.5	14.2	16.0	16.0	16.0	16.0	16.0
TOTAL in bn euros 2020	**39**	**87**	**88**	**94**	**107**	**119**	**127**	**130**	**132**	**133**

Revenues for VSDs only (without motor)

Revenues for VSDs only (without motor)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VSD - Very Small 0.12 - 0.75 kW 1-phase	4	34	42	44	46	49	52	56	59	63
VSD - Very Small 0.12 - 0.75 kW 3-phase	1	11	14	15	17	18	20	22	25	27
VSD - Small 0.75 - 7.5 kW 3-phase	14	41	49	57	64	73	86	101	119	140
VSD - Medium 7.5 - 75kW 3-phase	10	29	35	41	46	53	62	72	85	95
VSD - Large 75 - 375kW 3-phase	6	17	20	23	26	30	35	41	42	44
VSD - Very Large 375 - 1,000kW 3-phase	3	15	20	22	23	24	25	27	28	29
Total revenues, VSDs only (BAU)	**38**	**148**	**180**	**202**	**222**	**247**	**281**	**319**	**358**	**398**

db	REVENUE RETAIL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	9	13	14	16	16	16	16	16	16	16
	EIWH Electric Instant. ≥ 12 kW (primary)	46	39	38	40	44	48	53	57	61	65
	EIWHS Electric Instant. Shower (secondary)	7	9	9	8	9	9	10	11	11	12
	ESWH Electric Storage ≤ 30 L (secondary)	29	32	33	34	36	39	41	43	46	48
	ESWH Electric Storage > 30 L (primary)	180	210	192	201	215	229	242	256	270	284
	GIWH Gas Instant. < 13 L/min (secondary)	52	36	30	30	30	30	29	29	28	28
	GIWH Gas Instant. ≥ 13 L/min (primary)	15	14	12	12	12	12	12	12	12	11
	GSWH Gas Storage, Condensing	0	1	1	1	1	1	2	2	2	2
	GSWH Gas Storage, Non-condensing	24	14	10	6	6	5	4	4	3	2
	Dedicated WH Heat Pump	0	18	51	73	111	149	187	225	263	301
	Dedicated WH Solar (3.5 m2)	39	139	141	115	119	123	127	132	136	140
	WH dedicated Water Heater	**401**	**525**	**531**	**537**	**599**	**661**	**723**	**786**	**848**	**910**
	CHB Gas Combi Instant. WH	62	104	108	111	104	97	89	81	72	63
	CHB Gas + Cyl. WH	32	43	38	42	39	36	33	30	27	24
	CHB Jet Burner Gas + Cyl. WH	14	6	4	4	4	4	5	5	5	5
	CHB Jet Burner Oil + Cyl. WH	107	43	29	28	29	30	31	31	32	33
	CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	2	1
	CHB Hybrid Gas/Electric WH	0	0	1	2	7	11	17	23	31	40
	CHB Electric HP + Cyl. WH	2	32	39	66	114	163	212	260	312	364
	CHB Gas HP + Cyl. WH	0	0	1	3	5	7	10	12	15	18
	CHB Gas mCHP + Cyl. WH	1	1	2	4	7	9	11	14	16	18
	CHB Solar Combi (16 m2)	3	6	7	7	7	7	7	7	8	8
	CHC Central Heating combi, water heating	**222**	**238**	**231**	**270**	**319**	**368**	**417**	**466**	**519**	**572**
	TOTAL WATER HEATING	**623**	**763**	**763**	**807**	**918**	**1029**	**1140**	**1252**	**1367**	**1482**
	CHB Gas non-condensing	462	248	187	57	35	13	10	7	6	4
	CHB Gas condensing	31	675	614	754	725	697	641	586	521	456
	CHB Gas Jet burner non-condensing	97	31	11	4	3	2	2	1	1	1
	CHB Gas Jet burner condensing	0	10	18	25	26	28	29	30	31	32
	CHB Oil Jet burner non-condensing	685	211	71	23	19	15	12	9	8	6
	CHB Oil Jet burner condensing	0	70	117	159	168	178	186	194	200	206
	CHB Electric Joule-effect	7	11	10	11	11	10	9	8	7	7
	CHB Hybrid (gas-electric)	0	1	5	11	37	64	97	130	176	222
	CHB Electric Heat Pump	12	172	181	337	587	837	1086	1335	1600	1865
	CHB Gas Heat Pump	1	2	7	15	27	39	53	66	81	96
	CHB micro CHP	3	5	12	24	37	50	62	74	87	99
	CHB Solar combi (16 m2)	17	30	35	34	35	36	37	38	39	39
	CHB Central Heating boiler < 400 kW, space heating	**1315**	**1467**	**1268**	**1454**	**1711**	**1968**	**2224**	**2481**	**2757**	**3034**
	SFB Wood Manual [18 kW]	23	14	12	10	5	5	4	4	3	3
	SFB Wood Direct Draft [20 kW]	1	38	39	41	45	53	62	72	84	99
	SFB Coal [25 kW]	6	29	6	8	9	8	7	7	6	5
	SFB Pellets [25 kW]	0	10	15	15	15	16	18	20	22	24
	SFB Wood chips [160 kW]	0	6	6	7	8	9	10	11	12	13
	Total Solid Fuel Boiler	**30**	**96**	**78**	**81**	**83**	**91**	**101**	**113**	**127**	**144**
	CHAE-S (≤ 400 kW)	25	112	123	137	151	166	180	194	208	221
	CHAE-L (> 400 kW)	6	19	20	21	22	23	23	24	25	26
	CHWE-S (≤ 400 kW)	2	10	11	12	13	15	16	17	19	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	3	9	9	10	10	11	11	12	12	12
	CHWE-L (> 1500 kW)	2	6	6	6	7	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	23	24	25	26	28	29	30	31
	HT PCH-AE-L	10	17	18	19	20	21	22	23	24	25
	HT PCH-WE-S	3	5	5	5	6	6	6	6	6	7
	HT PCH-WE-M	11	19	20	21	22	23	24	25	26	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
	AC rooftop	12	40	40	31	18	5	5	5	5	5
	AC splits	20	77	81	78	76	73	70	67	64	62
	AC VRF	0	175	229	335	424	511	595	672	736	783
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**109**	**514**	**592**	**706**	**800**	**892**	**993**	**1088**	**1169**	**1232**
	AC rooftop (rev)	7	24	24	19	11	3	0	0	0	0
	AC splits (rev)	14	49	52	50	49	47	45	43	41	40
	AC VRF (rev)	0	149	186	286	348	399	442	475	495	501
	ACF (rev)	0	1	1	1	2	2	2	3	3	3
	AHF	43	28	26	27	25	24	21	19	18	17
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**64**	**252**	**289**	**384**	**434**	**474**	**510**	**540**	**557**	**560**
	Total AHC Air Heating & Cooling	**151**	**542**	**618**	**733**	**826**	**916**	**1015**	**1107**	**1188**	**1249**

db	REVENUE RETAIL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	123	177	175	215	236	226	218	210	202	195
	LH closed fireplace/inset [8 kW]	78	207	228	296	317	310	299	288	278	268
	LH wood stove [8 kW]	84	98	106	139	150	146	140	135	130	125
	LH coal stove [8 kW]	23	19	17	19	15	9	8	8	8	7
	LH cooker [10 kW]	72	142	169	215	228	225	217	208	207	207
	LH SHR stove [8 kW]	78	107	131	156	174	192	195	195	195	195
	LH pellet stove [8 kW]	0	80	99	118	127	135	137	137	137	137
	LH Solid fuel sum	**458**	**830**	**925**	**1158**	**1247**	**1243**	**1215**	**1181**	**1157**	**1134**
	LH Electric portable	19	23	24	24	24	24	24	24	24	24
	LH Electric fixed > 250W	159	185	145	133	133	133	133	133	133	133
	LH Electric fixed ≤ 250W	20	23	18	17	17	17	17	17	17	17
	LH Electric storage	16	20	20	22	21	21	20	19	18	17
	LH Electric underfloor	16	19	20	21	20	20	20	20	20	20
	LH Electric visibly glowing > 1.2 kW	0	1	1	1	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	29	48	48	48	48	48	48	48	48	48
	LH Electric sum	**258**	**318**	**276**	**265**	**264**	**263**	**262**	**261**	**260**	**259**
	LH Gas luminous (commercial)	0	1	1	1	1	0	0	0	0	0
	LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	1	1	0	0	0	0
	LH Gas open front	1	1	1	1	1	1	1	1	1	1
	LH Gas closed front	12	6	5	5	4	3	3	3	3	3
	LH Gas balanced flue	18	8	5	4	4	3	3	3	3	3
	LH Gas flueless	1	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**33**	**17**	**13**	**11**	**10**	**8**	**8**	**8**	**8**	**8**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	1	0	0	0	0	0	0	0
	LH Liquid balanced flue	2	1	1	0	0	0	0	0	0	0
	LH Liquid flueless	7	2	1	0	0	0	0	0	0	0
	LH Liquid fuel sum	**10**	**4**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**759**	**1168**	**1217**	**1436**	**1521**	**1514**	**1485**	**1451**	**1426**	**1402**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	23	267	211	230	243	247	252	278	319	369
	RAC fixed 6-12 kW, cooling	10	162	174	164	163	162	159	156	160	164
	RAC portable < 12 kW, cooling	2	24	23	17	16	16	15	16	16	17
	RAC < 12 kW total, cooling mode	**35**	**454**	**408**	**410**	**422**	**425**	**426**	**450**	**495**	**550**
	RAC fixed < 6 kW, reversible, heating	2	102	101	138	170	198	227	278	319	369
	RAC fixed 6-12 kW, reversible, heating	1	62	84	98	114	129	143	156	160	164
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**3**	**164**	**185**	**236**	**284**	**327**	**370**	**434**	**479**	**533**
	RAC Room Air Conditioner	**38**	**618**	**593**	**646**	**706**	**752**	**796**	**884**	**974**	**1083**
1	CIRC Integrated circulators	54	88	104	110	113	117	117	117	117	117
0.38	CIRC Large standalone circulators	0	0	0	0	0	0	0	0	0	0
0.38	CIRC Small standalone circulators	44	66	78	73	65	57	54	51	49	49
	CIRC Circulator pumps <2.5 kW, all	**97**	**154**	**182**	**182**	**178**	**174**	**171**	**168**	**166**	**166**
	CIRC Circulator pumps <2.5 kW, excl. double	**27**	**41**	**48**	**45**	**40**	**35**	**33**	**32**	**30**	**30**
	TOTAL SPACE HEATING (incl. rev.AC)	**2198**	**3188**	**3086**	**3636**	**4074**	**4409**	**4724**	**5051**	**5377**	**5704**
	TOTAL SPACE COOLING	**144**	**968**	**1000**	**1116**	**1222**	**1317**	**1420**	**1538**	**1664**	**1782**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	3	4	4	4	4	4	4	4
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	1	1	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	11	18	43	210	223	242	338	409	443
	R-UVU 100-250 m3/h	12	40	46	61	57	55	58	61	56	57
	R-BVU 100-250 m3/h	2	10	12	19	85	90	95	128	152	163
	R-UVU 250-1000 m3/h	22	59	62	76	70	70	75	80	77	80
	R-BVU 250-1000 m3/h	3	18	21	32	146	157	169	225	266	286
	R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1
	R-BVU 1000-2500 m3/h	0	5	5	5	6	6	7	8	8	9
	RVU, Total residential (incl. instal.mat.)	**42**	**145**	**168**	**241**	**578**	**606**	**650**	**845**	**973**	**1043**
	NR-UVU 250-1000 m3/h	8	9	9	10	9	9	9	8	8	7
	NR-BVU 250-1000 m3/h	0	18	18	22	25	29	31	35	39	41
	NR-UVU > 1000 m3/h	9	9	9	9	8	8	8	7	7	6
	NR-BVU 1000-2500 m3/h	0	36	35	41	44	50	54	58	64	68
	NR-AHU-S 2500-5500 m3/h	10	189	242	253	227	255	269	275	286	301
	NR-AHU-M 5500-14500 m3/h	122	326	380	389	346	372	380	381	390	399
	NR-AHU-L > 14500 m3/h	28	79	91	92	80	86	88	88	90	92
	NRVU, Total non-residential (incl. instal.mat.)	**178**	**665**	**785**	**815**	**739**	**809**	**840**	**852**	**883**	**915**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**220**	**810**	**952**	**1057**	**1317**	**1415**	**1490**	**1698**	**1856**	**1958**
	TOTAL VENTILATION	**220**	**810**	**952**	**1057**	**1317**	**1415**	**1490**	**1698**	**1856**	**1958**

db	REVENUE RETAIL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	202	301	219	182	56	29	16	10	6	3
	HID (HPM, HPS, MH)	33	99	71	44	27	10	3	1	0	0
	CFLni (all shapes)	22	87	66	48	29	8	2	1	0	0
	CFLi (retrofit for GLS, HL)	27	488	158	85	0	0	0	0	0	0
	GLS (DLS & NDLS)	286	121	10	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	54	498	584	125	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	0	92	202	541	551	509	549	656	758
	LED replacing HID (retrofit & luminaire)	0	0	161	106	159	187	217	249	282	320
	LED replacing CFLni (retrofit & luminaire)	0	0	18	26	27	31	33	36	40	44
	LED replacing DLS (retrofit & luminaire)	0	12	83	55	45	10	11	12	14	15
	LED replacing NDLS (retrofit & luminaire)	0	7	256	379	173	97	50	53	58	64
	SUBTOTAL non-LED	625	1593	1107	483	113	48	21	12	7	4
	SUBTOTAL LED	0	19	610	768	946	876	820	899	1050	1202
	TOTAL LIGHTING	**625**	**1613**	**1717**	**1252**	**1059**	**924**	**841**	**911**	**1057**	**1206**
	DP TV all types	7126	11690	6679	8331	9613	11055	11215	11215	11215	11215
	DP Monitor	456	1001	563	566	566	566	566	566	566	566
	DP Signage	0	67	294	675	507	507	507	507	507	507
	DP Electronic Displays, total	**7582**	**12758**	**7537**	**9573**	**10686**	**12128**	**12288**	**12288**	**12288**	**12288**
	SSTB	0	63	14	0	0	0	0	0	0	0
	CSTB	0	238	293	296	296	296	296	296	296	296
	Total STB set top boxes	**0**	**301**	**307**	**296**	**296**	**296**	**296**	**296**	**296**	**296**
	Game consoles > 20 W	16	1272	1272	1272	1272	1272	1272	1272	1272	1272
	Game consoles < 20 W	57	321	321	321	321	321	321	321	321	321
	Total Game consoles	**74**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**	**1592**
	ES Enterprise Servers total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DS Data Storage products total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PC Desktop	5213	8096	4283	4791	6610	7047	7301	7387	7415	7424
	PC Integrated Desktop	223	346	183	205	283	345	388	403	408	410
	PC Notebook	0	22372	19727	19678	25966	32747	37606	39368	39965	40163
	PC Tablet/slate	0	1018	11667	11249	12228	13254	13863	14069	14137	14160
	PC Thin client	0	171	166	176	177	178	179	179	179	179
	PC Integrated Thin Client	0	13	13	14	14	14	14	14	14	14
	PC Small-scale Server	22	42	53	54	54	55	55	55	55	55
	PC Workstation	204	364	447	511	612	732	813	842	851	854
	Total PC, electricity	**5661**	**32424**	**36541**	**36677**	**45945**	**54373**	**60218**	**62316**	**63025**	**63260**
	Inkjet Printer	191	315	41	45	43	41	39	37	35	33
	Inkjet MFD	235	608	465	294	280	266	253	241	229	216
	EP / Laser Printer mono	123	122	142	134	106	85	67	51	35	20
	EP / Laser Printer colour	0	118	133	163	180	189	196	199	203	207
	EP / Laser Copier mono	608	256	63	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	86	153	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	199	266	254	242	230	218	207	197	186
	EP / Laser MFD colour	0	1332	1780	1699	1616	1537	1463	1390	1317	1245
	Total IE Imaging Equipment	**1157**	**3035**	**3043**	**2591**	**2467**	**2348**	**2236**	**2126**	**2016**	**1906**
	Products regulated only for (networked) standby										
	SB Radios	165	133	107	95	86	78	70	62	53	45
	SB Electric toothbrushes	19	31	34	38	43	47	52	56	61	65
	SB Audio speakers (wired)	430	221	156	56	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	2	154	410	465	467	468	468	469	469
	SB Small appliances	498	805	825	847	857	866	876	885	894	904
	SB Media boxes /sticks	0	0	32	39	40	40	40	40	40	40
	SB Media players and recorders	0	243	211	28	0	0	0	0	0	0
	SB Projectors	1	77	65	27	12	0	0	0	0	0
	SB Home phones	87	403	419	398	374	360	353	346	338	331
	SB Office phones	87	158	145	136	135	137	134	131	129	126
	SB Home NAS	0	70	111	151	190	229	263	288	300	300
	SB Home Network Equipment	0	291	330	352	372	391	423	423	423	423
	SB Office Network Equipment	0	31	90	169	248	327	369	369	369	369
	SB Coffee makers	319	388	399	410	422	435	448	460	473	485
	Total (networked) SB (excl. double)	**1606**	**2853**	**3079**	**3157**	**3243**	**3378**	**3494**	**3527**	**3547**	**3556**
	Total EPS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**16080**	**52963**	**52100**	**53886**	**64229**	**74115**	**80124**	**82145**	**82764**	**82898**
	RF Household refrigerator and freezer	**2742**	**3513**	**3831**	**4025**	**4594**	**4411**	**4830**	**4979**	**5110**	**5225**
	Total CF Commercial Refrigeration	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

db	REVENUE RETAIL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	20	27	29	32	32	33	34	36	37	39
	PF Storage cabinet Frozen Vertical (FV)	11	14	15	17	17	17	18	19	19	20
	PF Storage cabinet Chilled Horizontal (CH)	4	6	6	7	7	7	7	7	8	8
	PF Storage cabinet Frozen Horizontal (FH)	3	4	4	5	5	5	5	6	6	6
	PF Storage cabinets All types	**38**	**52**	**54**	**61**	**61**	**62**	**64**	**67**	**70**	**73**
	PF Process Chiller AC MT S ≤ 300 kW	3	6	7	8	8	9	10	11	12	12
	PF Process Chiller AC MT L > 300 kW	3	6	7	7	8	9	10	10	11	12
	PF Process Chiller AC LT S ≤ 200 kW	2	5	6	6	7	7	8	9	9	10
	PF Process Chiller AC LT L > 200 kW	2	5	5	6	6	7	8	8	9	9
	PF Process Chiller WC MT S ≤ 300 kW	1	3	3	4	4	4	4	5	5	6
	PF Process Chiller WC MT L > 300 kW	2	4	5	5	6	6	7	7	8	8
	PF Process Chiller WC LT S ≤ 200 kW	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC LT L > 200 kW	2	3	4	4	5	5	5	6	6	7
	PF Process Chiller All MT&LT	**17**	**35**	**39**	**44**	**47**	**52**	**56**	**61**	**65**	**70**
	PF Condensing Unit MT S 0.2-1 kW	16	13	13	15	16	17	18	20	21	23
	PF Condensing Unit MT M 1-5 kW	34	28	29	32	34	36	39	42	45	49
	PF Condensing Unit MT L 5-20 kW	35	29	30	34	35	37	40	43	47	50
	PF Condensing Unit MT XL 20-50 kW	27	22	23	26	27	29	31	33	36	38
	PF Condensing Unit LT S 0.1-0.4 kW	3	2	2	3	3	3	3	3	4	4
	PF Condensing Unit LT M 0.4-2 kW	5	4	4	5	5	5	6	6	6	7
	PF Condensing Unit LT L 2-8 kW	13	11	11	13	13	14	15	16	17	19
	PF Condensing Unit LT XL 8-20 kW	11	9	10	11	11	12	13	14	15	16
0.6	**PF Condensing Unit, All MT&LT**	**143**	**119**	**122**	**139**	**143**	**153**	**165**	**178**	**191**	**206**
	PF Professional Refrigeration, Total	**112**	**134**	**142**	**161**	**166**	**175**	**187**	**199**	**212**	**225**
	TOTAL FOOD PRESERVATION	**2855**	**3648**	**3973**	**4186**	**4760**	**4586**	**5017**	**5178**	**5322**	**5450**
	CA Electric Hobs	973	2230	2397	2702	2845	2974	3095	3209	3315	3414
	CA Electric Ovens	2086	2517	2696	3043	2939	2838	2857	2892	2929	2966
	CA Gas Hobs	810	709	651	627	571	522	496	469	443	417
	CA Gas Ovens	279	291	296	375	361	347	334	321	308	296
	CA Range Hoods	506	629	662	868	1012	1021	1027	1031	1032	1032
	TOTAL COOKING	**4654**	**6376**	**6702**	**7615**	**7728**	**7702**	**7808**	**7922**	**8028**	**8124**
	WM Washing Machines	1497	2699	2769	2965	2742	2609	2483	2362	2333	2333
	WD Washer-Dryers	138	195	200	206	207	208	209	210	211	212
	Total WM-WD household Washing	**1635**	**2894**	**2969**	**3171**	**2949**	**2817**	**2691**	**2572**	**2544**	**2545**
	DW Household Dishwasher	**643**	**1911**	**2233**	**2507**	**2737**	**2952**	**3152**	**3337**	**3508**	**3665**
	LD condensing heat pump	0	105	609	851	961	1139	1083	1031	981	933
	LD condensing electric heat element	101	267	250	275	241	165	157	149	142	140
	LD vented electric	173	120	71	60	37	0	0	0	0	0
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**275**	**494**	**931**	**1187**	**1239**	**1303**	**1240**	**1180**	**1123**	**1074**
	VC Domestic mains	683	1132	1151	966	811	629	521	498	498	498
	VC Commercial mains	140	212	223	238	226	215	204	198	198	198
	VC Total in scope of CR 666/2013	**823**	**1344**	**1374**	**1204**	**1037**	**844**	**725**	**696**	**696**	**696**
	VC Cordless	23	94	296	624	925	1240	1501	1643	1701	1718
	VC Robot	0	81	164	301	440	594	722	791	819	827
	Total VC Vacuum Cleaner	**846**	**1519**	**1834**	**2129**	**2402**	**2677**	**2948**	**3130**	**3216**	**3242**
	TOTAL CLEANING	**3399**	**6818**	**7967**	**8994**	**9328**	**9750**	**10031**	**10219**	**10391**	**10526**
0.5	FAN Axial<300Pa [247 W flow out]	35	119	172	217	207	198	189	181	173	165
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	48	174	184	202	194	194	194	194	194	194
0.5	FAN Centr.FC [141 W flow out]	30	79	118	164	157	150	143	136	130	124
0.5	FAN Centr.BC-free [2120 W flow out]	17	44	61	68	72	70	69	67	67	68
0.5	FAN Centr.BC [2052 W flow out]	38	104	167	192	204	199	209	218	226	232
0.5	FAN Cross-flow [31 W flow out]	7	16	53	70	74	72	76	79	81	83
	Total FAN, industrial (excl. box & roof fans)	**88**	**268**	**377**	**457**	**455**	**442**	**440**	**438**	**436**	**434**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	50	81	88	83	85	82	78	74	71	67
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	29	47	45	41	40	38	36	33	31	30
0.45	Medium (L) 3-ph 75-375 kW no VSD	23	34	30	27	27	25	22	20	19	19
0.45	**Total 3ph 0.75-375 kW no VSD**	**102**	**162**	**163**	**150**	**152**	**144**	**136**	**128**	**121**	**116**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	19	58	91	154	165	169	176	186	196	206
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	14	43	81	110	116	119	124	130	137	141
0.45	Medium (L) 3-ph 75-375 kW with VSD	11	33	59	72	78	80	83	87	88	88
0.45	**Total 3-ph 0.75-375 kW with VSD**	**45**	**135**	**230**	**336**	**360**	**369**	**383**	**403**	**421**	**435**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**147**	**297**	**394**	**486**	**511**	**513**	**519**	**530**	**542**	**551**
0.45	Small 1 ph 0.12-0.75 kW no VSD	31	60	63	63	81	79	76	74	72	70
0.45	Small 1 ph 0.12-0.75 kW with VSD	5	41	50	53	58	61	65	69	73	77
0.45	**Total Small 1-ph 0.12-0.75 kW**	**36**	**101**	**113**	**116**	**139**	**140**	**141**	**143**	**145**	**147**

db	REVENUE RETAIL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 3 ph 0.12-0.75 kW no VSD	17	30	31	33	38	37	36	35	34	33
0.45	Small 3 ph 0.12-0.75 kW with VSD	2	15	19	21	25	26	28	31	34	37
0.45	**Total Small 3-ph 0.12-0.75 kW**	**19**	**45**	**50**	**54**	**63**	**63**	**64**	**66**	**68**	**70**
0.45	Large 3-ph LV 375-1000 kW no VSD	10	13	12	12	13	13	12	11	11	10
0.45	Large 3-ph LV 375-1000kW with VSD	4	23	31	35	39	39	41	42	44	45
0.45	**Total Large 3-ph LV 375-1000 kW**	**14**	**36**	**43**	**47**	**52**	**52**	**53**	**54**	**55**	**56**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	3	5	6	6	7	7	7	7	7	7
0.45	Explosion motors (M) 3-ph 7.5-75 kW	3	5	5	6	6	6	6	6	6	6
0.45	Explosion motors (L) 3-ph 75-375 kW	2	4	4	4	5	5	4	4	4	4
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**8**	**14**	**15**	**16**	**18**	**18**	**18**	**18**	**17**	**17**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	4	7	7	8	10	10	10	10	10	9
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	6	6	7	8	8	8	8	8	8
0.45	Brake motors (L) 3-ph 75-375 kW	3	5	5	5	6	6	6	6	6	6
0.45	**Total Brake 0.75-375 kW (no VSD)**	**10**	**18**	**18**	**20**	**25**	**24**	**24**	**23**	**23**	**23**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	**1-phase motors >0.75 kW (no VSD)**	**72**	**126**	**132**	**135**	**151**	**152**	**152**	**153**	**154**	**154**
	MT Elec. Motors LV 0.12-1000 kW	**169**	**350**	**421**	**480**	**528**	**530**	**535**	**543**	**552**	**560**
	WP ESOB < 45kW	46	62	68	74	77	83	88	94	99	105
	WP ESOB 45-150kW	8	11	12	13	14	15	16	17	18	19
	WP ESCC < 45kW	29	40	43	47	49	53	56	60	63	67
	WP ESCC 45-150kW	6	9	9	10	11	11	12	13	14	14
	WP ESCCi < 45kW	15	20	22	24	25	27	29	31	33	35
	WP ESCCi 45-150kW	1	2	2	2	2	2	2	2	2	3
	WP MSSB <6"	84	114	127	138	143	153	163	172	182	192
	WP MS_V <25 bar	26	36	39	43	45	48	51	54	57	61
	WP Water pumps	**217**	**293**	**323**	**351**	**366**	**392**	**417**	**443**	**469**	**495**
	Total WE Welding Equipment	**30**	**34**	**34**	**35**	**36**	**36**	**36**	**36**	**36**	**36**
	TOTAL INDUSTRY COMPONENTS	503	945	1155	1323	1384	1399	1428	1460	1492	1525
	TRAFO Distribution, kWh/a	47	74	99	107	115	123	132	141	149	158
	TRAFO Industry oil	24	40	66	71	76	82	87	93	99	105
	TRAFO Industry dry	12	19	27	29	31	34	36	38	41	43
	TRAFO Power	187	304	329	355	382	411	440	470	500	529
	TRAFO DER oil	0	2	6	10	17	27	40	53	66	79
	TRAFO DER dry	0	13	29	48	80	131	194	257	319	382
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**275**	**457**	**561**	**626**	**706**	**813**	**935**	**1057**	**1179**	**1301**
	Tyres C1, replacement for cars	3947	5674	6892	8302	9414	10521	10521	10521	10521	10521
	Tyres C1, OEM for cars	1189	1629	1915	2443	2835	3168	3168	3168	3168	3168
	Tyres C1, total	**5135**	**7302**	**8808**	**10745**	**12249**	**13689**	**13689**	**13689**	**13689**	**13689**
	Tyres C2, replacement for vans	685	892	929	1160	1342	1508	1508	1508	1508	1508
	Tyres C2, OEM for vans	144	160	200	220	278	318	318	318	318	318
	Tyres C2, total	**829**	**1052**	**1128**	**1379**	**1620**	**1826**	**1826**	**1826**	**1826**	**1826**
	Tyres C3, replacement for trucks/busses	1200	1213	2127	2468	2842	3168	3168	3168	3168	3168
	Tyres C3, OEM for trucks/busses	334	286	399	540	792	883	883	883	883	883
	Tyres C3, total	**1534**	**1498**	**2525**	**3009**	**3634**	**4050**	**4050**	**4050**	**4050**	**4050**
	Tyres, total C1+C2+C3	**7499**	**9853**	**12462**	**15133**	**17503**	**19565**	**19565**	**19565**	**19565**	**19565**
	TRANSPORT SECTOR	7499	9853	12462	15133	17503	19565	19565	19565	19565	19565
	GENERAL TOTAL (in m euros 2020)	**39073**	**88403**	**92438**	**99630**	**114226**	**127024**	**134524**	**137996**	**140063**	**141522**
	GENERAL TOTAL (in bn euros 2020)	39	88	92	100	114	127	135	138	140	142

SUMMARY ECO

Retail revenue (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.6**	**0.8**	**0.8**	**0.8**	**0.9**	**1.0**	**1.1**	**1.3**	**1.4**	**1.5**
SPACE HEATING	**2.2**	**3.2**	**3.1**	**3.6**	**4.1**	**4.4**	**4.7**	**5.1**	**5.4**	**5.7**
SPACE COOLING	**0.1**	**1.0**	**1.0**	**1.1**	**1.2**	**1.3**	**1.4**	**1.5**	**1.7**	**1.8**
VENTILATION	**0.2**	**0.8**	**1.0**	**1.1**	**1.3**	**1.4**	**1.5**	**1.7**	**1.9**	**2.0**
LIGHTING	**0.6**	**1.6**	**1.7**	**1.3**	**1.1**	**0.9**	**0.8**	**0.9**	**1.1**	**1.2**
ELECTRONICS	**16.1**	**53.0**	**52.1**	**53.9**	**64.2**	**74.1**	**80.1**	**82.1**	**82.8**	**82.9**
FOOD PRESERVATION	**2.9**	**3.6**	**4.0**	**4.2**	**4.8**	**4.6**	**5.0**	**5.2**	**5.3**	**5.4**
COOKING	**4.7**	**6.4**	**6.7**	**7.6**	**7.7**	**7.7**	**7.8**	**7.9**	**8.0**	**8.1**
CLEANING	**3.4**	**6.8**	**8.0**	**9.0**	**9.3**	**9.7**	**10.0**	**10.2**	**10.4**	**10.5**
INDUSTRY COMPONENTS	0.5	0.9	1.2	1.3	1.4	1.4	1.4	1.5	1.5	1.5
ENERGY SECTOR	**0.3**	**0.5**	**0.6**	**0.6**	**0.7**	**0.8**	**0.9**	**1.1**	**1.2**	**1.3**
TRANSPORT SECTOR	7.5	9.9	12.5	15.1	17.5	19.6	19.6	19.6	19.6	19.6
TOTAL in bn euros 2020	**39**	**88**	**92**	**100**	**114**	**127**	**135**	**138**	**140**	**142**

Retail revenue ECO-BAU (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.0	-	- 0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
SPACE HEATING	-	0.0	0.1	0.3	0.6	0.7	0.8	0.9	1.0	1.1
SPACE COOLING	-	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
VENTILATION	-	-	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LIGHTING	-	0.1	0.2	- 0.6	- 0.3	- 0.2	- 0.1	- 0.0	0.1	0.1
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	-	0.5	0.7	0.8	1.3	1.1	1.5	1.6	1.7	1.7
COOKING	-	-	0.1	0.6	0.6	0.5	0.4	0.4	0.3	0.3
CLEANING	-	1.0	1.5	1.6	1.5	1.4	1.2	1.0	0.8	0.7
INDUSTRY COMPONENTS	-	0.0	0.1	0.2	0.2	0.2	0.2	0.1	0.1	0.1
ENERGY SECTOR	-	-	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
TRANSPORT SECTOR	-	0.2	1.6	2.6	3.4	3.6	3.6	3.6	3.6	3.6
TOTAL in bn euros 2020	**0.0**	**1.9**	**4.4**	**5.9**	**7.6**	**7.6**	**7.9**	**7.9**	**8.0**	**8.1**

Revenues for VSDs only (without motor)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	4	34	42	44	46	49	52	56	59	63
VSD - Very Small 0.12 - 0.75 kW 3-phase	1	11	14	16	18	19	20	22	25	27
VSD - Small 0.75 - 7.5 kW 3-phase	14	42	63	102	108	111	116	124	132	141
VSD - Medium 7.5 - 75kW 3-phase	10	30	54	72	75	77	81	86	92	95
VSD - Large 75 - 375kW 3-phase	6	17	28	34	36	37	39	41	42	44
VSD - Very Large 375 - 1,000kW 3-phase	3	15	20	22	24	24	25	27	28	29
Total revenues, VSDs only (ECO)	**38**	**149**	**220**	**289**	**307**	**316**	**333**	**355**	**378**	**399**

db	REVENUE WHOLESALE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	9	13	14	16	16	16	16	16	16	16
	EIWH Electric Instant. ≥ 12 kW (primary)	46	39	38	40	44	48	53	57	61	65
	EIWHS Electric Instant. Shower (secondary)	7	9	9	8	9	9	10	11	11	12
	ESWH Electric Storage ≤ 30 L (secondary)	29	32	33	34	36	39	41	43	46	48
	ESWH Electric Storage > 30 L (primary)	180	210	192	201	215	229	242	256	270	284
	GIWH Gas Instant. < 13 L/min (secondary)	52	36	30	30	30	30	29	29	28	28
	GIWH Gas Instant. ≥ 13 L/min (primary)	15	14	12	12	12	12	12	12	12	11
	GSWH Gas Storage, Condensing	0	1	1	1	1	1	2	2	2	2
	GSWH Gas Storage, Non-condensing	24	14	10	6	6	5	4	4	3	2
	Dedicated WH Heat Pump	0	18	51	73	111	149	187	225	263	301
	Dedicated WH Solar (3.5 m2)	39	139	141	115	119	123	127	132	136	140
	WH dedicated Water Heater	**401**	**525**	**531**	**537**	**599**	**661**	**723**	**786**	**848**	**910**
	CHB Gas Combi Instant. WH	62	104	108	116	117	118	119	119	118	116
	CHB Gas + Cyl. WH	32	43	45	48	49	49	49	49	49	48
	CHB Jet Burner Gas + Cyl. WH	14	6	4	4	4	4	5	5	5	5
	CHB Jet Burner Oil + Cyl. WH	107	43	29	28	29	30	31	31	32	33
	CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	2	1
	CHB Hybrid Gas/Electric WH	0	0	0	1	1	2	3	5	8	14
	CHB Electric HP + Cyl. WH	2	32	36	44	51	58	67	78	89	102
	CHB Gas HP + Cyl. WH	0	0	1	1	1	2	3	4	6	8
	CHB Gas mCHP + Cyl. WH	1	1	1	2	3	4	5	8	11	15
	CHB Solar Combi (16 m2)	3	6	6	6	6	7	7	7	7	7
	CHC Central Heating combi, water heating	**222**	**238**	**233**	**253**	**264**	**277**	**291**	**307**	**326**	**350**
	TOTAL WATER HEATING	**623**	**763**	**764**	**790**	**863**	**938**	**1014**	**1093**	**1174**	**1260**
	CHB Gas non-condensing	462	248	230	225	208	191	174	158	143	128
	CHB Gas condensing	31	675	561	598	635	669	697	719	735	742
	CHB Gas Jet burner non-condensing	97	31	14	12	12	11	10	9	9	8
	CHB Gas Jet burner condensing	0	10	14	16	18	19	21	23	24	25
	CHB Oil Jet burner non-condensing	685	211	94	82	77	71	66	61	57	52
	CHB Oil Jet burner condensing	0	70	94	100	111	121	132	142	151	160
	CHB Electric Joule-effect	7	11	10	11	11	10	9	8	7	7
	CHB Hybrid (gas-electric)	0	1	2	4	7	11	18	30	50	82
	CHB Electric Heat Pump	12	172	194	239	279	326	379	440	511	593
	CHB Gas Heat Pump	1	2	3	5	8	11	16	23	33	48
	CHB micro CHP	3	5	6	10	14	21	30	43	61	88
	CHB Solar combi (16 m2)	17	30	30	33	34	35	36	37	38	39
	CHB Central Heating boiler < 400 kW,	**1315**	**1467**	**1255**	**1337**	**1412**	**1496**	**1588**	**1694**	**1819**	**1971**
	SFB Wood Manual [18 kW]	23	14	9	5	3	3	3	3	2	2
	SFB Wood Direct Draft [20 kW]	1	38	39	41	38	47	55	65	76	90
	SFB Coal [25 kW]	6	29	6	8	9	8	7	7	6	5
	SFB Pellets [25 kW]	0	10	15	15	15	16	18	20	22	24
	SFB Wood chips [160 kW]	0	6	6	7	8	9	10	11	12	13
	Total Solid Fuel Boiler	**30**	**96**	**75**	**76**	**73**	**83**	**93**	**104**	**118**	**135**
	CHAE-S (≤ 400 kW)	25	112	123	137	151	166	180	194	208	221
	CHAE-L (> 400 kW)	6	19	20	21	22	23	23	24	25	26
	CHWE-S (≤ 400 kW)	2	10	11	12	13	15	16	17	19	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	3	9	9	10	10	11	11	12	12	12
	CHWE-L (> 1500 kW)	2	6	6	6	7	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	23	24	25	26	28	29	30	31
	HT PCH-AE-L	10	17	18	19	20	21	22	23	24	25
	HT PCH-WE-S	3	5	5	5	6	6	6	6	6	7
	HT PCH-WE-M	11	19	20	21	22	23	24	25	26	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
	AC rooftop	12	40	40	31	18	5	5	5	5	5
	AC splits	20	77	81	78	76	73	70	67	64	62
	AC VRF	0	175	229	335	424	511	595	672	736	783
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**109**	**514**	**592**	**706**	**800**	**892**	**993**	**1088**	**1169**	**1232**
	AC rooftop (rev)	7	24	24	19	11	3	0	0	0	0
	AC splits (rev)	14	49	52	50	49	47	45	43	41	40
	AC VRF (rev)	0	149	186	286	348	399	442	475	495	501
	ACF (rev)	0	1	1	1	2	2	2	3	3	3
	AHF	43	28	26	24	23	22	20	19	18	17
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**64**	**252**	**289**	**381**	**432**	**473**	**510**	**540**	**557**	**560**
	Total AHC Air Heating & Cooling	**151**	**542**	**618**	**731**	**823**	**914**	**1014**	**1107**	**1188**	**1249**

db	REVENUE WHOLESALE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	104	150	148	148	147	146	146	146	146	146
	LH closed fireplace/inset [8 kW]	66	175	193	211	213	216	217	217	217	217
	LH wood stove [8 kW]	71	83	90	98	99	101	101	101	101	101
	LH coal stove [8 kW]	19	16	15	13	10	7	6	6	6	6
	LH cooker [10 kW]	61	120	143	166	170	174	175	175	175	175
	LH SHR stove [8 kW]	66	91	111	131	147	162	165	165	165	165
	LH pellet stove [8 kW]	0	68	84	100	107	114	116	116	116	116
	LH Solid fuel sum	**388**	**702**	**783**	**867**	**893**	**920**	**925**	**925**	**925**	**925**
	LH Electric portable	16	19	20	20	20	20	20	20	20	20
	LH Electric fixed > 250W	135	156	121	113	113	113	113	113	113	113
	LH Electric fixed ≤ 250W	17	20	15	14	14	14	14	14	14	14
	LH Electric storage	14	17	15	14	14	14	14	14	14	14
	LH Electric underfloor	13	16	17	17	17	17	17	17	17	17
	LH Electric visibly glowing > 1.2 kW	0	1	1	1	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	24	40	40	40	40	40	40	40	40	40
	LH Electric sum	**219**	**269**	**230**	**219**	**219**	**219**	**219**	**219**	**219**	**219**
	LH Gas luminous (commercial)	0	1	1	1	0	0	0	0	0	0
	LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	0	0	0	0	0	0
	LH Gas open front	1	1	1	1	1	1	1	1	1	1
	LH Gas closed front	10	5	4	4	3	3	3	3	3	3
	LH Gas balanced flue	16	7	4	4	3	3	3	3	3	3
	LH Gas flueless	1	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**28**	**14**	**11**	**9**	**8**	**7**	**7**	**7**	**7**	**7**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	0	0	0	0	0	0	0	0
	LH Liquid balanced flue	1	1	0	0	0	0	0	0	0	0
	LH Liquid flueless	6	2	1	0	0	0	0	0	0	0
	LH Liquid fuel sum	**8**	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**643**	**988**	**1025**	**1096**	**1121**	**1147**	**1152**	**1152**	**1152**	**1152**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	32	315	235	260	288	315	345	386	442	512
	RAC fixed 6-12 kW, cooling	14	169	166	164	170	176	179	179	198	219
	RAC portable < 12 kW, cooling	2	26	23	18	18	19	19	20	21	21
	RAC < 12 kW total, cooling mode	**48**	**510**	**425**	**442**	**476**	**509**	**543**	**585**	**661**	**753**
	RAC fixed < 6 kW, reversible, heating	3	120	113	156	202	252	311	386	442	512
	RAC fixed 6-12 kW, reversible, heating	1	64	80	98	119	140	161	179	198	219
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**4**	**185**	**193**	**254**	**321**	**393**	**472**	**565**	**641**	**731**
	RAC Room Air Conditioner	**52**	**694**	**618**	**696**	**797**	**902**	**1015**	**1150**	**1302**	**1484**
1	CIRC Integrated circulators	188	307	341	357	385	407	407	407	407	407
0.38	CIRC Large standalone circulators	89	165	171	169	161	146	147	147	146	144
0.38	CIRC Small standalone circulators	152	229	227	214	194	171	170	170	170	170
	CIRC Circulator pumps <2.5 kW, all	**428**	**702**	**739**	**740**	**740**	**724**	**724**	**724**	**724**	**721**
	CIRC Circulator pumps <2.5 kW, excl. double	**149**	**245**	**247**	**237**	**220**	**196**	**196**	**196**	**196**	**195**
	TOTAL SPACE HEATING (incl. rev.AC)	**2204**	**3233**	**3084**	**3382**	**3579**	**3787**	**4010**	**4251**	**4483**	**4745**
	TOTAL SPACE COOLING	**157**	**1024**	**1017**	**1148**	**1276**	**1401**	**1537**	**1673**	**1830**	**1984**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	3	3	3	3	3	3
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0	1	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	10	17	37	188	207	228	318	385	417
	R-UVU 100-250 m3/h	12	37	39	45	42	41	44	47	44	46
	R-BVU 100-250 m3/h	1	9	11	17	77	83	89	120	143	153
	R-UVU 250-1000 m3/h	21	55	55	61	56	56	60	64	61	64
	R-BVU 250-1000 m3/h	3	17	20	30	137	148	159	212	251	270
	R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1
	R-BVU 1000-2500 m3/h	0	5	5	5	6	6	7	8	8	9
	RVU, Total residential (incl. instal.mat.)	**39**	**137**	**149**	**198**	**509**	**546**	**591**	**773**	**896**	**963**
	NR-UVU 250-1000 m3/h	8	9	8	8	7	7	7	7	6	6
	NR-BVU 250-1000 m3/h	0	18	18	22	25	29	31	35	39	41
	NR-UVU > 1000 m3/h	9	9	9	8	7	7	7	6	6	6
	NR-BVU 1000-2500 m3/h	0	36	35	40	44	50	54	58	64	68
	NR-AHU-S 2500-5500 m3/h	10	189	236	236	211	237	250	257	268	283
	NR-AHU-M 5500-14500 m3/h	122	326	369	360	319	345	354	357	367	378
	NR-AHU-L > 14500 m3/h	28	79	89	86	75	81	83	84	86	88
	NRVU, Total non-residential (incl. instal.mat.)	**178**	**665**	**765**	**760**	**687**	**756**	**787**	**803**	**836**	**869**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**218**	**802**	**914**	**959**	**1196**	**1302**	**1377**	**1576**	**1732**	**1832**
	TOTAL VENTILATION	**218**	**802**	**914**	**959**	**1196**	**1302**	**1377**	**1576**	**1732**	**1832**

db	REVENUE WHOLESALE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	206	307	277	210	145	106	89	70	54	41
	HID (HPM, HPS, MH)	33	99	89	61	47	26	13	7	3	2
	CFLni (all shapes)	26	102	90	87	70	35	18	10	4	3
	CFLi (retrofit for GLS, HL)	30	395	258	310	186	138	75	51	32	21
	GLS (DLS & NDLS)	306	251	212	147	87	51	30	17	10	6
	HL (DLS & NDLS, LV & MV)	61	476	593	607	376	194	103	56	32	19
	LED replacing LFL (retrofit & luminaire)	0	1	54	191	259	346	379	441	529	623
	LED replacing HID (retrofit & luminaire)	0	0	16	99	115	145	173	207	240	273
	LED replacing CFLni (retrofit & luminaire)	0	0	3	12	20	25	28	32	34	37
	LED replacing DLS (retrofit & luminaire)	0	0	13	39	44	26	18	15	13	13
	LED replacing NDLS (retrofit & luminaire)	0	5	33	219	175	118	90	72	61	57
	SUBTOTAL non-LED	662	1631	1519	1424	910	550	327	212	136	91
	SUBTOTAL LED	0	6	119	560	612	659	688	766	878	1004
	TOTAL LIGHTING	**662**	**1637**	**1638**	**1984**	**1522**	**1209**	**1016**	**978**	**1014**	**1095**
	DP TV all types	891	1461	835	1041	1202	1382	1402	1402	1402	1402
	DP Monitor	262	576	324	326	326	326	326	326	326	326
	DP Signage	0	84	368	844	633	633	633	633	633	633
	DP Electronic Displays, total	**1153**	**2121**	**1527**	**2211**	**2161**	**2341**	**2361**	**2361**	**2361**	**2361**
	SSTB	0	316	72	0	0	0	0	0	0	0
	CSTB	0	1188	1465	1478	1478	1478	1478	1478	1478	1478
	Total STB set top boxes (Complex & Simple)	**0**	**1503**	**1537**	**1478**	**1478**	**1478**	**1478**	**1478**	**1478**	**1478**
	Game consoles > 20 W	2	163	163	163	163	163	163	163	163	163
	Game consoles < 20 W	7	41	41	41	41	41	41	41	41	41
	Total GC Game consoles	**9**	**204**	**204**	**204**	**204**	**204**	**204**	**204**	**204**	**204**
	ES Enterprise Servers total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DS Data Storage products total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PC Desktop	606	941	498	557	769	819	849	859	862	863
	PC Integrated Desktop	26	40	21	24	33	40	45	47	47	48
	PC Notebook	0	2601	2294	2288	3019	3808	4373	4578	4647	4670
	PC Tablet/slate	0	127	1458	1406	1529	1657	1733	1759	1767	1770
	PC Thin client	0	214	208	219	222	223	224	224	224	224
	PC Integrated Thin Client	0	17	16	17	17	17	17	17	17	17
	PC Small-scale Server	27	53	67	68	68	68	68	69	69	69
	PC Workstation	235	418	515	588	704	842	935	968	979	983
	Total PC, electricity	**894**	**4412**	**5077**	**5167**	**6360**	**7475**	**8244**	**8520**	**8613**	**8644**
	Inkjet Printer	53	88	12	13	12	11	11	10	10	9
	Inkjet MFD	65	169	129	82	78	74	71	67	64	60
	EP / Laser Printer mono	102	101	118	112	88	71	56	42	29	16
	EP / Laser Printer colour	0	98	111	136	150	157	163	166	169	172
	EP / Laser Copier mono	506	213	52	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	71	127	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	166	221	211	201	191	182	173	164	154
	EP / Laser MFD colour	0	1051	1404	1341	1275	1213	1154	1097	1039	982
	Total IE Imaging Equipment	**726**	**1957**	**2175**	**1895**	**1804**	**1717**	**1635**	**1555**	**1475**	**1395**
	Products regulated only for (networked) standby										
	SB Radios	411	334	268	236	216	195	175	154	134	113
	SB Electric toothbrushes	48	77	85	95	106	118	129	140	151	163
	SB Audio speakers (wired)	1075	553	391	140	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	6	386	1026	1163	1169	1170	1171	1172	1173
	SB Small appliances	1245	2011	2063	2118	2142	2165	2189	2213	2236	2260
	SB Media boxes /sticks	0	0	80	99	99	99	99	99	99	99
	SB Media players and recorders	1	609	528	70	0	0	0	0	0	0
	SB Projectors	3	192	163	67	29	0	0	0	0	0
	SB Home phones	7	30	31	30	28	27	26	26	25	25
	SB Office phones	58	105	96	91	90	91	89	88	86	84
	SB Home NAS	0	351	554	756	952	1147	1317	1440	1499	1502
	SB Home Network Equipment	0	727	826	881	929	978	1056	1056	1056	1056
	SB Office Network Equipment	0	76	225	424	621	818	921	921	921	921
	SB Coffee makers	24	29	30	31	32	33	34	35	35	36
	Total (networked) SB (excl. double)	**2870**	**5101**	**5728**	**6062**	**6406**	**6840**	**7205**	**7342**	**7415**	**7432**
db											
0.0	EPS ≤ 6W, low-V	3	39	28	19	14	7	3	1	1	0
0.3	EPS 6–10 W	16	230	248	265	278	292	299	307	315	323
0.6	EPS 10–12 W	0	190	227	245	247	248	250	252	253	255
0.5	EPS 15–20 W	0	1	5	10	11	12	13	13	14	15
1.0	EPS 20–30 W	1	27	28	26	25	24	22	20	18	16
0.8	EPS 30–65 W, multiple-V	0	0	0	4	6	8	10	13	15	18
1.0	EPS 30-65 W	0	0	0	4	11	18	18	18	18	18
1.0	EPS 65–120 W	0	21	20	15	9	0	0	0	0	0
0.5	EPS 65–120 W, multiple-V	0	125	46	13	14	14	14	14	14	14
0.0	EPS 12–15 W	1	21	42	51	52	52	52	52	52	52
	EPS, total	**21**	**653**	**644**	**653**	**664**	**675**	**681**	**690**	**700**	**710**
	EPS, double counted subtracted	**14**	**360**	**361**	**368**	**373**	**379**	**381**	**386**	**392**	**399**
	TOTAL ELECTRONICS	**5667**	**15658**	**16608**	**17385**	**18785**	**20433**	**21509**	**21847**	**21938**	**21912**

db	REVENUE WHOLESALE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	RF Household refrigerator and freezer	**206**	**230**	**235**	**240**	**244**	**248**	**251**	**255**	**259**	**262**
	CF open vertical chilled multi deck (RVC2)	82	94	93	95	97	98	100	101	103	104
	CF open horizontal frozen island (RHF4)	10	11	11	11	11	12	12	12	12	12
	CF other supermarket display (non-BCs)	188	233	247	258	267	277	286	296	307	318
	CF Plug in one door beverage cooler	161	206	205	213	221	228	236	243	251	260
	CF Plug in horizontal ice cream freezer	66	85	85	88	91	94	97	101	104	107
	CF Spiral vending machine	108	84	69	72	75	78	81	84	87	90
	Total CF Commercial Refrigeration	**614**	**714**	**710**	**737**	**762**	**786**	**811**	**837**	**864**	**892**
	PF Storage cabinet Chilled Vertical (CV)	40	55	57	60	63	66	68	71	74	77
	PF Storage cabinet Frozen Vertical (FV)	21	29	30	31	33	34	36	37	39	40
	PF Storage cabinet Chilled Horizontal (CH)	8	11	12	12	13	13	14	15	15	16
	PF Storage cabinet Frozen Horizontal (FH)	6	9	9	9	10	10	11	11	12	12
	PF Storage cabinets All types	**76**	**103**	**108**	**113**	**118**	**124**	**129**	**134**	**140**	**145**
	PF Process Chiller AC MT S ≤ 300 kW	6	12	14	15	17	18	20	22	23	25
	PF Process Chiller AC MT L > 300 kW	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC LT S ≤ 200 kW	5	10	11	12	14	15	16	18	19	20
	PF Process Chiller AC LT L > 200 kW	5	10	11	12	13	14	15	17	18	19
	PF Process Chiller WC MT S ≤ 300 kW	3	6	6	7	8	8	9	10	10	11
	PF Process Chiller WC MT L > 300 kW	4	8	9	10	11	12	13	14	16	17
	PF Process Chiller WC LT S ≤ 200 kW	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC LT L > 200 kW	3	7	8	8	9	10	11	12	13	13
	PF Process Chiller All MT&LT	**35**	**70**	**78**	**86**	**95**	**104**	**113**	**122**	**131**	**140**
	PF Condensing Unit MT S 0.2-1 kW	31	26	27	29	31	34	36	39	42	45
	PF Condensing Unit MT M 1-5 kW	68	56	58	63	67	73	78	84	91	98
	PF Condensing Unit MT L 5-20 kW	70	58	60	64	69	75	80	87	93	101
	PF Condensing Unit MT XL 20-50 kW	53	44	46	49	53	57	62	66	71	77
	PF Condensing Unit LT S 0.1-0.4 kW	5	5	5	5	5	6	6	7	7	8
	PF Condensing Unit LT M 0.4-2 kW	10	8	8	9	10	10	11	12	13	14
	PF Condensing Unit LT L 2-8 kW	26	22	22	24	26	28	30	32	35	37
	PF Condensing Unit LT XL 8-20 kW	23	19	19	21	22	24	26	28	30	33
0.6	**PF Condensing Unit, All MT&LT**	**286**	**238**	**244**	**264**	**284**	**306**	**330**	**355**	**383**	**412**
	PF Professional Refrigeration, Total	**225**	**268**	**284**	**304**	**327**	**350**	**374**	**398**	**424**	**450**
	TOTAL FOOD PRESERVATION	**1044**	**1212**	**1229**	**1282**	**1332**	**1384**	**1436**	**1490**	**1546**	**1604**
	CA Electric Hobs	73	167	180	195	205	215	224	232	241	248
	CA Electric Ovens	156	189	200	217	210	212	214	217	220	222
	CA Gas Hobs	61	53	49	44	41	39	37	35	33	31
	CA Gas Ovens	21	22	21	20	20	19	19	18	17	17
	CA Range Hoods	38	47	50	52	55	58	61	63	66	69
	TOTAL COOKING	**349**	**478**	**499**	**529**	**531**	**543**	**555**	**566**	**577**	**588**
	WM Washing Machines	112	168	169	182	175	175	175	175	175	175
	WD Washer-Dryers	10	15	15	15	15	16	16	16	16	16
	Total WM-WD household Washing	**123**	**182**	**184**	**198**	**190**	**191**	**191**	**191**	**191**	**191**
	DW Household Dishwasher	**48**	**108**	**126**	**145**	**162**	**179**	**197**	**214**	**232**	**249**
	LD condensing heat pump	0	2	3	4	6	9	11	13	16	18
	LD condensing electric heat element	8	21	30	40	38	34	31	28	27	25
	LD vented electric	13	10	12	12	12	12	12	12	12	12
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**21**	**33**	**45**	**56**	**56**	**55**	**54**	**53**	**54**	**55**
	VC Domestic mains	57	94	87	79	66	51	42	41	41	41
	VC Commercial mains	104	157	151	147	147	147	147	147	147	147
	VC Total in scope of CR 666/2013	**161**	**251**	**239**	**226**	**213**	**198**	**190**	**188**	**188**	**188**
	VC Cordless	2	8	26	55	82	110	133	146	151	152
	VC Robot	0	8	16	29	43	58	71	78	80	81
	Total VC Vacuum Cleaner	**104**	**159**	**156**	**156**	**160**	**165**	**169**	**171**	**171**	**172**
	TOTAL CLEANING	**296**	**482**	**511**	**554**	**569**	**590**	**610**	**629**	**648**	**667**
0.5	FAN Axial<300Pa [247 W flow out]	81	275	317	359	359	359	359	359	359	359
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	111	400	424	447	447	447	447	447	447	447
0.5	FAN Centr.FC [141 W flow out]	69	182	211	240	240	240	240	240	240	240
0.5	FAN Centr.BC-free [2120 W flow out]	40	100	114	128	142	145	148	150	153	156
0.5	FAN Centr.BC [2052 W flow out]	86	239	274	310	345	352	387	422	457	493
0.5	FAN Cross-flow [31 W flow out]	16	37	42	48	53	54	59	64	69	74
	Total FAN, industrial (excl. box & roof fans)	**202**	**616**	**691**	**766**	**793**	**799**	**820**	**842**	**863**	**885**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	114	184	188	185	178	169	159	147	137	125
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	68	107	108	105	100	93	86	77	66	60
0.45	Medium (L) 3-ph 75-375 kW no VSD	53	78	77	73	66	58	48	38	37	38
0.45	**Total 3ph 0.75-375 kW no VSD**	**234**	**369**	**372**	**364**	**343**	**320**	**293**	**262**	**241**	**223**

db	REVENUE WHOLESALE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	45	132	159	184	209	238	277	324	379	446
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	33	98	118	137	155	177	206	241	281	313
0.45	Medium (L) 3-ph 75-375 kW with VSD	25	75	90	104	119	136	158	184	188	192
0.45	**Total 3-ph 0.75-375 kW with VSD**	**103**	**305**	**367**	**425**	**482**	**550**	**642**	**748**	**848**	**951**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**337**	**674**	**739**	**789**	**826**	**870**	**935**	**1010**	**1089**	**1174**
0.45	Small 1 ph 0.12-0.75 kW no VSD	72	138	145	145	145	144	143	142	140	139
0.45	Small 1 ph 0.12-0.75 kW with VSD	11	95	115	121	128	136	145	154	163	173
0.45	**Total Small 1-ph 0.12-0.75 kW**	**84**	**233**	**260**	**266**	**273**	**280**	**288**	**296**	**304**	**312**
0.45	Small 3 ph 0.12-0.75 kW no VSD	40	68	71	72	71	71	70	69	68	67
0.45	Small 3 ph 0.12-0.75 kW with VSD	4	35	43	47	52	57	63	69	76	83
0.45	**Total Small 3-ph 0.12-0.75 kW**	**44**	**103**	**115**	**119**	**123**	**128**	**133**	**138**	**144**	**150**
0.45	Large 3-ph LV 375-1000 kW no VSD	24	31	27	27	27	27	26	25	24	23
0.45	Large 3-ph LV 375-1000kW with VSD	9	52	72	79	84	88	92	95	99	104
0.45	**Total Large 3-ph LV 375-1000 kW**	**33**	**83**	**99**	**106**	**110**	**115**	**117**	**120**	**123**	**126**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	7	13	13	13	13	13	13	13	14	14
0.45	Explosion motors (M) 3-ph 7.5-75 kW	6	11	12	12	12	12	12	12	12	12
0.45	Explosion motors (L) 3-ph 75-375 kW	5	8	9	9	9	9	9	9	9	9
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**18**	**32**	**34**	**35**	**35**	**35**	**35**	**35**	**35**	**36**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	9	16	16	17	17	17	17	17	17	17
0.45	Brake motors (M) 3-ph 7.5-75 kW	8	14	15	15	15	15	15	15	15	16
0.45	Brake motors (L) 3-ph 75-375 kW	6	10	11	11	11	11	11	11	11	12
0.45	**Total Brake 0.75-375 kW (no VSD)**	**23**	**40**	**42**	**43**	**43**	**43**	**44**	**44**	**44**	**45**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	1
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**1**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**	**2**
0.45	**1-phase motors >0.75 kW (no VSD)**	**165**	**289**	**303**	**309**	**309**	**309**	**308**	**308**	**314**	**321**
	MT Elec. Motors LV 0.12-1000 kW	**388**	**801**	**877**	**918**	**947**	**980**	**1024**	**1073**	**1130**	**1192**
	WP ESOB < 45kW	92	125	136	148	154	165	176	188	199	210
	WP ESOB 45-150kW	16	22	24	26	28	30	32	34	36	37
	WP ESCC < 45kW	59	79	86	94	98	105	112	119	126	134
	WP ESCC 45-150kW	13	17	19	20	21	23	24	26	27	29
	WP ESCCi < 45kW	29	40	44	48	51	55	58	62	66	69
	WP ESCCi 45-150kW	2	3	3	4	4	4	4	5	5	5
	WP MSSB <6"	169	228	249	271	283	303	323	344	364	384
	WP MS_V <25 bar	53	71	78	85	89	95	102	108	115	121
	WP Water pumps	**433**	**586**	**639**	**697**	**728**	**780**	**833**	**885**	**937**	**989**
	Total WE Welding Equipment	**49**	**56**	**56**	**56**	**57**	**58**	**58**	**58**	**59**	**59**
	TOTAL INDUSTRY COMPONENTS	**1071**	**2059**	**2263**	**2438**	**2525**	**2617**	**2734**	**2858**	**2989**	**3125**
	TRAFO Distribution, kWh/a	47	74	80	87	93	100	107	114	121	128
	TRAFO Industry oil	24	40	43	46	50	53	57	61	65	68
	TRAFO Industry dry	12	19	20	22	23	25	27	28	30	32
	TRAFO Power	187	304	329	355	382	411	440	470	500	529
	TRAFO DER oil	0	2	4	6	10	16	24	32	39	47
	TRAFO DER dry	0	13	22	37	61	100	148	196	244	291
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**275**	**457**	**504**	**558**	**624**	**711**	**808**	**906**	**1004**	**1101**
	Tyres C1, replacement for cars	1316	1816	2001	2277	2577	2910	2910	2910	2910	2910
	Tyres C1, OEM for cars	396	543	638	686	776	876	876	876	876	876
	Tyres C1, total	**1712**	**2359**	**2639**	**2963**	**3353**	**3786**	**3786**	**3786**	**3786**	**3786**
	Tyres C2, replacement for vans	228	297	297	334	375	420	420	420	420	420
	Tyres C2, OEM for vans	48	53	67	70	79	88	88	88	88	88
	Tyres C2, total	**276**	**351**	**363**	**405**	**454**	**508**	**508**	**508**	**508**	**508**
	Tyres C3, replacement for trucks/busses	400	404	487	621	712	816	816	816	816	816
	Tyres C3, OEM for trucks/busses	111	95	133	173	199	227	227	227	227	227
	Tyres C3, total	**511**	**499**	**620**	**795**	**911**	**1043**	**1043**	**1043**	**1043**	**1043**
	Tyres, total C1+C2+C3	**2500**	**3209**	**3622**	**4162**	**4718**	**5338**	**5338**	**5338**	**5338**	**5338**
	TRANSPORT SECTOR	**2500**	**3209**	**3622**	**4162**	**4718**	**5338**	**5338**	**5338**	**5338**	**5338**
	GENERAL TOTAL (in m euros 2020)	**15066**	**31016**	**32652**	**35169**	**37521**	**40251**	**41944**	**43205**	**44272**	**45251**
	GENERAL TOTAL (in bn euros 2020)	15	31	33	35	38	40	42	43	44	45

SUMMARY BAU

Wholesale revenue BAU (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.6	0.8	0.8	0.8	0.9	0.9	1.0	1.1	1.2	1.3
SPACE HEATING	2.2	3.2	3.1	3.4	3.6	3.8	4.0	4.3	4.5	4.7
SPACE COOLING	0.2	1.0	1.0	1.1	1.3	1.4	1.5	1.7	1.8	2.0
VENTILATION	0.2	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.7	1.8
LIGHTING	0.7	1.6	1.6	2.0	1.5	1.2	1.0	1.0	1.0	1.1
ELECTRONICS	5.7	15.7	16.6	17.4	18.8	20.4	21.5	21.8	21.9	21.9
FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.6
COOKING	0.3	0.5	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
CLEANING	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7
INDUSTRY COMPONENTS	1.1	2.1	2.3	2.4	2.5	2.6	2.7	2.9	3.0	3.1
ENERGY SECTOR	0.3	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1
TRANSPORT SECTOR	2.5	3.2	3.6	4.2	4.7	5.3	5.3	5.3	5.3	5.3
TOTAL in bn euros 2020	**15**	**31**	**33**	**35**	**38**	**40**	**42**	**43**	**44**	**45**

Revenues for VSDs only (without motor, m euros)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	10	79	95	100	106	113	120	128	136	145
VSD - Very Small 0.12 - 0.75 kW 3-phase	3	26	32	35	38	42	47	52	57	63
VSD - Small 0.75 - 7.5 kW 3-phase	32	95	114	131	148	169	198	233	273	321
VSD - Medium 7.5 - 75kW 3-phase	23	68	81	94	106	121	142	167	196	219
VSD - Large 75 - 375kW 3-phase	13	38	46	53	60	69	80	94	98	100
VSD - Very Large 375 - 1,000kW 3-phase	6	34	46	50	53	55	58	61	64	67
Total revenues, VSDs only (BAU)	**88**	**340**	**415**	**464**	**512**	**569**	**646**	**735**	**824**	**915**

db	REVENUE WHOLESALE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	9	13	14	16	16	16	16	16	16	16
	EIWH Electric Instant. ≥ 12 kW (primary)	46	39	38	40	44	48	53	57	61	65
	EIWHS Electric Instant. Shower (secondary)	7	9	9	8	9	9	10	11	11	12
	ESWH Electric Storage ≤ 30 L (secondary)	29	32	33	34	36	39	41	43	46	48
	ESWH Electric Storage > 30 L (primary)	180	210	192	201	215	229	242	256	270	284
	GIWH Gas Instant. < 13 L/min (secondary)	52	36	30	30	30	30	29	29	28	28
	GIWH Gas Instant. ≥ 13 L/min (primary)	15	14	12	12	12	12	12	12	12	11
	GSWH Gas Storage, Condensing	0	1	1	1	1	1	2	2	2	2
	GSWH Gas Storage, Non-condensing	24	14	10	6	6	5	4	4	3	2
	Dedicated WH Heat Pump	0	18	51	73	111	149	187	225	263	301
	Dedicated WH Solar (3.5 m2)	39	139	141	115	119	123	127	132	136	140
	WH dedicated Water Heater	**401**	**525**	**531**	**537**	**599**	**661**	**723**	**786**	**848**	**910**
	CHB Gas Combi Instant. WH	62	104	108	111	104	97	89	81	72	63
	CHB Gas + Cyl. WH	32	43	38	42	39	36	33	30	27	24
	CHB Jet Burner Gas + Cyl. WH	14	6	4	4	4	4	5	5	5	5
	CHB Jet Burner Oil + Cyl. WH	107	43	29	28	29	30	31	31	32	33
	CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	2	1
	CHB Hybrid Gas/Electric WH	0	0	1	2	7	11	17	23	31	40
	CHB Electric HP + Cyl. WH	2	32	39	66	114	163	212	260	312	364
	CHB Gas HP + Cyl. WH	0	0	1	3	5	7	10	12	15	18
	CHB Gas mCHP + Cyl. WH	1	1	2	4	7	9	11	14	16	18
	CHB Solar Combi (16 m2)	3	6	7	7	7	7	7	7	8	8
	CHC Central Heating combi, water heating	**222**	**238**	**231**	**270**	**319**	**368**	**417**	**466**	**519**	**572**
	TOTAL WATER HEATING	**623**	**763**	**763**	**807**	**918**	**1029**	**1140**	**1252**	**1367**	**1482**
	CHB Gas non-condensing	462	248	187	57	35	13	10	7	6	4
	CHB Gas condensing	31	675	614	754	725	697	641	586	521	456
	CHB Gas Jet burner non-condensing	97	31	11	4	3	2	2	1	1	1
	CHB Gas Jet burner condensing	0	10	18	25	26	28	29	30	31	32
	CHB Oil Jet burner non-condensing	685	211	71	23	19	15	12	9	8	6
	CHB Oil Jet burner condensing	0	70	117	159	168	178	186	194	200	206
	CHB Electric Joule-effect	7	11	10	11	11	10	9	8	7	7
	CHB Hybrid (gas-electric)	0	1	5	11	37	64	97	130	176	222
	CHB Electric Heat Pump	12	172	181	337	587	837	1086	1335	1600	1865
	CHB Gas Heat Pump	1	2	7	15	27	39	53	66	81	96
	CHB micro CHP	3	5	12	24	37	50	62	74	87	99
	CHB Solar combi (16 m2)	17	30	35	34	35	36	37	38	39	39
	CHB Central Heating boiler < 400 kW, space heating	**1315**	**1467**	**1268**	**1454**	**1711**	**1968**	**2224**	**2481**	**2757**	**3034**
	SFB Wood Manual [18 kW]	23	14	12	10	5	5	4	4	3	3
	SFB Wood Direct Draft [20 kW]	1	38	39	41	45	53	62	72	84	99
	SFB Coal [25 kW]	6	29	6	8	9	8	7	7	6	5
	SFB Pellets [25 kW]	0	10	15	15	15	16	18	20	22	24
	SFB Wood chips [160 kW]	0	6	6	7	8	9	10	11	12	13
	Total Solid Fuel Boiler	**30**	**96**	**78**	**81**	**83**	**91**	**101**	**113**	**127**	**144**
	CHAE-S (≤ 400 kW)	25	112	123	137	151	166	180	194	208	221
	CHAE-L (> 400 kW)	6	19	20	21	22	23	23	24	25	26
	CHWE-S (≤ 400 kW)	2	10	11	12	13	15	16	17	19	20
	CHWE-M (> 400 kW; ≤ 1500 kW)	3	9	9	10	10	11	11	12	12	12
	CHWE-L (> 1500 kW)	2	6	6	6	7	7	7	7	8	8
	CHF	0	0	1	1	1	1	1	1	1	1
	HT PCH-AE-S	13	21	23	24	25	26	28	29	30	31
	HT PCH-AE-L	10	17	18	19	20	21	22	23	24	25
	HT PCH-WE-S	3	5	5	5	6	6	6	6	6	7
	HT PCH-WE-M	11	19	20	21	22	23	24	25	26	26
	HT PCH-WE-L	2	3	4	4	4	4	4	5	5	5
1	AC rooftop	12	40	40	31	18	5	5	5	5	5
1	AC splits	20	77	81	78	76	73	70	67	64	62
1	AC VRF	0	175	229	335	424	511	595	672	736	783
	ACF	0	0	1	1	1	1	1	1	1	1
	SubTotal AHC Air Cooling	**109**	**514**	**592**	**706**	**800**	**892**	**993**	**1088**	**1169**	**1232**
1	AC rooftop (rev)	7	24	24	19	11	3	0	0	0	0
	AC splits (rev)	14	49	52	50	49	47	45	43	41	40
1	AC VRF (rev)	0	149	186	286	348	399	442	475	495	501
1	ACF (rev)	0	1	1	1	2	2	2	3	3	3
1	AHF	43	28	26	27	25	24	21	19	18	17
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**64**	**252**	**289**	**384**	**434**	**474**	**510**	**540**	**557**	**560**
	Total AHC Air Heating & Cooling	**151**	**542**	**618**	**733**	**826**	**916**	**1015**	**1107**	**1188**	**1249**

db	REVENUE WHOLESALE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	104	150	148	182	200	191	184	177	171	165
	LH closed fireplace/inset [8 kW]	66	175	193	250	269	262	253	244	235	227
	LH wood stove [8 kW]	71	83	90	118	127	123	119	114	110	105
	LH coal stove [8 kW]	19	16	15	16	12	8	7	7	7	6
	LH cooker [10 kW]	61	120	143	182	193	190	183	176	175	175
	LH SHR stove [8 kW]	66	91	111	132	147	162	165	165	165	165
	LH pellet stove [8 kW]	0	68	84	100	107	114	116	116	116	116
	LH Solid fuel sum	**388**	**702**	**783**	**980**	**1055**	**1051**	**1028**	**1000**	**979**	**959**
	LH Electric portable	16	19	21	20	20	20	20	20	20	20
	LH Electric fixed > 250W	135	156	122	113	113	113	113	113	113	113
	LH Electric fixed ≤ 250W	17	20	15	14	14	14	14	14	14	14
	LH Electric storage	14	17	17	19	18	17	17	16	15	15
	LH Electric underfloor	13	16	17	17	17	17	17	17	17	17
	LH Electric visibly glowing > 1.2 kW	0	1	1	1	1	1	1	1	1	1
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	24	40	40	40	40	40	40	40	40	40
	LH Electric sum	**219**	**269**	**234**	**225**	**223**	**222**	**222**	**221**	**220**	**220**
	LH Gas luminous (commercial)	0	1	1	1	1	0	0	0	0	0
	LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	1	1	0	0	0	0
	LH Gas open front	1	1	1	1	1	1	1	1	1	1
	LH Gas closed front	10	5	4	4	3	3	3	3	3	3
	LH Gas balanced flue	16	7	4	4	3	3	3	3	3	3
	LH Gas flueless	1	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**28**	**14**	**11**	**10**	**8**	**7**	**7**	**7**	**7**	**7**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	0	0	0	0	0	0	0	0
	LH Liquid balanced flue	1	1	0	0	0	0	0	0	0	0
	LH Liquid flueless	6	2	1	0	0	0	0	0	0	0
	LH Liquid fuel sum	**8**	**3**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**643**	**988**	**1030**	**1215**	**1287**	**1282**	**1257**	**1228**	**1207**	**1187**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	32	371	293	319	337	344	350	386	442	512
	RAC fixed 6-12 kW, cooling	14	226	242	227	227	224	221	217	223	228
	RAC portable < 12 kW, cooling	2	30	29	21	20	20	19	20	21	21
	RAC < 12 kW total, cooling mode	**48**	**627**	**564**	**567**	**584**	**588**	**590**	**623**	**686**	**761**
	RAC fixed < 6 kW, reversible, heating	3	142	141	191	236	275	315	386	442	512
	RAC fixed 6-12 kW, reversible, heating	1	86	116	136	159	180	198	217	223	228
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**4**	**228**	**257**	**328**	**395**	**454**	**514**	**603**	**665**	**740**
	RAC Room Air Conditioner	**52**	**855**	**821**	**895**	**979**	**1042**	**1104**	**1226**	**1351**	**1502**
1	CIRC Integrated circulators	188	307	362	381	393	407	407	407	407	407
0.38	CIRC Large standalone circulators	89	165	276	258	230	197	187	178	170	161
0.38	CIRC Small standalone circulators	152	229	272	254	226	197	187	178	170	170
	CIRC Circulator pumps <2.5 kW, all	**428**	**702**	**910**	**893**	**849**	**801**	**782**	**764**	**747**	**739**
	CIRC Circulator pumps <2.5 kW, excl. double	**149**	**245**	**340**	**317**	**283**	**244**	**232**	**221**	**211**	**205**
	TOTAL SPACE HEATING (incl. rev.AC)	**2204**	**3276**	**3262**	**3779**	**4193**	**4513**	**4839**	**5186**	**5524**	**5871**
	TOTAL SPACE COOLING	**157**	**1141**	**1155**	**1274**	**1384**	**1480**	**1584**	**1711**	**1855**	**1993**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	3	4	4	4	4	4	3	3
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	1	1	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	10	17	41	197	210	228	318	385	417
	R-UVU 100-250 m3/h	12	37	43	57	54	52	54	57	52	53
	R-BVU 100-250 m3/h	1	9	11	18	80	84	89	120	143	153
	R-UVU 250-1000 m3/h	21	55	58	72	66	65	70	76	72	75
	R-BVU 250-1000 m3/h	3	17	20	30	137	148	159	212	251	270
	R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1
	R-BVU 1000-2500 m3/h	0	5	5	5	6	6	7	8	8	9
	RVU, Total residential (incl. instal.mat.)	**39**	**137**	**158**	**228**	**544**	**571**	**612**	**796**	**916**	**983**
	NR-UVU 250-1000 m3/h	8	9	9	10	9	9	9	8	8	7
	NR-BVU 250-1000 m3/h	0	18	18	22	25	29	31	35	39	41
	NR-UVU > 1000 m3/h	9	9	9	9	8	8	8	7	7	6
	NR-BVU 1000-2500 m3/h	0	36	35	41	44	50	54	58	64	68
	NR-AHU-S 2500-5500 m3/h	10	189	242	253	227	255	269	275	286	301
	NR-AHU-M 5500-14500 m3/h	122	326	380	389	346	372	380	381	390	399
	NR-AHU-L > 14500 m3/h	28	79	91	92	80	86	88	88	90	92
	NRVU, Total non-residential (incl. instal.mat.)	**178**	**665**	**785**	**815**	**739**	**809**	**840**	**852**	**883**	**915**
	VU Ventilation Units, res+nres (incl. instal.mat.)	**218**	**802**	**943**	**1043**	**1283**	**1380**	**1452**	**1648**	**1799**	**1897**
	TOTAL VENTILATION	**218**	**802**	**943**	**1043**	**1283**	**1380**	**1452**	**1648**	**1799**	**1897**

db	REVENUE WHOLESALE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	206	307	224	186	57	29	16	11	6	4
	HID (HPM, HPS, MH)	33	99	71	44	27	10	3	1	0	0
	CFLni (all shapes)	26	102	78	56	34	10	3	1	0	0
	CFLi (retrofit for GLS, HL)	30	542	176	95	0	0	0	0	0	0
	GLS (DLS & NDLS)	306	130	11	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	61	542	630	139	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	1	95	205	547	560	519	556	660	763
	LED replacing HID (retrofit & luminaire)	0	0	161	106	159	187	217	249	282	320
	LED replacing CFLni (retrofit & luminaire)	0	0	19	27	30	33	35	37	41	46
	LED replacing DLS (retrofit & luminaire)	0	16	103	66	51	11	12	14	15	16
	LED replacing NDLS (retrofit & luminaire)	0	9	331	470	207	113	57	59	64	71
	SUBTOTAL non-LED	662	1722	1191	520	119	49	22	13	7	4
	SUBTOTAL LED	0	26	708	874	994	904	840	915	1063	1217
	TOTAL LIGHTING	**662**	**1748**	**1899**	**1394**	**1113**	**953**	**861**	**928**	**1070**	**1221**
	DP TV all types	891	1461	835	1041	1202	1382	1402	1402	1402	1402
	DP Monitor	262	576	324	326	326	326	326	326	326	326
	DP Signage	0	84	368	844	633	633	633	633	633	633
	DP Electronic Displays, total	**1153**	**2121**	**1527**	**2211**	**2161**	**2341**	**2361**	**2361**	**2361**	**2361**
	SSTB	0	316	72	0	0	0	0	0	0	0
	CSTB	0	1188	1465	1478	1478	1478	1478	1478	1478	1478
	Total STB set top boxes (Complex & Simple)	**0**	**1503**	**1537**	**1478**	**1478**	**1478**	**1478**	**1478**	**1478**	**1478**
	Game consoles > 20 W	2	163	163	163	163	163	163	163	163	163
	Game consoles < 20 W	7	41	41	41	41	41	41	41	41	41
	Total GC Game consoles	**9**	**204**	**204**	**204**	**204**	**204**	**204**	**204**	**204**	**204**
	ES Enterprise Servers total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DS Data Storage products total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	PC Desktop	606	941	498	557	769	819	849	859	862	863
	PC Integrated Desktop	26	40	21	24	33	40	45	47	47	48
	PC Notebook	0	2601	2294	2288	3019	3808	4373	4578	4647	4670
	PC Tablet/slate	0	127	1458	1406	1529	1657	1733	1759	1767	1770
	PC Thin client	0	214	208	219	222	223	224	224	224	224
	PC Integrated Thin Client	0	17	16	17	17	17	17	17	17	17
	PC Small-scale Server	27	53	67	68	68	68	68	69	69	69
	PC Workstation	235	418	515	588	704	842	935	968	979	983
	Total PC, electricity	**894**	**4412**	**5077**	**5167**	**6360**	**7475**	**8244**	**8520**	**8613**	**8644**
	Inkjet Printer	53	88	12	13	12	11	11	10	10	9
	Inkjet MFD	65	169	129	82	78	74	71	67	64	60
	EP / Laser Printer mono	102	101	118	112	88	71	56	42	29	16
	EP / Laser Printer colour	0	98	111	136	150	157	163	166	169	172
	EP / Laser Copier mono	506	213	52	0	0	0	0	0	0	0
	EP / Laser Copier colour	0	71	127	0	0	0	0	0	0	0
	EP / Laser MFD mono	0	166	221	211	201	191	182	173	164	154
	EP / Laser MFD colour	0	1051	1404	1341	1275	1213	1154	1097	1039	982
	Total IE Imaging Equipment	**726**	**1957**	**2175**	**1895**	**1804**	**1717**	**1635**	**1555**	**1475**	**1395**
	Products regulated only for (networked) standby										
	SB Radios	411	334	268	236	216	195	175	154	134	113
	SB Electric toothbrushes	48	77	85	95	106	118	129	140	151	163
	SB Audio speakers (wired)	1075	553	391	140	0	0	0	0	0	0
	SB Audio speakers (wireless)	0	6	386	1026	1163	1169	1170	1171	1172	1173
	SB Small appliances	1245	2011	2063	2118	2142	2165	2189	2213	2236	2260
	SB Media boxes /sticks	0	0	80	99	99	99	99	99	99	99
	SB Media players and recorders	1	609	528	70	0	0	0	0	0	0
	SB Projectors	3	192	163	67	29	0	0	0	0	0
	SB Home phones	7	30	31	30	28	27	26	26	25	25
	SB Office phones	58	105	96	91	90	91	89	88	86	84
	SB Home NAS	0	351	554	756	952	1147	1317	1440	1499	1502
	SB Home Network Equipment	0	727	826	881	929	978	1056	1056	1056	1056
	SB Office Network Equipment	0	76	225	424	621	818	921	921	921	921
	SB Coffee makers	24	29	30	31	32	33	34	35	35	36
	Total (networked) SB (excl. double)	**2870**	**5101**	**5728**	**6062**	**6406**	**6840**	**7205**	**7342**	**7415**	**7432**
0.0	EPS ≤ 6W, low-V	3	40	32	24	17	9	4	2	1	0
0.3	EPS 6–10 W	16	231	249	265	278	292	299	307	315	323
0.6	EPS 10–12 W	0	191	227	245	247	248	250	252	253	255
0.5	EPS 15–20 W	0	1	5	11	11	13	13	13	14	15
1.0	EPS 20–30 W	1	28	31	29	27	25	22	20	18	16
0.8	EPS 30–65 W, multiple-V	0	0	0	4	6	8	10	13	15	18
1.0	EPS 30-65 W	0	0	0	4	11	18	18	18	18	18
1.0	EPS 65–120 W	0	21	20	16	9	0	0	0	0	0
0.5	EPS 65–120 W, multiple-V	0	125	46	13	14	14	14	14	14	14
0.0	EPS 12–15 W	1	21	42	51	52	52	52	52	52	52
	EPS, total	**21**	**657**	**652**	**663**	**671**	**679**	**683**	**690**	**700**	**710**
	EPS, double counted subtracted	**14**	**362**	**366**	**374**	**378**	**381**	**382**	**387**	**392**	**399**
	TOTAL ELECTRONICS	**5667**	**15660**	**16614**	**17391**	**18789**	**20435**	**21510**	**21847**	**21938**	**21912**

db	REVENUE WHOLESALE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	RF Household refrigerator and freezer	**206**	**264**	**287**	**302**	**345**	**331**	**362**	**373**	**383**	**392**
	CF open vertical chilled multi deck (RVC2)	82	94	93	95	113	123	119	116	112	109
	CF open horizontal frozen island (RHF4)	10	11	11	11	11	12	12	12	12	12
	CF other supermarket display (non-BCs)	188	233	247	258	267	277	286	296	307	318
	CF Plug in one door beverage cooler	161	206	205	213	230	234	236	243	251	260
	CF Plug in horizontal ice cream freezer	66	85	85	88	91	94	97	101	104	107
	CF Spiral vending machine	108	84	69	72	75	78	81	84	87	90
	Total CF Commercial Refrigeration	**614**	**714**	**710**	**737**	**788**	**817**	**831**	**852**	**873**	**896**
	PF Storage cabinet Chilled Vertical (CV)	40	55	57	65	65	66	68	71	74	77
	PF Storage cabinet Frozen Vertical (FV)	21	29	30	34	34	34	36	37	39	40
	PF Storage cabinet Chilled Horizontal (CH)	8	11	12	13	13	13	14	15	15	16
	PF Storage cabinet Frozen Horizontal (FH)	6	9	9	10	10	10	11	11	12	12
	PF Storage cabinets All types	**76**	**103**	**108**	**122**	**122**	**124**	**129**	**134**	**140**	**145**
	PF Process Chiller AC MT S ≤ 300 kW	6	12	14	16	17	18	20	22	23	25
	PF Process Chiller AC MT L > 300 kW	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC LT S ≤ 200 kW	5	10	11	13	14	15	16	18	19	20
	PF Process Chiller AC LT L > 200 kW	5	10	11	12	13	14	15	17	18	19
	PF Process Chiller WC MT S ≤ 300 kW	3	6	6	7	8	8	9	10	10	11
	PF Process Chiller WC MT L > 300 kW	4	8	9	10	11	12	13	14	16	17
	PF Process Chiller WC LT S ≤ 200 kW	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC LT L > 200 kW	3	7	8	8	9	10	11	12	13	13
	PF Process Chiller All MT&LT	**35**	**70**	**78**	**87**	**95**	**104**	**113**	**122**	**131**	**140**
	PF Condensing Unit MT S 0.2-1 kW	31	26	27	30	31	34	36	39	42	45
	PF Condensing Unit MT M 1-5 kW	68	56	58	65	67	73	78	84	91	98
	PF Condensing Unit MT L 5-20 kW	70	58	60	69	70	75	80	87	93	101
	PF Condensing Unit MT XL 20-50 kW	53	44	46	53	54	57	62	66	71	77
	PF Condensing Unit LT S 0.1-0.4 kW	5	5	5	5	5	6	6	7	7	8
	PF Condensing Unit LT M 0.4-2 kW	10	8	8	9	10	10	11	12	13	14
	PF Condensing Unit LT L 2-8 kW	26	22	22	26	26	28	30	32	35	37
	PF Condensing Unit LT XL 8-20 kW	23	19	19	22	23	24	26	28	30	33
0.6	**PF Condensing Unit, All MT&LT**	**286**	**238**	**244**	**279**	**286**	**306**	**330**	**355**	**383**	**412**
	PF Professional Refrigeration, Total	**225**	**268**	**284**	**321**	**331**	**350**	**374**	**398**	**424**	**450**
	TOTAL FOOD PRESERVATION	**1044**	**1246**	**1281**	**1360**	**1464**	**1498**	**1567**	**1623**	**1680**	**1738**
	CA Electric Hobs	73	167	180	203	213	223	232	241	249	256
	CA Electric Ovens	156	189	202	228	220	213	214	217	220	222
	CA Gas Hobs	61	53	49	47	43	39	37	35	33	31
	CA Gas Ovens	21	22	22	28	27	26	25	24	23	22
	CA Range Hoods	38	47	50	65	76	77	77	77	77	77
	TOTAL COOKING	**349**	**478**	**503**	**571**	**580**	**578**	**586**	**594**	**602**	**609**
	WM Washing Machines	112	202	208	222	206	196	186	177	175	175
	WD Washer-Dryers	10	15	15	15	15	16	16	16	16	16
	Total WM-WD household Washing	**123**	**217**	**223**	**238**	**221**	**211**	**202**	**193**	**191**	**191**
	DW Household Dishwasher	**48**	**143**	**167**	**188**	**205**	**221**	**236**	**250**	**263**	**275**
	LD condensing heat pump	0	8	46	64	72	85	81	77	74	70
	LD condensing electric heat element	8	20	19	21	18	12	12	11	11	11
	LD vented electric	13	9	5	4	3	0	0	0	0	0
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**21**	**37**	**70**	**89**	**93**	**98**	**93**	**89**	**84**	**81**
	VC Domestic mains	57	94	96	80	67	52	43	41	41	41
	VC Commercial mains	104	157	166	176	168	160	152	147	147	147
	VC Total in scope of CR 666/2013	**161**	**251**	**261**	**257**	**235**	**212**	**195**	**188**	**188**	**188**
	VC Cordless	2	8	26	55	82	110	133	146	151	152
	VC Robot	0	8	16	29	43	58	71	78	80	81
	Total VC Vacuum Cleaner	**104**	**159**	**170**	**185**	**181**	**177**	**173**	**171**	**171**	**172**
	TOTAL CLEANING	**296**	**556**	**630**	**700**	**700**	**708**	**705**	**702**	**710**	**718**
0.5	FAN Axial<300Pa [247 W flow out]	81	275	395	498	476	455	435	416	398	381
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	111	400	424	465	447	447	447	447	447	447
0.5	FAN Centr.FC [141 W flow out]	69	182	272	378	361	345	329	314	300	286
0.5	FAN Centr.BC-free [2120 W flow out]	40	100	140	157	166	162	158	153	153	156
0.5	FAN Centr.BC [2052 W flow out]	86	239	383	441	470	458	481	501	519	534
0.5	FAN Cross-flow [31 W flow out]	16	37	121	161	171	166	174	181	187	192
	Total FAN, industrial (excl. box & roof fans)	**202**	**616**	**867**	**1051**	**1045**	**1016**	**1012**	**1007**	**1002**	**998**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	114	186	202	190	195	188	180	171	163	154
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	68	108	104	94	92	87	82	77	71	69
0.45	Medium (L) 3-ph 75-375 kW no VSD	53	79	69	62	62	57	51	46	44	43
0.45	**Total 3ph 0.75-375 kW no VSD**	**234**	**373**	**375**	**345**	**349**	**332**	**312**	**294**	**278**	**266**

db	REVENUE WHOLESALE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	45	134	208	354	380	390	405	427	450	475
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	33	100	187	253	267	274	284	300	316	324
0.45	Medium (L) 3-ph 75-375 kW with VSD	25	76	135	166	180	185	192	199	202	202
0.45	**Total 3-ph 0.75-375 kW with VSD**	**103**	**310**	**530**	**772**	**827**	**848**	**881**	**926**	**968**	**1001**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**337**	**683**	**905**	**1117**	**1176**	**1180**	**1193**	**1220**	**1246**	**1267**
0.45	Small 1 ph 0.12-0.75 kW no VSD	72	138	145	145	186	181	176	171	165	160
0.45	Small 1 ph 0.12-0.75 kW with VSD	11	95	115	121	134	141	149	158	167	177
0.45	**Total Small 1-ph 0.12-0.75 kW**	**84**	**233**	**260**	**266**	**319**	**322**	**325**	**329**	**333**	**338**
0.45	Small 3 ph 0.12-0.75 kW no VSD	40	68	71	75	87	85	83	80	78	75
0.45	Small 3 ph 0.12-0.75 kW with VSD	4	35	43	49	57	60	65	72	78	86
0.45	**Total Small 3-ph 0.12-0.75 kW**	**44**	**103**	**115**	**124**	**144**	**145**	**148**	**152**	**156**	**161**
0.45	Large 3-ph LV 375-1000 kW no VSD	24	31	27	27	30	29	28	26	25	24
0.45	Large 3-ph LV 375-1000kW with VSD	9	52	72	80	90	90	93	97	101	104
0.45	**Total Large 3-ph LV 375-1000 kW**	**33**	**83**	**99**	**108**	**120**	**119**	**121**	**123**	**126**	**128**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	7	13	13	14	17	17	17	16	16	16
0.45	Explosion motors (M) 3-ph 7.5-75 kW	6	11	12	13	15	14	14	14	14	13
0.45	Explosion motors (L) 3-ph 75-375 kW	5	8	9	9	11	10	10	10	10	10
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**18**	**32**	**34**	**36**	**42**	**42**	**41**	**40**	**40**	**39**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	9	16	16	18	23	23	23	22	22	22
0.45	Brake motors (M) 3-ph 7.5-75 kW	8	14	15	16	19	19	19	18	18	18
0.45	Brake motors (L) 3-ph 75-375 kW	6	10	11	12	14	14	14	13	13	13
0.45	**Total Brake 0.75-375 kW (no VSD)**	**23**	**40**	**42**	**46**	**57**	**56**	**55**	**54**	**53**	**52**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	1	1	1	1	1	1	1	1	1
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	1	1	1	1	1	1	1
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**1**	**2**	**2**	**2**	**3**	**3**	**3**	**3**	**3**	**3**
0.45	**1-phase motors >0.75 kW (no VSD)**	**165**	**289**	**303**	**309**	**346**	**349**	**351**	**352**	**354**	**355**
	MT Elec. Motors LV 0.12-1000 kW	**388**	**806**	**968**	**1105**	**1214**	**1218**	**1230**	**1250**	**1270**	**1289**
	WP ESOB < 45kW	92	125	136	148	154	165	176	188	199	210
	WP ESOB 45-150kW	16	22	24	27	28	30	32	34	36	37
	WP ESCC < 45kW	59	79	87	94	98	105	112	119	126	134
	WP ESCC 45-150kW	13	17	19	20	21	23	24	26	27	29
	WP ESCCi < 45kW	29	40	44	48	51	55	58	62	66	69
	WP ESCCi 45-150kW	2	3	3	4	4	4	4	5	5	5
	WP MSSB <6"	169	228	253	276	287	306	325	344	364	384
	WP MS_V <25 bar	53	71	78	85	89	95	102	108	115	121
	WP Water pumps	**433**	**586**	**645**	**702**	**732**	**783**	**835**	**886**	**937**	**989**
	Total WE Welding Equipment	**49**	**56**	**56**	**56**	**58**	**59**	**58**	**58**	**59**	**59**
	TOTAL INDUSTRY COMPONENTS	**1071**	**2064**	**2537**	**2914**	**3050**	**3077**	**3135**	**3201**	**3268**	**3335**
	TRAFO Distribution, kWh/a	47	74	99	107	115	123	132	141	149	158
	TRAFO Industry oil	24	40	66	71	76	82	87	93	99	105
	TRAFO Industry dry	12	19	27	29	31	34	36	38	41	43
	TRAFO Power	187	304	329	355	382	411	440	470	500	529
	TRAFO DER oil	0	2	6	10	17	27	40	53	66	79
	TRAFO DER dry	0	13	29	48	80	131	194	257	319	382
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	**275**	**457**	**561**	**626**	**706**	**813**	**935**	**1057**	**1179**	**1301**
	Tyres C1, replacement for cars	1316	1891	2297	2767	3138	3507	3507	3507	3507	3507
	Tyres C1, OEM for cars	396	543	638	814	945	1056	1056	1056	1056	1056
	Tyres C1, total	**1712**	**2434**	**2936**	**3582**	**4083**	**4563**	**4563**	**4563**	**4563**	**4563**
	Tyres C2, replacement for vans	228	297	310	387	447	503	503	503	503	503
	Tyres C2, OEM for vans	48	53	67	73	93	106	106	106	106	106
	Tyres C2, total	**276**	**351**	**376**	**460**	**540**	**609**	**609**	**609**	**609**	**609**
	Tyres C3, replacement for trucks/busses	400	404	709	823	947	1056	1056	1056	1056	1056
	Tyres C3, OEM for trucks/busses	111	95	133	180	264	294	294	294	294	294
	Tyres C3, total	**511**	**499**	**842**	**1003**	**1211**	**1350**	**1350**	**1350**	**1350**	**1350**
	Tyres, total C1+C2+C3	**2500**	**3284**	**4154**	**5044**	**5834**	**6522**	**6522**	**6522**	**6522**	**6522**
	TRANSPORT SECTOR	**2500**	**3284**	**4154**	**5044**	**5834**	**6522**	**6522**	**6522**	**6522**	**6522**
	GENERAL TOTAL (in m euros 2020)	**15066**	**31477**	**34302**	**36903**	**40014**	**42985**	**44835**	**46271**	**47514**	**48599**
	GENERAL TOTAL (in bn euros 2020)	15	31	34	37	40	43	45	46	48	49

SUMMARY ECO

Wholesale revenue (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.6	0.8	0.8	0.8	0.9	1.0	1.1	1.3	1.4	1.5
SPACE HEATING	2.2	3.3	3.3	3.8	4.2	4.5	4.8	5.2	5.5	5.9
SPACE COOLING	0.2	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.9	2.0
VENTILATION	0.2	0.8	0.9	1.0	1.3	1.4	1.5	1.6	1.8	1.9
LIGHTING	0.7	1.7	1.9	1.4	1.1	1.0	0.9	0.9	1.1	1.2
ELECTRONICS	5.7	15.7	16.6	17.4	18.8	20.4	21.5	21.8	21.9	21.9
FOOD PRESERVATION	1.0	1.2	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.7
COOKING	0.3	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6
CLEANING	0.3	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
INDUSTRY COMPONENTS	1.1	2.1	2.5	2.9	3.1	3.1	3.1	3.2	3.3	3.3
ENERGY SECTOR	0.3	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.2	1.3
TRANSPORT SECTOR	2.5	3.3	4.2	5.0	5.8	6.5	6.5	6.5	6.5	6.5
TOTAL in bn euros 2020	**15**	**31**	**34**	**37**	**40**	**43**	**45**	**46**	**48**	**49**

Wholesale revenue ECO-BAU (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2
SPACE HEATING	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.9	1.0	1.1
SPACE COOLING	0.0	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0
VENTILATION	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LIGHTING	0.0	0.1	0.3	-0.6	-0.4	-0.3	-0.2	0.0	0.1	0.1
ELECTRONICS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
FOOD PRESERVATION	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
COOKING	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CLEANING	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
INDUSTRY COMPONENTS	0.0	0.0	0.3	0.5	0.5	0.5	0.4	0.3	0.3	0.2
ENERGY SECTOR	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
TRANSPORT SECTOR	0.0	0.1	0.5	0.9	1.1	1.2	1.2	1.2	1.2	1.2
TOTAL in bn euros 2020	**0.0**	**0.5**	**1.6**	**1.7**	**2.5**	**2.7**	**2.9**	**3.1**	**3.2**	**3.3**

Revenues for VSDs only (without motor, m euros)

VSD - Very Small 0.12 - 0.75 kW 1-phase	10	79	95	100	106	113	120	128	136	145
VSD - Very Small 0.12 - 0.75 kW 3-phase	3	26	32	36	41	43	47	52	57	63
VSD - Small 0.75 - 7.5 kW 3-phase	32	96	144	235	249	254	266	284	303	323
VSD - Medium 7.5 - 75kW 3-phase	23	69	124	165	173	177	185	198	211	219
VSD - Large 75 - 375kW 3-phase	13	39	65	78	82	85	89	95	98	100
VSD - Very Large 375 - 1,000kW 3-phase	6	34	46	51	55	55	58	61	64	67
Total revenues, VSDs only (ECO)	**88**	**342**	**507**	**665**	**707**	**727**	**765**	**817**	**869**	**917**

db **REVENUE INSTALL BAU (m euros 2020)**	**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
EIWH Electric Instant. < 12 kW (secondary)	17	25	28	31	31	31	31	31	31	31
EIWH Electric Instant. ≥ 12 kW (primary)	50	42	42	43	48	53	57	62	66	71
EIWHS Electric Instant. Shower (secondary)	7	9	9	9	10	10	11	11	12	13
ESWH Electric Storage ≤ 30 L (secondary)	112	124	125	130	139	148	157	166	175	184
ESWH Electric Storage > 30 L (primary)	638	743	683	713	762	811	860	909	958	1007
GIWH Gas Instant. < 13 L/min (secondary)	185	129	106	107	106	104	103	101	100	99
GIWH Gas Instant. ≥ 13 L/min (primary)	54	51	43	44	43	43	42	41	41	40
GSWH Gas Storage, Condensing	0	2	3	4	4	5	6	7	7	8
GSWH Gas Storage, Non-condensing	84	49	36	23	20	18	15	12	10	7
Dedicated WH Heat Pump	0	14	39	57	86	115	145	174	203	233
Dedicated WH Solar (3.5 m2)	133	477	483	393	408	422	437	452	466	481
WH dedicated Water Heater	**1280**	**1667**	**1596**	**1553**	**1657**	**1760**	**1864**	**1967**	**2070**	**2174**
CHB Gas Combi Instant. WH	315	530	550	590	596	601	603	602	597	587
CHB Gas + Cyl. WH	197	268	279	299	302	305	305	305	302	297
CHB Jet Burner Gas + Cyl. WH	96	42	29	29	30	31	32	32	33	34
CHB Jet Burner Oil + Cyl. WH	732	294	198	194	199	204	210	216	220	225
CHB Electric (Joule) + Cyl. WH	6	10	10	11	10	9	8	8	7	6
CHB Hybrid Gas/Electric WH	1	2	3	5	8	14	22	37	60	99
CHB Electric HP + Cyl. WH	19	272	308	375	433	500	576	663	763	877
CHB Gas HP + Cyl. WH	1	3	4	6	8	12	17	24	35	49
CHB Gas mCHP + Cyl. WH	4	6	9	13	19	27	38	54	78	111
CHB Solar Combi (16 m2)	19	34	34	36	37	38	38	39	40	40
CHC Central Heating combi, water heating	**1390**	**1460**	**1422**	**1557**	**1642**	**1740**	**1850**	**1980**	**2135**	**2325**
TOTAL WATER HEATING	2670	3127	3018	3110	3299	3501	3714	3947	4205	4499
CHB Gas non-condensing	2159	1161	1076	1053	971	893	815	741	668	597
CHB Gas condensing	180	3945	3282	3498	3716	3914	4076	4207	4299	4338
CHB Gas Jet burner non-condensing	627	202	91	80	74	69	64	59	55	50
CHB Gas Jet burner condensing	0	80	110	123	136	148	160	172	183	193
CHB Oil Jet burner non-condensing	4404	1357	602	530	493	457	425	395	365	337
CHB Oil Jet burner condensing	0	535	718	760	843	923	1002	1078	1148	1216
CHB Electric Joule-effect	29	48	46	51	47	43	40	36	32	29
CHB Hybrid (gas-electric)	3	10	17	29	48	80	133	220	364	601
CHB Electric Heat Pump	107	1501	1700	2091	2441	2848	3311	3848	4467	5183
CHB Gas Heat Pump	5	15	21	32	46	67	96	138	199	287
CHB micro CHP	20	33	47	72	104	150	216	311	448	644
CHB Solar combi (16 m2)	102	175	175	191	197	203	209	214	220	225
CHB Central Heating boiler < 400 kW, space heating	**7637**	**9062**	**7885**	**8509**	**9116**	**9795**	**10547**	**11421**	**12449**	**13701**
SFB Wood Manual [18 kW]	324	193	127	74	44	41	38	35	33	30
SFB Wood Direct Draft [20 kW]	7	315	323	340	316	394	462	540	633	756
SFB Coal [25 kW]	65	302	67	85	92	83	75	68	62	56
SFB Pellets [25 kW]	0	90	137	135	135	149	165	182	201	222
SFB Wood chips [160 kW]	0	19	19	23	27	29	32	36	40	44
Total Solid Fuel Boiler	**396**	**918**	**673**	**657**	**614**	**697**	**772**	**862**	**968**	**1107**
CHAE-S (≤ 400 kW)	93	408	450	499	551	604	656	708	757	804
CHAE-L (> 400 kW)	21	71	74	76	80	83	86	89	92	95
CHWE-S (≤ 400 kW)	5	24	26	29	32	35	38	41	44	47
CHWE-M (> 400 kW; ≤ 1500 kW)	6	22	23	24	25	26	27	28	29	30
CHWE-L (> 1500 kW)	2	9	9	9	10	10	11	11	11	12
CHF	0	2	2	2	3	3	4	4	5	5
HT PCH-AE-S	47	79	85	90	94	97	101	105	109	113
HT PCH-AE-L	38	63	68	72	75	78	81	84	87	90
HT PCH-WE-S	10	17	19	20	20	21	22	23	24	25
HT PCH-WE-M	27	45	48	51	53	55	57	59	62	64
HT PCH-WE-L	3	5	5	6	6	6	7	7	7	7
AC rooftop	86	292	296	227	132	35	35	35	35	35
AC splits	87	329	345	334	322	310	298	286	275	263
AC VRF	0	1053	1378	2015	2548	3075	3578	4040	4426	4707
ACF	0	2	2	2	3	3	4	4	5	5
SubTotal AHC Air Cooling	**426**	**2419**	**2828**	**3455**	**3953**	**4442**	**5004**	**5525**	**5968**	**6301**
AC rooftop (rev)	53	179	173	139	78	20	0	0	0	0
AC splits (rev)	58	211	221	215	207	199	192	184	177	169
AC VRF (rev)	0	899	1119	1719	2090	2400	2656	2854	2976	3010
ACF (rev)	0	3	4	5	6	8	9	10	11	11
AHF	283	184	173	162	153	144	136	127	119	111
AHE	0	0	0	0	0	0	0	0	0	0
SubTotal AHC Air Heating (rev double)	**394**	**1476**	**1690**	**2241**	**2535**	**2771**	**2993**	**3175**	**3282**	**3302**
Total AHC Air Heating & Cooling	**709**	**2603**	**3001**	**3618**	**4108**	**4588**	**5141**	**5653**	**6088**	**6413**

db	REVENUE INSTALL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	346	497	492	490	487	484	483	483	483	483
	LH closed fireplace/inset [8 kW]	211	563	618	676	684	693	695	695	695	695
	LH wood stove [8 kW]	163	189	206	224	227	230	231	231	231	231
	LH coal stove [8 kW]	66	55	50	46	34	23	21	21	21	21
	LH cooker [10 kW]	120	237	281	326	335	343	345	345	345	345
	LH SHR stove [8 kW]	1033	1419	1733	2051	2293	2535	2584	2584	2584	2584
	LH pellet stove [8 kW]	0	109	135	161	173	184	187	187	187	187
	LH Solid fuel sum	**1939**	**3068**	**3516**	**3975**	**4234**	**4493**	**4546**	**4546**	**4546**	**4546**
	LH Electric portable	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed > 250W	162	189	147	136	136	136	136	136	136	136
	LH Electric fixed ≤ 250W	41	47	37	34	34	34	34	34	34	34
	LH Electric storage	16	19	18	17	17	17	17	17	17	17
	LH Electric underfloor	137	167	176	175	173	173	173	173	173	173
	LH Electric visibly glowing > 1.2 kW	3	4	4	4	4	4	4	4	4	4
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	30	50	50	50	50	50	50	50	50	50
	LH Electric sum	**390**	**478**	**432**	**418**	**416**	**416**	**416**	**416**	**416**	**416**
	LH Gas luminous (commercial)	1	1	1	1	1	1	1	1	1	1
	LH Gaseous Tube (commercial < 120 kW)	1	1	1	1	1	1	1	1	1	1
	LH Gas open front	2	2	2	2	2	1	1	1	1	1
	LH Gas closed front	11	6	5	4	4	3	3	3	3	3
	LH Gas balanced flue	26	11	7	6	5	5	5	5	5	5
	LH Gas flueless	0	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**41**	**21**	**16**	**14**	**12**	**11**	**11**	**11**	**11**	**11**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	0	0	0	0	0	0	0	0
	LH Liquid balanced flue	3	1	1	1	1	0	0	0	0	0
	LH Liquid flueless	0	0	0	0	0	0	0	0	0	0
	LH Liquid fuel sum	**4**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**2374**	**3569**	**3966**	**4408**	**4663**	**4920**	**4973**	**4973**	**4973**	**4973**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	162	1571	1172	1299	1437	1572	1722	1926	2206	2554
	RAC fixed 6-12 kW, cooling	34	406	401	394	411	423	430	431	477	528
	RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode	**195**	**1977**	**1573**	**1693**	**1847**	**1995**	**2153**	**2357**	**2684**	**3082**
	RAC fixed < 6 kW, reversible, heating	14	600	563	779	1006	1257	1550	1926	2206	2554
	RAC fixed 6-12 kW, reversible, heating	3	155	193	237	287	338	387	431	477	528
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**16**	**755**	**755**	**1016**	**1293**	**1596**	**1937**	**2357**	**2684**	**3082**
	RAC Room Air Conditioner	**212**	**2732**	**2328**	**2709**	**3141**	**3590**	**4090**	**4713**	**5368**	**6164**
1	CIRC Integrated circulators	492	806	896	937	1011	1069	1069	1069	1069	1069
0.38	CIRC Large standalone circulators	31	57	59	59	56	51	51	51	51	50
0.38	CIRC Small standalone circulators	303	459	454	427	388	342	340	340	340	340
	CIRC Circulator pumps <2.5 kW, all	**827**	**1323**	**1409**	**1423**	**1455**	**1462**	**1460**	**1461**	**1460**	**1460**
	CIRC Circulator pumps <2.5 kW, excl. double	**207**	**320**	**318**	**301**	**275**	**244**	**243**	**243**	**242**	**242**
	TOTAL SPACE HEATING (incl. rev.AC)	**11026**	**16100**	**15287**	**17132**	**18496**	**20022**	**21466**	**23030**	**24598**	**26407**
	TOTAL SPACE COOLING	**621**	**4396**	**4401**	**5148**	**5801**	**6437**	**7157**	**7881**	**8652**	**9383**
	R-UVU ≤ 100 m3/h for Extract Spaces	2	5	5	6	6	7	7	8	7	8
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	1	1	1	1	2
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	12	19	42	214	235	257	344	409	443
	R-UVU 100-250 m3/h	26	78	81	92	91	98	107	116	118	126
	R-BVU 100-250 m3/h	5	31	34	53	289	328	356	399	439	477
	R-UVU 250-1000 m3/h	50	153	157	179	176	190	207	225	230	245
	R-BVU 250-1000 m3/h	10	60	66	104	566	642	698	779	853	928
	R-UVU > 1000 m3/h	13	10	9	8	7	7	6	6	5	4
	R-BVU 1000-2500 m3/h	0	37	35	40	41	47	50	53	57	59
	RVU, Total residential (install.labour only)	**107**	**386**	**406**	**525**	**1390**	**1554**	**1689**	**1931**	**2119**	**2292**
	NR-UVU 250-1000 m3/h	54	50	44	44	38	39	37	34	31	28
	NR-BVU 250-1000 m3/h	0	133	122	137	139	159	167	174	183	190
	NR-UVU > 1000 m3/h	116	97	82	77	61	61	57	52	47	41
	NR-BVU 1000-2500 m3/h	0	344	325	364	381	433	460	488	523	548
	NR-AHU-S 2500-5500 m3/h	134	2467	2976	2897	2464	2721	2791	2835	2896	2970
	NR-AHU-M 5500-14500 m3/h	1443	4115	4567	4416	3759	4105	4175	4219	4291	4365
	NR-AHU-L > 14500 m3/h	372	1089	1209	1166	985	1075	1092	1104	1120	1137
	NRVU, Total non-residential (install.labour only)	**2118**	**8296**	**9325**	**9101**	**7827**	**8594**	**8778**	**8905**	**9090**	**9280**
	VU Ventilation Units, res+nres (install.labour only)	**2224**	**8682**	**9732**	**9626**	**9217**	**10148**	**10467**	**10836**	**11209**	**11573**
	TOTAL VENTILATION	**2224**	**8682**	**9732**	**9626**	**9217**	**10148**	**10467**	**10836**	**11209**	**11573**

db	REVENUE INSTALL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1401	2108	1907	1452	989	734	594	452	351	273
	HID (HPM, HPS, MH)	136	356	308	210	162	90	44	22	12	6
	CFLni (all shapes)	88	343	325	307	233	120	51	20	8	3
	CFLi (retrofit for GLS, HL)	18	233	156	190	120	89	51	35	23	15
	GLS (DLS & NDLS)	542	450	375	261	152	89	52	30	18	10
	HL (DLS & NDLS, LV & MV)	64	285	341	383	257	142	80	46	27	15
	LED replacing LFL (retrofit & luminaire)	0	0	25	201	538	935	1026	1190	1435	1697
	LED replacing HID (retrofit & luminaire)	0	0	4	38	83	132	157	186	214	244
	LED replacing CFLni (retrofit & luminaire)	0	0	7	49	139	242	275	326	377	402
	LED replacing DLS (retrofit & luminaire)	0	0	4	38	77	67	56	51	50	52
	LED replacing NDLS (retrofit & luminaire)	0	0	5	177	250	274	261	238	228	233
	SUBTOTAL non-LED	2249	3777	3412	2803	1912	1264	872	606	437	323
	SUBTOTAL LED	0	0	44	502	1087	1651	1774	1991	2303	2627
	TOTAL LIGHTING	**2249**	**3777**	**3456**	**3305**	**2999**	**2914**	**2646**	**2597**	**2741**	**2950**
	TOTAL ELECTRONICS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	27	31	31	32	32	33	33	34	34	35
	CF open horizontal frozen island (RHF4)	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	90	112	119	124	128	133	137	142	147	152
	CF Plug in one door beverage cooler	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration	**121**	**147**	**153**	**159**	**164**	**169**	**175**	**180**	**186**	**191**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**121**	**147**	**153**	**159**	**164**	**169**	**175**	**180**	**186**	**191**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total WM-WD household Washing	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0	2	3	4	6	8	11	13	15	17
	LD condensing electric heat element	13	35	52	68	65	59	53	49	46	43
	LD vented electric	95	76	85	88	87	85	85	85	85	85
	LD vented gas	1	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**109**	**114**	**140**	**160**	**158**	**153**	**149**	**147**	**146**	**146**
	Total VC Vacuum Cleaner	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING	**109**	**114**	**140**	**160**	**158**	**153**	**149**	**147**	**146**	**146**
0.5	FAN Axial<300Pa [247 W flow out]	39	133	153	173	173	173	173	173	173	173
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	40	145	153	162	162	162	162	162	162	162
0.5	FAN Centr.FC [141 W flow out]	20	53	61	70	70	70	70	70	70	70
0.5	FAN Centr.BC-free [2120 W flow out]	17	44	50	56	62	63	64	65	67	68
0.5	FAN Centr.BC [2052 W flow out]	38	104	119	135	150	153	168	184	199	214
0.5	FAN Cross-flow [31 W flow out]	6	13	15	17	19	19	21	23	25	27
	Total FAN, industrial (excl. box & roof fans)	**80**	**246**	**276**	**306**	**318**	**320**	**329**	**339**	**348**	**357**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	132	214	218	215	206	196	184	171	159	145
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	39	62	62	61	58	54	50	44	39	35
0.45	Medium (L) 3-ph 75-375 kW no VSD	10	14	14	13	12	10	9	7	7	7
0.45	**Total 3ph 0.75-375 kW no VSD**	**181**	**290**	**294**	**289**	**276**	**261**	**243**	**222**	**204**	**187**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	83	244	293	340	385	439	512	597	700	822
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	54	159	191	221	251	286	334	390	456	508
0.45	Medium (L) 3-ph 75-375 kW with VSD	28	83	100	117	133	152	176	205	210	215
0.45	**Total 3-ph 0.75-375 kW with VSD**	**165**	**486**	**585**	**678**	**768**	**877**	**1023**	**1193**	**1366**	**1545**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**345**	**776**	**879**	**967**	**1044**	**1137**	**1265**	**1415**	**1570**	**1732**
0.45	Small 1 ph 0.12-0.75 kW no VSD	79	150	158	158	157	157	155	154	153	151
0.45	Small 1 ph 0.12-0.75 kW with VSD	23	189	229	241	255	271	288	306	325	345
0.45	**Total Small 1-ph 0.12-0.75 kW**	**102**	**339**	**387**	**399**	**413**	**428**	**444**	**460**	**478**	**496**
0.45	Small 3 ph 0.12-0.75 kW no VSD	50	84	89	89	89	88	87	86	84	83
0.45	Small 3 ph 0.12-0.75 kW with VSD	8	68	84	91	100	110	121	133	147	161
0.45	**Total Small 3-ph 0.12-0.75 kW**	**58**	**152**	**172**	**181**	**189**	**198**	**208**	**219**	**231**	**244**
0.45	Large 3-ph LV 375-1000 kW no VSD	6	8	7	7	7	7	7	6	6	6
0.45	Large 3-ph LV 375-1000kW with VSD	12	73	101	111	117	123	128	133	139	145
0.45	**Total Large 3-ph LV 375-1000 kW**	**18**	**81**	**108**	**118**	**124**	**130**	**135**	**140**	**145**	**151**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	8	15	15	16	16	16	16	16	16	16
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	7	7	7	7	7	7	7	7	7
0.45	Explosion motors (L) 3-ph 75-375 kW	1	2	2	2	2	2	2	2	2	2
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**13**	**23**	**24**	**24**	**24**	**24**	**24**	**24**	**25**	**25**

db	REVENUE INSTALL BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	10	18	19	20	20	19	19	19	20	20
0.45	Brake motors (M) 3-ph 7.5-75 kW	5	8	9	9	9	9	9	9	9	9
0.45	Brake motors (L) 3-ph 75-375 kW	1	2	2	2	2	2	2	2	2	2
0.45	**Total Brake 0.75-375 kW (no VSD)**	**16**	**28**	**30**	**30**	**30**	**30**	**30**	**30**	**31**	**31**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	**1-phase motors >0.75 kW (no VSD)**	**169**	**297**	**311**	**318**	**318**	**318**	**317**	**317**	**323**	**331**
	MT Elec. Motors LV 0.12-1000 kW	**397**	**933**	**1051**	**1121**	**1179**	**1247**	**1334**	**1434**	**1542**	**1656**
	WP ESOB < 45kW	97	131	143	156	162	174	185	197	208	220
	WP ESOB 45-150kW	6	9	10	10	11	12	12	13	14	15
	WP ESCC < 45kW	293	395	430	468	487	522	557	592	627	662
	WP ESCC 45-150kW	10	14	15	16	17	18	19	21	22	23
	WP ESCCi < 45kW	120	161	176	191	199	213	227	242	256	270
	WP ESCCi 45-150kW	2	2	3	3	3	3	3	4	4	4
	WP MSSB <6"	380	512	558	607	631	677	722	768	813	858
	WP MS_V <25 bar	144	194	211	230	239	256	274	291	308	325
	WP Water pumps	**1052**	**1419**	**1546**	**1681**	**1749**	**1874**	**2001**	**2126**	**2251**	**2377**
	Total WE Welding Equipment	**162**	**183**	**185**	**186**	**188**	**190**	**192**	**193**	**194**	**196**
	TOTAL INDUSTRY COMPONENTS	1691	2781	3058	3295	3434	3632	3856	4091	4335	4586
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euros 2020)	**20709**	**39125**	**39246**	**41935**	**43569**	**46976**	**49629**	**52709**	**56071**	**59734**
	GENERAL TOTAL (in bn euros 2020)	21	39	39	42	44	47	50	53	56	60

SUMMARY BAU

INSTALL excl. VAT (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**2.7**	**3.1**	**3.0**	**3.1**	**3.3**	**3.5**	**3.7**	**3.9**	**4.2**	**4.5**
SPACE HEATING	**11.0**	**16.1**	**15.3**	**17.1**	**18.5**	**20.0**	**21.5**	**23.0**	**24.6**	**26.4**
SPACE COOLING	**0.6**	**4.4**	**4.4**	**5.1**	**5.8**	**6.4**	**7.2**	**7.9**	**8.7**	**9.4**
VENTILATION	**2.2**	**8.7**	**9.7**	**9.6**	**9.2**	**10.1**	**10.5**	**10.8**	**11.2**	**11.6**
LIGHTING	**2.2**	**3.8**	**3.5**	**3.3**	**3.0**	**2.9**	**2.6**	**2.6**	**2.7**	**3.0**
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	**0.1**	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.1**	**0.1**	**0.1**	**0.1**
INDUSTRY COMPONENTS	**1.7**	**2.8**	**3.1**	**3.3**	**3.4**	**3.6**	**3.9**	**4.1**	**4.3**	**4.6**
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euros 2020	**21**	**39**	**39**	**42**	**44**	**47**	**50**	**53**	**56**	**60**

Revenues for VSDs only (without motor)

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VSD - Very Small 0.12 - 0.75 kW 1-phase	22	172	208	218	231	246	261	278	296	315
VSD - Very Small 0.12 - 0.75 kW 3-phase	7	57	69	76	83	92	102	112	124	137
VSD - Small 0.75 - 7.5 kW 3-phase	70	206	247	286	322	367	431	506	595	698
VSD - Medium 7.5 - 75kW 3-phase	50	147	177	204	231	263	309	362	426	475
VSD - Large 75 - 375kW 3-phase	28	83	100	116	131	149	175	205	212	218
VSD - Very Large 375 - 1,000kW 3-phase	12	70	95	104	109	115	121	127	134	140
Total revenues, VSDs only (BAU)	**190**	**735**	**897**	**1003**	**1107**	**1232**	**1399**	**1591**	**1786**	**1983**

db	REVENUE INSTALL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	17	25	28	31	31	31	31	31	31	31
	EIWH Electric Instant. ≥ 12 kW (primary)	50	42	42	43	48	53	57	62	66	71
	EIWHS Electric Instant. Shower (secondary)	7	9	9	9	10	10	11	11	12	13
	ESWH Electric Storage ≤ 30 L (secondary)	112	124	125	130	139	148	157	166	175	184
	ESWH Electric Storage > 30 L (primary)	638	743	683	713	762	811	860	909	958	1007
	GIWH Gas Instant. < 13 L/min (secondary)	185	129	106	107	106	104	103	101	100	99
	GIWH Gas Instant. ≥ 13 L/min (primary)	54	51	43	44	43	43	42	41	41	40
	GSWH Gas Storage, Condensing	0	2	3	4	4	5	6	7	7	8
	GSWH Gas Storage, Non-condensing	84	49	36	23	20	18	15	12	10	7
	Dedicated WH Heat Pump	0	14	39	57	86	115	145	174	203	233
	Dedicated WH Solar (3.5 m2)	133	477	483	393	408	422	437	452	466	481
	WH dedicated Water Heater	**1280**	**1667**	**1596**	**1553**	**1657**	**1760**	**1864**	**1967**	**2070**	**2174**
	CHB Gas Combi Instant. WH	315	530	548	565	528	491	451	410	364	318
	CHB Gas + Cyl. WH	197	268	237	260	243	226	207	189	167	146
	CHB Jet Burner Gas + Cyl. WH	96	42	29	29	30	31	32	32	33	34
	CHB Jet Burner Oil + Cyl. WH	732	294	198	194	199	204	210	216	220	225
	CHB Electric (Joule) + Cyl. WH	6	10	10	11	10	9	8	8	7	6
	CHB Hybrid Gas/Electric WH	1	2	6	13	48	82	124	166	225	283
	CHB Electric HP + Cyl. WH	19	272	330	563	979	1396	1811	2226	2668	3110
	CHB Gas HP + Cyl. WH	1	3	7	16	29	43	57	72	88	104
	CHB Gas mCHP + Cyl. WH	4	6	17	32	49	66	82	99	115	132
	CHB Solar Combi (16 m2)	19	34	40	38	39	40	41	42	43	44
	CHC Central Heating combi, water heating	**1390**	**1460**	**1421**	**1720**	**2153**	**2587**	**3023**	**3460**	**3931**	**4402**
	TOTAL WATER HEATING	**2670**	**3127**	**3017**	**3273**	**3810**	**4347**	**4887**	**5427**	**6001**	**6576**
	CHB Gas non-condensing	2159	1161	874	267	164	60	48	35	28	21
	CHB Gas condensing	180	3945	3593	4410	4242	4074	3751	3429	3046	2664
	CHB Gas Jet burner non-condensing	627	202	69	23	19	15	12	9	8	6
	CHB Gas Jet burner condensing	0	80	136	190	201	212	221	231	239	246
	CHB Oil Jet burner non-condensing	4404	1357	455	149	122	96	78	60	49	38
	CHB Oil Jet burner condensing	0	535	893	1211	1280	1350	1412	1474	1521	1568
	CHB Electric Joule-effect	29	48	46	51	47	43	40	36	32	29
	CHB Hybrid (gas-electric)	3	10	33	77	273	470	712	954	1290	1626
	CHB Electric Heat Pump	107	1501	1582	2950	5133	7317	9492	11667	13982	16297
	CHB Gas Heat Pump	5	15	40	89	161	234	315	396	485	575
	CHB micro CHP	20	33	91	175	268	362	453	544	634	725
	CHB Solar combi (16 m2)	102	175	207	198	203	209	215	220	225	230
	CHB Central Heating boiler < 400 kW, space heating	**7637**	**9062**	**8018**	**9788**	**12115**	**14441**	**16748**	**19054**	**21540**	**24025**
	SFB Wood Manual [18 kW]	324	193	171	132	76	66	58	51	44	39
	SFB Wood Direct Draft [20 kW]	7	315	324	345	376	440	515	603	706	827
	SFB Coal [25 kW]	65	302	67	85	92	83	75	68	62	56
	SFB Pellets [25 kW]	0	90	137	135	141	150	165	182	201	222
	SFB Wood chips [160 kW]	0	19	20	24	27	29	32	36	40	44
	Total Solid Fuel Boiler	**396**	**918**	**718**	**722**	**712**	**769**	**846**	**940**	**1052**	**1187**
	CHAE-S (≤ 400 kW)	93	408	450	499	551	604	656	708	757	804
	CHAE-L (> 400 kW)	21	71	74	76	80	83	86	89	92	95
	CHWE-S (≤ 400 kW)	5	24	26	29	32	35	38	41	44	47
	CHWE-M (> 400 kW; ≤ 1500 kW)	6	22	23	24	25	26	27	28	29	30
	CHWE-L (> 1500 kW)	2	9	9	9	10	10	11	11	11	12
	CHF	0	2	2	3	3	4	4	4	5	5
	HT PCH-AE-S	47	79	85	90	94	97	101	105	109	113
	HT PCH-AE-L	38	63	68	72	75	78	81	84	87	90
	HT PCH-WE-S	10	17	19	20	20	21	22	23	24	25
	HT PCH-WE-M	27	45	48	51	53	55	57	59	62	64
	HT PCH-WE-L	3	5	5	6	6	6	7	7	7	7
	AC rooftop	86	292	296	227	132	35	35	35	35	35
	AC splits	87	329	345	334	322	310	298	286	275	263
	AC VRF	0	1053	1378	2015	2548	3075	3578	4040	4426	4707
	ACF	0	2	2	3	3	4	4	4	5	5
	SubTotal AHC Air Cooling	**426**	**2419**	**2828**	**3456**	**3954**	**4443**	**5004**	**5525**	**5968**	**6301**
	AC rooftop (rev)	53	179	173	139	78	20	0	0	0	0
	AC splits (rev)	58	211	221	215	207	199	192	184	177	169
	AC VRF (rev)	0	899	1119	1719	2090	2400	2656	2854	2976	3010
	ACF (rev)	0	3	4	5	6	8	9	10	11	11
	AHF	283	184	173	177	169	157	141	127	119	111
	AHE	0	0	0	0	0	0	0	0	0	0
	SubTotal AHC Air Heating (rev double)	**394**	**1476**	**1690**	**2256**	**2551**	**2783**	**2998**	**3175**	**3282**	**3302**
	Total AHC Air Heating & Cooling	**709**	**2603**	**3001**	**3633**	**4124**	**4600**	**5146**	**5653**	**6088**	**6413**

db	REVENUE INSTALL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	346	497	492	605	663	634	611	589	568	547
	LH closed fireplace/inset [8 kW]	211	563	618	803	862	841	812	783	755	727
	LH wood stove [8 kW]	163	189	206	270	290	283	272	262	251	242
	LH coal stove [8 kW]	66	55	50	54	43	28	24	23	22	22
	LH cooker [10 kW]	120	237	281	358	381	374	361	347	345	345
	LH SHR stove [8 kW]	1033	1419	1733	2063	2298	2535	2584	2584	2584	2584
	LH pellet stove [8 kW]	0	109	135	161	173	184	187	187	187	187
	LH Solid fuel sum	**1939**	**3068**	**3516**	**4314**	**4709**	**4880**	**4852**	**4774**	**4712**	**4653**
	LH Electric portable	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed > 250W	162	189	148	136	136	136	136	136	136	136
	LH Electric fixed ≤ 250W	41	47	37	34	34	34	34	34	34	34
	LH Electric storage	16	19	20	22	21	20	20	19	18	17
	LH Electric underfloor	137	167	178	179	174	173	173	173	173	173
	LH Electric visibly glowing > 1.2 kW	3	4	4	4	4	4	4	4	4	4
	LH Electric visibly glowing ≤ 1.2 kW	1	1	1	1	1	1	1	1	1	1
	LH Electric Towel Heaters	30	50	50	50	50	50	50	50	50	50
	LH Electric sum	**390**	**478**	**438**	**427**	**422**	**419**	**419**	**418**	**417**	**416**
	LH Gas luminous (commercial)	1	1	1	1	1	1	1	1	1	1
	LH Gaseous Tube (commercial < 120 kW)	1	1	1	1	1	1	1	1	1	1
	LH Gas open front	2	2	2	2	2	1	1	1	1	1
	LH Gas closed front	11	6	5	4	4	3	3	3	3	3
	LH Gas balanced flue	26	11	7	6	5	5	5	5	5	5
	LH Gas flueless	0	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**41**	**21**	**17**	**15**	**13**	**11**	**11**	**11**	**11**	**11**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	0	0	0	0	0	0	0	0	0	0
	LH Liquid closed front	1	1	0	0	0	0	0	0	0	0
	LH Liquid balanced flue	3	1	1	1	1	0	0	0	0	0
	LH Liquid flueless	0	0	0	0	0	0	0	0	0	0
	LH Liquid fuel sum	**4**	**2**	**2**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
	LH Local Space Heaters total	**2374**	**3569**	**3973**	**4757**	**5145**	**5311**	**5282**	**5204**	**5140**	**5081**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	162	1851	1461	1591	1681	1713	1748	1926	2206	2554
	RAC fixed 6-12 kW, cooling	34	543	583	547	546	541	531	522	536	550
	RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode	**195**	**2394**	**2044**	**2138**	**2227**	**2254**	**2279**	**2448**	**2743**	**3103**
	RAC fixed < 6 kW, reversible, heating	14	707	701	954	1177	1371	1573	1926	2206	2554
	RAC fixed 6-12 kW, reversible, heating	3	207	280	328	382	433	478	522	536	550
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**16**	**914**	**981**	**1283**	**1559**	**1803**	**2051**	**2448**	**2743**	**3103**
	RAC Room Air Conditioner	**212**	**3309**	**3025**	**3421**	**3786**	**4057**	**4330**	**4896**	**5485**	**6207**
1	CIRC Integrated circulators	492	806	951	1001	1031	1069	1069	1069	1069	1069
0.38	CIRC Large standalone circulators	31	57	96	90	80	68	65	62	59	56
0.38	CIRC Small standalone circulators	303	459	545	507	453	394	375	357	340	340
	CIRC Circulator pumps <2.5 kW, all	**827**	**1323**	**1591**	**1598**	**1564**	**1532**	**1509**	**1488**	**1468**	**1466**
	CIRC Circulator pumps <2.5 kW, excl. double	**207**	**320**	**397**	**370**	**330**	**287**	**273**	**260**	**247**	**246**
	TOTAL SPACE HEATING (incl. rev.AC)	**11026**	**16260**	**15778**	**19176**	**22412**	**25394**	**28198**	**31080**	**34005**	**36944**
	TOTAL SPACE COOLING	**621**	**4813**	**4872**	**5594**	**6181**	**6697**	**7283**	**7973**	**8710**	**9404**
	R-UVU ≤ 100 m3/h for Extract Spaces	2	5	6	7	7	7	8	9	8	8
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	1	1	1	1	2
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	12	19	44	226	248	271	359	425	460
	R-UVU 100-250 m3/h	26	78	81	93	91	99	108	117	119	127
	R-BVU 100-250 m3/h	5	31	34	53	290	329	358	401	440	479
	R-UVU 250-1000 m3/h	50	153	157	179	176	190	207	225	231	246
	R-BVU 250-1000 m3/h	10	60	66	104	566	642	698	779	854	929
	R-UVU > 1000 m3/h	13	10	9	8	7	7	6	6	5	4
	R-BVU 1000-2500 m3/h	0	37	35	40	41	47	50	53	57	59
	RVU, Total residential (install.labour only)	**107**	**386**	**407**	**529**	**1405**	**1570**	**1706**	**1950**	**2140**	**2315**
	NR-UVU 250-1000 m3/h	54	50	44	44	38	39	37	34	31	28
	NR-BVU 250-1000 m3/h	0	133	122	137	139	159	167	174	183	190
	NR-UVU > 1000 m3/h	116	97	82	77	61	61	57	52	47	41
	NR-BVU 1000-2500 m3/h	0	344	325	364	381	433	460	488	523	548
	NR-AHU-S 2500-5500 m3/h	134	2467	2976	2897	2464	2721	2791	2835	2896	2970
	NR-AHU-M 5500-14500 m3/h	1443	4115	4567	4416	3759	4105	4175	4219	4291	4365
	NR-AHU-L > 14500 m3/h	372	1089	1209	1166	985	1075	1092	1104	1120	1137
	NRVU, Total non-residential (install.labour only)	**2118**	**8296**	**9325**	**9101**	**7827**	**8594**	**8778**	**8905**	**9090**	**9281**
	VU Ventilation Units, res+nres (install.labour only)	**2224**	**8682**	**9733**	**9630**	**9232**	**10164**	**10485**	**10855**	**11230**	**11595**
	TOTAL VENTILATION	**2224**	**8682**	**9733**	**9630**	**9232**	**10164**	**10485**	**10855**	**11230**	**11595**

db	REVENUE INSTALL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1401	2108	1523	1286	418	214	112	67	40	25
	HID (HPM, HPS, MH)	136	356	247	149	92	36	11	4	1	0
	CFLni (all shapes)	88	343	281	194	101	28	5	1	0	0
	CFLi (retrofit for GLS, HL)	18	320	109	60	0	0	0	0	0	0
	GLS (DLS & NDLS)	542	229	15	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	64	316	342	118	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	0	62	278	1081	1258	1172	1286	1565	1813
	LED replacing HID (retrofit & luminaire)	0	0	53	56	114	148	169	193	219	248
	LED replacing CFLni (retrofit & luminaire)	0	0	51	142	185	269	292	328	381	400
	LED replacing DLS (retrofit & luminaire)	0	2	44	87	81	30	34	38	43	49
	LED replacing NDLS (retrofit & luminaire)	0	0	70	486	312	234	144	158	179	202
	SUBTOTAL non-LED	2249	3673	2518	1806	612	278	127	72	42	25
	SUBTOTAL LED	0	2	280	1049	1774	1938	1811	2003	2386	2712
	TOTAL LIGHTING	**2249**	**3675**	**2797**	**2855**	**2386**	**2215**	**1938**	**2074**	**2428**	**2737**
	TOTAL ELECTRONICS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	27	31	31	32	38	41	40	39	37	36
	CF open horizontal frozen island (RHF4)	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	90	112	119	124	128	133	137	142	147	152
	CF Plug in one door beverage cooler	0	0	0	0	0	0	0	0	0	0
	CF Plug in horizontal ice cream freezer	0	0	0	0	0	0	0	0	0	0
	CF Spiral vending machine	0	0	0	0	0	0	0	0	0	0
	Total CF Commercial Refrigeration	**121**	**147**	**153**	**159**	**170**	**178**	**181**	**185**	**189**	**193**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**121**	**147**	**153**	**159**	**170**	**178**	**181**	**185**	**189**	**193**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total WM-WD household Washing	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0	7	43	61	69	81	77	73	70	67
	LD condensing electric heat element	13	34	32	35	31	21	20	19	18	18
	LD vented electric	95	66	39	33	21	0	0	0	0	0
	LD vented gas	1	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**109**	**109**	**115**	**129**	**120**	**102**	**97**	**93**	**88**	**85**
	Total VC Vacuum Cleaner	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL CLEANING	**109**	**109**	**115**	**129**	**120**	**102**	**97**	**93**	**88**	**85**
0.5	FAN Axial<300Pa [247 W flow out]	39	133	191	241	230	220	210	201	192	184
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	40	145	153	169	162	162	162	162	162	162
0.5	FAN Centr.FC [141 W flow out]	20	53	79	110	105	100	95	91	87	83
0.5	FAN Centr.BC-free [2120 W flow out]	17	44	61	68	72	70	69	67	67	68
0.5	FAN Centr.BC [2052 W flow out]	38	104	167	192	204	199	209	218	226	232
0.5	FAN Cross-flow [31 W flow out]	6	13	44	58	62	60	63	66	68	69
	Total FAN, industrial (excl. box & roof fans)	**80**	**246**	**347**	**419**	**417**	**406**	**404**	**402**	**400**	**399**
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	132	216	234	220	226	218	208	199	189	179
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	39	62	60	54	54	51	48	44	41	40
0.45	Medium (L) 3-ph 75-375 kW no VSD	10	14	13	11	11	10	9	8	8	8
0.45	**Total 3ph 0.75-375 kW no VSD**	**181**	**293**	**307**	**286**	**290**	**279**	**265**	**251**	**238**	**227**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	83	247	384	653	701	719	747	788	830	876
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	54	162	303	410	433	444	461	486	512	525
0.45	Medium (L) 3-ph 75-375 kW with VSD	28	85	151	185	201	207	214	223	225	226
0.45	**Total 3-ph 0.75-375 kW with VSD**	**165**	**494**	**838**	**1248**	**1336**	**1369**	**1423**	**1496**	**1568**	**1627**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**345**	**787**	**1145**	**1533**	**1626**	**1648**	**1688**	**1748**	**1806**	**1854**
0.45	Small 1 ph 0.12-0.75 kW no VSD	79	150	158	158	202	197	191	185	180	174
0.45	Small 1 ph 0.12-0.75 kW with VSD	23	189	229	241	266	281	298	315	334	353
0.45	**Total Small 1-ph 0.12-0.75 kW**	**102**	**339**	**387**	**399**	**468**	**478**	**489**	**500**	**513**	**527**
0.45	Small 3 ph 0.12-0.75 kW no VSD	50	84	89	93	109	106	103	100	97	94
0.45	Small 3 ph 0.12-0.75 kW with VSD	8	68	84	95	110	116	126	138	151	166
0.45	**Total Small 3-ph 0.12-0.75 kW**	**58**	**152**	**172**	**188**	**219**	**222**	**229**	**238**	**248**	**259**
0.45	Large 3-ph LV 375-1000 kW no VSD	6	8	7	7	8	8	7	7	7	6
0.45	Large 3-ph LV 375-1000kW with VSD	12	73	101	113	126	126	131	136	141	146
0.45	**Total Large 3-ph LV 375-1000 kW**	**18**	**81**	**108**	**120**	**134**	**134**	**138**	**143**	**147**	**152**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	8	15	15	16	19	19	19	19	19	18
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	7	7	7	8	8	8	8	8	8
0.45	Explosion motors (L) 3-ph 75-375 kW	1	2	2	2	2	2	2	2	2	2
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**13**	**23**	**24**	**25**	**30**	**30**	**29**	**29**	**28**	**28**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	10	18	19	21	27	27	26	26	26	25
0.45	Brake motors (M) 3-ph 7.5-75 kW	5	8	9	9	11	11	11	11	10	10
0.45	Brake motors (L) 3-ph 75-375 kW	1	2	2	2	3	2	2	2	2	2
0.45	**Total Brake 0.75-375 kW (no VSD)**	**16**	**28**	**30**	**32**	**41**	**40**	**40**	**39**	**38**	**38**

db	REVENUE INSTALL ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	1	1	1	1	1	1	1	1
0.45	8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**0**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**	**1**
0.45	**1-phase motors >0.75 kW (no VSD)**	**169**	**297**	**311**	**318**	**356**	**359**	**361**	**363**	**364**	**365**
	MT Elec. Motors LV 0.12-1000 kW	**397**	**939**	**1198**	**1439**	**1581**	**1601**	**1636**	**1683**	**1731**	**1774**
	WP ESOB < 45kW	97	131	144	156	162	174	185	197	208	220
	WP ESOB 45-150kW	6	9	10	10	11	12	12	13	14	15
	WP ESCC < 45kW	293	395	432	468	487	522	557	592	627	662
	WP ESCC 45-150kW	10	14	15	16	17	18	19	21	22	23
	WP ESCCi < 45kW	120	161	176	191	199	213	227	242	256	270
	WP ESCCi 45-150kW	2	2	3	3	3	3	3	4	4	4
	WP MSSB <6"	380	512	568	617	641	684	727	769	813	858
	WP MS_V <25 bar	144	194	213	230	239	256	274	291	308	325
	WP Water pumps	**1052**	**1419**	**1559**	**1692**	**1759**	**1881**	**2005**	**2128**	**2251**	**2377**
	Total WE Welding Equipment	**162**	**183**	**185**	**186**	**192**	**194**	**192**	**193**	**194**	**196**
	TOTAL INDUSTRY COMPONENTS	**1691**	**2787**	**3289**	**3736**	**3949**	**4083**	**4237**	**4406**	**4577**	**4746**
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euros 2020)	**20709**	**39600**	**39755**	**44553**	**48260**	**53180**	**57306**	**62092**	**67228**	**72279**
	GENERAL TOTAL (in bn euros 2020)	21	40	40	45	48	53	57	62	67	72

SUMMARY ECO

INSTALL excl. VAT (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**2.7**	**3.1**	**3.0**	**3.3**	**3.8**	**4.3**	**4.9**	**5.4**	**6.0**	**6.6**
SPACE HEATING	**11.0**	**16.3**	**15.8**	**19.2**	**22.4**	**25.4**	**28.2**	**31.1**	**34.0**	**36.9**
SPACE COOLING	**0.6**	**4.8**	**4.9**	**5.6**	**6.2**	**6.7**	**7.3**	**8.0**	**8.7**	**9.4**
VENTILATION	**2.2**	**8.7**	**9.7**	**9.6**	**9.2**	**10.2**	**10.5**	**10.9**	**11.2**	**11.6**
LIGHTING	**2.2**	**3.7**	**2.8**	**2.9**	**2.4**	**2.2**	**1.9**	**2.1**	**2.4**	**2.7**
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	**0.1**	**0.1**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**	**0.2**
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**	**0.1**
INDUSTRY COMPONENTS	1.7	2.8	3.3	3.7	3.9	4.1	4.2	4.4	4.6	4.7
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euros 2020	**21**	**40**	**40**	**45**	**48**	**53**	**57**	**62**	**67**	**72**

INSTALL excl. VAT, ECO-BAU (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**0.0**	-	**- 0.0**	**0.2**	**0.5**	**0.8**	**1.2**	**1.5**	**1.8**	**2.1**
SPACE HEATING	-	**0.2**	**0.5**	**2.0**	**3.9**	**5.4**	**6.7**	**8.1**	**9.4**	**10.5**
SPACE COOLING	-	**0.4**	**0.5**	**0.4**	**0.4**	**0.3**	**0.1**	**0.1**	**0.1**	**0.0**
VENTILATION	-	-	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
LIGHTING	-	**- 0.1**	**- 0.7**	**- 0.4**	**- 0.6**	**- 0.7**	**- 0.7**	**- 0.5**	**- 0.3**	**- 0.2**
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	-	-	-	-	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
COOKING	-	-	-	-	-	-	-	-	-	-
CLEANING	-	**- 0.0**	**- 0.0**	**- 0.0**	**- 0.0**	**- 0.1**	**- 0.1**	**- 0.1**	**- 0.1**	**- 0.1**
INDUSTRY COMPONENTS	-	0.0	0.2	0.4	0.5	0.5	0.4	0.3	0.2	0.2
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-
TOTAL in bn euros 2020	**0**	**0**	**1**	**3**	**5**	**6**	**8**	**9**	**11**	**13**

<u>Revenues for VSDs only (without motor, m euros)</u>

VSD - Very Small 0.12 - 0.75 kW 1-phase	22	172	208	218	231	246	261	278	296	315
VSD - Very Small 0.12 - 0.75 kW 3-phase	7	57	69	78	88	93	102	112	124	137
VSD - Small 0.75 - 7.5 kW 3-phase	70	208	313	511	541	553	579	618	659	703
VSD - Medium 7.5 - 75kW 3-phase	50	149	270	358	377	385	403	430	458	475
VSD - Large 75 - 375kW 3-phase	28	85	142	170	179	184	193	206	212	218
VSD - Very Large 375 - 1,000kW 3-phase	12	70	95	106	115	115	121	127	134	140
Total revenues, VSDs only (ECO)	**190**	**741**	**1097**	**1441**	**1531**	**1576**	**1659**	**1770**	**1883**	**1988**

db	REVENUE MAINTENANCE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	48	62	69	80	88	92	94	94	94	94
	EIWH Electric Instant. ≥ 12 kW (primary)	164	185	175	164	158	164	177	194	210	227
	EIWHS Electric Instant. Shower (secondary)	20	28	29	28	28	29	30	32	33	35
	ESWH Electric Storage ≤ 30 L (secondary)	750	934	935	931	951	1002	1063	1129	1195	1261
	ESWH Electric Storage > 30 L (primary)	1607	2085	2079	2037	1972	2055	2181	2316	2452	2587
	GIWH Gas Instant. < 13 L/min (secondary)	954	964	826	694	616	602	594	585	577	568
	GIWH Gas Instant. ≥ 13 L/min (primary)	155	179	168	156	138	137	135	134	132	130
	GSWH Gas Storage, Condensing	0	1	4	6	8	10	11	13	15	16
	GSWH Gas Storage, Non-condensing	178	168	135	101	72	54	43	37	32	26
	Dedicated WH Heat Pump	0	20	52	107	185	278	381	490	600	709
	Dedicated WH Solar (3.5 m2)	97	719	930	1014	1049	1007	983	1016	1051	1086
	WH dedicated Water Heater	**3973**	**5346**	**5401**	**5317**	**5265**	**5430**	**5693**	**6041**	**6390**	**6739**
	CHB Gas Combi Instant. WH	533	1310	1412	1489	1513	1568	1620	1634	1636	1629
	CHB Gas + Cyl. WH	246	404	420	430	434	448	463	467	467	465
	CHB Jet Burner Gas + Cyl. WH	78	70	58	47	36	28	25	26	27	27
	CHB Jet Burner Oil + Cyl. WH	591	512	420	332	253	189	169	172	176	181
	CHB Electric (Joule) + Cyl. WH	5	7	7	8	9	9	8	8	7	6
	CHB Hybrid Gas/Electric WH	0	0	1	1	2	4	6	10	17	28
	CHB Electric HP + Cyl. WH	4	29	43	59	75	86	101	116	134	154
	CHB Gas HP + Cyl. WH	0	1	1	1	2	3	4	6	9	12
	CHB Gas mCHP + Cyl. WH	0	1	2	2	3	4	6	9	13	18
	CHB Solar Combi (16 m2)	3	5	6	6	7	7	8	8	8	8
	CHC Central Heating combi, water heating	**1461**	**2338**	**2370**	**2377**	**2334**	**2346**	**2410**	**2456**	**2494**	**2530**
	TOTAL WATER HEATING	**5434**	**7684**	**7772**	**7694**	**7599**	**7777**	**8103**	**8496**	**8884**	**9270**
	CHB Gas non-condensing	4950	7265	6217	5008	3852	3525	3257	2929	2672	2422
	CHB Gas condensing	69	3025	4744	6509	8009	8788	9346	9652	10026	10309
	CHB Gas Jet burner non-condensing	610	529	427	324	226	132	83	73	67	62
	CHB Gas Jet burner condensing	0	11	26	44	63	84	97	106	115	123
	CHB Oil Jet burner non-condensing	4283	3671	2947	2223	1538	885	549	481	445	413
	CHB Oil Jet burner condensing	0	73	172	284	407	536	610	659	716	771
	CHB Electric Joule-effect	25	32	36	41	44	43	42	38	34	31
	CHB Hybrid (gas-electric)	2	3	4	8	14	23	38	63	105	173
	CHB Electric Heat Pump	23	167	249	342	438	505	591	679	790	918
	CHB Gas Heat Pump	1	3	5	7	12	17	25	35	51	73
	CHB micro CHP	2	7	9	12	17	25	37	52	75	108
	CHB Solar combi (16 m2)	17	27	31	35	39	41	42	43	44	45
	CHB Central Heating boiler < 400 kW, space heating	**9982**	**14813**	**14867**	**14837**	**14658**	**14604**	**14718**	**14810**	**15141**	**15450**
	SFB Wood Manual [18 kW]	306	135	114	91	66	42	27	20	18	16
	SFB Wood Direct Draft [20 kW]	3	48	95	140	175	180	192	217	262	319
	SFB Coal [25 kW]	289	138	146	126	96	63	47	46	43	38
	SFB Pellets [25 kW]	0	14	26	38	49	57	61	65	71	79
	SFB Wood chips [160 kW]	0	5	6	7	7	7	8	9	10	11
	Total Solid Fuel Boiler	**599**	**339**	**387**	**402**	**392**	**349**	**335**	**358**	**404**	**464**
	CHAE-S (≤ 400 kW)	206	887	1128	1334	1488	1641	1806	1975	2143	2308
	CHAE-L (> 400 kW)	52	191	235	273	300	313	324	336	349	362
	CHWE-S (≤ 400 kW)	17	75	95	112	125	137	151	165	179	193
	CHWE-M (> 400 kW; ≤ 1500 kW)	23	86	107	125	137	144	150	156	162	168
	CHWE-L (> 1500 kW)	11	43	53	62	69	72	75	78	81	84
	CHF	0	7	13	19	23	28	33	38	43	48
	HT PCH-AE-S	107	192	218	242	259	273	285	296	308	319
	HT PCH-AE-L	104	187	213	236	253	266	278	289	300	311
	HT PCH-WE-S	23	41	47	52	56	59	61	64	66	69
	HT PCH-WE-M	102	184	209	231	248	261	273	283	294	305
	HT PCH-WE-L	11	21	24	27	29	31	32	34	35	36
	AC rooftop	105	428	474	466	395	268	146	76	55	55
	AC splits	215	938	1038	1079	1086	1059	1018	980	942	904
	AC VRF	1	1009	1641	2492	3309	4341	5363	6291	7167	7930
	ACF	0	2	5	7	8	10	12	14	15	17
	SubTotal AHC Air Cooling	**978**	**4292**	**5499**	**6757**	**7785**	**8901**	**10006**	**11074**	**12140**	**13109**
	AC rooftop (rev)	65	265	291	281	236	158	79	24	2	0
	AC splits (rev)	156	647	716	745	750	732	704	678	652	626
	AC VRF (rev)	0	888	1424	2120	2812	3633	4377	4891	5307	5593
	ACF (rev)	0	5	9	13	16	20	24	27	31	34
	AHF	103	99	92	86	81	76	72	68	63	59
	AHE	0	2	1	1	1	1	1	1	1	1
	SubTotal AHC Air Heating (rev double)	**325**	**1906**	**2533**	**3246**	**3896**	**4621**	**5257**	**5689**	**6056**	**6313**
	Total AHC Air Heating & Cooling	**1081**	**4392**	**5592**	**6844**	**7867**	**8978**	**10079**	**11143**	**12205**	**13169**

db	REVENUE MAINTENANCE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	167	243	263	277	287	292	292	291	290	289
	LH closed fireplace/inset [8 kW]	83	228	282	335	383	420	443	456	461	463
	LH wood stove [8 kW]	119	140	147	155	163	170	177	182	185	185
	LH coal stove [8 kW]	73	48	45	43	40	35	30	25	21	18
	LH cooker [10 kW]	162	327	386	452	513	556	577	584	587	587
	LH SHR stove [8 kW]	65	91	100	113	128	145	164	178	189	194
	LH pellet stove [8 kW]	0	61	93	122	146	165	176	183	185	185
	LH Solid fuel sum	**669**	**1138**	**1314**	**1497**	**1660**	**1784**	**1859**	**1899**	**1917**	**1922**
	LH Electric portable	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed > 250W	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0	0	0
	LH Electric storage	0	0	0	0	0	0	0	0	0	0
	LH Electric underfloor	0	0	0	0	0	0	0	0	0	0
	LH Electric visibly glowing > 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	0	0	0	0	0	0	0	0	0	0
	LH Electric sum	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Gas luminous (commercial)	3	3	3	3	3	3	2	2	2	2
	LH Gaseous Tube (commercial < 120 kW)	3	3	4	4	4	3	3	3	3	3
	LH Gas open front	12	12	12	12	12	11	10	9	9	9
	LH Gas closed front	62	48	41	34	28	24	21	19	18	18
	LH Gas balanced flue	142	99	79	60	45	35	29	27	25	25
	LH Gas flueless	0	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**223**	**166**	**138**	**113**	**92**	**76**	**65**	**60**	**57**	**56**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	1	1	1	1	1	1	1	1	1	1
	LH Liquid closed front	6	5	4	3	3	2	2	2	2	2
	LH Liquid balanced flue	14	10	8	6	5	3	3	3	3	2
	LH Liquid flueless	0	0	0	0	0	0	0	0	0	0
	LH Liquid fuel sum	**22**	**16**	**14**	**11**	**9**	**7**	**6**	**6**	**5**	**5**
	LH Local Space Heaters total	**913**	**1320**	**1466**	**1620**	**1761**	**1867**	**1931**	**1965**	**1980**	**1984**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	60	595	561	452	469	525	582	644	721	820
	RAC fixed 6-12 kW, cooling	14	144	154	133	137	145	155	164	176	193
	RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode	**74**	**739**	**714**	**585**	**606**	**670**	**737**	**808**	**897**	**1012**
	RAC fixed < 6 kW, reversible, heating	5	166	203	216	278	366	464	578	698	818
	RAC fixed 6-12 kW, reversible, heating	1	41	57	64	81	101	123	147	171	192
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**6**	**207**	**260**	**280**	**359**	**467**	**587**	**725**	**869**	**1011**
	RAC Room Air Conditioner	**80**	**946**	**974**	**865**	**964**	**1137**	**1324**	**1533**	**1766**	**2023**
1	CIRC Integrated circulators	36	56	63	70	76	81	85	86	86	86
0.38	CIRC Large standalone circulators	38	56	56	54	52	48	44	43	43	43
0.38	CIRC Small standalone circulators	79	118	120	118	113	106	100	98	98	98
	CIRC Circulator pumps <2.5 kW, all	**153**	**230**	**240**	**242**	**240**	**235**	**229**	**227**	**227**	**227**
	CIRC Circulator pumps <2.5 kW, excl. double	**73**	**108**	**109**	**107**	**102**	**95**	**89**	**88**	**88**	**88**
	TOTAL SPACE HEATING (incl. rev.AC)	**11897**	**18692**	**19621**	**20491**	**21168**	**22003**	**22916**	**23635**	**24538**	**25309**
	TOTAL SPACE COOLING	**1052**	**5031**	**6213**	**7342**	**8391**	**9571**	**10742**	**11882**	**13037**	**14121**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	3	3	3	3	3	4
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0	0	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	20	31	53	159	329	508	700	896	1106
	R-UVU 100-250 m3/h	17	42	48	54	58	61	63	64	65	65
	R-BVU 100-250 m3/h	1	13	18	24	52	94	139	187	236	288
	R-UVU 250-1000 m3/h	90	227	259	289	311	327	339	344	347	348
	R-BVU 250-1000 m3/h	2	30	42	58	121	222	327	441	556	679
	R-UVU > 1000 m3/h	3	7	8	9	9	9	9	9	9	9
	R-BVU 1000-2500 m3/h	0	3	5	7	8	10	11	13	15	16
	RVU, Total residential	**114**	**343**	**414**	**496**	**721**	**1054**	**1400**	**1761**	**2126**	**2516**
	NR-UVU 250-1000 m3/h	39	87	96	102	106	108	108	108	106	103
	NR-BVU 250-1000 m3/h	0	49	71	95	117	139	162	186	209	234
	NR-UVU > 1000 m3/h	30	68	75	80	83	84	84	84	82	80
	NR-BVU 1000-2500 m3/h	0	31	46	61	75	89	104	119	134	150
	NR-AHU-S 2500-5500 m3/h	5	81	128	176	216	252	288	323	359	393
	NR-AHU-M 5500-14500 m3/h	486	751	837	921	984	1033	1081	1130	1178	1225
	NR-AHU-L > 14500 m3/h	178	275	306	336	359	377	395	413	430	448
	NRVU, Total non-residential	**737**	**1342**	**1558**	**1771**	**1940**	**2082**	**2223**	**2362**	**2499**	**2631**
	VU Ventilation Units, res + non-res.	**851**	**1685**	**1972**	**2267**	**2661**	**3136**	**3623**	**4124**	**4625**	**5147**
	TOTAL VENTILATION	**851**	**1685**	**1972**	**2267**	**2661**	**3136**	**3623**	**4124**	**4625**	**5147**

db	REVENUE MAINTENANCE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	430	738	827	884	857	726	562	437	340	266
	HID (HPM, HPS, MH)	223	550	608	616	514	336	173	91	48	26
	CFLni (all shapes)	214	927	1001	1008	897	578	254	107	45	18
	CFLi (retrofit for GLS, HL)	64	841	1093	1114	962	806	541	356	229	152
	GLS (DLS & NDLS)	596	507	426	307	179	105	61	36	21	12
	HL (DLS & NDLS, LV & MV)	109	516	630	719	573	325	187	108	63	37
	LED replacing LFL (retrofit & luminaire)	0	0	3	52	202	471	792	1096	1394	1697
	LED replacing HID (retrofit & luminaire)	0	0	3	77	271	552	831	1046	1237	1428
	LED replacing CFLni (retrofit & luminaire)	0	0	4	79	334	818	1328	1683	1982	2274
	LED replacing DLS (retrofit & luminaire)	0	0	3	60	210	401	551	681	806	933
	LED replacing NDLS (retrofit & luminaire)	0	0	5	233	821	1465	2167	2783	3365	3937
	SUBTOTAL non-LED	1634	4079	4585	4648	3981	2876	1778	1135	746	511
	SUBTOTAL LED	0	0	18	501	1838	3707	5668	7289	8783	10269
	TOTAL LIGHTING	**1634**	**4079**	**4602**	**5148**	**5819**	**6583**	**7447**	**8424**	**9529**	**10781**
	DP TV all types	140	239	284	333	351	410	457	472	472	472
	DP Monitor	9	125	96	73	73	73	73	73	73	73
	DP Signage	0	1	6	18	26	26	25	25	25	25
	DP Electronic Displays, total	**149**	**365**	**385**	**424**	**449**	**508**	**555**	**570**	**570**	**570**
	Total STB set top boxes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total GC Game consoles	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total ES + DS (Servers, data Storage)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total PC (Personal Computers)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Inkjet Printer	0	0	0	0	0	0	0	0	0	0
	Inkjet MFD	0	0	0	0	0	0	0	0	0	0
	EP / Laser Printer mono	614	628	549	448	352	280	221	171	124	77
	EP / Laser Printer colour	0	702	1102	1600	1847	1988	2077	2135	2176	2218
	EP / Laser Copier mono	426	195	116	25	0	0	0	0	0	0
	EP / Laser Copier colour	0	104	276	180	0	0	0	0	0	0
	EP / Laser MFD mono	0	1206	1701	1906	1815	1726	1641	1559	1479	1400
	EP / Laser MFD colour	0	2870	4044	4533	4316	4105	3906	3714	3525	3336
	Total IE Imaging Equipment	**1040**	**5705**	**7789**	**8693**	**8330**	**8098**	**7845**	**7579**	**7305**	**7031**
	Total (networked) SB (excl. double)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total EPS (External power supplies)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**1189**	**6070**	**8174**	**9117**	**8779**	**8607**	**8400**	**8149**	**7875**	**7601**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	184	205	213	216	217	221	224	228	232	235
	CF open horizontal frozen island (RHF4)	21	23	24	24	25	25	25	26	26	27
	CF other supermarket display (non-BCs)	592	684	748	793	827	858	889	920	952	986
	CF Plug in one door beverage cooler	158	197	206	209	217	225	232	240	248	256
	CF Plug in horizontal ice cream freezer	51	63	66	67	70	72	75	77	80	82
	CF Spiral vending machine	53	54	43	35	35	37	38	40	41	43
	Total CF Commercial Refrigeration	**1058**	**1227**	**1301**	**1345**	**1392**	**1438**	**1484**	**1530**	**1579**	**1629**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**1058**	**1227**	**1301**	**1345**	**1392**	**1438**	**1484**	**1530**	**1579**	**1629**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Washing Machines	315	485	518	535	545	552	550	547	547	547
	WD Washer-Dryers	14	20	21	22	22	23	23	23	23	23
	Total WM-WD household Washing	**329**	**505**	**539**	**557**	**567**	**575**	**573**	**570**	**570**	**570**
	Total DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0	1	3	6	10	16	24	32	40	48
	LD condensing electric heat element	13	96	105	126	149	156	152	144	136	128
	LD vented electric	68	81	73	71	74	74	75	75	75	75
	LD vented gas	0	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**81**	**179**	**181**	**203**	**233**	**246**	**250**	**251**	**251**	**251**
	VC Domestic mains	232	441	451	434	382	314	245	207	198	198
	VC Commercial mains	55	91	94	90	90	90	90	90	90	90
	VC Total in scope of CR 666/2013	**287**	**532**	**546**	**524**	**472**	**404**	**335**	**297**	**288**	**288**
	VC Cordless	8	39	74	213	361	508	648	748	796	815
	VC Robot	0	23	70	117	184	259	332	384	408	418
	Total VC Vacuum Cleaner	**295**	**594**	**690**	**854**	**1017**	**1171**	**1314**	**1429**	**1492**	**1521**
	TOTAL CLEANING	**705**	**1277**	**1410**	**1614**	**1818**	**1992**	**2137**	**2250**	**2313**	**2342**
0.5	FAN Axial<300Pa [247 W flow out]	140	394	467	525	580	614	624	624	624	624
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	194	583	675	720	753	773	778	778	778	778
0.5	FAN Centr.FC [141 W flow out]	120	259	317	357	388	411	418	418	418	418
0.5	FAN Centr.BC-free [2120 W flow out]	69	146	175	194	213	233	247	254	260	264
0.5	FAN Centr.BC [2052 W flow out]	125	289	350	387	429	471	508	545	592	643
0.5	FAN Cross-flow [31 W flow out]	28	50	59	69	79	86	93	100	108	117
	Total FAN, industrial (excl. box & roof fans)	**338**	**861**	**1021**	**1126**	**1221**	**1294**	**1334**	**1359**	**1390**	**1422**

db	REVENUE MAINTENANCE BAU (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	452	610	653	677	676	657	627	588	539	482
0.45	Medium (L) 3-ph 75-375 kW no VSD	274	355	373	384	378	359	328	287	249	225
0.45	**Total 3ph 0.75-375 kW no VSD**	**726**	**965**	**1026**	**1060**	**1055**	**1016**	**954**	**875**	**788**	**707**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	71	181	229	283	339	399	469	550	646	753
0.45	Medium (L) 3-ph 75-375 kW with VSD	63	160	203	253	307	365	429	504	576	630
0.45	**Total 3-ph 0.75-375 kW with VSD**	**134**	**341**	**432**	**535**	**645**	**764**	**898**	**1054**	**1222**	**1383**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**860**	**1306**	**1458**	**1596**	**1700**	**1779**	**1852**	**1929**	**2010**	**2090**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	Large 3-ph LV 375-1000 kW no VSD	111	135	132	126	119	113	112	111	111	110
0.45	Large 3-ph LV 375-1000kW with VSD	8	45	68	94	117	134	143	150	158	166
0.45	**Total Large 3-ph LV 375-1000 kW**	**119**	**180**	**200**	**220**	**236**	**247**	**255**	**262**	**268**	**276**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	28	42	46	50	52	54	55	56	58	59
0.45	Explosion motors (L) 3-ph 75-375 kW	16	24	26	29	30	32	32	33	34	35
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**44**	**65**	**72**	**78**	**82**	**85**	**87**	**90**	**92**	**94**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	Brake motors (M) 3-ph 7.5-75 kW	35	52	58	62	65	67	69	70	72	74
0.45	Brake motors (L) 3-ph 75-375 kW	20	30	33	36	38	39	41	42	43	44
0.45	**Total Brake 0.75-375 kW (no VSD)**	**55**	**82**	**90**	**98**	**103**	**106**	**109**	**112**	**115**	**118**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	2	2	2	3	3	3	3	3	3
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	2	2	2	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**5**	**5**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	MT Elec. Motors LV 0.12-1000 kW	**594**	**900**	**1003**	**1098**	**1169**	**1222**	**1269**	**1318**	**1369**	**1420**
	WP ESOB < 45kW	420	577	619	674	724	766	814	868	923	977
	WP ESOB 45-150kW	28	39	41	45	48	51	54	58	62	65
	WP ESCC < 45kW	1155	1587	1702	1852	1991	2105	2236	2386	2535	2685
	WP ESCC 45-150kW	40	56	60	65	70	74	78	84	89	94
	WP ESCCi < 45kW	471	647	694	755	812	859	912	973	1034	1095
	WP ESCCi 45-150kW	7	10	10	11	12	13	14	15	16	16
	WP MSSB <6"	3138	4312	4624	5032	5410	5720	6076	6483	6889	7294
	WP MS_V <25 bar	784	1078	1156	1258	1352	1430	1519	1621	1722	1824
	WP Water pumps	**6044**	**8306**	**8907**	**9693**	**10420**	**11018**	**11703**	**12487**	**13269**	**14050**
	Total WE Welding Equipment	**98**	**111**	**114**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
	TOTAL INDUSTRY COMPONENTS	7074	10177	11045	12031	12925	13650	14424	15283	16147	17012
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euros 2020)	**30894**	**55924**	**62109**	**67049**	**70552**	**74756**	**79276**	**83773**	**88528**	**93211**
	GENERAL TOTAL (in bn euros 2020)	31	56	62	67	71	75	79	84	89	93

SUMMARY

MAINTENANCE BAU excl. VAT (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**5.4**	**7.7**	**7.8**	**7.7**	**7.6**	**7.8**	**8.1**	**8.5**	**8.9**	**9.3**
SPACE HEATING	**11.9**	**18.7**	**19.6**	**20.5**	**21.2**	**22.0**	**22.9**	**23.6**	**24.5**	**25.3**
SPACE COOLING	**1.1**	**5.0**	**6.2**	**7.3**	**8.4**	**9.6**	**10.7**	**11.9**	**13.0**	**14.1**
VENTILATION	**0.9**	**1.7**	**2.0**	**2.3**	**2.7**	**3.1**	**3.6**	**4.1**	**4.6**	**5.1**
LIGHTING	**1.6**	**4.1**	**4.6**	**5.1**	**5.8**	**6.6**	**7.4**	**8.4**	**9.5**	**10.8**
ELECTRONICS	**1.2**	**6.1**	**8.2**	**9.1**	**8.8**	**8.6**	**8.4**	**8.1**	**7.9**	**7.6**
FOOD PRESERVATION	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
COOKING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CLEANING	**0.7**	**1.3**	**1.4**	**1.6**	**1.8**	**2.0**	**2.1**	**2.3**	**2.3**	**2.3**
INDUSTRY COMPONENTS	7.1	10.2	11.0	12.0	12.9	13.7	14.4	15.3	16.1	17.0
ENERGY SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TRANSPORT SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL in bn euros 2020	**31**	**56**	**62**	**67**	**71**	**75**	**79**	**84**	**89**	**93**

Revenues for VSDs only (without motor, m euros)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	0	0	0	0	0	0	0	0	0	0
VSD - Very Small 0.12 - 0.75 kW 3-phase	0	0	0	0	0	0	0	0	0	0
VSD - Small 0.75 - 7.5 kW 3-phase	0	0	0	0	0	0	0	0	0	0
VSD - Medium 7.5 - 75kW 3-phase	16	40	50	62	74	88	103	121	142	165
VSD - Large 75 - 375kW 3-phase	15	38	48	60	72	86	101	119	136	149
VSD - Very Large 375 - 1,000kW 3-phase	1	4	6	8	10	11	12	13	13	14
Total revenues, VSDs only (BAU)	**31**	**81**	**104**	**130**	**157**	**185**	**216**	**252**	**291**	**328**

db	REVENUE MAINTENANCE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	EIWH Electric Instant. < 12 kW (secondary)	48	62	69	80	88	92	94	94	94	94
	EIWH Electric Instant. ≥ 12 kW (primary)	164	185	175	164	158	164	177	194	210	227
	EIWHS Electric Instant. Shower (secondary)	20	28	29	28	28	29	30	32	33	35
	ESWH Electric Storage ≤ 30 L (secondary)	750	934	935	931	951	1002	1063	1129	1195	1261
	ESWH Electric Storage > 30 L (primary)	1607	2085	2079	2037	1972	2055	2181	2316	2452	2587
	GIWH Gas Instant. < 13 L/min (secondary)	954	964	826	694	616	602	594	585	577	568
	GIWH Gas Instant. ≥ 13 L/min (primary)	155	179	168	156	138	137	135	134	132	130
	GSWH Gas Storage, Condensing	0	1	4	6	8	10	11	13	15	16
	GSWH Gas Storage, Non-condensing	178	168	135	101	72	54	43	37	32	26
	Dedicated WH Heat Pump	0	20	52	107	185	278	381	490	600	709
	Dedicated WH Solar (3.5 m2)	97	719	930	1014	1049	1007	983	1016	1051	1086
	WH dedicated Water Heater	**3973**	**5346**	**5401**	**5317**	**5265**	**5430**	**5693**	**6041**	**6390**	**6739**
	CHB Gas Combi Instant. WH	533	1310	1409	1473	1458	1444	1398	1300	1190	1074
	CHB Gas + Cyl. WH	246	404	412	408	390	374	363	337	309	279
	CHB Jet Burner Gas + Cyl. WH	78	70	58	47	36	28	25	26	27	27
	CHB Jet Burner Oil + Cyl. WH	591	512	420	332	253	189	169	172	176	181
	CHB Electric (Joule) + Cyl. WH	5	7	7	8	9	9	8	8	7	6
	CHB Hybrid Gas/Electric WH	0	0	1	3	8	19	35	56	81	110
	CHB Electric HP + Cyl. WH	4	29	44	68	108	165	245	335	428	522
	CHB Gas HP + Cyl. WH	0	1	1	2	5	9	15	21	27	34
	CHB Gas mCHP + Cyl. WH	0	1	2	4	7	11	15	20	25	30
	CHB Solar Combi (16 m2)	3	5	6	7	8	8	8	8	9	9
	CHC Central Heating combi, water heating	**1461**	**2338**	**2361**	**2351**	**2281**	**2255**	**2281**	**2283**	**2278**	**2270**
	TOTAL WATER HEATING	**5434**	**7684**	**7762**	**7668**	**7546**	**7685**	**7974**	**8324**	**8668**	**9010**
	CHB Gas non-condensing	4950	7265	6115	4183	2281	1189	505	285	160	116
	CHB Gas condensing	69	3025	4840	7264	9225	10208	10362	9606	8898	8057
	CHB Gas Jet burner non-condensing	610	529	425	313	203	98	38	19	14	11
	CHB Gas Jet burner condensing	0	11	27	53	83	113	136	151	160	167
	CHB Oil Jet burner non-condensing	4283	3671	2935	2151	1386	655	245	124	88	70
	CHB Oil Jet burner condensing	0	73	182	345	536	731	869	962	1019	1062
	CHB Electric Joule-effect	25	32	36	41	44	43	42	38	34	31
	CHB Hybrid (gas-electric)	2	3	6	15	47	109	205	330	476	643
	CHB Electric Heat Pump	23	167	249	373	592	894	1321	1796	2292	2797
	CHB Gas Heat Pump	1	3	6	14	29	53	83	116	151	189
	CHB micro CHP	2	7	11	20	37	61	87	113	140	166
	CHB Solar combi (16 m2)	17	27	33	38	42	44	44	44	45	47
	CHB Central Heating boiler < 400 kW, space heating	**9982**	**14813**	**14866**	**14811**	**14505**	**14200**	**13935**	**13584**	**13478**	**13356**
	SFB Wood Manual [18 kW]	306	135	114	91	66	42	27	20	18	16
	SFB Wood Direct Draft [20 kW]	3	48	95	140	175	180	192	217	262	319
	SFB Coal [25 kW]	289	138	146	126	96	63	47	46	43	38
	SFB Pellets [25 kW]	0	14	26	38	49	57	61	65	71	79
	SFB Wood chips [160 kW]	0	5	6	7	7	7	8	9	10	11
	Total Solid Fuel Boiler	**599**	**339**	**387**	**402**	**392**	**349**	**335**	**358**	**404**	**464**
	CHAE-S (≤ 400 kW)	206	887	1128	1334	1488	1641	1806	1975	2143	2308
	CHAE-L (> 400 kW)	52	191	235	273	300	313	324	336	349	362
	CHWE-S (≤ 400 kW)	17	75	95	112	125	137	151	165	179	193
	CHWE-M (> 400 kW; ≤ 1500 kW)	23	86	107	125	137	144	150	156	162	168
	CHWE-L (> 1500 kW)	11	43	53	62	69	72	75	78	81	84
	CHF	0	7	13	19	23	28	33	38	43	48
	HT PCH-AE-S	107	192	218	242	259	273	285	296	308	319
	HT PCH-AE-L	104	187	213	236	253	266	278	289	300	311
	HT PCH-WE-S	23	41	47	52	56	59	61	64	66	69
	HT PCH-WE-M	102	184	209	231	248	261	273	283	294	305
	HT PCH-WE-L	11	21	24	27	29	31	32	34	35	36
	AC rooftop	105	428	474	466	395	268	146	76	55	55
	AC splits	215	938	1038	1079	1086	1059	1018	980	942	904
	AC VRF	1	1009	1641	2492	3309	4341	5363	6291	7167	7930
	ACF	0	2	5	7	8	10	12	14	15	17
	SubTotal AHC Air Cooling	**978**	**4292**	**5499**	**6757**	**7785**	**8901**	**10006**	**11074**	**12140**	**13109**
	AC rooftop (rev)	65	265	291	281	236	158	79	24	2	0
	AC splits (rev)	156	647	716	745	750	732	704	678	652	626
	AC VRF (rev)	0	888	1424	2120	2812	3633	4377	4891	5307	5593
	ACF (rev)	0	5	9	13	16	20	24	27	31	34
	AHF	103	99	92	86	81	76	72	68	63	59
	AHE	0	2	1	1	1	1	1	1	1	1
	SubTotal AHC Air Heating (rev double)	**325**	**1906**	**2533**	**3246**	**3896**	**4621**	**5257**	**5689**	**6056**	**6313**
	Total AHC Air Heating & Cooling	**1081**	**4392**	**5592**	**6844**	**7867**	**8978**	**10079**	**11143**	**12205**	**13169**

db	REVENUE MAINTENANCE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace [8 kW]	167	243	263	277	287	292	292	291	290	289
	LH closed fireplace/inset [8 kW]	83	228	282	335	383	420	443	456	461	463
	LH wood stove [8 kW]	119	140	147	155	163	170	177	182	185	185
	LH coal stove [8 kW]	73	48	45	43	40	35	30	25	21	18
	LH cooker [10 kW]	162	327	386	452	513	556	577	584	587	587
	LH SHR stove [8 kW]	65	91	100	113	128	145	164	178	189	194
	LH pellet stove [8 kW]	0	61	93	122	146	165	176	183	185	185
	LH Solid fuel sum	**669**	**1138**	**1314**	**1497**	**1660**	**1784**	**1859**	**1899**	**1917**	**1922**
	LH Electric portable	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed > 250W	0	0	0	0	0	0	0	0	0	0
	LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0	0	0
	LH Electric storage	0	0	0	0	0	0	0	0	0	0
	LH Electric underfloor	0	0	0	0	0	0	0	0	0	0
	LH Electric visibly glowing > 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0
	LH Electric Towel Heaters	0	0	0	0	0	0	0	0	0	0
	LH Electric sum	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LH Gas luminous (commercial)	3	3	3	3	3	3	2	2	2	2
	LH Gaseous Tube (commercial < 120 kW)	3	3	4	4	4	3	3	3	3	3
	LH Gas open front	12	12	12	12	12	11	10	9	9	9
	LH Gas closed front	62	48	41	34	28	24	21	19	18	18
	LH Gas balanced flue	142	99	79	60	45	35	29	27	25	25
	LH Gas flueless	0	0	0	0	0	0	0	0	0	0
	LH Gaseous fuel sum	**223**	**166**	**138**	**113**	**92**	**76**	**65**	**60**	**57**	**56**
	LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0
	LH Liquid open front	1	1	1	1	1	1	1	1	1	1
	LH Liquid closed front	6	5	4	3	3	2	2	2	2	2
	LH Liquid balanced flue	14	10	8	6	5	3	3	3	3	2
	LH Liquid flueless	0	0	0	0	0	0	0	0	0	0
	LH Liquid fuel sum	**22**	**16**	**14**	**11**	**9**	**7**	**6**	**6**	**5**	**5**
	LH Local Space Heaters total	**913**	**1320**	**1466**	**1620**	**1761**	**1867**	**1931**	**1965**	**1980**	**1984**
	Revenues partitioned over cooling and heating										
	RAC fixed < 6 kW, cooling	60	595	561	452	469	525	582	644	721	820
	RAC fixed 6-12 kW, cooling	14	144	154	133	137	145	155	164	176	193
	RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, cooling mode	**74**	**739**	**714**	**585**	**606**	**670**	**737**	**808**	**897**	**1012**
	RAC fixed < 6 kW, reversible, heating	5	166	203	216	278	366	464	578	698	818
	RAC fixed 6-12 kW, reversible, heating	1	41	57	64	81	101	123	147	171	192
	RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0
	RAC < 12 kW total, heating mode	**6**	**207**	**260**	**280**	**359**	**467**	**587**	**725**	**869**	**1011**
	RAC Room Air Conditioner	**80**	**946**	**974**	**865**	**964**	**1137**	**1324**	**1533**	**1766**	**2023**
1	CIRC Integrated circulators	36	56	63	70	76	81	85	86	86	86
0.38	CIRC Large standalone circulators	38	56	56	54	52	48	44	43	43	43
0.38	CIRC Small standalone circulators	79	118	120	118	113	106	100	98	98	98
	CIRC Circulator pumps <2.5 kW, all	**153**	**230**	**240**	**242**	**240**	**235**	**229**	**227**	**227**	**227**
	CIRC Circulator pumps <2.5 kW, excl. double	**73**	**108**	**109**	**107**	**102**	**95**	**89**	**88**	**88**	**88**
	TOTAL SPACE HEATING (incl. rev.AC)	**11897**	**18692**	**19620**	**20466**	**21015**	**21598**	**22134**	**22409**	**22875**	**23215**
	TOTAL SPACE COOLING	**1052**	**5031**	**6213**	**7342**	**8391**	**9571**	**10742**	**11882**	**13037**	**14121**
	R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	3	3	3	3	3	4
	R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0	0	1
	R-BVU ≤ 100 m3/h for Habitable Spaces	1	20	31	53	159	329	508	700	896	1106
	R-UVU 100-250 m3/h	17	42	48	54	58	61	63	64	65	65
	R-BVU 100-250 m3/h	1	13	18	24	52	94	139	187	236	288
	R-UVU 250-1000 m3/h	90	227	259	289	311	327	339	344	347	348
	R-BVU 250-1000 m3/h	2	30	42	58	121	222	327	441	556	679
	R-UVU > 1000 m3/h	3	7	8	9	9	9	9	9	9	9
	R-BVU 1000-2500 m3/h	0	3	5	7	8	10	11	13	15	16
	RVU, Total residential	**114**	**343**	**414**	**496**	**721**	**1054**	**1400**	**1761**	**2126**	**2516**
	NR-UVU 250-1000 m3/h	39	87	96	102	106	108	108	108	106	103
	NR-BVU 250-1000 m3/h	0	49	71	95	117	139	162	186	209	234
	NR-UVU > 1000 m3/h	30	68	75	80	83	84	84	84	82	80
	NR-BVU 1000-2500 m3/h	0	31	46	61	75	89	104	119	134	150
	NR-AHU-S 2500-5500 m3/h	5	81	128	176	216	252	288	323	359	393
	NR-AHU-M 5500-14500 m3/h	486	751	837	921	984	1033	1081	1130	1178	1225
	NR-AHU-L > 14500 m3/h	178	275	306	336	359	377	395	413	430	448
	NRVU, Total non-residential	**737**	**1342**	**1558**	**1771**	**1940**	**2082**	**2223**	**2362**	**2499**	**2631**
	VU Ventilation Units, res + non-res.	**851**	**1685**	**1972**	**2267**	**2661**	**3136**	**3623**	**4124**	**4625**	**5147**
	TOTAL VENTILATION	**851**	**1685**	**1972**	**2267**	**2661**	**3136**	**3623**	**4124**	**4625**	**5147**

db	REVENUE MAINTENANCE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	430	735	817	846	689	398	190	99	58	35
	HID (HPM, HPS, MH)	223	550	529	459	332	168	62	21	7	3
	CFLni (all shapes)	214	927	964	777	484	202	49	8	1	0
	CFLi (retrofit for GLS, HL)	64	1036	1328	1044	384	103	0	0	0	0
	GLS (DLS & NDLS)	596	316	30	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	109	556	657	378	34	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	0	8	84	362	792	1156	1424	1665	1914
	LED replacing HID (retrofit & luminaire)	0	0	86	239	458	726	949	1123	1287	1461
	LED replacing CFLni (retrofit & luminaire)	0	0	41	312	750	1196	1533	1783	2025	2293
	LED replacing DLS (retrofit & luminaire)	0	1	57	254	518	609	689	779	882	998
	LED replacing NDLS (retrofit & luminaire)	0	0	61	787	1843	2429	2864	3240	3666	4147
	SUBTOTAL non-LED	1634	4120	4325	3505	1923	870	301	128	66	38
	SUBTOTAL LED	0	1	253	1675	3931	5752	7192	8349	9525	10813
	TOTAL LIGHTING	**1634**	**4121**	**4578**	**5179**	**5854**	**6622**	**7492**	**8477**	**9591**	**10851**
	DP TV all types	140	239	284	333	351	410	457	472	472	472
	DP Monitor	9	125	96	73	73	73	73	73	73	73
	DP Signage	0	1	6	18	26	26	25	25	25	25
	DP Electronic Displays, total	**149**	**365**	**385**	**424**	**449**	**508**	**555**	**570**	**570**	**570**
	Total STB set top boxes	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total GC Game consoles	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total ES + DS (Servers, data Storage)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total PC (Personal Computers)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Inkjet Printer	0	0	0	0	0	0	0	0	0	0
	Inkjet MFD	0	0	0	0	0	0	0	0	0	0
	EP / Laser Printer mono	614	628	549	448	352	280	221	171	124	77
	EP / Laser Printer colour	0	702	1102	1600	1847	1988	2077	2135	2176	2218
	EP / Laser Copier mono	426	195	116	25	0	0	0	0	0	0
	EP / Laser Copier colour	0	104	276	180	0	0	0	0	0	0
	EP / Laser MFD mono	0	1206	1701	1906	1815	1726	1641	1559	1479	1400
	EP / Laser MFD colour	0	2870	4044	4533	4316	4105	3906	3714	3525	3336
	Total IE Imaging Equipment	**1040**	**5705**	**7789**	**8693**	**8330**	**8098**	**7845**	**7579**	**7305**	**7031**
	Total (networked) SB (excl. double)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	Total EPS (External power supplies)	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL ELECTRONICS	**1189**	**6070**	**8174**	**9117**	**8779**	**8607**	**8400**	**8149**	**7875**	**7601**
	RF Household refrigerator and freezer	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	CF open vertical chilled multi deck (RVC2)	184	205	213	216	217	221	224	228	232	235
	CF open horizontal frozen island (RHF4)	21	23	24	24	25	25	25	26	26	27
	CF other supermarket display (non-BCs)	592	684	748	793	827	858	889	920	952	986
	CF Plug in one door beverage cooler	158	197	206	209	217	225	232	240	248	256
	CF Plug in horizontal ice cream freezer	51	63	66	67	70	72	75	77	80	82
	CF Spiral vending machine	53	54	43	35	35	37	38	40	41	43
	Total CF Commercial Refrigeration	**1058**	**1227**	**1301**	**1345**	**1392**	**1438**	**1484**	**1530**	**1579**	**1629**
	PF Professional Refrigeration, Total	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TOTAL FOOD PRESERVATION	**1058**	**1227**	**1301**	**1345**	**1392**	**1438**	**1484**	**1530**	**1579**	**1629**
	TOTAL COOKING	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	WM Washing Machines	315	485	518	535	545	552	550	547	547	547
	WD Washer-Dryers	14	20	21	22	22	23	23	23	23	23
	Total WM-WD household Washing	**329**	**505**	**539**	**557**	**567**	**575**	**573**	**570**	**570**	**570**
	DW Household Dishwasher	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	LD condensing heat pump	0	2	28	80	131	163	187	200	200	200
	LD condensing electric heat element	13	96	94	84	76	67	57	50	50	50
	LD vented electric	68	80	59	39	27	16	6	0	0	0
	LD vented gas	0	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	**81**	**179**	**181**	**203**	**233**	**246**	**250**	**251**	**251**	**251**
	VC Domestic mains	232	441	451	434	382	314	245	207	198	198
	VC Commercial mains	55	91	94	90	90	90	90	90	90	90
	VC Total in scope of CR 666/2013	**287**	**532**	**546**	**524**	**472**	**404**	**335**	**297**	**288**	**288**
	VC Cordless	8	39	74	213	361	508	648	748	796	815
	VC Robot	0	23	70	117	184	259	332	384	408	418
	Total VC Vacuum Cleaner	**295**	**594**	**690**	**854**	**1017**	**1171**	**1314**	**1429**	**1492**	**1521**
	TOTAL CLEANING	**705**	**1277**	**1410**	**1614**	**1818**	**1992**	**2137**	**2250**	**2313**	**2342**
0.5	FAN Axial<300Pa [247 W flow out]	140	394	467	525	580	614	624	624	624	624
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	194	583	675	720	753	773	778	778	778	778
0.5	FAN Centr.FC [141 W flow out]	120	259	317	357	388	411	418	418	418	418
0.5	FAN Centr.BC-free [2120 W flow out]	69	146	175	194	213	233	247	254	260	264
0.5	FAN Centr.BC [2052 W flow out]	125	289	350	387	429	471	508	545	592	643
0.5	FAN Cross-flow [31 W flow out]	28	50	59	69	79	86	93	100	108	117
	Total FAN, industrial (excl. box & roof fans)	**338**	**861**	**1021**	**1126**	**1221**	**1294**	**1334**	**1359**	**1390**	**1422**

db	REVENUE MAINTENANCE ECO (m euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	452	610	632	574	499	478	470	460	448	439
0.45	Medium (L) 3-ph 75-375 kW no VSD	274	355	361	335	297	258	244	231	220	216
0.45	**Total 3ph 0.75-375 kW no VSD**	**726**	**965**	**994**	**909**	**796**	**737**	**713**	**691**	**669**	**655**
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	71	181	255	415	566	628	670	715	763	808
0.45	Medium (L) 3-ph 75-375 kW with VSD	63	160	219	316	413	496	539	578	613	642
0.45	**Total 3-ph 0.75-375 kW with VSD**	**134**	**342**	**474**	**731**	**979**	**1124**	**1209**	**1292**	**1376**	**1450**
0.45	**Total 3-ph 0.75-375 kW w/wo VSD**	**860**	**1306**	**1468**	**1640**	**1775**	**1861**	**1922**	**1983**	**2044**	**2105**
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 1-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	0
0.45	**Total Small 3-ph 0.12-0.75 kW**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
0.45	Large 3-ph LV 375-1000 kW no VSD	111	135	132	126	119	113	112	111	111	110
0.45	Large 3-ph LV 375-1000kW with VSD	8	45	68	94	117	134	143	150	158	166
0.45	**Total Large 3-ph LV 375-1000 kW**	**119**	**180**	**200**	**220**	**236**	**247**	**255**	**262**	**268**	**276**
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	28	42	46	50	52	54	55	56	58	59
0.45	Explosion motors (L) 3-ph 75-375 kW	16	24	26	29	30	32	32	33	34	35
0.45	**Total Expl. 0.75-375 kW (no VSD)**	**44**	**65**	**72**	**78**	**82**	**85**	**87**	**90**	**92**	**94**
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	Brake motors (M) 3-ph 7.5-75 kW	35	52	58	62	65	67	69	70	72	74
0.45	Brake motors (L) 3-ph 75-375 kW	20	30	33	36	38	39	41	42	43	44
0.45	**Total Brake 0.75-375 kW (no VSD)**	**55**	**82**	**90**	**98**	**103**	**106**	**109**	**112**	**115**	**118**
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0
0.45	8-pole motors (M) 3-ph 7.5-75 kW	1	2	2	2	3	3	3	3	3	3
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	2	2	2	2	2	2
0.45	**Total 8-pole 0.75-375 kW (no VSD)**	**2**	**3**	**4**	**4**	**4**	**4**	**4**	**4**	**5**	**5**
0.45	**1-phase motors >0.75 kW (no VSD)**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	MT Elec. Motors LV 0.12-1000 kW	**594**	**900**	**1009**	**1122**	**1210**	**1267**	**1308**	**1348**	**1388**	**1428**
	WP ESOB < 45kW	420	577	619	674	724	766	814	868	923	977
	WP ESOB 45-150kW	28	39	41	45	48	51	54	58	62	65
	WP ESCC < 45kW	1155	1587	1702	1852	1991	2105	2236	2386	2535	2685
	WP ESCC 45-150kW	40	56	60	65	70	74	78	84	89	94
	WP ESCCi < 45kW	471	647	694	755	812	859	912	973	1034	1095
	WP ESCCi 45-150kW	7	10	10	11	12	13	14	15	16	16
	WP MSSB <6"	3138	4312	4624	5032	5410	5720	6076	6483	6889	7294
	WP MS_V <25 bar	784	1078	1156	1258	1352	1430	1519	1621	1722	1824
	WP Water pumps	**6044**	**8306**	**8907**	**9693**	**10420**	**11018**	**11703**	**12487**	**13269**	**14050**
	Total WE Welding Equipment	**98**	**111**	**114**	**114**	**115**	**116**	**117**	**118**	**119**	**120**
	TOTAL INDUSTRY COMPONENTS	**7074**	**10177**	**11050**	**12055**	**12966**	**13695**	**14463**	**15312**	**16166**	**17020**
	TOTAL ENERGY SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	TRANSPORT SECTOR	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
	GENERAL TOTAL (in m euros 2020)	**30894**	**55966**	**62080**	**67052**	**70422**	**74344**	**78449**	**82458**	**86730**	**90937**
	GENERAL TOTAL (in bn euros 2020)	31	56	62	67	70	74	78	82	87	91

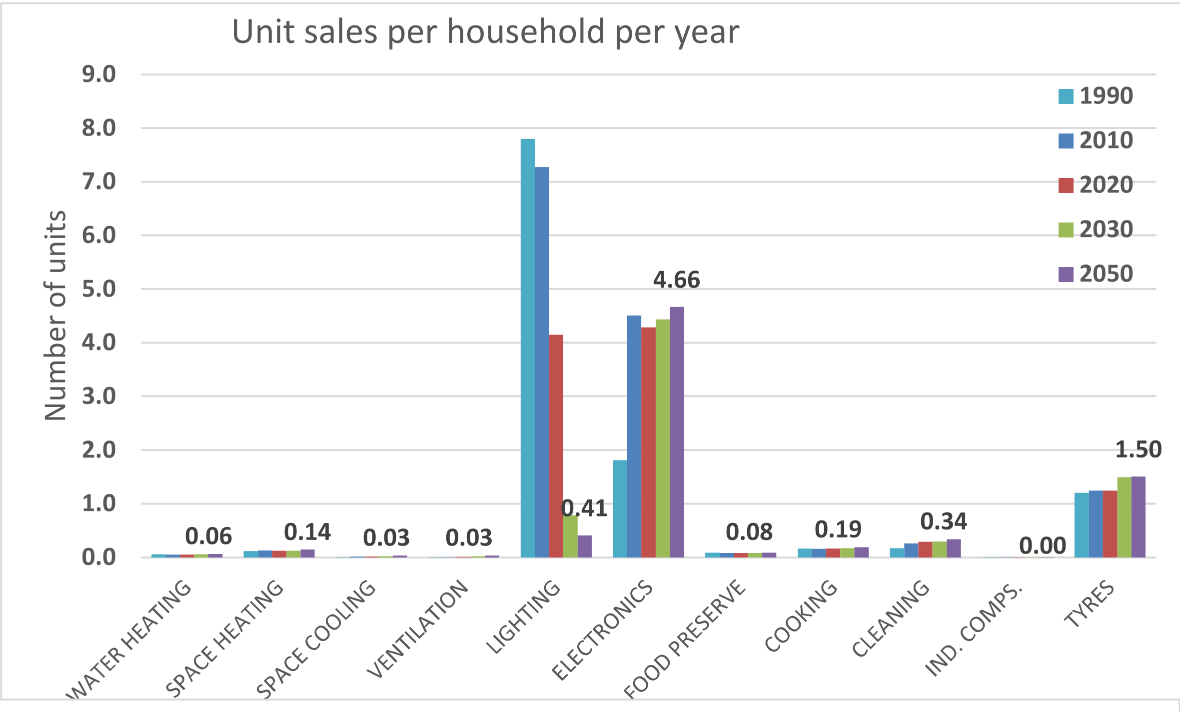
SUMMARY

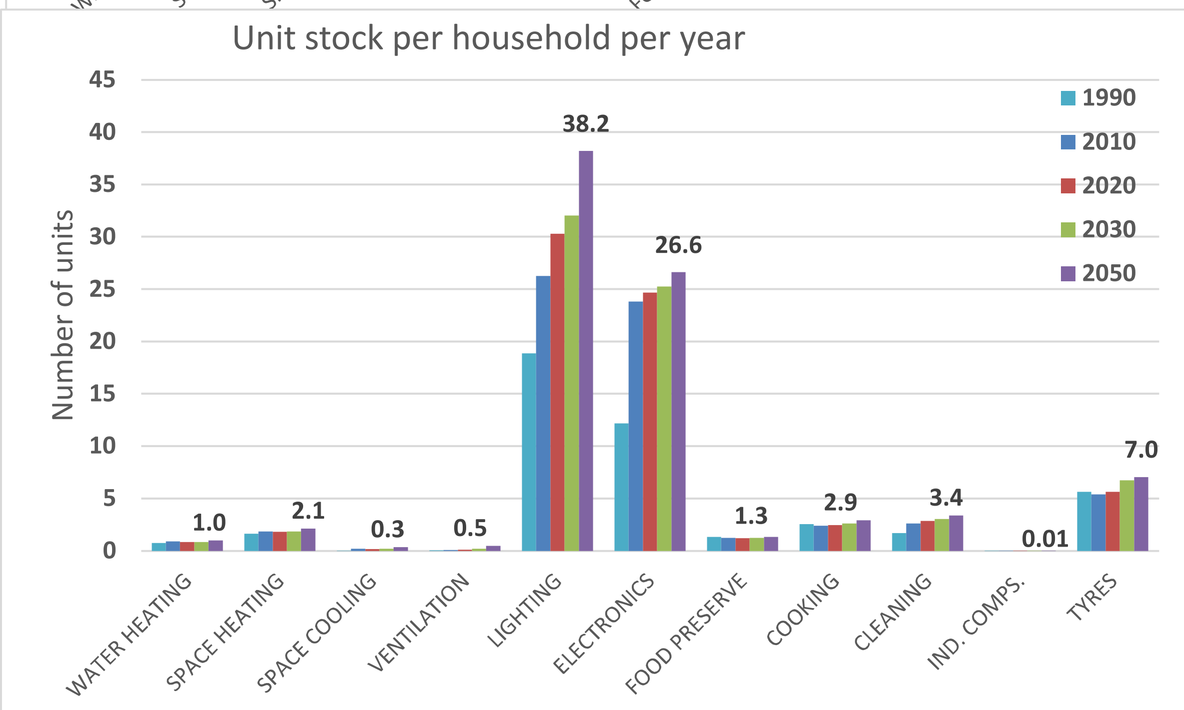
MAINTENANCE ECO excl. VAT (bn euros 2020)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	**5.4**	**7.7**	**7.8**	**7.7**	**7.5**	**7.7**	**8.0**	**8.3**	**8.7**	**9.0**
SPACE HEATING	**11.9**	**18.7**	**19.6**	**20.5**	**21.0**	**21.6**	**22.1**	**22.4**	**22.9**	**23.2**
SPACE COOLING	**1.1**	**5.0**	**6.2**	**7.3**	**8.4**	**9.6**	**10.7**	**11.9**	**13.0**	**14.1**
VENTILATION	**0.9**	**1.7**	**2.0**	**2.3**	**2.7**	**3.1**	**3.6**	**4.1**	**4.6**	**5.1**
LIGHTING	**1.6**	**4.1**	**4.6**	**5.2**	**5.9**	**6.6**	**7.5**	**8.5**	**9.6**	**10.9**
ELECTRONICS	**1.2**	**6.1**	**8.2**	**9.1**	**8.8**	**8.6**	**8.4**	**8.1**	**7.9**	**7.6**
FOOD PRESERVATION	**1.1**	**1.2**	**1.3**	**1.3**	**1.4**	**1.4**	**1.5**	**1.5**	**1.6**	**1.6**
COOKING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CLEANING	**0.7**	**1.3**	**1.4**	**1.6**	**1.8**	**2.0**	**2.1**	**2.3**	**2.3**	**2.3**
INDUSTRY COMPONENTS	**7.1**	**10.2**	**11.1**	**12.1**	**13.0**	**13.7**	**14.5**	**15.3**	**16.2**	**17.0**
ENERGY SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TRANSPORT SECTOR	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
TOTAL in bn euros 2020	**31**	**56**	**62**	**67**	**70**	**74**	**78**	**82**	**87**	**91**

Revenues for VSDs only (without motor, m euros)										
VSD - Very Small 0.12 - 0.75 kW 1-phase	0	0	0	0	0	0	0	0	0	0
VSD - Very Small 0.12 - 0.75 kW 3-phase	0	0	0	0	0	0	0	0	0	0
VSD - Small 0.75 - 7.5 kW 3-phase	0	0	0	0	0	0	0	0	0	0
VSD - Medium 7.5 - 75kW 3-phase	16	40	56	91	124	138	147	157	167	177
VSD - Large 75 - 375kW 3-phase	15	38	52	75	97	117	127	136	145	151
VSD - Very Large 375 - 1,000kW 3-phase	1	4	6	8	10	11	12	13	13	14
Total revenues, VSDs only (ECO)	**31**	**81**	**113**	**174**	**232**	**266**	**286**	**306**	**325**	**343**

Parameters per Household (hh)	Sales, units / household					Stock, units / household				
(residential products only)	1990	2010	2020	2030	2050	1990	2010	2020	2030	2050
Number of EU27 (2020) households (mln)	**152**	**182**	**196**	**201**	**200**					
WH dedicated Water Heater	0.03	0.03	0.03	0.03	0.04	0.48	0.50	0.45	0.45	0.56
CHC Central Heating combi, water heating	0.02	0.02	0.02	0.02	0.02	0.27	0.39	0.38	0.38	0.42
TOTAL WATER HEATING (CH double)	**0.05**	**0.05**	**0.05**	**0.05**	**0.06**	**0.75**	**0.89**	**0.83**	**0.82**	**0.98**
CHB Central Heating boiler, space heating	0.02	0.02	0.02	0.02	0.02	0.28	0.38	0.37	0.37	0.40
SFB Solid Fuel Boilers	0.00	0.00	0.00	0.00	0.00	0.08	0.04	0.04	0.03	0.04
AHC central Air Cooling	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
AHC central Air Heating	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
LH Local Space Heaters	0.08	0.09	0.08	0.08	0.08	1.17	1.25	1.23	1.20	1.24
RAC Room Air Conditioners < 12 kW, cooling	0.00	0.02	0.01	0.02	0.03	0.02	0.19	0.16	0.20	0.35
RAC Room Air Conditioners < 12 kW, heating	0.00	0.01	0.01	0.01	0.03	0.00	0.05	0.07	0.13	0.33
CIRC Circulator pumps <2.5 kW excl. double	0.01	0.01	0.01	0.01	0.01	0.10	0.12	0.11	0.10	0.09
TOTAL SPACE HEATING (incl. rev.AC)	**0.12**	**0.13**	**0.12**	**0.12**	**0.14**	**1.64**	**1.83**	**1.82**	**1.83**	**2.11**
TOTAL SPACE COOLING	**0.00**	**0.02**	**0.02**	**0.02**	**0.03**	**0.02**	**0.19**	**0.16**	**0.20**	**0.35**
R-UVU ≤ 100 m3/h, small unidirectional	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01
R-BVU ≤ 100 m3/h, small bi-directional	0.00	0.00	0.00	0.01	0.02	0.00	0.01	0.01	0.08	0.29
R-UVU > 100 m3/h, large unidirectional	0.00	0.00	0.01	0.00	0.00	0.03	0.06	0.07	0.08	0.09
R-BVU > 100 m3/h, large, bidirectional	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.02	0.07
TOTAL VENTILATION	**0.00**	**0.01**	**0.01**	**0.02**	**0.03**	**0.03**	**0.08**	**0.10**	**0.20**	**0.46**
non-LED light sources	7.8	7.2	0.9	0.0	0.0	18.8	26.2	14.5	2.4	0.2
LED light sources	0.0	0.0	3.3	0.8	0.4	0.0	0.1	15.8	29.6	38.0
TOTAL LIGHTING	**7.8**	**7.3**	**4.1**	**0.8**	**0.4**	**18.8**	**26.2**	**30.3**	**32.0**	**38.2**
DP Electronic displays, TVs	0.13	0.30	0.20	0.26	0.27	1.04	1.48	1.92	2.30	2.66
DP Electronic displays, Monitors	0.03	0.06	0.03	0.03	0.03	0.03	0.39	0.21	0.21	0.21
STB Set Top Boxes	0.00	0.25	0.16	0.15	0.16	0.00	0.73	0.80	0.77	0.78
GC Game consoles	0.00	0.06	0.05	0.05	0.05	0.00	0.40	0.38	0.37	0.37
PC Personal Computers	0.07	0.28	0.37	0.51	0.59	0.23	1.30	1.55	2.09	2.56
Inkjet printers and multi-functional devices	0.03	0.05	0.03	0.03	0.02	0.11	0.21	0.17	0.15	0.12
Laser printers, copiers and mfds	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.01
Consumables: paper, ink, toner										
Standby of devices regulated only for Standby	1.5	1.9	1.8	1.8	1.8	10.5	13.6	13.1	12.9	13.1
EPS External Power Supplies (excl. double)	0.09	1.65	1.64	1.62	1.71	0.25	5.70	6.54	6.48	6.77
TOTAL ELECTRONICS	**1.8**	**4.5**	**4.3**	**4.4**	**4.7**	**12.2**	**23.8**	**24.7**	**25.3**	**26.6**
RF Household Refrigeration	0.09	0.08	0.08	0.08	0.08	1.33	1.23	1.21	1.23	1.32
TOTAL FOOD PRESERVATION	**0.09**	**0.08**	**0.08**	**0.08**	**0.08**	**1.33**	**1.23**	**1.21**	**1.23**	**1.32**
CA Electric Hobs	0.04	0.05	0.06	0.06	0.08	0.51	0.68	0.78	0.88	1.09
CA Electric Ovens	0.05	0.04	0.05	0.05	0.05	0.84	0.77	0.79	0.86	0.93
CA Gas Hobs	0.03	0.02	0.02	0.02	0.01	0.53	0.37	0.32	0.29	0.24
CA Gas Ovens	0.01	0.01	0.01	0.01	0.01	0.29	0.19	0.16	0.15	0.14
CA Range Hoods	0.03	0.03	0.03	0.03	0.04	0.36	0.37	0.39	0.42	0.51
TOTAL COOKING	**0.16**	**0.16**	**0.16**	**0.17**	**0.19**	**2.54**	**2.40**	**2.45**	**2.60**	**2.90**
WM Washing Machines (excl. cons.)	0.05	0.06	0.06	0.06	0.06	0.63	0.81	0.83	0.83	0.83
WD Washer-Dryers (excl. cons.)	0.00	0.00	0.00	0.00	0.00	0.03	0.03	0.03	0.03	0.04
WM & WD detergent and water costs										
DW Household Dishwashers (excl. cons.)	0.02	0.03	0.04	0.04	0.06	0.18	0.35	0.46	0.58	0.85
DW detergent and water costs										
LD household Laundry Dryer	0.01	0.02	0.02	0.02	0.02	0.11	0.21	0.22	0.26	0.27
VC Vacuum Cleaners (excl. cons.)	0.09	0.15	0.17	0.17	0.19	0.74	1.20	1.30	1.30	1.39
VC bags & filters costs										
TOTAL CLEANING	**0.17**	**0.26**	**0.29**	**0.30**	**0.34**	**1.70**	**2.60**	**2.84**	**3.02**	**3.37**
WP Water pumps	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
TOTAL INDUSTRY COMPONENTS	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
Tyres C1, for cars, total	1.20	1.24	1.24	1.49	1.50	5.62	5.39	5.64	6.73	7.05
TRANSPORT SECTOR	**1.20**	**1.24**	**1.24**	**1.49**	**1.50**	**5.62**	**5.39**	**5.64**	**6.73**	**7.05**
TOTAL per EU household (direct)	**11**	**14**	**10**	**7**	**7**	**44**	**64**	**70**	**74**	**83**
TOTAL per EU household (indirect)	**5**	**7**	**6**	**4**	**5**	**20**	**33**	**38**	**45**	**66**

Summary per functional group per household	Sales, units / household					Stock, units / household				
	1990	2010	2020	2030	2050	1990	2010	2020	2030	2050
WATER HEATING	0.05	0.05	0.05	0.05	0.06	0.7	0.9	0.8	0.8	1.0
SPACE HEATING	0.12	0.13	0.12	0.12	0.14	1.6	1.8	1.8	1.8	2.1
SPACE COOLING	0.00	0.02	0.02	0.02	0.03	0.0	0.2	0.2	0.2	0.3
VENTILATION	0.00	0.01	0.01	0.02	0.03	0.0	0.1	0.1	0.2	0.5
LIGHTING	7.80	7.27	4.15	0.78	0.41	18.8	26.2	30.3	32.0	38.2
ELECTRONICS	1.81	4.51	4.28	4.44	4.66	12.2	23.8	24.7	25.3	26.6
FOOD PRESERVE	0.09	0.08	0.08	0.08	0.08	1.3	1.2	1.2	1.2	1.3
COOKING	0.16	0.16	0.16	0.17	0.19	2.5	2.4	2.5	2.6	2.9
CLEANING	0.17	0.26	0.29	0.30	0.34	1.7	2.6	2.8	3.0	3.4
IND. COMPS.	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01
TYRES	1.20	1.24	1.24	1.49	1.50	5.6	5.4	5.6	6.7	7.0
TOTAL per EU household (direct)	**11**	**14**	**10**	**7**	**7**	**45**	**65**	**70**	**74**	**83**
TOTAL per EU household (indirect)	5	7	6	4	5	20	33	38	45	66
TOTAL per EU household (direct and indirect)	16	21	16	12	12	64	98	108	119	149

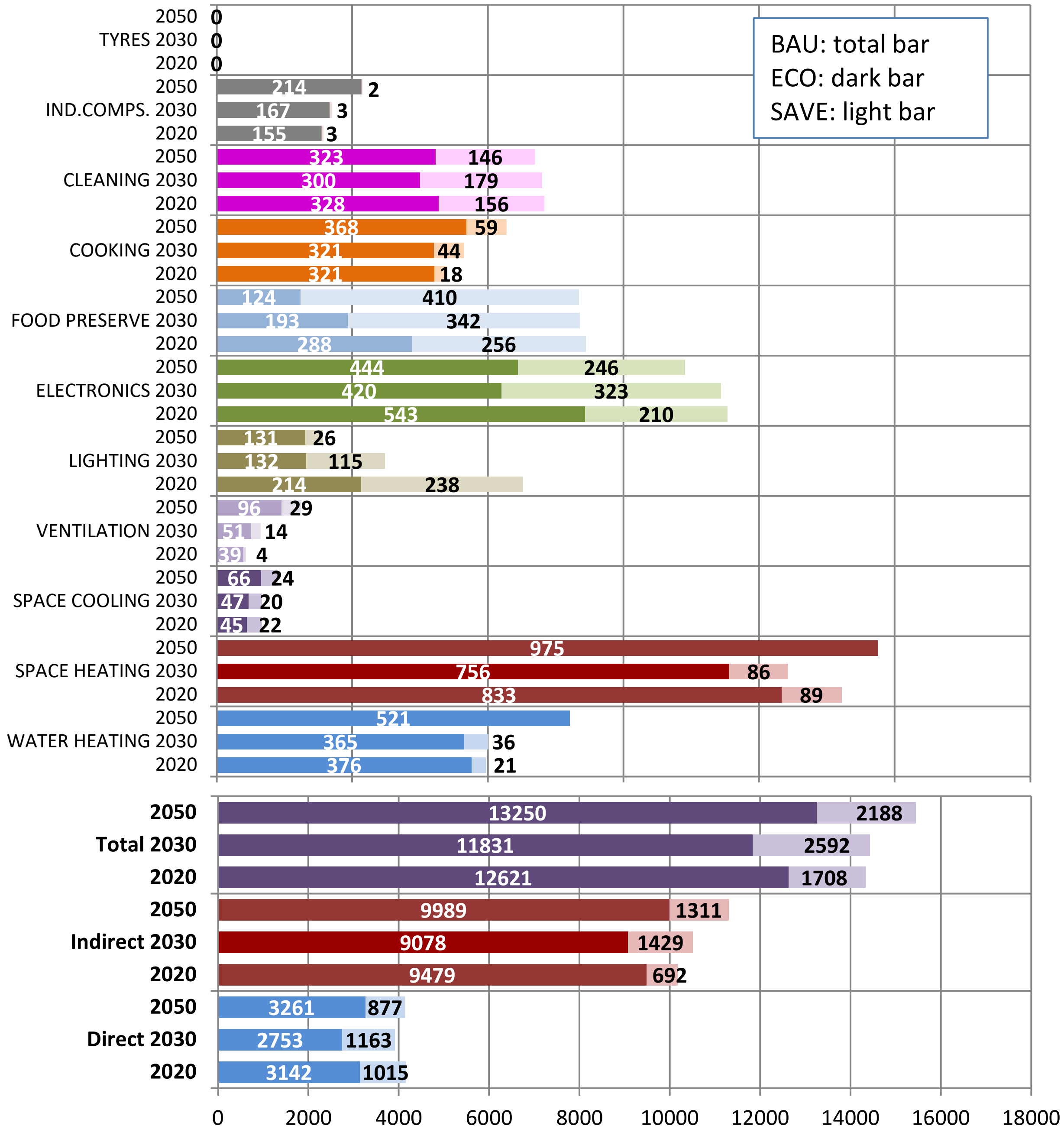




Parameters per Household (hh)	**Electricity, kWh/a / household**										
(residential products only)	**1990**	**2010**	**2020**			**2030**			**2050**		
			BAU	**ECO**	***Save***	**BAU**	**ECO**	***Save***	**BAU**	**ECO**	***Save***
WH dedicated Water Heater	311	367	352	331	*20*	352	308	*45*	457	400	*57*
CHC Central Heating combi, water heating	27	40	45	45	*0*	48	57	*-9*	64	121	*-57*
TOTAL WATER HEATING	**338**	**408**	**396**	**376**	***21***	**401**	**365**	***36***	**521**	**521**	***0***
CHB Central Heating boiler, space heating	250	248	246	227	*19*	241	249	*-8*	262	414	*-152*
SFB Solid Fuel Boilers	0	0	0	0	*0*	0	0	*0*	0	0	*0*
AHC central Air Cooling	2	6	6	6	*0*	6	5	*0*	5	5	*0*
AHC central Air Heating	3	7	7	6	*0*	6	5	*1*	4	4	*1*
LH Local Space Heaters	852	661	525	502	*23*	410	366	*44*	341	302	*39*
RAC Room Air Conditioners < 12 kW, cooling	12	92	61	39	*22*	61	42	*19*	85	61	*23*
RAC Room Air Conditioners < 12 kW, heating	5	105	115	79	*35*	162	122	*40*	285	243	*43*
CIRC Circulator pumps <2.5 kW excl. double	34	39	30	19	*12*	24	14	*10*	18	13	*5*
TOTAL SPACE HEATING (incl. rev.AC)	**1144**	**1061**	**922**	**833**	**89**	**843**	**756**	**86**	**911**	**975**	**-64**
TOTAL SPACE COOLING	**15**	**98**	**67**	**45**	**22**	**67**	**47**	**20**	**90**	**66**	**24**
R-UVU ≤ 100 m3/h, small unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	1	1	1	*0*	7	6	*1*	24	20	*4*
R-UVU > 100 m3/h, large unidirectional	17	33	35	32	*3*	37	27	*10*	40	27	*13*
R-BVU > 100 m3/h, large, bidirectional	0	4	6	6	*0*	20	17	*3*	61	49	*12*
TOTAL VENTILATION	**17**	**38**	**43**	**39**	***4***	**65**	**51**	***14***	**125**	**96**	***29***
non-LED light sources	450	494	436	159	*277*	183	32	*150*	34	3	*32*
LED light sources	0	0	15	54	*-39*	65	100	*-35*	122	128	*-6*
TOTAL LIGHTING	**450**	**494**	**452**	**214**	***238***	**248**	**132**	***115***	**156**	**131**	***26***
DP Electronic displays, TVs	158	314	365	284	*81*	377	179	*198*	342	207	*135*
DP Electronic displays, Monitors	3	35	14	7	*7*	11	4	*7*	8	3	*4*
STB Set Top Boxes	0	52	84	61	*23*	70	53	*17*	69	53	*16*
GC Game consoles	0	26	47	26	*21*	43	23	*20*	43	23	*20*
PC Personal Computers	70	106	64	64	*0*	69	69	*0*	64	64	*0*
Inkjet printers and multi-functional devices	7	4	3	1	*2*	3	1	*2*	2	1	*1*
Laser printers, copiers and mfds	11	4	5	2	*3*	4	1	*3*	3	1	*2*
Consumables: paper, ink, toner											
Standby of devices regulated only for Standby	40	142	140	77	*63*	137	72	*65*	134	73	*61*
EPS External Power Supplies (excl. double)	1	26	32	22	*11*	29	18	*11*	25	18	*6*
TOTAL ELECTRONICS	**289**	**709**	**753**	**543**	**210**	**744**	**420**	**323**	**690**	**444**	**246**
RF Household Refrigeration	681	573	544	288	*256*	535	193	*342*	534	124	*410*
TOTAL FOOD PRESERVATION	**681**	**573**	**544**	**288**	**256**	**535**	**193**	**342**	**534**	**124**	**410**
CA Electric Hobs	124	166	189	185	*4*	211	203	*8*	255	245	*10*
CA Electric Ovens	113	108	99	88	*11*	99	74	*24*	105	76	*29*
CA Gas Hobs	0	0	0	0	*0*	0	0	*0*	0	0	*0*
CA Gas Ovens	0	0	0	0	*0*	0	0	*0*	0	0	*0*
CA Range Hoods	48	49	51	49	*3*	55	43	*12*	67	47	*20*
TOTAL COOKING	**284**	**323**	**339**	**321**	***18***	**365**	**321**	***44***	**427**	**368**	***59***
WM Washing Machines (excl. cons.)	274	191	161	99	*62*	136	82	*54*	100	80	*20*
WD Washer-Dryers (excl. cons.)	46	45	40	32	*8*	35	29	*5*	30	29	*1*
WM & WD detergent and water costs											
DW Household Dishwashers (excl. cons.)	63	96	121	86	*34*	145	98	*47*	187	119	*68*
DW detergent and water costs											
LD household Laundry Dryer	49	82	69	54	*14*	68	40	*28*	66	35	*30*
VC Vacuum Cleaners (excl. cons.)	51	66	93	56	*37*	95	50	*45*	86	60	*26*
VC bags & filters costs											
TOTAL CLEANING	**482**	**481**	**483**	**328**	***156***	**479**	**300**	***179***	**469**	**323**	***146***
WP Water pumps	133	148	158	155	*3*	170	167	*3*	215	214	*2*
TOTAL INDUSTRY COMPONENTS	133	148	158	155	*3*	170	167	*3*	215	214	*2*
Tyres C1, for cars, total	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TRANSPORT SECTOR	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
TOTAL per EU household (direct)	**3834**	**4332**	**4157**	**3142**	***1015***	**3916**	**2753**	***1163***	**4138**	**3261**	***877***
	Electricity, kWh/a / household										
TOTAL per EU household (indirect)	**7457**	**9495**	**10171**	**9479**	***692***	**10507**	**9078**	***1429***	**11300**	**9989**	***1311***

Summary per functional group per household	Electricity, kWh/a / household										
	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WATER HEATING	338	408	396	376	*21*	401	365	*36*	521	521	*0*
SPACE HEATING	1144	1061	922	833	*89*	843	756	*86*	911	975	*-64*
SPACE COOLING	15	98	67	45	*22*	67	47	*20*	90	66	*24*
VENTILATION	17	38	43	39	*4*	65	51	*14*	125	96	*29*
LIGHTING	450	494	452	214	*238*	248	132	*115*	156	131	*26*
ELECTRONICS	289	709	753	543	*210*	744	420	*323*	690	444	*246*
FOOD PRESERVE	681	573	544	288	*256*	535	193	*342*	534	124	*410*
COOKING	284	323	339	321	*18*	365	321	*44*	427	368	*59*
CLEANING	482	481	483	328	*156*	479	300	*179*	469	323	*146*
INDUSTRY COMPONENTS	133	148	158	155	*3*	170	167	*3*	215	214	*2*
TYRES	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL per EU household (direct)	**3834**	**4332**	**4157**	**3142**	***1015***	**3916**	**2753**	***1163***	**4138**	**3261**	***877***
TOTAL per EU household (indirect)	7457	9495	10171	9479	*692*	10507	9078	*1429*	11300	9989	*1311*
TOTAL per EU household (direct and indirect)	11291	13827	14328	12621	*1708*	14423	11831	*2592*	15438	13250	*2188*

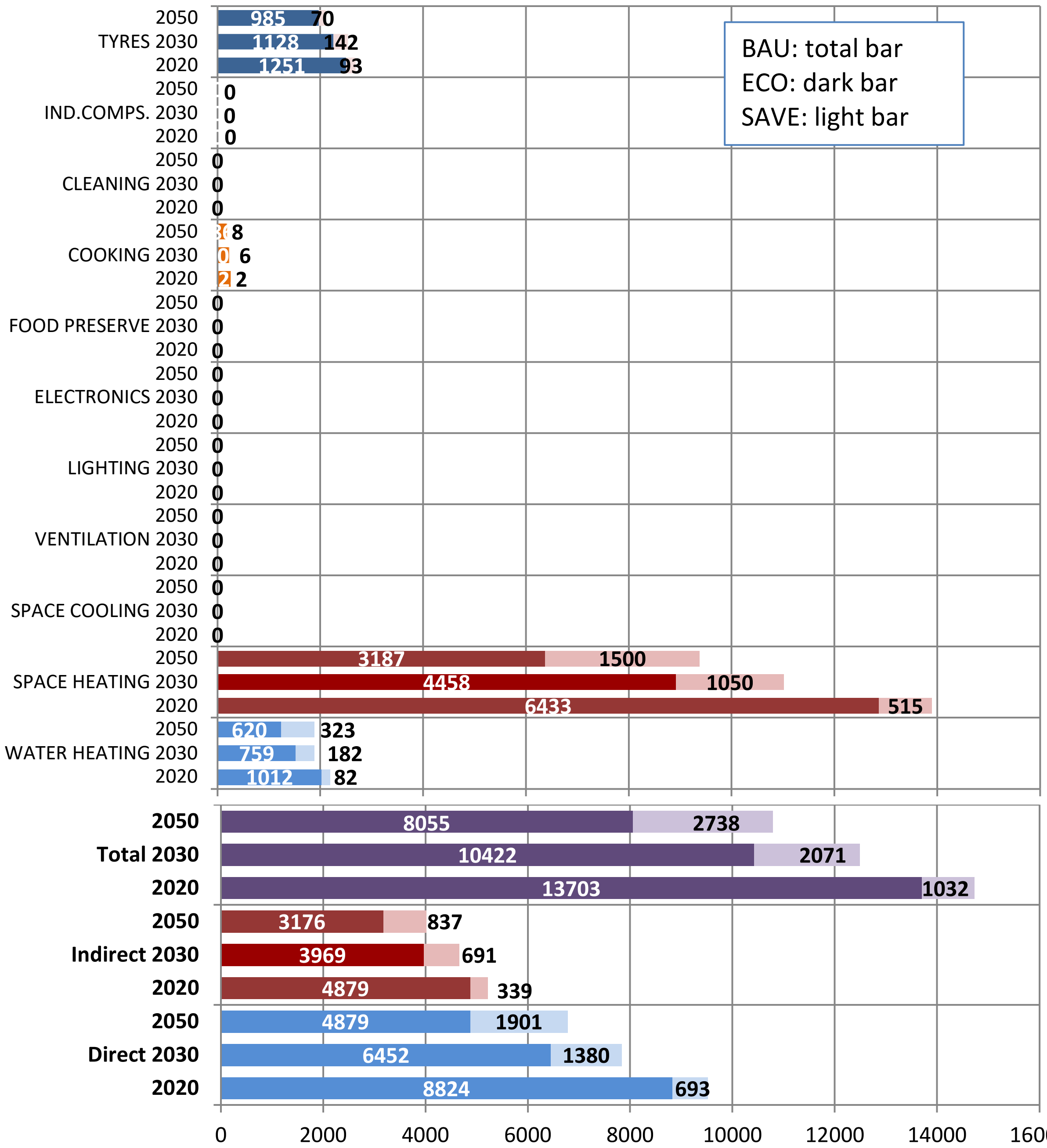
Electricity per household
ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



Parameters per Household (hh)	Fuel, kWh NCV/a / household										
(residential products only)	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WH dedicated Water Heater	198	168	112	93	*19*	80	56	*24*	62	48	*15*
CHC Central Heating combi, water heating	896	1146	982	919	*63*	861	703	*158*	881	573	*309*
TOTAL WATER HEATING	**1094**	**1314**	**1095**	**1012**	***82***	**941**	**759**	***182***	**943**	**620**	***323***
CHB Central Heating boiler, space heating	8410	6956	5138	4656	*482*	3973	3044	*929*	3185	1847	*1338*
SFB Solid Fuel Boilers	4207	1120	978	960	*18*	666	624	*41*	662	620	*42*
AHC central Air Cooling	0	0	0	0	*0*	0	0	*0*	0	0	*0*
AHC central Air Heating	26	16	11	10	*1*	8	7	*2*	5	4	*1*
LH Local Space Heaters	786	776	821	805	*16*	861	783	*78*	835	717	*118*
RAC Room Air Conditioners < 12 kW, cooling	0	0	0	0	*0*	0	0	*0*	0	0	*0*
RAC Room Air Conditioners < 12 kW, heating	0	0	0	0	*0*	0	0	*0*	0	0	*0*
CIRC Circulator pumps <2.5 kW excl. double	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL SPACE HEATING (incl. rev.AC)	**13429**	**8868**	**6948**	**6433**	**515**	**5508**	**4458**	**1050**	**4688**	**3187**	**1500**
TOTAL SPACE COOLING	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
R-UVU ≤ 100 m3/h, small unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-UVU > 100 m3/h, large unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU > 100 m3/h, large, bidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL VENTILATION	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
non-LED light sources	0	0	0	0	*0*	0	0	*0*	0	0	*0*
LED light sources	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL LIGHTING	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
DP Electronic displays, TVs	0	0	0	0	*0*	0	0	*0*	0	0	*0*
DP Electronic displays, Monitors	0	0	0	0	*0*	0	0	*0*	0	0	*0*
STB Set Top Boxes	0	0	0	0	*0*	0	0	*0*	0	0	*0*
GC Game consoles	0	0	0	0	*0*	0	0	*0*	0	0	*0*
PC Personal Computers	0	0	0	0	*0*	0	0	*0*	0	0	*0*
Inkjet printers and multi-functional devices	0	0	0	0	*0*	0	0	*0*	0	0	*0*
Laser printers, copiers and mfds	0	0	0	0	*0*	0	0	*0*	0	0	*0*
Consumables: paper, ink, toner											
Standby of devices regulated only for Standby	0	0	0	0	*0*	0	0	*0*	0	0	*0*
EPS External Power Supplies (excl. double)	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL ELECTRONICS	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
RF Household Refrigeration	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL FOOD PRESERVATION	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**
CA Electric Hobs	0	0	0	0	*0*	0	0	*0*	0	0	*0*
CA Electric Ovens	0	0	0	0	*0*	0	0	*0*	0	0	*0*
CA Gas Hobs	161	112	97	96	*0*	85	84	*2*	69	67	*1*
CA Gas Ovens	71	43	33	32	*1*	29	24	*5*	25	19	*6*
CA Range Hoods	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL COOKING	**233**	**155**	**130**	**128**	***2***	**114**	**108**	***6***	**94**	**86**	***8***
WM Washing Machines (excl. cons.)	0	0	0	0	*0*	0	0	*0*	0	0	*0*
WD Washer-Dryers (excl. cons.)	0	0	0	0	*0*	0	0	*0*	0	0	*0*
WM & WD detergent and water costs											
DW Household Dishwashers (excl. cons.)	0	0	0	0	*0*	0	0	*0*	0	0	*0*
DW detergent and water costs											
LD household Laundry Dryer	0	0	0	0	*0*	0	0	*0*	0	0	*0*
VC Vacuum Cleaners (excl. cons.)	0	0	0	0	*0*	0	0	*0*	0	0	*0*
VC bags & filters costs											
TOTAL CLEANING	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
WP Water pumps	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TOTAL INDUSTRY COMPONENTS	**0**	**0**	**0**	**0**	***0***	**0**	**0**	***0***	**0**	**0**	***0***
Tyres C1, for cars, total	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TRANSPORT SECTOR	**2553**	**1596**	**1344**	**1251**	***93***	**1271**	**1128**	***142***	**1055**	**985**	***70***
TOTAL per EU household (direct)	**17309**	**11933**	**9517**	**8824**	***693***	**7833**	**6452**	***1380***	**6780**	**4879**	***1901***
	Fuel, kWh NCV/a / household										
TOTAL per EU household (indirect)	**8684**	**6329**	**5218**	**4879**	***339***	**4660**	**3969**	***691***	**4014**	**3176**	***837***

Summary per functional group per household	Fuel, kWh NCV/a / household										
	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WATER HEATING	1094	1314	1095	1012	*82*	941	759	*182*	943	620	*323*
SPACE HEATING	13429	8868	6948	6433	*515*	5508	4458	*1050*	4688	3187	*1500*
SPACE COOLING	0	0	0	0	*0*	0	0	*0*	0	0	*0*
VENTILATION	0	0	0	0	*0*	0	0	*0*	0	0	*0*
LIGHTING	0	0	0	0	*0*	0	0	*0*	0	0	*0*
ELECTRONICS	0	0	0	0	*0*	0	0	*0*	0	0	*0*
FOOD PRESERVE	0	0	0	0	*0*	0	0	*0*	0	0	*0*
COOKING	233	155	130	128	*2*	114	108	*6*	94	86	*8*
CLEANING	0	0	0	0	*0*	0	0	*0*	0	0	*0*
INDUSTRY COMPONENTS	0	0	0	0	*0*	0	0	*0*	0	0	*0*
TYRES	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TOTAL per EU household (direct)	**17309**	**11933**	**9517**	**8824**	***693***	**7833**	**6452**	***1380***	**6780**	**4879**	***1901***
TOTAL per EU household (indirect)	8684	6329	5218	4879	*339*	4660	3969	*691*	4014	3176	*837*
TOTAL per EU household (direct and indirect)	25994	18263	14735	13703	*1032*	12493	10422	*2071*	10793	8055	*2738*

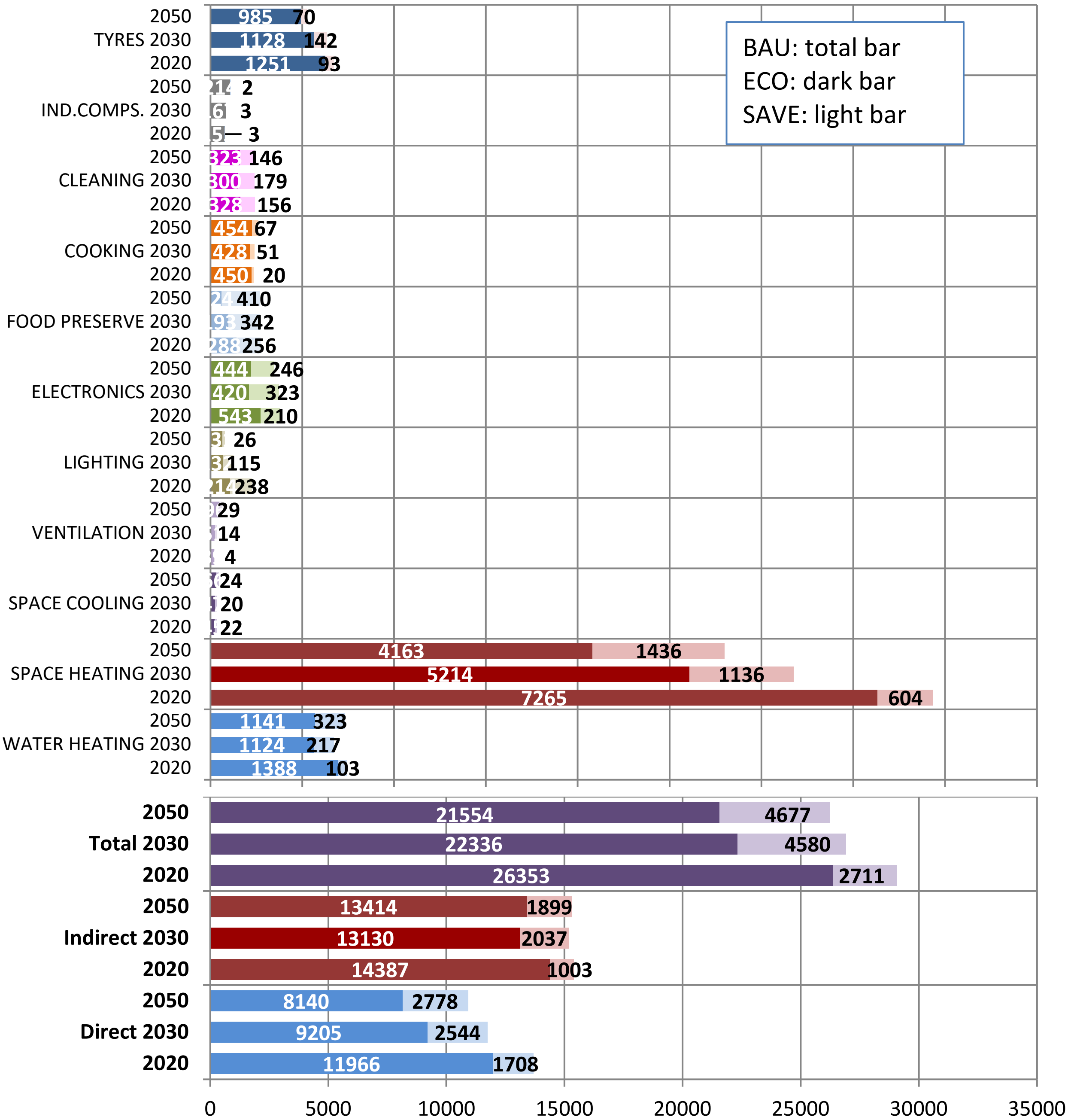
Fuel per household
ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



Parameters per Household (hh)	Final Energy, kWh/a / household										
(residential products only)	1990	2010	2020 BAU	2020 ECO	2020 *Save*	2030 BAU	2030 ECO	2030 *Save*	2050 BAU	2050 ECO	2050 *Save*
WH dedicated Water Heater	509	536	464	424	*40*	432	363	*69*	519	447	*72*
CHC Central Heating combi, water heating	923	1186	1027	964	*63*	910	761	*149*	945	694	*251*
TOTAL WATER HEATING	**1433**	**1722**	**1491**	**1388**	***103***	**1341**	**1124**	***217***	**1464**	**1141**	***323***
CHB Central Heating boiler, space heating	8661	7205	5384	4883	*501*	4214	3292	*921*	3448	2261	*1187*
SFB Solid Fuel Boilers	4207	1120	978	960	*18*	666	624	*41*	662	620	*42*
AHC central Air Cooling	2	6	6	6	*0*	6	5	*0*	5	5	*0*
AHC central Air Heating	28	22	17	17	*1*	14	12	*2*	9	8	*2*
LH Local Space Heaters	1638	1437	1345	1307	*38*	1271	1149	*121*	1176	1019	*157*
RAC Room Air Conditioners < 12 kW, cooling	12	92	61	39	*22*	61	42	*19*	85	61	*23*
RAC Room Air Conditioners < 12 kW, heating	5	105	115	79	*35*	162	122	*40*	285	243	*43*
CIRC Circulator pumps <2.5 kW excl. double	34	39	30	19	*12*	24	14	*10*	18	13	*5*
TOTAL SPACE HEATING (incl. rev.AC)	**14573**	**9929**	**7870**	**7265**	**604**	**6350**	**5214**	**1136**	**5598**	**4163**	**1436**
TOTAL SPACE COOLING	**15**	**98**	**67**	**45**	***22***	**67**	**47**	***20***	**90**	**66**	***24***
R-UVU ≤ 100 m3/h, small unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	1	1	1	*0*	7	6	*1*	24	20	*4*
R-UVU > 100 m3/h, large unidirectional	17	33	35	32	*3*	37	27	*10*	40	27	*13*
R-BVU > 100 m3/h, large, bidirectional	0	4	6	6	*0*	20	17	*3*	61	49	*12*
TOTAL VENTILATION	**17**	**38**	**43**	**39**	***4***	**65**	**51**	***14***	**125**	**96**	***29***
non-LED light sources	450	494	436	159	*277*	183	32	*150*	34	3	*32*
LED light sources	0	0	15	54	*-39*	65	100	*-35*	122	128	*-6*
TOTAL LIGHTING	**450**	**494**	**452**	**214**	***238***	**248**	**132**	***115***	**156**	**131**	***26***
DP Electronic displays, TVs	158	314	365	284	*81*	377	179	*198*	342	207	*135*
DP Electronic displays, Monitors	3	35	14	7	*7*	11	4	*7*	8	3	*4*
STB Set Top Boxes	0	52	84	61	*23*	70	53	*17*	69	53	*16*
GC Game consoles	0	26	47	26	*21*	43	23	*20*	43	23	*20*
PC Personal Computers	70	106	64	64	*0*	69	69	*0*	64	64	*0*
Inkjet printers and multi-functional devices	7	4	3	1	*2*	3	1	*2*	2	1	*1*
Laser printers, copiers and mfds	11	4	5	2	*3*	4	1	*3*	3	1	*2*
Consumables: paper, ink, toner											
Standby of devices regulated only for Standby	40	142	140	77	*63*	137	72	*65*	134	73	*61*
EPS External Power Supplies (excl. double)	1	26	32	22	*11*	29	18	*11*	25	18	*6*
TOTAL ELECTRONICS	**289**	**709**	**753**	**543**	**210**	**744**	**420**	**323**	**690**	**444**	**246**
RF Household Refrigeration	681	573	544	288	*256*	535	193	*342*	534	124	*410*
TOTAL FOOD PRESERVATION	**681**	**573**	**544**	**288**	**256**	**535**	**193**	**342**	**534**	**124**	**410**
CA Electric Hobs	124	166	189	185	*4*	211	203	*8*	255	245	*10*
CA Electric Ovens	113	108	99	88	*11*	99	74	*24*	105	76	*29*
CA Gas Hobs	161	112	97	96	*0*	85	84	*2*	69	67	*1*
CA Gas Ovens	71	43	33	32	*1*	29	24	*5*	25	19	*6*
CA Range Hoods	48	49	51	49	*3*	55	43	*12*	67	47	*20*
TOTAL COOKING	**517**	**479**	**469**	**450**	***20***	**479**	**428**	***51***	**521**	**454**	***67***
WM Washing Machines (excl. cons.)	274	191	161	99	*62*	136	82	*54*	100	80	*20*
WD Washer-Dryers (excl. cons.)	46	45	40	32	*8*	35	29	*5*	30	29	*1*
WM & WD detergent and water costs											
DW Household Dishwashers (excl. cons.)	63	96	121	86	*34*	145	98	*47*	187	119	*68*
DW detergent and water costs											
LD household Laundry Dryer	49	83	69	55	*14*	68	40	*28*	66	35	*30*
VC Vacuum Cleaners (excl. cons.)	51	66	93	56	*37*	95	50	*45*	86	60	*26*
VC bags & filters costs											
TOTAL CLEANING	**482**	**481**	**483**	**328**	***156***	**479**	**300**	***179***	**469**	**323**	***146***
WP Water pumps	133	148	158	155	*3*	170	167	*3*	215	214	*2*
TOTAL INDUSTRY COMPONENTS	**133**	**148**	**158**	**155**	***3***	**170**	**167**	***3***	**215**	**214**	***2***
Tyres C1, for cars, total	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TRANSPORT SECTOR	**2553**	**1596**	**1344**	**1251**	***93***	**1271**	**1128**	***142***	**1055**	**985**	***70***
TOTAL per EU household (direct)	**21143**	**16265**	**13674**	**11966**	***1708***	**11749**	**9205**	***2544***	**10918**	**8140**	***2778***
	Final Energy, kWh/a / household										
TOTAL per EU household (indirect)	**16141**	**15824**	**15389**	**14387**	***1003***	**15167**	**13130**	***2037***	**15313**	**13414**	***1899***

Summary per functional group per household	Final Energy, kWh/a / household										
	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WATER HEATING	1433	1722	1491	1388	*103*	1341	1124	*217*	1464	1141	*323*
SPACE HEATING	14573	9929	7870	7265	*604*	6350	5214	*1136*	5598	4163	*1436*
SPACE COOLING	15	98	67	45	*22*	67	47	*20*	90	66	*24*
VENTILATION	17	38	43	39	*4*	65	51	*14*	125	96	*29*
LIGHTING	450	494	452	214	*238*	248	132	*115*	156	131	*26*
ELECTRONICS	289	709	753	543	*210*	744	420	*323*	690	444	*246*
FOOD PRESERVE	681	573	544	288	*256*	535	193	*342*	534	124	*410*
COOKING	517	479	469	450	*20*	479	428	*51*	521	454	*67*
CLEANING	482	481	483	328	*156*	479	300	*179*	469	323	*146*
INDUSTRY COMPONENTS	133	148	158	155	*3*	170	167	*3*	215	214	*2*
TYRES	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TOTAL per EU household (direct)	**21143**	**16265**	**13674**	**11966**	***1708***	**11749**	**9205**	***2544***	**10918**	**8140**	***2778***
TOTAL per EU household (indirect)	16141	15824	15389	14387	*1003*	15167	13130	*2037*	15313	13414	*1899*
TOTAL per EU household (direct and indirect)	37284	32089	29063	26353	*2711*	26916	22336	*4580*	26231	21554	*4677*

Final Energy per household
ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a

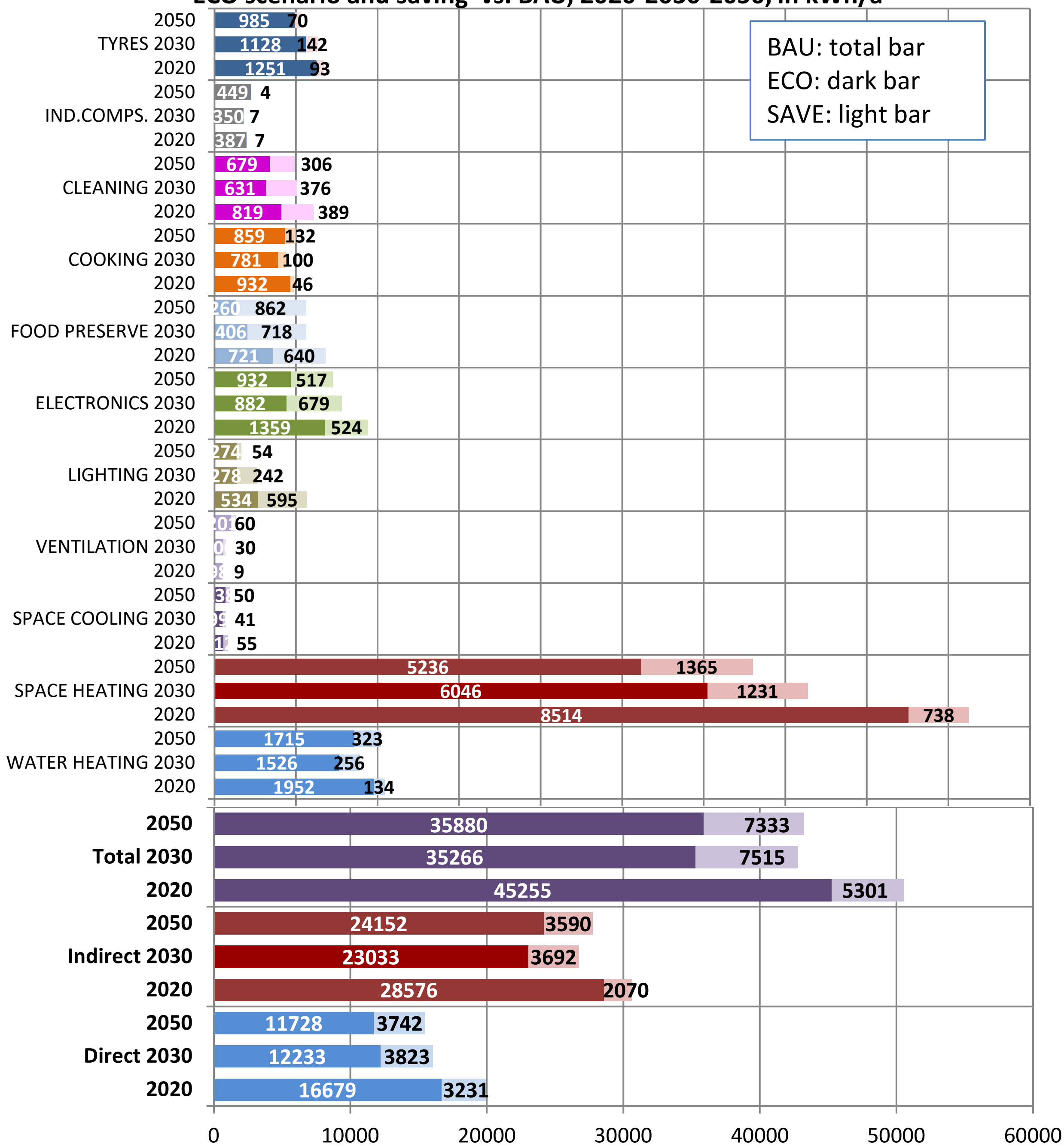


Parameters per Household (hh)	Primary Energy, kWh/a / household										
(residential products only)	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
Primary Energy Factor for electricity	**2.5**	**2.5**	**2.5**	**2.5**	**2.5**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**	**2.1**
WH dedicated Water Heater	976	1087	991	921	*70*	819	702	*118*	1021	887	*134*
CHC Central Heating combi, water heating	964	1246	1095	1031	*64*	963	824	*139*	1016	828	*188*
TOTAL WATER HEATING	**1940**	**2333**	**2086**	**1952**	***134***	**1782**	**1526**	***256***	**2037**	**1715**	***323***
CHB Central Heating boiler, space heating	9036	7577	5752	5223	*529*	4478	3566	*913*	3736	2717	*1020*
SFB Solid Fuel Boilers	4207	1120	978	960	*18*	666	624	*41*	662	620	*42*
AHC central Air Cooling	6	15	15	15	*0*	12	11	*1*	11	10	*1*
AHC central Air Heating	33	33	27	26	*1*	21	17	*3*	14	12	*2*
LH Local Space Heaters	2916	2429	2132	2059	*73*	1721	1552	*169*	1551	1351	*200*
RAC Room Air Conditioners < 12 kW, cooling	31	230	152	97	*55*	129	88	*40*	178	128	*49*
RAC Room Air Conditioners < 12 kW, heating	12	262	286	199	*88*	341	257	*84*	599	510	*90*
CIRC Circulator pumps <2.5 kW excl. double	84	98	76	47	*29*	50	29	*21*	38	27	*11*
TOTAL SPACE HEATING (incl. rev.AC)	**16288**	**11519**	**9252**	**8514**	**738**	**7277**	**6046**	**1231**	**6600**	**5236**	**1365**
TOTAL SPACE COOLING	**37**	**245**	**167**	**112**	***55***	**140**	**99**	***41***	**188**	**138**	***50***
R-UVU ≤ 100 m3/h, small unidirectional	0	1	1	1	*0*	1	0	*0*	1	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	1	3	3	*0*	15	13	*2*	50	42	*8*
R-UVU > 100 m3/h, large unidirectional	43	83	88	80	*8*	78	57	*21*	83	56	*28*
R-BVU > 100 m3/h, large, bidirectional	1	10	16	15	*1*	43	36	*7*	128	103	*25*
TOTAL VENTILATION	**44**	**95**	**107**	**98**	***9***	**136**	**106**	***30***	**262**	**201**	***60***
non-LED light sources	1125	1234	1090	398	*692*	383	68	*315*	72	6	*66*
LED light sources	0	0	39	136	*-97*	137	210	*-73*	256	268	*-12*
TOTAL LIGHTING	**1125**	**1235**	**1129**	**534**	***595***	**520**	**278**	***242***	**328**	**274**	***54***
DP Electronic displays, TVs	394	785	913	710	*203*	792	376	*417*	719	436	*283*
DP Electronic displays, Monitors	7	87	34	17	*17*	24	8	*16*	16	7	*9*
STB Set Top Boxes	0	129	210	151	*58*	148	112	*36*	144	111	*33*
GC Game consoles	0	65	117	66	*52*	90	47	*43*	91	48	*43*
PC Personal Computers	175	265	160	160	*0*	145	145	*0*	135	135	*0*
Inkjet printers and multi-functional devices	17	10	7	3	*5*	5	2	*4*	4	1	*3*
Laser printers, copiers and mfds	27	11	11	5	*7*	8	3	*5*	7	3	*5*
Consumables: paper, ink, toner											
Standby of devices regulated only for Standby	100	355	350	193	*157*	288	152	*136*	282	153	*129*
EPS External Power Supplies (excl. double)	2	64	81	54	*26*	61	37	*24*	52	39	*13*
TOTAL ELECTRONICS	**723**	**1773**	**1883**	**1359**	**524**	**1562**	**882**	**679**	**1450**	**932**	**517**
RF Household Refrigeration	1702	1432	1360	721	*640*	1124	406	*718*	1122	260	*862*
TOTAL FOOD PRESERVATION	**1702**	**1432**	**1360**	**721**	**640**	**1124**	**406**	**718**	**1122**	**260**	**862**
CA Electric Hobs	310	415	473	462	*11*	443	427	*16*	536	515	*21*
CA Electric Ovens	282	270	247	220	*27*	207	156	*51*	220	159	*61*
CA Gas Hobs	161	112	97	96	*0*	85	84	*2*	69	67	*1*
CA Gas Ovens	71	43	33	32	*1*	29	24	*5*	25	19	*6*
CA Range Hoods	120	124	128	122	*6*	116	91	*26*	141	99	*42*
TOTAL COOKING	**944**	**964**	**978**	**932**	***46***	**881**	**781**	***100***	**991**	**859**	***132***
WM Washing Machines (excl. cons.)	685	477	403	247	*155*	287	172	*114*	210	167	*43*
WD Washer-Dryers (excl. cons.)	114	113	100	80	*19*	73	62	*11*	63	62	*2*
WM & WD detergent and water costs											
DW Household Dishwashers (excl. cons.)	157	241	302	216	*86*	304	207	*98*	393	250	*143*
DW detergent and water costs											
LD household Laundry Dryer	122	207	173	136	*36*	144	85	*59*	138	74	*64*
VC Vacuum Cleaners (excl. cons.)	127	164	232	139	*93*	200	106	*94*	180	126	*55*
VC bags & filters costs											
TOTAL CLEANING	**1205**	**1202**	**1208**	**819**	***389***	**1007**	**631**	***376***	**985**	**679**	***306***
WP Water pumps	333	370	394	387	*7*	357	350	*7*	452	449	*4*
TOTAL INDUSTRY COMPONENTS	**333**	**370**	**394**	**387**	***7***	**357**	**350**	***7***	**452**	**449**	***4***
Tyres C1, for cars, total	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TRANSPORT SECTOR	**2553**	**1596**	**1344**	**1251**	***93***	**1271**	**1128**	***142***	**1055**	**985**	***70***
TOTAL per EU household (direct)	**26894**	**22763**	**19910**	**16679**	***3231***	**16057**	**12233**	***3823***	**15470**	**11728**	***3742***
	Primary Energy, kWh/a / household										
TOTAL per EU household (indirect)	**27327**	**30066**	**30646**	**28576**	***2070***	**26725**	**23033**	***3692***	**27743**	**24152**	***3590***

Summary per functional group per household	1990	2010	2020 BAU	2020 ECO	2020 *Save*	2030 BAU	2030 ECO	2030 *Save*	2050 BAU	2050 ECO	2050 *Save*
	Primary Energy, kWh/a / household										
WATER HEATING	1940	2333	2086	1952	*134*	1782	1526	*256*	2037	1715	*323*
SPACE HEATING	16288	11519	9252	8514	*738*	7277	6046	*1231*	6600	5236	*1365*
SPACE COOLING	37	245	167	112	*55*	140	99	*41*	188	138	*50*
VENTILATION	44	95	107	98	*9*	136	106	*30*	262	201	*60*
LIGHTING	1125	1235	1129	534	*595*	520	278	*242*	328	274	*54*
ELECTRONICS	723	1773	1883	1359	*524*	1562	882	*679*	1450	932	*517*
FOOD PRESERVE	1702	1432	1360	721	*640*	1124	406	*718*	1122	260	*862*
COOKING	944	964	978	932	*46*	881	781	*100*	991	859	*132*
CLEANING	1205	1202	1208	819	*389*	1007	631	*376*	985	679	*306*
INDUSTRY COMPONENTS	333	370	394	387	*7*	357	350	*7*	452	449	*4*
TYRES	2553	1596	1344	1251	*93*	1271	1128	*142*	1055	985	*70*
TOTAL per EU household (direct)	**26894**	**22763**	**19910**	**16679**	***3231***	**16057**	**12233**	***3823***	**15470**	**11728**	***3742***
TOTAL per EU household (indirect)	27327	30066	30646	28576	*2070*	26725	23033	*3692*	27743	24152	*3590*
TOTAL per EU household (direct and indirect)	54220	52829	50556	45255	*5301*	42781	35266	*7515*	43213	35880	*7333*

Primary Energy per household

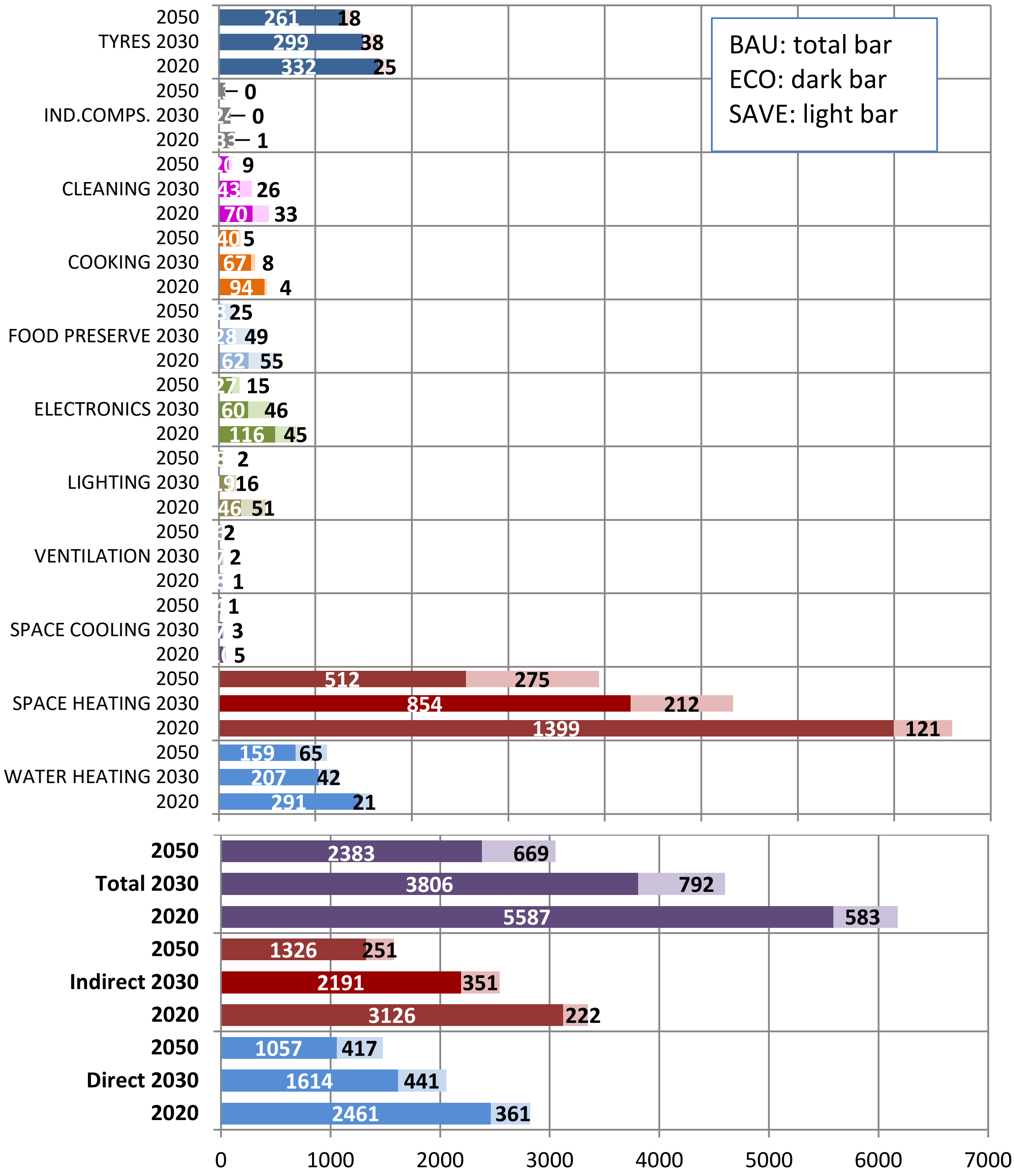
ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



Parameters per Household (hh)	GHG Emissions, kgCO2eq/a / household										
(residential products only)	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WH dedicated Water Heater	195	150	97	89	*8*	66	55	*11*	40	34	*6*
CHC Central Heating combi, water heating	217	258	215	202	*13*	183	152	*31*	183	125	*58*
TOTAL WATER HEATING	**412**	**408**	**312**	**291**	***21***	**249**	**207**	***42***	**224**	**159**	***65***
CHB Central Heating boiler, space heating	2120	1636	1166	1063	*104*	864	675	*190*	674	413	*261*
SFB Solid Fuel Boilers	892	220	167	165	*2*	78	73	*5*	46	42	*5*
AHC central Air Cooling	1	2	1	1	*0*	1	1	*0*	0	0	*0*
AHC central Air Heating	7	5	4	4	*0*	3	2	*0*	1	1	*0*
LH Local Space Heaters	512	259	153	147	*6*	94	85	*9*	47	41	*6*
RAC Room Air Conditioners < 12 kW, cooling	6	29	13	8	*5*	9	6	*3*	5	4	*1*
RAC Room Air Conditioners < 12 kW, heating	2	33	24	17	*8*	23	17	*6*	17	15	*3*
CIRC Circulator pumps <2.5 kW excl. double	17	12	7	4	*2*	3	2	*1*	1	1	*0*
TOTAL SPACE HEATING (incl. rev.AC)	**3551**	**2167**	**1521**	**1399**	**121**	**1066**	**854**	**212**	**788**	**512**	**275**
TOTAL SPACE COOLING	**7**	**31**	**14**	**10**	***5***	**10**	**7**	***3***	**5**	**4**	***1***
R-UVU ≤ 100 m3/h, small unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	0	0	0	*0*	1	1	*0*	1	1	*0*
R-UVU > 100 m3/h, large unidirectional	9	11	7	7	*1*	5	4	*1*	2	2	*1*
R-BVU > 100 m3/h, large, bidirectional	0	1	1	1	*0*	3	2	*0*	4	3	*1*
TOTAL VENTILATION	**9**	**12**	**9**	**8**	***1***	**9**	**7**	***2***	**8**	**6**	***2***
non-LED light sources	225	157	93	34	*59*	26	5	*21*	2	0	*2*
LED light sources	0	0	3	12	*-8*	9	14	*-5*	7	8	*0*
TOTAL LIGHTING	**225**	**157**	**97**	**46**	***51***	**35**	**19**	***16***	**10**	**8**	***2***
DP Electronic displays, TVs	79	100	78	61	*17*	54	26	*28*	21	13	*8*
DP Electronic displays, Monitors	1	11	3	1	*1*	2	1	*1*	0	0	*0*
STB Set Top Boxes	0	16	18	13	*5*	10	8	*2*	4	3	*1*
GC Game consoles	0	8	10	6	*4*	6	3	*3*	3	1	*1*
PC Personal Computers	35	34	14	14	*0*	10	10	*0*	4	4	*0*
Inkjet printers and multi-functional devices	3	1	1	0	*0*	0	0	*0*	0	0	*0*
Laser printers, copiers and mfds	5	1	1	0	*1*	1	0	*0*	0	0	*0*
Consumables: paper, ink, toner											
Standby of devices regulated only for Standby	20	45	30	16	*13*	20	10	*9*	8	4	*4*
EPS External Power Supplies (excl. double)	0	8	7	5	*2*	4	3	*2*	2	1	*0*
TOTAL ELECTRONICS	**145**	**225**	**161**	**116**	**45**	**106**	**60**	**46**	**42**	**27**	**15**
RF Household Refrigeration	340	182	116	62	*55*	76	28	*49*	33	8	*25*
TOTAL FOOD PRESERVATION	**340**	**182**	**116**	**62**	**55**	**76**	**28**	**49**	**33**	**8**	**25**
CA Electric Hobs	62	53	40	40	*1*	30	29	*1*	16	15	*1*
CA Electric Ovens	56	34	21	19	*2*	14	11	*3*	6	5	*2*
CA Gas Hobs	32	22	19	19	*0*	17	17	*0*	14	13	*0*
CA Gas Ovens	14	9	7	6	*0*	6	5	*1*	5	4	*1*
CA Range Hoods	24	16	11	10	*1*	8	6	*2*	4	3	*1*
TOTAL COOKING	**188**	**134**	**98**	**94**	***4***	**75**	**67**	***8***	**45**	**40**	***5***
WM Washing Machines (excl. cons.)	137	61	34	21	*13*	19	12	*8*	6	5	*1*
WD Washer-Dryers (excl. cons.)	23	14	9	7	*2*	5	4	*1*	2	2	*0*
WM & WD detergent and water costs											
DW Household Dishwashers (excl. cons.)	31	31	26	18	*7*	21	14	*7*	11	7	*4*
DW detergent and water costs											
LD household Laundry Dryer	24	26	15	12	*3*	10	6	*4*	4	2	*2*
VC Vacuum Cleaners (excl. cons.)	25	21	20	12	*8*	14	7	*6*	5	4	*2*
VC bags & filters costs											
TOTAL CLEANING	**241**	**153**	**103**	**70**	***33***	**68**	**43**	***26***	**29**	**20**	***9***
WP Water pumps	67	47	34	33	*1*	24	24	*0*	13	13	*0*
TOTAL INDUSTRY COMPONENTS	**67**	**47**	**34**	**33**	***1***	**24**	**24**	***0***	**13**	**13**	***0***
Tyres C1, for cars, total	677	423	357	332	*25*	337	299	*38*	280	261	*18*
TRANSPORT SECTOR	**677**	**423**	**357**	**332**	***25***	**337**	**299**	***38***	**280**	**261**	***18***
TOTAL per EU household (direct)	**5861**	**3939**	**2822**	**2461**	***361***	**2055**	**1614**	***441***	**1475**	**1057**	***417***
	GHG Emissions, kgCO2eq/a / household										
TOTAL per EU household (indirect)	**5810**	**4464**	**3347**	**3126**	***222***	**2543**	**2191**	***351***	**1577**	**1326**	***251***

Summary per functional group per household	GHG Emissions, kgCO2eq/a / household										
	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WATER HEATING	412	408	312	291	*21*	249	207	*42*	224	159	*65*
SPACE HEATING	3551	2167	1521	1399	*121*	1066	854	*212*	788	512	*275*
SPACE COOLING	7	31	14	10	*5*	10	7	*3*	5	4	*1*
VENTILATION	9	12	9	8	*1*	9	7	*2*	8	6	*2*
LIGHTING	225	157	97	46	*51*	35	19	*16*	10	8	*2*
ELECTRONICS	145	225	161	116	*45*	106	60	*46*	42	27	*15*
FOOD PRESERVE	340	182	116	62	*55*	76	28	*49*	33	8	*25*
COOKING	188	134	98	94	*4*	75	67	*8*	45	40	*5*
CLEANING	241	153	103	70	*33*	68	43	*26*	29	20	*9*
INDUSTRY COMPONENTS	67	47	34	33	*1*	24	24	*0*	13	13	*0*
TYRES	677	423	357	332	*25*	337	299	*38*	280	261	*18*
TOTAL per EU household (direct)	**5861**	**3939**	**2822**	**2461**	***361***	**2055**	**1614**	***441***	**1475**	**1057**	***417***
TOTAL per EU household (indirect)	5810	4464	3347	3126	*222*	2543	2191	*351*	1577	1326	*251*
TOTAL per EU household (direct and indirect)	11671	8403	6170	5587	*583*	4598	3806	*792*	3052	2383	*669*

Greenhouse gas emissions per household
ECO scenario and saving vs. BAU, 2020-2030-2050, in kgCO2/a

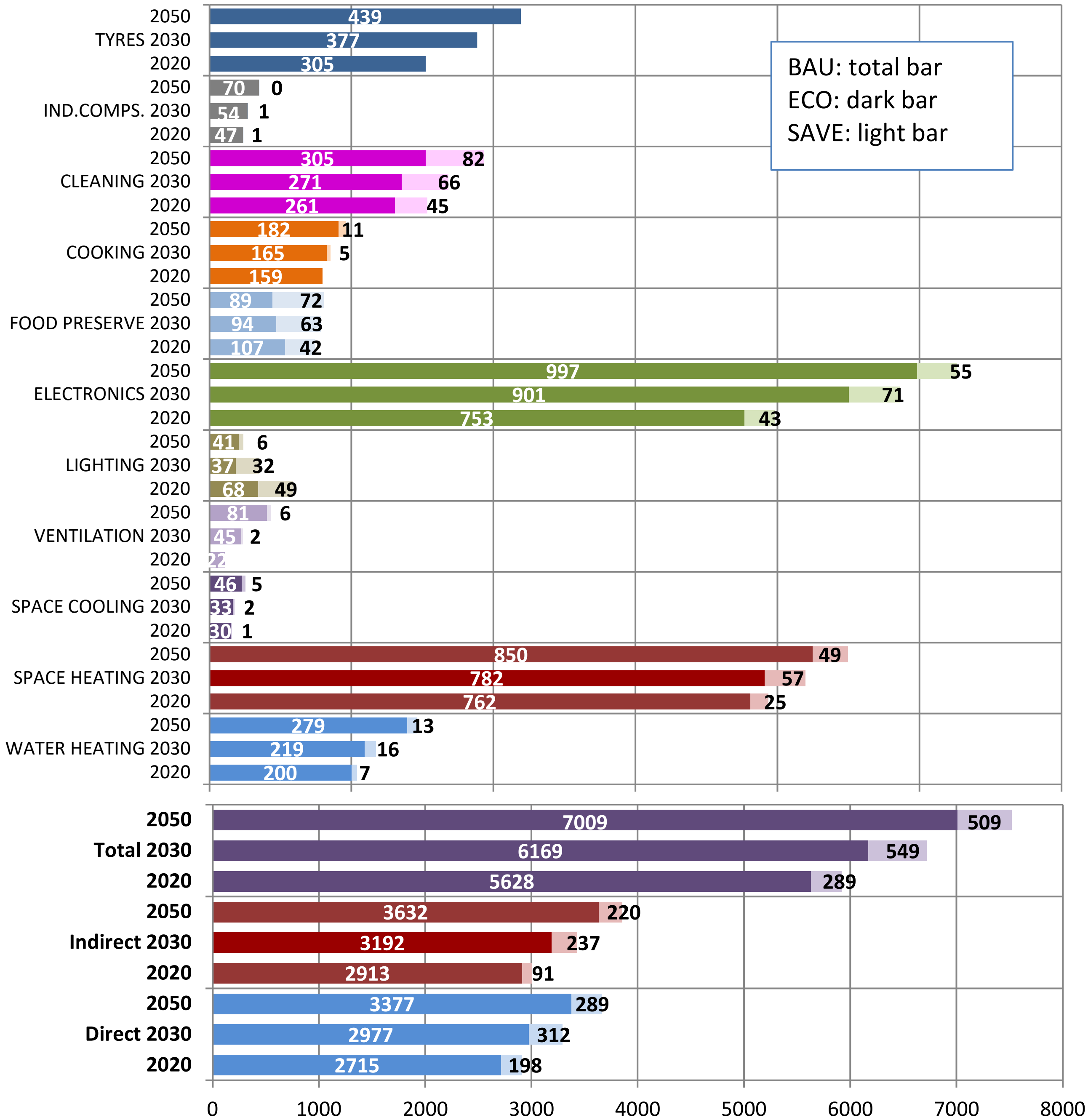


Parameters per Household (hh)	**User Expense, 2020 euros/a / household (incl. VAT)**										
(residential products only)	**1990**	**2010**	**2020**			**2030**			**2050**		
			BAU	**ECO**	***Save***	**BAU**	**ECO**	***Save***	**BAU**	**ECO**	***Save***
WH dedicated Water Heater	118	121	118	113	*5*	127	115	*12*	164	150	*14*
CHC Central Heating combi, water heating	77	121	90	88	*2*	108	103	*4*	129	129	*-1*
TOTAL WATER HEATING	**195**	**242**	**208**	**200**	***7***	**235**	**219**	***16***	**292**	**279**	***13***
CHB Central Heating boiler, space heating	598	730	468	446	*22*	517	473	*44*	526	500	*26*
SFB Solid Fuel Boilers	126	60	46	47	*0*	41	41	*0*	58	58	*0*
AHC central Air Cooling	1	3	3	3	*0*	4	4	*0*	5	5	*0*
AHC central Air Heating	2	3	3	3	*0*	3	3	*0*	3	2	*0*
LH Local Space Heaters	274	226	226	229	*-3*	218	214	*4*	212	200	*12*
RAC Room Air Conditioners < 12 kW, cooling	5	36	28	27	*1*	31	29	*2*	46	41	*5*
RAC Room Air Conditioners < 12 kW, heating	1	26	32	27	*5*	50	43	*7*	92	83	*9*
CIRC Circulator pumps <2.5 kW excl. double	12	13	11	10	*1*	10	8	*1*	8	7	*1*
TOTAL SPACE HEATING (incl. rev.AC)	**1013**	**1058**	**787**	**762**	**25**	**839**	**782**	**57**	**899**	**850**	**49**
TOTAL SPACE COOLING	**6**	**39**	**31**	**30**	***1***	**35**	**33**	***2***	**51**	**46**	***5***
R-UVU ≤ 100 m3/h, small unidirectional	0	0	0	0	*0*	0	0	*0*	0	0	*0*
R-BVU ≤ 100 m3/h, small bi-directional	0	1	2	2	*0*	11	11	*0*	28	27	*1*
R-UVU > 100 m3/h, large unidirectional	7	13	14	15	*0*	15	14	*2*	17	15	*2*
R-BVU > 100 m3/h, large, bidirectional	0	3	5	5	*0*	20	19	*1*	42	39	*3*
TOTAL VENTILATION	**7**	**16**	**21**	**22**	***0***	**47**	**45**	***2***	**87**	**81**	***6***
non-LED light sources	108	106	104	37	*67*	47	6	*41*	8	0	*7*
LED light sources	0	0	13	32	*-18*	23	32	*-9*	40	41	*-1*
TOTAL LIGHTING	**108**	**106**	**117**	**68**	***49***	**70**	**37**	***32***	**47**	**41**	***6***
DP Electronic displays, TVs	143	204	174	157	*17*	211	167	*44*	208	177	*30*
DP Electronic displays, Monitors	7	18	9	8	*1*	9	7	*2*	8	7	*1*
STB Set Top Boxes	0	39	45	40	*5*	42	39	*4*	42	39	*4*
GC Game consoles	1	27	30	26	*4*	30	25	*4*	30	26	*5*
PC Personal Computers	74	307	349	349	*0*	490	490	*0*	567	567	*0*
Inkjet printers and multi-functional devices	6	8	3	3	*0*	3	3	*0*	2	2	*0*
Laser printers, copiers and mfds	6	9	9	9	*1*	8	8	*1*	7	7	*0*
Consumables: paper, ink, toner	21	31	14	14	*0*	9	9	*0*	7	7	*0*
Standby of devices regulated only for Standby	86	135	146	133	*13*	154	139	*14*	164	151	*14*
EPS External Power Supplies (excl. double)	1	15	16	14	*2*	16	14	*2*	16	15	*1*
TOTAL ELECTRONICS	**345**	**792**	**796**	**753**	**43**	**972**	**901**	**71**	**1052**	**997**	**55**
RF Household Refrigeration	191	141	149	107	*42*	157	94	*63*	161	89	*72*
TOTAL FOOD PRESERVATION	**191**	**141**	**149**	**107**	**42**	**157**	**94**	**63**	**161**	**89**	**72**
CA Electric Hobs	43	60	72	72	*0*	82	82	*0*	99	98	*1*
CA Electric Ovens	53	48	51	50	*1*	51	46	*5*	54	48	*7*
CA Gas Hobs	20	16	11	12	*0*	12	12	*0*	10	10	*0*
CA Gas Ovens	8	7	5	6	*-1*	5	6	*-1*	5	5	*0*
CA Range Hoods	17	16	18	19	*-1*	20	20	*0*	25	21	*3*
TOTAL COOKING	**141**	**147**	**157**	**159**	***-3***	**170**	**165**	***5***	**193**	**182**	***11***
WM Washing Machines (excl. cons.)	86	67	66	60	*6*	62	53	*9*	54	50	*5*
WD Washer-Dryers (excl. cons.)	12	11	11	9	*2*	10	9	*1*	9	9	*0*
WM & WD detergent and water costs	74	76	77	51	*26*	82	49	*34*	95	54	*41*
DW Household Dishwashers (excl. cons.)	24	36	48	48	*0*	60	56	*4*	81	70	*11*
DW detergent and water costs	8	15	21	15	*6*	28	19	*9*	45	29	*16*
LD household Laundry Dryer	16	22	25	28	*-2*	26	26	*0*	26	23	*3*
VC Vacuum Cleaners (excl. bags, filters)	26	35	50	43	*7*	61	51	*10*	69	64	*6*
VC bags & filters costs	6	9	8	8	*0*	8	8	*0*	7	7	*0*
TOTAL CLEANING	**253**	**270**	**306**	**261**	***45***	**336**	**271**	***66***	**387**	**305**	***82***
WP Water pumps	42	40	48	47	*1*	54	54	*1*	70	70	*0*
TOTAL INDUSTRY COMPONENTS	42	40	48	47	*1*	54	54	*1*	70	70	*0*
Tyres C1, for cars, total	362	342	293	305	*-12*	373	377	*-4*	428	439	*-11*
TRANSPORT SECTOR	**362**	**342**	**293**	**305**	***-12***	**373**	**377**	***-4***	**428**	**439**	***-11***
TOTAL per EU household (direct)	**2662**	**3195**	**2913**	**2715**	***198***	**3289**	**2977**	***312***	**3666**	**3377**	***289***
	User Expense, 2020 euros/a / household (excl. VAT)										
TOTAL per EU household (indirect)	**2153**	**2893**	**3004**	**2913**	***91***	**3429**	**3192**	***237***	**3852**	**3632**	***220***

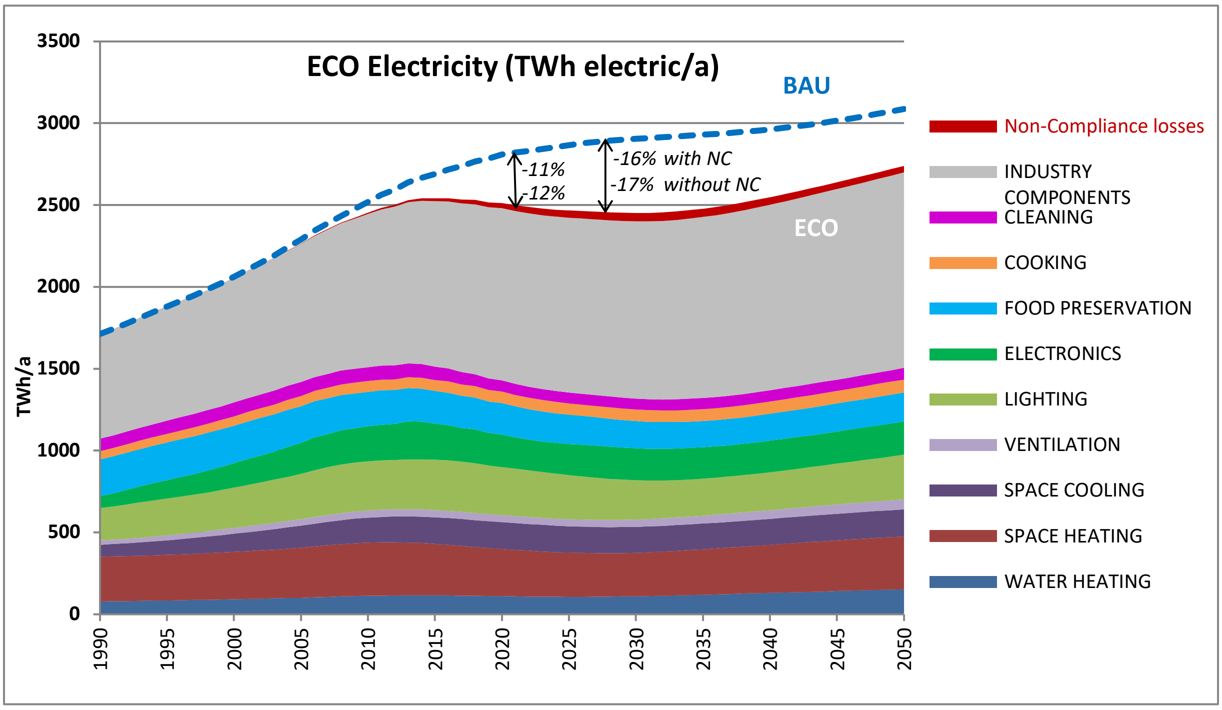
Households

Summary per functional group per household	User Expense, 2020 euros/a / household (incl. VAT)										
	1990	2010	2020			2030			2050		
			BAU	ECO	*Save*	BAU	ECO	*Save*	BAU	ECO	*Save*
WATER HEATING	195	242	208	200	*7*	235	219	*16*	292	279	*13*
SPACE HEATING	1013	1058	787	762	*25*	839	782	*57*	899	850	*49*
SPACE COOLING	6	39	31	30	*1*	35	33	*2*	51	46	*5*
VENTILATION	7	16	21	22	*0*	47	45	*2*	87	81	*6*
LIGHTING	108	106	117	68	*49*	70	37	*32*	47	41	*6*
ELECTRONICS	345	792	796	753	*43*	972	901	*71*	1052	997	*55*
FOOD PRESERVE	191	141	149	107	*42*	157	94	*63*	161	89	*72*
COOKING	141	147	157	159	*-3*	170	165	*5*	193	182	*11*
CLEANING	253	270	306	261	*45*	336	271	*66*	387	305	*82*
INDUSTRY COMPONENTS	42	40	48	47	*1*	54	54	*1*	70	70	*0*
TYRES	362	342	293	305	*-12*	373	377	*-4*	428	439	*-11*
TOTAL per EU household (direct)	**2662**	**3195**	**2913**	**2715**	***198***	**3289**	**2977**	***312***	**3666**	**3377**	***289***
TOTAL per EU household (indirect)	2153	2893	3004	2913	*91*	3429	3192	*237*	3852	3632	*220*
TOTAL per EU household (direct and indirect)	4815	6089	5917	5628	*289*	6717	6169	*549*	7518	7009	*509*

User expense per household (incl. VAT, 2020 euros)
ECO scenario and saving vs. BAU, 2020-2030-2050, in euros/a

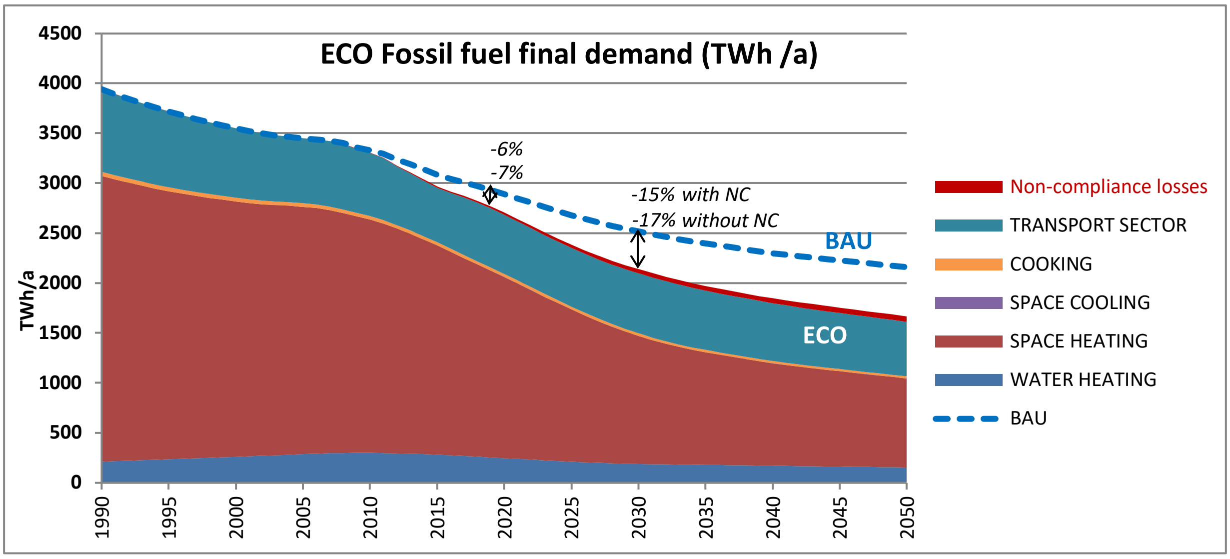


Effects of Non-Compliance (NC) on EIA Totals		**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
(preliminary estimate)											
Savings lost due to non-compliance (NCloss)		10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
ELECTRICITY, Totals incl. Energy sector vs BAU	TWh										
ELECBAU		1711	2520	2690	2808	2865	2905	2929	2962	3015	3086
ELECECO (without Non-Compliance)		1711	2445	2521	2473	2411	2383	2402	2468	2556	2649
ELECSAVE (without Non-Compliance)		0	75	168	335	454	522	527	494	460	437
ELEC savings lost due to Non-Compliance		0	8	17	33	45	52	53	49	46	44
ELECECO-NC (with Non-Compliance)		1711	2452	2538	2507	2456	2435	2455	2517	2602	2692
ELECSAVE-NC (with Non-Compliance)		0	68	152	301	409	470	475	445	414	394
% saving vs BAU (without Non-Compliance)		*0%*	*-3%*	*-6%*	*-12%*	*-16%*	*-18%*	*-18%*	*-17%*	*-15%*	*-14%*
% saving vs BAU (with Non-Compliance)		*0%*	*-3%*	*-6%*	*-11%*	*-14%*	*-16%*	*-16%*	*-15%*	*-14%*	*-13%*
ELECTRICITY, Totals excl. Energy sector	TWh										
ELECBAU		1711	2520	2690	2808	2865	2905	2929	2962	3015	3086
ELECECO (without Non-Compliance)		1711	2445	2523	2479	2422	2399	2426	2501	2597	2699
ELECSAVE (without Non-Compliance)		0	75	167	329	444	505	503	461	419	388
ELEC savings lost due to Non-Compliance		0	8	17	33	44	51	50	46	42	39
ELECECO-NC (with Non-Compliance)		1711	2452	2540	2512	2466	2450	2477	2547	2638	2737
ELECSAVE-NC (with Non-Compliance)		0	68	150	296	399	455	453	415	377	349
% saving vs BAU (without Non-Compliance)		*0%*	*-3%*	*-6%*	*-12%*	*-15%*	*-17%*	*-17%*	*-16%*	*-14%*	*-13%*
% saving vs BAU (with Non-Compliance)		*0%*	*-3%*	*-6%*	*-11%*	*-14%*	*-16%*	*-15%*	*-14%*	*-13%*	*-11%*

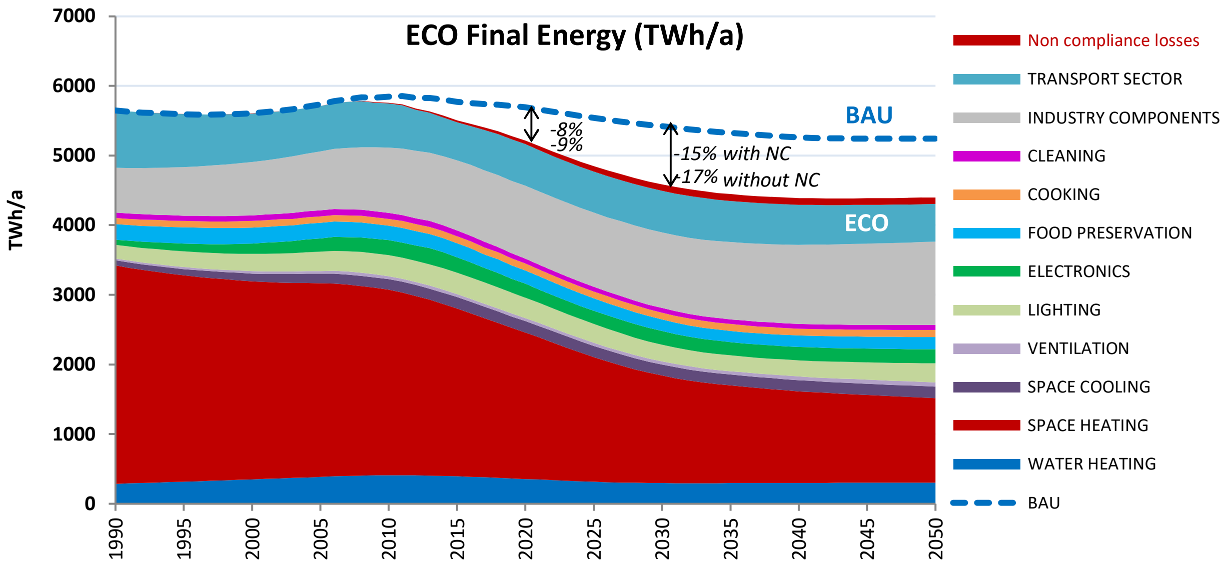


		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
FUEL, Totals (Energy sector vs BAU is zero)	TWh										
FUELBAU		3940	3329	3082	2888	2678	2516	2395	2297	2226	2158
FUELECO (without Non-Compliance)		3940	3303	2954	2686	2351	2099	1925	1795	1698	1610
FUELSAVE (without Non-Compliance)		0	25	129	202	327	417	470	502	528	547
FUEL savings lost due to Non-Compliance		0	3	13	20	33	42	47	50	53	55
FUELECO-NC (with Non-Compliance)		3940	3306	2966	2706	2383	2141	1972	1845	1751	1665
FUELSAVE-NC (with Non-Compliance)		0	23	116	182	294	375	423	452	475	493
% saving vs BAU (without Non-Compliance)		*0%*	*-1%*	*-4%*	*-7%*	*-12%*	*-17%*	*-20%*	*-22%*	*-24%*	*-25%*
% saving vs BAU (with Non-Compliance)		*0%*	*-1%*	*-4%*	*-6%*	*-11%*	*-15%*	*-18%*	*-20%*	*-21%*	*-23%*

Effects of Non-Compliance (NC) on EIA Totals | 1990 | 2010 | 2015 | 2020 | 2025 | 2030 | 2035 | 2040 | 2045 | 2050

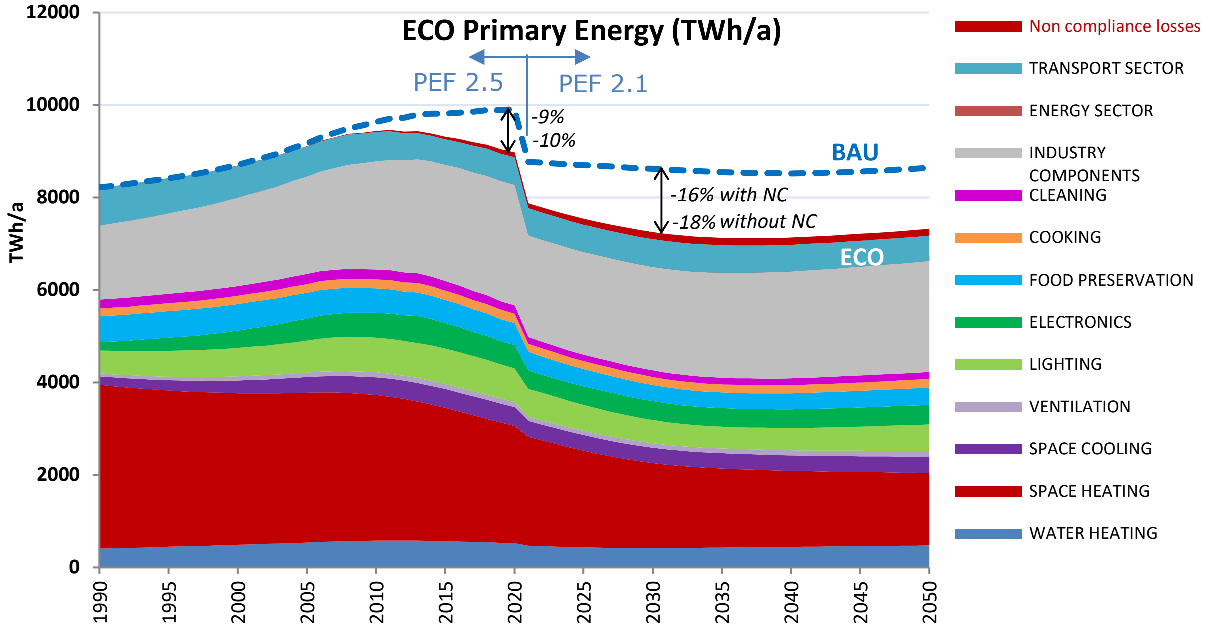


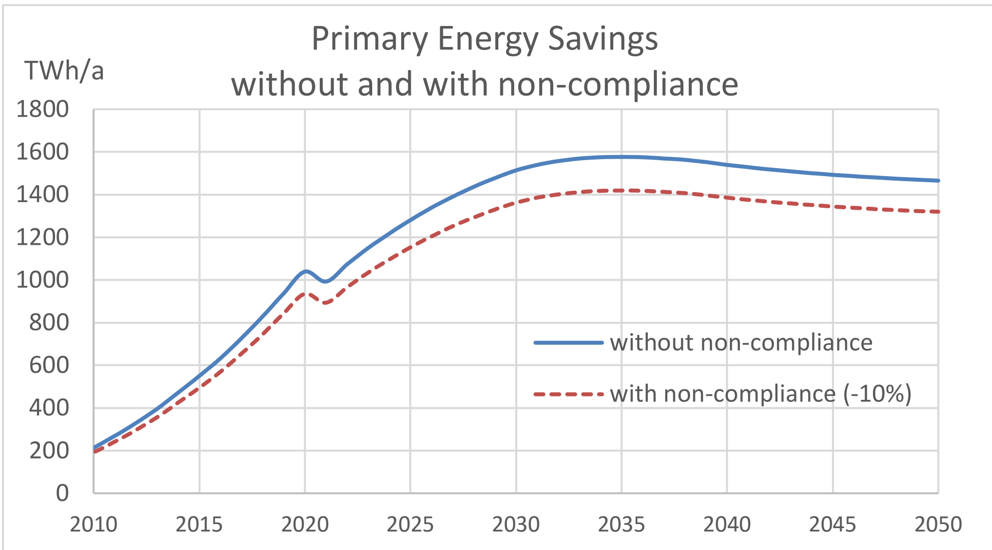
FINAL ENERGY, Totals excl. Energy sector	TWh									
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
FNRGBAU	5652	5849	5772	5696	5543	5420	5324	5259	5241	5244
FNRGECO (without Non-Compliance)	5652	5748	5476	5165	4772	4498	4351	4296	4294	4309
FNRGSAVE (without Non-Compliance)	0	101	296	531	771	922	973	963	946	935
FNRGECO-NC (with Non-Compliance)	5652	5758	5506	5218	4849	4590	4449	4392	4389	4402
FNRGSAVE-NC (with Non-Compliance)	0	91	266	478	694	830	875	867	852	841
FNRG savings lost due to Non-Compliance	0	10	30	53	77	92	97	96	95	93
% saving vs BAU (without Non-Compliance)	*0%*	*-2%*	*-5%*	*-9%*	*-14%*	*-17%*	*-18%*	*-18%*	*-18%*	*-18%*
% saving vs BAU (with Non-Compliance)	*0%*	*-2%*	*-5%*	*-8%*	*-13%*	*-15%*	*-16%*	*-16%*	*-16%*	*-16%*



PRIMARY ENERGY, Totals incl. Energy sector vs BAU	TWh									
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NRGBAU	8219	9629	9807	9908	8695	8616	8546	8517	8558	8638
NRGECO (without Non-Compliance)	8219	9415	9257	8869	7414	7102	6969	6978	7065	7173
NRGSAVE (without Non-Compliance)	0	214	550	1039	1281	1513	1577	1539	1493	1466
NRGECO-NC (with Non-Compliance)	8219	9436	9312	8973	7542	7253	7127	7131	7214	7319
NRGSAVE-NC (with Non-Compliance)	0	193	495	935	1153	1362	1419	1385	1344	1319
NRG savings lost due to Non-Compliance	0	21	55	104	128	151	158	154	149	147
% saving vs BAU (without Non-Compliance)	*0%*	*-2%*	*-6%*	*-10%*	*-15%*	*-18%*	*-18%*	*-18%*	*-17%*	*-17%*
% saving vs BAU (with Non-Compliance)	*0%*	*-2%*	*-5%*	*-9%*	*-13%*	*-16%*	*-17%*	*-16%*	*-16%*	*-15%*

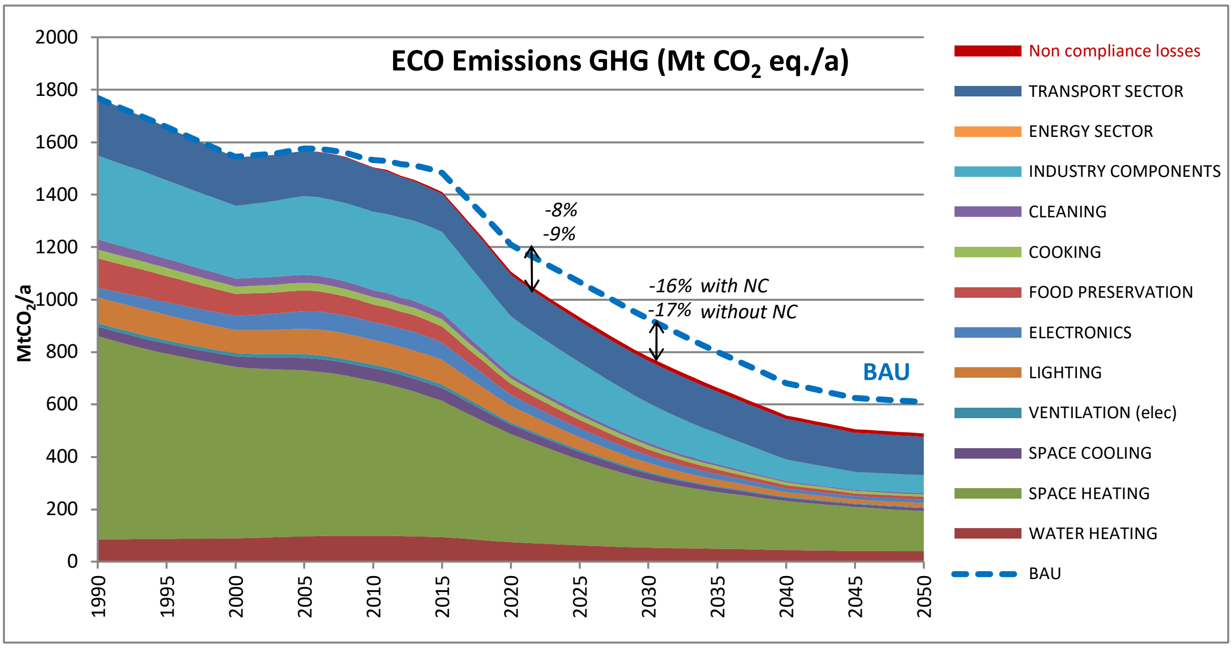
Effects of Non-Compliance (NC) on EIA Totals — **1990 2010 2015 2020 2025 2030 2035 2040 2045 2050**





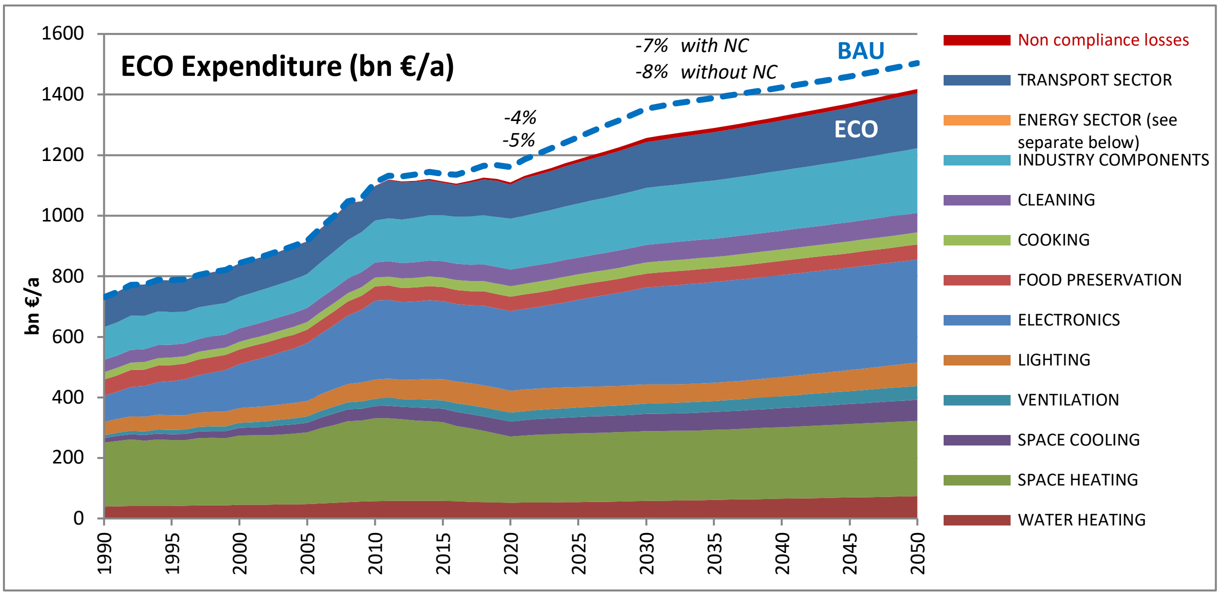
GHG-emissions, Totals incl. Energy sector vs BAU	MtCO2eq	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Temporary data (first estimate)										
EMISSBAU		1769	1531	1483	1209	1067	926	801	682	625	610
EMISSECO (without Non-Compliance)		1769	1502	1402	1095	918	766	649	545	493	476
EMISSSAVE (without Non-Compliance)		0	30	81	114	149	160	152	137	132	134
EMISS savings lost due to Non-Compliance		0	3	8	11	15	16	15	14	13	13
EMISSECO-NC (with Non-Compliance)		1769	1505	1410	1106	932	782	664	558	506	490
EMISSSAVE-NC (with Non-Compliance)		0	27	73	103	134	144	137	123	119	120
% saving vs BAU (without Non-Compliance)		*0%*	*-2%*	*-5%*	*-9%*	*-14%*	*-17%*	*-19%*	*-20%*	*-21%*	*-22%*
% saving vs BAU (with Non-Compliance)		*0%*	*-2%*	*-5%*	*-8%*	*-13%*	*-16%*	*-17%*	*-18%*	*-19%*	*-20%*

Effects of Non-Compliance (NC) on EIA Totals		**1990**	**2010**	**2015**	**2020**	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**



Energy costs, Totals incl. Energy sector vs BAU	bn euros	*Temporary data (first estimate)*									
NRGCOSTBAU		500	630	650	641	699	743	749	763	780	806
NRGCOSTECO (without Non-Compliance)		500	615	608	567	589	607	608	625	646	674
NRGCOSTSAVE (without Non-Compliance)		0	15	42	74	110	136	141	138	134	133
NRGCOST savings lost due to Non-Compliance		0	2	4	7	11	14	14	14	13	13
NRGCOSTECO-NC (with Non-Compliance)		500	616	612	574	600	621	622	638	659	687
NRGCOSTSAVE-NC (with Non-Compliance)		0	14	38	67	99	122	127	124	121	119
% saving vs BAU (without Non-Compliance)		*0%*	*-2%*	*-6%*	*-12%*	*-16%*	*-18%*	*-19%*	*-18%*	*-17%*	*-16%*
% saving vs BAU (with Non-Compliance)		*0%*	*-2%*	*-6%*	*-10%*	*-14%*	*-16%*	*-17%*	*-16%*	*-15%*	*-15%*

User Expense, Totals incl. Energy sector vs BAU	bn euros	*Temporary data (first estimate)*									
EXPENSBAU		730	1110	1138	1160	1260	1353	1388	1423	1459	1503
EXPENSECO (without Non-Compliance)		730	1097	1109	1103	1175	1242	1274	1313	1355	1401
EXPENSSAVE (without Non-Compliance)		0	13	29	57	85	110	114	110	104	102
EXPENS savings lost due to Non-Compliance		0	2	4	7	11	14	14	14	13	13
EXPENSECO-NC (with Non-Compliance)		730	1098	1113	1110	1186	1256	1288	1327	1368	1414
EXPENSSAVE-NC (with Non-Compliance)		0	11	25	49	74	97	100	96	91	88
% saving vs BAU (without Non-Compliance)		*0%*	*-1%*	*-3%*	*-5%*	*-7%*	*-8%*	*-8%*	*-8%*	*-7%*	*-7%*
% saving vs BAU (with Non-Compliance)		*0%*	*-1%*	*-2%*	*-4%*	*-6%*	*-7%*	*-7%*	*-7%*	*-6%*	*-6%*



year 2020	BAU	ECO no NC	ECO with NC	SAVE no NC	SAVE with NC	loss due to NC
Electricity (TWh/a)	2808	2473	2507	335	301	33
Final Fuel (TWh/a)	2888	2686	2706	202	182	20
Final Energy (TWh/a)	5696	5165	5218	531	478	53
Primary Energy (TWh/a)	9908	8869	8973	1039	935	104
GHG-emissions (MtCO2eq/a)	1209	1095	1106	114	103	11
Energy costs (bn euros/a)	641	567	574	74	67	7
User expense (bn euros/a)	1160	1103	1110	57	49	7

year 2030	BAU	ECO no NC	ECO with NC	SAVE no NC	SAVE with NC	loss due to NC
Electricity (TWh/a)	2905	2383	2435	522	470	52
Final Fuel (TWh/a)	2516	2099	2141	417	375	42
Final Energy (TWh/a)	5420	4498	4590	922	830	92
Primary Energy (TWh/a)	8616	7102	7253	1513	1362	151
GHG-emissions (MtCO2eq/a)	926	766	782	160	144	16
Energy costs (bn euros/a)	743	607	621	136	122	14
User expense (bn euros/a)	1353	1242	1256	110	97	14

Final Energy does not count savings for Distribution Transformers
Primary Energy: PEF 2.5 in 2020; PEF 2.1 in 2030
User Expense: assumes that NC does not change acquisition costs

ANNEX B: Status of measures per 31.12.2021

Ecodesign, Energy Labelling, Energy Star & Voluntary Agreements [status 31.12.2021]

Framework Directives		*repealed*	**ED**	**EL**	**ES**	**status**
	Ecodesign [ED]	Dir 2005/32/EC	Dir 2009/125/EC			rev.
	Energy Labelling [EL]	Dir 92/75/EEC Dir 2010/30		Reg 2017/1369		
	Energy Star [ES]	Dec 2001/469 Reg 2422/2001 Dec 2003/269			Reg 106/2008 Dec 2013/107	

Lot	**Product**	*repealed*	**ED**	**EL**	**ES (*)/ VA etc.**	
Space- and water heating/cooling						
2	WH dedicated Water Heater		CR 814/2013	CDR 812/2013		rev.
1	CH Central Heating boiler (incl. combi)	Dir 92/42/EEC Dir 2004/8 (CHP)	CR 813/2013	CDR 811/2013		rev.
15	SFB Solid Fuel Boilers		CR 2015/1189	CDR 2015/1187		
21 /E6	AHC Air Cooling & Heating (>12 kW)		CR 2016/2281			
20	LH Local Heaters		CR 2015/1185 CR 2015/1188	CDR 2015/1186		rev.
10	RAC Room Air Conditioner (<12 kW)	CD 2002/31	CR 206/2012	CDR 626/2011		rev.
11	CIRC Circulator pumps (<2.5 kW)		CR 641/2009, am 622/2012			rev.
E6 /10	VU Ventilation Units		CR 1253/2014			rev.
Lighting						
8 /9 /19	LS Light Sources	CD 98/11 am. 2015/1428 CDR 874/2012	CR 2019/2020 am. 2021/341	CDR 2019/2015 am. 2021/340		
	Tertiary sector (LFL, HID, ballast)	Dir 2000/55 (ballasts, MEPS) CR 245/2009, am 347/2010				
	NDLS Non Directional LS	CR 244/2009, am 859/2009				
	DLS Directional LS	CR 1194/2012				
Electronics						
5	DP electronic DisPlays	CR 642/2009, am 801/2013 CDR 1062/2010	CR 2019/2021 am. 2021/341	CDR 2019/2013 am. 2021/340	Cd 2016/1756* (displays 7.0)	
18	STB set top boxes (Complex & Simple)		CR 107/2009 (SSTB)		VA v4.0 2015 (CSTB) COM 2012 (684)	rev. [SSTB] VA: http://cstb.eu
E3	VIDEO recorders, players, games				VA v3.0 2020 (game consoles) COM 2015 (178)	www.efficientgaming.eu/
E9	Enterprise servers & Data Storage products		CR 2019/424 am. 2021/341		Cd 2014/202* (ES v2.0)	
3	PC Personal Computers		CR 617/2013		Cd 2015/1402* (computers 6.1)	rev. completed 2017
4	IE imaging equipment				Cd 2014/202* (Im.Eq. v2.0) VA v5.2 2015 (Im.Eq.) COM 2013 (23)	www. eurovaprint.eu
6 /26	SB (networked) Stand-By		CR 1275/2008, am 801/2013			rev. completed 2017, IA 2019
7	EPS External Power Supplies	CR 278/2009	CR 2019/1782			
27	UPS Uninterruptable Power Supplies				Cd 2014/202* (UPS v1.0)	prep. study 2014. No data in EIA.
Food preservation						
13	RF Household Refrigerators & freezers	CD 2003/66 (label) Dir 96/57 (MEPS) CR 643/2009 CDR 1060/2010	CR 2019/2019 am. 2021/341	CDR 2019/2016 am. 2021/340		
12	CF Commercial Refrigeration (refrigerating appliances with a direct sales function)		CR 2019/2024 am. 2021/341	CDR 2019/2014 am. 2021/340		
E1	PF Professional Refrigeration		CR 2015/1095	CDR 2015/1094		

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	

Cooking

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
22 /23	CA Cooking Appliances	CD 2002/40	CR 66/2014	CDR 65/2014		rev. 2021
25	CM household Coffee Makers		in CR 801/2013			see Lot 6/26

Cleaning

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
14	WM household Washing Machine	CD 95/12 (WM) CD 96/60 (WD) CR 1015/2010 cor(2010/L298/87) CDR 1061/2010	CR 2019/2023 am. 2021/341	CDR 2019/2014 am. 2021/340		
14	DW Household Dishwashers	CD 97/17 CR 1016/2010 CDR 1059/2013	CR 2019/2022 am. 2021/341	CDR 2019/2017 am. 2021/340		
16	LD household Laundry Dryers	CD 95/13	CR 932/2012	CDR 392/2012		rev.
17	VC Vacuum Cleaners		CR 666/2013	CDR 665/2013**		rev. 2019 draft IA 2022

Industrial components

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
11	FAN Industrial Fans (>125W)		CR 327/2011			draft IA 2016
11	MT Industrial motors (0.75-375 kW)	CR 640/2009, amendment 4/2014	CR 2019/1781 am. 2021/341			
30	MT Industrial & Special motors (0.12-1000 kW)		CR 2019/1781			
11	WP Water pumps		CR 547/2012			rev. 2019 draft IA 2022
28	Wastewater Pumps					rev. 2019
29	Pool- & acquarium pumps					rev. 2019
31	CP Standard Air Compressors					WD draft 10/2014; IA draft 9/2015; additional PS completed 2017
E5	Welding Equipment		CR 2019/1784			

Energy sector

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
E2	TRAFO Utility Transformers		CR 548/2014 am. 2019/1783			

Transportation sector

Lot	Product	*repealed*	ED	EL	ES (*)/ VA etc.	
T	TYRE Tyres (replacement and OEM)	Reg. 1222/2009		Reg. 2020/740		

Other (No measures; no data inserted in EIA)

24	Professional dishwashers, washing machines and dryers	Awaiting completion of standardization (expected 8/2019) following Mandate M/539 in C(2015)8756
32	Windows	Windows themselves do not use energy but they are ErP with influence on space heating/cooling and lighting in buildings. Prep. study and CF in 2015; WP 16-19 states Impact Assessment is ongoing, but seems unlikely that Ecodesign or Labelling measures will be implemented.
33	Smart Appliances	Prep. study completed autumn 2018. See http://www.eco-smartappliances.eu for details
35	Power Generating equipment	Product group has been abandoned for Ecodesign and Energy Labelling
36	Thermal Insulation	Product group has been abandoned for Ecodesign and Energy Labelling
37	Lighting Systems	Prep. study completed December 2016. Topic 'on hold'. See http://ecodesign-lightingsystems.eu/ for details.
38	Building Automation Control Systems	Scoping study finished July 2018. Follow-up study draft final reports November 2020. For details see https://ec.europa.eu/energy/studies_main/preparatory-studies/ecodesign-preparatory-study-building-automation-and-control-systems_en
39	Refrigerated Containers	Prep. study launched May 2019, Task 1 and 2 reports June 2020.
n/a	Electric Kettles	Prep. study completed December 2020. CF January 2021. For details see: http:www.ec.europa.eu/energy/studies_main/preparatory-studies/ecodesign-and-energy-labelling-preparatory-study-electric-kettles_en#documents.
ENTR 4	Industrial furnaces and ovens	Product group has been abandoned for Ecodesign and Energy Labelling
ENTR 7	Steam boilers	Product group has been abandoned for Ecodesign and Energy Labelling
ENTR 8	Power Cables	Product group has been abandoned for Ecodesign and Energy Labelling
GROW10	PV panels and inverters	Preparatory study started in October 2017. Policy recommendations issued 20/12/2019. See http://susproc.jrc.ec.europa.eu/solar_photovoltaics/index.html for details.
GROW11	Lifts	Preparatory study completed 31/10/2019. See https://www.eco-lifts.eu/eco-lifts-en/index.php for details
GROW12	Hand dryers	Preparatory study completed in May 2020. See http://www.ecohanddryers.eu/ for details.

GROW13	Large Storage Batteries (not part of WP16-19)	Preparatory study completed August 2019. Follow-up study 2020. See https://ecodesignbatteries.eu/ for details
ENV	Taps and Shower heads (water-related products)	No regulation, but Voluntary waterlabel by industry; no data inserted in EIA Prep. study 2012-2014; update started June 2017. Stakeholder meeting Autumn 2018. See http://www.europeanwaterlabel.eu/thelabel.asp and http://susproc.jrc.ec.europa.eu/taps_and_showers/ for details
ENV	High-Pressure cleaners	Prep. study completed in 2020. See https://ec.europa.eu/jrc/en/publication/preparatory-study-ecodesign-and-energy-labelling-measures-high-pressure-cleaners
n/a	Medical equipment	COCIR Self-Regulatory Initiative, SRI v3 2013. SRI not formally endorsed by EC as a VA in Ecodesign context; therefore not included in EIA. See https://www.cocir.org/initiatives/ecodesign-initiative.html for details and annual reports.

Source with links and full references on ED and EL: www.eup-network.de
Source with links and full references on ES: http://www.eu-energystar.org/en/254.shtml

Acronyms: Dir=Directive of European Parliament and Council; Reg=Regulation of European Parliament and Council; Dec=Council Decision; CD=Commission Directive; CR=Commission Regulation; CDR=Commission Delegated Regulation; Cd=Commission Decision; cor=Corrigendum; WD=Commission Working Document (draft measure); VA=Voluntary Agreement, under Ecodesign; VA?=draft VA; am=amendment; app=approved by the RegCom;rev=preparations for review ongoing; prep.=preparatory study ongoing; MEPS=Minimum energy Efficiency Performance Standards.

Legislation published in the Official Journal (OJ) before December 2009 has the suffix (for Directives) or prefix (for Commission Regulations) or suffix (for Directives and other) 'EC'. Legislation published after December 2009 ('post Lisbon') has the prefix or suffix 'EU'.

* The EU ENERGY STAR programme followed an Agreement between the European Community (EU) and the Government of the US to coordinate energy labelling of office equipment. It was managed by the European Commission. The US partner was the Environmental Protection Agency (EPA), which started the scheme in the US in 1992. The EU-US agreement expired on 20 February 2018.

** Measurements for an energy label formerly required an empty vacuum cleaner bag. Dyson, a manufacturer of bagless vacuum cleaners, filed and won a lawsuit against it at the European Court of Justice in Luxembourg (Dyson ruling – Case T-544/13 RENV). The EU Commission had two months to file an appeal against this ruling in order to preserve the EU regulation. They have failed to do so, and now the ruling is legally binding. As a result, EU Regulation (EU) 665/2013 is null and void. (Source: https://www.vde.com/tic-en/news/2019/energyabel-vacuum-cleaner).
EIA 2021 data consider the impacts of this annulment, based on 2019 review study and 2022 draft IA

ANNEX C: Studies per 31.12.2021

Preparatory studies, IA reports and communications (COM)

Working Programmes (WP) and Methodology studies			WPs	
	1st WP study (--> WP 2009-2011)	EPTA with PE, NTUA, Nov. 2007	COM(2008) 660	
	amended WP study (--> WP 2012-2014)	VHK, Dec. 2011	SWD(2012)434	
	WP 2016-2019		COM(2016) 773	
	WP 2020-2024	Study ongoing, VMAS, VHK, Öko		
	Methodology for EuP (MEEuP, old)	VHK, Nov. 2005		
	Methodology for ErP (MEErP, new)	VHK, Nov. 2011		
	ICT Impact study	VHK and Viegand Maagøe, 2020		

Lot	Product	Preparatory study, author(s) and year of publication	EC IA reports	COM, Guide on tests & calculations
Space- and water heating/cooling				
2	WH dedicated Water Heater	VHK with BRGC, Sept. 2007 rev. VHK completed 2019 follow-up study ongoing	SWD(2013)294 SWD(2013)295 SEC(2013)445	draft COM 2013
1	CH Central Heating boiler (incl. combi)	VHK with BRGC, Sept. 2007 rev. VHK completed 2019 follow-up study ongoing	SWD(2013)296 SWD(2013)297 SEC(2013)446	draft COM 2013
15	SFB Solid Fuel Boilers	BIOIS/AEA, Jan. 2010	SWD(2015)0092 SWD(2015)0093 SEC(2015)0182	
21 /E6	AHC Air Cooling & Heating (>12 kW)	Armines, Sept. 2011 (Lot E6, AC); BIOIS, July 2012 (Lot 21)	SWD(2016)421 SWD(2016)422 SEC(2016)0500	
20	LH Local Heaters	BIOIS, June 2012 rev. VMAS 2019	SWD(2015)0090 SWD(2015)0091 SEC(2015)0181	
10	RAC Room Air Conditioner (<12 kW) & comfort fans	Armines, March 2009 rev. Armines/VMAS 2018	SWD(2012)34 SWD(2012)35 SEC(2012)157	
11	CIRC Circulator pumps (<2.5 kW)	AEA, Feb. 2008 rev. VMAS 2018	SEC(2009)1016 SEC(2009)1017 SEC(2009)1018	
E6 /10	VU Ventilation Units	Armines, Mar.2009 (Lot 10, residential) VHK, June 2012 (Lot E6, non-res.) rev. VHK 2020	SWD(2014)0222 SWD(2014)0223 SEC(2014)0410	
Lighting				
8 /9 /19	LS Light Sources	rev. VHK Oct. 2015	SWD(2019) 357	
	Tertiary sector (LFL, HID, ballast)	VITO, Jan-April 2007	SEC(2009)324	COM(2010/C 92/04)
	NDLS Non Directional LS	VITO, Oct. 2009	SEC(2009)327	
	DLS Directional LS	VITO, Oct. 2009	SWD(2012)419	
37	Lighting Systems	VITO et al, completed 12/2016		
Electronics				
5	DP electronic DisPlays	Fh IZM, Aug. 2007	SEC(2009)1011	Guide 2009
		VHK Aug. 2012 review	SWD(2019) 354	
18	STB set top boxes (Complex & Simple)	MVV/BH, Dec.2007 [SSTB]; BIOIS/Fh IZM, Dec. 2008 [CSTB]	SEC(2009)114 SWD(2012)391 (VA)	
E3	VIDEO recorders, players, games	AEA/ Intertek, Nov. 2010 rev. CSES, Ökopol & TU Wien 2019 (for games consoles)	SWD(2015)89 [VA]	
E9	Enterprise servers & Data Storage products	BIOIS/Fh IZM, June 2015 Intertek, TA study Standards, 2016	SWD(2019)106	
3	PC Personal Computers	IVF, Aug. 2007 review study VITO/VMAS 2017	SWD(2013)218 SWD(2013)219 SEC(2013)354	
4	IE imaging equipment	Fh IZM, May 2008 review study VMAS/VHK 2019	SWD(2013)14 SWD(2013)15 SEC(2013)74	
6 /26	SB (networked) Stand-By	Fh IZM, Oct. 2007 rev. VHK/VMAS 2017 Draft IA 2019	SEC(2008)3070 SEC(2008)3071 SEC(2008)3072	COM(2012/C 394/05)
7	EPS External Power Supplies	BIOIS/Fh IZM, Jan. 2007 rev. VMAS 2012/3 additional rev. VMAS 2014/3	SEC(2009)434 SEC(2009)435 SEC(2009)436 SWD(2019) 345	COM(2013/C 130/05)
27	Uninterruptable Power Supplies (UPS)	Ricardo-AEA, June 2014		no data in EIA

Lot	Product	Preparatory study, author(s) and year of publication	EC IA reports	COM, Guide on tests & calculations
Food preservation				
13	RF Household Refrigerators & freezers	ISIS/ENEA, March 2008 rev. VHK/Armines 2016	SEC(2009)1020 SEC(2009)1021 SEC(2009)1022 SWD(2019) 341	corr(2010/C 272/08)
12	CF Commercial Refrigeration (refrigerating appliances with a direct sales function)	BIOIS, Dec. 2007; update JRC 2014	SWD(2019) 352	
E1	PF Professional Refrigeration	BIOIS, July 2011 rev. started 2021	SWD(2015)0097 SWD(2015)0096 SEC(2015)0196	
Cooking				
22 /23	CA Cooking Appliances	BIOIS/ERA, Aug. 2011 (hobs, ovens); Armines, Mar.2009 (hoods) rev. JRC 2021	SWD(2014)3 SWD(2014)4 SEC(2014)43	
25	CM household Coffee Makers	BIOIS/ARTS, July 2011		
Cleaning				
14	WM household Washing Machine	ENEA/UniBonn, March 2010 rev. JRC 2017	SEC(2010)1352 SEC(2010)1353 SEC(2010)1354 SWD(2019) 349	
14	DW Household Dishwashers	ENEA/UniBonn, March 2010 rev. JRC 2017	SEC(2010)1356 SEC(2010)1357 SEC(2010)1358 SWD(2019) 347	
16	LD household Laundry Drier	PWC, March 2008 rev. VMAS 2019	SWD(2012)289 SWD(2012)290 SEC(2012)556	
17	VC Vacuum Cleaners	AEA, Feb. 2009 rev. VHK June 2016, durability aspects rev. VMAS June 2019	SWD(2013)240 SWD(2013)241 SEC(2013)385	draft IA 2022
Industrial components				
11	FAN Industrial Fans (>125W)	Fh ISI, Feb. 2008 rev. VHK, March 2015	SEC(2011)384 SEC(2011)385 SEC(2011)386 Draft IA 2016	
11	MT Industrial motors (0.75-375 kW)	ISR, Feb. 2008 rev. De Almeida et al July 2014	SEC(2009)1013 SEC(2009)2014 SEC(2009)2015 SWD(2019) 343	
30	MT Industrial & Special motors (0.12-1000 kW)	ISR, Mar. 2014	SWD(2019) 343	
11	WP Water pumps	AEA, Feb. 2008 rev. VMAS/VHK 2019 all pumps	SWD(2012)178 SWD(2012)179 SEC(2012)392	
28	Wastewater Pumps	BIOIS/ Atkins, Jan/Feb 2014		
29	Pool- & acquarium pumps	BIOIS/ Atkins, Jan/Feb 2014		
31	CP Standard Air Compressors	VHK, apr. 2014 VHK, follow-up study low-pressure and oil-free, June 2017	Draft IA (2015) Draft WD, 2014	
E5	Machine tools (Welding Equipment)	Fh IZM, Aug. 2012	SWD(2019) 340	
Energy sector				
E2	TRAFO Utility Transformers	VITO/ BIOIS, Jan. 2011 rev. VITO, July 2017	SWD(2014)0162 SWD(2014)0161	no new IA for CR 2019/1783
E8	Power cables	VITO, 2015		
Transportation sector				
T	TYRE Tyres (Replacement and OEM)	EPEC, July 2008 rev. VMAS, March 2016	SEC(2008)2860 SEC(2008)2061 SEC(2008)2805 SWD(2018)188 SWD(2018)189 SEC(2018)234	
Other (more information on sheet 'Measures')				
E4	Industrial furnaces and ovens	BIOIS/ ERA, Sept. 2012		
E7	Steam boilers	PwC/Fh ISI/NTUA, Oct. 2014		
24	Professional dishwashers	BIOIS/Öko/Ö-Q, May 2011		
	Professional washing machines and driers	BIOIS/Öko, May 2011		
32	Windows	ift/VHK/VITO, June 2015		

All prep. studies can be downloaded from www.eup-network.de or www.eceee.com
All IA studies can be downloaded from http://ec.europa.eu/smart-regulation/impact
Commission Communications can be found on the European Union Eurlex website

Contractor acronyms (alphabetically)

AEA	AEA Technology, Didcot, UK (now: **Ricardo-AEA**)
ARTS	Association de Recherche, Technologie et Sciences, Paris, FR
Atkins	WS Atkins, UK
BH	Bob Harrison, private consultant, UK
BIOIS	Bio Intelligence Services, Paris, FR (now: **Deloitte**)
BRGC	BRG Consult, London, UK
ENEA	ENEA, Ispra, IT
EPEC	EPEC p/a GHK Consulting, Brussels, BE
EPTA	EPTA, Athens, GR
ERA	ERA Technology, Surrey, UK
Fh ISI	Fraunhofer Institute Systems and Innovation Research, Karlsruhe, DE
Fh IZM	Fraunhofer Institut für Zuverlässigkeit and Mikro-integration, Berlin, DE
ift	ift Rosenheim, DE
Intertek	Intertek, UK
IPTS	EC, JRC, IPTS, Seville, ES
ISIS	ISIS, Rome, IT
ISR	ISR-University of Coimbra, PO
JRC	Joint Research Center
NTUA	University of Athens, GR
Öko	Öko-Institut e.V., Freiburg, DE
Ö-Q	Büro Q-quadrat, DE
PE	PE International, DE
PWC	Price Waterhouse Coopers, Neuilly-sur-Seine, FR
VHK	Van Holsteijn en Kemna, Delft, NL
VITO	VITO, Mol, BE
VMAS	Viegand Maagøe, Copenhagen, DK
WI	Wuppertal Institute, Wuppertal, DE

ANNEX D: Product groups and defined base cases per 31.12.2021

Lot	Acro	Base cases	
1	**CHB**	**Boilers and combiboilers**	
	SH	*Base cases for space heating (rated heat output ≤ 400 kW):*	
		CHB Gas non-condensing	
		CHB Gas condensing	
		CHB Gas Jet burner non-condensing	
		CHB Gas Jet burner condensing	
		CHB Oil Jet burner non-condensing	
		CHB Oil Jet burner condensing	
		CHB Electric Joule-effect	
		CHB Hybrid (gas-electric)	
		CHB Electric Heat Pump	
		CHB Gas Heat Pump	
		CHB micro CHP	
		CHB Solar combi (16 m2)	
	WH	*Base cases for water heating (rated heat output ≤ 400 kW):*	
		CHB Gas Combi Instant. WH	
		CHB Gas + Cyl. WH	
		CHB Jet Burner Gas + Cyl. WH	
		CHB Jet Burner Oil + Cyl. WH	
		CHB Electric (Joule) + Cyl. WH	
		CHB Hybrid Gas/Electric WH	
		CHB Electric HP + Cyl. WH	
		CHB Gas HP + Cyl. WH	
		CHB Gas mCHP + Cyl. WH	
		CHB Solar Combi (16 m2)	
2	**WH**	**Dedicated water heaters (DWH)**	
		EIWH Electric Instant. < 12 kW (secondary)	
		EIWH Electric Instant. ≥ 12 kW (primary)	
		EIWHS Electric Instant. Shower (secondary)	
		ESWH Electric Storage ≤ 30 L (secondary)	
		ESWH Electric Storage > 30 L (primary)	
		GIWH Gas Instant. < 13 L/min (secondary)	
		GIWH Gas Instant. ≥ 13 L/min (primary)	
		GSWH Gas Storage, Condensing	
		GSWH Gas Storage, Non-condensing	
		Dedicated WH Heat Pump	
		Dedicated WH Solar (3.5 m2)	
3	**PC**	**Personal Computers, Lot 3**	
		PC Desktop	
		PC Integrated Desktop	
		PC Notebook	
		PC Tablet/slate	
		PC Thin client	
		PC Integrated Thin Client	
		PC Small-scale Server	
		PC Workstation	
4	**IE**	**Imaging equipment, Lot 4**	
		EP-Copier mono (Electro Photographic a.k.a. 'laser')	
		EP-Copier colour	
		EP-printer mono	
		EP-printer colour	
		EP-MFD mono (Multi-Functional Devices)	
		EP-MFD colour	
		IJ-printer (Inkjet, Single Functional Device)	
		IJ-MFD (Multi-Functional Devices)	
		Professional devices (only for new proposed measures in Review study, not considered in EIA yet)	not in EIA
		Scanners (not covered by VA, not in IA 2013, limited data in Review study) disappearing from market)	not in EIA
			not in EIA
5	**DP**	**Electronic Displays, Lot 5**	
		Standard TV (NoNA, no network availability)	
		TV with low network availability (LoNA)	
		Smart TV, with high network availability (HiNA)	
		Computer monitors	
		Signage displays	

Lot	Acro	Base cases

6 **SB** **Standby and off-mode losses of EuPs, Lot 6**

See data under Lot 26

7 **EPS** **External Power Supplies, Lot 7**

Base case	EIA name:
a. 5W low voltage (e.g. mobile phone and rechargeable grooming products)	EPS ≤ 6W, low-V
b. 10W normal voltage (e.g. tablets, smart phones etc.)	EPS 6–10 W
c. 12W normal voltage (e.g. small network equipment and set-top boxes etc.)	EPS 10–12 W
d. 18W normal voltage (e.g. portable devices and portable game consoles etc.)	EPS 15–20 W
e. 30W normal voltage (e.g. notebook computer)	EPS 20–30 W
f. 36W multiple voltage output (e.g. multi-device universal chargers etc.)	EPS 30–65 W, multiple-V
g. 65W normal voltage (e.g. high-end notebooks computers)	EPS 30-65 W
h. 120W normal voltage (e.g. high-end notebook computers)	EPS 65–120 W
i. 120W Multiple voltage output (e.g. stationary game consoles)	EPS 65–120 W, multiple-V
j. 15 W normal voltage (e.g. loudspeakers and sound systems)	EPS 12–15 W

8/9 **LS** **Tertiary Lighting, Lot 8–9**

Base case	
LFL T12 (Linear Fluorescent Lamps diameter 38 mm, incl. ballast) (res & nres)	EIA aggregated BC: LFL
LFL T8h (Linear Fluorescent Lamps diameter 26 mm, halophosphor, incl. ballast) (res & nres)	
LFL T8t (Linear Fluorescent Lamps diameter 26 mm, triphosphor, incl. ballast) (res & nres)	
LFL T5 new (14-80 W) (Linear Fluorescent Lamps diameter 16 mm, incl. electronic ballast) (res & nres)	
LFL X (other Linear Fluorescent Lamps incl. T5 old 4-13 W, special FL, incl. ballast) (res & nres)	
LED replacing LFL incl. control gear (retrofit & luminaire) (res & nres)	
HPM (High-Pressure Mercury lamps, incl. ballast (nres only)	EIA aggregated BC: HID
HPS (High-Pressure Sodium lamps, incl. ballast (nres only)	
MH (Metal-Halide lamps, incl. ballast) (nres only)	
LED replacing HID incl. control gear (retrofit & luminaire) (nres only)	
CFLni (Compact Fluorescent Lamp without integrated control gear), incl. control gear (res & nres)	EIA: CFLni
LED replacing CFLni incl. control gear (retrofit & luminaire) (res & nres)	

10 **RAC** **Room air conditioning appliances (RAC), Lot 10**

RAC fixed < 6 kW, cooling and heating
RAC fixed 6-12 kW, cooling and heating
RAC portable < 12 kW, cooling only
Residential ventilation and kitchen hoods Lot 10 (now in ENTR Lot 6 Ventilation for ventilation; in Lot 22/23 for hoods)

11 **MT** **Electric industrial motors (0.75-375 kW), Lot 11** (see also Lot 30)

Medium 3-phase Induction Motors (S) 0.75-7.5 kW
Medium 3-phase Induction Motors (M) 7.5-75 kW
Medium 3-phase Induction Motors (L) 75-375 kW

11 **FAN** **Industrial fans, Lot 11**

Axial fan <300Pa
Axial fan>300Pa
Centrifugal FC (Forward Curved) fan
Centrifugal BC (Backward Curved) fan, freestanding
Centrifugal BC fan
Cross-flow fan
(jet-fan)

11 **CIRC** **Circulators, Lot 11**

Small stand-alone circulators
Large stand-alone circulators
Integrated boiler circulators
(Drinking water circulators)

11 **WP** **Electric water pumps , Lot 11** (see also Lot 28/29)

End Suction Own Bearings (ESOB), < 45 kW, CF, VF, VF+VSD
End Suction Own Bearings (ESOB), 45-150 kW, CF, VF, VF+VSD
End Suction Close Coupled (ESCC), < 45 kW, CF, VF, VF+VSD
End Suction Close Coupled (ESCC), 45-150 kW, CF, VF, VF+VSD
End Suction Close Coupled, Inline, (ESCCi), < 45 kW, CF, VF, VF+VSD
End Suction Close Coupled, Inline, (ESCCi), 45-150 kW, CF, VF, VF+VSD
Submersible Multistage (MSS), ≤ 6"diameter, CF, VF, VF+VSD
Vertical Multistage(MS), ≤ 25 bar, CF, VF, VF+VSD

Lot	Acro	Base cases	
		Commercial refrigerators and freezers, Lot 12	
12	**CF**	(now: refrigerating appliances with a direct sales function)	
		Remote open vertical chilled multi deck (RVC2)	
		Remote open horizontal frozen island (RHF4)	
		Other supermarket display cabinets (non-base cases)	
		Plug-in one door beverage cooler	
		Plug in horizontal ice cream freezer	
		Spiral vending machine	
13	**RF**	**Domestic refrigerators and freezers Lot 13**	
		Total (aggregate from)	
		Domestic Refrigerators (incl. fridge-freezers)	
		Domestic Freezers	
14	**WM**	**Domestic washing machines, Lot 14**	
		Domestic washing machines (6, 7, 8, 9 kg capacity; aggregate in EIA)	
		Domestic washer-dryers	
14	**DW**	**Domestic dishwashers, Lot 14**	
		Domestic dishwashers	
15	**SFB**	**Solid fuel small combustion installations, Lot 15**	
		Small domestic man. Boiler (Wood logs): WOODMANB	
		Small domestic DD (DownDraft) gasifying boiler (Wood) WOODDDB	
		Retort boiler (Coal) COALB	
		Pellet boiler (Pellets) PELLB	
		Non-domestic chip boiler (Wood chips) CHIPB	
16	**LD**	**Domestic laundry driers (LD), Lot 16**	
		LD condensing heat pump	
		LD condensing electric heat element	
		LD vented electric	
		LD vented gas	
17	**VC**	**Vacuum cleaners (VC), Lot 17**	
		VC Cylinder Domestic mains	
		VC Upright Domestic mains	
		VC Handstick Domestic mains	
		VC Cylinder Commercial mains	
		VC Upright Commercial mains	
		VC Cordless - domestic, cleaning and standby, not in scope of CR 666/2013, added to complete picture	
		VC Cordless - commercial, cleaning and standby, not in scope of CR 666/2013, added to complete picture	
		VC Robot - domestic, cleaning and standby, not in scope of CR 666/2013, added to complete picture	
		VC Robot - commercial, cleaning and standby, not in scope of CR 666/2013, added to complete picture	
		VC consumables: bags and filters costs, not in scope of CR 666/2013, added to complete economics	
18	**STB**	**Complex set-top boxes (CSTB), Lot 18**	
		Basic CSTB with SD (Standard Definition signal)	
		CSTB with SD, HDD (Hard Disk Drive)	
		CSTB with SD, HDD, second tuner, return path	
		Basic CSTB with HD (High Definition signal)	
		CSTB with HD, HDD	
		CSTB with HD, HDD second tuner, return path	
		Triple play box	
18	**STB**	**Simple set-top boxes (SSTB), Lot 18a**	
		SSTB	
		SSTB /PVR (Personal Video Recorder)	
19	**LS**	**Non-directional (NDLS) and Directional Light Sources (DLS) Lot 19**	
		GLS R (General Lighting Service incandescent lamp, with reflector, DLS) (res & nres)	EIA aggregated BC : GLS
		GLS X (General Lighting Service incandescent lamp, all other shapes, NDLS) (res & nres)	
		HL LV R (Low Voltage Halogen Reflector lamps, MR11, MR16, etc., GU4, GU5.3 cap, DLS) (res & nres)	EIA aggregated BC : HL
		HL MV X (Mains Voltage Halogen Reflector lamps, R- & PAR-lamps, etc. GU10 or E-cap, DLS) (res & nres)	
		HL LV C (Low Voltage Halogen capsules, G4, GY6.35 caps, NDLS) (res & nres)	
		HL MV C (Mains Voltage Halogen capsules, G9 cap, NDLS) (res & nres)	
		HL MV E (Mains Voltage Halogen lamps, E-cap, substitute for GLS, NDLS) (res & nres)	
		HL MV L (Mains Voltage Linear Halogen lamps, R7s cap, NDLS) (res & nres)	
		CFLi (Compact Fluorescent Lamp with integrated control gear, substitute for HL &GLS, NDLS) (res & nres)	EIA: CFLi
		LED replacing DLS, incl. control gear (retrofit & luminaire) (res & nres)	
		LED replacing NDLS, incl. control gear (retrofit & luminaire) (res & nres)	

Lot	Acro	Base cases
20	**LH**	**Local room heating products, Lot 20**
		Open fireplace (Wood)
		Closed fireplace/inset (Wood)
		Wood stove
		Coal stove
		Cooker
		SHR (Slow Heat Release) stove
		Pellet stove
		Electric portable
		Electric fixed > 250W
		Electric fixed ≤ 250W
		Electric storage
		Electric underfloor
		Electric visibly glowing > 1.2 kW
		Electric visibly glowing ≤ 1.2 kW
		Electric Towel Heaters
		Gas luminous (commercial)
		Gaseous Tube (commercial < 120 kW)
		Gas open front
		Gas closed front
		Gas balanced flue
		Gas flueless
		Liquid tube (commercial < 120 kW)
		Liquid open front
		Liquid closed front
		Liquid balanced flue
		Liquid flueless
21	**AHC**	**Air heating & AC products, Lot 21 (+ENTR Lot 6 AC + ENTR Lot1 HT Chillers)**
		Cooling:
		Chiller, Air to water, Electric, Small (CHAE-S (≤ 400 kW))
		Chiller, Air to water, Electric, Large (CHAE-L (> 400 kW))
		Chiller, Water to water, Electric, Small (CHWE-S (≤ 400 kW))
		Chiller, Water to water, Electric, Medium (CHWE-M (> 400; ≤ 1500 kW))
		Chiller, Water to water, Electric, Large (CHWE-L (≥ 1500 kW))
		Chiller, Fuel (CHF)
		Air conditioner [splits] (AC splits)
		Air conditioner [VRF] (AC VRF)
		Air conditioner [rooftop] (AC rooftop)
		Air conditioner, Fuel (ACF)
		High Temperature Process Chiller, Air to water, Electric, Small (HT PCH-AE-S)
		High Temperature Process Chiller, Air to water, Electric, Large (HT PCH-AE-L)
		High Temperature Process Chiller, Water to water, Electric, Small (HT PCH-WE-S)
		High Temperature Process Chiller, Water to water, Electric, Medium (HT PCH-WE-M)
		High Temperature Process Chiller, Water to water, Electric, Large (HT PCH-WE-L)
		Heating:
		Air conditioner [splits, reversible] (AC splits (rev))
		Air conditioner [VRF,reversible] (AC VRF (rev))
		Air conditioner [rooftop, reversible] (AC rooftop (rev))
		Air conditioner, Fuel [reversible] (ACF (rev))
		Air Heater, Fuel (AHF)
		Air Heater, Electric (AHE)
22	**CA**	**Domestic and commercial ovens, Lot 22** (with Lot 23 and hoods from Lot 10)
23	**CA**	**Domestic and commercial hobs and grills, Lot 23** (with Lot 22 and hoods from Lot 10)
		Electric hobs
		Gas hobs
		Electric ovens
		Gas ovens
		Range hoods

Lot	Acro	Base cases	
24	**PW**	**Professional washing machines (WM), dishwashers (DW) and driers (LD), Lot 24** (no regulation)	not in EIA
		(currently 20 basecase in IA, but probably to reduce to 9 below)	
		WM Washer extractors	
		WM Tunnel washers	
		DW Water-change ware washer	
		DW One tank ware washers	
		DW Multiple tank ware washers	
		LD Condensing tumble drier	
		LD Air vented tumble drier	
		LD Cabinet drier	
		LD Pass-through drier	
25	**CM**	**Household coffee machines, Lot 25** (only measures under the new generic standby regulation)	
		Dripfilter coffeemaker	in EIA low-power mode data only (under SB heading). On-mode data removed in EIA 2019
		Pad filter coffeemaker	
		Hard cap coffeemaker	
		Semi-auto coffeemaker	
		Fully-auto coffeemaker	
26	**SB**	**Networked standby losses, Lot 26** (EIA data based on 2017 review study and 2019 draft IA)	
		Radios (sb & off modes)	in EIA with low-power mode data only
		Electric toothbrushes (off mode)	
		Audio speakers (wired) (sb & off modes)	
		Audio speakers (wireless) (nsb & off modes)	
		Small appliances (sb & off modes)	
		Media boxes /sticks (sb mode)	
		Media players and recorders (sb mode)	
		Projectors (sb & off modes)	
		Home phones (nsb mode)	
		Office phones (nsb mode)	
		Home NAS (nsb mode)	
		Home Network Equipment (nsb mode)	
		Office Network Equipment (nsb mode)	
		Coffee makers (off mode)	
		Washing Machines (sb & off, until 2021)	in EIA with on-mode data and low-power mode data. Primarily accounted under product group. Copy for information under SB heading but signalled as double counted
		Dishwashers (sb & off, until 2021)	
		Laundry Dryers (sb & off modes)	
		Electric Ovens (sb mode)	
		Electric Hobs (sb mode)	
		Complex Set-Top Boxes (low-power modes)	
		Game consoles (sb mode)	
		IE Inkjet Printers (nsb mode)	
		IE Inkjet MFDs (nsb mode)	
		IE Laser Printers (nsb mode)	
		IE Laser Copiers (nsb mode)	
		IE Laser MFDs (nsb mode)	
		Smart phones	*no data in EIA or no data in EIA under SB-heading, because of negligible impact, or because out-of-scope of CR 1275/2008 (as amended)*
		Classic cell phones	
		Faxes	
		Charging stands	
		Hair clippers and dryers	
		Motor-operated building elements	
		Elevation beds	
		Height-adjustable desks	
		Simple Set-Top Boxes (SSTB)	
		Desktop PCs	
		Notebooks and tablets	
		Simple TV	
		Complex TV	
		Displays (Monitors)	
		LV-EPS	

Lot	Acro	Base cases	
27	**UPS**	**Uninterruptible power supplies (UPS), Lot 27** (no regulation)	product group removed in EIA 2019
		UPS below 1.5 kVA (BC1)	
		UPS 1.5 to 5 kVA (BC2)	
		UPS 5.1 to 10 kVA (BC3)	
		UPS 10.1 to 200 kVA (BC4)	
28	**WWP**	**Pumps for waste waters, Lot 28** (no final regulation)	not in EIA
		Centrifugal Submersible: Mixed flow & Axial pumps (BC2)	
		Centrifugal Submersible pump – Once a day operation (BC3)	
		Centrifugal Submersible domestic drainage pump<40mm passage (BC4)	
		Submersible dewatering pumps (BC5)	
		Centrifugal dry well pump (BC6)	
		Slurry pumps: Light duty (BC7A)	
		Slurry pumps: Heavy duty (BC7B)	
		Submersible vortex radial pumps for wastewater < 10 kW and 10-160 kW	
		Submersible channel radial pumps for wastewater < 10 KW, 10-25 kW and 25-160 kW	
29	**PP**	**Large pumps and pumps for pools, fountains, aquariums, Lot 29** (no final regulation)	not in EIA
		Swimming Pool pumps < 2.2 kW	
		Fountain, pond, aquarium, spa and counter-current pumps	
		End Suction water pumps (over 150 kW)	
		Submersible bore-hole pumps > 6"diameter	
		Vertical multi-stage pumps 25-40 bar	
		Horizontal multi-stage pumps, < 25 bar and 25-40 bar	
		Booster sets < 150 kW	
30	**SMT**	**Special motors, Lot 30** (Regulation 2019, see also Lot 11)	
		Medium 3-phase Induction motor (S) 0.75-7.5 kW no VSD (also considered in Lot 11)	
		Medium 3-phase Induction motor (M) 7.5-75 kW no VSD (also considered in Lot 11)	
		Medium 3-phase Induction motor (L) 75-375 kW no VSD (also considered in Lot 11)	
		Medium 3-phase Induction motor (S) 0.75-7.5 kW with VSD (also considered in Lot 11)	
		Medium 3-phase Induction motor (M) 7.5-75 kW with VSD (also considered in Lot 11)	
		Medium 3-phase Induction motor (L) 75-375 kW with VSD (also considered in Lot 11)	
		Small 1-phase Induction motor 0.12-0.75 kW no VSD	
		Small 3-phase Induction motor 0.12-0.75 kW no VSD	
		Small 1- or 3-phase Induction motor 0.12-0.75 kW with VSD	
		Large 3-phase Induction motor, < 1000 V, 375-1000kW no VSD	
		Large 3-phase Induction motor, < 1000 V, 375-1000kW with VSD	
		Explosion medium 3-phase Induction motor (S) 0.75-7.5 kW	
		Explosion medium 3-phase Induction motor (M) 7.5-75 kW	
		Explosion medium 3-phase Induction motor (L) 75-375 kW	
		Brake medium 3-phase Induction motor (S) 0.75-7.5 kW	
		Brake medium 3-phase Induction motor (M) 7.5-75 kW	
		Brake medium 3-phase Induction motor (L) 75-375 kW	
		8-pole medium 3-phase Induction motor (S) 0.75-7.5 kW	
		8-pole medium 3-phase Induction motor (M) 7.5-75 kW	
		8-pole medium 3-phase Induction motor (L) 75-375 kW	
		Single phase Induction motor > 0.75 kW	
		Variable Speed Drives (VSD) for the above motors	
		Medium Voltage Induction motor, > 1000 V, 375-1000 kW (out of scope of CR; not in EIA)	
		Submersible borehole Induction motor 0.22 -22 kW (out of scope of CR; not in EIA)	
		Submersible borehole Induction motor 22 -550 kW (out of scope of CR; not in EIA)	
		Soft starters (out of scope of CR; not in EIA)	
31	**CP**	**Compressors, Lot 31** (no final regulation)	product group removed in EIA 2021
		Rotary Fixed Speed 5-1280 l/s	
		Rotary Variable speed 5-1280 l/s	
		Pistons 2-64 l/s	
32	**WD**	**Windows, Lot 32** (no final regulation)	not in EIA
		without (a)/ with (b) shutters (or other window covering, shading devices):	
		Single (1a/1b)	
		Double IGU, standard (2a/2b)	
		Double IGU, lowE, argon (3a/3b)	
		Double IGU, lowE, argon, impr. (4a/4b)	
		Triple IGU, lowE, argon (5a/5b)	
		Triple IGU, lowE, argon, impr. (6a/6b)	
		Coupled (7a/7b)	
		Quadruple (8a/8b)	
		as 2a/2b, with solar control glazing (9a/9b)	
		as 4a/4b, with solar control glazing (10a/10b)	
		as 6a/6b, with solar control glazing (11a/11b)	

Lot	Acro	Base cases

E1 PF Refrigerating and freezing equipment, ENTR Lot 1 (HT Chillers now in Lot 21_6)

Professional refrigerated storage cabinets:

PF Storage cabinet Chilled Vertical (CV, 600 litres net volume)
PF Storage cabinet Frozen Vertical (FV, 600 litres net volume)
PF Storage cabinet Chilled Horizontal (CH, 300 litres net volume)
PF Storage cabinet Frozen Horizontal (FH, 200 litres net volume)
Blast cabinets (only information requirements in CR 2015/1095, no energy efficiency effects: not included in EIA)
Walk in cold rooms (not in scope of CR 2015/1095: not included in EIA)

Process chillers (only Low- and Medium-Temperature; HT chillers moved to Lot 21):

PF Process Chiller AC MT S ≤ 300 kW (AC=Air-Cooled)
PF Process Chiller AC MT L > 300 kW
PF Process Chiller AC LT S ≤ 200 kW
PF Process Chiller AC LT L > 200 kW
PF Process Chiller WC MT S ≤ 300 kW (WC=Water-Cooled)
PF Process Chiller WC MT L > 300 kW
PF Process Chiller WC LT S ≤ 200 kW
PF Process Chiller WC LT L > 200 kW

Condensing Units (only Low- and Medium-Temperature in scope of CR 2015/1095):

PF Condensing Unit MT S 0.2-1 kW
PF Condensing Unit MT M 1-5 kW
PF Condensing Unit MT L 5-20 kW
PF Condensing Unit MT XL 20-50 kW
PF Condensing Unit LT S 0.1-0.4 kW
PF Condensing Unit LT M 0.4-2 kW
PF Condensing Unit LT L 2-8 kW
PF Condensing Unit LT XL 8-20 kW

LT & MT Condensing Units:
Partial double counting with other refrigeration products considered in EIA

E2 TRAFO Distribution and power transformers, ENTR Lot 2

Distrib.trafo 400 kVA, P0 750W, Pk 4600 W (BC1)
Industry trafo 1 MVA, P01700W, Pk 10500W (BC2)
Industry trafo 1.25 MVA, P0 2800W, Pk 13100W (BC3)
Power trafo 100 MVA, P0 40.5 kW, Pk 326 kW, prim. 132 kV, sec. 33 kV (BC4
DER (Distributed Energy Resources) trafo (oil) 2 MVA, P0 3.1 kW, Pk 21 kW (BC5)
DER trafo (dry) 2 Mva, P0 4 kW, Pk 18 kW (BC6)
Separation trafo 16 kVA, P0 110 W, Pk 750 W (BC7)

E3 VIDEO Sound and imaging equipment, ENTR Lot 3 (VA for game controles)

Game consoles
Video (DVD or Blu-ray) players with or without HDD (VP)
Video (DVD or Blu-ray) recorders with or without HDD (VR)
Video projectors

only low-power mode data in EIA (under SB heading). On-mode data removed in EIA 2019

E4 IO Industrial ovens, ENTR Lot 4 (product group abandoned for Ecodesign)

not in EIA

Laboratory ovens (BC1)
Industrial Batch Oven – Medium-sized-electric, MIBOe (BC2a)
Industrial Batch Oven– Medium-sized – gas, MIBOg (BC2b)
Industrial Continuous Oven– Medium-sized – electric, MICOe (BC3a)
Industrial Continuous Oven – Medium-sized – gas, MICOg (BC3b)
Industrial Batch Furnace –Medium-sized – electric, MIBFe (BC4a)
Industrial Batch Furnace – Medium-sized– gas, MIBFg (BC4b)
Industrial Continuous Furnace – Medium-sized– electric, MICFe (BC5a)
Industrial Continuous Furnace – Medium-sized-gas, MICFg (BC5b)
Large industrial furnace (large continuous brick kiln) (BC6)
Large industrial oven (large continuous drying oven for wet clay bricks and roof tiles) (BC7)

E5 TOOL Machine tools, ENTR Lot 5 (Regulation 2019 limited to Welding Equipment, see below)

Only WE in EIA, see below

Numerically controlled machining centre, (BC1)
Numerically controlled deep drawing or bending machine tool, (BC2)
Laser cutting machine tool, (BC3)
Non-numerically controlled metal working drilling machine, (BC4)
Machine tool for woodworking, light stationary table saw, (BC5)
Machine tool for woodworking, horizontal panel saw, (BC6)
Machine tool for woodworking, throughfeed edge banding machine, (BC7)
Machine tool for woodworking, CNC machining centre (BC8)
Transportable welding equipment (BC9)

Lot	Acro	Base cases	
E5	**WE**	**Welding Equipment, ENTR Lot 5** (Regulation 2019)	
		Manual metal arc welding (MMA)	EIA single aggregated BC, Welding Equipment
		Tungsten inert gas welding (TIG)	
		Metal active gas (MAG) and metal inert gas (MIG) welding	
		Plasma arc cutting	
		all BCs further subdivided in inverter-based and transformer based	
		all BCs sometimes further subdivided in 3-phase DC, 1-phase DC and 1- and 3-phase AC	
		Consumable: shielding gas	
		Consumable: filler wires and electrodes	
E6	**VU**	**Ventilation units, ENTR Lot 6** (ACs incorporated in Lot 21; Ventilation with Lot 10)	
		Residential	
		R-UVU ≤ 100 m3/h for Extract Spaces	
		R-UVU ≤ 100 m3/h for Habitable Spaces	
		R-BVU ≤ 100 m3/h for Habitable Spaces	
		R-UVU 100-250 m3/h	
		R-BVU 100-250 m3/h	
		R-UVU 250-1000 m3/h	
		R-BVU 250-1000 m3/h	
		R-UVU > 1000 m3/h	
		R-BVU 1000-2500 m3/h	
		Non-Residential	
		NR-UVU 250-1000 m3/h	
		NR-BVU 250-1000 m3/h	
		NR-UVU > 1000 m3/h	
		NR-BVU 1000-2500 m3/h	
		NR-AHU-S 2500-5500 m3/h	
		NR-AHU-M 5500-14500 m3/h	
		NR-AHU-L > 14500 m3/h	
E7	**STB**	**Steam Boilers, ENTR Lot 7** (product group abandoned for Ecodesign)	not in EIA
		Very small sized industrial steam boiler fired with natural gas, medium pressure (2.5 MWth) (BC1)	
		Very small sized industrial steam boiler fired with natural gas, high pressure (2.5 MWth) (BC2)	
		Small sized industrial steam boiler fired with natural gas, medium pressure (7 MWth) (BC3)	
		Small sized industrial steam boiler fired with natural gas, high pressure (7 MWth) (BC4)	
		Medium sized industrial steam boiler fired with natural gas, medium pressure (20 MWth) (BC5)	
		Medium sized industrial steam boiler fired with natural gas, high pressure (20 MWth) (BC6)	
		Large sized industrial steam boiler fired with natural gas, medium pressure (35 MWth) (BC7)	
		Large sized industrial steam boiler fired with natural gas, high pressure (35 MWth) (BC8)	
		Large sized industrial steam boiler, natural gas, medium pressure, water tube design (35 MWth) (BC9)	
		Large sized industrial steam boiler, natural gas, high pressure, water tube design (35 MWth) (BC10)	
E8	**CAB**	**Power Cables, ENTR Lot 8** (product group abandoned for Ecodesign)	not in EIA
		The base cases from the prep. study represent typical electric circuits in line with the market structure:	
		distribution circuit in the services sector (BC1)	
		lighting circuit in the services sector (BC2)	
		socket-outlet circuit in the services sector (BC3)	
		dedicated circuit in the services sector (BC4)	
		distribution circuit in the industry sector (BC5)	
		lighting circuit in the industry sector (BC6)	
		socket-outlet circuit in the industry sector (BC7)	
		dedicated circuit in the industry sector (BC8, copper conductors)	
		dedicated circuit in the industry sector (BC9, aluminium conductors)	

Lot	Acro	Base cases	
E9	**ES&DS**	**Enterprise Servers and Data Storage Products, ENTR Lot 9**	
		Servers (ES):	
		ES tower 1-socket traditional	
		ES rack 1-socket traditional	
		ES rack 2-socket traditional	
		ES rack 2-socket cloud	
		ES rack 4-socket traditional	
		ES rack 4-socket cloud	
		ES rack 2-socket resilient trad.	
		ES rack 2-socket resilient cloud	
		ES rack 4-socket resilient trad.	
		ES rack 4-socket resilient cloud	
		ES blade 1-socket traditional	
		ES blade 2-socket traditional	
		ES blade 2-socket cloud	
		ES blade 4-socket traditional	
		ES blade 4-socket cloud	
		Data Storage products (DS):	
		DS Online 2	
		DS Online 3	
		DS Online 4	
E0	**MED**	**Medical imaging equipment ENTR** (Voluntary agreement not recognized under Ecodesign)	not in EIA
		MR scanner	
		CT scanner	
		X-ray Angio	
V1	**TAP**	**Water taps and shower heads, Lot ENV 1** (see notes for 'Measures')	not in EIA
		typical tap made of brass (average weight) used in domestic applications (BC1)	
		typical tap made of brass (average weight) used in non-domestic applications (BC2)	
		typical shower system (shower valve + shower outlet, average weight), domestic applications (BC3)	
		typical shower system (shower valve + shower outlet, average weight), non-domestic applications (BC4)	
V2	**TOIL**	**Toilets, Lot ENV 2** (pilot project aiming at Eco label and GPP criteria. Preliminary report with Key Findings, Jan. 2014, JRC/IPTS, http://susproc.jrc.ec.europa.eu/toilets)	not in EIA
T	**TYRE**	**Tyres** (Labelling Regulation)	
		C1 tyres, replacement (mainly for cars in use)	
		C1 tyres, OEM (mainly for new cars sold)	
		C2 tyres, replacement (mainly for Light Commercial Vehicles, vans in use)	
		C2 tyres, OEM (mainly for new Light Commercial vehicles, vans sold)	
		C3 tyres, replacement (mainly for Heavy Commercial Vehicles, trucks/busses in use)	
		C3 tyres, OEM (mainly for new Heavy Commercial vehicles, trucks/busses sold)	
		(re-treaded C3 tyres are not included in the Impact Assessment analyses but will be subject to Regulation once a suitable testing method to measure the performance of such tyres is added)	

ANNEX E: Ecodesign Impacts Accounting by Product Group (Key Facts)

Summary of Key Facts, quantitative data derived from impacts per parameter (Annex A) with explanatory texts added.

Dedicated Water Heaters

The scope of the Ecodesign measures is water heaters with a rated heat output smaller than 400 kW, and hot water storage tanks with a storage volume smaller than 2000 litres, including those integrated in packages of water heater and solar devices. This includes electric storage (ESWH) and instantaneous (EIWH) water heaters, gas and oil fired storage (GSWH) and instantaneous (GIWH) water heaters as well as solar-assisted water heaters (SOLWH). For efficiency and NO_x emission limits there is a category below 70 kW and above 70 kW.

Excluded are all combi water heaters and dedicated water heaters using gaseous or liquid biomass and solid fuels. Water heaters covered by the Industrial Emissions Directive 2010/75/EU, water heaters which do not meet at least the load profile with the smallest reference energy in the regulation, water heaters designed for making hot drinks and/or food only as well as certain replacement heat generators or their housing are also excluded. The scope of Energy Label regulation covers the same scope as the Ecodesign regulation but is limited to a rated heat output smaller than 70 kW and hot water storage tanks with a storage volume smaller than 2000 litres.

Design options for dedicated water heaters include improved insulation (storage WH), smart temperature control (anticipating user behaviour; e.g. storage WH), electronic ignition (electricity or water-pressure driven, for instantaneous gas WHs instead of pilot-flame), electronic instead of hydraulic temperature control for instantaneous electric WHs, heat pump storage WHs (ventilation exhaust air and/or outdoor air source; possibly with refrigerants like CO_2), solar assisted WHs.

WH Dedicated Water Heater	**unit**	**1990**		**2010**			**2020**			**2030**	
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Sales volume	'000	7 947	8 710	8 710	0	8 515	8 515	0	9 632	9 632	0
Stock of units in use	'000	110 795	139 810	139 810	0	135 345	135 345	0	138 297	138 297	0
Effective heat output per unit	kWh/a	653	748	748	0	791	791	0	797	797	0
EU effective heat output	TWh heat/a	72	105	105	0	107	107	0	110	110	0
EU hot water (60 °C) use	M m^3/a	1 240	1 792	1 792	0	1 834	1 834	0	1 889	1 889	0
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	228	305	305	0	299	278	-21	254	217	-36
o/w electricity	*TWh elec/a*	*73*	*103*	*103*	*0*	*106*	*100*	*-6*	*109*	*95*	*-14*
o/w fuel	*TWh fuel/a*	*46*	*47*	*47*	*0*	*34*	*28*	*-6*	*25*	*17*	*-7*
Final energy	TWh final/a	119	150	150	0	140	128	-12	134	113	-21
GWP emissions	$MtCO_2$/a	45	42	42	0	29	27	-2	20	17	-3
Acquisition costs (incl. install)	bn €	4	5	5	0	5	5	0	6	6	0
Energy costs	bn €	17	20	20	0	22	21	-1	25	21	-3
Maintenance costs	bn €	4	6	6	0	6	6	0	6	6	0
Total running costs	bn €	21	27	27	0	28	27	-1	31	28	-3
Total expenditure	bn €	26	32	32	0	34	32	-1	37	34	-3
Revenue Industry	m €	1562	2048	2048	0	2094	2094	0	2579	2579	0
Revenue Wholesale	m €	401	525	525	0	537	537	0	661	661	0
Revenue Retail	m €	401	525	525	0	537	537	0	661	661	0
Revenue Installation	m €	1280	1667	1667	0	1553	1553	0	1760	1760	0
Revenue Maintenance (excl. VAT)	m €	3973	5346	5346	0	5317	5317	0	5430	5430	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	27	36	36	0	37	37	0	45	45	0
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	52	69	69	0	68	68	0	73	73	0
Jobs Total	'000 jobs	81	107	107	0	107	107	0	120	120	0

(Combi) Boilers

The scope of the Ecodesign measures is space heaters and combination heaters with a rated heat output smaller than 400 kW, including those integrated in packages of space heater, temperature control and solar device or packages of combination heater, temperature control and solar devices. This includes gas- and oil fired central heating boilers, electric resistance boilers, heat pump boilers (electric and gas-fired) and micro-cogeneration boilers smaller than 50 kW all intended for space heating ('solo') or space- and water heating ('combi'). For seasonal efficiency and NO_x emission limits there is a category below 70 kW (with an unconditional exemption for solo-boilers to 10 kW and combi-boilers to 30 kW) and above 70 kW.

Excluded are boilers for gaseous or liquid biomass, solid fuel boilers, certain replacement heat generators or their housing, micro-cogeneration boilers with a maximum electrical capacity of 50 kW or above, dedicated water heaters, air or steam heaters as well as heaters covered by the Industrial Emissions Directive 2010/75/EU. The scope of Energy Label regulation covers the same scope as the Ecodesign regulation but is limited to a rated heat output smaller than 70 kW.

Design options for more efficient space heating with central heating boilers include condensing technology (secondary heat exchanger to extract extra heat from flue gases), pre-mix or otherwise fan-assisted burners, improved combustion control (e.g. O_2 sensors), lower radiation losses of the housing, improved efficiency and control of the integrated circulation pump, lower auxiliary electricity for the gas valves, CPU and a possible combustion fan, weather dependent boiler temperature control, temperature control with local emitters sensors/actuators ('smart home' systems), solar assistance, hybrid solutions with traditional boilers and electric heat pumps, full electric air/water/ground source heat pumps, gas-fired (ab)sorption heat pumps, fuel cells, efficient micro-cogeneration.

Design options for water heating with combi boilers are similar to those for dedicated water heaters but also include passive flue heat recovery devices (PFHRD), where the cold sanitary water temperature (colder than returning central heating water) allows to extract (and store) more heat from flue gases both during water- and space heating.

CHC Central Heating combi, water heating	**unit**	**1990**		**2010**			**2020**			**2030**	
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Sales	'000	3 362	4 643	4 643	0	5 092	5 036	-56	5 329	5 440	111
Stock	'000	49 793	85 552	85 552	0	90 621	89 981	-640	92 230	91 970	-260
Effective heat output per unit	kWh/a	2 106	2 163	2 163	0	2 143	2 143	0	2 120	2 126	5
EU effective heat output	TWh heat/a	105	185	185	0	194	193	-1	196	196	0
EU hot water (60 °C) use	M m^3/a	1 797	3 172	3 172	0	3 329	3 306	-23	3 353	3 352	-1
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	177	276	276	0	260	245	-15	235	201	-34
o/w electricity	*TWh elec/a*	*5*	*9*	*9*	*0*	*11*	*11*	*0*	*12*	*14*	*2*
o/w fuel	*TWh fuel/a*	*165*	*254*	*254*	*0*	*234*	*219*	*-15*	*211*	*172*	*-39*
Final energy	TWh final/a	170	262	262	0	244	229	-15	222	186	-36
GWP emissions	$MtCO_2$/a	40	57	57	0	51	48	-3	45	37	-8
Acquisition costs (incl. install)	bn €	3	3	3	0	3	4	0	4	5	2
Energy costs	bn €	9	20	20	0	14	14	-1	19	16	-2
Maintenance costs (incl. VAT)	bn €	2	3	3	0	3	3	0	3	3	0
Total running costs	bn €	11	23	23	0	17	16	-1	21	19	-3
Total expenditure	bn €	14	26	26	0	21	20	-1	25	24	-1
Revenue Industry	m €	828	887	887	0	942	1004	62	1030	1369	338
Revenue Wholesale	m €	222	238	238	0	253	270	17	277	368	91
Revenue Retail	m €	222	238	238	0	253	270	17	277	368	91
Revenue Installation	m €	1390	1460	1460	0	1557	1720	163	1740	2587	846
Revenue Maintenance (excl. VAT)	m €	1461	2338	2338	0	2377	2351	0	2346	2255	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	15	16	16	0	16	18	1	18	24	6
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	28	37	37	0	38	40	1	40	48	8
Jobs Total	'000 jobs	43	53	53	0	56	58	3	59	73	14

CHB Central Heating boiler < 400 kW	**unit**	**1990**		**2010**			**2020**			**2030**	
space heating	**Scenario**	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Sales	'000	4 121	5 098	5 098	0	5 548	5 548	0	5 904	5 904	0
Stock	'000	61 069	98 280	98 280	0	102 939	102 939	0	105 357	105 357	0
Effective heat output per unit	kWh/a	14 599	10 825	10 825	0	9 339	9 263	-76	8 131	7 893	-238
EU effective heat output	TWh heat/a	892	1 064	1 064	0	961	954	-8	857	832	-25
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	1957	1973	1950	-23	1610	1462	-148	1288	1026	-263
o/w electricity	*TWh elec/a*	*54*	*65*	*64*	*-1*	*69*	*63*	*-5*	*69*	*72*	*2*
o/w fuel	*TWh fuel/a*	*1821*	*1811*	*1791*	*-21*	*1439*	*1304*	*-135*	*1143*	*876*	*-267*
Final energy	TWh final/a	1875	1876	1854	-22	1507	1367	-140	1212	947	-265
GWP emissions	$MtCO_2$/a	459	426	421	-5	327	297	-29	249	194	-55
Acquisition costs (incl. install)	bn €	17	20	20	0	19	21	2	21	30	8
Energy costs	bn €	94	142	141	-2	89	81	-8	102	83	-20
Maintenance costs (incl. VAT)	bn €	11	17	17	0	17	17	0	17	16	0
Total running costs	bn €	105	159	158	-2	105	98	-8	119	99	-20
Total expenditure	bn €	122	179	178	-2	124	118	-6	140	128	-12
Revenue Industry	m €	5059	5644	5644	0	5143	5596	453	5756	7572	1816
Revenue Wholesale	m €	1315	1467	1467	0	1337	1454	118	1496	1968	472
Revenue Retail	m €	1315	1467	1467	0	1337	1454	118	1496	1968	472
Revenue Installation	m €	7637	9062	9062	0	8509	9788	1280	9795	14441	4647
Revenue Maintenance (excl. VAT)	m €	9982	14813	14813	0	14837	14811	-25	14604	14200	-405
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	89	99	99	0	90	98	8	101	133	32
Jobs Wholesale	'000 jobs	5	5	5	0	5	5	0	5	7	2
Jobs Retail/ installation/ maintenance	'000 jobs	173	230	230	0	224	237	13	235	279	44
Jobs Total	'000 jobs	267	334	334	0	319	340	21	341	419	77

Solid Fuel Boilers

CR (EU) 2015/1189 regards ecodesign requirements for SFB and applies to solid fuel boilers with a rated heat output of 500 kilowatt ('kW') or less, including those integrated in packages of a solid fuel boiler, supplementary heaters, temperature controls and solar devices as defined in Article 2 of Delegated Regulation (EU) 2015/1187. The regulation does NOT apply to boilers generating heat exclusively for providing hot drinking or sanitary water; boilers for heating and distributing gaseous heat transfer media such as vapour or air; solid fuel cogeneration boilers with a maximum electrical capacity of 50 kW or more; non-woody biomass boilers. Minimum efficiency requirements apply from January 2015 and are expressed in terms of seasonal space heating energy efficiency, as defined more in detail in annex III of the regulation. The regulation also limits the emissions of particulate matter, organic gaseous compounds, carbon monoxide, and nitrogen oxides, but these emissions are currently not being accounted in EIA.

CDR (EU) 2015/1187 regards the energy labelling for SFB. It applies to solid fuel boilers with a rated heat output of 70 kW or less and packages of a solid fuel boiler with a rated heat output of 70 kW or less, supplementary heaters, temperature controls and solar devices. The exemptions are the same as listed above for the ecodesign regulation. Energy labels shall be applied from April 2017. Annex II of the regulation defines energy efficiency classes in terms of EEI. The EEI is defined in annex IX of the regulation and is similar to the seasonal space heating energy efficiency but with an additional (bonus) factor of 1.45 for biomass boilers.

SFB Solid Fuel Boilers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	274	610			400			403		
Stock	'000	13 738	7 699			9 068			7 783		
Effective heat output per unit	kWh/a	17 501	18 691			17 300			15 763		
EU effective heat output	TWh heat/a	240	144			157			123		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	709	243	243	0	237	233	-4	172	161	-11
o/w electricity	*TWh elec/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
o/w fuel	*TWh fuel/a*	*709*	*243*	*243*	*0*	*237*	*233*	*-4*	*172*	*161*	*-11*
Final energy	TWh final/a	709	243	243	0	237	233	-4	172	161	-11
GWP emissions	$MtCO_2/a$	150	45	45	0	37	36	0	18	17	-1
Acquisition costs (incl. install)	bn €	1	4	4	0	3	3	0	3	4	0
Energy costs	bn €	19	8	8	0	7	7	0	6	6	0
Maintenance costs (incl. VAT)	bn €	1	0	0	0	0	0	0	0	0	0
Total running costs	bn €	19	9	9	0	8	8	0	7	6	0
Total expenditure	bn €	21	13	13	0	11	11	0	10	10	0
Revenue Industry	m €	785	2483	2483	0	1959	2093	134	2151	2341	189
Revenue Wholesale	m €	30	96	96	0	76	81	5	83	91	7
Revenue Retail	m €	30	96	96	0	76	81	5	83	91	7
Revenue Installation	m €	396	918	918	0	657	722	64	697	769	71
Revenue Maintenance (excl. VAT)	m €	599	339	339	0	402	402	0	349	349	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	14	43	43	0	34	37	2	38	41	3
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	9	12	12	0	10	11	1	10	11	1
Jobs Total	'000 jobs	23	56	56	0	45	48	3	48	52	4

Air Heating & Cooling

Commission Regulation (EU) 2016/2281 regards air heating products with a rated heating capacity not exceeding 1 MW; cooling products with a rated cooling capacity not exceeding 2 MW; fan coil units; and high temperature process chillers.

CR 2016/2281 does NOT apply to: products covered by CR (EU) 2015/1185 (Local Space Heaters); products covered by CR (EU) No 206/2012 (air conditioners and comfort fans); comfort chillers and high temperature process chillers (HTPCH) leaving chilled water temperatures of less than + 2 ºC; products designed for using predominantly biomass fuels; products using solid fuels; products that supply heat or cold in combination with electric power ('cogeneration') by means of a fuel combustion or conversion process; products covered by Directive 2010/75/EU (industrial emissions - integrated pollution prevention and control); HTPCH that operate using exclusively evaporative condensing; custom-made HTPCH assembled on site and made on a one-off basis; HTPCH in which refrigeration is effected by an absorption process that uses heat as the energy source; and air heating and/or cooling products of which the primary function is the purpose of storing and merchandising perishable materials at specified temperatures by commercial, institutional or industrial facilities and of which space heating and/or space cooling is a secondary function.

The regulation sets minimum energy efficiency requirements starting from January 2018 (tier 1), with more stringent requirements applying from January 2021 (tier 2). These requirements are formulated in terms of minimum seasonal space heating energy efficiency and useful efficiencies for air heating and air cooling products (refer to primary energy), and in terms of seasonal energy performance ratio (SEPR) for high temperature process chillers (refers to electricity). For cooling products, lower efficiencies are allowed if the refrigerants used have a low Global Warming Potential (refrigerant leakage problem). EIA takes into account the higher required energy efficiencies for products using refrigerants with GWP > 150, but starting from EIA 2019, CO_2 emissions due to refrigerant losses are no longer accounted (being covered mainly by the F-gas regulation). In addition the regulation sets limits on NOx emissions, but these are currently not accounted in EIA.

AHC central Air Cooling	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales, Total Central Air Cooling	'000	124	526			620			684		
o/w CH, comfort chillers	*'000*	*22*	*94*			*113*			*136*		
o/w AC, air conditioners	*'000*	*87*	*408*			*479*			*517*		
o/w HT PCH, high temp. process chillers	*'000*	*15*	*24*			*28*			*30*		
Stock comfort chillers & reversibles	'000	1 471	6 539			8 793			10 113		
o/w CH, comfort chillers	*'000*	*300*	*1 276*			*1 913*			*2 338*		
o/w AC, air conditioners	*'000*	*1 004*	*4 963*			*6 502*			*7 348*		
o/w HT PCH, high temp. process chillers	*'000*	*167*	*301*			*378*			*427*		
Effective cooling output per unit, CH+AC	kWh cooling/a	34 494	25 517			24 108			21 783		
Effective cooling output per unit, HT PCH	kWh cooling/a	1 569 859	1 572 832			1 573 018			1 574 569		
EU effective cooling output, CH+AC	TWh cooling/a	45	159			203			211		
EU effective cooling output, HT PCH	TWh cooling/a	263	473			595			673		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	176	333	333	0	387	379	-8	330	304	-26
o/w electricity	*TWh elec/a*	*70*	*133*	*133*	*0*	*155*	*151*	*-3*	*157*	*145*	*-12*
o/w fuel	*TWh fuel/a*	*0.0*	*0.1*	*0.1*	*0.0*	*0.2*	*0.2*	*0.0*	*0.3*	*0.2*	*-0.1*
Final energy	TWh final/a	70	133	133	0	155	152	-3	157	145	-12
GWP emissions from energy use	MtCO_2/a	35	42	42	0	33	32	-1	22	21	-2
Acquisition costs (incl. install)	bn €	2	8	8	0	11	11	0	13	13	0
Energy costs	bn €	11	19	19	0	26	25	-1	28	26	-2
Maintenance costs (incl. VAT)	bn €	1	4	4	0	7	7	0	9	9	0
Total running costs	bn €	12	23	23	0	32	32	-1	37	35	-2
Total expenditure	bn €	14	31	31	0	43	42	-1	50	48	-2
Revenue Industry	m €	865	4091	4091	0	5618	5620	2	7100	7101	1
Revenue Wholesale	m €	109	514	514	0	706	706	0	892	892	0
Revenue Retail	m €	109	514	514	0	706	706	0	892	892	0
Revenue Installation	m €	426	2419	2419	0	3455	3456	1	4442	4443	1
Revenue Maintenance (excl. VAT)	m €	978	4292	4292	0	6757	6757	0	8901	8901	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	15	72	72	0	98	98	0	124	124	0
Jobs Wholesale	'000 jobs	0	2	2	0	2	2	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	14	66	66	0	100	100	0	130	130	0
Jobs Total	'000 jobs	29	140	140	0	201	201	0	257	257	0

AHC central Air Heating	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales air heaters & reversible AC's	'000	185	378			432			451		
o/w reversible AC (double with cooling)	*'000*	*62*			*295*			*359*			*385*
Stock	'000	2 172	4 972			5 945			6 559		
o/w reversible AC (double with cooling)	*'000*	*716*			*3 514*			*4 699*			*5 452*
Effective heat output per unit	kWh heat/a	69 787	42 474			36 341			31 468		
EU effective heat output	TWh heat/a	152	211			216			206		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	233	254	254	0	230	219	-11	182	153	-29
o/w electricity	*TWh elec/a*	*16*	*45*	*45*	*0*	*50*	*47*	*-2*	*48*	*42*	*-6*
o/w fuel	*TWh fuel/a*	*194*	*141*	*141*	*0*	*106*	*100*	*-6*	*82*	*66*	*-16*
Final energy	TWh final/a	209	186	186	0	156	148	-8	130	107	-22
GWP emissions from energy	MtCO$_2$/a	49	44	44	0	33	31	-2	24	20	-4
Acquisition costs (incl. install, excl. rev.AC)	bn €	0.7	0.5	0.5	0.0	0.4	0.4	0.0	0.4	0.4	0.0
Energy costs	bn €	10	14	14	0	13	12	-1	14	12	-2
Maintenance costs (incl. VAT, excl. rev.AC)	bn €	0.1	0.1	0.1	0.0	0.1	0.1	0.0	0.1	0.1	0.0
Total running costs (excl. maint. rev AC)	bn €	10	15	15	0	13	13	-1	14	12	-2
Total expenditure (excl. acq & maint rev AC)	bn €	10	15	15	0	14	13	-1	15	12	-2
Revenue Industry (excl. rev. AC)	m €	340	222	222	0	196	214	19	175	190	15
Revenue Wholesale (")	m €	43	28	28	0	25	27	2	22	24	2
Revenue Retail (")	m €	43	28	28	0	25	27	2	22	24	2
Revenue Installation (")	m €	283	184	184	0	162	178	16	145	157	12
Revenue Maintenance (", excl. VAT)	m €	103	101	101	0	87	87	0	77	77	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	6	4	4	0	3	4	0	3	3	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	4	3	3	0	3	3	0	2	2	0
Jobs Total	'000 jobs	10	7	7	0	6	7	1	5	6	0

Local Space Heaters

CR (EU) 2015/1185 provides ecodesign requirements for solid fuel local space heaters with a nominal heat output of 50 kW or less. Exemptions include non-woody biomess, outdoor use only, direct heat output less than 6% of combined direct and indirect heat output, not factory assembled, air heating products, sauna stoves. Minimum efficiency requirements under this regulation apply from January 2022 and are expressed in terms of seasonal space heating energy efficiency as further defined in Annex III of the regulation. The seasonal efficiency is the useful efficiency at nominal heat output (based on NCV, application of factor CC=2.5 for electricity), negatively corrected by -10% and for auxiliary electricity consumption and permanent pilot flames, and postively corrected for the effects of controls. The regulation also limits the emission of particulate matter (PM), organic gaseous compunds (OGCs), carbon monxide (CO), and of nitrogen oxides (NOx), but these emissions are currently NOT accounted in the EIA.

CR (EU) 2015/1188 provides ecodesign requirements for domestic LSH with a nominal heat output of 50 kW or less and for commercial LSH (luminous or tube heater) with 120 kW or less that convert electricity or gaseous or liquid fuels directly into heat. Exemptions include vapour compression cycle, sorption cycle, purposes other than indoor space heating for human comfort, outdoor-use only, air heating products, sauna stoves, slave heaters. Minimum efficiency requirements under this regulation apply from January 2018 and are expressed in terms of seasonal space heating energy efficiency as further defined in Annex III of the regulation. The seasonal efficiency is the useful efficiency at nominal heat output (based on NCV, application of factor CC=2.5 for electricity, based on GCV for commercial LSH), negatively corrected by -10% and for auxiliary electricity consumption and permanent pilot flames, and postively corrected for the effects of controls and heat storage. For commercial LSH, the emission efficiency is also taken into account. The regulation also limits the emission of nitrogen oxides (NOx), but these emissions are currently NOT accounted in the EIA.

CDR (EU) 2015/1186 regards energy labelling for LSH with a nominal heat output of 50 kW or less. Exemptions include electric LSH, vapour compression cycle, sorption cycle, non-woody biomass, other than indoor heating for human comfort, outdoor-use only, LSH for which the direct heat output is less than 6 % of the combined direct and indirect heat output at nominal heat output (note: they will usually be regulated as 'boilers'), not factory assembled, luminous LSH, tube LSH, air heating products, sauna stoves. Energy labels shall be applied from January 2022 for solid fuel LSH and from January 2018 for other LSH (same dates as ecodesign). Energy efficiency classes are defined in annex II of the regulation in terms of EEI. The EEI are defined in annex VIII. They are similar to the seasonal space heating efficiency (with similar correction factors), but with application of a biomass label factor 1.45 for biomass LSH.

Design options mentioned in preparatory study at product level are: Closing combustion (glass front), balanced flue, premix, electric ignition (eliminating pilot flame), mechanical draft, single split reversible heat pump (substitute for electric convector), modulating (or 2 stage) power control. At component level they include: PI controller, programmable thermostat with setback functionality, absence detection, open window detection, automatic (electromechanical, electronic) charge control (for static storage heaters)

LH Local Space Heaters	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	17 807	22 308			20 857			21 005		
Stock	'000	247 633	312 814			326 743			323 348		
Effective heat output per unit	kWh/a	844	747	747	0	730	726	-4	725	710	-15
EU effective heat output	TWh heat/a	209	234	234	0	239	237	-1	234	230	-5
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	619	607	607	0	561	541	-21	451	405	-46
o/w electricity	*TWh elec/a*	*193*	*179*	*179*	*0*	*152*	*145*	*-7*	*122*	*108*	*-13*
o/w solid fuel	*TWh fuel/a*	*117*	*148*	*148*	*0*	*173*	*170*	*-3*	*190*	*172*	*-17*
o/w gaseous fuel	*TWh fuel/a*	*18*	*12*	*12*	*0*	*8*	*8*	*0*	*5*	*5*	*-1*
o/w liquid fuel	*TWh fuel/a*	*2*	*1*	*1*	*0*	*1*	*1*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	330	339	339	0	334	323	-10	317	286	-31
GWP emissions from energy	$MtCO_2/a$	112	67	67	0	42	40	-2	26	23	-3
Acquisition costs (incl. install)	bn €	10	15	15	0	17	19	2	18	20	2
Energy costs	bn €	43	36	36	0	37	35	-1	34	30	-4
Maintenance costs (incl. VAT)	bn €	1	2	2	0	2	2	0	2	2	0
Total running costs	bn €	44	38	38	0	39	37	-1	36	33	-4
Total expenditure	bn €	54	53	53	0	56	56	0	55	53	-2
Revenue Industry	m €	4553	6959	6959	0	7675	8502	828	8023	8957	934
Revenue Wholesale	m €	643	988	988	0	1096	1215	119	1147	1282	135
Revenue Retail	m €	759	1168	1168	0	1295	1436	141	1355	1514	159
Revenue Installation	m €	2374	3569	3569	0	4408	4757	350	4920	5311	391
Revenue Maintenance (excl. VAT)	m €	913	1320	1320	0	1620	1620	0	1867	1867	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	80	122	122	0	134	149	14	140	157	16
Jobs Wholesale	'000 jobs	2	3	3	0	4	4	0	4	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	40	60	60	0	72	77	5	79	85	6
Jobs Total	'000 jobs	122	185	185	0	210	230	20	224	246	23

Room Air Conditioners

The ED and EL measures relate to electric mains-operated air conditioners with a rated capacity of <= 12 kW for cooling, or heating if the product has no cooling function, and comfort fans with an electric fan power input <= 125W. Excluded are appliances that use non-electric energy sources and air conditioners of which the condenser-side or evaporator- side, or both, do not use air for heat transfer medium.

Design options for room air conditioners include inverter driven variable speed drives to to adjust the performance of the appliance depending on (changing) operating conditions (outdoor and indoor air temperature), reduction of energy consumption of auxiliary functions like, standby, off-mode, reactivation function and use of refrigerants with lower Global Warming Potential.

RAC Room Air Conditioner	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	373	4 205			4 377			5 878		
o/w reversible and also used for heating	'000	27	1 395			2 373			4 340		
Stock	'000	4 376	50 293			46 089			59 641		
o/w reversible and also used for heating	'000	329	12 893			20 120			38 531		
Effective cooling output per unit	kWh cool/a	1 333	1 370	1 370	0	1 403	1 403	0	1 406	1 406	0
Effective heat output per reversible unit	kWh heat/a	5 999	5 109	5 109	0	4 794	4 751	-42	4 363	4 230	-133
EU effective cooling output	TWh cool/a	6	69	69	0	65	65	0	84	84	0
EU effective heat output	TWh heat/a	2	66	66	0	96	96	-1	168	163	-5
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy total (100% electric)	TWh prim/a	10.1	143	110	-33	139	93	-46	152	111	-41
Electricity total	TWh elec/a	4.1	57	44	-13	56	37	-18	72	53	-20
o/w electricity cooling	*TWh elec/a*	*2.9*	*27*	*20*	*-7*	*19*	*12*	*-7*	*20*	*13*	*-6*
o/w electricity heating	*TWh elec/a*	*1.1*	*31*	*24*	*-6*	*36*	*25*	*-11*	*53*	*39*	*-13*
Final energy	TWh final/a	4	57	44	-13	56	37	-18	72	53	-20
GWP emissions total	$MtCO_2/a$	2.0	18.2	14.0	-4.2	11.9	7.9	-4.0	10.3	7.5	-2.8
o/w GWP emissions for cooling	*$MtCO_2/a$*	*1.5*	*8.5*	*6.3*	*-2.1*	*4.1*	*2.6*	*-1.5*	*2.8*	*1.9*	*-0.9*
o/w GWP emissions for heating	*$MtCO_2/a$*	*0.6*	*9.7*	*7.6*	*-2.1*	*7.8*	*5.3*	*-2.4*	*7.5*	*5.6*	*-1.9*
Acquisition costs (incl. install)	bn €	0	6	7	1	6	7	2	8	9	1.1
Energy costs total	bn €	1	10	7	-2	11	7	-4	15	11	-4.1
o/w energy cooling	*bn €*	*1*	*4*	*3*	*-1*	*4*	*2*	*-1*	*4*	*3*	*-1.3*
o/w energy heating	*bn €*	*0*	*5*	*4*	*-1*	*7*	*5*	*-2*	*11*	*8*	*-2.8*
Maintenance costs (incl. VAT)	bn €	0	1	1	0	1	1	0	1	1	0.0
Total running costs	bn €	1	11	8	-2	12	8	-4	16	12	-4.1
Total expenditure	bn €	1	17	16	-1	18	16	-2	24	21	-3.0
Revenue Industry	m €	100	1332	1640	308	1321	1700	379	1698	1965	266
Revenue Wholesale	m €	52	694	855	161	696	895	199	902	1042	140
Revenue Retail	m €	38	502	618	116	503	646	144	651	752	101
Revenue Installation	m €	212	2732	3309	576	2709	3421	711	3590	4057	467
Revenue Maintenance (excl. VAT)	m €	80	946	946	0	865	865	0	1137	1137	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	2	23	29	5	23	30	7	30	34	5
Jobs Wholesale	'000 jobs	0	2	3	1	2	3	1	3	4	0
Jobs Retail/ installation/ maintenance	'000 jobs	3	40	46	7	39	47	8	51	56	6
Jobs Total	'000 jobs	5	65	78	13	64	80	16	84	95	11

Circulators <2.5 kW

This Regulation addresses glandless standalone circulators and glandless circulators integrated in products. Excluded, except for certain product information requirements, are drinking water circulators and circulators integrated in products and placed on the market no later than 1 January 2020 as replacement for identical circulators integrated in products and placed on the market no later than 1 August 2015.

Design options for small circulators include more efficient (EC/DC permanent magnet) motors, variable speed drives, improved impeller design with lower hydraulic loss through smoother finish of stainless steel impellers, wider and optimised range of housings, intelligent controls.

Note: below data include double counted amounts (integrated circulators and 38% of stand-alone circulators already counted under central heating boilers).

CIRC Circulator pumps <2.5 kW	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	8 726	13 071			14 184			14 651		
Stock	'000	79 661	121 008			136 929			145 048		
Load per unit (W=Pa·m^3/s; kWh=10^3·W·h)	kWh flow/a	158	158			158			158		
EU load (1 TWh=10^{12}·W·h)	TWh flow/a	13	19			21			21		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	69	98	98	0	92	61	-31	73	44	-29
o/w electricity	*TWh elec/a*	*27*	*39*	*39*	*0*	*37*	*24*	*-13*	*35*	*21*	*-14*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	27	39	39	0	37	24	-13	35	21	-14
GWP emissions	$MtCO_2/a$	14	12	12	0	8	5	-3	5	3	-2
Acquisition costs (incl. install)	bn €	3	5	5	0	5	6	1	5	6	0
Energy costs	bn €	5	7	7	0	7	5	-2	7	4	-3
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	6	7	7	0	7	5	-2	8	5	-3
Total expenditure	bn €	9	12	12	0	13	11	-2	13	10	-2
Revenue Industry	m €	1265	2077	2077	0	2189	2651	462	2138	2373	235
Revenue Wholesale	m €	428	702	702	0	740	893	153	724	801	77
Revenue Retail	m €	97	154	154	0	164	182	18	166	174	7
Revenue Installation	m€	827	1323	1323	0	1423	1598	174	1462	1532	70
Revenue Maintenance (excl. VAT)	m€	153	230	230	0	242	242	0	235	235	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	22	36	36	0	38	46	8	37	42	4
Jobs Wholesale	'000 jobs	2	2	2	0	3	3	1	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	10	16	16	0	17	19	2	17	18	1
Jobs Total	'000 jobs	34	55	55	0	58	68	10	57	62	5

Ventilation Units

VU's provide savings on space heating, as compared to natural ventilation, when they recuperate heat from the outgoing airflow and use this to pre-heat the incoming air. The total EU heat savings due to VU's are reported below on the lines labelled (4) in the unit-column. Due to these heat savings, space heating appliances need to produce less heat in output, i.e. their 'load' (=user demand for heat output) goes down. The BAU heat savings due to VU's have already been considered in the BAU loac for space heating appliances and thus do not lead to additional savings. The difference between ECO and BAU heat savings due to VU's (column inc) is the positive effect of Ecodesign measures for VU's on space heating appliances. The BAU load for space heating appliances is reduced by this heat saving difference to obtain the ECO load for space heating appliances. The lower load implies that space heating appliances need less primary energy in input, so heat savings by VU's lead to energy savings on space heating appliances. The saved amount depends on the efficiency of the space heating appliance and therefore the heat saving effects of VU-Ecodesign have already been included in the ECO-scenario data for space heating appliances. The same is true for the reduction in emissions and energy costs related to these energy savings . As these savings on space heating appliances are due to measures taken on VU's, they are also reported here, but they are not considered when computing EIA totals, to avoid double counting.

To realize the heat savings discussed above, and in general to maintain indoor air quality, VU's consume electricity. The Ecodesign measures increase the energy efficiency of VU's and thus obtain savings on electricity consumption. These savings, and related reduction of emissions and electricity costs, are related only to VU's and are NOT already included in the data for space heating appliances. Electricity-related savings on VU's are taken into account when computing EIA-totals. Consequently, data on energy, emissions and energy costs in the table below are split in VU-electricity-related data (1) and heat-saving-related data (2). The sum of the two (3) provides the total impact of Ecodesign measures on VU's, but the heat-saving-related data (2) are already also included in those for space heating appliances.

Ventilation Units	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	568	1 490			2 119			4 169		
Stock	'000	7 226	19 775			27 754			49 232		
Annual ventilation per unit	1000m3/a	6 270	4 752			4 733			3 300		
EU total mechanical ventilation	T m³/a	45	94			131			162		
o/w non-residential	T m³/a	39	73			100			117		
o/w residential	T m³/a	7	20			32			45		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Heat recovered by VUs	TWh heat/a (4)	28	54	54	0	85	100	15	109	158	49
o/w non-residential	TWh heat/a (4)	27	52	52	0	81	95	14	95	134	40
o/w residential	TWh heat/a (4)	0	2	2	0	4	5	1	14	23	9
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (elec.&heat effects vs BAU)	TWh prim/a (3)	66	108	108	0	113	86	-27	112	41	-71
o/w own VU electricity	TWh elec/a (1)	26	43	43	0	45	43	-2	53	45	-8
o/w electricity for space heating (due to ECO-VU heat savings vs. BAU-VU)	*TWh elec/a (2)*	*0*	*0*	*0*	*0*	*0*	*-3*	*-3*	*0*	*-9*	*-9*
o/w fuel for space heating (due to ECO-VU heat savings vs. BAU-VU)	*TWh prim/a (2)*	*0*	*0*	*0*	*0*	*0*	*-13*	*-13*	*0*	*-35*	*-35*
Final energy (elec.&heat effects vs BAU)	TWh final/a (3)	26	43	43	0	45	26	-19	53	1	-52
o/w own VU electricity	TWh elec/a (1)	26	43	43	0	45	43	-2	53	45	-8
o/w final energy for space heating (due to ECO-VU heat savings vs. BAU-VU)	*TWh final/a (2)*	*0*	*0*	*0*	*0*	*0*	*-16*	*-16*	*0*	*-44*	*-44*
GWP emissions (from own VU electricity)	$MtCO_2/a$ (1)	13	14	14	0	10	9	-1	8	6	-1.2
GWP emissions (from heat savings vs. BAU)	*$MtCO_2/a$ (2)*	*0*	*0*	*0*	*0*	*0*	*-3*	*-3*	*0*	*-8*	*-7.6*
Acquisition costs (incl. install)	bn €	4	16	16	0	19	19	1	21	22	1
Energy costs (from own VU electricity)	bn € (1)	5	7	7	0	8	8	0	11	9	-2
Energy costs (from heat savings vs. BAU)	*bn € (2)*	*0*	*0*	*0*	*0*	*0*	*-1*	*-1*	*0*	*-4*	*-4*
Maintenance costs (incl. VAT)	bn €	1	2	2	0	2	2	0	3	3	0
Running costs (from electricity + maint.)	bn € (1)	5	8	8	0	11	10	0	14	12	-2
Total expenditure (own elec. +acq. +maint.)	bn € (1)	10	25	25	0	29	29	0	35	34	-1
Total expenditure (from heat savings vs. BAU)	*bn € (2)*	*0*	*0*	*0*	*0*	*0*	*-1*	*-1*	*0*	*-4*	*-4*
Revenue Industry	m €	1554	5769	5769	0	6725	7260	535	7788	8293	505
Revenue Wholesale	m €	218	802	802	0	959	1043	85	1302	1380	78
Revenue Retail	m €	220	810	810	0	971	1057	86	1336	1415	80
Revenue Installation	m €	2224	8682	8682	0	9626	9630	4	10148	10164	16
Revenue Maintenance (excl. VAT)	m €	851	1685	1685	0	2267	2267	0	3136	3136	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	27	101	101	0	118	127	9	136	145	9
Jobs Wholesale	'000 jobs	1	3	3	0	3	4	0	5	5	0
Jobs Retail/ installation/ maintenance	'000 jobs	30	103	103	0	118	120	1	136	137	1
Jobs Total	'000 jobs	58	206	206	0	239	250	11	277	287	10

Light Sources

The BAU scenario is the projection for the situation without any measures taken in 2009-2012, so without regulations 244/2009, 245/2009, 1194/2012 and 874/2012. Based on new data from the Lot 8/9/19 review study and the following IA study, the BAU scenario has been redefined during the IA study in November 2017/ April 2018, see details in that study.

The ECO scenario reflects the final voted measures as published end 2019 (CR 2019/2020 and CDR 2019/2015). Ecodesign measures entail the phase-out of LFL T8 (2-,4- and 5-feet only) (in 2023), CFLi and all remaining halogen lamps (in 2021), except halogen capsules with G9, G4 or GY6.35 cap (allowed on the market until Sept. 2023) and linear models with R7s cap below 2700 lm. The Energy Label for light sources is rescaled to A-G with new border values for the efficiency classes (from 85 to 210 lm/W in steps of 25 lm/W).

Consequently the savings reported in EIA are the combined savings due to the old regulations (244/2009, 245/2009, 1194/2012, 874/2012) and due to the new regulations as published in December 2019 (CR 2019/2020 and CDR 2019/2015).

Energy data in the table below include electricity consumption by control gears (CG) and standby (sb; estimate). Starting from EIA 2019, electricity consumption by Special Purpose Lamps (SPL) and lighting controls (ctrl) is no longer included (because not regulated).
Acquisition costs cover only light sources, sold stand-alone or inside a luminaire, but luminaire costs are not included. Installation costs are included (covering also rewiring for LED retrofits where used) but refer only to the (retrofit) light source, not to substitution of luminaires or separate control gears. Maintenance costs are mainly a share of luminaire cleaning costs assigned to the light sources (see preparatory study). Costs for separate control gears (not integrated with the light source) are not included.

LS Light Sources	**unit**	**1990**	**2010**			**2020**			**2030**		
		BAU	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Sales	m	1 743	2 383	2 181	-202	2 310	1 509	-801	1 364	582	-782
Stock	m	4 620	8 659	8 606	-53	10 767	10 793	26	12 641	12 658	17
EU output capacity in lm	Tlm	4.6	8.9	8.9	0.0	12.7	13.0	0.3	16.2	16.7	0.5
EU accumulated operating hours total	Tlm	3.9	7.4	7.4	0.0	9.4	9.4	0.1	11.5	11.7	0.2
incl. CG and sb, excl. SPL and ctrl.	**Scenario**	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	494	789	751	-38	936	734	-202	703	502	-202
o/w electricity	*TWh elec/a*	*198*	*316*	*300*	*-15*	*375*	*294*	*-81*	*335*	*239*	*-96*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	198	316	300	-15	375	294	-81	335	239	-96
GWP emissions	$MtCO_2/a$	99	100	95	-5	80	63	-17	48	34	-14
Acquisition costs (incl. install)	bn €	6	13	13	0	16	15	-1	12	12	-1
Energy costs	bn €	36	49	46	-3	67	52	-15	64	45	-19
Maintenance costs	bn €	2	4	4	0	5	5	0	6	6	0
Total running costs	bn €	36	51	50	0	70	57	-13	69	52	-17
Total expenditure	bn €	44	65	63	-2	88	72	-16	83	63	-19
Revenue Industry	m €	2575	5228	5504	276	8212	8717	505	6839	7415	576
Revenue Wholesale	m €	662	1637	1748	110	1984	1394	-590	1209	953	-256
Revenue Retail	m €	625	1518	1613	95	1823	1252	-571	1138	924	-214
Revenue Installation	m €	2249	3777	3675	-102	3305	2855	-450	2914	2215	-699
Revenue Maintenance (excl. VAT)	m €	1634	4079	4121	42	5148	5179	31	6583	6622	39
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	45	92	96	5	144	153	9	120	130	10
Jobs Wholesale	'000 jobs	2	6	6	0	7	5	-2	4	3	-1
Jobs Retail/ installation/ maintenance	'000 jobs	43	91	92	1	101	89	-12	100	91	-9
Jobs Total	'000 jobs	91	188	194	6	251	246	-5	224	224	0

Electronic Displays

Commission Regulation (EC) No 642/2009 , OJ L 191/42, 23.7.2009, set Ecodesign requirements for televisions (TV sets and TV monitors). Starting from 2010/2012, requirements regarded the on-mode power, off-mode power and standby power. In addition, there were existing EU ENERGY STAR measures for computer monitors, which were also involved in the standby regulation (Commission Regulation (EC) No 1275/2008, OJ L339/49, 18.12.2008). CR 642/2009 is repealed from March 2021 by CR (EU) 2019/2021, which also removes all electronic displays from the standby regulation.

Commission Delegated Regulation (EU) No 1062/2010, OJ L 314/64, 30.11.2010, defined energy classes and energy labels for televisions. Classes are defined on a G to A+++ scale. This regulation is repealed from March 2021 by CDR (EU) 2019/2013, which redefines an A-G label scale.

The new Ecodesign regulation (CR 2019/2021) and Energy Labelling regulation (CDR 2019/2013) extend the scope of Ecodesign to all Electronic Displays (DP), including also computer monitors and signage displays. Exempted are: DP with area ≤ 100 cm2; digital photo frames; projectors; all-in-one video conference systems; medical displays; virtual reality headsets, displays integrated or to be integrated into products listed into Article 2, point 3(a) and point 4 of Directive 2012/19/EU (WEEE-directive); displays that are components or subassemblies of products covered by implementing measures adopted under Directive 2009/125/EC (ecodesign directive). In addition energy efficiency, labelling and some functional requirements do not apply to: broadcast displays; professional displays; security displays; digital interactive whiteboards; digital photo-frames, digital signage displays (so only off-mode, standby, material efficiency and information availability requirements for these DP). Status displays and control panels are also exempt from off-mode and (networked) standby requirements.

The BAU scenario in EIA represents the situation without any regulation (also without CR 642/2009, 1062/2010, 1275/2008, Energy Star). This is different from the 2018 IA, where the BAU scenario used as reference includes these regulations.
The ECO scenario in EIA reflects the preferred Option 3 (Ambitious) of the 2018 IA document and the final 2019 regulations.

See sheet LoadNotes for further information.

DP Electronic Displays	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales (TV+Monitor+Signage)	'000	29 455	83 489			59 668			73 151		
Stock (TV+Monitor+Signage)	'000	185 717	446 262			521 649			626 211		
Viewable area per TV	dm²	10	28			51			68		
Viewable area per Monitor	dm²	5	11			16			20		
Viewable area per Signage display	dm²	16	46			84			113		
EU total viewable area for all DPs	km²	18	101			242			398		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	69	194	194	0	264	213	-51	238	130	-108
o/w on-mode electricity	*TWh elec/a*	*24*	*75*	*75*	*0*	*98*	*77*	*-20*	*102*	*51*	*-51*
o/w standby- and off-mode electricity	*TWh elec/a*	*3*	*3*	*3*	*0*	*8*	*8*	*0*	*11*	*11*	*-1*
total electricity (on-mode, off-mode, standby	*TWh elec/a*	*27*	*78*	*78*	*0*	*106*	*85*	*-20*	*113*	*62*	*-51*
Final energy	TWh final/a	27	78	78	0	106	85	-20	113	62	-51
GWP emissions	$MtCO_2/a$	14	25	25	0	23	18	-4	16	9	-7
Acquisition costs (incl. install)	bn €	20	33	33	0.0	26	26	0.0	32	32	0.0
Energy costs	bn €	6	13	13	0.0	21	17	-4.1	24	13	-11.1
Maintenance costs (incl. VAT)	bn €	0.2	0.4	0.4	0.0	0.5	0.5	0.0	0.6	0.6	0.0
Total running costs	bn €	6	14	14	0.0	21	17	-4.1	25	14	-11.1
Total expenditure	bn €	26	47	47	0.0	48	44	-4.1	57	46	-11.1
Revenue Industry	m €	7955	13719	13719	0	11222	11222	0	13464	13464	0
Revenue Wholesale	m €	1153	2121	2121	0	2211	2211	0	2341	2341	0
Revenue Retail	m €	7582	12758	12758	0	9573	9573	0	12128	12128	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	149	365	365	0	424	424	0	508	508	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	139	240	240	0	197	197	0	236	236	0
Jobs Wholesale	'000 jobs	4	7	7	0	8	8	0	8	8	0
Jobs Retail/ installation/ maintenance	'000 jobs	112	189	189	0	143	143	0	181	181	0
Jobs Total	'000 jobs	255	437	437	0	348	348	0	425	425	0

Set Top Boxes

Simple set-top boxes don't exist anymore and are replaced by complex set-top boxes in all relevant applications, as shown in the Omnibus 2013 study and confirmed by the Commission in the CF of mid-2014. This is a perfectly normal evolution within the ITC market, but the consequence is that they don't contribute to the savings. All savings come from Complex set-top boxes.

Complex Set-top Boxes (CSTB) are regulated by a Voluntary Agreement (VA) since 2011. Current (2019) applicable version is VA 6 Tier 4 (www.cstb.eu). Active modes (4.5 h/d), standby (15 h/d), and standby after AutoPowerDown (APD, 4.5 h/d) are distinguished, but combined in a single Total Energy Consumption (TEC) value in kWh/a. Maximum limits are set for the TEC, depending on base functionality type (cable, satellite, IP, terrestial, thin-client/remote) and many additional functionalities. All products are now required to have APD capability.

CSTB data have been updated in EIA 2019 using TEC data from the VA independent inspector report 2018. TEC values reported for service providers have been used as a reference. These values are higher, but probably closer to reality, than values reported for equipment manufacturers (see also April 2020 ICT interim report).
In the EIA 2019 update, sales have been kept constant from 2016 on 41 mln units per year (stock 205 mln), removing the further increase that was present in previous EIA issues.

The Impact Assessment on Standby separately estimates electricity consumption for networked standby of CSTBs, but this estimate is not compatible with the overall estimate deriving from the VA. For the moment the EIA electricity consumption for low-power modes of CSTBs (regulated by CR 1275/2008 as amended) has therefore been estimated to be 65% of the overall electricity consumption.

STB Set Top Boxes	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	0	50 060			34 666			34 666		
Stock	'000	0	147 850			174 828			173 332		
Unit average hours in 'on' mode per day	h/d	0.0	4.5			4.5			4.5		
EU billion hours in 'on'-mode per year	bn h 'on'/a	0.0	243			287			285		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	26	23	-3	46	33	-13	33	25	-8
o/w electricity	*TWh elec/a*	*0*	*10*	*9*	*-1*	*18*	*13*	*-5*	*16*	*12*	*-4*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	0	10	9	-1	18	13	-5	16	12	-4
GWP emissions	$MtCO_2/a$	0	3	3	0	4	3	-1	2	2	-1
Acquisition costs (incl. install)	bn €	0	6	6	0	6	6	0	6	6	0
Energy costs	bn €	0	2	2	0	4	3	-1	3	3	-1
Total expenditure	bn €	0	8	8	0	10	9	-1	9	9	-1
Revenue Industry	m €	0	3292	3292	0	3236	3236	0	3236	3236	0
Revenue Wholesale	m €	0	1503	1503	0	1478	1478	0	1478	1478	0
Revenue Retail	m €	0	301	301	0	296	296	0	296	296	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	0	58	58	0	57	57	0	57	57	0
Jobs Wholesale	'000 jobs	0	5	5	0	5	5	0	5	5	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	4	4	0	4	4	0	4	4	0
Jobs Total	'000 jobs	0	67	67	0	66	66	0	66	66	0

Video, game consoles

The 2015 Voluntary Agreement for game consoles (Self-Regulatory Initiative, SRI) sets requirements for the auto-power down (APD) function and for the maximum power during console operation in navigation or media-playback mode. As regards the gaming mode, the APD requirements apply, but there is no power cap in the SRI. The power-related requirements of the SRI apply to consoles with power > 20 W in gaming mode. In addition to the SRI, game consoles (of all powers) are subject to CR 801/2013 (networked standby) and CR 1275/2008 (standby and off-mode).

The EIA2020 update considers SRI version 3.0 (last revision of March 2020), data from the 2019 Impact Assessment on Standby, from the 2019 Review study on the Voluntary Agreement on Game consoles (for Playstation 4, Xbox One and Nintendo Switch), from the 2017 Industry report on the SRI (Playstation 4, Xbox One), from the 2016 thesis by Amanda Webb and from other online sources (for older game console models).

Design options for game consoles include power management and reduction of power in the various states of standby, inactive/idle and active use as well as increasing hardware flexibility to perform less computationally intensive tasks with some of the processing resources disabled (e.g. media playback is often much higher in game consoles than in standalone media devices), reducing the duration and frequency of auto-wake events, implementing and improving auto power down functionality to enable the console to automatically enter a low power state (normally standby or networked standby) if there is no user input for a predefined time.

New game console models have more features, higher computing performance, higher display resolution, etc. compared to their predecessors. As a consequence, typically, new models initially have a higher power consumption, but this is then reduced by optimization in later years. Annual sales quantities show strong variations, with peaks in the first and second year after launch of a new model, and decreasing in later years.

Although the APD function by default sets the console in a (networked) standby state (after 1 hour of inactivity for gaming or navigation, or after 4 hours for media playback), a majority of users changes the default settings, keeping some console features active, so that power consumption after an APD is often higher than the limit set for (networked) standby in the Commission Regulations. In the 2019 review study on the VA for game consoles, networked standby mode is combined, with several other 'non-active' (but not always low-power) modes in a 'rest mode'. The power consumption in this 'rest mode' is not (yet) regulated.

All these factors together make it complex to define average powers and average usage hours for the various console operating modes. In particular the definition of a BAU scenario (what would have happened in absence of measures) is difficult. The recent review studies (CSES 2019, Industry 2017) use the BAU scenario indicated in the 2016 thesis of Amanda Webb, and EIA followed this approach. This BAU scenario is uncertain however, and as a consequence, so are the reported savings.

VIDEO (Game Consoles)	**unit**	**1990**		**2010**			**2020**			**2030**	
Sales	'000	600		10 600			10 600			10 600	
Stock	'000	600		72 672			74 200			74 200	
Unit average hours in 'on' mode per day	h/d	1.5	1.7	1.6	0.0	2.8	2.2	-0.6	2.8	2.2	-0.6
EU billion hours in 'on'-mode per year	bn h 'on'/a	0	44	43	-1	75	60	-15	75	60	-15
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	0	12	12	-0.1	23	13	-10.1	18	10	-8.6
o/w electricity	*TWh elec/a*	*0*	*5*	*5*	*0.0*	*9*	*5*	*-4.0*	*9*	*5*	*-4.1*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0.0*	*0*	*0*	*0.0*	*0*	*0*	*0.0*
Final energy	TWh final/a	0	5	5	0.0	9	5	-4.0	9	5	-4.1
GWP emissions	$MtCO_2/a$	0	2	2	0.0	2	1	-0.9	1	1	-0.6
Acquisition costs (incl. install)	bn €	0	4	4	0.0	4	4	0.0	4	4	0.0
Energy costs	bn €	0	1	1	0.0	2	1	-0.8	2	1	-0.9
Total expenditure	bn €	0	5	5	0.0	6	5	-0.8	6	5	-0.9
Revenue Industry	m €	74	1606	1606	0.0	1606	1606	0.0	1606	1606	0.0
Revenue Wholesale	m €	9	204	204	0.0	204	204	0.0	204	204	0.0
Revenue Retail	m €	74	1592	1592	0.0	1592	1592	0.0	1592	1592	0.0
Revenue Installation	m€	0	0	0	0.0	0	0	0.0	0	0	0.0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0.0	0	0	0.0	0	0	0.0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	1	28	28	0	28	28	0	28	28	0
Jobs Wholesale	'000 jobs	0	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	1	23	23	0	23	23	0	23	23	0
Jobs Total	'000 jobs	2	52	52	0	52	52	0	52	52	0

Enterprise Servers (ES) and Data Storage Products (DS)

Regulation CR 2019/424 applies to servers and online data storage products, where:

'**server**' means a computing product that provides services and manages networked resources for client devices, such as desktop computers, notebook computers, desktop thin clients, internet protocol telephones, smartphones, tablets, telecommunication, automated systems or other servers, primarily accessed via network connections, and not through direct user input devices, such as a keyboard or a mouse and with the following characteristics:
(a) it is designed to support server operating systems (OS) and/or hypervisors, and targeted to run user-installed enterprise applications;
(b) it supports error-correcting code and/or buffered memory (including both buffered dual in-line memory modules and buffered on board configurations);
(c) all processors have access to shared system memory and are independently visible to a single OS or hypervisor;

'**data storage product**' means a fully-functional storage system that supplies data storage services to clients and devices attached directly or through a network. Components and subsystems that are an integral part of the data storage product architecture (e.g., to provide internal communications between controllers and disks) are considered to be part of the data storage product. In contrast, components that are normally associated with a storage environment at the data centre level (e.g. devices required for operation of an external storage area network) are not considered to be part of the data storage product. A data storage product may be composed of integrated storage controllers, data storage devices, embedded network elements, software, and other devices;

The EIA ECO scenario represents the situation with CR 2019/424 in force (This closely corresponds to policy option PO 3.2 of the IA).
The EIA BAU scenario represents the situation without the new 2019 regulation. This is essentially the same BAU scenario considered in the IA.

Servers (ES) were previously regulated in CR 617/2013 on computers and computer servers, but that regulation has been ineffective in practice (no energy savings; see also remarks elsewhere for computers). In addition, there is an Energy Star specification for ES, but only 28% of servers on the EU market is labelled Energy Star. ES and DS are also involved in the 'EU Code of Conduct (CoC) on Data Centre Energy Efficiency' (CoC), but effects of that code are beyond the scope of EIA. Moreover, the available studies do not provide data for a BAU scenario without the effects of CR 617/2013, Energy Star and CoC. Hence, the BAU scenario in EIA already includes the effects of CR 617/2013, Energy Star and CoC, and the difference BAU - ECO thus provides only the effects of the new proposed regulation.
Data presented below do NOT include indirect effects of ES&DS improvements on the infrastructure of data centers (e.g. space cooling).
See sheet LoadNotes for further information on this.

Enterprise Servers and Data Storage	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	171	3 631			3 771			5 084		
Stock	'000	707	18 605			20 263			27 041		
EU demand for PSU output for ES & DS	TWh elec/a	2	38			42			62		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	5	121	121	0.0	125	120	-4.9	147	141	-6.2
o/w electricity	*TWh elec/a*	*2*	*48*	*48*	*0.0*	*50*	*48*	*-2.0*	*70*	*67*	*-3.0*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0.0*	*0*	*0*	*0.0*	*0*	*0*	*0.0*
Final energy	TWh final/a	2	48	48	0.0	50	48	-2.0	70	67	-3.0
GWP emissions	MtCO_2/a	1	15	15	0.0	11	10	-0.4	10	10	-0.4
Acquisition costs	bn €	1	33	33	0.0	33	33	0.0	44	44	0.0
Energy costs	bn €	0	7	7	0.0	9	8	-0.3	13	13	-0.6
Total expenditure	bn €	2	40	40	0.0	42	41	-0.3	57	56	-0.6
Revenue Industry	m€	1451	33150	33150	0	32971	32971	0	43558	43558	0
Revenue Wholesale	m€	0	0	0	0	0	0	0	0	0	0
Revenue Retail	m€	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	25	581	581	0	577	577	0	763	763	0
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Total	'000 jobs	25	581	581	0	577	577	0	763	763	0

Computers

The ED regulation 617/2013 applies to computers that can be powered directly from the mains alternating current (AC) including via an external or internal power supply, which includes desktop computers, integrated desktop computers (AIO, 'All-in-One'), notebook computers (including tablet computers, slate computers and mobile thin clients), desktop thin clients, workstations, mobile workstations, and small-scale servers. Since 2019, (Enterprise) Servers and Data Storage Products have their own ED regulation 2019/424, which removes servers (except small-scale servers) from the scope of CR 617/2013.
The regulation does not apply to blade system and components, servers, game consoles (addressed in ENTR Lot 3) and docking stations. Notebook computers with power less than 6W in idle state and/or viewable diagonal screen size less than 22,86 cm (9 inches) are also exempted from CR 617/2013, but the standby regulation CR 1275/2008 would apply, unless these notebooks use a low-voltage external power supply.
Computers were also covered by EU ENERGY STAR measures, until February 2018, with the same scope as above.

Design options to reduce the power consumption of personal computers are Moore's Law (moving towards 14 nm technology in 2016-2017), solid state drives (instead of or in addition to hard-disks), improved power management, efficient power supplies, multi-core processors, adaptive clocks, etc. For notebook and tablet PCs the use of efficient display technology (LED/OLED backlighting, Moore's Law in image control) is relevant.

CR 617/2013 sets limits on the annual total energy consumption (ETEC in kWh/year) for (integrated) desktops and notebooks. The formula used to calculate ETEC includes only power usage in off-mode, sleep-mode and idle-mode. There are ETEC allowances for e.g. additional GB of RAM, extra internal storage, discrete TV tuner, discrete audio card, discrete graphics cards.
Electricity consumption in active usage mode is not regulated and therefore not included in the energy consumption reported in EIA.
CR 617/2013 further sets limits on the power in sleep-mode, off-mode and in the lowest-power-state (for desktops and notebooks), and on the efficiency of internal power supplies (for all computer types except notebooks). It also requires a power management function to be enabled (for desktops and notebooks), switching the computer to a state with power consumption lower than sleep mode, after a certain period of inactivity. Further details on the LoadNotes sheet.

For PCs (Lot 3) the minimum requirements were based on the prep. study 2007 and for this fast-moving sector were not effective when introduced in 2013. Consequently ECO scenario data have been taken identical to BAU scenario data, and no savings are reported. EIA does not yet take into account the new proposed ecodesign measures of the 2017 review study on CR 617/2013, because these have not been formally adopted yet.

PC Personal Computers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	16 561	79 154			99 214			141 950		
Stock	'000	55 495	368 033			430 748			605 196		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	42	78	78	0	51	51	0	48	48	0
o/w electricity	*TWh elec/a*	*17*	*31*	*31*	*0*	*20*	*20*	*0*	*23*	*23*	*0*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	17	31	31	0	20	20	0	23	23	0
GWP emissions	$MtCO_2/a$	8	10	10	0	4	4	0	3	3	0
Acquisition costs (incl. install)	bn €	14	77	77	0	89	89	0	131	131	0
Energy costs	bn €	3	5	5	0	4	4	0	5	5	0
Total expenditure	bn €	17	82	82	0	93	93	0	136	136	0
Revenue Industry	m €	5741	31580	31580	0	36450	36450	0	53591	53591	0
Revenue Wholesale	m €	894	4412	4412	0	5167	5167	0	7475	7475	0
Revenue Retail	m €	5661	32424	32424	0	36677	36677	0	54373	54373	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	101	553	553	0	638	638	0	938	938	0
Jobs Wholesale	'000 jobs	3	15	15	0	18	18	0	26	26	0
Jobs Retail/ installation/ maintenance	'000 jobs	83	473	473	0	535	535	0	793	793	0
Jobs Total	'000 jobs	186	1042	1042	0	1192	1192	0	1758	1758	0

Imaging Equipment

Imaging Equipment (IE) is regulated in Ecodesign context by a Voluntary Agreement (VA, see www.eurovaprint.eu). The VA requires that a certain % of IE-models of VA-signatories meets (US) Energy Star (ES) requirements for IE. The current version 5.2 of the VA (active since 2015) refers to ES v2.0; the initial version 4.0 of the VA (active 2011-2015) referred to ES v1.0. A revision of the VA referring to ES v3.0 is ongoing (Autumn 2019).
According to the 2019 Independent Inspector report over year 2018, the 11 VA signatories covered 97% of the EU Sales of IE in scope of the VA, while 98.74% of TEC models and 99.96% of OM models were compliant with the VA primary design requirements (and 100% compliant with resource and information requirements).

The VA covers Copiers, Printers, Fax-machines and Multi-functional devices (MFDs) that use Electrophotography (EP), Inkjet (IJ, including high performance IJ) or Solid Ink (SI) marking technology. The VA is limited to household and office equipment: Standard black & white (BW) format products with maximum speed < 66 A4 images per minute (ipm) and Standard Colour format products with maximum speed <51 A4 ipm, thus excluding products for professional use. It also addresses OEM-cartridges.

The VA Primary requirements regard energy consumption, default delay times for OM products, and duplex availability (front/rear printing) for TEC products. In addition there are Resource efficiency requirements (e.g. on N-printing: N images per face of paper) and Information requirements. EIA data focus on energy consumption but also consider impacts on paper and toner use.

TEC products are Standard-size (not large, not small) Copiers, Printers, MFDs, etc. using high-temperature marking technologies such as EP (Laser), SI, and High Performance IJ. TEC stands for Typical Electricity Consumption, referring to the corresponding test method in ES V2.0. The TEC method measures energy consumption (kWh) in normal operation over a specified period of time. This includes the active mode (e.g. printing, copying, scanning) as well as recovery-, ready-, sleep-, off-modes. The method involves combining energy measurements for the various modes in a complex formula to obtain a single weekly TEC value. Energy consumption in active mode depends e.g. on the number of images printed, which in the test method relates to the maximum printing speed (ipm). The allowable limit TEC value in ES v2.0 also depends on the device speed, and on monochrome or colour, and multi- or single-functionality. The TEC method is not intended for low-temperature technologies such as conventional Ink Jet (IJ) or Impact, nor for Large-format or Small-format products.

OM products cover the non-TEC products, i.e. devices that use (non-high performance) Ink Jet, Dot Matrix or Impact technologies, as well as scanners and all large-format and small-format devices. OM stands for Operational Mode, referring to the test method in ES v2.0 that is used to determine power values for Ready, Sleep, and Off modes. This test does not include the active mode (e.g. printing, copying, scanning), but only off-, auto-off-, ready-, sleep-modes, etc. It measures powers, not energy. There are power limits for the sleep mode (depending on device type and size, interface configuration, special features) and for the standby mode (minimum of all non-active modes).

The data in EIA 2019 for years up to 2010 are mainly based on the IA 2013 (SWD(2013) 15 final) and thus similar to those in EIA 2018. For later years, EIA data have been updated to reflect new information from the October 2019 Review study and from the 2019 Independent Inspector report for the VA.
The EIA ECO scenario provides the impacts of past and existing measures (VA 4.0/ES 1.0, VA 5.2/ES 2.0). New measures proposed in the Review study and drafts for the new VA referring to ES v3.0 have not been considered yet, because they were not finalized by December 2019.

IE are also regulated by the standby regulation (CR 1275/2008 as amended). The 2019 draft IA on Standby calculated standby electricity consumption of IEs separately from the TEC/OM for the VA, but values are not always compatible. In EIA it has been assumed that 75% of the VA-TEC values is covered by CR 1275/2008, and 90% of the VA-OM values. These shares are rough estimates.

EP & IJ imaging equipment	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	14 104	26 825			19 707			17 823		
Stock	'000	53 437	110 149			106 994			96 121		
IJ images printed per unit per year	ipy	1 000	807			417			300		
EP images printed per unit per year	ipy	28 000	22 583			11 686			8 389		
EU output, images per year (ipy)	bn ipy	595	832			505			322		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
EU total sheets of paper used per year	bn A4 sheets	372	520	503	-16	315	269	-47	201	171	-30
EU total weight of paper used per year	Mton/a	1.9	2.6	2.5	-0.1	1.6	1.3	-0.2	1.0	0.9	-0.1
EU total weight of ink/toner used per year	kton/a	13.5	21.4	21.4	0	13.0	13.0	0	8.4	8.4	0
IJ Stock average unit electricity	kWh/a/unit	63	18	12	-7	17	6	-11	17	6	-12
EP Stock average unit electricity	kWh/a/unit	831	276	215	-60	258	102	-156	263	91	-172
Electricity	TWh elec/a	19	11	8	-3	12	5	-7	11	4	-7
Primary Energy (for electricity)	TWh prim/a	47	27	21	-6	29	11	-18	22	8	-15
Primary Energy (for paper, ink, toner) *	TWh prim/a	21	29	28	-1	18	15	-3	11	10	-2
GWP emissions (from electricity)	$MtCO_2/a$	9.4	3.4	2.6	-0.8	2.5	1.0	-1.5	1.5	0.5	-1.0
GWP emissions (from paper, ink, toner) *	$MtCO_2/a$	1.1	1.6	1.6	0.0	1.0	0.8	-0.1	0.6	0.5	-0.1
Acquisition costs (Imag. Equip. only)	bn €	5.2	13.9	13.9	0.0	12.9	12.9	0.0	11.7	11.7	0.0
Electricity costs	bn €	3.4	1.7	1.3	-0.4	2.2	0.9	-1.3	2.2	0.7	-1.4
Repair and Maintenance costs	bn €	1.1	5.8	5.8	0.0	8.8	8.8	0.0	8.2	8.2	0.0
Consumable costs, paper	bn €	5.1	7.1	6.9	-0.2	4.3	3.7	-0.6	2.7	2.3	-0.4
Consumable costs, ink and toner	bn €	11.9	19.4	19.4	0.0	11.1	11.1	0.0	7.2	7.2	0.0
Total running costs	bn €	21	34	33	-0.6	26	24	-2.0	20	19	-1.8
Total expenditure (incl. consumables)	bn €	27	48	47	-0.6	39	37	-2.0	32	30	-1.8
Revenue Industry **	m €	3167	8523	8523	0	8225	8225	0	7455	7455	0
Revenue Wholesale **	m €	726	1957	1957	0	1895	1895	0	1717	1717	0
Revenue Retail **	m €	1157	3035	3035	0	2591	2591	0	2348	2348	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance	m€	1040	5705	5705	0	8693	8693	0	8098	8098	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	55	149	149	0	144	144	0	131	131	0
Jobs Wholesale	'000 jobs	3	7	7	0	7	7	0	6	6	0
Jobs Retail/ installation/ maintenance	'000 jobs	26	94	94	0	114	114	0	105	105	0
Jobs Total **	'000 jobs	84	250	250	0	265	265	0	242	242	0

* Impact mainly from paper, see Resources. Does not include cartridge or container 'housing', only the ink and toner itself

Standby

CR 1275/2008 (as amended) establishes ecodesign requirements related to electric power consumption in networked standby-, standby- and off-mode, for the placing on the market of electrical and electronic household and office equipment, meaning any energy-using product which (a) is made commercially available as a single functional unit and is intended for the end-user; (b) falls under the list of energy-using products of Annex I of CR 1275/2008 (as amended); (c) is dependent on energy input from the mains power source in order to work as intended (directly or through an external power supply); and (d) is designed for use with a nominal voltage rating of 250 V or below.
The Regulation does not apply to equipment placed on the market with a low voltage external power supply to work as intended. Also note that for all equipment where the standby- and off-mode power is subject to specific separate regulation, the generic standby regulation does not apply. This means that the scope of CR 1275/2008 varies with time. As an example, from 2021 washing machines and dishwashers will be removed from the scope of CR 1275, because low-power modes are regulated in the new specific regulations for WM and DW.

Design options to reduce standby energy use include (improved) power management of the various standby states, reduction of standby through reduction of sensing frequency (only one check every x milliseconds for an external signal instead of continuous check).

EIA 2019 data are based on the 2017 review study, on the draft IA of 2019, and underlying Excel calculation sheets. Only impacts of CR 1275/2008 (as amended) are taken into account, not of new proposed measures in the IA (because not finalized yet in December 2019). As clarified in Annex D (Base Cases) EIA data under the standby heading do not include products that are out-of-scope of CR 1275 or that have negligible impact. In addition, EIA data under the standby heading are split in two groups. For the first group, EIA reports only standby data, and the main accounting is under the standby heading. For the second group, EIA reports both active/on-mode data and low-power mode data, and the main accounting is under the product group. For the second group a copy of the low-power mode data is also reported under the standby heading, but signalled there as being double counted. As regards monetary data, for the second group of products, under the standby heading only energy costs are accounted. No attempt has been made to split the product price or the maintenance costs in a share for the active/on-mode and a share for the low-power mode.

The first Key-facts table reported below summarizes data for the first group of products, i.e. it excludes double counted amounts already included in the accounting for the specific product group. The second Key-facts table includes also double counted amounts (first and second group of products together) and thus gives the full energy and GHG emission impacts of CR 1275/2008 (as amended). As monetary data for the second group of products are incomplete, acquisition costs, revenues and jobs in the second table are identical to those of the first table.

Total (networked) SB (EXCL. DOUBLE)	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	236 786	366 982			386 818			405 498		
Stock	'000	1 685 263	2 678 450			2 790 846			2 871 592		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	18	75	71	-3	81	45	-36	73	39	-34
o/w electricity	*TWh elec/a*	*7*	*30*	*29*	*-1*	*32*	*18*	*-14*	*35*	*18*	*-16*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	7	30	29	-1	32	18	-14	35	18	-16
GWP emissions	$MtCO_2$/a	4	9	9	0	7	4	-3	5	3	-2
Acquisition costs (incl. install)	bn €	12	22	22	0	26	26	0	29	29	0
Energy costs	bn €	1	5	5	0	6	4	-3	7	4	-3
Total expenditure	bn €	14	27	27	0	33	30	-3	37	33	-3
Revenue Industry	m €	6017	10972	10972	0	13058	13058	0	14846	14846	0
Revenue Wholesale	m €	2870	5101	5101	0	6062	6062	0	6840	6840	0
Revenue Retail	m €	1606	2853	2853	0	3157	3157	0	3378	3378	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	105	192	192	0	229	229	0	260	260	0
Jobs Wholesale	'000 jobs	10	18	18	0	21	21	0	24	24	0
Jobs Retail/ installation/ maintenance	'000 jobs	23	42	42	0	46	46	0	49	49	0
Jobs Total	'000 jobs	139	252	252	0	296	296	0	333	333	0

Total (networked) SB (INCL. DOUBLE)	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	278 935	472 139			499 622			519 675		
Stock	'000	2 127 855	3 494 670			3 809 515			3 970 784		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	54	130	121	-10	166	92	-74	135	67	-68
o/w electricity	*TWh elec/a*	*21*	*52*	*48*	*-4*	*66*	*37*	*-30*	*64*	*32*	*-32*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	21	52	48	-4	66	37	-30	64	32	-32
GWP emissions	$MtCO_2$/a	11	17	15	-1	14	8	-6	9	5	-5
Acquisition costs (incl. install)	bn €	12	22	22	0	26	26	0	29	29	0
Energy costs	bn €	4	9	8	-1	13	7	-6	14	7	-7
Total expenditure	bn €	17	31	31	-1	39	33	-6	43	36	-7
Revenue Industry	m €	6017	10972	10972	0	13058	13058	0	14846	14846	0
Revenue Wholesale	m €	2870	5101	5101	0	6062	6062	0	6840	6840	0
Revenue Retail	m €	1606	2853	2853	0	3157	3157	0	3378	3378	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	105	192	192	0	229	229	0	260	260	0
Jobs Wholesale	'000 jobs	10	18	18	0	21	21	0	24	24	0
Jobs Retail/ installation/ maintenance	'000 jobs	23	42	42	0	46	46	0	49	49	0
Jobs Total	'000 jobs	139	252	252	0	296	296	0	333	333	0

External Power Supplies

Electricity consumption by EPS occurs in active mode (during power conversion) and in no-load mode (EPS attached to power inlet but without primary load at the outlet). For the active mode, EIA considers only the EPS conversion losses: the remainder of the input energy is passed on by the EPS to the primary load, not 'consumed' by the EPS, and thus not counted in EIA (this is different from the approach in the 2018 Impact Assessment). Some primary products that use an EPS are also covered by Ecodesign regulations themselves (e.g. notebook computers, tablets, set-top boxes, NAS, gateways, game-consoles), and in several cases at least a part of the EPS losses is already taken into account there. The most relevant products for which this double counting does not apply are mobile phones, smart phones, rechargeable grooming products, loudspeakers and sound-systems. These double counted amounts of active EPS losses (overall approximately 55%) have NOT been removed in the data presented below (that give the full impact of the EPS regulation): they are removed only when summing EPS data with data of other EIA products, using preliminary estimated double counting factors, see e.g. ELEC sheets.
EPS electricity consumption in no-load mode is accounted in full in EIA, assuming there is no double counting for no-load.

In most cases, EPS are not sold separately, but bought by consumers together with the primary product for which they are intended. The 2018 Impact Assessment therefore uses equivalent representative purchase prices for the EPSs. This approach has been copied in EIA. The double counting factors are also applied to these monetary data, but data presented below are 'full' (double counted amounts not removed). The revenues accounted for 'industry' refer to those for the EPS-manufacturer. The wholesale revenues refer primarily to the EPS-part of revenues for the primary product manufacturer, which usually delivers the EPS together with the primary product. The 2018 IA did not consider retail revenues for EPSs, and this approach has been maintained in EIA.

The BAU scenario in EIA represents the situation without any regulation (without CR 278/2009). This is different from the 2018 IA, where the BAU scenario used as reference includes the effects of CR 278/2009. The ECO scenario in EIA corresponds to the final published CR (EU) 2019/1782 (and to the PO2 policy option of the 2018 Impact Assessment), introducing more severe requirements for active efficiency and for maximum no-load power from April 2020, aligning EU requirements with those in force in the USA.

See sheet LoadNotes for further information.

includes double counted amounts

EPS External Power Supplies	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	18 712	400 937			429 653			436 316		
Stock	'000	51 071	1 386 147			1 708 761			1 738 987		
EU demand for EPS output energy	TWh / a	0.2	35			48			49		
EU total EPS no-load hours	Th / a	0.2	3.4			3.7			3.8		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Active mode electricity losses	TWh elec/a	0	10	10	-0.1	15	11	-4.1	14	10	-4.5
No-load mode electricity consumption	TWh elec/a	0	2	2	0.0	1	1	-0.9	1	0	-0.9
total electricity (active losses + no-load)	TWh elec/a	0	12	12	-0.1	17	12	-5.0	15	10	-5.4
Final energy	TWh final/a	0	12	12	-0.1	17	12	-5.0	15	10	-5.4
Primary energy	TWh prim/a	0	30	30	-0.3	42	29	-12.5	32	21	-11.4
GWP emissions	$MtCO_2/a$	0.1	3.8	3.8	0.0	3.6	2.5	-1.1	2.2	1.4	-0.8
Acquisition costs	bn €	0.1	4.4	4.4	0.0	4.4	4.5	0.1	4.6	4.6	0.0
Energy costs, active mode	bn €	0.0	1.8	1.8	0.0	3.0	2.2	-0.8	3.1	2.1	-1.0
Energy costs, no-load mode	bn €	0.0	0.3	0.3	0.0	0.3	0.1	-0.2	0.3	0.1	-0.2
Maintenance costs	bn €	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total running costs	bn €	0.0	2.1	2.0	0.0	3.3	2.3	-1.0	3.3	2.2	-1.2
Total expenditure	bn €	0.2	6.5	6.5	0.0	7.7	6.8	-0.9	7.9	6.8	-1.2
Revenue Industry	m€	70	2190	2201	11	2188	2223	35	2263	2276	12
Revenue Wholesale	m€	21	653	657	3	653	663	10	675	679	4
Revenue Retail	m€	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	1	38	39	0	38	39	1	40	40	0
Jobs Wholesale	'000 jobs	0	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Total	'000 jobs	1	41	41	0	41	41	1	42	42	0

Household Refrigerators & Freezers

Energy labels for Household Refrigerators were first introduced in 1994 by COMMISSION DIRECTIVE 94/2/EC.
The first limits on allowable electricity consumption (in kWh/24h) were set in 1996 by DIRECTIVE 96/57/EC.
The 1994/1996 Directives were replaced in 2009/2010 by CR (EC) No 643/2009 (ecodesign) and CDR (EU) No 1060/2010.

In December 2019, revised regulations were published: CR (EU) 2019/2019 for Ecodesign and CDR (EU) 2019/2016 for Energy Labelling. These regulations repeal the 2009/2010 regulations and apply to electric mains-operated RF with volume > 10 litres and≤ 1500 litres. Not applicable to: (a) products covered by CR (EU) 2015/1095 (professional refrigeration, PF), (b) refrigerating appliances with a direct sales function (now covered by CR 2019/2024 and CDR 2019/2018); (c) mobile refrigerating appliances. More ambitious ecodesign requirements are set, and more extensive requirements are set for wine storage appliances, RF with transparent doors, low-noise RF. The definition of the Standard Annual Energy consumption (SAEc) is changed w.r.t. CR 643/2009, changing also the values for the Energy Efficiency Index (EEI). The scale for the energy efficiency / label classes is revised.

The ECO scenario in EIA is the preferred policy option of IA 2018 (i.e. the LLCC scenario), which closely corresponds to the new 2019 regulations.
The BAU scenario in EIA represents the situation without any regulation (not even the 1994/1996 Directives), which is different from the BAU in IA 2018 which includes the effects of earlier regulations.

RF Household Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	14 323	15 991			16 732			17 242		
Stock	'000	219 351	244 578			258 072			269 539		
Reference SAEC (EEI=100)	kWh/a	468	526			563			602		
EU freezer net volume RF	M m³ @ -18C°	10	14			17			20		
EU refrigerator net volume RF	M m³ @ 5C°	35	49			60			71		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	281	284	213	-71	290	154	-136	246	89	-157
o/w electricity	*TWh elec/a*	*112*	*113*	*85*	*-28*	*116*	*61*	*-55*	*117*	*42*	*-75*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	112	113	85	-28	116	61	-55	117	42	-75
GWP emissions	$MtCO_2/a$	56	36	27	-9	25	13	-12	17	6	-11
Acquisition costs (incl. install)	bn €	7	8	9	1	8	10	2	8	11	3
Energy costs	bn €	24	20	15	-5	23	12	-11	26	9	-16
Maintenance costs (incl. VAT)	bn €	0	0	0	0	0	0	0	0	0	0
Total running costs	bn €	24	20	15	-5	23	12	-11	26	9	-16
Total expenditure	bn €	31	28	24	-4	31	22	-9	34	20	-14
Revenue Industry	m €	2842	3173	3642	469	3320	4172	852	3421	4572	1151
Revenue Wholesale	m €	206	230	264	34	240	302	62	248	331	83
Revenue Retail	m €	2742	3061	3513	452	3203	4025	822	3301	4411	1110
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	50	56	64	8	58	73	15	60	80	20
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	40	45	51	7	47	59	12	48	64	16
Jobs Total	'000 jobs	91	101	116	15	106	133	27	109	146	37

Commercial Refrigeration (with direct sales function)

Data in EIA on 'refrigerating appliances with a direct sales function' (formerly referred to as 'commercial refrigeration', CF) have been updated in autumn 2019 to reflect the final voted Commission Regulation (EU) 2019/2024 (ecodesign) and Commission Delegated Regulation (EU) 2019/2018 (energy labelling).

The ecodesign requirements apply to electric mains-operated refrigerating appliances with a direct sales function, including appliances sold for refrigeration of items other than foodstuffs. This includes e.g. horizontal or vertical refrigerators and freezers with a display function in supermarkets, beverage coolers, ice-cream freezers, gelato-scooping cabinets, refrigerated vending machines.

Excluded from the scope are: products only powered by energy sources other than electricity; remote components, such as the condensing unit, compressors or water condensed unit; food processing; storage of medicines or scientific samples; functioning by ducting chilled air that is produced by an external air chiller unit; professional refrigerated storage cabinets, blast cabinets, condensing units and process chillers as defined in Regulation (EU) 2015/1095; wine storage appliances and minibars (covered by the Regulation (EU) 2019/2019 on 'household' refrigerators).

The following appliances have only information and resource-efficiency requirements (i.e. no energy efficiency requirements and no label): products not using a vapour compression refrigeration cycle; sale and display of live foodstuffs, such as living fish and shellfish, refrigerated aquaria and water tanks; saladettes; horizontal serve-over counters with integrated storage designed to work at chilled operating temperatures; corner cabinets; vending machines designed to work at frozen operating temperatures; serve-over fish counters with flaked ice.

In line with the preparatory studies (BIOIS 2007; JRC 2014) and the IA 2015 and 2018, EIA considers non-supermarket appliances (beverage coolers, ice cream freezers, vending machines) and supermarket display cabinets. Earlier studies only considered the supermarket remote base cases RVC2 (vertical chilled) and RHF4 (horizontal frozen). However the regulations apply to many other supermarket models as well. The IA presents tables for 'base cases only' (12 TWh/a savings in 2030) and tables 'including non-base cases' (19 TWh/a savings in 2030), showing a significant impact for the non-base cases. Consequently, it was agreed to include the non-base cases in the accounting, estimating some of the missing basic input data. The presented EIA data are based on the final voted regulations.

Different from earlier EIA editions, emissions due to refrigerant losses are no longer included. They are not regulated in Ecodesign, being addressed in the F-gas regulation (Regulation (EU) No 517/2014 of the European Parliament and of the Council of 16 April 2014).

CF Commercial Refrigeration	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	1 241	1 525			1 587			1 696		
Stock	'000	11 416	13 713			14 413			15 448		
EU freezer net volume CF	M m3 @ -18/-15	1.2	1.5			1.6			1.7		
EU refrigerator net volume CF	M m3 @ -1/+7°C	7.7	9.0			9.5			10.2		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	154	147	147	0	132	131	-1	112	79	-33
o/w electricity	*TWh elec/a*	*62*	*59*	*59*	*0*	*53*	*52*	*0*	*53*	*37*	*-16*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	62	59	59	0	53	52	0	53	37	-16
GWP emissions	$MtCO_2/a$	31	19	19	0	11	11	0	8	5	-2
Acquisition costs (incl. install)	bn €	2	3	3	0	3	3	0	3	3	0
Energy costs	bn €	11	9	9	0	10	10	0	11	8	-3
Maintenance costs (incl. VAT)	bn €	1	1	1	0	1	1	0	1	1	0
Total running costs	bn €	12	10	10	0	11	11	0	12	9	-3
Total expenditure	bn €	14	13	13	0	14	14	0	15	12	-3
Revenue Industry	m €	1432	1666	1666	0	1720	1720	0	1835	1907	73
Revenue Wholesale	m €	614	714	714	0	737	737	0	786	817	31
Revenue Retail	m €	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m €	121	147	147	0	159	159	0	169	178	8
Revenue Maintenance (excl. VAT)	m €	1058	1227	1227	0	1345	1345	0	1438	1438	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	25	29	29	0	30	30	0	32	33	1
Jobs Wholesale	'000 jobs	2	3	3	0	3	3	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	10	12	12	0	13	13	0	14	14	0
Jobs Total	'000 jobs	38	44	44	0	46	46	0	49	50	1

Professional Refrigeration

CR 2015/1095 (ecodesign) covers professional refrigerated storage cabinets, blast cabinets, process chillers and condensing units. CR 2015/1094 (energy labelling) only applies to professional refrigerated storage cabinets. For blast cabinets the CR only provides information requirements that are assumed to have no energy efficiency effects. Walk-in cold rooms are not explicitly mentioned in the CR and consequently excluded from the scope. Consequently, blast cabinets and walk-in cold rooms are not included in EIA.

Professional refrigerated storage cabinets are for non-household, professional use in e.g. restaurants, canteens and catering applications. This distinguishes them from household refrigeration appliances that are covered by CR 643/2009, lot ENER 13. They are also distinguished from Commercial Refrigeration products (Lot ENER 12, regulation proposed in 2015) that primarily have a display/ sales function with access by customers, while the professional refrigeration (PF) products primarily have a storage function (not display) and are accessed by professionals (not by customers).

CR 2015/1095 excludes from the scope: professional refrigerated storage cabinets that are primarily powered by energy sources other than electricity; professional refrigerated storage cabinets operating with a remote condensing unit; open cabinets, where being open is a fundamental requirement for their primary functionality; cabinets specifically designed for food processing; cabinets specifically designed only for the purpose of thawing frozen foodstuffs in a controlled manner; saladettes; serve-over counters and other similar forms of cabinets primarily intended for display and sale of foodstuffs in addition to refrigeration and storage; cabinets that do not use a vapour compression refrigeration cycle; continuous-process blast equipment; custom-made professional refrigerated storage cabinets; built-in cabinets; roll-in and pass-through cabinets; static air cabinets; chest freezers.

Process chillers are in scope only if they are intended for operation at low-temperature (capable of delivering its rated cooling capacity at an indoor heat exchanger outlet temperature of – 25 °C, at standard rating conditions) or medium-temperature (-8 °C). Excluded from the scope: process chillers intended to operate at high temperature; process chillers exclusively using evaporative condensing; custom-made process chillers assembled on site, made on a one-off basis; absorption chillers. Note that high-temperature process chillers are considered separately in EIA under lot ENER 21-ENTR 6.

Condensing units are in scope only if they operate at low-temperature (capable of delivering its rated cooling capacity at a saturated evaporating temperature of – 35 °C;) or medium-temperature (-10 °C). Excluded from the scope: condensing units including an evaporator, which may be an integral evaporator, such as in monobloc units, or a remote evaporator, such as in split units; compressor packs or racks, which do not include a condenser; condensing units of which the condenser-side does not use air as heat transfer medium.

Condensing units (CUs) are not a complete refrigeration product, but a component (they need to be combined with an evaporator and an expansion device). Consequently many CUs are included in other refrigeration products that are also accounted in EIA, introducing the problem of**double counting of the energy consumed by CUs**. A dedicated study revealed that 60% of the CU-energy is double counted with the energy of other CF- and PF-products included in EIA. This double counting has been considered when computing the PF product group totals.

Note: double counted amounts for Condensing Units are not included in data presented below (except where explicitly indicated otherwise)

Professional refrigeration products	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales (includes all CUs)	'000	939	917			1 011			1 149		
Stock (includes all CUs)	'000	7 778	7 680			8 122			9 225		
EU freezer net volume Storage cabinets	M m³ @ -18C°	0.3	0.4			0.5			0.5		
EU refrigerator net volume Storage cabinets	M m³ @ 5C°	0.7	1.0			1.1			1.2		
EU cooling demand LT&MT process chillers	TWhcool/a	38	83			113			140		
EU cooling demand LT&MT condensing units (60% double counting included)	TWhcool/a	155	127			130			151		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	128	167	167	0	201	193	-8	203	181	-21
o/w electricity	*TWh elec/a*	*51*	*67*	*67*	*0*	*80*	*77*	*-3*	*96*	*86*	*-10*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	51	67	67	0	80	77	-3	96	86	-10
GWP emissions	$MtCO_2/a$	26	21	21	0	17	16	-1	14	12	-1
Acquisition costs	bn €	1	1	1	0	2	2	0	2	2	0
Energy costs	bn €	8	9	9	0	11	10	-1	14	12	-2
Total expenditure	bn €	9	10	10	0	12	12	0	16	14	-2
Revenue Industry	m €	787	940	940	0	1064	1125	60	1224	1224	0
Revenue Wholesale	m €	225	268	268	0	304	321	17	350	350	0
Revenue Retail	m €	112	134	134	0	152	161	9	175	175	0
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	14	16	16	0	19	20	1	21	21	0
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	2	2	2	0	2	2	0	3	3	0
Jobs Total	'000 jobs	16	19	19	0	22	23	1	25	25	0

Cooking Appliances

Design options for hobs include optimized burner and pot support (gas hobs), switch to more efficient heating technology (electric from solid plate to radiant to induction); mass-reduction (for solid plate electric hobs), use of smart electronic controls (gas, radiant and induction), use of pot sensors (automatic switch off when no pot present) (all types, automatic cooking (all types). Design options for ovens include Improvement of thermal insulation, reduction of thermal mass, optimized door design. For range hoods the design options include change of AC motor to EC motor, improvement of fan design, improvement interior design to lower the pressure drop, improvement of motor and fan control, air pollution, humidity and temperature sensors.

CA Cooking Appliances	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	28 835	33 252			37 026			38 898		
Stock	'000	456 198	510 031			557 536			605 113		
EU load hobs, volume boiled water (food)	Mm³/a	0.22	0.26			0.29			0.31		
EU load ovens, no. of cycles (=ovendishes)	bn cyc/a	23	24			25			27		
(data include low-power modes)	**Scenario**	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	166	200	199	0	216	205	-11	199	175	-24
o/w electricity	*TWh elec/a*	*49*	*66*	*66*	*0*	*74*	*70*	*-4*	*81*	*71*	*-11*
o/w fuel	*TWh fuel/a*	*43*	*34*	*34*	*0*	*31*	*31*	*0*	*28*	*26*	*-1*
Final energy	TWh final/a	92	100	100	0	105	100	-5	109	97	-12
GWP emissions	$MtCO_2$/a	33	28	28	0	22	21	-1	17	15	-2
Acquisition costs (incl. install)	bn €	12	16	16	0	18	19	1	18	19	1
Energy costs	bn €	13	14	14	0	17	16	-1	20	17	-2
Total expenditure	bn €	24	30	30	0	34	35	1	38	37	-1
Revenue Industry	m €	4947	6716	6716	0	7422	8018	596	7600	8093	494
Revenue Wholesale	m €	349	478	478	0	529	571	42	543	578	35
Revenue Retail	m €	4654	6376	6376	0	7052	7615	563	7235	7702	467
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	87	118	118	0	130	140	10	133	142	9
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	68	93	93	0	103	111	8	106	112	7
Jobs Total	'000 jobs	156	212	212	0	235	254	19	241	256	16

Household Washing Machines and Washer-Dryers

Household washing machines (WM) and washer-dryers (WD) have had an energy labelling since 1995/1996 (CD 95/12/EC; CD 96/60/EC).
Subsequently, WM were regulated by CR 1015/2010 (Ecodesign) and CDR 1061/2010 (Labelling), which repealed CD 95/12/EC for WM, but CD 96/60/EC for labelling of WD remained active.
In 2019, new regulations CR 2019/2023 and CDR 2019/2014 were adopted, with requirements applicable from 2021 to WM and WD. These regulations repeal the 2010-regulations and CD 96/60/EC.

The EIA BAU scenario for WM and WD represents the projection of what would have happened if no measures would have been taken, starting from 1996. This BAU scenario is different from the one considered in the 2019 Impact Assessment (which takes into account the impacts of the 1995/1996 and 2010 regulations).
The updated (2019) EIA ECO scenario aims to take into account the impacts of all combined measures, including the 2019 regulations.

The 2019 regulations apply to placing on the market or putting into service of electric mains-operated household WM and WD (excluding those covered by the machinery directive 2006/42/EC), including built-in, and including if also operable from batteries. There is no limit on WM/WD capacity, but products below 2 kg have less requirements.
The 2019 regulations require WM/WD to have a washing cycle called 'eco 40-60', able to clean normally soiled cotton declared washable at 40°C or 60°C, together in the same cycle, and a washing cycle called '20 °C', which is able to clean lightly soiled cotton laundry, at a nominal temperature of 20°C. Efficiency-, functional-, duration- and wateruse-requirements apply to the 'eco 40-60' program.

Design options for household washing machines include reduction of tub-drum clearances, improved thermal efficiency (lower transmission, radiation and conduction losses), improved motor (Switched Reluctance, DC) and drive (direct drive instead of belt-drive) efficiency, more effective mechanical action (vsd and smart control), optimising time-temperature trade-off, increasing drum load-to-volume ratio, using accurate and smart water level control, optimised programming of water level, rinsing and intermediate spinning, smart water inlet, circulation and application solutions (jet, bypass and recirculation, etc.), soil sensors (bio-sensors, turbidity sensors). Consumer options that have a large influence are the ever decreasing programme temperature and increased loading efficiency.

WM-WD Total household Washing	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	7 707	11 441			12 464			11 993		
Stock	'000	103 135	158 318			174 734			180 352		
EU weight of laundry washed	Mt laundry/a	70	111			121			124		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	125	111	89	-21	101	66	-35	75	49	-26
o/w electricity	*TWh elec/a*	*50*	*44*	*36*	*-9*	*41*	*27*	*-14*	*36*	*23*	*-12*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	50	44	36	-9	41	27	-14	36	23	-12
GWP emissions	$MtCO_2/a$	25	14	11	-3	9	6	-3	5	3	-2
Acquisition costs (incl. install)	bn €	4	6	7	1	7	8	1	6	7	1
Energy costs	bn €	11	8	6	-2	8	5	-3	8	5	-3
Consumable resources	bn €	12	14	11	-3	16	10	-5	17	10	-7
Total running costs	bn €	23	23	18	-5	25	16	-8	26	16	-10
Total expenditure	bn €	27	29	25	-3	31	24	-7	32	23	-9
Revenue Industry	m €	1666	2478	2948	470	2686	3230	545	2589	2870	281
Revenue Wholesale	m €	123	182	217	35	198	238	40	191	211	21
Revenue Retail	m €	1635	2433	2894	461	2636	3171	535	2541	2817	276
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	329	505	505	0	557	557	0	575	575	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	29	43	52	8	47	57	10	45	50	5
Jobs Wholesale	'000 jobs	0	1	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	27	40	47	7	43	51	8	42	46	4
Jobs Total	'000 jobs	56	84	99	15	91	109	17	88	97	9

Household Dishwashers

Household dishwashers (DW) have had an energy labelling since 1997 (CD 97/17/EC).
Subsequently, DW were regulated by CR 1016/2010 (Ecodesign) and CDR 1059/2010 (Labelling), which repealed CD 97/17/EC.
In 2019, new regulations CR 2019/2022 and CDR 2019/2017 were adopted, with requirements applicable from 2021. These regulations repeal the 2010-regulations.

The EIA BAU scenario for DW represents the projection of what would have happened if no measures would have been taken, starting from 1997.
The EIA ECO scenario aims to take into account the impacts of all combined measures, including the 2019 regulations.

The 2019 regulations apply to placing on the market or putting into service of electric mains-operated household DW (excluding those covered by the machinery directive 2006/42/EC), including built-in, and including if also operable from batteries. There is no limit on DW capacity (expressed in number of place settings (ps)). The 2019 regulations require DW to have an 'eco programme'. Efficiency- and functional-requirements apply to this program. In addition there are requirements for low-power-mode, resource efficiency, and information requirements.

Design options for household dishwashers include improved thermal efficiency (less transmission, radiation and conduction losses through insulation, avoiding cold bridges, etc.), better pump efficiency and control (EC/DC motors, vsd), optimised time-temperature trade off, decreased water level (alternating valve already implemented, optimised spray arms), partial reuse of rinsing water (water saving), heat exchangers, drying without additional heat (optimised condensing technology), lower hot rinse temperature, increased program options, hot fill and fuel switch, turbidity and bio sensors (time and intensity optimisation).

DW Household Dishwashers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	2 614	5 852			7 833			9 727		
Stock	'000	29 921	67 976			96 528			125 977		
EU place settings (ps) washed	bn ps/a	44	132			197			257		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	26	47	38	-9	64	45	-18	66	45	-21
o/w electricity	*TWh elec/a*	*10*	*19*	*15*	*-4*	*25*	*18*	*-7*	*31*	*21*	*-10*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	10	19	15	-4	25	18	-7	31	21	-10
GWP emissions	$MtCO_2/a$	5	6	5	-1	5	4	-2	4	3	-1
Acquisition costs (incl. install)	bn €	2	4	5	1	5	6	1	6	7	1
Energy costs	bn €	2	3	3	-1	5	4	-1	7	5	-2
Consumable resources	bn €	1	3	2	-1	4	3	-1	6	4	-2
Total running costs	bn €	4	6	5	-1	10	7	-3	13	9	-4
Total expenditure	bn €	5	10	10	0	14	13	-1	19	16	-3
Revenue Industry	m €	664	1488	1974	487	1990	2590	599	2472	3049	577
Revenue Wholesale	m €	48	108	143	35	145	188	44	179	221	42
Revenue Retail	m €	643	1440	1911	471	1927	2507	580	2393	2952	559
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	12	26	35	9	35	45	10	43	53	10
Jobs Wholesale	'000 jobs	0	0	1	0	1	1	0	1	1	0
Jobs Retail/ installation/ maintenance	'000 jobs	9	21	28	7	28	37	8	35	43	8
Jobs Total	'000 jobs	21	47	63	16	63	83	19	79	97	18

Household Laundry Dryers

Design options for household laundry driers include improved thermal efficiency (less transmission, radiation and conduction losses), optimised time-temperature trade off, optimised airflow-temperature trade-off, reduced drum clearances and optimised drum geometry, drum volume vs. load ratio, partial recirculating and in-/outgoing air heat exchangers (vented driers), humidity sensors/controls (instead of timer-control), improved fan efficiency (EC/DC motors, vsd, optimised impeller), fuel switch to gas-fired driers and last but not least heat pump (condensing) driers.

LD Household Laundry Dryers	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	2 259	3 175			4 489			4 700		
Stock	'000	18 164	40 216			45 587			55 430		
EU laundry dried	Mt laundry/a	10	27			21			26		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	19	40	40	0	36	28	-7	30	18	-13
o/w electricity	*TWh elec/a*	*8*	*16*	*16*	*0*	*14*	*11*	*-3*	*14*	*9*	*-6*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	8	16	16	0	14	11	-3	14	9	-6
GWP emissions	$MtCO_2/a$	4	5	5	0	3	2	-1	2	1	-1
Acquisition costs (incl. install)	bn €	1	1	1	0	2	3	1	2	3	1
Energy costs	bn €	2	3	3	0	3	2	-1	3	2	-1
Total expenditure	bn €	3	4	4	0	5	6	0	6	6	0
Revenue Industry	m €	282	450	506	56	763	1217	455	752	1337	585
Revenue Wholesale	m €	21	33	37	4	56	89	33	55	98	43
Revenue Retail	m €	275	439	494	55	743	1187	443	733	1303	571
Revenue Installation	m €	109	114	109	-5	160	129	-31	153	102	-50
Revenue Maintenance (excl. VAT)	m €	81	179	179	0	203	203	0	246	246	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	5	8	9	1	13	21	8	13	23	10
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	6	9	10	1	14	20	6	14	22	8
Jobs Total	'000 jobs	11	17	19	2	28	42	14	28	46	18

Vacuum Cleaners

EIA 2021 data for Vacuum Cleaners (VCs) have been updated based on the 2019 Review study and on the draft 2022 impact assessment (IA) study. The EIA update is limited to the impacts of the ecodesign CR 666/2013. New measures proposed in the review study and the draft IA are not (yet) taken into account in EIA because not finally approved. IA data are preliminary and might still change. Hence, also EIA data could further change in future.

CR 666/2013 applies to electric mains-operated vacuum cleaners, including hybrid vacuum cleaners (can be powered by both electric mains and batteries). The regulation does not apply to wet, wet and dry, battery operated, robot, industrial, or central vacuum cleaners, floor polishers and outdoor vacuums. CDR 665/2013 (labelling for VCs) has been annulled, and the impact of this has been modelled in the underlying studies.

Although cordless and robot VCs are not in scope of the current regulation, they are increasingly being used to (partially) substitute mains-operated VCs. Representing only the latter in EIA would give a wrong impression of trends in energy consumption for vacuum cleaning over the years. Therefore, cordless and robot VCs are also included in EIA, but with the same data for the BAU and ECO scenarios (because they are not subject to existing ecodesign measures).

VC Vacuum Cleaners	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	15 316	29 830			35 390			37 461		
Stock	'000	121 194	234 343			271 040			279 816		
EU surface dry vacuum cleaned	1000 km²/a	701	1 207			1 291			1 342		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	24	47	47	0	65	36	-29	59	29	-31
o/w electricity	*TWh elec/a*	*10*	*19*	*19*	*0*	*26*	*14*	*-12*	*28*	*14*	*-15*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	10	19	19	0	26	14	-12	28	14	-15
GWP emissions	$MtCO_2/a$	5	6	6	0	6	3	-3	4	2	-2
Acquisition costs (incl. install)	bn €	2.5	4.4	4.4	0	5.9	6.1	0.2	7.5	7.6	0.1
Energy costs	bn €	2.0	3.2	3.2	0	5.1	2.9	-2.3	6.0	2.9	-3.1
Maintenance costs (incl. VAT)	bn €	0.3	0.7	0.7	0	1.0	1.0	0.0	1.4	1.4	0.0
Consumable resources (bags, filters)	bn €	1.1	1.8	1.8	0	1.9	1.9	0.0	1.9	1.9	0.0
Total running costs	bn €	3.5	5.7	5.7	0	8.0	5.8	-2.3	9.3	6.2	-3.1
Total expenditure	bn €	6.0	10.1	10.1	0	14.0	11.9	-2.1	16.8	13.8	-3.0
Revenue Industry	m €	1140	2019	2019	0	2691	2791	100	3407	3454	47
Revenue Wholesale	m €	104	159	159	0	156	185	29	165	177	13
Revenue Retail	m €	846	1519	1519	0	2071	2129	58	2649	2677	28
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	295	594	594	0	854	854	0	1171	1171	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	20	35	35	0	47	49	1.8	60	60	0.8
Jobs Wholesale	'000 jobs	0	1	1	0	1	1	0.1	1	1	0.0
Jobs Retail/ installation/ maintenance	'000 jobs	15	27	27	0	38	39	0.8	49	49	0.4
Jobs Total	'000 jobs	35	63	63	0	85	88	2.7	109	110	1.3

Industrial Fans

Design options for Industrial fans to reduce energy consumption include improved aerodynamics for the impellers and adequate design for the job (axial, centrifugal, cross-flow), backwards curved instead or forwards curved fans, guide vanes, motor improvements (from AC to EC/DC), better transmission efficiency (direct drive, V-belts instead of flat belts), variable speed drives.

Note: data presented below do not include double counted amounts.

FAN Industrial Fans >125W	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	4 138	13 256			16 349			16 626		
Stock	'000	62 067	164 698			214 407			244 105		
Load per unit	kWh flow/ a	617	583			583			594		
EU load (W=Pa * m^3/s ; TWh=10^{12}* W * h)	TWh flow/ a	38	96			125			145		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	112	288	288	0	375	340	-35	362	298	-64
o/w electricity	*TWh elec/a*	*45*	*115*	*115*	*0*	*150*	*136*	*-14*	*172*	*142*	*-31*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	45	115	115	0	150	136	-14	172	142	-31
GWP emissions	$MtCO_2$/a	22	37	37	0	32	29	-3	25	20	-4
Acquisition costs (incl. install)	bn €	1	3	3	0	4	5	1	4	5	1
Energy costs	bn €	7	16	16	0	25	23	-2	31	26	-6
Total expenditure	bn €	9	20	20	0	30	29	-1	36	32	-4
Revenue Industry	m €	587	1795	1795	0	2232	3060	828	2327	2961	635
Revenue Wholesale	m €	202	616	616	0	766	1051	284	799	1016	218
Revenue Retail	m €	88	268	268	0	333	457	124	347	442	95
Revenue Installation	m €	80	246	246	0	306	419	112	320	406	85
Revenue Maintenance (excl. VAT)	m €	338	861	861	0	1126	1126	0	1294	1294	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	10	31	31	0	39	54	15	41	52	11
Jobs Wholesale	'000 jobs	1	2	2	0	3	4	1	3	4	1
Jobs Retail/ installation/ maintenance	'000 jobs	5	14	14	0	17	20	3	19	21	2
Jobs Total	'000 jobs	16	47	47	0	59	77	18	63	77	14

Industrial Motors

A first ecodesign preparatory study (Lot 11) was performed in 2008 and led to the existing CR (EC) No 640/2009 of 22 July 2009 (with corresponding Impact Assessment also from 2009). This regulation regards motors, including where integrated in other products. ‘Motor’ means an electric single speed, three-phase 50 Hz or 50/60 Hz, squirrel cage induction motor that has 2 to 6 poles, a rated voltage Un up to 1 000 V, a rated output PN between 0.75 kW and 375 kW and is rated on the basis of continuous duty operation. It excludes motors designed to operate wholly immersed in a liquid, motors completely integrated into a product (for example gear, pump, fan or compressor) of which the energy performance cannot be tested independently from the product, motors specifically designed to operate at altitudes exceeding 1 000 metres above sea-level, where ambient air temperatures exceed 40 °C, in maximum operating temperature above 400 °C, where ambient air temperatures are less than – 15 °C for any motor or less than 0 °C for a motor with air cooling, where the water coolant temperature at the inlet to a product is less than 5 °C or exceeding 25 °C, in potentially explosive atmospheres as defined in Directive 94/9/EC of the European Parliament and of the Council and brake motors except as regards the information requirements of Annex I, points 2(3) to (6) and (12).

The more recent CR (EU) No 4/2014 of 6 January 2014 amends the 640/2009, in particular as regards the atmospheric conditions for the exempted motors: motors specified to operate exclusively at altitudes exceeding 4 000 metres above sea-level, where ambient air temperatures exceed 60 °C, in maximum operating temperature above 400 °C, where ambient air temperatures are less than – 30 °C for any motor or less than 0 °C for a motor with water cooling, where the water coolant temperature at the inlet to a product is less than 0 °C or exceeding 32 °C.

A second ecodesign preparatory study (Lot 30) deals with special motors but also reconsiders the 'non-special' motors previously handled in the Lot 11 study and in the existing regulation. This second study is from March 2014, led to a Working Document in September 2014, and to a draft Impact Assessment in August 2015. Following RSB-comments, the WD and IA were rewritten in 2017 and the scenario analyses underlying the IA were updated. The effect of the use of VSDs was modelled in a more transparent and detailed manner.

The new regulation 2019/1781, OJ L 272/74 of 25.10.2019, extends the scope of regulation 640/2009 as amended by 4/2014. Single-phase motors are now also in scope and the power range is extended to 0.12-1000 kW. The scope extension includes 1-phase 0.12-0.75 kW, 3-phase 0.12-0.75 kW, 1-phase > 0.75 kW, large motors 375-1000 kW, explosion motors (with separate requirements for Ex-eb motors and 'other' explosion motors, brake motors and 8-pole motors. Direct Current (DC) motors and motors with mechanical coommutators remain excluded. Medium voltage motors (> 1000 V) and submersible motors also remain excluded. The new regulation no longer explicitly encourages the use of VSDs, but minimum efficiency requirements are added for VSDs. Data in EIA reflect the final voted regulation.

Design options for motor efficiency include reduction of primary and secondary resistances losses (a.k.a. 'Copper losses'), iron losses (dissipation of magnetic energy) and stray losses (dissipation of harmonic energies of the motor under load in the form of energies are dissipated as currents in the copper windings, harmonic flux components in the iron parts, leakage in the laminate core) and mechanical losses (friction motor bearings and cooling fan) mainly through the use of superior materials, larger copper (rather than aluminium) cross sections to reduce electrical resistance, use of brushless/electronically commutating (EC)/ DC permanent magnet technology, use of direct drives (instead of belt drive) and variable speed drives.

Note: data presented below do not include double counted amounts.

MT Electric Motors LV 0.12-1000 kW	**unit**	**1990**		**2010**			**2020**			**2030**	
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Sales	'000	25 819	38 419	38 419	0	42 449	42 449	0	44 185	44 185	0
o/w motors with VSD	'000	869	3 594	3 610	16	5 091	6 789	1 698	6 378	7 811	1 433
Stock	'000	219 077	324 702	324 702	0	380 084	380 084	0	402 700	402 700	0
o/w motors with VSD	'000	5 383	25 080	25 099	19	39 518	47 886	8 368	50 539	65 262	14 723
EU Load (TWh=10^{12}*W*h)	TWh output/a	731	1 044	1 044	0	1 212	1 177	-35	1 280	1 212	-68
o/w motors with VSD	TWh output/a	48	144	144	0	245	298	53	350	452	102
Stock Average Unit Load	kWh out/a	3 336	3 214	3 214	0	3 189	3 096	-93	3 178	3 009	-169
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	1173	1639	1638	-1	1894	1823	-71	1674	1551	-123
corresponding to electricity	*TWh elec/a*	*469*	*655*	*655*	*0*	*758*	*729*	*-28*	*797*	*738*	*-59*
Final energy	TWh final/a	469	655	655	0	758	729	-28	797	738	-59
GWP emissions	$MtCO_2/a$	235	208	208	0	162	156	-6	114	105	-8
Acquisition costs (incl. install)	bn €	2	4	4	0	5	6	1	6	7	1
o/w for VSDs	bn €	1	2	2	0	3	4	1	4	5	1
Energy costs	bn €	64	74	74	0	88	84	-3	101	93	-7
Maintenance costs (incl. VAT)	bn €	1	1	1	0	1	1	0	1	1	0
Total running costs	bn €	65	74	74	0	89	86	-3	102	94	-7
Total expenditure	bn €	67	79	79	0	94	92	-2	107	101	-6
Revenue Industry	m €	1129	2333	2347	14	2675	3219	544	2855	3549	694
o/w for VSDs	m €	255	990	997	7	1350	1937	586	1657	2118	461
Revenue Wholesale	m €	388	801	806	5	918	1105	187	980	1218	238
Revenue Retail	m €	169	348	350	2	399	480	81	426	530	104
Revenue Installation (of extra VSD only)	m €	397	933	939	6	1121	1439	318	1247	1601	354
Revenue Maintenance (excl. VAT)	m €	594	900	900	0	1098	1122	24	1222	1267	45
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	20	41	41	0	47	56	10	50	62	12
Jobs Wholesale	'000 jobs	1	3	3	0	3	4	1	3	4	1
Jobs Retail/ installation/ maintenance	'000 jobs	11	21	21	0	25	29	4	28	33	5
Jobs Total	'000 jobs	32	65	65	0	75	90	14	81	99	18

Water pumps

EIA 2021 for WPs has been updated based on the "Ecodesign Pump Review, Study of Commission Regulation (EU) No. 547/2012, Extended report (final version), Viegand Maagøe and Van Holsteijn en Kemna B.V., December 2018" and on the draft impact assessment (IA) study (ongoing, to be finalized in 2022). The EIA update is limited to the impacts of the current regulation (CR 547/2012). New measures and scope extension proposed in the review study and the draft IA are not (yet) taken into account in EIA because not finally approved. IA data are preliminary and might still change. Hence, also EIA data could further change in future.

CR 547/2012 (ecodesign for WPs) applies to rotodynamic water pumps for pumping clean water, including where integrated in other products. The CR does not apply to pumps designed specifically for pumping clean water at temperatures below – 10 °C or above 120 °C (except some information requirements), water pumps designed only for fire-fighting applications, displacement water pumps, self-priming water pumps.
According to the definitions in the CR: 'water pump' is the hydraulic part of a device that moves clean water by physical or mechanical action and is of one of the following designs:
— End suction own bearing (ESOB),
— End suction close coupled (ESCC),
— End suction close coupled inline (ESCCi),
— Vertical multistage (MS-V),
— Submersible multistage (MSS).
Scope limitations: ESOB, ESCC and ESCCi with maximum shaft power 150 kW, MS-V for pressures up to 25 bar, MSS with nominal outer diameter of 4' (10,16 cm) or 6" (15,24 cm) designed to be operated in a borehole (additional conditions in the definitions of the CR).

WP Water pumps	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	935	1 261			1 494			1 665		
Stock	'000	9 058	12 447			14 526			16 511		
EU load (TWh=10^{12}* W * h)	TWh flow/a	61	83			96			108		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	297	396	396	0	454	446	-8.2	423	415	-7.8
o/w electricity	*TWh elec/a*	*119*	*159*	*159*	*0*	*182*	*179*	*-3.3*	*201*	*198*	*-3.7*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0.0*	*0*	*0*	*0.0*
Final energy	TWh final/a	119	159	159	0	182	179	-3.3	201	198	-3.7
GWP emissions	$MtCO_2$/a	59	50	50	0	39	38	-0.7	29	28	-0.5
Acquisition costs (incl. install)	bn €	3	4	4	0	5	5	0.0	6	6	0.0
Energy costs	bn €	20	22	22	0	29	28	-0.5	35	34	-0.6
Maintenance costs (incl. VAT)	bn €	6	9	9	0	10	10	0.0	11	11	0.0
Total running costs	bn €	26	31	31	0	39	39	-0.5	46	46	-0.6
Total expenditure	bn €	29	35	35	0	44	44	-0.5	52	51	-0.6
Revenue Industry	m €	1445	1955	1955	0	2326	2342	16	2602	2613	11
Revenue Wholesale	m €	433	586	586	0	697	702	5	780	783	3
Revenue Retail	m €	217	293	293	0	349	351	2	390	392	2
Revenue Installation	m €	1052	1419	1419	0	1681	1692	11	1874	1881	7
Revenue Maintenance (excl. VAT)	m €	6044	8306	8306	0	9693	9693	0	11018	11018	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	25	34	34	0	41	41	0.3	46	46	0.2
Jobs Wholesale	'000 jobs	2	2	2	0	2	2	0.0	3	3	0.0
Jobs Retail/ installation/ maintenance	'000 jobs	65	89	89	0	105	105	0.1	119	119	0.1
Jobs Total	'000 jobs	92	126	126	0	148	148	0.4	167	167	0.3

Welding Equipment

EIA data are based on CR (EU) 2019/1784 of 1 October 2019 and on Impact Assessment SWD(2019) 340 final. Compared to the IA, the final CR does not include the 2028 Tier 2 requirements on efficiency of power supplies, nor the information requirement on actual consumption of shielding gas. In addition, EIA had to estimate some parameter values that were not reported in IA. For these reasons, EIA data may deviate from IA data. EIA data were checked with EC policy officer and no comments were received.

Regulation scope is electrical mains-operated welding equipment, including manual metal arc; shielded metal arc; self-shielded flux-cored; flux cored arc; metal active gas and metal inert gas; tungsten inert gas -welding; and plasma arc cutting. The Regulation does not apply to submerged arc welding; limited-duty arc welding; resistance welding; stud welding.

From 1 January 2023, the CR sets a minimum efficiency for power sources of welding equipment, and a maximum power consumption in idle state. In addition there are resource requirements and information re quirements. Among these: Where a display is provided for a welding equipment it shall provide indication of the use of welding wire or filler material in grams per minute or equivalent standardised units of measurement. This is expected to reduce the consumption of wires and electrodes.

WE Welding Equipment	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	'000	422	479			486			497		
Stock	'000	2 611	2 969			3 049			3 111		
Unit load (3.4 kW; 440 h/a arc-on)	kWh/a	1 560	1 560			1 560			1 560		
EU Load (output of welding equipment)	TWh/a	3.9	4.5			4.6			4.7		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
On-mode efficiency, sales average	%	65.0%	75.0%	75.0%	0	76.6%	76.6%	0	76.9%	87.5%	10.7%
Idle-mode efficiency, sales average	W	90.4	80.4	80.4	0	79.5	79.5	0	79.0	49.9	-29
Shielding gas consumption, stock average	kg/unit/a	440	440	440	0	440	440	0	440	396	-44
Wire / electrode consumption, stock average	kg/unit/a	552	552	552	0	552	552	0	552	525	-28
Electricity total	TWh elec/a	6.5	6.4	6.4	0.0	6.4	6.4	0.0	6.5	5.6	-0.9
o/w for arc-on mode	*TWh elec/a*	*6.2*	*6.1*	*6.1*	*0.0*	*6.0*	*6.0*	*0.0*	*6.1*	*5.4*	*-0.7*
o/w for idle mode	*TWh elec/a*	*0.4*	*0.4*	*0.4*	*0.0*	*0.4*	*0.4*	*0.0*	*0.4*	*0.2*	*-0.1*
Primary Energy (from electricity)	TWh prim/a	16.4	16.1	16.1	0.0	16.0	16.0	0.0	13.6	11.8	-1.8
Primary Energy (from consumables)	TWh prim/a	7.9	9.0	9.0	0.0	9.2	9.2	0.0	9.4	8.9	-0.5
GWP emissions (from electricity)	$MtCO_2/a$	3.3	2.0	2.0	0.0	1.4	1.4	0.0	0.9	0.8	-0.1
GWP emissions (from consumables)	$MtCO_2/a$	2.1	2.4	2.4	0.0	2.5	2.5	0.0	2.5	2.4	-0.1
Acquisition costs (Weld. equip., incl. install)	bn €	0.46	0.52	0.52	0.00	0.53	0.53	0.00	0.54	0.55	0.01
Energy costs	bn €	0.83	0.65	0.65	0.00	0.62	0.62	0.00	0.69	0.59	-0.09
Repair and Maintenance costs	bn €	0.10	0.11	0.11	0.00	0.11	0.11	0.00	0.12	0.12	0.00
Consumable costs (gas, filler wire, electrode)	bn €	1.90	2.16	2.16	0.00	2.22	2.22	0.00	2.26	2.07	-0.19
Total expenditure (incl. consumables)	bn €	3.29	3.44	3.44	0.00	3.48	3.48	0.00	3.61	3.34	-0.27
Revenue Industry (excl. consumables)	m €	221	251	251	0	255	255	0	260	266	5
Revenue Wholesale (excl. consumables)	m €	49	56	56	0	56	56	0	58	59	1
Revenue Retail (excl. consumables)	m €	30	34	34	0	35	35	0	35	36	1
Revenue Installation	m €	162	183	183	0	186	186	0	190	194	4
Revenue Maintenance	m €	98	111	111	0	114	114	0	116	116	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	3.9	4.4	4.4	0.0	4.5	4.5	0.0	4.6	4.7	0.1
Jobs Wholesale	'000 jobs	0.2	0.2	0.2	0.0	0.2	0.2	0.0	0.2	0.2	0.0
Jobs Retail/ installation/ maintenance	'000 jobs	2.7	3.1	3.1	0.0	3.1	3.1	0.0	3.2	3.2	0.0
Jobs Total (excl. consumables)	'000 jobs	6.8	7.7	7.7	0.0	7.8	7.8	0.0	8.0	8.1	0.1

Utility transformers

Utility transformers are used in the distribution of electricity. Consequently their energy consumption is already included in the electric power generation efficiency (CC=40% until 2020 / 47.6% from 2021) and their acquisition costs can be assumed to be already included in some way in the electricity rates. Although the table below reports the full BAU and ECO energies and costs, in the Ecodesign Impact Accounting (for combination of the impacts of transformers with those of other products) the BAU energy and cost are set to zero as a reference and only the improvement over this reference is accounted as ECO impact. The same principle is NOT applied to Revenues and jobs, that are accounted in the totals in full.
CR (EU) 2019/1783 amends CR (EU) 548/2014, but these amendments have a negligible impact, so EIA 2019 did not apply any changes for this.

TRAFO Utility Transformers	**unit**	**1990**		**2010**			**2020**			**2030**	
Sales	'000	107		156			184			225	
Stock	'000	2 387		3 597			4 401			5 355	
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy	TWh prim/a	131	215	215	0	277	263	-14	302	267	-35
o/w electricity	*TWh elec/a*	*53*	*86*	*86*	*0*	*111*	*105*	*-6*	*144*	*127*	*-17*
o/w fuel	*TWh fuel/a*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*	*0*
Final energy	TWh final/a	0	0	0	0	0	0	0	0	0	0
GWP emissions	$MtCO_2/a$	26	27	27	0	24	23	-1	21	18	-2
Acquisition costs (incl. install)	bn €	3	5	5	0	6	6	1	7	8	1
Energy costs	bn €	7	9	9	0	11	10	-1	15	13	-2
Total expenditure	bn €	9	13	13	0	16	16	0	22	22	-1
Revenue Industry	m €	2199	3660	3660	0	4463	5006	543	5685	6506	821
Revenue Wholesale	m €	275	457	457	0	558	626	68	711	813	103
Revenue Retail	m €	275	457	457	0	558	626	68	711	813	103
Revenue Installation	m€	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	39	64	64	0	78	88	10	100	114	14
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	2	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	4	7	7	0	8	9	1	10	12	1
Jobs Total	'000 jobs	43	72	72	0	88	99	11	112	129	16

Tyres (replacement and OEM)

The EU adopted in 2009 two sets of rules relating to tyres:

1. The Tyre Labelling Regulation (TLR, Regulation (EC) No 1222/2009, OJ L 342 of 22.12.2009, p.46) harmonising the information on tyre parameters to be provided to end-users allowing them to make informed purchasing choices.

2. The Regulation on type-approval requirements for the general safety of motor vehicles (“General Safety Regulation” or GSR, Regulation (EC) No 661/2009, OJ L 200 of 31.7.2009, p.1) putting in place harmonised technical requirements that tyres must satisfy before they can be placed on the Union market.
The GSR puts in place minimum requirements for, amongst others, (i) the rolling resistance, (ii) external rolling noise and (iii) wet grip performance of tyres. These minimum requirements became applicable for all three parameters from 1 November 2012, with a second tier of more stringent requirements for the rolling resistance starting to apply on 1 November 2016 (with further requirements coming into application in 2018 and 2020).

The TLR was reviewed in 2016, leading to a proposal for a new TLR in 2018. The ECO-scenario in EIA reflects Policy Option 4 (PO4) as presented in the 2018 Impact Assessment (IA, SWD(2018)189). The BAU-scenario in EIA is without the TLR, but includes the GSR. Consequently EIA shows the savings of the PO4 policy option with respect to a scenario without any tyre labelling regulation. This is different from the IA, which compares PO4 with the situation including the existing TLR.
Policy Option 4 includes e.g.: information campaigns to increase awareness of the label, improvements in enforcement, online labelling, mandatory labelling of tyres delivered with vehicles at all times (more clearly includes OEM tyres; incl. when leasing), label for C3 tyres, snow and ice performance on label, re-adjustment of label classes, tyre registration database, amendments to technical documentation, test methods, laboratory alignment procedure, extension of type approval process.

The TLR relates to C1, C2 and C3 tyre types, as defined in article 8 of the GSR. C1 tyres are used typically for passenger cars, C2 tyres for light commercial vehicles (LCVs, vans) and C3 tyres for heavy commercial vehicles (HCVs, trucks, busses).
In addition the 2018 IA makes a distinction between OEM tyres (mounted on new vehicles sold; often not selected by the vehicle buyer) and replacement tyres (selected by the vehicle user/owner). The reason for this additional distinction is that the existing TLR seems to have been less effective for OEM tyres, leading to a difference in average RRC (rolling resistance coefficient) for OEM and replacement tyres. For ease of traceability, EIA has maintained this distinction made in the IA.

The tyre efficiency in EIA is the fuel consumed by vehicles due to the rolling resistance of the tyres, expressed in 'L/100km/vehicle due to RRC'. The efficiency values are reported on sheets EFNBAU and EFNECO. The differences between BAU and ECO express the decrease in vehicle fuel losses due to the rolling resistance of tyres. The changes in fuel consumption derive from changes in RRC as explained on sheet 'LoadNotes'. That sheet also reports the underlying RRC values. In EIA, Energy, Emissions, Energy costs, Total User Expenses all relate to the fuel losses due to rolling resistance, not to the total fuel consumption of vehicles.

EIA concentrates on the energy impacts due to changes in RRC. The proposed TLR also has effects on Wet Grip and Noise emission of tyres. This leads to advantages in societal costs (less incidents, healthier people) that are not being reported in EIA. Wet Grip coefficients are reported near the bottom of sheets EFNBAU and EFNECO, but not further used in the accounting. Information on Noise emissions is reported near the bottom of the EMISS-sheets.

Tyres, total C1+C2+C3	**unit**	**1990**	**2010**			**2020**			**2030**		
Sales	mln	263	323			353			434		
Stock	mln	1 207	1 387			1 564			1 917		
EU distance travelled by vehicles	bn km/a	3 171	3 629			4 106			5 029		
	Scenario	**BAU**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**	**BAU**	**ECO**	**inc**
Primary energy (fuel losses due to RRC)	TWh prim/a	826	637	632	-5	625	593	-32	660	603	-58
o/w fuel	*TWh fuel/a*	*826*	*637*	*632*	*-5*	*625*	*593*	*-32*	*660*	*603*	*-58*
Final energy (fuel losses due to RRC)	TWh final/a	826	637	632	-5	625	593	-32	660	603	-58
GWP emissions	$MtCO_2/a$	220	169	168	-1	166	158	-9	176	160	-15
Acquisition costs	bn €	22	29	29	1	37	45	8	48	58	10
Energy costs (for fuel losses due to RRC)	bn €	75	84	84	-1	71	68	-4	102	93	-9
Total expenditure	bn €	98	113	113	0	108	112	4	150	151	1
Revenue Industry	m €	9998	12837	13137	300	16647	20177	3530	21351	26087	4736
Revenue Wholesale	m €	2500	3209	3284	75	4162	5044	882	5338	6522	1184
Revenue Retail	m €	7499	9628	9853	225	12486	15133	2647	16013	19565	3552
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	0	0	0	0	0	0	0	0	0	0
Jobs Industry (⅓), OEM (⅓) & services (⅓)	'000 jobs	175	225	230	5	292	353	62	374	457	83
Jobs Wholesale	'000 jobs	9	11	12	0	15	18	3	19	23	4
Jobs Retail/ installation/ maintenance	'000 jobs	109	140	144	3	182	221	39	234	286	52
Jobs Total	'000 jobs	293	377	385	9	488	592	104	626	765	139

ANNEX F: Business Revenues (summary tables)

Quantitative data summarised from impacts per parameter (Annex A)

Revenue in 2020 euros

Revenue Industry (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1562	2048	2048	0	2094	2094	0	2579	2579	0
CHC Central Heating combi, water heating	828	887	887	0	942	1004	62	1030	1369	338
CH Central Heating boiler, space heating	5059	5644	5644	0	5143	5596	453	5756	7572	1816
SFB Solid Fuel Boilers	785	2483	2483	0	1959	2093	134	2151	2341	189
AHC central Air Cooling	865	4091	4091	0	5618	5620	2	7100	7101	1
AHC central Air Heating (excl. reversible AC)	340	222	222	0	196	214	19	175	190	15
LH Local Heaters	4553	6959	6959	0	7675	8502	828	8023	8957	934
RAC Room Air Conditioner	100	1332	1640	308	1321	1700	379	1698	1965	266
CIRC Circulator pumps <2.5 kW excl. double	446	733	733	0	712	955	243	590	736	146
VU Ventilation Units (res & nonres)	1554	5769	5769	0	6725	7260	535	7788	8293	505
LS Light Sources	2575	5228	5504	276	8212	8717	505	6839	7415	576
DP electronic DisPlays	7955	13719	13719	0	11222	11222	0	13464	13464	0
STB Set Top Boxes	0	3292	3292	0	3236	3236	0	3236	3236	0
VIDEO (Game Consoles)	74	1606	1606	0	1606	1606	0	1606	1606	0
ES+DS Enterprise Servers and Data Storage	1451	33150	33150	0	32971	32971	0	43558	43558	0
PC Personal Computers	5741	31580	31580	0	36450	36450	0	53591	53591	0
IE imaging equipment	3167	8523	8523	0	8225	8225	0	7455	7455	0
SB (networked) Stand-By	6017	10972	10972	0	13058	13058	0	14846	14846	0
EPS External Power Supplies excl. double	48	1207	1214	7	1233	1254	21	1270	1277	7
RF Household Refrigeration	2842	3173	3642	469	3320	4172	852	3421	4572	1151
CF Commercial Refrigeration	1432	1666	1666	0	1720	1720	0	1835	1907	73
PF Professional Refrigeration	787	940	940	0	1064	1125	60	1224	1224	0
CA Cooking Appliances	4947	6716	6716	0	7422	8018	596	7600	8093	494
WM-WD household Washing Machines	1666	2478	2948	470	2686	3230	545	2589	2870	281
DW Household Dishwashers	664	1488	1974	487	1990	2590	599	2472	3049	577
LD household Laundry Drier	282	450	506	56	763	1217	455	752	1337	585
VC Vacuum Cleaners	1140	2019	2019	0	2691	2791	100	3407	3454	47
FAN Industrial Fans >125W	587	1795	1795	0	2232	3060	828	2327	2961	635
MT Motors AC, LV, 0.12-1000 kW	1129	2333	2347	14	2675	3219	544	2855	3549	694
WP Water pumps	1445	1955	1955	0	2326	2342	16	2602	2613	11
WE Welding Equipment	221	251	251	0	255	255	0	260	266	5
TRAFO Utility Transformers	2199	3660	3660	0	4463	5006	543	5685	6506	821
TYRE Replacement and OEM Tyres	9998	12837	13137	300	16647	20177	3530	21351	26087	4736
TOTAL in bn euros	**72**	**181**	**184**	**2**	**199**	**211**	**12**	**241**	**256**	**15**

Revenue Wholesale (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	401	525	525	0	537	537	0	661	661	0
CHC Central Heating combi, water heat	222	238	238	0	253	270	17	277	368	91
CH Central Heating boiler, space heat	1315	1467	1467	0	1337	1454	118	1496	1968	472
SFB Solid Fuel Boilers	30	96	96	0	76	81	5	83	91	7
AHC central Air Cooling	109	514	514	0	706	706	0	892	892	0
AHC central Air Heating (excl. reversible AC)	43	28	28	0	25	27	2	22	24	2
LH Local Heaters	643	988	988	0	1096	1215	119	1147	1282	135
RAC Room Air Conditioner	52	694	855	161	696	895	199	902	1042	140
CIRC Circulator pumps <2.5 kW excl. double	149	245	245	0	237	317	80	196	244	48
VU Ventilation Units (res & nonres)	218	802	802	0	959	1043	85	1302	1380	78
LS Light Sources	662	1637	1748	110	1984	1394	-590	1209	953	-256
DP electronic DisPlays	1153	2121	2121	0	2211	2211	0	2341	2341	0
STB set top boxes (Complex & Simple)	0	1503	1503	0	1478	1478	0	1478	1478	0
VIDEO (Game Consoles)	9	204	204	0	204	204	0	204	204	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	894	4412	4412	0	5167	5167	0	7475	7475	0
IE imaging equipment	726	1957	1957	0	1895	1895	0	1717	1717	0
SB (networked) Stand-By	2870	5101	5101	0	6062	6062	0	6840	6840	0
EPS External Power Supplies excl. double	14	360	362	2	368	374	6	379	381	2
RF Household Refrigerators & freezers	206	230	264	34	240	302	62	248	331	83
Total CF Commercial Refrigeration	614	714	714	0	737	737	0	786	817	31
Total PF Professional Refrigeration (excl.)	225	268	268	0	304	321	17	350	350	0
Total CA Cooking Appliances	349	478	478	0	529	571	42	543	578	35
WM-WD household Washing Machines	123	182	217	35	198	238	40	191	211	21
DW Household Dishwashers	48	108	143	35	145	188	44	179	221	42
LD household Laundry Drier	21	33	37	4	56	89	33	55	98	43
VC Vacuum Cleaners	104	159	159	0	156	185	29	165	177	13
FAN Industrial Fans >125W (excl. box/ roof)	202	616	616	0	766	1051	284	799	1016	218
MT Motors AC, LV, 0.12-1000 kW	388	801	806	5	918	1105	187	980	1218	238
WP Water pumps	433	586	586	0	697	702	5	780	783	3
WE Welding Equipment	49	56	56	0	56	56	0	58	59	1
TRAFO Utility Transformers	275	457	457	0	558	626	68	711	813	103
TYRE Replacement and OEM Tyres	2500	3209	3284	75	4162	5044	882	5338	6522	1184
TOTAL in bn euros	**15**	**31**	**31**	**0**	**35**	**37**	**2**	**40**	**43**	**3**

Revenue Retail (in m €)

	1990	2010			2020			2030		
product groups	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	401	525	525	0	537	537	0	661	661	0
CHC Central Heating combi, water heat	222	238	238	0	253	270	17	277	368	91
CH Central Heating boiler, space heat	1315	1467	1467	0	1337	1454	118	1496	1968	472
SFB Solid Fuel Boilers	30	96	96	0	76	81	5	83	91	7
AHC central Air Cooling	109	514	514	0	706	706	0	892	892	0
AHC central Air Heating (excl. reversible AC)	43	28	28	0	25	27	2	22	24	2
LH Local Heaters	759	1168	1168	0	1295	1436	141	1355	1514	159
RAC Room Air Conditioner	38	502	618	116	503	646	144	651	752	101
CIRC Circulator pumps <2.5 kW excl. double	27	41	41	0	38	45	7	30	35	5
VU Ventilation Units (res & nonres)	220	810	810	0	971	1057	86	1336	1415	80
LS Light Sources	625	1518	1613	95	1823	1252	-571	1138	924	-214
DP electronic DisPlays	7582	12758	12758	0	9573	9573	0	12128	12128	0
STB set top boxes (Complex & Simple)	0	301	301	0	296	296	0	296	296	0
VIDEO (Game Consoles)	74	1592	1592	0	1592	1592	0	1592	1592	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	5661	32424	32424	0	36677	36677	0	54373	54373	0
IE imaging equipment	1157	3035	3035	0	2591	2591	0	2348	2348	0
SB (networked) Stand-By	1606	2853	2853	0	3157	3157	0	3378	3378	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	2742	3061	3513	452	3203	4025	822	3301	4411	1110
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration (excl.)	112	134	134	0	152	161	9	175	175	0
Total CA Cooking Appliances	4654	6376	6376	0	7052	7615	563	7235	7702	467
WM-WD household Washing Machines	1635	2433	2894	461	2636	3171	535	2541	2817	276
DW Household Dishwashers	643	1440	1911	471	1927	2507	580	2393	2952	559
LD household Laundry Drier	275	439	494	55	743	1187	443	733	1303	571
VC Vacuum Cleaners	846	1519	1519	0	2071	2129	58	2649	2677	28
FAN Industrial Fans >125W (excl. box/ roof)	88	268	268	0	333	457	124	347	442	95
MT Motors AC, LV, 0.12-1000 kW	169	348	350	2	399	480	81	426	530	104
WP Water pumps	217	293	293	0	349	351	2	390	392	2
WE Welding Equipment	30	34	34	0	35	35	0	35	36	1
TRAFO Utility Transformers	275	457	457	0	558	626	68	711	813	103
TYRE Replacement and OEM Tyres	7499	9628	9853	225	12486	15133	2647	16013	19565	3552
TOTAL in bn euros	**39**	**86**	**88**	**2**	**93**	**99**	**6**	**119**	**127**	**8**

Revenue Installation (in m €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1280	1667	1667	0	1553	1553	0	1760	1760	0
CHC Central Heating combi, water heat	1390	1460	1460	0	1557	1720	163	1740	2587	846
CH Central Heating boiler, space heat	7637	9062	9062	0	8509	9788	1280	9795	14441	4647
SFB Solid Fuel Boilers	396	918	918	0	657	722	64	697	769	71
AHC central Air Cooling	426	2419	2419	0	3455	3456	1	4442	4443	1
AHC central Air Heating (excl. reversible AC)	283	184	184	0	162	178	16	145	157	12
LH Local Heaters	2374	3569	3569	0	4408	4757	350	4920	5311	391
RAC Room Air Conditioner	212	2732	3309	576	2709	3421	711	3590	4057	467
CIRC Circulator pumps <2.5 kW excl. double	207	320	320	0	301	370	69	244	287	43
VU Ventilation Units (res & nonres)	2224	8682	8682	0	9626	9630	4	10148	10164	16
LS Light Sources	2249	3777	3675	-102	3305	2855	-450	2914	2215	-699
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO (Game Consoles)	0	0	0	0	0	0	0	0	0	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
IE imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By	0	0	0	0	0	0	0	0	0	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	121	147	147	0	159	159	0	169	178	8
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
WM-WD household Washing Machines	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	109	114	109	-5	160	129	-31	153	102	-50
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	80	246	246	0	306	419	112	320	406	85
MT Motors AC, LV, 0.12-1000 kW	397	933	939	6	1121	1439	318	1247	1601	354
WP Water pumps	1052	1419	1419	0	1681	1692	11	1874	1881	7
WE Welding Equipment	162	183	183	0	186	186	0	190	194	4
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement and OEM Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euros	**21**	**38**	**38**	**0**	**40**	**42**	**3**	**44**	**51**	**6**

Revenue Maintenance (excl. VAT, in m€)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	3973	5346	5346	0	5317	5317	0	5430	5430	0
CHC Central Heating combi, water heat	1461	2338	2338	0	2377	2351	0	2346	2255	0
CH Central Heating boiler, space heat	9982	14813	14813	0	14837	14811	-25	14604	14200	-405
SFB Solid Fuel Boilers	599	339	339	0	402	402	0	349	349	0
AHC central Air Cooling	978	4292	4292	0	6757	6757	0	8901	8901	0
AHC central Air Heating (excl. reversible AC)	103	101	101	0	87	87	0	77	77	0
LH Local Heaters	913	1320	1320	0	1620	1620	0	1867	1867	0
RAC Room Air Conditioner	80	946	946	0	865	865	0	1137	1137	0
CIRC Circulator pumps <2.5 kW excl. double	73	108	108	0	107	107	0	95	95	0
VU Ventilation Units (res & nonres)	851	1685	1685	0	2267	2267	0	3136	3136	0
LS Light Sources	1634	4079	4121	42	5148	5179	31	6583	6622	39
DP electronic DisPlays	149	365	365	0	424	424	0	508	508	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO (Game Consoles)	0	0	0	0	0	0	0	0	0	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
IE imaging equipment	1040	5705	5705	0	8693	8693	0	8098	8098	0
SB (networked) Stand-By	0	0	0	0	0	0	0	0	0	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	1058	1227	1227	0	1345	1345	0	1438	1438	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
WM-WD household Washing Machines	329	505	505	0	557	557	0	575	575	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	81	179	179	0	203	203	0	246	246	0
VC Vacuum Cleaners	295	594	594	0	854	854	0	1171	1171	0
FAN Industrial Fans >125W (excl. box/ roof)	338	861	861	0	1126	1126	0	1294	1294	0
MT Motors AC, LV, 0.12-1000 kW	594	900	900	0	1098	1122	24	1222	1267	45
WP Water pumps	6044	8306	8306	0	9693	9693	0	11018	11018	0
WE Welding Equipment	98	111	111	0	114	114	0	116	116	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement and OEM Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in bn euros	**31**	**54**	**54**	**0**	**64**	**64**	**0**	**70**	**70**	**0**

Total Revenue by product group (in m€)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	7616	10111	10111	0	10039	10039	0	11092	11092	0
CHC Central Heating combi, water heat	4123	5162	5162	0	5382	5615	259	5671	6945	1366
CH Central Heating boiler, space heat	25308	32453	32453	0	31161	33104	1942	33146	40148	7003
SFB Solid Fuel Boilers	1841	3933	3933	0	3170	3379	209	3364	3639	275
AHC central Air Cooling	2486	11830	11830	0	17242	17245	3	22227	22229	2
AHC central Air Heating (excl. reversible AC)	812	563	563	0	494	533	39	441	471	31
LH Local Heaters	9242	14003	14003	0	16094	17532	1438	17311	18930	1619
RAC Room Air Conditioner	481	6207	7368	1161	6095	7528	1433	7978	8952	975
CIRC Circulator pumps <2.5 kW excl. double	902	1447	1447	0	1396	1794	398	1156	1397	241
VU Ventilation Units (res & nonres)	5067	17748	17748	0	20547	21257	710	23709	24388	679
LS Light Sources	7745	16240	16661	421	20473	19397	-1075	18683	18129	-554
DP electronic DisPlays	16838	28962	28962	0	23430	23430	0	28441	28441	0
STB set top boxes (Complex & Simple)	0	5095	5095	0	5010	5010	0	5010	5010	0
VIDEO (Game Consoles)	157	3403	3403	0	3403	3403	0	3403	3403	0
ES+DS Enterprise Servers and Data Storage	1451	33150	33150	0	32971	32971	0	43558	43558	0
PC Personal Computers	12296	68416	68416	0	78294	78294	0	115439	115439	0
IE imaging equipment	6090	19220	19220	0	21404	21404	0	19619	19619	0
SB (networked) Stand-By	10493	18926	18926	0	22277	22277	0	25063	25063	0
EPS External Power Supplies excl. double	63	1567	1576	9	1601	1628	27	1648	1657	9
RF Household Refrigerators & freezers	5790	6464	7419	955	6764	8499	1735	6970	9314	2344
Total CF Commercial Refrigeration	3224	3755	3755	0	3962	3962	0	4228	4341	112
Total PF Professional Refrigeration (excl.)	1125	1342	1342	0	1521	1607	86	1749	1749	0
Total CA Cooking Appliances	9951	13570	13570	0	15003	16205	1201	15377	16373	996
WM-WD household Washing Machines	3753	5599	6564	966	6077	7196	1120	5895	6473	578
DW Household Dishwashers	1355	3036	4029	993	4062	5285	1223	5044	6223	1178
LD household Laundry Drier	768	1214	1324	110	1924	2825	900	1939	3087	1148
VC Vacuum Cleaners	2386	4291	4291	0	5772	5960	187	7391	7479	88
FAN Industrial Fans >125W (excl. box/ roof)	1295	3786	3786	0	4764	6112	1348	5087	6120	1032
MT Motors AC, LV, 0.12-1000 kW	2676	5315	5342	27	6212	7366	1154	6731	8166	1435
WP Water pumps	9191	12560	12560	0	14746	14779	34	16664	16687	22
WE Welding Equipment	559	635	635	0	646	646	0	660	671	11
TRAFO Utility Transformers	2749	4575	4575	0	5578	6257	679	7106	8132	1026
TYRE Replacement and OEM Tyres	19996	25674	26274	600	33295	40354	7059	42702	52174	9472
TOTAL in bn euros	**178**	**390**	**395**	**5**	**431**	**453**	**22**	**515**	**546**	**31**

Total Revenue by functional group (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	12	15	15	0	15	16	0	17	18	1
SPACE HEATING	38	56	56	1	55	60	5	59	69	10
SPACE COOLING	3	15	16	1	20	21	1	26	27	0
VENTILATION	5	18	18	0	21	21	1	24	24	1
LIGHTING	8	16	17	0	20	19	-1	19	18	-1
ELECTRONICS	47	179	179	0	188	188	0	242	242	0
FOOD PRESERVATION	10	12	13	1	12	14	2	13	15	2
COOKING	10	14	14	0	15	16	1	15	16	1
CLEANING	8	14	16	2	18	21	3	20	23	3
INDUSTRY COMPONENTS	14	22	22	0	26	29	3	29	32	3
ENERGY SECTOR	3	5	5	0	6	6	1	7	8	1
TRANSPORT SECTOR	20	26	26	1	33	40	7	43	52	9
TOTAL in bn euros	**178**	**390**	**395**	**5**	**431**	**453**	**22**	**515**	**546**	**31**

Total Revenue by sector (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	72	181	184	2	199	211	12	241	256	15
Wholesale	15	31	31	0	35	37	2	40	43	3
Retail	39	86	88	2	93	99	6	119	127	8
Installation	21	38	38	0	40	42	3	44	51	6
Maintenance	31	54	54	0	64	64	0	70	70	0
TOTAL in bn euros	**178**	**390**	**395**	**5**	**431**	**453**	**22**	**515**	**546**	**31**

ANNEX G: Direct Employment Impacts (summary tables)

Quantitative data are summarised from impacts per parameter (Annex A). Direct employment relates to identifiable jobs in the added-value chain of the product, starting from and including first-level OEMs. It may not fully include small direct impacts from OEMs further upstream or --in as much as they are not included as a levy on the purchase price-- employment impacts in the waste and recycling industry. The possible effect of not including direct employment at this level of detail, for which typically no or very little data is available, is assumed to be small (<10%) and the effort not worthwhile.

The employment impact also does not include the indirect employment impacts of employees and companies spending their income on goods, services and taxes. This is a large impact. Depending on the product sector and depending on the methodology employed (input/output analysis, process analysis, etc.) the indirect employment effect may be a factor 3 to 7 higher than the direct employment effect. However, given the lack of consensus on the methodology --both with economists and the European institutions-- the MEEuP or MEErP methodology requires no such assessment, nor have most preparatory and IA studies ventured into this area for other reasons. The only exception is the 'Stage 6 review' of light sources (VHK 2013), where such an assessment by an external stakeholder (trade unions) has been included in the report.

Jobs Industry **(in 1000 jobs)**

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	27	36	36	0	37	37	0	45	45	0
CHC Central Heating combi, water heat	15	16	16	0	16	18	1	18	24	6
CH Central Heating boiler, space heat	89	99	99	0	90	98	8	101	133	32
SFB Solid Fuel Boilers	14	43	43	0	34	37	2	38	41	3
AHC central Air Cooling	15	72	72	0	98	98	0	124	124	0
AHC central Air Heating (excl. AC rev)	6	4	4	0	3	4	0	3	3	0
LH Local Heaters	80	122	122	0	134	149	14	140	157	16
RAC Room Air Conditioner	2	23	29	5	23	30	7	30	34	5
CIRC Circulator pumps <2.5 kW excl. double	8	13	13	0	12	17	4	10	13	3
VU Ventilation Units (res & nonres)	27	101	101	0	118	127	9	136	145	9
LS Light Sources	45	92	96	5	144	153	9	120	130	10
DP electronic DisPlays	139	240	240	0	197	197	0	236	236	0
STB set top boxes (Complex & Simple)	0	58	58	0	57	57	0	57	57	0
VIDEO (Game Consoles)	1	28	28	0	28	28	0	28	28	0
ES+DS Enterprise Servers and Data Storage	25	581	581	0	577	577	0	763	763	0
PC Personal Computers	101	553	553	0	638	638	0	938	938	0
IE imaging equipment	55	149	149	0	144	144	0	131	131	0
SB (networked) Stand-By	105	192	192	0	229	229	0	260	260	0
EPS External Power Supplies excl. double	1	21	21	0	22	22	0	22	22	0
RF Household Refrigerators & freezers	50	56	64	8	58	73	15	60	80	20
Total CF Commercial Refrigeration	25	29	29	0	30	30	0	32	33	1
Total PF Professional Refrigeration (excl.)	14	16	16	0	19	20	1	21	21	0
Total CA Cooking Appliances	87	118	118	0	130	140	10	133	142	9
WM-WD household Washing Machines	29	43	52	8	47	57	10	45	50	5
DW Household Dishwashers	12	26	35	9	35	45	10	43	53	10
LD household Laundry Drier	5	8	9	1	13	21	8	13	23	10
VC Vacuum Cleaners	20	35	35	0	47	49	2	60	60	1
FAN Industrial Fans >125W (excl. box/ roof)	10	31	31	0	39	54	15	41	52	11
MT Motors AC, LV, 0.12-1000 kW	20	41	41	0	47	56	10	50	62	12
WP Water pumps	25	34	34	0	41	41	0	46	46	0
WE Welding Equipment	4	4	4	0	4	4	0	5	5	0
TRAFO Utility Transformers	39	64	64	0	78	88	10	100	114	14
TYRE Replacement and OEM Tyres	175	225	230	5	292	353	62	374	457	83
TOTAL in 1000 jobs	**1269**	**3173**	**3215**	**42**	**3482**	**3690**	**207**	**4223**	**4484**	**261**

Jobs Wholesale **(in 1000 jobs)**

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	1	2	2	0	2	2	0	2	2	0
CHC Central Heating combi, water heat	1	1	1	0	1	1	0	1	1	0
CH Central Heating boiler, space heat	5	5	5	0	5	5	0	5	7	2
SFB Solid Fuel Boilers	0	0	0	0	0	0	0	0	0	0
AHC central Air Cooling	0	2	2	0	2	2	0	3	3	0
AHC central Air Heating (excl. AC rev)	0	0	0	0	0	0	0	0	0	0
LH Local Heaters	2	3	3	0	4	4	0	4	4	0
RAC Room Air Conditioner	0	2	3	1	2	3	1	3	4	0
CIRC Circulator pumps <2.5 kW excl. double	1	1	1	0	1	1	0	1	1	0
VU Ventilation Units (res & nonres)	1	3	3	0	3	4	0	5	5	0
LS Light Sources	2	6	6	0	7	5	-2	4	3	-1
DP electronic DisPlays	4	7	7	0	8	8	0	8	8	0
STB set top boxes (Complex & Simple)	0	5	5	0	5	5	0	5	5	0
VIDEO (Game Consoles)	0	1	1	0	1	1	0	1	1	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	3	15	15	0	18	18	0	26	26	0
IE imaging equipment	3	7	7	0	7	7	0	6	6	0
SB (networked) Stand-By	10	18	18	0	21	21	0	24	24	0
EPS External Power Supplies excl. double	0	1	1	0	1	1	0	1	1	0
RF Household Refrigerators & freezers	1	1	1	0	1	1	0	1	1	0
Total CF Commercial Refrigeration	2	3	3	0	3	3	0	3	3	0
Total PF Professional Refrigeration (excl.)	1	1	1	0	1	1	0	1	1	0
Total CA Cooking Appliances	1	2	2	0	2	2	0	2	2	0
WM-WD household Washing Machines	0	1	1	0	1	1	0	1	1	0
DW Household Dishwashers	0	0	1	0	1	1	0	1	1	0
LD household Laundry Drier	0	0	0	0	0	0	0	0	0	0
VC Vacuum Cleaners	0	1	1	0	1	1	0	1	1	0
FAN Industrial Fans >125W (excl. box/ roof)	1	2	2	0	3	4	1	3	4	1
MT Motors AC, LV, 0.12-1000 kW	1	3	3	0	3	4	1	3	4	1
WP Water pumps	2	2	2	0	2	2	0	3	3	0
WE Welding Equipment	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers	1	2	2	0	2	2	0	2	3	0
TYRE Replacement and OEM Tyres	9	11	12	0	15	18	3	19	23	4
TOTAL in 1000 jobs	**53**	**108**	**109**	**2**	**122**	**128**	**6**	**139**	**149**	**10**

Jobs Retail **(in 1000 jobs)**

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	6	8	8	0	8	8	0	10	10	0
CHC Central Heating combi, water heat	3	3	3	0	4	4	0	4	5	1
CH Central Heating boiler, space heat	19	21	21	0	20	21	2	22	29	7
SFB Solid Fuel Boilers	0	1	1	0	1	1	0	1	1	0
AHC central Air Cooling	2	8	8	0	10	10	0	13	13	0
AHC central Air Heating (excl. AC rev)	1	0	0	0	0	0	0	0	0	0
LH Local Heaters	11	17	17	0	19	21	2	20	22	2
RAC Room Air Conditioner	1	7	9	2	7	9	2	9	11	1
CIRC Circulator pumps <2.5 kW excl. double	0	1	1	0	1	1	0	0	1	0
VU Ventilation Units (res & nonres)	3	12	12	0	14	15	1	19	21	1
LS Light Sources	9	22	24	1	27	18	-8	17	13	-3
DP electronic DisPlays	111	186	186	0	140	140	0	177	177	0
STB set top boxes (Complex & Simple)	0	4	4	0	4	4	0	4	4	0
VIDEO (Game Consoles)	1	23	23	0	23	23	0	23	23	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	83	473	473	0	535	535	0	793	793	0
IE imaging equipment	17	44	44	0	38	38	0	34	34	0
SB (networked) Stand-By	23	42	42	0	46	46	0	49	49	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	40	45	51	7	47	59	12	48	64	16
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0
Total PF Professional Refrigeration (excl.)	2	2	2	0	2	2	0	3	3	0
Total CA Cooking Appliances	68	93	93	0	103	111	8	106	112	7
WM-WD household Washing Machines	24	36	42	7	38	46	8	37	41	4
DW Household Dishwashers	9	21	28	7	28	37	8	35	43	8
LD household Laundry Drier	4	6	7	1	11	17	6	11	19	8
VC Vacuum Cleaners	12	22	22	0	30	31	1	39	39	0
FAN Industrial Fans >125W (excl. box/ roof)	1	4	4	0	5	7	2	5	6	1
MT Motors AC, LV, 0.12-1000 kW	2	5	5	0	6	7	1	6	8	2
WP Water pumps	3	4	4	0	5	5	0	6	6	0
WE Welding Equipment	0	0	0	0	1	1	0	1	1	0
TRAFO Utility Transformers	4	7	7	0	8	9	1	10	12	1
TYRE Replacement and OEM Tyres	109	140	144	3	182	221	39	234	286	52
TOTAL in 1000 jobs	**570**	**1259**	**1287**	**27**	**1363**	**1449**	**86**	**1737**	**1847**	**110**

Jobs Installation **(in 1000 jobs)**

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	11	15	15	0	14	14	0	15	15	0
CHC Central Heating combi, water heat	12	13	13	0	14	15	1	15	23	7
CH Central Heating boiler, space heat	67	79	79	0	74	86	11	86	126	41
SFB Solid Fuel Boilers	3	8	8	0	6	6	1	6	7	1
AHC central Air Cooling	4	21	21	0	30	30	0	39	39	0
AHC central Air Heating (excl. AC rev)	2	2	2	0	1	2	0	1	1	0
LH Local Heaters	21	31	31	0	39	42	3	43	47	3
RAC Room Air Conditioner	2	24	29	5	24	30	6	31	36	4
CIRC Circulator pumps <2.5 kW excl. double	2	3	3	0	3	3	1	2	3	0
VU Ventilation Units (res & nonres)	19	76	76	0	84	84	0	89	89	0
LS Light Sources	20	33	32	-1	29	25	-4	26	19	-6
DP electronic DisPlays	0	0	0	0	0	0	0	0	0	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO (Game Consoles)	0	0	0	0	0	0	0	0	0	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
IE imaging equipment	0	0	0	0	0	0	0	0	0	0
SB (networked) Stand-By	0	0	0	0	0	0	0	0	0	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	1	1	1	0	1	1	0	1	2	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
WM-WD household Washing Machines	0	0	0	0	0	0	0	0	0	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	1	1	1	0	1	1	0	1	1	0
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	1	2	2	0	3	4	1	3	4	1
MT Motors AC, LV, 0.12-1000 kW	3	8	8	0	10	13	3	11	14	3
WP Water pumps	9	12	12	0	15	15	0	16	16	0
WE Welding Equipment	1	2	2	0	2	2	0	2	2	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement and OEM Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in 1000 jobs	**180**	**331**	**335**	**4**	**349**	**372**	**23**	**388**	**443**	**54**

Jobs Maintenance (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	35	47	47	0	47	47	0	48	48	0
CHC Central Heating combi, water heat	13	20	20	0	21	21	0	21	20	0
CH Central Heating boiler, space heat	87	130	130	0	130	130	0	128	124	-4
SFB Solid Fuel Boilers	5	3	3	0	4	4	0	3	3	0
AHC central Air Cooling	9	38	38	0	59	59	0	78	78	0
AHC central Air Heating (excl. AC rev)	1	1	1	0	1	1	0	1	1	0
LH Local Heaters	8	12	12	0	14	14	0	16	16	0
RAC Room Air Conditioner	1	8	8	0	8	8	0	10	10	0
CIRC Circulator pumps <2.5 kW excl. double	1	1	1	0	1	1	0	1	1	0
VU Ventilation Units (res & nonres)	7	15	15	0	20	20	0	27	27	0
LS Light Sources	14	36	36	0	45	45	0	58	58	0
DP electronic DisPlays	1	3	3	0	4	4	0	4	4	0
STB set top boxes (Complex & Simple)	0	0	0	0	0	0	0	0	0	0
VIDEO (Game Consoles)	0	0	0	0	0	0	0	0	0	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0
PC Personal Computers	0	0	0	0	0	0	0	0	0	0
IE imaging equipment	9	50	50	0	76	76	0	71	71	0
SB (networked) Stand-By	0	0	0	0	0	0	0	0	0	0
EPS External Power Supplies excl. double	0	0	0	0	0	0	0	0	0	0
RF Household Refrigerators & freezers	0	0	0	0	0	0	0	0	0	0
Total CF Commercial Refrigeration	9	11	11	0	12	12	0	13	13	0
Total PF Professional Refrigeration (excl.)	0	0	0	0	0	0	0	0	0	0
Total CA Cooking Appliances	0	0	0	0	0	0	0	0	0	0
WM-WD household Washing Machines	3	4	4	0	5	5	0	5	5	0
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0
LD household Laundry Drier	1	2	2	0	2	2	0	2	2	0
VC Vacuum Cleaners	3	5	5	0	7	7	0	10	10	0
FAN Industrial Fans >125W (excl. box/ roof)	3	8	8	0	10	10	0	11	11	0
MT Motors AC, LV, 0.12-1000 kW	5	8	8	0	10	10	0	11	11	0
WP Water pumps	53	73	73	0	85	85	0	96	96	0
WE Welding Equipment	1	1	1	0	1	1	0	1	1	0
TRAFO Utility Transformers	0	0	0	0	0	0	0	0	0	0
TYRE Replacement and OEM Tyres	0	0	0	0	0	0	0	0	0	0
TOTAL in 1000 jobs	**269**	**474**	**474**	**0**	**559**	**559**	**0**	**615**	**611**	**-3**

TOTAL direct jobs by product group (in 1000 jobs)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	81	107	107	0	107	107	0	120	120	0
CHC Central Heating combi, water heat	43	53	53	0	56	58	3	59	73	15
CH Central Heating boiler, space heat	267	334	334	0	319	340	21	341	419	77
SFB Solid Fuel Boilers	23	56	56	0	45	48	3	48	52	4
AHC central Air Cooling	29	140	140	0	201	201	0	257	257	0
AHC central Air Heating (excl. AC rev)	10	7	7	0	6	7	1	5	6	0
LH Local Heaters	122	185	185	0	210	230	20	224	246	23
RAC Room Air Conditioner	5	65	78	13	64	80	16	84	95	11
CIRC Circulator pumps <2.5 kW excl. double	11	18	18	0	17	23	5	14	18	3
VU Ventilation Units (res & nonres)	58	206	206	0	239	250	11	277	287	10
LS Light Sources	91	188	194	6	251	246	-5	224	224	0
DP electronic DisPlays	255	437	437	0	348	348	0	425	425	0
STB set top boxes (Complex & Simple)	0	67	67	0	66	66	0	66	66	0
VIDEO (Game Consoles)	2	52	52	0	52	52	0	52	52	0
ES+DS Enterprise Servers and Data Storage	25	581	581	0	577	577	0	763	763	0
PC Personal Computers	186	1042	1042	0	1192	1192	0	1758	1758	0
IE imaging equipment	84	250	250	0	265	265	0	242	242	0
SB (networked) Stand-By	139	252	252	0	296	296	0	333	333	0
EPS External Power Supplies excl. double	1	22	23	0	23	23	0	24	24	0
RF Household Refrigerators & freezers	91	101	116	15	106	133	27	109	146	37
Total CF Commercial Refrigeration	38	44	44	0	46	46	0	49	50	1
Total PF Professional Refrigeration (excl.)	16	19	19	0	22	23	1	25	25	0
Total CA Cooking Appliances	156	212	212	0	235	254	19	241	256	16
WM-WD household Washing Machines	56	84	99	15	91	109	17	88	97	9
DW Household Dishwashers	21	47	63	16	63	83	19	79	97	18
LD household Laundry Drier	11	17	19	2	28	42	14	28	46	18
VC Vacuum Cleaners	35	63	63	0	85	88	3	109	110	1
FAN Industrial Fans >125W (excl. box/ roof)	16	47	47	0	59	77	18	63	77	14
MT Motors AC, LV, 0.12-1000 kW	32	65	65	0	75	90	14	81	99	18
WP Water pumps	92	126	126	0	148	148	0	167	167	0
WE Welding Equipment	7	8	8	0	8	8	0	8	8	0
TRAFO Utility Transformers	43	72	72	0	88	99	11	112	129	16
TYRE Replacement and OEM Tyres	293	377	385	9	488	592	104	626	765	139
TOTAL in 1000 jobs	**2340**	**5346**	**5421**	**75**	**5875**	**6198**	**323**	**7102**	**7533**	**433**

TOTAL direct jobs by functional group (in 1000 jobs)

	1990	2010			2020			2030		
Functional group	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	124	160	160	0	162	165	3	179	193	15
SPACE HEATING (excl. reversible AC)	435	633	640	6	629	687	58	675	788	113
SPACE COOLING	32	172	179	6	233	241	8	299	305	5
VENTILATION	58	206	206	0	239	250	11	277	287	10
LIGHTING	91	188	194	6	251	246	-5	224	224	0
ELECTRONICS	693	2703	2703	0	2818	2819	0	3663	3663	0
FOOD PRESERVATION	144	164	179	15	174	202	28	183	221	38
COOKING	156	212	212	0	235	254	19	241	256	16
CLEANING	123	212	244	32	267	321	54	304	351	47
INDUSTRY COMPONENTS	147	245	246	0	290	323	33	319	351	32
ENERGY SECTOR	43	72	72	0	88	99	11	112	129	16
TRANSPORT SECTOR	293	377	385	9	488	592	104	626	765	139
TOTAL in 1000 jobs	**2340**	**5346**	**5421**	**75**	**5875**	**6198**	**323**	**7102**	**7533**	**433**

TOTAL direct jobs by sector (in 1000 jobs)

	1990	2010			2020			2030		
Sector	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry (incl. OEM & business services)	1269	3173	3215	42	3482	3690	207	4223	4484	261
Wholesale	53	108	109	2	122	128	6	139	149	10
Retail	570	1259	1287	27	1363	1449	86	1737	1847	110
Installation	180	331	335	4	349	372	23	388	443	54
Maintenance	269	474	474	0	559	559	0	615	611	-3
TOTAL in 1000 jobs	**2340**	**5346**	**5421**	**75**	**5875**	**6198**	**323**	**7102**	**7533**	**433**

ANNEX H: References

Commission Regulations (Ecodesign)

COMMISSION REGULATION (EC) No 1275/2008 of 17 December 2008 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for standby and off mode electric power consumption of electrical and electronic household and office equipment, OJ L 339, 18.12.2008, p.45

COMMISSION REGULATION (EC) No 107/2009 of 4 February 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for simple set-top boxes, OJ L 36, 5.2.2009, p.8

COMMISSION REGULATION (EC) No 244/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for non-directional household lamps, OJ L 76, 24.3.2009, p.3

COMMISSION REGULATION (EC) No 245/2009 of 18 March 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, and repealing Directive 2000/55/EC of the European Parliament and of the Council, OJ L 76, 24.3.2009, p.17

COMMISSION REGULATION (EC) No 278/2009 of 6 April 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for no-load condition electric power consumption and average active efficiency of external power supplies, OJ L 93, 7.4.2009, p.3

COMMISSION REGULATION (EC) No 640/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for electric motors, OJ L 191, 23.7.2009, p.26

COMMISSION REGULATION (EC) No 641/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products, OJ L 191, 23.7.2009, p.35

COMMISSION REGULATION (EC) No 642/2009 of 22 July 2009 implementing Directive 2005/32/EC of the European Parliament and of the Council with regard to ecodesign requirements for televisions, OJ L 191, 23.7.2009, p.42

COMMISSION REGULATION (EC) No 859/2009 of 18 September 2009 amending Regulation (EC) No 244/2009 as regards the ecodesign requirements on ultraviolet radiation of non-directional household lamps, OJ L 247, 19.9.2009, p.3

COMMISSION REGULATION (EU) No 347/2010 of 21 April 2010 amending Commission Regulation (EC) No 245/2009 as regards the ecodesign requirements for fluorescent lamps without integrated ballast, for high intensity discharge lamps, and for ballasts and luminaires able to operate such lamps, OJ L 104, 24.4.2010, p.20

COMMISSION REGULATION (EU) No 1015/2010 of 10 November 2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household washing machines, OJ L 293, 11.11.2010, p.21

COMMISSION REGULATION (EU) No 1016/2010 of 10 November 2010 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household dishwashers, OJ L 293, 11.11.2010, p.31

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Part 3 : Special Report Materials

European Commission

Ecodesign Impact Accounting

SPECIAL REPORT MATERIALS
2021

Material content of regulated energy-related products

Prepared by
VHK for the European Commission
May 2022

Energy

Ecodesign Impact Accounting

Special report 2021,

Material content of regulated energy-related products

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SPECIFIC CONTRACT No ENER/C3/FV 2018-445/06/FWC 2016-542/06/SI2.805274

Acronyms

ABS	Acrylonitrile butadiene styrene
AC	Air-Cooled (refrigeration)
AC	Air Conditioning (electric)
ACF	Air Conditioning, Fossil fuel fired
AHC	Air Heating & Cooling equipment
AHE	Air Heaters, Electric
AHF	Air Heaters, Fossil fuel fired
Al	Aluminium
BAU	Business as usual (scenario)
BC	Base Case
BoM	Bill of Materials
C1	Tyres designed primarily for vehicles of cat. M1, N1, O1 and O2 ('passenger cars')
C2	Tyres designed primarily for vehicles of cat. M2, M3, N, O3 and O4 with a load capacity index in single formation ≤ 121 and the speed category symbol ≥'N' ('vans')
C3	Tyres designed primarily for vehicles of categories M2, M3, N, O3, O4 with specific load capacity indices ('trucks', 'busses')
CEXH	Central exhaust VU
CF	Commercial refrigeration (Refrigeration appliances with a direct sales function)
CFL	Compact fluorescent light source
CH	Central heating
CHAE-L	Chiller, Air-cooled, Electric, Large
CHAE-S	Chiller, Air-cooled, Electric, Small
CHB	Central heating boiler
CHC	Central heating combi
CHF	Chiller combustion engine driven
CHWE-L	Chiller, Water-cooled, Electric, Large
CHWE-M	Chiller, Water-cooled, Electric, Medium
CHWE-S	Chiller, Water-cooled, Electric, Small
CIRC	Circulator
CK	Cooking appliances
CM	Coffee maker
CR	Commission Regulation
CRT	Cathode-ray tube (display)
CSTB	Complex set-up box
CU	Condensing Unit
Cu	Copper
DP	Electronic Display
DS	Data Storage product
DW	Dishwasher
DWH	Dedicated Water Heater
EC	European Commission
ECO	Ecodesign (scenario)
ED	Ecodesign
EIA	Ecodesign Impact Accounting
EPS	External Power Supply
EPS	Extended polystyrene
ErP	Energy-related Product
ES	Enterprise Servers
ESCC	End-Suction Close-Coupled (water pump)
ESCCi	End-Suction Close-Coupled in-line (pump)
ESDS	Servers and Data Storage products
ESOB	End-Suction Own Bearing (water pump)
FAN	Industrial fans
GC	Game consoles
GHG	Greenhouse gas emissions
GLS	General lighting service ('incandescent')
HDPE	High-density polyethylene
hh	household
HID	High intensity discharge lamp
HI-PS	High-impact polystyrene
HT PC	High Temperature Process Chiller
IC	Integrated Circuit
IE	Imaging equipment
LCD	Liquid crystal display
LD	Laundry dryer
LDPE	Low-density polyethylene
LLDPE	Linear low-density polyethylene
LED	Light emitting diode
LFL	linear fluorescent lamps
LH	Local Space Heaters
LS	Light source
LSH	Local Space Heater
m, mln	million
MEErP	Methodology for the Ecodesign of Energy-related products
MEEuP	Methodology for the Ecodesign of Energy-using products
Mg	Magnesium
MSSB	Multi-stage Submersible Borehole (pump)
MS-V	Multi-Stage Vertical (water pump)
MT	Electrical motors
Mt, Mton	Mega tonnes (10^9 kg)
NAS	Network attached storage
NRVU	Non-residential VU
PA(6)	Polyamide (e.g. nylon)
PC	Polycarbonate
PC	Personal computer
PE	Polyethylene
PET	polyethylene terephthalate (polyester)
PF	Professional refrigeration products
PMMA	Polymethyl methacrylate (acrylic glass)
PP	Polypropylene
PS	Polystyrene
PUR	Polyurethane
PVC	Polyvinyl chloride
PWB	Printed wiring board
RAC	Room air conditioner
RCU	Remote condensing unit
RF	Household refrigerators and freezers
RVU	Residential VU
SAN	Styrene Acrylonitrile resin
SB	Products regulated for Standby

SC	Space Cooling
SFB	Solid fuel boilers
SH	Space Heating
SHR	Slow Heat Release stoves
SMD	Surface mounted device
SSTB	Simple set-up box
St	Steel
STB	Set-up box
TRAFO	Distribution transformer
TYRE	Tyres
VC	Vacuum cleaner
VSD	Variable Speed Drive
VU	Ventilation unit
WE	Welding Equipment
WH	Water heater or Water Heating
WM	Washing machine
WP	Water pump
Zn	Zinc

Executive Summary

As part of the *European Green Deal* [1] and with the European Climate Law [2], the EU has set itself a binding target of achieving climate neutrality by 2050. As an intermediate step, the EU has raised its 2030 climate ambition, committing to cutting GHG-emissions by at least 55% below 1990 level in 2030 (cf. *'Fit for 55'* package). The newly proposed 2030 target for energy efficiency [3], following the *'energy efficiency first'* principle, entails a reduction of 9% with respect to the projections for 2030 according to the EU Reference scenario 2020 [4].

Another priority in the European Green Deal is given by the Commission's 2020 *Circular Economy Action Plan* [5] (CEAP) calling for circularity with requirements regarding inter alia durability, reusability, upgradability, reparability, fighting single use and premature obsolescence as well as promoting recycled content, high-quality recycling and remanufacturing. Also, digitalisation of product information (digital passports, tagging and watermarks), 'product-as-a-service' or other models are being mentioned.

In this political context, it is important to monitor the implementation and performance of legislation relating to the energy and climate goals, and to assess related impacts in real time.

As regards energy consumption during product use and related emissions, this monitoring is performed in the Ecodesign Impact Accounting (EIA), see the EIA2021 Overview Report and Status Report. Circularity aspects and material resource efficiency are currently not covered in the EIA.

Analysis of the consumption of (non-energy) material resources is a mandatory part of ecodesign studies, following the methodologies for those studies: first MEEuP 2005 [6] and later MEErP 2011 [7]. The 'Ecoreport' Excel tool, part of the MEErP 2011, prescribes a strict format for quantitative material data that has been followed in almost all studies.

Based on the Bills of Materials (BoMs) and other EcoReport inputs reported in the ecodesign studies, in 2016 a 'Special Report Material Inputs for Production' and an 'EcoReport for the average EIA product' were published in EIA context [8]. These reports provide insight in the non-energy resources (material resources) associated with regulated energy-related products (ErP, as accounted in the EIA), and in the energy use and emissions for the production, distribution, and end-of-life phases (the non-use phases) of these products.

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[1] The European Green Deal, COM (2019) 640 final

[2] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), OJ L 243, 9.7.2021, p. 1–17.

[3] Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652.

[4] Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast), COM (2021) 558 final, Brussels, 14.7.2021. Note that 9% reduction with respect of the projection for 2030 according to the Reference Scenario 2020 a reduction of 36% for final and 39% for primary energy consumption respectively when compared to the 2007 Reference Scenario projections for 2030.

[5] A new Circular Economy Action Plan for a cleaner and more competitive Europe. COM/2020/98 final, Brussels.

[6] Kemna, R., Methodology for Ecodesign of Energy-using Products (MEEuP), VHK for the Commission, Nov. 2015.

[7] Kemna, R., Methodology for Ecodesign of Energy-related Products (MEErP), VHK for the Commission, 2011.

[8] Ecodesign Impact Accounting, 'Special Report Material Inputs for Production', and 'EcoReport for the average EIA product', VHK for the European Commission, December 2016, https://www.vhk.nl/research/eia.htm

These 2016 reports were a one-time exercise, performed separately from the main accounting of energy and emissions. A full integration of material resource efficiency data in EIA is not straightforward, inter alia because a clear methodology on how this should be done is lacking, and because material data are currently not available as a time-series. The ongoing revision of the MEErP and of the associated EcoReport tool [9] is expected to clarify these methodology aspects, and to update the reference environmental impact data.

In preparation of future work in EIA, the current document updates the 2016 'Special Report Material Inputs for Production', providing an estimate for the material content of regulated energy-related products listed in the EIA for the year 2020, and putting this content in an overall EU perspective.

This analysis is a harmonised compilation of Bills of Materials (BoMs) over a 16-year time period (2005-2021) performed by different contractors and with varying level of quality. VHK has tried to use the most reliable and recent BoMs especially for dynamic sectors, such as electronics, but can assume no liability for the information in this report or the use thereof. Nonetheless, the strong point of this analysis is an unprecedented level of detail across a very large part of the whole range of energy-related products and, with all its possible flaws, constitutes the most comprehensive inventory of the material contents of ErP in the EU.

After introductory chapters 1 and 2, explaining background and methodology, the material content of regulated energy-related products (ErP) sold in 2020 is calculated in Chapter 3. The material contained in products in use (stock) in 2020 is presented in Chapter 4. Chapter 5 gives a more detailed view of the specific materials involved and discusses their main uses. Chapter 6 compares the material content of ErP sold in 2020 with the total EU27 consumption of plastics, metals, glass, cardboard, paper and rubber.

The main conclusions are:

- The total mass of regulated energy-related products sold in EU27 in 2020 is 15.8 Mton (Table 1), of which 12.2 Mton of plastics, metals, glass, cardboard, paper and rubber. This is 4.1% of the total EU27 consumption of these materials in 2020 (297 Mton).
- The main consumers (Figure 1) are tyres (3960 kton; 25%), local space heaters (1394 kton; 9%), household refrigerators and freezers (1119 kton; 7%) and electric motors (1008 kton; 6%).
- Of the total mass (Figure 2), 41% (6500 kton) are ferrous metals (steel sheets and profiles, cast iron) and 33% (5265 kton) miscellaneous materials. The latter include natural and synthetic rubber and fillers for rubber (tyres), refractory ceramics (slow heat release stoves), glass, concrete, refrigerants, mineral oil (transformers), and others. Plastics cover 10% of the mass (1622 kton, 6% bulk plastics, 4% tec plastics), non-ferrous metals 8% (1296 kton, approximately half aluminum and half copper) and 4% (687 kton) is packaging. Electronics represent 2.2% of the mass (340 kton).
- The total mass of regulated energy-related products in use in EU27 in 2020 (stock) is 177 Mton.

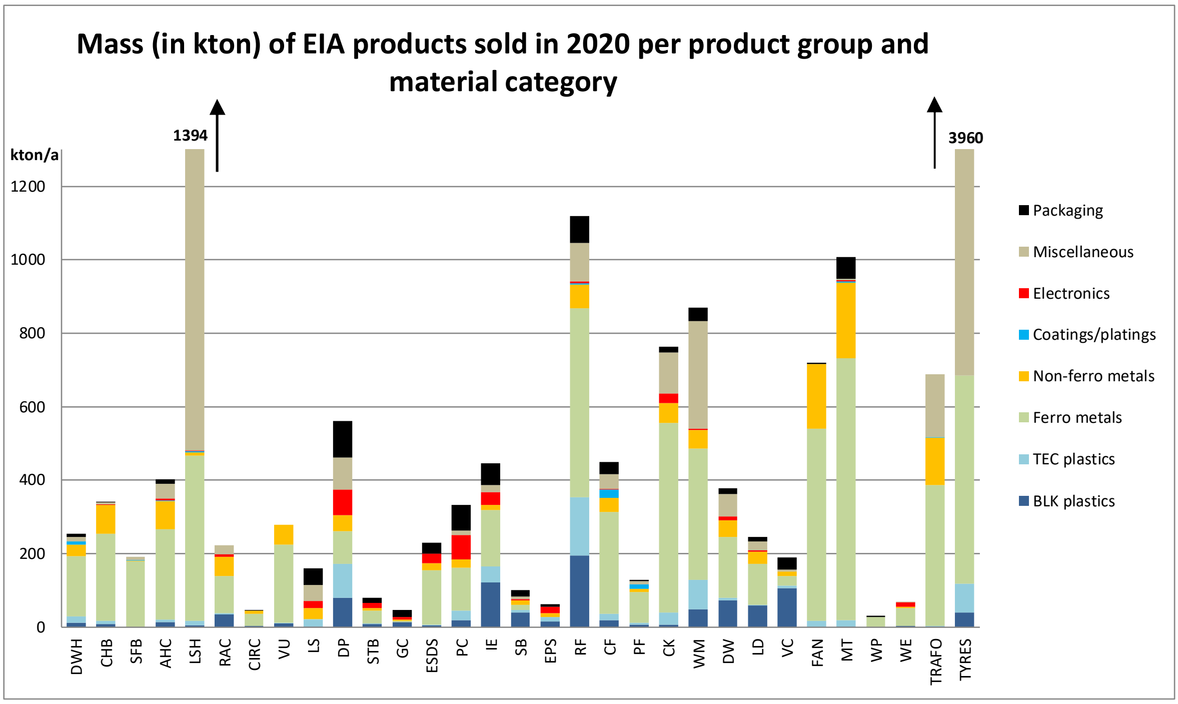
[9] Methodology for the Ecodesign of Energy-related Products, MEErP revision, https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/521/home

This study is not intended as a priority listing for circular economy policy measures. This analysis is an important part of the puzzle, but for proper decision support a comprehensive assessment is needed. For instance, there can be negative trade-offs between longevity and safety (e.g. for tyres) and between longevity and energy consumption. Longevity of products slows down the introduction of more energy efficient new products, which is important for products where there is still a large energy saving potential (refrigerators, electronic displays). Also recycling plays a role, e.g. cooking appliances have a relatively high materials input, but most of these materials are metals and easy to recycle. Furthermore, this special report uses 'mass' as a parameter, but in a more comprehensive assessment all environmental impact categories of the EcoReport (energy, carbon emissions, acidifying emissions, etc.) have to be considered in all phases of the product life cycle. Last but not least, the current analysis makes an inventory of the materials that end up in the final product. It does not take into account production waste, which may add some 10-15% (after primary scrap recycling). The resources consumption during use (part of the main EIA analysis) is not integrated here. Additional information on non-energy consumables can be found in the 'EcoReport for the average EIA product' [10].

Table 1 : EU27 total consumption of plastics, metals, glass, cardboard/paper and rubber in 2020 compared to the materials contained in regulated Energy-related products sold in 2020

Materials consumption, comparison overview	**EU27 Total kton**	**Regulated ErP (EIA) kton**	**EIA/EU**
Bulk plastics	36097	1073	3.0%
TEC plastics	9545	676	7.1%
Ferrous metals	140966	6500	4.6%
Non-ferrous metals	13966	1296	9.3%
Misc., glass	29815	395	1.3%
Misc., paper & cardboard	64000	527	0.8%
Misc., rubber	2980	1772	59%
Total	**297369**	**12239**	**4.1%**
Coatings		59	
Electronics		340	
Other miscellaneous		3064	
Other packaging		65	
Total		**15767**	

[10] 'EcoReport for the average EIA product', VHK for the European Commission, December 2016, https://www.vhk.nl/research/eia.htm



DWH	Dedicated Water Heater	**EPS**	External Power Supplies
CHB	Central Heating Boiler or Combi	**RF**	Household Refrigeration
SFB	Solid Fuel Boilers	**CF**	Commercial Refrigeration [11]
AHC	Central Air Heating & Cooling	**PF**	Professional Refrigeration
LSH	Local Space Heaters	**CK**	Cooking Appliances
RAC	Room Air Conditioner	**WM**	household Washing Machines
CIRC	Circulator pumps <2.5 kW	**DW**	household Dishwashers
VU	Ventilation Units	**LD**	household Laundry Dryer
LS	Light Sources	**VC**	Vacuum Cleaners
DP	electronic DisPlays	**FAN**	Industrial Fans >125W
STB	Set Top Boxes	**MT**	Motors 0.12-1000 kW
GC	Game Consoles	**WP**	Water pumps
ESDS	Enterprise Servers & Data Storage	**WE**	Welding Equipment
PC	Personal Computers	**TRAFO**	Utility Transformers
IE	Imaging Equipment	**TYRE**	Tyres
SB	Products regulated for Standby		

Figure 1. Total mass of regulated Energy-related products sold in EU27 in 2020, per product type (in kton)

[11] Refrigerating appliances with a direct sales function

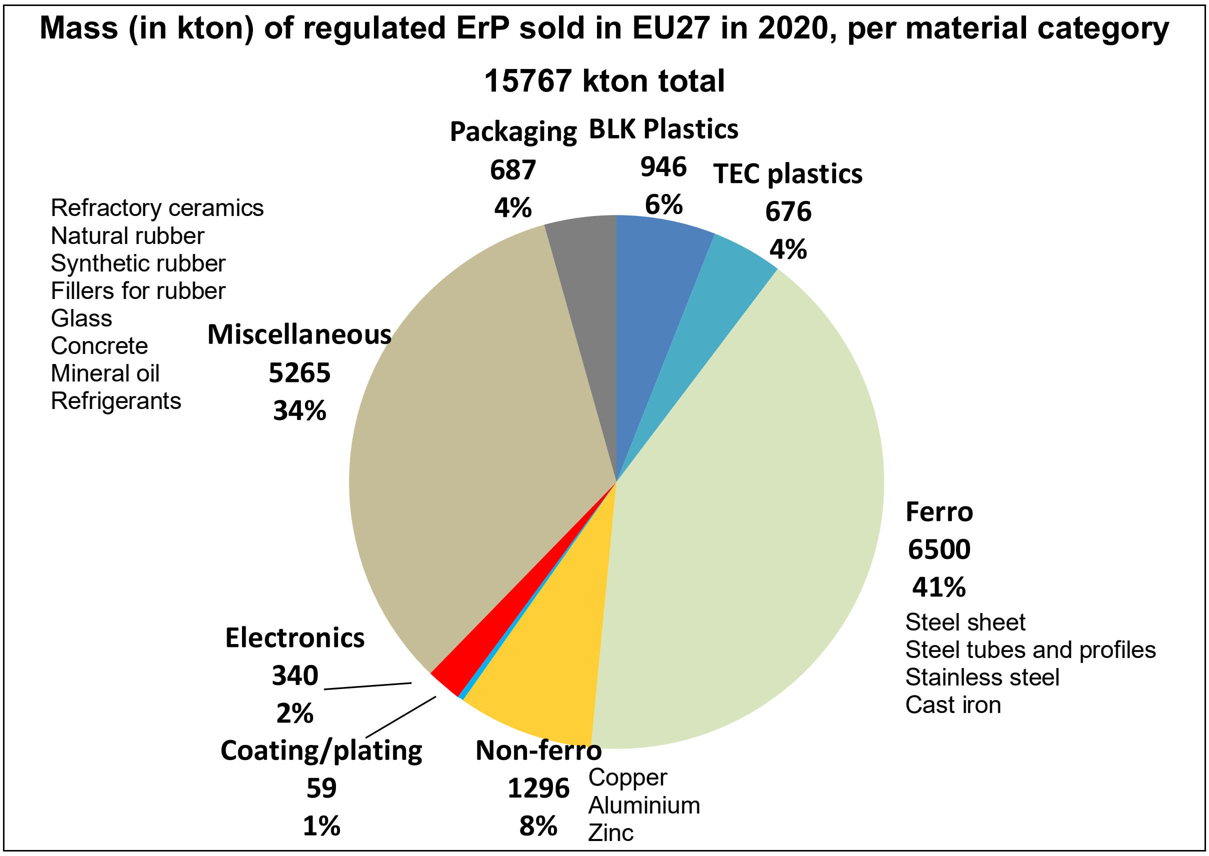


Figure 2. Material content per category in regulated Energy-related products sold in 2020 (in kton)

Table of Contents

1. Introduction

As part of the *European Green Deal* [12] and with the European Climate Law [13], the EU has set itself a binding target of achieving climate neutrality by 2050. As an intermediate step, the EU has raised its 2030 climate ambition, committing to cutting GHG-emissions by at least 55% below 1990 level in 2030 (cf. *'Fit for 55'* package). The newly proposed 2030 target for energy efficiency [14], following the *'energy efficiency first'* (EE1st) principle, entails a reduction of 9% with respect to the projections for 2030 according to the EU Reference scenario 2020 [15].

Another priority in the European Green Deal is given by the Commission's 2020 *Circular Economy Action Plan* [16] (CEAP) calling for circularity with requirements regarding inter alia durability, reusability, upgradability, reparability, fighting single use and premature obsolescence as well as promoting recycled content, high-quality recycling and remanufacturing. Also, digitalisation of product information (digital passports, tagging and watermarks), 'product-as-a-service' or other models are being mentioned.

In this political context, it is important to monitor the implementation and performance of legislation relating to the energy and climate goals, and to assess related impacts in real time.

As regards energy consumption during product use and related emissions, this monitoring is performed in the Ecodesign Impact Accounting (EIA), see the separate EIA2021 Overview Report and Status Report. Circularity aspects and material resource efficiency are currently not covered in the EIA. This is a drawback because several recent ecodesign regulations [17] have resource efficiency requirements and several recent

[12] The European Green Deal, COM (2019) 640 final

[13] Regulation (EU) 2021/1119 of the European Parliament and of the Council of 30 June 2021 establishing the framework for achieving climate neutrality and amending Regulations (EC) No 401/2009 and (EU) 2018/1999 ('European Climate Law'), OJ L 243, 9.7.2021, p. 1–17.

[14] Directive of the European Parliament and of the Council amending Directive (EU) 2018/2001 of the European Parliament and of the Council, Regulation (EU) 2018/1999 of the European Parliament and of the Council and Directive 98/70/EC of the European Parliament and of the Council as regards the promotion of energy from renewable sources and repealing Council Directive (EU) 2015/652.

[15] Proposal for a Directive of the European Parliament and of the Council on energy efficiency (recast), COM (2021) 558 final, Brussels, 14.7.2021. Note that 9% reduction with respect of the projection for 2030 according to the Reference Scenario 2020 a reduction of 36% for final and 39% for primary energy consumption respectively when compared to the 2007 Reference Scenario projections for 2030.

[16] A new Circular Economy Action Plan for a cleaner and more competitive Europe. COM/2020/98 final, Brussels.

[17] The following listing is not intended to be exhaustive:

CR (EU) 2019/2023 for household washing machines and washer-dryers, Annex II.8: availability of spare parts, maximum delivery time of spare parts, access to repair and maintenance information, information on refrigerant gases, requirements for dismantling for material recovery and recycling while avoiding pollution.

CR (EU) 2019/2022 for household dishwashers, Annex II.5: availability of spare parts, maximum delivery time of spare parts, access to repair and maintenance information, information on refrigerant gases, requirements for dismantling for material recovery and recycling while avoiding pollution.

CR (EU) 2019/2019 for refrigerating appliances, Annex II.3: availability of spare parts, maximum delivery time of spare parts, access to repair and maintenance information, requirements for dismantling for material recovery and recycling while avoiding pollution.

CR (EU) 2019/2024 for refrigerating appliances with a direct sales function, Annex II.2: availability of spare parts, maximum delivery time of spare parts, access to repair and maintenance information, requirements for dismantling for material recovery and recycling while avoiding pollution.

CR (EU) 2019/1784 for welding equipment, Annex II.2: availability of spare parts

CR (EU) 2019/2020 for light sources and separate control gears, Article 4: promotes replaceability of light sources and separate control gears (with commonly available tools; user information on replaceability) and requires dismantling of light sources and separate control gears from containing products at end-of-life.

(review) studies propose such requirements and estimate their impacts [18]. It would thus be opportune to include also the impacts of existing resource efficiency measures in the accounting (as far as feasible).

Analysis of the consumption of (non-energy) material resources is a mandatory part of every preparatory Ecodesign study for Energy-related Products (ErPs) since 2005, following the methodologies for preparatory studies: first MEEuP 2005 [19] and later MEErP 2011 [20]. The 'Ecoreport' Excel tool, part of the MEErP 2011, prescribes a strict format for quantitative material data that has been followed in almost all studies.

Based on the Bills of Materials (BoMs) and other EcoReport inputs reported in the ecodesign preparatory studies, in 2016 a 'Special Report Material Inputs for Production' and an 'EcoReport for the average EIA product' were published in EIA context [21]. These reports provide insight in the non-energy resources (material resources) associated with the products accounted in EIA, and in the energy use and emissions for the production, distribution, and end-of-life phases (the non-use phases).

This was a one-time exercise, performed separately from the main accounting of energy and emissions. A full integration of material resource efficiency data in EIA is not straightforward, inter alia because a clear methodology on how this should be done is lacking, and because material data are not available as a time-series. The ongoing revision of the MEErP and the associated EcoReport tool [22] is expected to clarify these methodology aspects, and to update the reference data.

CR (EU) 2019/2021 for electronic displays, Annex II.D: design for dismantling, recycling and recovery, marking of plastic components, cadmium logo, halogenated flame retardants not allowed, availability of spare parts, maximum delivery time of spare parts, access to repair and maintenance information.

CR (EU) 2019/424 for servers and data storage products, Annex II.1.2: joining, fastening or sealing techniques shall not prevent the disassembly for repair or reuse purposes, functionality for secure data deletion, firmware availability.

Industry Voluntary Agreement to improve the environmental performance of imaging equipment placed on the european market, [Version 3] Draft FY20 v. 5 April 2021, chapter 7: availability N-up printing, design for recycling, design for dismantling for recycling and recovery, availability of spare parts and service information and critical software updates, availability of software and firmware updates, polymer composition, recycled plastic content.

Energy Efficiency of Games Consoles, Self-Regulatory Initiative to further improve the energy efficiency of Games Consoles, Version 3.0 – March 2020, Sony Interactive Entertainment Inc., Microsoft Corporation, Nintendo Co., Ltd., section 3.2 Non-energy Efficiency Commitments, Resource Efficiency and end-of-life design/treatment Requirements

[18] The following listing is not intended to be exhaustive:

Review study on Circulators, Final report, Viegand Maagøe A/S, April 2018, chapter 6 Review of designs for Recoverability, Recyclability and Reusability (RRR).

Review study on household tumble driers, Final report, Viegand Maagøe A/S, June 2019, sections 6.1.9-6.1.11: reduced use of virgin materials and environmental impacts by displaying content of recycled plastics of drier to the consumers; increased durability and reparability of tumble driers by easy access of critical parts by professionals and ensuring availability of spare parts; increased dismantling and recyclability at End-of-Life by a modular design which enhances recovery of critical materials, plastics and metals.

Review study on Local Space Heaters, Final Report, Viegand Maagøe and Danish Technical Institute, May 2019, section 6.7 Resource efficiency options.

Preparatory study on the Review of Regulation 617/2013 (Lot 3) Computers and Computer Servers, Task 7 report Policy measures and scenario analyses, Final version, Viegand Maagøe and VITO, July 2018, section 7.6: Proposed resource efficiency policy measures.

Review of Regulation 206/2012 and 626/2011 Air conditioners and comfort fans, Task 6 report DESIGN OPTIONS, Final version, Viegand Maagøe and ARMINES, May 2018, section 6.2.2 Environmental improvement assessment: interaction between energy saving options and material content of products (more copper and electronics; replacement of copper by aluminium).

[19] Kemna, R., Methodology for Ecodesign of Energy-using Products (MEEuP), VHK for the Commission, Nov. 2015.

[20] Kemna, R., Methodology for Ecodesign of Energy-related Products (MEErP), VHK for the Commission, 2011.

[21] Ecodesign Impact Accounting, 'Special Report Material Inputs for Production', and 'EcoReport for the average EIA product', VHK for the European Commission, December 2016, https://www.vhk.nl/research/eia.htm

[22] Methodology for the Ecodesign of Energy-related Products, MEErP revision, https://susproc.jrc.ec.europa.eu/product-bureau/product-groups/521/home

In preparation of future work in EIA, the current document updates the 2016 'Special Report Material Inputs for Production', providing an estimate for the material content of products listed in the EIA for year 2020. Awaiting the revision of the EcoReport tool, the 2016 'EcoReport for the average EIA product' has not yet been updated.

This analysis is a harmonised compilation of Bills of Materials (BoMs) over a 16-year time period (2005-2021) performed by different contractors and with varying level of quality. VHK has tried to use the most reliable and recent BoMs especially for dynamic sectors, such as electronics, but can assume no liability for the information in this report or the use thereof. Nonetheless, the strong point of this analysis is an unprecedented level of detail across a very large part of the whole range of energy-related products and, with all its possible flaws, constitutes the most comprehensive inventory of material inputs in ErP in the EU.

2. Methodology

2.1. Material categories and types

All Bills of Materials (BoMs) used as input to EcoReports in ecodesign preparatory and review studies up to year 2021 have been collected in a dedicated Excel file and elaborated and harmonised. The EcoReport subdivides the materials in 7 categories:

- Bulk Plastics
- Technical Plastics
- Ferrous metals
- Non-ferrous metals
- Coating / plating
- Electronics
- Miscellaneous

Within each category there are various material types. For the present analysis, an additional material category '**packaging**' has been added, and the EcoReport material types have been slightly extended, in particular in the 'miscellaneous' category. The resulting list is presented in Annex A.

<u>Remarks on material categories and types:</u>

- The list of material types in the EcoReport is necessarily limited. This implies that ecodesign studies may be faced with the problem that one or more of the materials in the studied product are not available in the EcoReport. In this case a 'proxy' is typically selected, i.e. the material type in the EcoReport that comes closest to the material used in the product (in terms of environmental impacts).
- The quality and level of detail of the BoMs in the ecodesign studies varies. Where a full EcoReport file was available, the processing of the BoMs usually did not pose problems, but in several studies only the total material masses per category are reported, without a further split in material types. In these cases the study team sometimes had to make assumptions for the material types.
- In the EcoReport, packaging materials are mixed with product materials, and it is not always clear if an entry in the BoM refers to packaging or not. Not all studies did take packaging into account, meaning that the totals for packaging presented in this study may be underestimated.

  The 2016 analysis handled packaging a posteriori, assuming that all cardboard, paper, LDPE and EPS was packaging. This is not entirely true. The 2021 analysis attempted to separate packaging right from the start. This means that LDPE and EPS can be product materials listed under plastics or packaging materials listed under packaging. In the same way, cardboard and paper can be product materials listed under miscellaneous or packaging materials listed under packaging.

Wood (e.g. for transport pallets) has been accounted under cardboard.

Paper for documentation and manuals is accounted under packaging.

- Refrigerant masses are part of the BoMs and accounted under 'miscellaneous'. Where BoMs did not specify refrigerants, the quantities have been taken from EIA2018 (which still had these data).
- Consumables (paper, ink/toner, detergents, water, vacuum cleaner bags and filters, shielding gas and electrodes/fillers for welding) are not included in the BoMs [23].
- The EcoReport has a special material type 'mercury', which is not part of one of the 7 material categories. In the current analysis, mercury appears only on the BoM for light sources, with a (relatively low) total weight of 843 kg in products sold in 2020. Mercury is not further being reported in this analysis.

2.2. Match between BoMs and EIA products

The BoMs from the ecodesign studies are intended to be for representative reference products (called base cases in the MEErP), but unfortunately there is not a one-to-one match between these BoMs and the base case products listed in the EIA.

The EIA2016 analysis took as reference the available BoMs and then attempted to link the EIA sales and stocks to these BoMs to derive total material masses for products sold or used (stock) in a given year.

The EIA2021 analysis reverses this, trying to derive BoMs for all base cases that are listed in the EIA Master file, and for which sales and stock are readily available. This is a first step towards a further integration of material resources in EIA. The derivation of the BoMs for EIA products from the available BoMs in the studies sometimes involves interpretations and assumptions, but where reasonably possible, it has been preferred to use these estimates over leaving the material masses zero. The sources for the BoMs and remarks on their elaboration can be found in Annex B. More detailed information is in the dedicated EIA Materials Excel file.

For in total 13 products listed in the EIA, no BoM was available or could be derived. These products are marked in red in Annex C and include fuel-fired chillers, fuel-fired air conditioners, electric central air heaters, signage displays and several of the products regulated only for standby. These products represent approximately 10% of the overall sales of EIA products in 2020, but it regards mainly small products (e.g. small appliances regulated for standby), so their (unknown) share of total material weight would be far less than 10%.

For in total 43 products listed in the EIA, a BoM has been derived in this study. These products are marked in green in Annex C and include e.g. gas-fired jet burners, several chillers and process chillers, some of the LED light source types, game consoles < 20W, most of the server base cases, some of the personal computer base cases, laser copiers, explosion motors, brake motors, 8-pole motors and 1-phase motors > 0.75 kW. These products represent approximately 3% of the overall sales of EIA products in 2020, and 4% of the total mass of products sold in 2020.

[23] Information on consumables can be found in Annex A, sheet Resources, of the EIA 2021 Status Report.

2.3. Time-aspects of BoMs

Different from the information on energy and emissions in the main EIA, for material data there are no time series. The Bills of Materials can typically be retained representative for the year in which they were made, which varies from 2005 to 2021, see Annex C.

Ecodesign review studies sometimes present new BoMs which can then be compared with BoMs from the original preparatory studies, but such a comparison is often not straightforward. The new BoMs can be for products with different capacities and features than the products of the old BoMs.

In addition, many review studies tend to use the original BoMs, maybe revisiting and re-elaborating them. For some EIA products, the same was done in this study, see previous paragraph. This means that BoMs tend to evolve over time, but essentially they are still valid for one year (or anyway for a limited period), without a time-series of data.

For some products particularly in the electronics sector, there is a continuous development aimed at weight reduction. For instance, over the last 10-15 years the weight of televisions of the same screen size has decreased by over 80% (e.g. from 60 to 9 kg for a 32" screen). Other products have grown heavier because of increase in size (+10% over the last years for refrigerators and washing machines) and/or energy efficiency (e.g. more insulation of refrigerators, more copper in motors, etc.). This study has taken great care to use the most recent BoMs especially for the above mentioned products where changes are expected. Nonetheless, the data presented here will have an uncertainty—at aggregate level—of roughly ±10%.

The current analysis assumes that the BoMs are representative both for products sold in 2020 and for products in use (stock) in 2020, which are a mix of newer and older products. The unit product BoMs (see Annex D) are multiplied by respectively the 2020 sales and the 2020 stock, taken directly from the EIA2021 update, to compute total material masses for EIA products in EU27.

2.4. Double counting

Some product groups are listed twice in EIA, for different functionalities, but material inputs for these products should be counted only once:

- central heating combis: this study lists material inputs for the space heating function, ignoring the water heating function;
- reversible air-conditioners: this study lists material inputs for the cooling function, ignoring the space heating function;
- products regulated both for active mode and standby mode: this study lists material inputs for the main product function, ignoring the EIA entries for standby of the same products.

This is also clarified in the product listing in Annex C.

Some products groups in EIA are not only sold and used as an independent product, but can also be sold integrated as a component in other regulated products. This implies that, similar to the double counting of energy in EIA, there could be an issue of double counting of material inputs. E.g. the material inputs for condensing units could be double counted in other refrigeration products, those for motors could be double counted in pumps or fans, fans could be double counted with ventilation units and air conditioners.

The double counting factor for material inputs is not necessarily the same as the double counting for energy that is applied in the main EIA Master file (see the EIA2021 Status Report, section 2.7). It depends on the components that have been taken into account when compiling the BoMs of the higher-level products, and this is not always evident. E.g. it is not clear if circulators are included in the BoMs for central heating boilers, or if external power supplies are included in the BoMs for the main products for which they are used.

The current analysis does not consider double counting factors. The impression from examining the various BoMs is that no large error is made by this, but the EU27 totals presented could be slightly overestimated due to this. The double counting issue requires further study in future.

2.5. Excel file

A dedicated EIA Materials Excel file has been created. The contents of this file is summarized below:

- For each product group the file has a separate sheet which collects the various BoMs and other reference information. Elaborations to derive new BoMs, e.g. through scaling or weighted-averaging are also made here. Rows near the top of the sheet contain the final BoMs for the relevant EIA base cases, in a fixed format that is the same on all product sheets, and with reference to information elsewhere on the sheet, so that all numbers in the BoMs are traceable.
- The sheet MAT_UNIT collects the BoMs from the product-specific sheets, for all EIA base cases. Data on this sheet are linked to those on the product-specific sheets. The contents of this sheet is presented in Annex D of this report.
- The sheet MAT_SALES multiplies the unit BoMs (from MAT_UNIT) by the sales (from EIA2021). A drop-down menu allows to choose the year for the sales, and the BAU or ECO sales [24]. The sheet provides EU27 totals for all EIA base case products, per material type and per material category. There is also a data summary for the 31 product groups.
- The sheet MAT_STOCK multiplies the unit BoMs (from MAT_UNIT) by the stock (from EIA2021). A drop-down menu allows to choose the year for the stock, and the BAU or ECO stock [24]. The sheet provides EU27 totals for all EIA base case products, per material type and per material category. There is also a data summary for the 31 product groups.
- Sheets SALESBAU, SALESECO, STOCKBAU and STOCKECO contain a copy of the EIA2021 sales and stocks, for 1990, and for 2010 to 2050 in 5-year intervals.
- Sheet GRAPHS collects the graphs used in this report.
- Sheet EU collects information on the EU27 total consumption of plastics, metals, glass, paper and cardboard, and rubber, for comparison with the material contained in EIA products.

[24] For most products there is no difference between BAU-scenario and ECO-scenario sales, but there are exemptions, e.g. for light sources the speed of the shift to LEDs differs between the scenarios, and for electric motors the speed of shift from motors without VSD to motors with VSD differs between the scenarios. For details see the EIA 2021 Status Report, annex A, sheets SALESBAU and SALESECO. Materials results presented in this study are for the ECO-scenario.

3. Material content of EIA products sold in 2020

The EU27 total material content of EIA products sold in 2020 is determined multiplying the unit product masses (derived from the Bills of Materials, see Annex D) by the sales quantities for year 2020 (from EIA2021). This provides the total mass of all products, the distribution of this mass over the material categories and types, and insights in *which* products consume *what* materials.

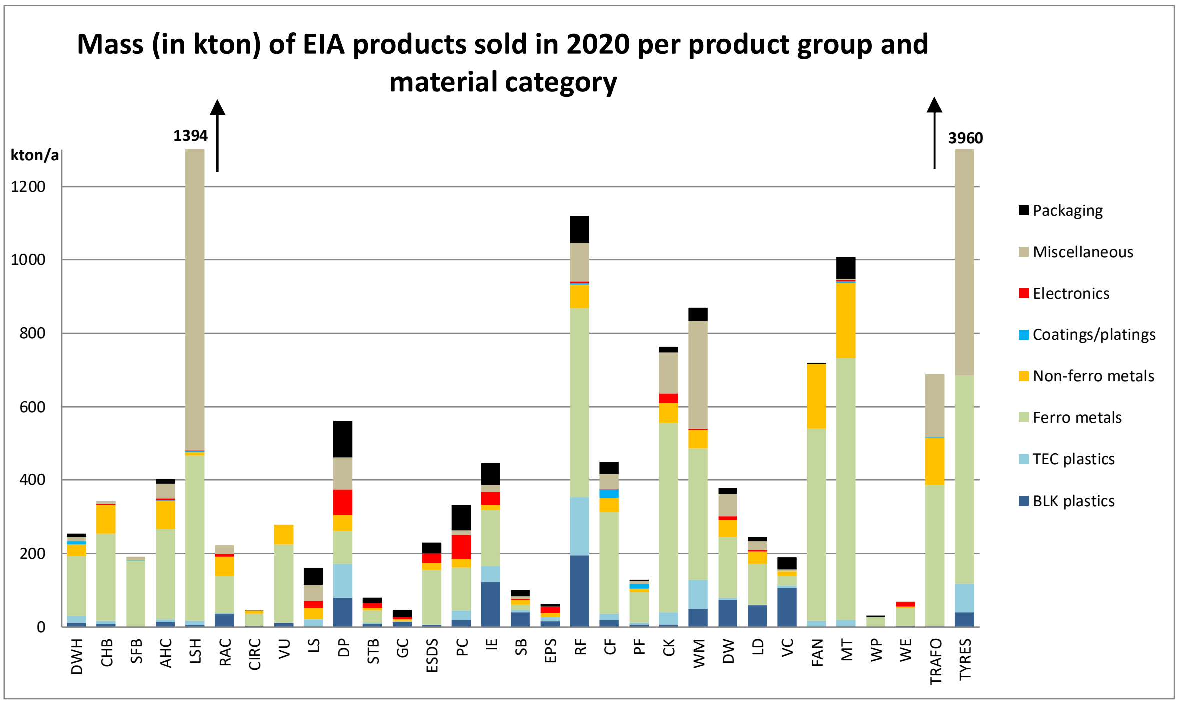
The total material mass contained in EIA products sold in EU27 in 2020 is 15767 kton. The largest contributions come from (Figure 3, Table 2):

- tyres (3960 kton, 25%): rubber, fillers and steel,
- local space heaters (1394 kton, 9%): large contribution of refractory ceramics of slow heat release (SHR) stoves,
- household refrigerators and freezers (1119 kton, 7%),
- electric motors (1008 kton, 6%).

Of the total mass, 41% (6500 kton) are ferrous metals (Figure 4) and 33% (5265 kton) miscellaneous materials. The latter include e.g. rubbers and fillers for rubber (tyres), refractory ceramics (SHR stoves), glass, concrete, refrigerants, mineral oil (transformers), and others. Plastics cover 10% of the mass (1622 kton, 6% bulk plastics, 4% tec plastics), non-ferrous metals 8% (1296 kton, approximately half aluminum and half copper) and 4% (687 kton) is packaging. Electronics represent only 2.2% of the mass (340 kton).

Table 3 gives the top 10 of most used material types: 21% of the total mass is galvanized steel sheet [25].

[25] Or similar material that has been classified as such in the EcoReports.



DWH	Dedicated Water Heater	**EPS**	External Power Supplies
CHB	Central Heating Boiler or Combi	**RF**	Household Refrigeration
SFB	Solid Fuel Boilers	**CF**	Commercial Refrigeration [26]
AHC	Central Air Heating & Cooling	**PF**	Professional Refrigeration
LSH	Local Space Heaters	**CK**	Cooking Appliances
RAC	Room Air Conditioner	**WM**	household Washing Machines
CIRC	Circulator pumps <2.5 kW	**DW**	household Dishwashers
VU	Ventilation Units	**LD**	household Laundry Dryer
LS	Light Sources	**VC**	Vacuum Cleaners
DP	electronic DisPlays	**FAN**	Industrial Fans >125W
STB	Set Top Boxes	**MT**	Motors 0.12-1000 kW
GC	Game Consoles	**WP**	Water pumps
ESDS	Enterprise Servers & Data Storage	**WE**	Welding Equipment
PC	Personal Computers	**TRAFO**	Utility Transformers
IE	Imaging Equipment	**TYRE**	Tyres
SB	Products regulated for Standby		

Figure 3. Total mass of EIA products sold in 2020, per product type (in kton)

[26] Refrigerating appliances with a direct sales function

Table 2. Material content of EIA products sold in year 2020, per product group and per material type, in kton/a (data underlying Figure 3).

Material masses for products sold in year 2020 in [kton]	Sales (000 units)	Total (kton)	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
DWH Dedicated Water Heaters	9303	255	11	18	165	31	7	1	12	10
CHB Central Heating Boilers	5548	341	8	9	238	77	0	2	5	2
SFB Solid Fuel Boilers	400	191	0	0	179	2	0	1	9	0
AHC Air Heating & Cooling	694	403	14	7	246	76	1	6	40	12
LH Local Heaters	20857	1394	5	11	451	9	3	2	903	9
RAC Room Air Conditioner	4377	223	34	3	100	53	0	7	24	0
CIRC Circulator pumps <2.5 kW	14184	47	3	0	33	9	0	0	0	3
VU Ventilation Units	2119	279	10	1	212	54	0	1	0	0
LS Light Sources	1508971	160	1	20	0	30	0	19	43	47
DP Electronic Displays	59668	562	80	93	89	43	0	70	87	100
STB Set Top Boxes	34666	80	9	1	34	7	1	12	1	15
GC Game consoles	10600	46	13	0	4	4	0	8	0	18
ESDS Servers and Data Storage	3771	229	6	1	147	20	0	26	0	29
PC Personal Computers	99214	332	18	27	115	24	0	66	12	69
IE Imaging Equipment	19707	446	122	43	154	14	1	33	20	59
SB Products regulated for Standby	386818	101	40	8	14	11	0	5	6	18
EPS External Power Supplies	429653	61	15	12	1	9	0	18	0	6
RF Household Refrigeration	16732	1119	196	157	516	64	3	6	104	74
CF Commercial Refrigeration	1587	449	19	18	277	38	23	1	41	33
PF Professional Refrigeration	1011	129	7	5	83	9	12	0	10	3
CK Cooking Appliances	37026	763	6	33	518	53	1	26	112	15
WM household Washing Machines	12464	869	48	81	357	51	0	3	293	36
DW household Dishwashers	7833	377	72	7	166	46	0	11	62	14
LD household Laundry Dryers	4489	245	59	2	112	33	0	2	26	11
VC Vacuum Cleaners	25641	190	105	7	26	13	0	0	5	35
FAN Industrial Fans >125W	16349	719	0	16	524	177	0	0	0	3
MT Elec. Motors LV 0.12-1000 kW	42449	1008	2	16	713	206	4	4	3	60
WP Water pumps	1494	31	0	0	27	0	0	0	0	4
WE Welding Equipment	486	68	3	0	49	3	0	13	0	0
TRAFO Utility Transformers	184	688	1	2	384	129	2	0	171	0
Tyres, total C1+C2+C3	352545	3960	39	79	566	0	0	0	3276	0
EU27 TOTAL	**3130842**	**15767**	**946**	**676**	**6500**	**1296**	**59**	**340**	**5265**	**687**
share (%)			6%	4%	41%	8%	0%	2%	33%	4%

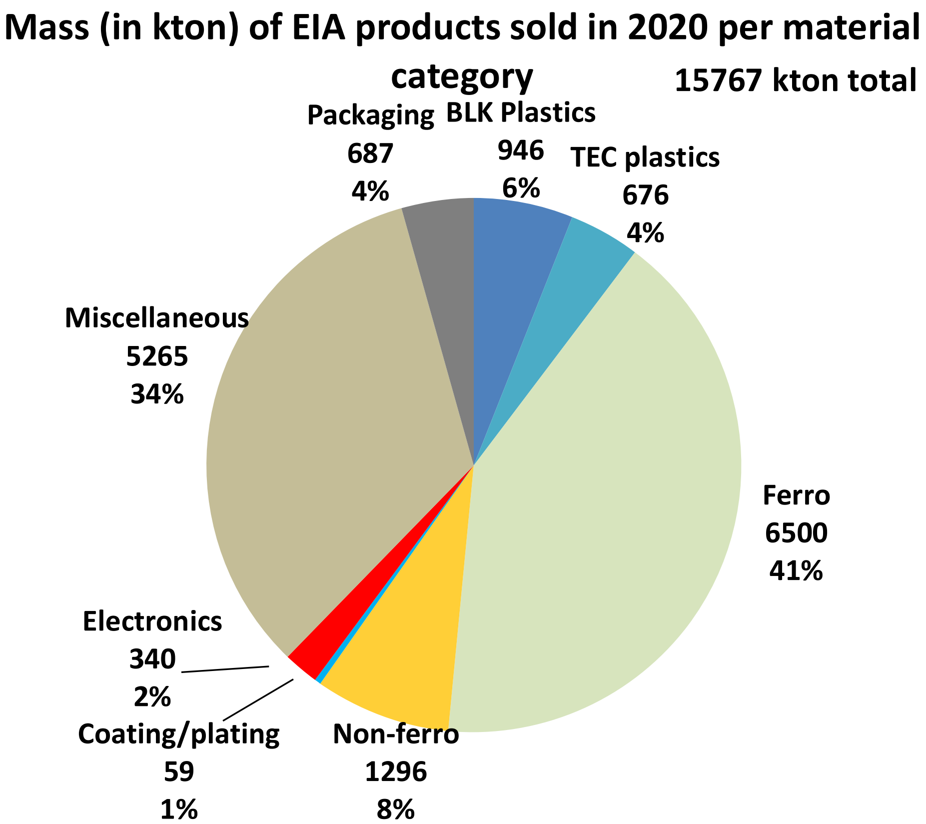


Figure 4. Material content per category in EIA products sold in 2020

Table 3. Top 10 most-consumed materials in products sold in 2020

Rank	Material type	kton	Share of total
1	Steel sheet galvanized	3326	21.1%
2	Miscellaneous-Other	1729	11.0%
3	Steel tube/profile	1524	9.7%
4	Cast iron	1138	7.2%
5	Fillers for Rubber	1019	6.5%
6	Natural Rubber	913	5.8%
7	Synthetic Rubber	859	5.4%
8	Cardboard (packaging)	476	3.1%
9	Stainless 18/8 coil	443	2.8%
10	Glass	395	2.5%

4. Material content of EIA products in use in 2020

The EU27 total material content of EIA products used in 2020 (stock) is determined multiplying the unit product masses (derived from the Bills of Materials, see Annex D) by the stock quantities for year 2020 (from EIA2021).

Compared to the distribution for the sales presented in the preceding section, this adds the influence of product lifetime. Products with a relatively short average lifetime (such as tyres) have a smaller share in the stock total mass than in the sales total mass. Products with high average lifetime, such as distribution transformers and local space heaters, have a higher share in the stock total mass.

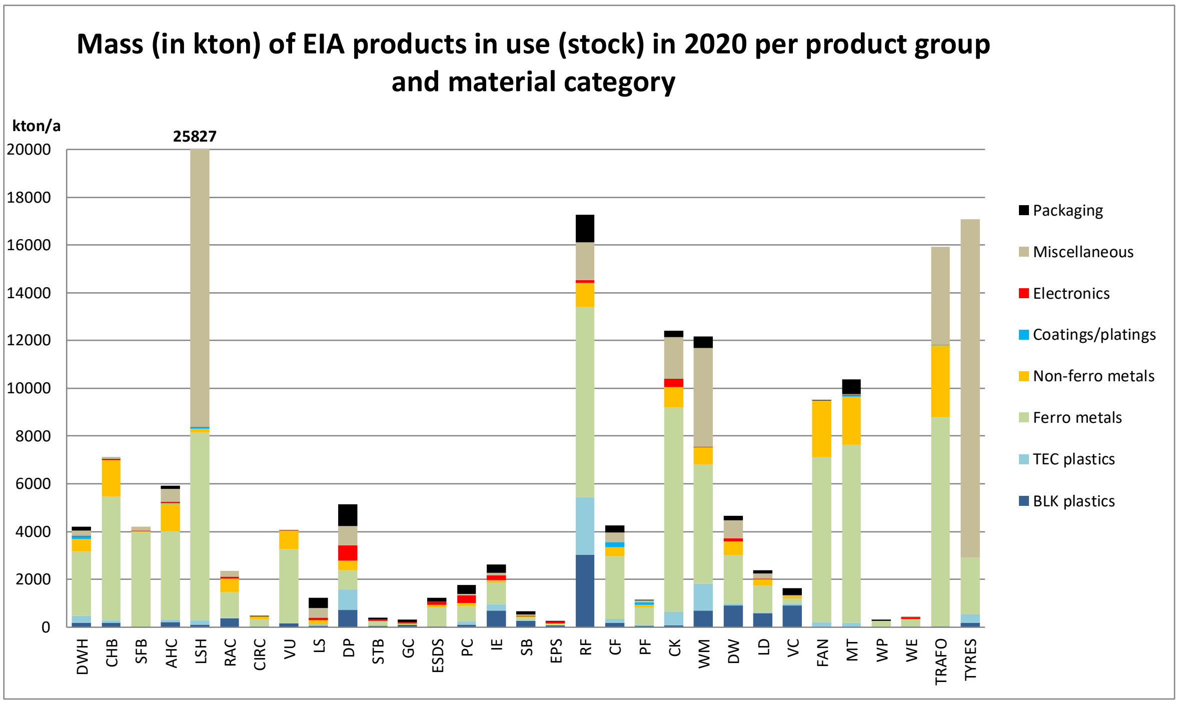
The total material mass contained in EIA products used in EU27 in 2020 is 177278 kton. The largest contributions come from (Figure 5, Table 4):

- local space heaters (25827 kton, 15%), large contribution of refractory ceramics of slow heat release (SHR) stoves, with 25 year lifetime,
- household refrigerators and freezers (17266 kton, 10%), 16 year lifetime,
- tyres (17072 kton, 10%), rubber, fillers and steel, 4-5 year lifetime,
- distribution transformers (15926 kton, 9%), 25-40 year lifetime,
- cooking appliances (12404 kton, 7%), 14-19 year lifetime,
- household washing machines (12185 kton, 7%), 13-15 year lifetime,
- electric motors (10362 kton, 6%), 8-18 years lifetime.

Of the total mass, 48% (85716 kton) are ferrous metals (Figure 6) and 27% (47161 kton) miscellaneous materials, including e.g. rubbers and fillers for rubber (tyres), refractory ceramics (SHR stoves), glass, concrete, refrigerants, mineral oil (transformers), and others. Plastics cover 10% of the mass (17272 kton, 6% bulk plastics, 4% tec plastics), non-ferrous metals 10% (17244 kton, approximately 40% aluminum and 60% copper) and 4% (6572 kton) is packaging [27]. Electronics represent only 1.5% of the mass (2636 kton).

Table 5 gives the top 10 of most used material types: 26% of the total mass is galvanized steel sheet.

[27] This the combined packaging mass that at some time was used for the products now in stock.



DWH	Dedicated Water Heater	**EPS**	External Power Supplies
CHB	Central Heating Boiler or Combi	**RF**	Household Refrigeration
SFB	Solid Fuel Boilers	**CF**	Commercial Refrigeration [28]
AHC	Central Air Heating & Cooling	**PF**	Professional Refrigeration
LSH	Local Space Heaters	**CK**	Cooking Appliances
RAC	Room Air Conditioner	**WM**	household Washing Machines
CIRC	Circulator pumps <2.5 kW	**DW**	household Dishwashers
VU	Ventilation Units	**LD**	household Laundry Dryer
LS	Light Sources	**VC**	Vacuum Cleaners
DP	electronic DisPlays	**FAN**	Industrial Fans >125W
STB	Set Top Boxes	**MT**	Motors 0.12-1000 kW
GC	Game Consoles	**WP**	Water pumps
ESDS	Enterprise Servers & Data Storage	**WE**	Welding Equipment
PC	Personal Computers	**TRAFO**	Utility Transformers
IE	Imaging Equipment	**TYRE**	Tyres
SB	Products regulated for Standby		

Figure 5. Total mass of EIA products in use (stock) in 2020, per product group (in kton)

[28] Refrigerating appliances with a direct sales function

Table 4. Material content of EIA products in use (stock) in year 2020, per product group and per material type, in kton/a (data underlying Figure 5).

Material masses for products in use (stock) in year 2020 in [kton]	Stock (000 units)	Total (kton)	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
DWH Dedicated Water Heaters	146884	4203	175	307	2687	529	112	10	233	151
CHB Central Heating Boilers	102939	7137	187	106	5164	1537	7	40	76	20
SFB Solid Fuel Boilers	9068	4204	0	0	3981	37	5	14	166	2
AHC Air Heating & Cooling	10039	5922	208	88	3718	1158	14	72	531	133
LH Local Heaters	326743	25827	89	198	7874	156	55	24	17269	162
RAC Room Air Conditioner	46089	2362	366	35	1063	567	0	71	260	0
CIRC Circulator pumps <2.5 kW	136929	468	30	0	323	85	2	0	0	28
VU Ventilation Units	27754	4058	143	16	3104	782	0	14	0	0
LS Light Sources	10793278	1222	37	96	2	145	1	121	401	419
DP Electronic Displays	521649	5142	727	859	798	389	0	645	801	923
STB Set Top Boxes	174828	404	45	5	173	37	3	62	5	75
GC Game consoles	74200	323	89	1	28	25	0	55	0	125
ESDS Servers and Data Storage	20263	1227	30	7	780	113	0	143	0	154
PC Personal Computers	430748	1748	97	140	653	126	0	314	60	359
IE Imaging Equipment	106994	2635	695	256	927	85	4	196	119	353
SB Products regulated for Standby	2790846	646	248	47	89	69	0	33	40	119
EPS External Power Supplies	1708761	252	62	49	3	37	0	74	0	26
RF Household Refrigeration	258072	17266	3016	2425	7956	993	44	85	1602	1145
CF Commercial Refrigeration	14413	4260	176	165	2640	360	218	5	381	314
PF Professional Refrigeration	8122	1139	58	47	716	95	113	0	81	28
CK Cooking Appliances	557536	12404	84	546	8569	848	10	355	1730	261
WM household Washing Machines	174734	12185	679	1132	5000	715	0	39	4111	510
DW household Dishwashers	96528	4647	892	84	2042	563	0	131	762	173
LD household Laundry Dryers	45609	2366	573	21	1131	281	0	21	227	114
VC Vacuum Cleaners	224842	1633	902	66	225	101	0	3	39	296
FAN Industrial Fans >125W	214407	9509	0	211	6918	2346	0	0	0	33
MT Elec. Motors LV 0.12-1000 kW	380084	10362	16	156	7451	2031	43	29	28	608
WP Water pumps	14526	302	0	0	259	0	0	0	0	42
WE Welding Equipment	3049	427	16	0	309	22	0	80	0	0
TRAFO Utility Transformers	4401	15926	16	30	8727	3012	43	0	4098	0
Tyres, total C1+C2+C3	1563856	17072	175	350	2404	0	0	0	14143	0
EU27 TOTAL	**20988188**	**177278**	**9830**	**7442**	**85716**	**17244**	**676**	**2636**	**47161**	**6572**
share (%)			6%	4%	48%	10%	0%	1%	27%	4%

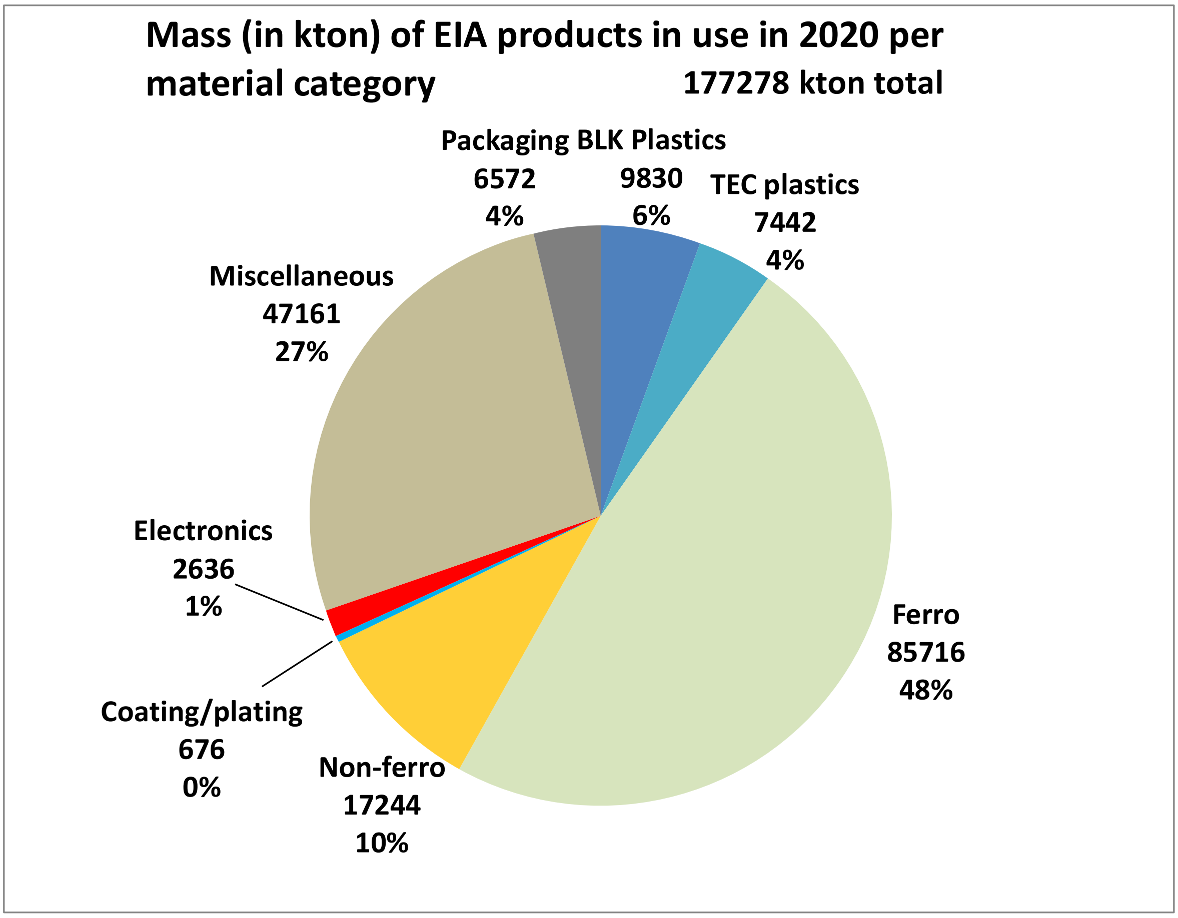


Figure 6. Material content per category in EIA products in use (stock) in 2020

Table 5. Top 10 most-consumed materials in products in use in 2020

Rank	Material type	kton	Share of total
1	Steel sheet galvanized	46220	26.1%
2	Miscellaneous-Other	24826	14.0%
3	Cast iron	17303	9.8%
4	Steel tube/profile	15441	8.7%
5	Stainless 18/8 coil	6043	3.4%
6	Glass	5129	2.9%
7	AL diecast	4456	2.5%
8	Fillers for Rubber	4403	2.5%
9	Cardboard (packaging)	4266	2.4%
10	Synthetic Rubber	3996	2.3%

5. Material consumption per category

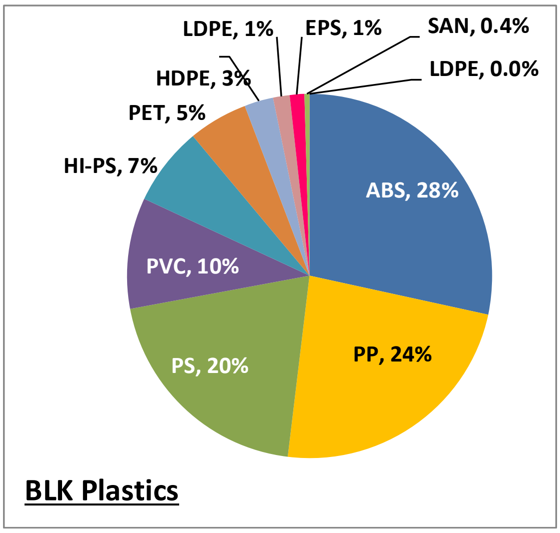
For each of the 7 material categories and for packaging, this chapter provides the mass shares for the individual material types in that category. In addition it is shown in which product groups the materials of the category are mainly applied. These data are presented for the materials contained in products sold in the reference year 2020 (i.e. sales based data).

5.1. Bulk plastics

The total quantity of Bulk Plastics in EIA products sold in 2020 is 946 kton.

More than half of the Bulk Plastics (61%) is consumed by only five product groups (Figure 7). Household refrigerators and freezers (RF) have the highest share (21%), followed by imaging equipment (IE, 13%), vacuum cleaners (VC, 11%), electronic displays (DP, 8%) and household dishwashers (DW, 8%). Bulk plastics are mainly used for the housings of these products.

The most used material types are ABS (28%), polypropylene (PP: 24%), polystyrene (PS: 20%) and PVC (10%).



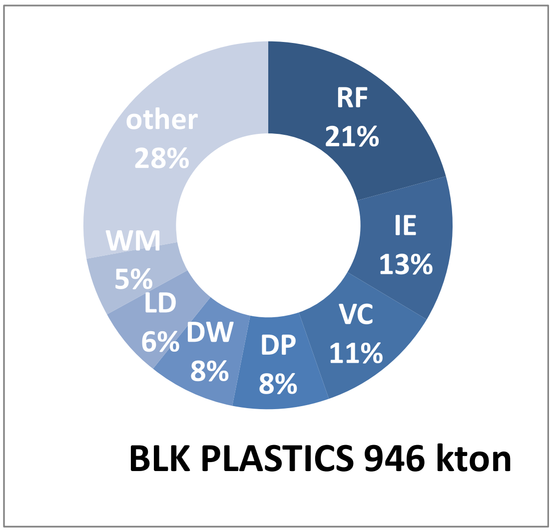


Figure 7. Bulk Plastics in EIA products sold in 2020

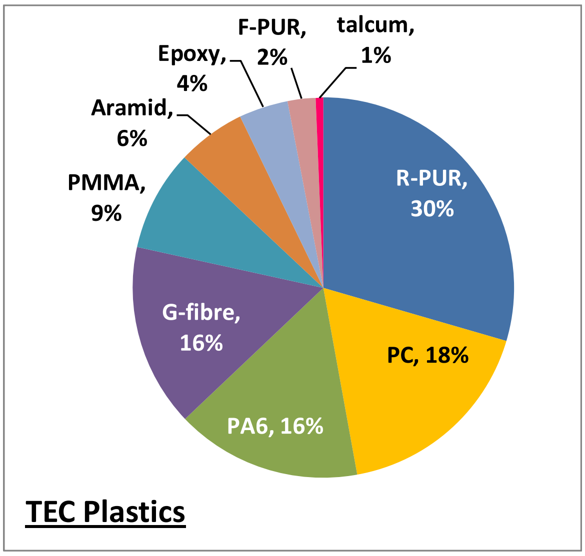
5.2. TEC plastics

The total quantity of Tec Plastics in EIA products sold in 2020 is 676 kton.

The main consumers are (Figure 8): household refrigeration (RF, 23%), electronic displays (DP, 14%), washing machines (WM, 12%) and tyres (12%) [29].

Rigid polyurethane (R-PUR, 30%) is the most widely used TEC plastic (used e.g. for thermal insulation in refrigerators). Other common TEC Plastics are polycarbonate (PC, 18%), PA6 (Nylon, 16%), E-Glass fibre (for reinforcement, 16%) and PMMA (Plexiglas, 9%).

[29] The tyres contain textiles, including polyester, nylon, aramid and rayon. The textile weight has been evenly divided over materials 10-PET, 11-PA6 and 19-Aramid (rayon has been ignored)



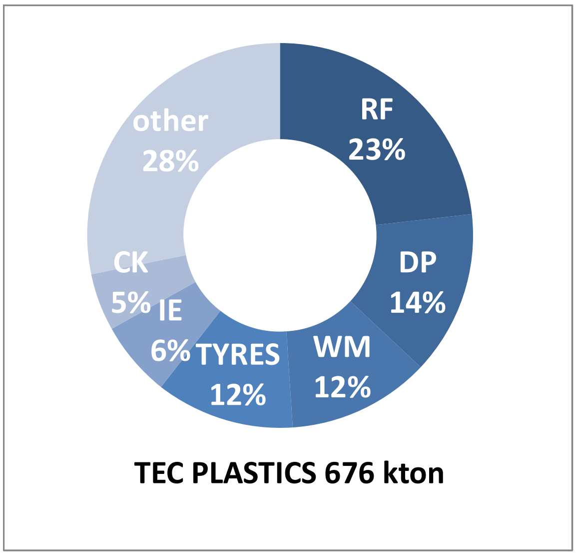


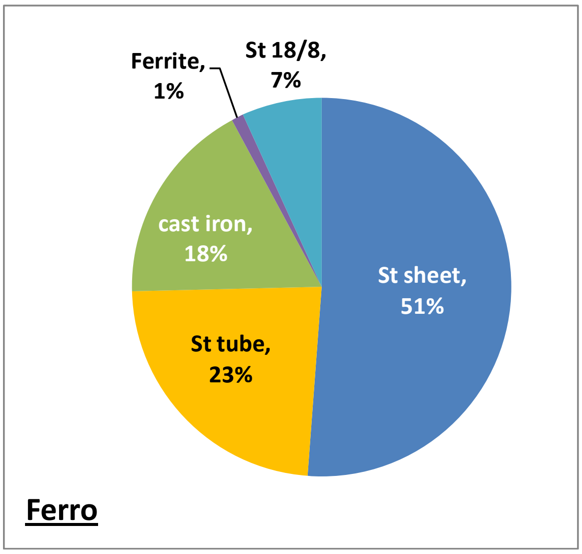
Figure 8. TEC Plastics in EIA products sold in 2020

5.3. Ferro

The total quantity of Ferrous metals in EIA products sold in 2020 is 6500 kton.

The Ferro group does not have a dominant consuming product group (Figure 9). Electric motors have the highest share (11%), but, as explained, this does not consider double counting, so might be overestimated.

More than half of the Ferro material use consists of steel sheet galvanised (51%), followed by steel tubes and profiles (23%), cast iron (18%), stainless steel 18/8 (7%) and a small amount of ferrite (1%).



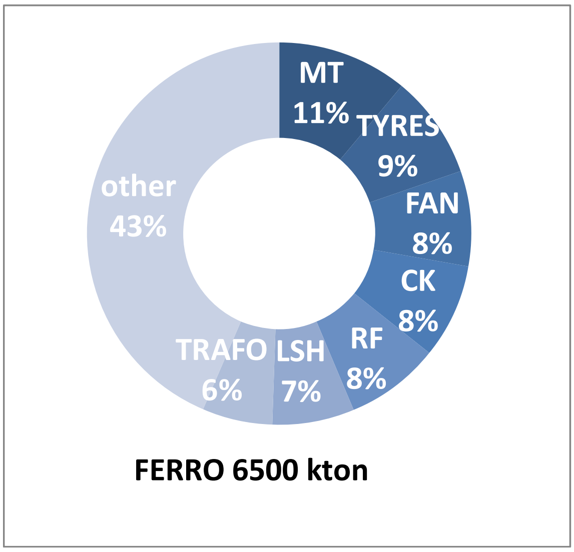


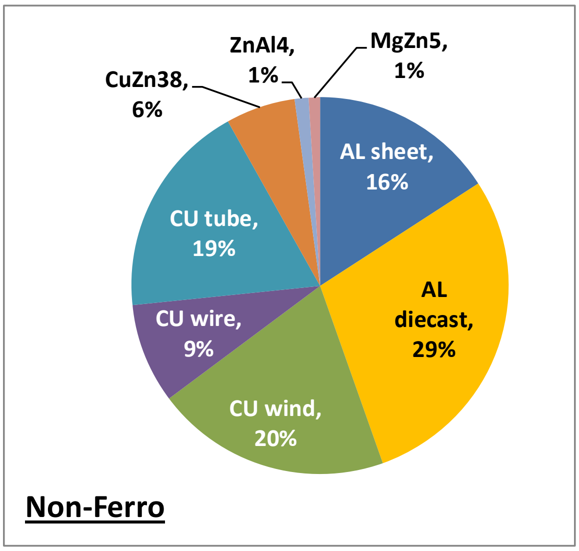
Figure 9. Ferrous metals in EIA products sold in 2020

5.4. Non-Ferro

The total quantity of Non-ferrous metals in EIA products sold in 2020 is 1296 kton.

In the Non-Ferro group (Figure 10), copper is the main consumer (54%), subdivided in Cu tube/sheet, Cu wire, Cu winding wire and CuZn38 diecast. Another 45% of the group consists of aluminium die cast and aluminium sheet/extrusion.

Non-Ferro metals are mainly found in industrial products such as electric motors (16%), industrial fans (13%), and utility transformers (10%). The rest of the non-ferro metals is spread out over many different product groups.



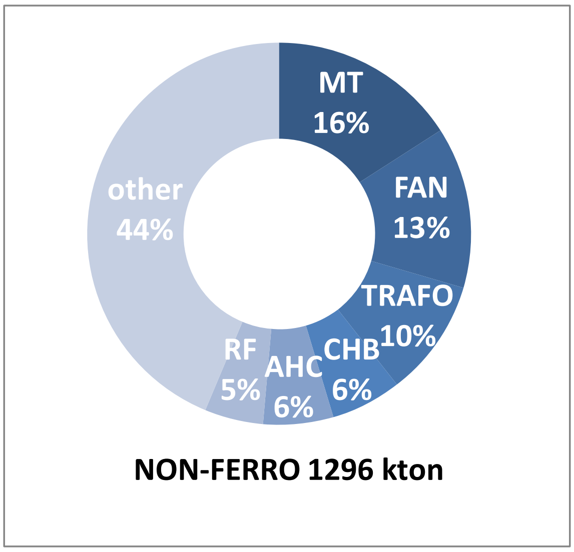


Figure 10. Non-ferrous metals in EIA products sold in 2020

5.5. Coating

The total quantity of coating/plating in EIA products sold in 2020 is 59 kton.

The main share in this group (Figure 11) is for powder coating (59%), followed by pre-coating coil (40%). Platings, Cu/Ni/Cr and Au/Pt/Pd, are around 1%.

Coating/plating is applied in few product groups. The main shares can be found in commercial refrigeration (39%), professional refrigeration (20%) and dedicated water heaters (13%).

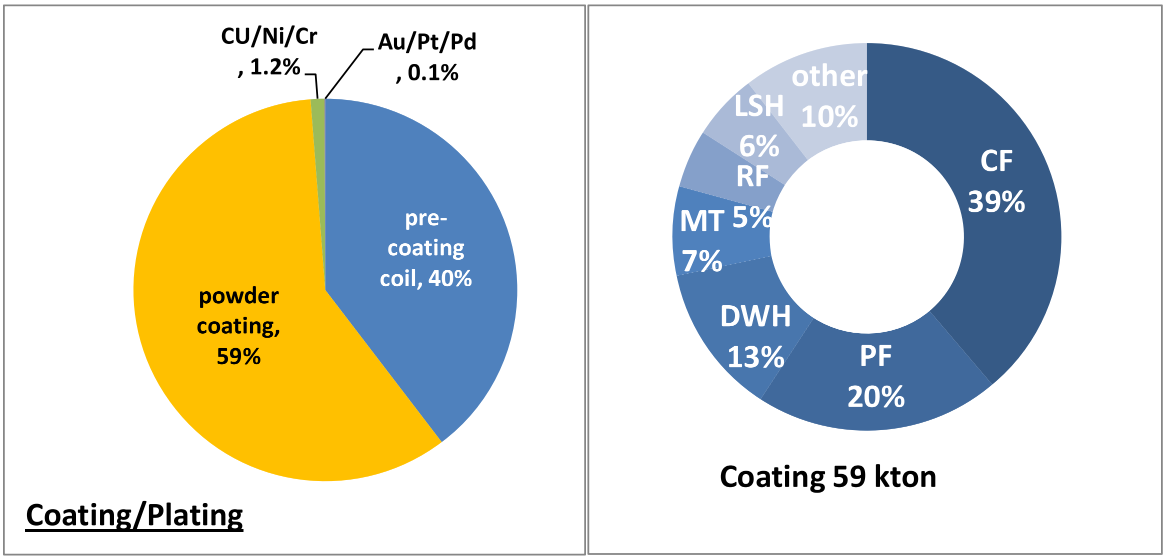


Figure 11. Coating/plating in EIA products sold in 2020

5.6. Electronics

The total quantity of electronics in EIA products sold in 2020 is 340 kton.

Non-surprisingly, electronic materials are mainly used in products of the EIA functional group ‘electronics’ (Figure 12): displays (20%), personal computers (19%), imaging equipment (10%), servers and data storage products (8%) and external power supplies (5%). Drivers and control gears for lighting represent 6%. Surprisingly, another 8% of electronics is in cooking appliances: this mass is all for controller boards.

In the Electronics group, the most apparent components are the controller boards (37%), LCD screens (18%) and big capacitors & coils (18%). Note that 80-90 weight % of certain components are <u>not</u> semiconductor materials (ICs, diodes, resistors, etc.) but support-materials such as resin-boards (for PWBs, controller boards), glass (for LCD screens), conductor material (copper/aluminium) and plastics (e.g. for slots, ports, enclosures).

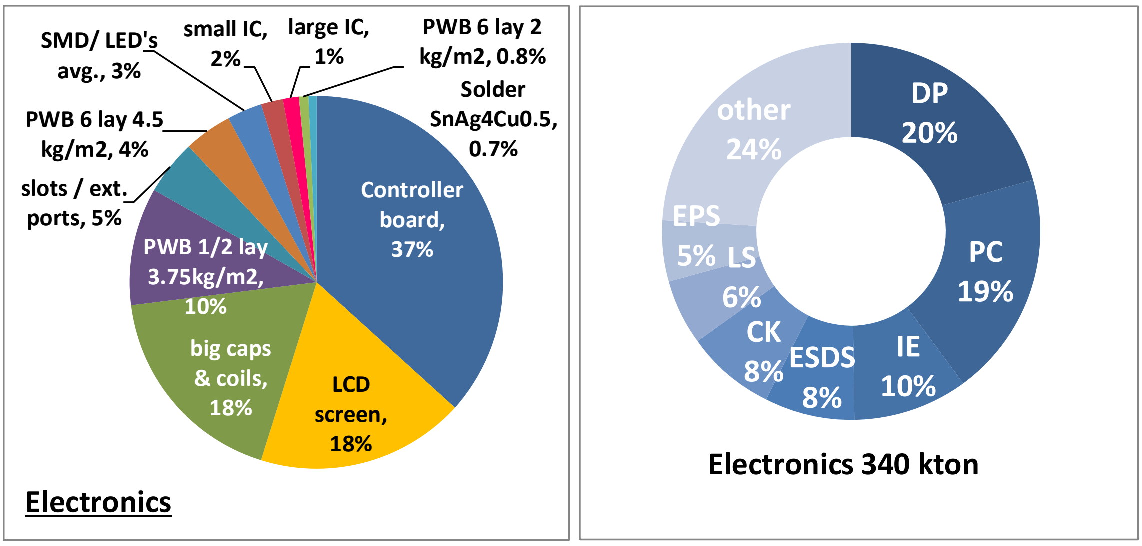


Figure 12. Electronics in EIA products sold in 2020

5.7. Miscellaneous

The total quantity of miscellaneous materials in EIA products sold in 2020 is 5265 kton.

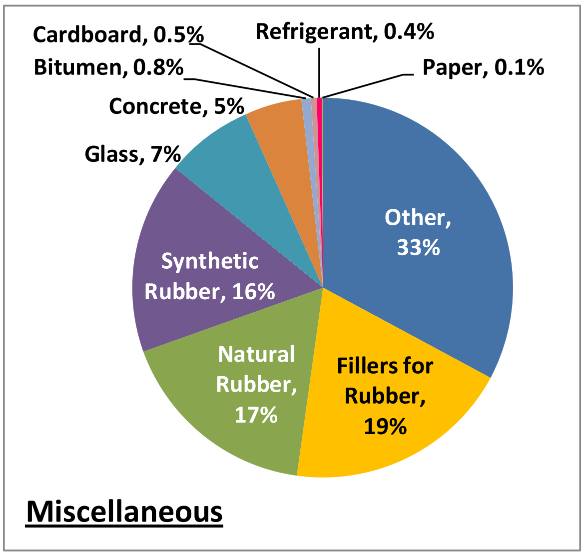
Tyres use 62% of the total miscellaneous mass, in particular fillers for rubber (19%), natural rubber (17%) and synthetic rubber (16%). The 17% for local space heaters is mainly refractory ceramics, in particular for slow heat release (SHR) stoves. The 6% share for washing machines is mainly for the concrete in the base. For a large part, the 3% for transformers is mineral oil, with smaller contributions from ceramics and wood. The 2% for cooking appliances and household fridges is mainly glass.

Refrigerants are 21.4 kton (0.4% of miscellaneous total). Of this, 45% is contained in central air conditioners, 23% in room air conditioners, 17% in professional refrigeration (including condensing units), 4% in household refrigerators, 4% in heat pump laundry dryers, and 4% in heat pumps for space heating.

Cardboard (including wood) and paper registered under miscellaneous is for use in the products, not for packaging or documentation.

Miscellaneous–other in total represents 1729 kton, which is 33% of all miscellaneous material and 11% of the entire mass of EIA products sold in 2020. The main contributions come from:

- Local space heaters (903 kton): refractory ceramics (e.g. for SHR stoves)
- Tyres (514 kton): oil, sulphur, ZnO
- Transformers (150 kton): mainly mineral oil, some ceramics and wood



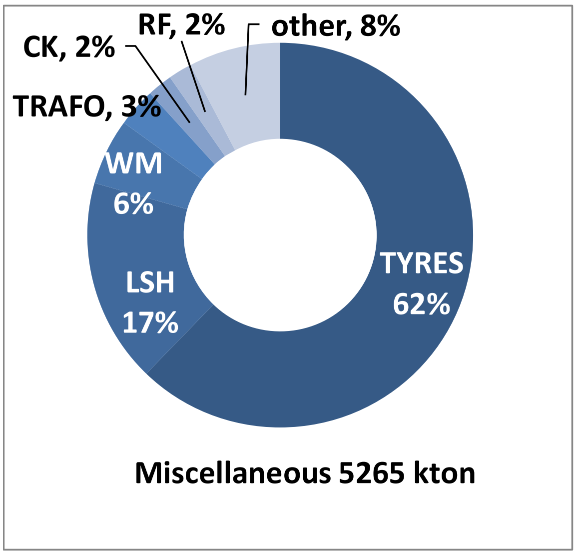


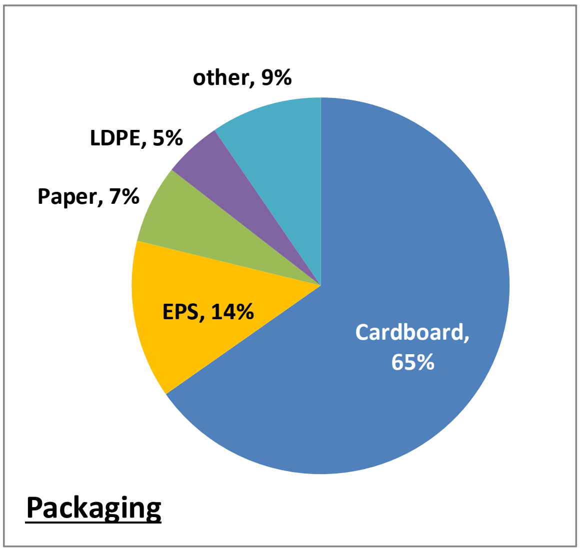
Figure 13. Miscellaneous materials in EIA products sold in 2020

5.8. Packaging

The total quantity of packaging materials used for EIA products sold in 2020 is 687 kton [30].

Cardboard represents 65% of this mass; this includes also wood for e.g. transport pallets. Expanded Poly Styrene (EPS) covers 14% (this a bulky material, but not heavy). Paper is 7% of the packaging mass; this includes also documentation and manuals. Low-density polyethylene (LDPE) is 5%.

Packaging mass is spread over many products groups, but main contributors are electronic displays (15%), household fridges (11%), personal computers (10%), electric motors (9%), imaging equipment (8%) and light sources (7%).



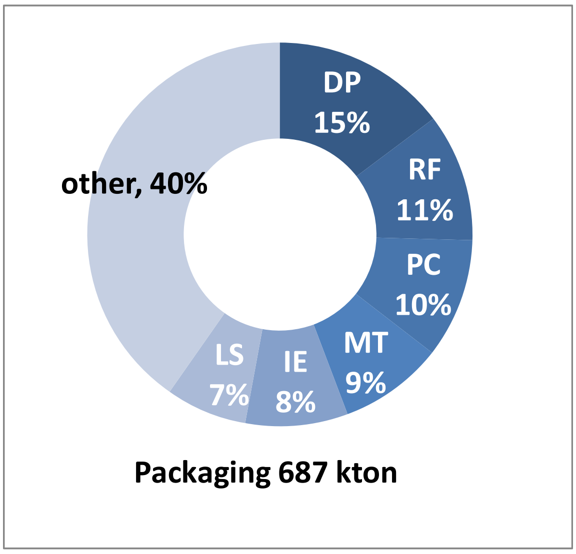


Figure 14. Packaging materials for EIA products sold in 2020

6. Comparison EIA materials with EU27 total

From various sources, the EU27 total material consumption in year 2020 for the relevant material categories and types was retrieved [31]. The material content of the EIA products sold in 2020, as reported in chapter 3, is compared with these EU totals, and the shares of EIA products in the EU total are reported. This provides insight in the potential maximum relative impact of circularity and material resource efficiency requirements. In total, almost 300 Mt of plastics, metal, glass, rubber, paper & cardboard was consumed in the EU27 in 2020. For electronic components and coatings no EU data could be retrieved, but these categories have a relatively small share in the total mass.

[30] This might be underestimated: not all BoMs provide information on packaging

[31] These EU totals probably do not include the materials contained in components and products that are manufactured outside EU27 and imported. This means that the actual material consumption could be slightly higher.

6.1. Plastics

Plastics Europe [32] reports an EU27 plastics consumption in 2020 of 44.5 Mton. Integrating this with 1.1 Mton E-glass fibre reported by Glass Alliance Europe [33], the total ‘plastics’ mass to be compared with EIA products is 45.6 Mton [34]. Figure 15 shows how the total EU mass is divided over BLK plastics (79%) and TEC plastics (21%), and over the various material types within these categories. Figure 16 shows in which applications the plastic is used. This includes packaging (40% share), so for the comparison with EIA products, LDPE and EPS accounted under packaging have been added here.

Table 6 provides the data underlying Figure 15 and compares the EU totals with the plastics contained in EIA products. Overall, the EIA products sold in 2020 consumed 3.8% of the EU plastics total. The share is 3.0% for the BLK plastics and 7.1% for the TEC plastics.

In the BLK plastics category, the largest EIA vs EU shares are found for SAN/ABS [35] (36%) and for polystyrene (PS/EPS/HI-PS, 13%). ABS is used in many EIA products, but the largest consumers are vacuum cleaners (71 kton), electronic displays (37 kton), imaging equipment (32 kton) and washing machines (22 kton). PS is mainly used in household fridges (139 kton) and imaging equipment (42 kton). High-impact polystyrene (HI-PS) is mainly used in imaging equipment (29 kton) and electronic displays (21 kton), and expanded polystyrene (EPS) mainly in packaging (93 kton).

In the TEC plastics category, the largest EIA vs EU shares are found for PMMA (25%), PC (18%) and PA (14%). In EIA products, more than 90% of the PMMA [36] is used in electronic displays. Polycarbonate (PC) is mainly used in electronic displays (31 kton) and imaging equipment (30 kton). Other relatively large users are personal computers (14 kton), external power supplies (12 kton) and light sources (11 kton). In the EIA material accounting, polyamide (PA, also known as nylon, PA6/PA66) is mainly found in tyres (40 kton), industrial fans (16 kton) and personal computers (11 kton).

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[32] https://plasticseurope.org/wp-content/uploads/2021/12/AF-Plastics-the-facts-2021_250122.pdf. The original data are for EU27+UK+CH+N. Based on information in the source, 9% was subtracted from the original data to get figures for EU27. The source data do not include recycled plastics.

[33] Glass Alliance Europe, Panorama of the EU glass industry, continuous reinforcement fibres, apparent consumption, EU28 for year 2020: 1238 kton. Subtracted 9% for UK.

[34] No EU total information was found for talcum fillers and for aramid fibres.

[35] ABS is the terpolymer of Acrylonitrile-Butadiene-Styrene. SAN is the bipolymer of Acrylonitrile-Styrene.

[36] Poly(methyl methacrylate) (PMMA) is a transparent engineering thermoplastic. It is also known as e.g. acrylic glass, Plexiglas, perspex.

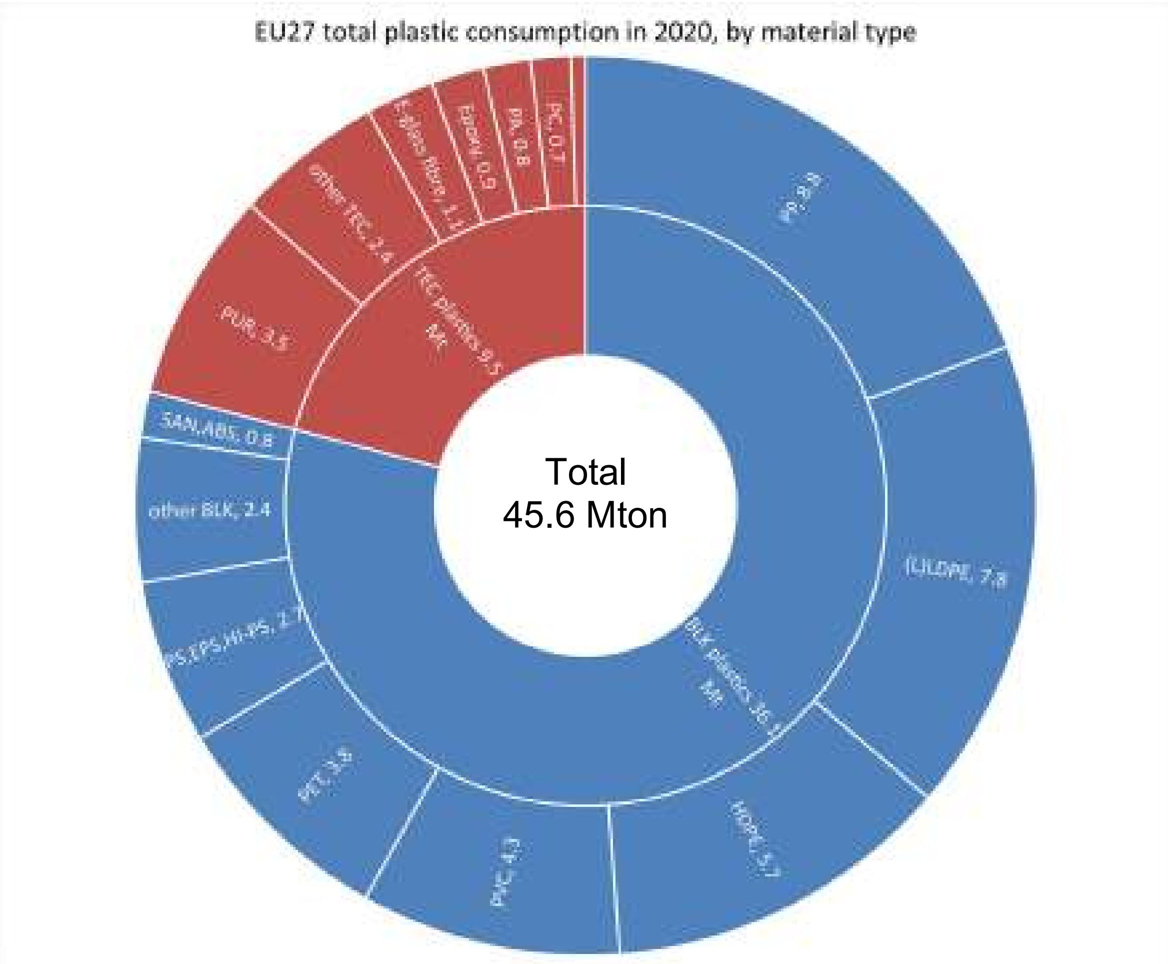

Figure 15. EU27 total plastics consumption (Mton) in year 2020, per category (BLK plastics and TEC plastics) and per material type. Recycled plastics are not included. E-glass fibre is also included in TEC plastics.

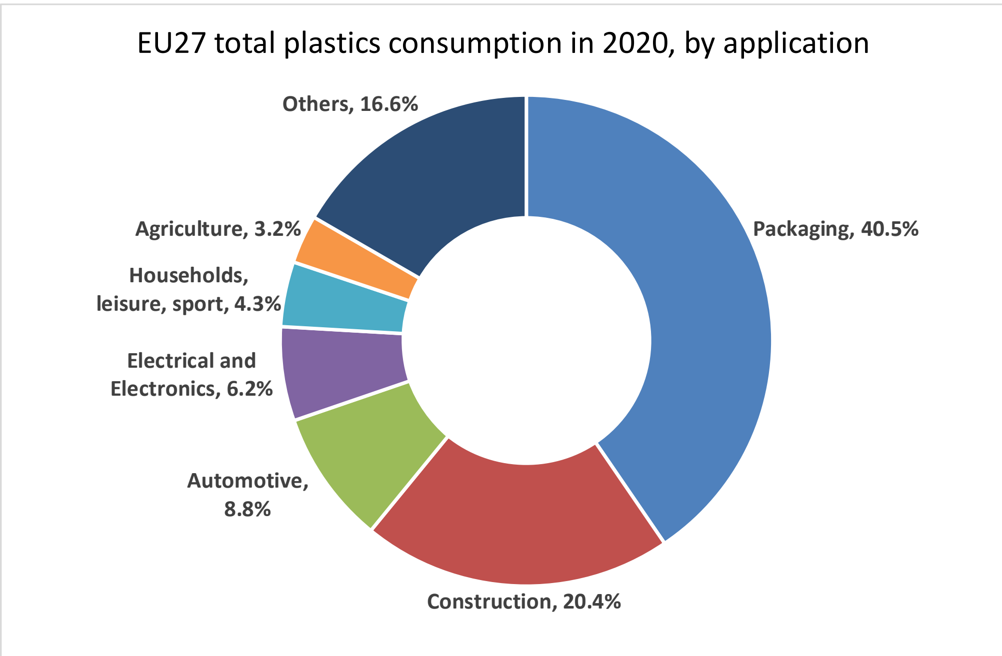

Figure 16. EU27 total plastics consumption in year 2020, per application

Table 6 : EU27 total plastics consumption in 2020 compared to plastics contained in EIA products sold in 2020

Plastics consumption	EU27 Total kton	EIA Products kton	EIA/EU
LDPE, LLDPE	7763	48*	0.6%
HDPE	5725	24	0.4%
PP	8786	223	2.5%
PS, EPS, HI-PS	2700	362*	13.4%
PVC	4257	94	2.2%
SAN, ABS	752	273	36.3%
PET	3750	50	1.3%
other BLK plastics	2364		
Total BLK plastics	**36097**	**1073***	**3.0%**
PA	770	106	13.8%
PC	661	119	18.1%
PMMA	236	58	24.5%
Epoxy	866	28	3.3%
PUR (rigid and flex)	3451	216	6.2%
E-glass fibre	1121	105	9.4%
Other TEC plastics	2440		
talcum filler & aramid fibres		44	
Total TEC plastics	**9545**	**676**	**7.1%**
Total plastics	**45643**	**1749***	**3.8%**
* includes LDPE and EPS used for packaging of EIA products			

6.2. Ferro metals

The total EU27 consumption of ferrous metals in 2020 is 141 Mton, based on information from Eurofer [37] for steel products and from CAEF [38] for castings. Figure 17 shows how the total EU mass is divided over flat steel (sheet/plate, 55%), long steel (tubes/profiles, 36%), castings (5%) and stainless steel (4%). Figure 18 shows in which applications the ferrous metals are used [37].

Table 7 compares the EU totals with the ferrous metals contained in EIA products. Overall, the EIA products sold in 2020 consumed 4.6% of the EU ferrous metals total. The share is 4.3% for flat steel, 3.0% for long steel, 8.3% for stainless steel, and 15.7% for castings.

In EIA products, iron castings are mainly used in local space heaters (327 kton), household fridges (259 kton), electric motors (144 kton), solid fuel boilers (143 kton) and room air conditioners (100 kton). Of the stainless steel, approximately half is used in washing machines.

[37] European-Steel-in-Figures-2021.pdf (eurofer.eu). The comparison uses the data for 2020, but due to the Covid crisis these are 8-15% lower than the 2019 figures and 13-21% lower than the 2018 figures. The latter are on the same level as the 2011-2017 figures.

[38] https://www.caef.eu/wp-content/uploads/2019/01/CAEF-Co7_2020-complete.pdf. The data on castings are production figures for 16 of the EU27 countries (missing: Ireland, Luxemburg, Malta, Cyprus, Greece, Romania, Slovakia, Estonia, Latvia, Lithuania, Netherlands). Most country data are for 2020, some for most recent year available. Production of Norway, Switzerland, Turkey and United Kingdom has not been counted.

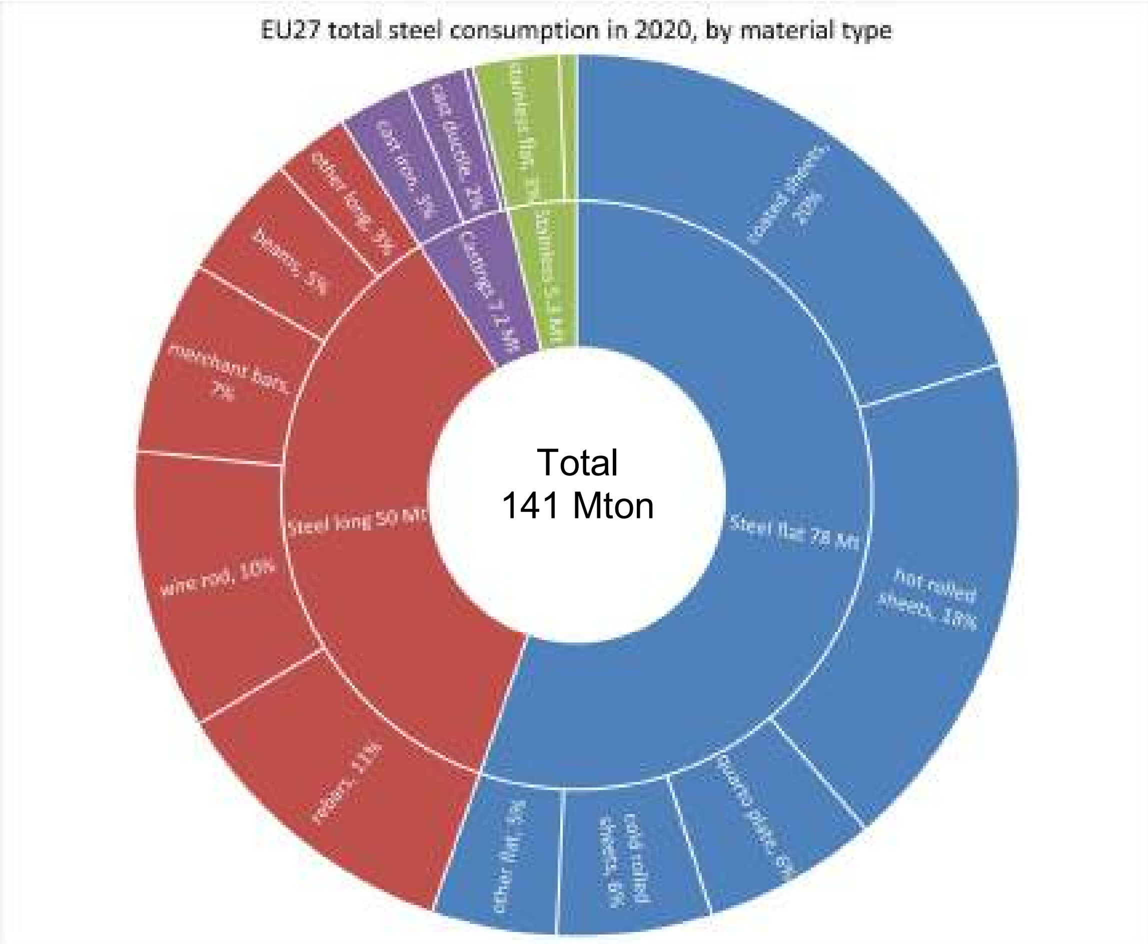

Figure 17. EU27 total ferrous metals consumption (Mton) in year 2020, per category (flat steel, long steel, stainless steel, and castings) and per type.

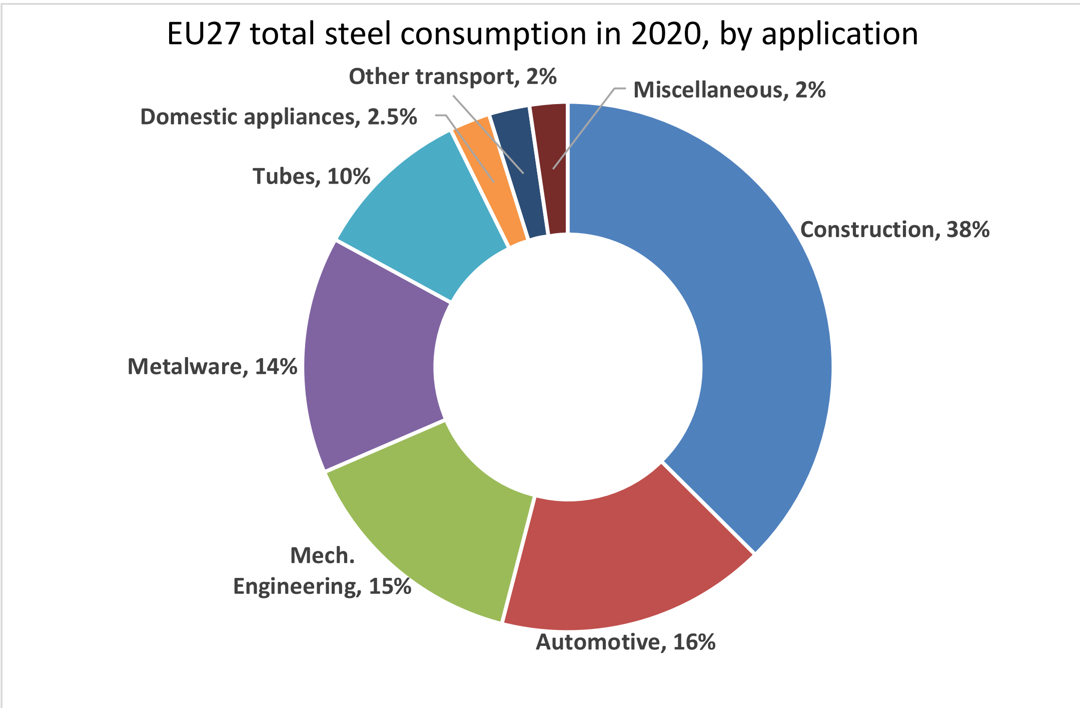

Figure 18. EU27 total ferrous metals consumption in year 2020, per application

Table 7 : EU27 total consumption of ferrous metals in 2020 compared to ferrous metals contained in EIA products sold in 2020

Ferrous metals consumption	EU27 Total kton	EIA Products kton	EIA/EU
Steel flat / sheet galvanized	77972	3326	4.3%
Steel long / tube-profile	50428	1524	3.0%
Fe-Castings / cast iron	7232	1138	15.7%
Stainless steel	5334	443	8.3%
Ferrite		68	
Total ferro-metals	**140966**	**6500**	**4.6%**

6.3. Non-Ferro metals

The total EU27 consumption of non-ferrous metals in 2020 is 14 Mton, of which 9.1 Mton aluminium, 4.7 Mton copper and 0.2 Mton zinc. This is based on information from European Aluminium [39] for aluminium sheets and extrusions, from ICSG for copper [40], and from CAEF [41] for non-ferrous castings. Figure 19 shows how the total EU mass is divided over the three materials and their subtypes. Figure 20 and Figure 21 show in which applications aluminium and copper are used.

Table 8 compares the EU totals with the non-ferrous metals contained in EIA products. Overall, the EIA products sold in 2020 consumed 9.3% of the EU non-ferrous metals total. The share is 14.8% for copper, and 6.3% for aluminium.

In EIA products, the largest consumers of aluminium (sheets, extrusions and diecasts) are industrial fans (25%) and electric motors (20%). Central air conditioners / heaters, ventilation units, household fridges, washing machines and cooking appliances each consume around 5% of the aluminium.

The largest consumers of copper (all shapes) are utility transformers (16%), electric motors (13%), central heating boilers (8%), and dishwashers (7%). Central air conditioners / heaters, room air conditioners, electronic displays, household fridges and industrial fans each consume around 5% of the copper.

[39] https://www.european-aluminium.eu/activity-report-2021-2022/market-overview/ The original figures seem to be for EU27+UK. 15% has been subtracted to get EU27 figures, and 2021-11-16_european-aluminium_environmental-profile-report-for-the-aluminium-refining-industry_executive-summary.pdf

[40] The World Copper Factbook 2021 (icsg.org). EU totals for copper consumption have been derived from global consumption using the 15% EU share indicated in the source. The EU total has been subdivided over the various shapes using the distribution of Figure 19, which comes from the same source. Likely that EU in the source does not correspond to EU27. Not clear if and how copper contained in products imported into EU has to be handled. Would require further study.

[41] https://www.caef.eu/wp-content/uploads/2019/01/CAEF-Co7_2020-complete.pdf. The data on castings are production figures for 16 of the EU27 countries (missing: Ireland, Luxemburg, Malta, Cyprus, Greece, Romania, Slovakia, Estonia, Latvia, Lithuania, Netherlands). Most country data are for 2020, some for most recent year available. Production of Norway, Switzerland, Turkey and United Kingdom has not been counted.

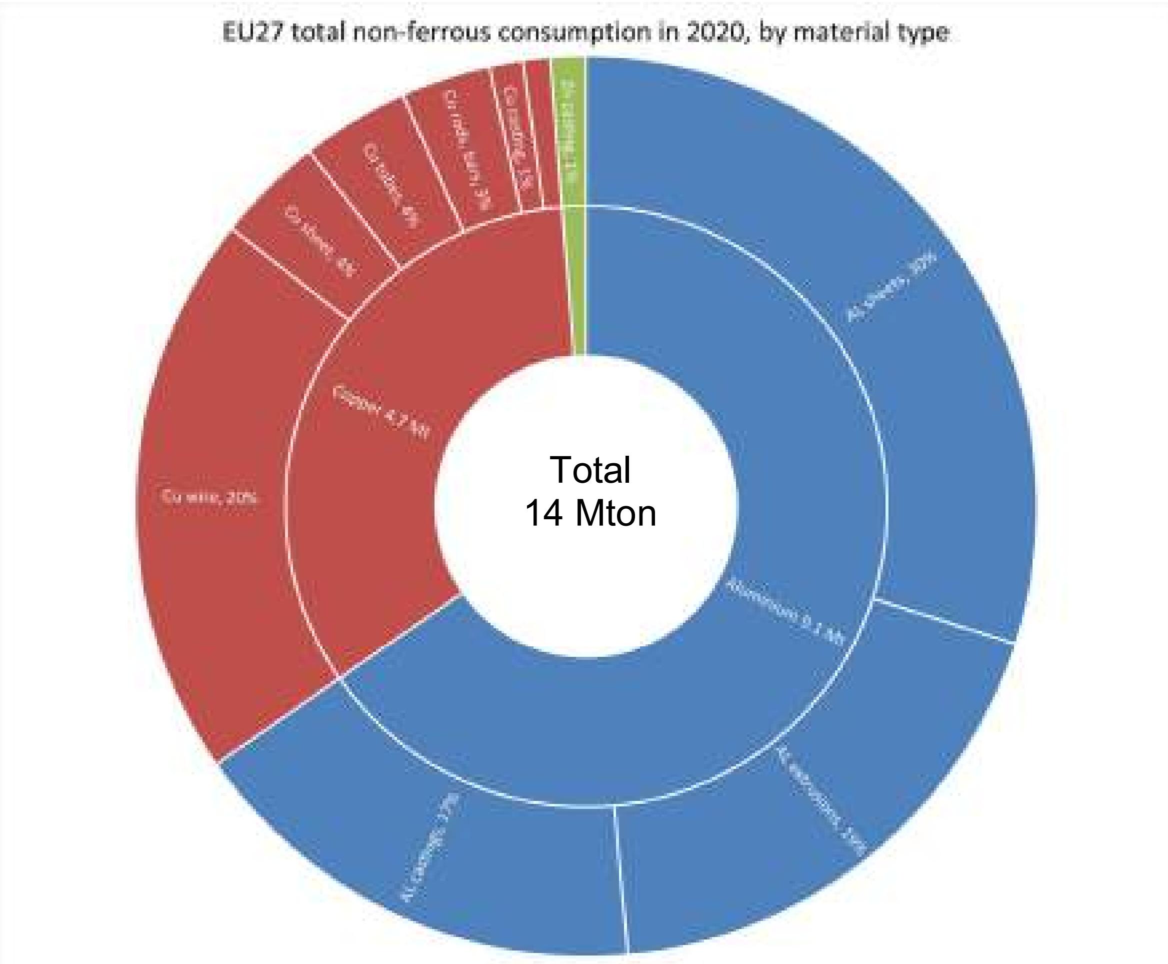

Figure 19. EU27 total non-ferrous metals consumption (Mton) in year 2020, per category (aluminium, copper, zinc) and per type.

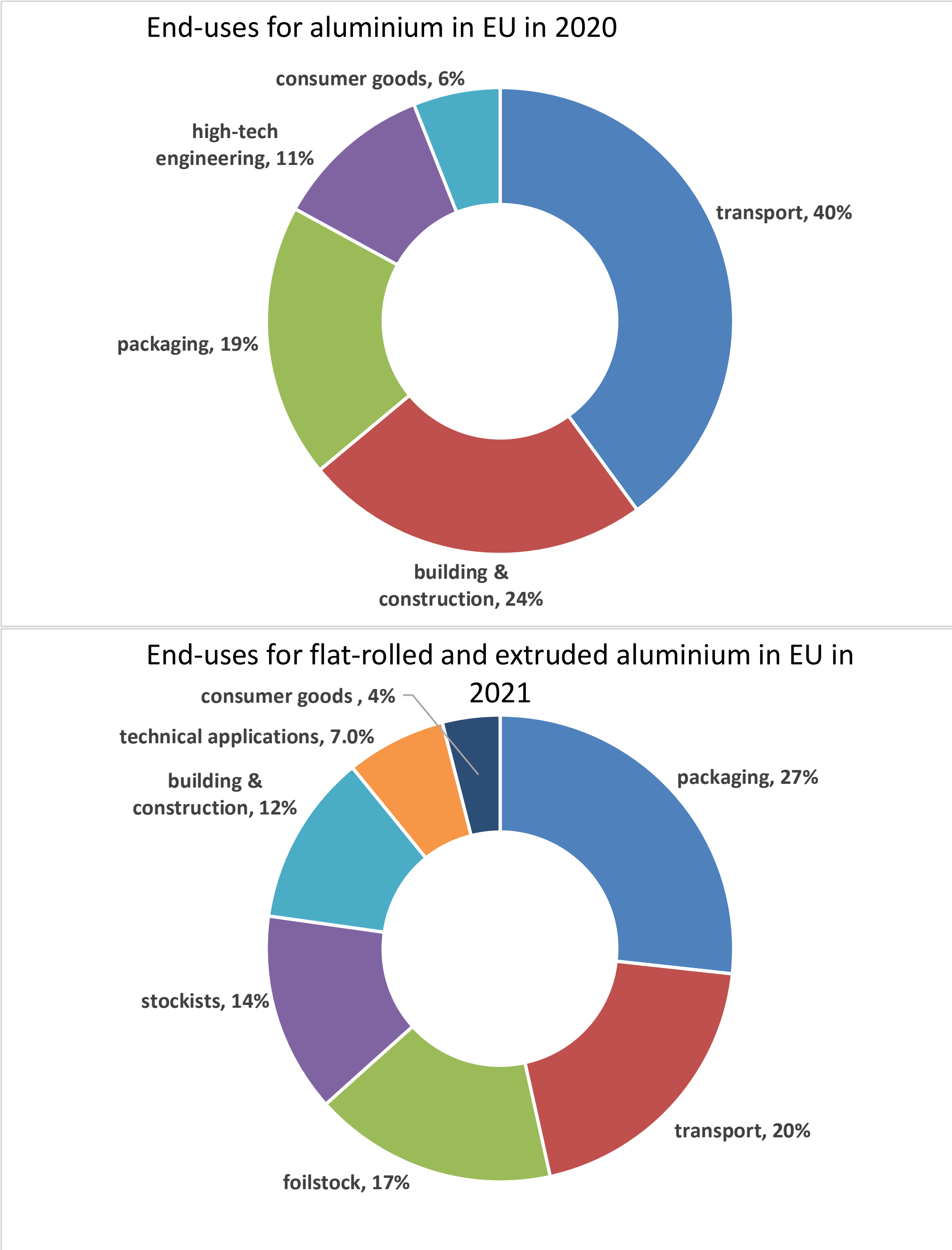

Figure 20. EU27 consumption of aluminium per application. Top graph for all aluminium in year 2020 from source [42] , bottom graph for flat-rolled and extruded aluminium in year 2021 from source [43]. See note for differences [44]

[42]2021-11-16_european-aluminium_environmental-profile-report-for-the-aluminium-refining-industry_executive-summary.pdf

[43] https://www.european-aluminium.eu/activity-report-2021-2022/market-overview/

[44] The two figures for aluminium are from different sources and the reason for the large differences between them could not be traced. The difference might be in the types of aluminium products considered, but also in the years considered. In the period 2019-2021 the Covid pandemic had large influences on the market.

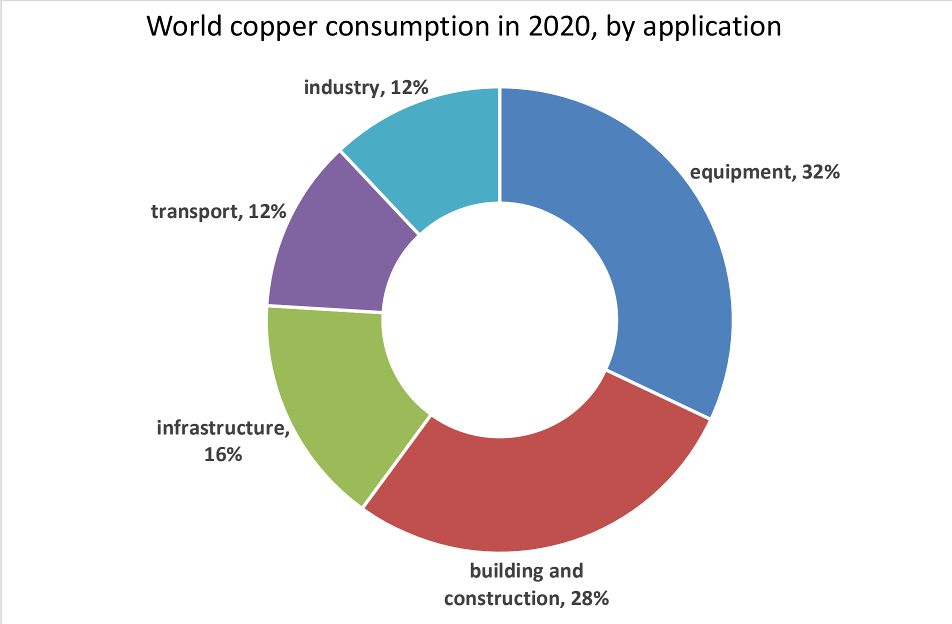

Figure 21. World consumption of copper per application. Source [45].

Table 8 : EU27 total consumption of non-ferrous metals in 2020 compared to non-ferrous metals contained in EIA products sold in 2020

Non-ferrous metals consumption	EU27 Total kton	EIA Products kton	EIA/EU
AL sheet/extrusion	6776	205	3.0%
Light castings / AL diecast	2343	372	15.9%
Aluminium total	**9119**	**578**	**6.3%**
Cu-wire (incl. winding wire)	2835	372	13.1%
Cu-tube/sheet	1215	241	19.8%
Cu-other semis	450		
Cu-alloy castings / CuZn38	167	77	45.9%
Copper total	**4667**	**689**	**14.8%**
ZnAl4 casting	179	16	9.0%
MgZn5 casting		12	
Total ferro-metals	**13966**	**1296**	**9.3%**

6.4. Miscellaneous materials

Glass

According to Glass Alliance Europe [46], the total EU27 apparent consumption of glass in 2020 was 29815 kton. The glass contained in EIA products sold in 2020 is 395 kton (1.3%).

[45] The World Copper Factbook 2021 (icsg.org).

[46] Glass Alliance Europe, Panorama of the EU glass industry, apparent consumption, for EU28 in kton: container glass 22478, flat glass 10375, domestic glassware 1152, continuous reinforcement fibres 1238, special glass 533, other glass 539, total 36315 kton. Subtracting reinforcement fibres (already counted under TEC plastics) and subtracting 15% for UK, the total becomes 29815 kton.

Paper and cardboard

According to CEPI [47], the total EU27 consumption of paper and cardboard in 2020 was 64000 kton. The paper and cardboard contained in EIA products sold in 2020 (including their packaging and documentation) is 527 kton (0.8%) [48].

Rubber

According to ETRMA [49], in 2020 the demand for natural rubber in EU27 was 930 kton, of which 73% (679 kton) for tyres and 27% (251 kton) for general rubber goods (GRG). In the same year, the demand for synthetic rubber was 2050 kton, of which 45% (923 kton) for tyres and 55% (1127 kton) for GRG.

In EIA, tyres sold in 2020 contain 913 kton of natural rubber (134% of the EU total for tyres from ETRMA) and 830 kton of synthetic rubber (90% of the ETRMA total for tyres), for a total of 1743 kton (109% of ETRMA combination for tyres). The main reason that EIA rubber content of tyres is higher than ETRMA values, is probably that EIA does not consider the dip in sales in 2020 due to the Covid pandemic [50].

There are no other products in EIA that consume natural rubber. Other products in EIA that consume synthetic rubber are washing machines (18 kton), vacuum cleaners (4 kton), dishwashers (3 kton), laundry dryers (2.3 kton), phones and coffeemakers (1.2 kton) and cooking appliances (0.8 kton), for a total of 29 kton. This is 2.6% of the EU total synthetic rubber for GRG of 1127 kton.

Table 9 : EU27 total consumption of glass, paper, cardboard and rubber in 2020 compared to the same materials contained in EIA products sold in 2020

Miscellaneous materials consumption	EU27 Total kton	EIA Products kton	EIA/EU
Glass	29815	395	1.3%
Paper and cardboard	64000	527	0.8%
Natural rubber for tyres	679	913	134%
Natural rubber for GRG	251	0	0%
Natural rubber total	930	913	98%
Synthetic rubber for tyres	923	830	90%
Synthetic rubber for GRG	1127	29	2.6%
Synthetic rubber total	2050	859	42%
All rubber for tyres	1602	1743	109%
All rubber for GRG	1378	29	2.1%
All rubber total	2980	1772	59%

GRG: general rubber goods

[47] Confederation of European Paper Industries, Key-Stats-2020-FINAL.pdf (cepi.org) Reporting seems to be for CEPI member countries, which are: Austria, Belgium, Czech Republic, Finland, France, Germany, Hungary, Italy, The Netherlands, Norway, Poland, Portugal, Romania, Slovakia, Slovenia, Spain, Sweden, and United Kingdom. Total paper and cardboard consumption in 2020 is 70984 kton, of which 41298 packaging paper and board, 18412 graphic paper, 7754 sanitary and household paper and 3519 kton other paper and board. Subtracted 10% to remove UK and add missing EU27 countries: 64000 kton of paper and cardboard.

[48] This does not count the graphic paper consumed by imaging equipment during printing.

[49] European Tyre and Rubber Industry, statistics edition 2021, page 42 and following, source IRSG. Data on p.42 are announced to be for EU+UK, but later graphs clarify that 2020 data are for EU27.

[50] Other reasons might be the applied factors for Brexit. EIA could also reconsider the shares natural vs synthetic rubber assumed in BoMs underlying EIA data, and check if EIA masses for rubber still contain a share of mass for fillers.

6.5. Comparison overview

Considering plastics, metals, glass, paper and cardboard, and rubber, the content of EIA products sold in 2020 is 4.1% of the EU27 total consumption of these materials in 2020. As shown in Table 10, the largest share (59%) is for rubber, almost entirely for the tyres. Another relatively large share (9.3%) is for non-ferrous metals (aluminium and copper). For a further detailed breakdown of each material categroy, and sources for the EU27 totals, see the preceding subsections.

Table 10 : EU27 total consumption of plastics, metals, glass, cardboard/paper and rubber in 2020 compared to the same materials contained in EIA products sold in 2020

Materials consumption, comparison overview	EU27 Total kton	EIA Products kton	EIA/EU
Bulk plastics [51]	36097	1073	3.0%
TEC plastics	9545	676	7.1%
Ferrous metals	140966	6500	4.6%
Non-ferrous metals	13966	1296	9.3%
Misc., glass	29815	395	1.3%
Misc., paper & cardboard [52]	64000	527	0.8%
Misc., rubber	2980	1772	59%
Total	**297369**	**12239**	**4.1%**
Coatings		59	
Electronics		340	
Other miscellaneous		3064	
Other packaging		65	
Total		**15767**	

6.6. Concluding remarks

Note that this study is **not** to be used as a priority listing for circular economy policy measures. This analysis is an important part of the puzzle, but for proper decision support a comprehensive assessment is needed. For instance, there can be negative trade-offs between longevity and safety (e.g. for tyres) and between longevity and energy consumption. Longevity of products slows down the introduction of more energy efficient new products, which is important for products where there is still a large energy saving potential (refrigerators, electronic displays). Also recycling plays a role, e.g. cooking appliances have a relatively high materials input, but most of these materials are metals and easy to recycle. Furthermore, this special report uses ‘mass’ as a parameter, but in a more comprehensive assessment all environmental impact categories of the EcoReport (energy, carbon emissions, acidifying emissions, etc.) have to be considered in all phases of the product life cycle. Last but not least, the current analysis makes an inventory of the materials that end up in the final product. It does not take into account production waste,

[51] Includes LDPE and EPS used for packaging of EIA products

[52] Includes paper and cardboard (and wood) used for packaging of EIA products

which may add some 10-15% (after primary scrap recycling). The resources consumption during use (part of the main EIA analysis) is not integrated here. Additional information can be found in the 'EcoReport for the average EIA product' [53], published in 2016 and not updated since.

Also note that this analysis is based on a harmonised compilation of Bills of Materials (BoMs) over a 16-year time period (2005-2021) performed by different contractors with varying levels of detail and quality. The authors have taken great care to use the best available data, but can assume no liability for the reliability of the data and its use.

[53] 'EcoReport for the average EIA product', VHK for the European Commission, December 2016, https://www.vhk.nl/research/eia.htm

Annex A. Material categories and types

Material Category	Material Type
Bulk Plastics	LDPE
	HDPE
	LLDPE
	PP
	PS
	EPS
	HI-PS
	PVC
	SAN
	PET
	ABS
TEC Plastics	PA 6
	PC
	PMMA
	Epoxy
	Rigid PUR
	Flex PUR
	Talcum filler
	E-glass fibre
	Aramid fibre
Ferro	St sheet galv
	St tube/profile
	Cast iron
	Ferrite
	Stainless 18/8 coil
Non-ferro	Al sheet/extrusion
	Al diecast
	Cu winding wire
	Cu wire
	Cu tube/sheet
	CuZn38 cast
	ZnAl4 cast
	MgZn5 cast

Material Category	Material Type
Coatings	pre-coating coil
	powder coating
	Cu/Ni/Cr plating
	Au/Pt/Pd
Electronics	LCD screen
	CRT screen
	big caps & coils
	slots / ext. ports
	large IC
	small IC
	SMD/ LED's avg.
	PWB 1/2 lay 3.75 kg/m2
	PWB 6 lay 4.5 kg/m2
	PWB 6 lay 2 kg/m2
	Solder SnAg4Cu0.5
	PWB assembly
	Controller board
Miscellaneous	Glass
	Bitumen
	Cardboard
	Paper
	Concrete
	Refrigerant
	Natural Rubber
	Synthetic Rubber
	Fillers for Rubber
	Other
Packaging	Cardboard
	Paper
	LDPE
	EPS
	Other packaging

Annex B. Bills of Materials sources

Acro	Product	Source and remarks	Year
DWH	Dedicated Water Heater	**Source for BoMs**: Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review Study Task 5, Environment & Economics, FINAL REPORT, VHK for the European Commission, July 2019. **Remarks:** The BoMs in the 2019 review study are a new elaboration of the original data from the 2007 preparatory study. They are directly available for all DWH base cases listed in EIA.	2019
CHC	Central Heating Combis for water heating	Central heating combis (CHCs) are used both for water heating and space heating. Their material content has been registered only under Central Heating Boilers for space heating, multiplying by the sales and stock for these space heaters.	n/a
CHB	Central Heating Boiler	**Source for BoMs**: Space and Combination Heaters, Ecodesign and Energy Label, Review Study Task 5, Environment & Economics, FINAL REPORT, VHK for the European Commission, July 2019 **Remarks**: - The BoMs in the 2019 review study are a new elaboration of data from various sources with years ranging from 2007 to 2019. - BoMs are assumed to cover all CHC and CHB base cases for both WH and SH that are in EIA, although it is not completely clear in how far storage cylinders are included. - BoM data in source are more detailed than the base cases in EIA, e.g. with split between <70 kW, 70-400 kW and >400 kW. This size-distinction is not made in EIA. >400 kW is currently not regulated, therefore not in EIA, and thus data have been ignored. For <70 kW and 70-400 kW, a sales-weighted average is used for the EIA base cases, based on the 2016 sales reported in source. - EIA does not distinguish between ASHP and GSHP, between gas sorption HP and gas engine HP, between mCHP types Stirling, engine and fuel cell. Sales-weighted average is used for the EIA base cases, based on the 2016 sales reported in source. - EIA does not distinguish between small (4 m2) and large (16 m2) solar. EIA uses only 16 m2 as reference, so material data for 4 m2 have been ignored. - No specific BoMs are available for gas-fired jet burners. Values have been set identical to those for oil-fired jet burners.	2019
SFB	Solid Fuel Boilers	No new data. Same BoMs used as in the 2016 analysis, but some copying errors from BoMs to overall table have been corrected.	2009
AHC	Central Air Heating & Cooling	No new data. Same BoMs used as in the 2016 analysis. - Only one BoM was available for an AC chiller (400kW) and one for a WC chiller (900kW). BoMS for other chillers listed in EIA were derived considering the total weight/kW ratios from the prep.study and applying the same distribution over the material categories. - Air conditioners used for cooling and for heating are the same product, and material content has now been accounted only under cooling (2016 analysis seems to have double counted part of the weights). - For ACs splits and VRF there are BoMs from different studies, with large differences between them, and the situation is not clear. The current analysis combines 50%/50% the different BoMs for AC Splits and for AC VRF. The BoM for AC rooftop is unique and has directly been used. - For AHF there are three BoMs, but there is only one aggregated entry in EIA. Previous analysis used the following sales distribution to compute sales-weighted average BoM: 10% Residential warm air heater [lot 21, BC1A] - 15 kW, 29% Warm air heater [lot 20, BC7] - 40 kW, 57% Non-residential warm air heater [lot 21, BC1B] - 120 kW. New analysis copied the same approach. - No BoM's were available for HTPCH, but they have been derived here (same values used as in 2016 analysis). Used same method and data as for chillers: weight/kW ratio to calculate total weight and apply same relative material shares. - No BoMs available for CHF, ACF and AHE: left empty. - Refrigerants were not taken into account as construction materials in the 2016 analysis. They have been added in the 2022 analysis from the EIA2018 report, sheet EMISSRATES, where they were still included (later removed from EIA).	2012
LSH	Local Space Heaters	- For solid LSH there is no review study, so no new information. Same data used as in 2016 analysis. However, in previous analyses, refractory ceramics, which is a large weight, did not end up in overall totals. This has been changed in the 2022 analysis. They are part of miscellaneous now. - For electric, gas and liquid fuel LSH, BoMs have been taken from Review study on Local Space Heaters, Final report, Viegand Maagøe and Danish Technical Institute, May 2019. This source states that material composition has not changed since the prep. study and thus uses 2012 BIO Intelligence study data (with some adaptations). The EIA 2016 materials data were quite different, and probably based on additional BoMs, received during the 2014 data collection. These data are clearer as regards split between product and packaging. The sources are relatively clear on the material group (plastic, ferro, non-ferro), but not on the precise type of material in that group. The situation with the various BoMs introduces uncertainty. The 2022 analysis sometimes uses data from the review study, sometimes from the 2016 analysis, sometimes a mix.	2012 (solid) 2019 (other)
RAC	Room Air Conditioner	**Source for BoMs**: Review of Regulation 206/2012 and 626/2011 Air conditioners and comfort fans, Task 5 report ENVIRONMENT & ECONOMICS, Final version, Viegand Maagøe and Armines, May 2018. However, data in review seem essentially to have been copied from the preceding 2012 prep.study. **Remarks**: - BoMS are available also for Comfort fans, but these are not accounted in EIA, so ignored. - In the 2016 analysis, portable air-conditioners were not included because they were not separately identified in EIA. In EIA2020 there are separate data for portable RACs, so	2018

Acro	Product	Source and remarks	Year
		they are included now. - As almost all RACs are reversible, BoMs for reversible have been used for all RACs (difference in weight between cooling-only and reversible is small anyway). - Similar to the approach for central ACs, all RAC material data are accounted under the cooling function, and no data are entered under the heating function. - Refrigerants (charges declared in review study) have been subtracted from miscellaneous 'other' and registered separately. - PCBs (weights declared in review study) have been subtracted from controller board and registered separately as 6 lay 2 kg/m2 PCB (assumed)	
CIRC	Circulator pumps <2.5 kW	**Source for BoMs**: Review study on Circulators, Final report, Viegand Maagøe, April 2018. The review study copies the BoMs from the 2008 study, raises some doubts if they are still valid, but does not present alternatives. **Remarks**: - Review study notes that the 2008 BoMs are without VSDs / controllers, and hence do not include any Electronics. However, no information is supplied allowing to estimate the material contents of these controllers. - Reference powers in EIA are smaller than those associated with the BoMs, but BoMs have not been scaled for this (same as in EIA2016 analysis). - Especially for integrated circulators, there might be a material-overlap with central heating boilers (uncertain in how far circulators have been included there). Full sales and stock for circulators have been used.	2018
VU	Ventilation Units	**Source for BoMs**: Ventilation Units, Ecodesign and Energy Labelling, Preparatory Review Study, Phase 1.1 and phase 1.2, Final Report TASK 5. Base Cases, VHK, August 2020. The review study copies the BoMs from the 2009 and 2012 preparatory studies, stating that they still seem sufficiently representative. **Remarks**: - The reporting in the review study is per material group, not for each material type. The distribution over the types has been derived from information for NRVUs in the associated prep.study. - For UVU > 1000 m3/h the total weight of 20 kg seems low compared to other UVU sizes, but it corresponds with the CEXH data in the prep study. - In the 2016 analysis for RVU, material 8-PVC had been accounted as material 2-HDPE. It is not clear if this is an error or an intentional correction. In the new analysis 8-PVC has been used.	2019
LS	Light Sources	- For **non-LED**, BoMs have been taken from the 2015 review study and are identical to those used in the EIA 2016 analysis. Some values have been corrected. - For **LEDs**, the 2015 review study had only one BoM for a 1000 lm LS (to which EIA 2016 applied a scale factor 0.62 for 620 lm). This is not adequate to represent all LED LS types present in EIA2020, so an attempt has been made to check and improve, using reference data from 'LED catalogue Data and EL - VHK-LW20180507.xlsx' (internal VHK database for light sources). Details in specific Excel for EIA Materials.	2015
DP	electronic DisPlays	No new information; essentially same data used as in EIA 2016 analysis. Some BoM data go back to original 2005 prep.study, but later elaboration in 2015. Also used as reference: JRC Technical Reports, Analysis of material efficiency aspects of Energy related Product for the development of EU Ecolabel criteria, Analysis of product groups: personal computers and electronic displays, June 2016 **Remarks**: - The available BoMs do not distinguish between NoNA, LoNA and HiNA TVs: the same data have been used for all types. - The BoM for Monitors is 4/9 of the BoM for TVs, as derived in the 2016 analysis (except for pedestal, power cord and manual). - No BoM is available for signage displays	2015
STB	Set Top Boxes	No new information; essentially same data used as in EIA 2016 analysis. **Remarks**: - Simple STB assumes 94% with plastic housing and 6% with PVR. - Complex STB assumes 71% without additional features and 29% with harddisk.	Simple: 2007 Complex: 2008
GC	Game Consoles	Essentially the same data have been used as in the EIA 2016 analysis. Total weights have been checked online with data for PS1-5 and XBOX-models and found to be reasonable. A new BoM was derived for game consoles < 20W, dividing the reference BoM by 2. This gives a total weight comparable to the average of various Nintendo models.	2021
ESDS	Servers and Data Storage	No new information; essentially same data used as in EIA 2016 analysis, which were based on: Preparatory study for implementing measures of the Ecodesign Directive 2009/125/EC DG ENTR Lot 9 - Enterprise servers and data equipment Task 5: Environment & Economics, July 2015 – Final report, Bio by Deloitte and Fraunhofer IZM. **Remarks**: - The new EIA subdivision has many more base cases than the 3 for which a BoM is available, so assumptions are needed. Although some information would be available to scale the BoMs, for example using the energy consumption for the various base cases, such a scaling would be disputable and uncertain. It has been preferred to simply apply the BoM for rack servers (and blade servers) to all EIA base cases for rack servers (and blade servers) in the same way. This is anyway a better estimate than leaving many base cases empty. - No BoM is available for tower servers. However, rather than declaring that no BoM is available and setting all material to zero, it seems a better estimate to use the BoM for rack servers. - The BoM for storage servers seems to be for Online categories 2 and 3. The same BoM has been used for category 4 (low sales anyway; better than setting everything to zero).	2015
PC	Personal Computers	**Sources used**: - Preparatory study on the Review of Regulation 617/2013 (Lot 3), Computers and Computer Servers, Task 4 Technologies and Simplified tasks 5 & 6 report, Base cases and	2016 (workstation, thin

Acro	Product	Source and remarks	Year
		Design options, Final version for consultation, VITO and Viegand Maagoe, February 2017 - JRC Technical Reports, Analysis of material efficiency aspects of Energy related Product for the development of EU Ecolabel criteria, Analysis of product groups: personal computers and electronic displays, June 2016 - JRC Technical Reports, Analysis of material efficiency aspects of personal computers product group, January 2018 - Ecodesign preparatory study on mobile phones, smartphones and tablets, Final Report. Fraunhofer IZM ISI, VITO, February 2021 **Remarks**: - For desktops and notebooks, total weights have been redetermined based on the sources above, but the subdivision over material types is based on the original BoMs of the 2005 prep.study. - For tablets, total mass is based on the dedicated 2021 study, but distribution over material types has been estimated here (and is approximate). - Integrated desktops: scaled the BoM for desktops, but added a display twice the weight of a notebook screen. - Thin client: no new information: use 1/10 of 2005 desktop BoM (same as EIA 2016). - Workstation: no new information: use 1.5 times 2005 desktop BoM (same as EIA 2016). - Integrated thin client: by lack of info, set identical to thin client, but add a display twice the weight of that of a notebook. - Small-scale server: set identical to workstation. (for details see dedicated Excel on EIA Materials)	clients) 2021 (others)
IE	Imaging Equipment	**Source for BoMs**: Revision of Voluntary Agreement on Imaging Equipment, Task 1-7 Final Report, Viegand Maagøe, October 2019. The total masses per material category are new from the review study, but distribution over material types is scaled from 2007 BoMs. There is no BoM for laser Copiers (only for MFDs). As sales of Copiers drop to zero by 2020, this is not a critical lack of data. For Copiers, the same BoM is used as for SFD Printers.	2019
SB	(networked) Stand-By	- For projectors, media players and recorders there are no new data; same data used as in EIA 2016 analysis (based on 2010 prep.study. - For home and office phones, the data from 'Ecodesign preparatory study on mobile phones, smartphones and tablets, Final Report. Fraunhofer IZM ISI, VITO, February 2021', section 21.6 for cordless DECT phones have been used. - For coffee makers, the data from 'Preparatory Studies for Ecodesign Requirements of EuPs (III), Lot 25 Non-Tertiary Coffee Machines, Task 4: Technical analysis of existing products – Final version, July 2011, Bio Intelligence Service and ARTS' have been used, taking sales-weighted average over the BoMs for 5 base cases, using 2020 sales from Task 2 of the same source, as estimated in 2011. - For other products regulated only for standby, no BoMs available (left empty)	2010 (projectors, video) 2021 (phones, coffeemakers)
EPS	External Power Supplies	- The BoMs used in EIA2016 analysis came from: Preparatory Studies for Eco-design Requirements of EuPs, Lot 7 Battery chargers and external power supplies, Final Report, January 2007, Bio Intelligence Service, Fraunhofer IZM, CODDE. - The 2012 review study and the 2019 impact assessment do not provide information on EPS masses and material composition. Some information is presented in: 'ADDITIONAL ASSESSMENT IN THE FRAME OF THE REVIEW STUDY ON COMMISSION REGULATION (EC) NO. 278/2009 EXTERNAL POWER SUPPLIES, March 2014, Final Report, Viegand Maagoe', which frequently refers to: 'An energy-aware survey on ICT device power supplies, GeSi, ITU, Univ. Genova, 2012'. - The EIA2021 material analysis essentially uses the same 2007 BoMs as the previous analysis, but elaborating data in a different way, because base cases are formulated differently in EIA now. For total masses per EPS type, the document from GeSi/ITU has been used as reference. Compared to the 2016 analysis, this causes differences per material group and material type: some BoMs are no longer used and others weighted differently.	2021
RF	Household Refrigeration	**References:** [1] Preparatory Studies for Eco-design Requirements of EuPs, Lot 13 Domestic Refrigerators & Freezers, Final Report Draft Version Tasks 3-5 (plus Annexes), December 2007, ISIS, ENEA, Univ.Bonn [2] Preparatory/review study, Commission Regulation (EC) No. 643/2009 with regard to ecodesign requirements for household refrigeration appliances and Commission Delegated Regulation (EU) No. 1060/2010 with regard to energy labelling of household refrigeration appliances, FINAL REPORT, VHK, ARMINES, Viegand & Maagøe, Wuppertal Institute, VITO, March 2016 **Remarks:** - Ref [1] (2007) presents BoMs for refrigerator, fridge-freezer, upright freezer and chest freezer. - Ref [2] (2016) used these BoMs, scaling them to get average total weights from 2014 CECED database. Ref [2] also added a BoM for winecooler. - The EIA 2016 analysis already used the BoMs from 2016 review study, and there is no new information since that. - This EIA2021 analysis uses the same BoMs, determining a single sales-weighted average BoM for the single EIA base case, using the 2015 sales distribution reported in ref [2]. - The data for packaging as reported in ref [2] were added to the EIA 2016 BoMs. - Refrigerant data have been separated from 'other'.	2016

Acro	Product	Source and remarks	Year
CF	Refrigeration appliances with a direct sales function (Commercial Refrigeration)	**References:** [1] Preparatory Studies for Eco-design Requirements of EuPs, Lot 12 Commercial refrigerators and freezers, Final Report, December 2007, Bio Intelligence Service. [2] Ecodesign for Commercial Refrigeration, Preparatory study update, Final report, JRC 2014. **Remarks:** - The original BoMs come from ref [1] Task 5. - Ref [2] used the BoMs of ref [1], and so did the EIA2016 analysis. - RVC2 and RHF4 are Remote units, and indeed compressor and condenser (the remote condensing unit) is not included in the BoMs. Refrigerant is also not in those BoMs. Where refrigerants are present in the 2007 BoMs, they have now been registered separately and removed from the 'other' amount. - For Ice Cream Freezers, the original BoM for many components specified only the material group, without detailed material type. The EIA 2016 analysis put all associated masses under 'other', but something went wrong, because total mass doubled compared to the 2007 BoM of 74.5 kg. The 2021 analysis divides the 'other' mass in more detail, following the subdivision for beverage coolers for the same components. - For the supermarket non-base-case, the EIA2016 analysis derived a BoM, based on the BoMs for RVC2 and RHF4 for the remotes (40% share) and adding a condensing/compressing unit for the plug-ins (60% share). This BoM has been re-used in the 2021 analysis, but separating the packaging and adding some refrigerant for the plug-ins.	2007 (others) 2016 (non-BCs) 2021 (ice cream)
PF	Professional Refrigeration	**References:** [1a] Preparatory Studies for Eco-design Requirements of EuPs, Lot 1 Refrigerating and freezing equipment, Task 5: technical analysis of improvement options, Final report, May 2011, BIO IS [1b] same, but Task 4 report. **Remarks:** - **Storage cabinets**: single BoM available from ref [1b] has been used in EIA2016 analysis. EIA2021 analysis uses same BoM, but scales for the four different EIA base cases based on internal volume, separates packaging mass, adds refrigerant mass, and makes some corrections (15.9 kg were missing in EIA2016). Ref [1a] and ref [1b] report different data, which adds to uncertainty. - **Process Chillers**: No detailed BoM available in ref [1]. EIA2016 analysis derived BoMs from data for comfort chillers (GROW E6 study), using the same distribution over material types and scaling for total mass. In EIA2021 base cases are different, distinguishing between AC (air cooled) and WC (water cooled), between MT and LT, and on cooling capacity. Based on information in ref [1], the new analysis derived a basic BoM for a water-cooled CH with cooling capacity of 264 kW. For the other base cases this BoM was scaled in function of cooling capacity, subtracting 7.5% if MT and adding 7.5% if LT, and subtracting additional 10% if air-cooled. No packaging and manuals are included for the chillers (no data available). Refrigerants added from EIA2018. These values are much higher than the 100-250 g in table 5-72 of [1a]. Also here, information in refs [1a] and [1b] is not the same. - **Condensing Units (RCU)**: No detailed BoM available in ref [1]. EIA2016 analysis derived BoMs using the relative material composition of the hermetic compressor BoM + fan+motor BoM (but did not consider the condenser). New EIA2021 analysis derives a basic BoM for the average mass of RCU MT and RCU LT of ref [1b] 4.9.2 of 152 kg, using the distribution over material categories of the same ref [1b] 4.9.2. Within each category further distribute over the material types using the subBoMs for compressor, motor/fan and condenser module. For the EIA base cases scale this basic BoM in function of cooling capacity, subtracting 10% if MT and adding 10% if LT. No packaging and manuals are included for the RCUs (no data available). Refrigerants added from EIA2018. These values are in line with those in table 5-74 of [1a]. Also here, information in refs [1a] and [1b] is not the same. For the commercial refrigeration remote base cases, the RCUs are not included in the BoMs, so assume that there is no double counting issue.	2021
CK	Cooking Appliances	**References:** [1a] Preparatory Studies for Eco-design Requirements of EuPs, Lot 22 Domestic and Commercial Ovens, Task 5 Base Cases, Final version, BIO IS, ERA, August 2011. [1b] same as [1a] but Task 4 Technical Analysis [2] Preparatory Studies for Eco-design Requirements of EuPs, Lot 23 Domestic and Commercial Hobs and Grills, Task 4 Technical Analysis, Final version, BIO IS, ERA, August 2011. [3] Preparatory study on the environmental performance of residential room conditioning appliances (airco and ventilation), Study on residential ventilation - Final report, February 2009, ARMINES et al [4] Review study of Ecodesign and Energy Labelling for Cooking appliances, JRC, 2nd draft corrected, April 2021 **Remarks:** - **Ovens**: new BoM data from ref [4] have been used for the EIA2021 analysis, for both electric and gas ovens. - **Gas Hobs**: For gas hobs, ref [4] uses the same BoM as in ref [2], and thus the same as used in the EIA2016 analysis. No change for EIA2021. - **Electric Hobs**: For electric hobs, ref [4] distinguishes between radiant hobs and induction hobs. There is a description of types of materials used for induction hobs and a mass breakdown per category for radiant and induction. The detailed breakdown per material type lacks in ref [4] but has been derived based on the breakdown in ref [2] and descriptions in ref [4]. A sales-weighted average BoM over radiant (40%) and induction (60%) has been used for EIA electric hobs. - **Range Hoods**: Ref [4] provides new BoM data for cooking fume extractors, for chimney-type and cabinet-type, but only per material category. Total masses are smaller than in EIA2016 (based on ref [3]). Detailed breakdown of category-masses of ref [4] derived	2021

Acro	Product	Source and remarks	Year
		here based on breakdown in EIA2016. A sales-weighted average BoM over chimney-type (55%) and cabinet-type (45%) has been used for EIA.	
WM	household Washing Machine	**Source for new BoMs**: Ecodesign and Energy Label for Household Washing machines and washer dryers, Preparatory study Final report, JRC, Oeko-Institut, Univ. Bonn, 2017 - Source provides new BoMs for 7 kg WM and WD. These BoMs have been used directly for the EIA2021 analysis. - EPDB (rubber for door seal) was classified as LDPE in source; here put under 94-Synthetic Rubber.	2017
DW	household Dishwashers	**Source for new BoMs:** Ecodesign and Energy Label for Household Dishwashers, Preparatory study Final report, JRC, Oeko-Institut, Univ. Bonn, 2017. - Source provides new BoMs for 9 ps and 13 ps DWs. These BoMs have been model-weighted averaged (15%-85%) for the EIA2021 analysis. - EPDB (rubber for door seal) was classified as LDPE in source; here put under 94-Synthetic Rubber. Silicon was unclassified, here also put under 94. - Paper is assumed to be documentation and manuals, so moved to packaging section.	2017
LD	household Laundry Dryer	**References:** [1] Ecodesign of Laundry Dryers, Preparatory studies for Ecodesign requirements of Energy-using-Products (EuP) – Lot 16, Final Report, March 2009, Pricewaterhouse Coopers et al. [2] Review study on household tumble driers, Final report, June 2019, Viegand Maagøe **Remarks:** - The EIA2016 analysis used data from ref [1]. The data in [1] in the various tables are not always the same, which gives confusion. EIA2016 seems to have inverted some of the values. - Ref [2] presents new BoMs, including also heat pump dryer, but the specification is not very detailed (only category totals provided). The detailed breakdown of ref [1] has been used, but scaling to the category totals of ref [2] where necessary. A rough estimate for packaging has been added, based on ref [1]. - Refrigerant added for heat pump dryers according to ref [2]. - BoM for vented gas taken identical to vented electric (same done in ref [2])	2019
VC	Vacuum Cleaners	**References:** [1] Work on Preparatory Studies for Eco-Design Requirements of EuPs (II) Lot 17 Vacuum Cleaners TREN/D3/390-2006 Final Report, AEA/ED04902/Issue 2, February 2009 [2] Review study on Vacuum cleaners, Final report, Viegand Maagøe A/S, Van Holsteijn en Kemna B.V., June 2019 [3] Technical support for Environmental Footprinting, material efficiency in product policy and the European Platform on LCA, Durability assessment of vacuum cleaners, Silvia Bobba, Fulvio Ardente, Fabrice Mathieux, JRC November 2015 [4] Life cycle environmental impacts of vacuum cleaners and the effects of European regulation, Alejandro Gallego-Schmid, Joan Manuel F. Mendoza, Harish Kumar Jeswani, Adisa Azapagic, Science of the Total Environment 559 (2016) 192-203 [5] Evolving towards a more sustainable vacuum cleaner - are we seeing greater reduction of energy consumption, fewer input resources, and more recycling?, VHK presentation 2020. **Remarks:** - EIA2016 used the BoM data from ref [1]. - New BoM data are available in the ref [2], which for household canister type VC is based on detailed data in [3]. - The ref [3] hh canister type has a mass of 5.72 kg (plus 1.26 packaging and manuals; total 6.98 kg). In ref [2] for avg household mains VC the mass is 6.78 kg, which could be including packaging and thus close to the ref [3] canister. In ref [4], the ref VC is lighter: 4.5 kg excl packaging, 5.4 kg incl. packaging. As canisters represent 85-90% of the household mains VCs sales, for EIA2021 use the ref [3] BoM for household mains canister type (AND for all mains household VCs as now aggregated in EIA). - In ref [1], commercial VCs weigh around 30% more than household VCs. The increase is mainly in bulk plastics and non-ferro, while Tecplastics are less. In ref [2], commercial VCs weigh around 60% more than household VCs. The increase is in bulk plastics, ferro, non-ferro and misc, while Tecplastics are less. For EIA2021 use same BoM distribution as for ref [3] household canister, but scale per material category, using avg scale factor of ref [1] and ref [2], such that total mass of 11.11 kg matches. - BoMs are available also for Cordless VCs and robots, but as these are not currently regulated, their masses have not been included. - EIA2021 material reporting still uses the VC base cases from EIA2020 (household mains and professional mains, without further split and without battery-operated), but sales and stock for mains-operated VCs have been updated to the new, lower values of EIA2021.	2019
FAN	Industrial Fans >125W	**References:** [1] EuP Lot 11: Fans for ventilation in non residential buildings, Final Report, Fraunhofer ISI, February 2008 [2] Ecodesign Fan Review, Review study of Commission Regulation (EU) No 327/2011, Final report, VHK March 2015 - EIA2016 BoMs were taken directly from ref [1] and no new information was found in ref [2], so EIA2021 analysis uses the same material data as before.	2008
MT	Electric Motors 0.12-1000 kW	**References:** [1] EuP Lot 11 Motors, Final, De Almeida et al, ISR-Univ. of Coimbra, February 2008 [2a] EuP Lot 30: Electric Motors and Drives, Task 5: Definition of Base Case, ENER/C3/413-2010, Final, De Almeida et al, ISR-Univ. of Coimbra, June 2014 [2b] same as [2a], but Task 4: Technical analysis existing products **Remarks:** - At the time of the 2016 analysis, EIA had a single aggregated base case for all motors. The analysis presented BoMs for high efficiency (EEF1) and medium efficiency (EEF2) motors, for capacities 1.1, 11 and 110 kW, based on ref [1]. An estimate was made for	2014

Acro	Product	Source and remarks	Year
		the distribution of sales over these six BoMs, based on information from ref [1]. - Ref [2] presents new BoM data, which have been examined in detail (there are some differences between the various tables of ref [2a] and [2b]) and compared, making a final choice on the data to use in the EIA analysis. - The BoMs in ref [2] are per EcoReport category, sometimes providing further details, but not indicating the precise EcoReport material types. The material types have been chosen during the EIA2016 analysis, and have been used here in the same way. In particular: impregnation material is 14-Epoxy; insulation material is 15-Rigid PUR; electrical steel is 21-Galvanized steel; other steel is 22-St Tube/profile; AL is 27-Al diecast; CU is 28-Cu winding wire; paint is 39-powder coating. - Total mass for packaging materials for motors has been distributed over Cardboard, Paper, LDPE and EPS. VSDs do not have packaging. - The BoMs for motors with VSD are the simple sum of the motor BoM and the VSD BoM of corresponding power. - For explosion, brake and 8-pole motors, no BoM was available. The same BoM has been assumed as for the corresponding 'normal' 4-pole medium motors without VSD (sales quantities are small for these motor types). - For 1-phase motors > 0.75 kW, no BoM was available. EIA has a 1.1 kW power: the BoM for 3-phase induction motors with the same power has been used with a scale factor 1.28 (For 0.37 kW motors, the 1-phase version weighs 28% more than the 3-phase version. The same ratio is assumed for the 1.1 kW motors. This choice has a large impact !) - The BoMs in ref [2] are for small IE1 motors and for other IE2 motors. No BoMs were available for IE3 and IE4 motors. - Medium voltage motors, submersed borehole motors and soft starters are not regulated and thus not accounted in EIA. - It is currently not completely clear if the BoMs for other regulated products include the motor or not. Compressors have been removed from EIA, and BoMs for water pumps are without motors, but . The quantities of sales and stock in the presented material analysis are the full quantities (not reduced for double counting), so that the results for MT are upper limits.	
WP	Water pumps	**References:** [1] Appendix 5: Lot 11 - Water Pumps (in commercial buildings, drinking water pumping, food industry, agriculture), AEA, February 2008 [2] Ecodesign Pump Review Study of Commission Regulation (EU) No. 547/2012 (Ecodesign requirements for water pumps), Extended report (final version), Viegand Maagøe and VHK, December 2018 [3] Masterfile_Task7_VHK_20160616.xlsx (Excel file with analyses for the review study, split in current scope and scope extensions; fixed and variable flow; with and without VSD) **Remarks:** - Essentially, ref [2] uses the same BoMs as ref [1] which was used for the EIA2016 materials analysis. Ref [2] only adds the motor BoM, and where applicable the VSD BoM, but as these masses are already counted separately under MT (see above), they should not be counted here. Consequently, EIA2021 uses the same WP BoMs as the 2016 analysis. - The material analysis for WPs is made for the EIA2020 single aggregated base case but sales and stock have been updated to the new, slightly lower values of EIA2021. The BoM for the EIA aggregated base case is made as a sales-weighted average, using the 2020 sales distribution of ref [3]: 15% ESOB < 22 kW, 2% ESOB 22-150 kW, 15% ESCC < 22 kW, 2% ESCC 22-150 kW, 6% ESCCi < 22 kW, 1% ESCCi 22-150 kW, 45% MSSB (of which 80% 4”, 20% 6”), 16% MS-V (80% small, 20% large).	2008
CP	Standard Air Compressors	This product group has been removed in EIA2021.	
TRAFO	Utility Transformers	**References:** [1] Final Report LOT 2: Distribution and power transformers, Tasks 1 – 7, VITO and BIO IS, January 2011 [2] PREPARATORY STUDY FOR THE REVIEW OF COMMISSION REGULATION 548/2014 ON ECODESIGN REQUIREMENTS FOR SMALL, MEDIUM AND LARGE POWER TRANSFORMERS, Final Report, VITO, July 2017 **Remarks:** - EIA 2016 analysis used BoM data from ref [1]. - Ref [2] provides a new BoM (only) for BC1 Distribution Transformer. This BoM has twice the total weight of the BoM in ref [1]. The BC seems to be the same. Could be that ref [2] refers to an improved version with lower losses, but the reason for the large weight increase is not clear. By lack of further info, in EIA2021 analysis use the average of the two BoMs for BC1. - Wood, paper and cardboard seem to be product materials here, used in insulation, they do not seem to be packaging in this case. EIA2016 in the end transferred all paper and cardboard to packaging, which is not adequate. In EIA2021, maintain them as product materials. - In ref [1], Mineral Oil was accounted as material 4-PP, and counted as Bulk Plastics. For EIA2021, put mineral oil under 99-other. - In ref [1], Ceramics was accounted as 55-Bitumen, and counted as Misc. For EIA2021, put ceramics under glass. - In ref [1], Wood was accounted as 58-Concrete, and counted as Misc. For EIA2021, put wood under cardboard.	2021
TYRE	Tyres	- Tyres have no Ecodesign regulation and consequently have never been analyzed following the MEErP, using an EcoReport based on a bill-of-materials. - The 2016 review report on the tyre labelling regulation (Final Report Review study on the Regulation (EC) No 1222/2009 on the labelling of tyres, Viegand Maagøe, March 2016) does not provide information on the Bill-of-Materials. - The EIA2016 analysis apparently used data from an Excel file, maybe provided ad hoc by Viegand, which contains a rather coarse BoM of rubber & carbon, steel and other (fibres,	2021

Acro	Product	Source and remarks	Year
		fillers). EIA2016 further split Rubber in natural and synthetic using ETRMA data, but the split contained errors and did not distinguish between passenger and truck tyres, which use different ratios. Considering the carbon as part of the rubber, with 70% of total weight does not seem adequate: rubber weight is around 43-45% of total. **Changes for the EIA2021 analysis**: - The total weights per tyre type have been maintained from the EIA2016 analysis. They seem compatible with info from other references. - The distribution of the total weight over the EcoReport material types has been changed and is now based on https://www.ustires.org/whats-tire-0. The distribution is different for truck tyres. This should correctly handle natural and synthetic rubber shares. - The filler materials (e.g. carbon black and silica) are a high share of overall weight (24-26%). It would be misleading to register them under 17-Talcum fillers because they would then account under TecPlastics. A new material 95-Fillers for Rubber has been created to keep this under Miscellaneous. - Textile (low weight share) has been spread out over PET (polyester), PA6 (nylon) and Aramid (no match found for rayon). This seems preferable over a registration as 'Other'. - The steel used in tyres are coated wires. Not so clear which EcoReport material to use for this, but 22-St Tube/Profiles seems better than 21-St Sheet galvanized. - This leaves as 99-Other e.g. oils, sulphur, zinc-oxide, and other anti-oxidants and anti-ozonants. - There is no information on a difference in composition between replacement tyres and OEM tyres (if any), so the same composition is assumed. - Retreaded tyres are not (yet) accounted in EIA and their impact on material composition has therefore not been further examined.	

Annex C. Availability of BoMs

List of EIA products with indication of BoM availability.

For products where a BoM is more or less directly available, two years are indicated: year 0 is the base reference year of the original BoM; year 1 is the last year in which the BoM was last elaborated.

Products for which a BoM has been derived in this study are listed in green.

Products that remain without a BoM are listed in red.

EIA product base case	Year 1	Year 0
EIWH Electric Instant. < 12 kW (secondary)	2019	2007
EIWH Electric Instant. ≥ 12 kW (primary)	2019	2007
EIWHS Electric Instant. Shower (secondary)	2019	2007
ESWH Electric Storage ≤ 30 L (secondary)	2019	2007
ESWH Electric Storage > 30 L (primary)	2019	2007
GIWH Gas Instant. < 13 L/min (secondary)	2019	2007
GIWH Gas Instant. ≥ 13 L/min (primary)	2019	2007
GSWH Gas Storage, Condensing	2019	2007
GSWH Gas Storage, Non-condensing	2019	2007
Dedicated WH Heat Pump	2019	
Dedicated WH Solar (3.5 m2)	2019	
WH dedicated Water Heater		
CHB Gas Combi Instant. WH		
CHB Gas + Cyl. WH		
CHB Jet Burner Gas + Cyl. WH		
CHB Jet Burner Oil + Cyl. WH		
CHB Electric (Joule) + Cyl. WH	WH Combis covered by SH boilers and combis	
CHB Hybrid Gas/Electric WH		
CHB Electric HP + Cyl. WH		
CHB Gas HP + Cyl. WH		
CHB Gas mCHP + Cyl. WH		
CHB Solar Combi (16 m2)		
CHC Central Heating combi, water heating		
CHB Gas non-condensing	2019	2012
CHB Gas condensing	2019	2012
CHB Gas Jet burner non-condensing	BoM derived here	
CHB Gas Jet burner condensing	BoM derived here	
CHB Oil Jet burner non-condensing	2019	2007
CHB Oil Jet burner condensing	2019	2019
CHB Electric Joule-effect	2019	2007
CHB Hybrid (gas-electric)	2019	2019
CHB Electric Heat Pump	2019	2012
CHB Gas Heat Pump	2019	2014-2016
CHB micro CHP	2019	2011-2017
CHB Solar combi (16 m2)	2019	2007
CHB Central Heating boiler < 400 kW		
SFB Wood Manual	2009	2009
SFB Wood Direct Draft	2009	2009
SFB Coal	2009	2009
SFB Pellets	2009	2009
SFB Wood chips	2009	2009
SFB Solid Fuel Boilers		
CHAE-S (≤ 400 kW)	2012	2012
CHAE-L (> 400 kW)	BoM derived here	
CHWE-S (≤ 400 kW)	BoM derived here	
CHWE-M (> 400 kW; ≤ 1500 kW)	2012	2012
CHWE-L (> 1500 kW)	BoM derived here	
CHF	no BoM available	
HT PCH-AE-S	BoM derived here	
HT PCH-AE-L	BoM derived here	
HT PCH-WE-S	BoM derived here	
HT PCH-WE-M	BoM derived here	
HT PCH-WE-L	BoM derived here	
AC rooftop	2012	2012

EIA product base case	Year 1	Year 0
AC splits	2012	2012
AC VRF	2012	2012
ACF	no BoM available	
AHC central Air Cooling		
AC rooftop (rev)	covered by cooling	
AC splits (rev)	covered by cooling	
AC VRF (rev)	covered by cooling	
ACF (rev)	covered by cooling	
AHF	2012	2012
AHE	no BoM available	
AHC central Air Heating		
LH open fireplace	2012	2012
LH closed fireplace/inset	2012	2012
LH wood stove	2012	2012
LH coal stove	2012	2012
LH cooker	2012	2012
LH SHR stove	2012	2012
LH pellet stove	2012	2012
LH Solid fuel		
LH Electric portable	2019	2012
LH Electric fixed > 250W	2019	2012
LH Electric fixed ≤ 250W	2019	2012
LH Electric storage	2019	2012
LH Electric underfloor	2019	2012
LH Electric visibly glowing > 1.2 kW	2019	
LH Electric visibly glowing ≤ 1.2 kW	2019	
LH Electric Towel Heaters	2019	
LH Electric		
LH Gas luminous (commercial)	2019	2012
LH Gaseous Tube (commercial < 120 kW)	2019	2012
LH Gas open front	2019	2012
LH Gas closed front	2019	2012
LH Gas balanced flue	2019	2012
LH Gas flueless	2019	2012
LH Gaseous fuel		
LH Liquid tube (commercial < 120 kW)	2019	2012
LH Liquid open front	2019	2012
LH Liquid closed front	2019	2012
LH Liquid balanced flue	2019	2012
LH Liquid flueless	2019	2012
LH Liquid fuel		
LH Local Heaters		
RAC fixed < 6 kW, cooling	2018	2012
RAC fixed 6-12 kW, cooling	2018	2012
RAC portable < 12 kW, cooling	2018	2012
RAC < 12 kW total, cooling mode		
RAC fixed < 6 kW, reversible, heating	covered by cooling	
RAC fixed 6-12 kW, reversible, heating	covered by cooling	
RAC portable < 12 kW, reversible, heating	covered by cooling	
RAC < 12 kW total, heating mode		
RAC Room Air Conditioner		
CIRC Integrated circulators	2008	2008
CIRC Large standalone circulators	2008	2008
CIRC Small standalone circulators	2008	2008
CIRC Circulator pumps <2.5 kW		
R-UVU ≤ 100 m3/h for Extract Spaces	2019	2009
R-UVU ≤ 100 m3/h for Habitable Spaces	2019	2009
R-BVU ≤ 100 m3/h for Habitable Spaces	2019	2009
R-UVU 100-250 m3/h	2019	2009
R-BVU 100-250 m3/h	2019	2009
R-UVU 250-1000 m3/h	2019	2009
R-BVU 250-1000 m3/h	2019	2009
R-UVU > 1000 m3/h	2019	2009
R-BVU 1000-2500 m3/h	2019	2009
RVU, Residential Ventilation Units		
NR-UVU 250-1000 m3/h	2019	2009
NR-BVU 250-1000 m3/h	2019	2009
NR-UVU > 1000 m3/h	2019	2009
NR-BVU 1000-2500 m3/h	2019	2009

EIA product base case	Year 1	Year 0
NR-AHU-S 2500-5500 m3/h	2019	2009
NR-AHU-M 5500-14500 m3/h	2019	2009
NR-AHU-L > 14500 m3/h	2019	2009
NRVU, Non-Residential Ventilation Units		
LFL (T12,T8h,T8t,T5,other)	2015	2015
HID (HPM, HPS, MH)	2015	2015
CFLni (all shapes)	2015	2015
CFLi (retrofit for GLS, HL)	2015	2015
GLS (DLS & NDLS) incl. from storage	2015	2015
GLS from storage	2015	2015
HL (DLS & NDLS, LV & MV) incl. storage	2015	2015
HL from storage	2015	2015
LED replacing LFL (retrofit & luminaire)	BoM derived here	
LED replacing HID (retrofit & luminaire)	BoM derived here	
LED replacing CFLni (retrofit & luminaire)	BoM derived here	
LED replacing DLS (retrofit & luminaire)	2021	2015
LED replacing NDLS (retrofit & luminaire)	2021	2015
LS Light Sources		
DP TV, standard (NoNA)	2015	2005
DP TV, LoNA	2015	
DP TV, HiNA ('Smart')	2015	
DP Monitor	2015	
DP Signage	no BoM available	
DP Electronic Displays		
SSTB	2007	2007
CSTB	2008	2008
STB set top boxes (Complex & Simple)		
Game consoles > 20 W	2010	2010
Game consoles < 20 W	BoM derived here	
GC Game consoles		
ES tower 1-socket traditional	BoM derived here	
ES rack 1-socket traditional	BoM derived here	
ES rack 2-socket traditional	2015	2015
ES rack 2-socket cloud	BoM derived here	
ES rack 4-socket traditional	BoM derived here	
ES rack 4-socket cloud	BoM derived here	
ES rack 2-socket resilient trad.	BoM derived here	
ES rack 2-socket resilient cloud	BoM derived here	
ES rack 4-socket resilient trad.	BoM derived here	
ES rack 4-socket resilient cloud	BoM derived here	
ES blade 1-socket traditional	BoM derived here	
ES blade 2-socket traditional	2015	2015
ES blade 2-socket cloud	BoM derived here	
ES blade 4-socket traditional	BoM derived here	
ES blade 4-socket cloud	BoM derived here	
ES Enterprise Servers		
DS Online 2	2015	2015
DS Online 3	2015	2015
DS Online 4	BoM derived here	
DS Data Storage products		
PC Desktop	2021	2005
PC Integrated Desktop	BoM derived here	
PC Notebook	2021	2005
PC Tablet/slate	2021	2021
PC Thin client	2016	2005
PC Integrated Thin Client	BoM derived here	
PC Small-scale Server	BoM derived here	
PC Workstation	2016	2005
PC Personal Computers		
Inkjet Printer	2019	2007
Inkjet MFD	2019	2007
EP / Laser Printer mono	2019	2007
EP / Laser Printer colour	2019	2007
EP / Laser Copier mono	BoM derived here	
EP / Laser Copier colour	BoM derived here	
EP / Laser MFD mono	2019	2007

EIA product base case	Year 1	Year 0
EP / Laser MFD colour	2019	2007
IE imaging equipment		
Regulated only for (networked) standby ((n)sb)		
SB Radios	no BoM available	
SB Electric toothbrushes	no BoM available	
SB Audio speakers (wired)	no BoM available	
SB Audio speakers (wireless)	no BoM available	
SB Small appliances	no BoM available	
SB Media boxes /sticks	no BoM available	
SB Media players and recorders	2010	2010
SB Projectors	2010	2010
SB Home phones	2021	2021
SB Office phones	2021	2021
SB Home NAS	no BoM available	
SB Home Network Equipment	no BoM available	
SB Office Network Equipment	no BoM available	
SB Coffee makers	2021	2011
Regulated also for (networked) standby ((n)sb)		
(already accounted elsewhere; here for info only)		
SB Washing Machines	See main product	
SB Dishwashers	See main product	
SB Laundry Dryers	See main product	
SB Electric Ovens	See main product	
SB Electric Hobs	See main product	
SB Complex Set-Top Boxes	See main product	
SB Game consoles	See main product	
SB IE Inkjet Printers	See main product	
SB IE Inkjet MFDs	See main product	
SB IE Laser Printers	See main product	
SB IE Laser Copiers	See main product	
SB IE Laser MFDs	See main product	
(networked) Standby		
EPS ≤ 6W, low-V	2021	2007
EPS 6–10 W	2021	2007
EPS 10–12 W	2021	2007
EPS 15–20 W	2021	2007
EPS 20–30 W	2021	2007
EPS 30–65 W, multiple-V	2021	2007
EPS 30-65 W	2021	2007
EPS 65–120 W	2021	2007
EPS 65–120 W, multiple-V	2007	2007
EPS 12–15 W	2021	2007
EPS External Power Supplies		
RF Household Refrigerators & freezers	2016	2007
CF open vertical chilled multi deck (RVC2)	2007	2007
CF open horizontal frozen island (RHF4)	2007	2007
CF other supermarket display (non-BCs)	2016	
CF Plug in one door beverage cooler	2007	2007
CF Plug in horizontal ice cream freezer	2021	2007
CF Spiral vending machine	2007	2007
CF Commercial Refrigeration		
PF Storage cabinet Chilled Vertical (CV)	2021	2011
PF Storage cabinet Frozen Vertical (FV)	2021	2011
PF Storage cabinet Chilled Horizontal (CH)	2021	2011
PF Storage cabinet Frozen Horizontal (FH)	2021	2011
PF Storage cabinets		
PF Process Chiller AC MT S ≤ 300 kW	2021	2011
PF Process Chiller AC MT L > 300 kW	2021	2011
PF Process Chiller AC LT S ≤ 200 kW	2021	2011
PF Process Chiller AC LT L > 200 kW	2021	2011
PF Process Chiller WC MT S ≤ 300 kW	2021	2011
PF Process Chiller WC MT L > 300 kW	2021	2011
PF Process Chiller WC LT S ≤ 200 kW	2021	2011
PF Process Chiller WC LT L > 200 kW	2021	2011
PF Process Chiller MT&LT		
PF Condensing Unit MT S 0.2-1 kW	2021	2011
PF Condensing Unit MT M 1-5 kW	2021	2011
PF Condensing Unit MT L 5-20 kW	2021	2011
PF Condensing Unit MT XL 20-50 kW	2021	2011
PF Condensing Unit LT S 0.1-0.4 kW	2021	2011

EIA product base case	Year 1	Year 0
PF Condensing Unit LT M 0.4-2 kW	2021	2011
PF Condensing Unit LT L 2-8 kW	2021	2011
PF Condensing Unit LT XL 8-20 kW	2021	2011
PF Condensing Unit MT&LT		
CA Electric Hobs	2021	2011
CA Electric Ovens	2021	2011
CA Gas Hobs	2021	2011
CA Gas Ovens	2021	2011
CA Range Hoods	2021	2009
CA Cooking Appliances		
WM Washing Machines	2017	2017
WD Washer-Dryers	2017	2017
WM-WD Total household Washing		
DW Household Dishwashers	2017	2017
LD condensing heat pump	2019	2019
LD condensing electric heat element	2019	2019
LD vented electric	2019	2019
LD vented gas	2019	2019
LD Household Laundry Dryers		
VC household	2019	2015
VC professional	2019	2009
VC Vacuum Cleaners		
FAN Axial<300Pa (all FAN types >125W)	2008	2008
FAN Axial>300Pa	2008	2008
FAN Centr.FC	2008	2008
FAN Centr.BC-free	2008	2008
FAN Centr.BC	2008	2008
FAN Cross-flow	2008	2008
FAN Industrial Fans >125W		
Medium (S) 3-ph 0.75-7.5 kW no VSD	2014	2014
Medium (M) 3-ph 7.5-75 kW no VSD	2014	2014
Medium (L) 3-ph 75-375 kW no VSD	2014	2014
Total 3ph 0.75-375 kW no VSD		
Medium (S) 3-ph 0.75-7.5 kW with VSD	2014	2014
Medium (M) 3-ph 7.5-75 kW with VSD	2014	2014
Medium (L) 3-ph 75-375 kW with VSD	2014	2014
Total 3-ph 0.75-375 kW with VSD		
Total 3-ph 0.75-375 kW w/wo VSD		
Small 1 ph 0.12-0.75 kW no VSD	2014	2014
Small 1 ph 0.12-0.75 kW with VSD	2014	2014
Total Small 1-ph 0.12-0.75 kW		
Small 3 ph 0.12-0.75 kW no VSD	2014	2014
Small 3 ph 0.12-0.75 kW with VSD	2014	2014
Total Small 3-ph 0.12-0.75 kW		
Large 3-ph LV 375-1000 kW no VSD	2014	2014
Large 3-ph LV 375-1000kW with VSD	2014	2014
Total Large 3-ph LV 375-1000 kW		
Explosion motors (S) 3-ph 0.75-7.5 kW	BoM derived here	
Explosion motors (M) 3-ph 7.5-75 kW	BoM derived here	
Explosion motors (L) 3-ph 75-375 kW	BoM derived here	
Total Expl. 0.75-375 kW (no VSD)		
Brake motors (S) 3-ph 0.75-7.5 kW	BoM derived here	
Brake motors (M) 3-ph 7.5-75 kW	BoM derived here	
Brake motors (L) 3-ph 75-375 kW	BoM derived here	
Total Brake 0.75-375 kW (no VSD)		
8-pole motors (S) 3-ph 0.75-7.5 kW	BoM derived here	
8-pole motors (M) 3-ph 7.5-75 kW	BoM derived here	
8-pole motors (L) 3-ph 75-375 kW	BoM derived here	
Total 8-pole 0.75-375 kW (no VSD)		
1-phase motors >0.75 kW (no VSD)	BoM derived here	
MT Elec. Motors LV 0.12-1000 kW		
WP Water pumps	2008	2008
WE Welding Equipment	2012	2012
TRAFO Distribution	2017	2011

EIA product base case	Year 1	Year 0
TRAFO Industry oil	2011	2011
TRAFO Industry dry	2011	2011
TRAFO Power	2011	2011
TRAFO DER oil	2011	2011
TRAFO DER dry	2011	2011
TRAFO Small	2011	2011
TRAFO Utility Transformers		
Tyres C1, replacement for cars	2021	2016
Tyres C1, OEM for cars	2021	2016
Tyres C1		
Tyres C2, replacement for vans	2021	2016
Tyres C2, OEM for vans	2021	2016
Tyres C2		
Tyres C3, replacement for trucks/busses	2021	2016
Tyres C3, OEM for trucks/busses	2021	2016
Tyres C3		

Annex D. Detailed BoMs per EIA base case

Table 11 : Material masses per unit product: total per material category and overall, in [kg] per product

	Total	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
	kg	kg	kg	kg	kg	kg	kg	kg	kg
EIWH Electric Instant. < 12 kW	1.3	0.3	0.5	0.1	0.2	0.0	0.0	0.0	0.2
EIWH Electric Instant. ≥ 12 kW	3.0	0.3	1.2	0.1	0.6	0.0	0.1	0.0	0.6
EIWHS Electric Instant. Shower	1.3	0.3	0.5	0.1	0.2	0.0	0.0	0.0	0.2
ESWH Electric Storage ≤ 30 L	5.5	0.8	0.1	0.3	2.6	0.0	0.1	0.0	1.7
ESWH Electric Storage > 30 L	41.4	2.0	2.1	31.1	2.6	1.9	0.1	0.0	1.6
GIWH Gas Instant. < 13 L/min	9.5	0.8	0.0	6.9	1.6	0.0	0.1	0.0	0.0
GIWH Gas Instant. ≥ 13 L/min	20.0	1.8	0.0	14.5	3.5	0.0	0.3	0.0	0.0
GSWH Gas Storage, Condensing	94.8	3.8	7.2	77.6	6.2	0.0	0.0	0.0	0.0
GSWH Gas Storage, Non-condensing	94.8	3.8	7.2	77.6	6.2	0.0	0.0	0.0	0.0
Dedicated WH Heat Pump	56.7	2.5	2.6	42.9	3.8	1.3	0.1	2.2	1.2
Dedicated WH Solar (3.5 m2)	129.8	0.3	15.5	61.3	27.3	0.0	0.0	25.1	0.2
DWH Dedicated Water Heater									
CHB Gas non-condensing	36.4	0.8	0.0	28.1	7.2	0.0	0.2	0.0	0.0
CHB Gas condensing	39.9	1.3	0.1	30.5	7.7	0.0	0.3	0.0	0.0
CHB Gas Jet burner non-condensing	205.0	6.6	0.6	156.9	39.6	0.0	1.3	0.0	0.0
CHB Gas Jet burner condensing	150.5	2.7	0.0	141.9	5.1	0.0	0.8	0.0	0.0
CHB Oil Jet burner non-condensing	205.0	6.6	0.6	156.9	39.6	0.0	1.3	0.0	0.0
CHB Oil Jet burner condensing	150.5	2.7	0.0	141.9	5.1	0.0	0.8	0.0	0.0
CHB Electric Joule-effect	7.5	0.4	1.9	0.6	1.8	0.0	0.7	0.0	2.2
CHB Hybrid (gas-electric)	198.6	2.7	12.9	120.1	61.1	0.0	0.2	1.5	0.0
CHB Electric Heat Pump	165.2	1.5	12.3	92.6	54.4	0.0	0.0	1.5	2.8
CHB Gas Heat Pump	355.5	5.5	6.2	291.5	40.9	1.4	5.6	4.5	0.0
CHB micro CHP	113.3	0.7	0.2	99.1	13.0	0.0	0.3	0.0	0.0
CHB Solar combi (16 m2)	384.0	3.9	31.7	13.5	208.6	10.6	1.8	110.3	3.4
CHB Central Heating boiler < 400 kW									
SFB Wood Manual	378.0	0.0	0.0	349.8	0.4	0.4	0.0	27.4	0.0
SFB Wood Direct Draft	468.1	0.0	0.0	457.1	6.5	0.5	3.0	0.5	0.5
SFB Coal	469.2	0.0	0.0	463.5	1.4	0.0	0.5	3.8	0.0
SFB Pellets	536.3	0.0	0.0	433.4	10.8	2.7	2.7	86.7	0.0
SFB Wood chips	1076.0	0.0	0.0	866.7	21.7	5.4	5.4	173.3	3.5
SFB Solid Fuel Boilers									
CHAE-S (≤ 400 kW)	427.4	15.1	0.0	313.5	65.9	0.0	0.0	32.9	0.0
CHAE-L (> 400 kW)	6597.4	245.0	0.0	5086.9	1069.3	0.0	0.0	196.3	0.0
CHWE-S (≤ 400 kW)	460.3	16.8	0.0	348.6	73.3	0.0	0.0	21.6	0.0
CHWE-M (> 400 kW; ≤ 1500 kW)	6623.7	246.1	0.0	5109.4	1074.0	0.0	0.0	194.2	0.0
CHWE-L (> 1500 kW)	11860.0	440.4	0.0	9144.4	1922.2	0.0	0.0	353.1	0.0
HT PCH-AE-S	1319.5	49.7	0.0	1033.0	217.2	0.0	0.0	19.6	0.0
HT PCH-AE-L	9100.0	343.1	0.0	7124.5	1497.6	0.0	0.0	134.9	0.0
HT PCH-WE-S	1825.0	68.8	0.0	1428.8	300.3	0.0	0.0	27.0	0.0
HT PCH-WE-M	5475.0	206.4	0.0	4286.4	901.0	0.0	0.0	81.1	0.0
HT PCH-WE-L	11680.0	440.4	0.0	9144.4	1922.2	0.0	0.0	173.1	0.0
AC rooftop	961.7	0.0	0.0	342.0	592.0	0.0	0.0	27.7	0.0
AC splits	149.0	12.6	12.6	46.3	25.6	0.0	2.5	44.2	5.2
AC VRF	774.3	15.6	15.6	386.5	135.8	7.1	29.9	121.7	62.0
AHF	299.7	6.4	6.4	216.5	24.1	2.6	12.8	18.7	12.1
AHC Air Heating & Cooling									
LH open fireplace	302.3	0.0	0.0	31.3	0.0	0.0	0.0	271.0	0.0
LH closed fireplace/inset	167.1	0.0	0.0	135.9	0.0	0.5	0.1	30.6	0.0
LH wood stove	160.7	0.0	0.0	152.5	0.0	0.2	0.0	8.0	0.0
LH coal stove	160.7	0.0	0.0	152.5	0.0	0.2	0.0	8.0	0.0
LH cooker	163.9	0.0	0.0	140.8	0.0	0.5	0.0	22.6	0.0
LH SHR stove	1504.8	0.0	0.0	55.7	0.0	0.0	0.0	1449.1	0.0
LH pellet stove	147.5	0.0	0.0	133.3	1.2	0.6	0.9	11.5	0.0
LH Solid fuel									
LH Electric portable	1.6	0.2	0.7	0.2	0.2	0.0	0.1	0.0	0.3
LH Electric fixed > 250W	10.1	0.4	0.4	5.3	1.0	0.3	0.1	1.5	1.2
LH Electric fixed ≤ 250W	2.6	0.1	0.1	1.3	0.2	0.1	0.1	0.4	0.3

	Total	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
	kg	kg	kg	kg	kg	kg	kg	kg	kg
LH Electric storage	118.6	0.1	0.1	17.5	0.8	0.1	0.1	97.6	2.4
LH Electric underfloor	4.3	0.6	2.5	0.1	0.6	0.0	0.1	0.2	0.3
LH Electric visibly glowing > 1.2 kW	2.6	0.4	1.3	0.4	0.4	0.0	0.1	0.0	0.0
LH Electric visibly glowing ≤ 1.2 kW	1.3	0.2	0.7	0.2	0.2	0.0	0.1	0.0	0.0
LH Electric Towel Heaters	5.4	0.3	0.3	3.8	0.6	0.3	0.1	0.0	0.0
LH Electric									
LH Gas luminous (commercial)	24.4	0.0	0.0	17.0	0.0	0.8	0.4	1.8	4.4
LH Gaseous Tube (comm. < 120 kW)	93.9	0.0	0.0	76.5	0.6	3.6	1.8	8.1	3.3
LH Gas open front	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Gas closed front	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Gas balanced flue	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Gas flueless	10.3	0.0	0.0	8.9	0.4	0.4	0.0	0.2	0.4
LH Gaseous fuel									
LH Liquid tube (comm. < 120 kW)	93.9	0.0	0.0	76.5	0.6	3.6	1.8	8.1	3.3
LH Liquid open front	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Liquid closed front	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Liquid balanced flue	22.2	0.0	0.0	17.8	0.8	0.7	0.0	0.3	2.5
LH Liquid flueless	10.3	0.0	0.0	8.9	0.4	0.4	0.0	0.2	0.4
LH Liquid fuel									
LH Local Heaters									
RAC fixed < 6 kW, cooling	41.0	6.4	0.6	18.5	9.8	0.0	1.2	4.5	0.0
RAC fixed 6-12 kW, cooling	96.0	14.9	1.4	43.2	23.0	0.0	2.9	10.6	0.0
RAC portable < 12 kW, cooling	32.0	5.0	0.5	14.4	7.7	0.0	1.0	3.5	0.0
RAC Room Air Conditioner									
CIRC Integrated circulators	2.0	0.2	0.0	1.4	0.5	0.0	0.0	0.0	0.0
CIRC Large standalone circulators	20.0	0.9	0.0	15.1	2.9	0.1	0.0	0.0	1.0
CIRC Small standalone circulators	2.9	0.2	0.0	1.8	0.5	0.0	0.0	0.0	0.4
CIRC Circulator pumps <2.5 kW									
R-UVU ≤ 100 m3/h for Extract Spaces	1.0	0.3	0.2	0.5	0.0	0.0	0.0	0.0	0.0
R-UVU ≤ 100 m3/h for Habitable Spaces	1.0	0.3	0.2	0.5	0.0	0.0	0.0	0.0	0.0
R-BVU ≤ 100 m3/h for Habitable Spaces	3.5	1.8	0.1	1.4	0.2	0.0	0.0	0.0	0.0
R-UVU 100-250 m3/h	4.8	1.6	0.3	1.4	1.4	0.0	0.1	0.0	0.0
R-BVU 100-250 m3/h	7.8	1.7	0.5	3.1	2.3	0.0	0.2	0.0	0.0
R-UVU 250-1000 m3/h	31.5	0.3	0.0	18.3	12.3	0.0	0.6	0.0	0.0
R-BVU 250-1000 m3/h	62.8	0.6	0.0	33.9	27.0	0.0	1.3	0.0	0.0
R-UVU > 1000 m3/h	20.4	8.1	1.3	8.1	2.4	0.0	0.5	0.0	0.0
R-BVU 1000-2500 m3/h	199.6	35.9	6.8	139.0	17.1	0.0	0.8	0.0	0.0
RVU, residential									
NR-UVU 250-1000 m3/h	31.5	0.3	0.0	18.3	12.3	0.0	0.6	0.0	0.0
NR-BVU 250-1000 m3/h	62.8	0.6	0.0	33.9	27.0	0.0	1.3	0.0	0.0
NR-UVU > 1000 m3/h	20.4	8.1	1.3	8.1	2.4	0.0	0.5	0.0	0.0
NR-BVU 1000-2500 m3/h	199.6	35.9	6.8	139.0	17.1	0.0	0.8	0.0	0.0
NR-AHU-S 2500-5500 m3/h	754.5	19.8	1.7	605.0	127.0	0.0	1.0	0.0	0.0
NR-AHU-M 5500-14500 m3/h	1609.0	42.8	3.7	1290.0	271.0	0.0	1.5	0.0	0.0
NR-AHU-L > 14500 m3/h	5227.0	142.0	12.0	4190.0	881.0	0.0	2.0	0.0	0.0
NRVU, non-residential									
VU Ventilation Units, res + non-res									
LFL (T12,T8h,T8t,T5,other)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.0
HID (HPM, HPS, MH)	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
CFLni (all shapes)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
CFLi (retrofit for GLS, HL)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
GLS (DLS & NDLS) incl. from storage	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
GLS from storage	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
HL (DLS & NDLS, LV & MV) incl. storage	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL from storage	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	0.3	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
LED replacing HID (retrofit & luminaire)	0.7	0.0	0.1	0.0	0.3	0.0	0.1	0.1	0.1
LED replacing CFLni (retrofit & luminaire)	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
LED replacing DLS (retrofit & luminaire)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LED replacing NDLS (retrofit & luminaire)	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LS Light Sources									
DP TV, standard (NoNA)	11.0	1.5	1.9	1.6	0.8	0.0	1.4	1.8	2.0
DP TV, LoNA	11.0	1.5	1.9	1.6	0.8	0.0	1.4	1.8	2.0
DP TV, HiNA ('Smart')	11.0	1.5	1.9	1.6	0.8	0.0	1.4	1.8	2.0
DP Monitor	6.4	1.1	0.8	1.5	0.6	0.0	0.6	0.8	1.0
DP Electronic Displays									
SSTB	1.3	0.4	0.0	0.4	0.0	0.0	0.2	0.0	0.2
CSTB	2.3	0.3	0.0	1.0	0.2	0.0	0.4	0.0	0.4
STB set top boxes (Complex & Simple)									

	Total	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
	kg	kg	kg	kg	kg	kg	kg	kg	kg
Game consoles > 20 W	5.0	1.4	0.0	0.4	0.4	0.0	0.9	0.0	1.9
Game consoles < 20 W	2.5	0.7	0.0	0.2	0.2	0.0	0.4	0.0	1.0
GC Game consoles									
ES tower 1-socket traditional	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 1-socket traditional	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 2-socket traditional	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 2-socket cloud	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 4-socket traditional	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 4-socket cloud	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 2-socket resilient trad.	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 2-socket resilient cloud	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 4-socket resilient trad.	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES rack 4-socket resilient cloud	27.8	1.3	0.3	14.3	3.1	0.0	4.0	0.0	4.8
ES blade 1-socket traditional	176.3	2.4	0.1	128.5	10.1	0.0	15.5	0.0	19.8
ES blade 2-socket traditional	176.3	2.4	0.1	128.5	10.1	0.0	15.5	0.0	19.8
ES blade 2-socket cloud	176.3	2.4	0.1	128.5	10.1	0.0	15.5	0.0	19.8
ES blade 4-socket traditional	176.3	2.4	0.1	128.5	10.1	0.0	15.5	0.0	19.8
ES blade 4-socket cloud	176.3	2.4	0.1	128.5	10.1	0.0	15.5	0.0	19.8
ES Enterprise Servers total									
DS Online 2	59.6	1.0	0.7	32.3	10.8	0.0	10.0	0.0	4.7
DS Online 3	59.6	1.0	0.7	32.3	10.8	0.0	10.0	0.0	4.7
DS Online 4	59.6	1.0	0.7	32.3	10.8	0.0	10.0	0.0	4.7
DS Data Storage products total									
ES + DS total									
PC Desktop	10.9	0.5	0.4	5.9	0.8	0.0	1.2	0.0	2.0
PC Integrated Desktop	9.2	0.4	0.4	4.9	0.7	0.0	1.1	0.0	1.6
PC Notebook	2.8	0.2	0.4	0.4	0.2	0.0	0.7	0.3	0.7
PC Tablet/slate	0.7	0.0	0.0	0.0	0.1	0.0	0.4	0.0	0.2
PC Thin client	1.3	0.1	0.1	0.7	0.1	0.0	0.1	0.0	0.2
PC Integrated Thin Client	1.4	0.1	0.1	0.7	0.1	0.0	0.2	0.0	0.2
PC Small-scale Server	19.1	0.9	0.8	10.4	1.5	0.0	2.2	0.0	3.4
PC Workstation	19.1	0.9	0.8	10.4	1.5	0.0	2.2	0.0	3.4
PC Personal Computers									
Inkjet Printer	4.4	2.2	0.6	0.8	0.3	0.0	0.2	0.1	0.2
Inkjet MFD	7.3	3.7	0.5	1.3	0.1	0.0	0.6	0.4	0.7
EP / Laser Printer mono	15.3	4.9	1.5	4.4	0.5	0.4	1.5	0.3	1.8
EP / Laser Printer colour	28.8	8.4	3.9	8.0	0.8	0.0	3.3	0.6	3.7
EP / Laser Copier mono	15.3	4.9	1.5	4.4	0.5	0.4	1.5	0.3	1.8
EP / Laser Copier colour	28.8	8.4	3.9	8.0	0.8	0.0	3.3	0.6	3.7
EP / Laser MFD mono	92.2	18.4	5.6	39.2	2.9	0.0	4.2	6.5	15.4
EP / Laser MFD colour	68.2	11.5	10.2	27.7	3.0	0.0	6.3	1.3	8.3
EP & IJ imaging equipment									
Regulated only for (networked) standby ((n)sb)									
SB Media players and recorders	1.9	0.4	0.0	0.6	0.1	0.0	0.2	0.0	0.7
SB Projectors	4.9	0.8	0.9	0.3	0.5	0.0	0.6	1.0	0.9
SB Home phones	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1
SB Office phones	0.4	0.2	0.0	0.0	0.0	0.0	0.1	0.0	0.1
SB Coffee makers (off mode)	3.5	1.5	0.3	0.5	0.4	0.0	0.1	0.2	0.5
(networked) Standby									
EPS ≤ 6W, low-V	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 6–10 W	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 10–12 W	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 15–20 W	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS 20–30 W	0.2	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
EPS 30–65 W, multiple-V	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
EPS 30-65 W	0.3	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0
EPS 65–120 W	0.4	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0
EPS 65–120 W, multiple-V	0.4	0.0	0.1	0.0	0.1	0.0	0.2	0.0	0.0
EPS 12–15 W	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
EPS External Power Supplies									
RF Household Refrigerators & freezers	66.9	11.7	9.4	30.8	3.8	0.2	0.3	6.2	4.4
CF open vertical chilled multi deck (RVC2)	614.0	13.8	26.4	463.3	49.1	21.9	0.2	3.9	35.3
CF open horizontal frozen island (RHF4)	793.7	31.1	21.1	457.6	65.5	21.6	1.3	103.9	91.6
CF other supermarket display (non-BCs)	714.1	22.5	23.8	467.8	59.6	21.7	1.1	54.1	63.5
CF Plug in one door beverage cooler	123.1	4.7	8.5	68.9	12.8	0.9	0.1	21.9	5.4
CF Plug in horizontal ice cream freezer	75.4	10.7	0.0	20.0	6.6	23.7	0.0	8.4	5.9
CF Spiral vending machine	297.0	34.9	4.5	144.3	8.4	76.3	1.0	20.0	7.7
CF Commercial Refrigeration									
PF Storage cabinet Chilled Vertical (CV)	135.2	17.0	16.8	51.1	5.2	29.4	0.1	5.5	10.0

	Total	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
	kg	kg	kg	kg	kg	kg	kg	kg	kg
PF Storage cabinet Frozen Vertical (FV)	149.5	18.8	18.6	56.5	5.8	32.5	0.1	6.0	11.1
PF Storage cabinet Chilled Horiz. (CH)	67.6	8.5	8.4	25.6	2.6	14.7	0.0	2.7	5.0
PF Storage cabinet Frozen Horiz.(FH)	49.8	6.3	6.2	18.8	1.9	10.8	0.0	2.0	3.7
PF Storage cabinets									
PF Process Chiller AC MT S ≤ 300 kW	1574.8	0.8	2.4	957.8	373.5	157.9	0.2	82.2	0.0
PF Process Chiller AC MT L > 300 kW	5465.1	2.7	8.5	3378.2	1317.4	557.0	0.5	200.7	0.0
PF Process Chiller AC LT S ≤ 200 kW	1783.1	0.9	2.8	1093.2	426.3	180.2	0.2	79.6	0.0
PF Process Chiller AC LT L > 200 kW	6378.1	3.1	9.9	3919.4	1528.5	646.2	0.6	270.4	0.0
PF Process Chiller WC MT S ≤ 300 kW	1853.2	0.9	2.9	1147.1	447.3	189.1	0.2	65.6	0.0
PF Process Chiller WC MT L > 300 kW	6328.3	3.1	10.0	3963.9	1545.8	653.6	0.6	151.2	0.0
PF Process Chiller WC LT S ≤ 200 kW	2241.5	1.1	3.5	1399.8	545.9	230.8	0.2	60.2	0.0
PF Process Chiller WC LT L > 200 kW	7443.2	3.7	11.7	4658.5	1816.7	768.1	0.7	183.7	0.0
PF Process Chillers MT&LT									
PF Condensing Unit MT S 0.2-1 kW	12.9	0.3	0.0	10.3	0.4	0.1	0.0	1.9	0.0
PF Condensing Unit MT M 1-5 kW	61.0	1.3	0.0	50.2	1.9	0.4	0.0	7.2	0.0
PF Condensing Unit MT L 5-20 kW	239.4	5.0	0.1	198.8	7.5	1.4	0.0	26.5	0.0
PF Condensing Unit MT XL 20-50 kW	727.3	15.3	0.3	608.7	23.1	4.4	0.0	75.5	0.0
PF Condensing Unit LT S 0.1-0.4 kW	8.3	0.2	0.0	6.4	0.2	0.0	0.0	1.5	0.0
PF Condensing Unit LT M 0.4-2 kW	27.1	0.5	0.0	20.9	0.8	0.1	0.0	4.7	0.0
PF Condensing Unit LT L 2-8 kW	130.4	2.6	0.0	104.3	4.0	0.7	0.0	18.7	0.0
PF Condensing Unit LT XL 8-20 kW	852.1	18.0	0.3	716.9	27.2	5.1	0.0	84.5	0.0
PF Condensing Units MT&LT									
PF Professional Refrigeration									
CA Electric Hobs	10.0	0.3	0.2	1.9	1.3	0.0	2.0	4.4	0.0
CA Electric Ovens	40.0	0.0	2.1	30.1	1.9	0.1	0.2	4.6	1.1
CA Gas Hobs	7.8	0.1	0.1	5.5	2.0	0.0	0.0	0.0	0.0
CA Gas Ovens	45.0	0.1	2.2	34.0	3.0	0.0	0.0	4.6	1.2
CA Range Hoods	9.2	0.3	0.3	8.4	0.2	0.0	0.1	0.0	0.0
CA Cooking Appliances									
WM Washing Machines	69.6	3.9	6.5	28.5	4.1	0.0	0.2	23.5	2.9
WD Washer-Dryers	73.0	4.2	7.0	30.7	4.4	0.0	0.2	23.6	2.9
WM-WD household Washing									
DW Household Dishwashers	48.1	9.2	0.9	21.2	5.8	0.0	1.4	7.9	1.8
LD condensing heat pump	60.1	13.9	0.6	24.9	9.9	0.0	0.5	7.7	2.5
LD condensing electric heat element	49.7	12.8	0.3	26.3	4.2	0.0	0.4	3.1	2.5
LD vented electric	40.0	9.3	0.4	21.3	2.8	0.0	0.4	3.3	2.5
LD vented gas	40.0	9.3	0.4	21.3	2.8	0.0	0.4	3.3	2.5
LD household Laundry Dryers									
VC household	7.0	3.9	0.3	1.0	0.4	0.0	0.0	0.2	1.3
VC professional	11.1	5.9	0.1	1.3	1.3	0.0	0.0	0.3	2.1
VC Vacuum Cleaners									
FAN Axial<300Pa	47.0	0.0	1.0	35.0	11.0	0.0	0.0	0.0	0.0
FAN Axial>300Pa	55.0	0.0	1.3	39.0	14.7	0.0	0.0	0.0	0.0
FAN Centr.FC	10.7	0.0	0.3	8.5	1.9	0.0	0.0	0.0	0.0
FAN Centr.BC-free	38.6	0.0	1.2	16.9	20.5	0.0	0.0	0.0	0.0
FAN Centr.BC	77.4	0.0	0.8	66.1	7.4	0.0	0.0	0.0	3.3
FAN Cross-flow	7.8	0.0	0.4	5.5	1.9	0.0	0.0	0.0	0.0
FAN Industrial Fans >125W									
Medium (S) 3-ph 0.75-7.5 kW no VSD	20.9	0.0	0.4	14.5	4.8	0.1	0.0	0.0	1.1
Medium (M) 3-ph 7.5-75 kW no VSD	128.9	0.0	1.3	93.1	24.1	0.6	0.0	0.0	9.9
Medium (L) 3-ph 75-375 kW no VSD	953.7	0.0	6.6	803.0	88.0	1.1	0.0	0.0	55.0
MT 3ph 0.75-375 kW no VSD									
Medium (S) 3-ph 0.75-7.5 kW w. VSD	23.4	0.3	0.4	15.0	5.9	0.1	0.5	0.0	1.1
Medium (M) 3-ph 7.5-75 kW w. VSD	135.0	0.6	1.3	94.8	26.5	0.6	1.3	0.0	9.9
Medium (L) 3-ph 75-375 kW w. VSD	972.4	3.3	6.6	808.5	89.1	1.1	8.8	0.0	55.0
MT 3-ph 0.75-375 kW with VSD									
Small 1 ph 0.12-0.75 kW no VSD	11.2	0.0	0.2	7.7	2.4	0.0	0.0	0.1	0.7
Small 1 ph 0.12-0.75 kW with VSD	12.0	0.1	0.2	7.7	2.8	0.0	0.2	0.1	0.7
MT Small 1-ph 0.12-0.75 kW									
Small 3 ph 0.12-0.75 kW no VSD	8.7	0.0	0.2	5.9	1.9	0.0	0.0	0.0	0.7
Small 3 ph 0.12-0.75 kW with VSD	9.6	0.1	0.2	5.9	2.4	0.0	0.2	0.0	0.7
MT Small 3-ph 0.12-0.75 kW									
Large 3-ph LV 375-1000 kW no VSD	2647.4	0.0	30.3	2200.0	275.0	3.0	0.0	84.2	55.0
Large 3-ph LV 375-1000kW w. VSD	2731.6	14.9	30.3	2224.8	280.0	3.0	39.6	84.2	55.0
MT Large 3-ph LV 375-1000 kW									
Explosion mt (S) 3-ph 0.75-7.5 kW	20.9	0.0	0.4	14.5	4.8	0.1	0.0	0.0	1.1
Explosion mt (M) 3-ph 7.5-75 kW	128.9	0.0	1.3	93.1	24.1	0.6	0.0	0.0	9.9
Explosion mt (L) 3-ph 75-375 kW	953.7	0.0	6.6	803.0	88.0	1.1	0.0	0.0	55.0
MT Expl. 0.75-375 kW (no VSD)									

	Total	BLK Plastics	TEC plastics	Ferro	Non-ferro	Coating/plating	Electronics	Miscellaneous	Packaging
	kg	kg	kg	kg	kg	kg	kg	kg	kg
Brake motors (S) 3-ph 0.75-7.5 kW	20.9	0.0	0.4	14.5	4.8	0.1	0.0	0.0	1.1
Brake motors (M) 3-ph 7.5-75 kW	128.9	0.0	1.3	93.1	24.1	0.6	0.0	0.0	9.9
Brake motors (L) 3-ph 75-375 kW	953.7	0.0	6.6	803.0	88.0	1.1	0.0	0.0	55.0
MT Brake 0.75-375 kW (no VSD)									
8-pole motors (S) 3-ph 0.75-7.5 kW	20.9	0.0	0.4	14.5	4.8	0.1	0.0	0.0	1.1
8-pole motors (M) 3-ph 7.5-75 kW	128.9	0.0	1.3	93.1	24.1	0.6	0.0	0.0	9.9
8-pole motors (L) 3-ph 75-375 kW	953.7	0.0	6.6	803.0	88.0	1.1	0.0	0.0	55.0
MT 8-pole 0.75-375 kW (no VSD)									
1-phase motors >0.75 kW (no VSD)	26.7	0.0	0.5	18.5	6.2	0.1	0.0	0.0	1.4
MT Elec. Motors LV 0.12-1000 kW									
WP Water pumps	20.8	0.0	0.0	17.8	0.0	0.0	0.0	0.0	2.9
WE Welding Equipment	140.0	5.2	0.0	101.5	7.1	0.0	26.2	0.0	0.0
TRAFO Distribution	1921.5	3.2	0.0	1078.3	381.2	2.9	0.0	456.0	0.0
TRAFO Industry oil	2451.1	0.0	0.0	1483.9	428.8	4.5	0.0	534.0	0.0
TRAFO Industry dry	2676.3	16.1	146.0	1991.7	460.3	1.4	0.0	60.8	0.0
TRAFO Power	100376.1	0.0	0.0	50793.7	18692.6	391.7	0.0	30498.1	0.0
TRAFO DER oil	4627.9	0.0	21.7	2828.5	952.2	4.3	0.0	821.2	0.0
TRAFO DER dry	5224.9	59.9	112.5	3984.5	841.0	5.6	0.0	221.4	0.0
TRAFO Small	85.0	0.0	0.0	50.0	35.0	0.0	0.0	0.0	0.0
TRAFO Utility Transformers									
Tyres C1, replacement for cars	8.5	0.1	0.2	1.0	0.0	0.0	0.0	7.2	0.0
Tyres C1, OEM for cars	8.5	0.1	0.2	1.0	0.0	0.0	0.0	7.2	0.0
Tyres C1, total									
Tyres C2, replacement for vans	11.0	0.1	0.3	1.3	0.0	0.0	0.0	9.2	0.0
Tyres C2, OEM for vans	11.0	0.1	0.3	1.3	0.0	0.0	0.0	9.2	0.0
Tyres C2, total									
Tyres C3, replacement for trucks/busses	62.7	0.0	0.0	13.2	0.0	0.0	0.0	49.5	0.0
Tyres C3, OEM for trucks/busses	62.7	0.0	0.0	13.2	0.0	0.0	0.0	49.5	0.0
Tyres C3, total									
Tyres, total C1+C2+C3									

Table 12 : Material masses per unit product: BLK plastics and TEC plastics, in [g] per product

	LDPE	HDPE	LLDPE	PP	PS	EPS	HI-PS	PVC	SAN	PET	ABS	PA 6	PC	PMMA	Epoxy	Rigid PUR	Flex PUR	Talcum	E-glass	Aramid
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
EIWH Electric Instant. < 12 kW	0	0	10	0	177	0	0	110	0	0	36	546	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW	0	0	16	0	146	0	12	64	0	0	28	1249	1	0	0	0	0	0	0	0
EIWHS Electric Instant. Shower	0	0	10	0	177	0	0	110	0	0	36	546	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L	0	0	0	0	0	0	757	0	0	0	0	0	0	0	0	79	0	0	0	0
ESWH Electric Storage > 30 L	0	0	0	0	0	0	2004	0	0	0	0	0	0	0	0	2070	0	0	0	0
GIWH Gas Instant. < 13 L/min	0	0	0	0	0	0	73	0	0	0	764	0	0	0	0	0	0	0	0	0
GIWH Gas Instant. ≥ 13 L/min	0	0	0	0	0	0	154	0	0	0	1609	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Condensing	0	0	0	161	0	0	3679	0	0	0	0	0	0	0	0	7183	0	0	0	0
GSWH Gas Storage, Non-condensing	0	0	0	161	0	0	3679	0	0	0	0	0	0	0	0	7183	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	0	0	2387	158	0	0	0	0	0	0	0	2615	0	0	0	0
Dedicated WH Solar (3.5 m2)	0	0	0	262	0	0	0	0	0	0	0	300	0	0	0	15188	52	0	0	0
DWH Dedicated Water Heater																				
CHB Gas non-condensing	0	0	0	27	0	0	0	2	0	0	804	0	0	0	0	0	35	0	0	0
CHB Gas condensing	0	0	0	66	0	0	0	5	0	0	1207	0	0	0	0	0	118	0	0	0
CHB Gas Jet burner non-condensing	0	0	0	339	0	0	0	26	0	0	6203	0	0	0	0	0	609	0	0	0
CHB Gas Jet burner condensing	0	0	0	0	0	0	0	0	0	0	2658	0	0	0	0	0	0	0	0	0
CHB Oil Jet burner non-condensing	0	0	0	339	0	0	0	26	0	0	6203	0	0	0	0	0	609	0	0	0
CHB Oil Jet burner condensing	0	0	0	0	0	0	0	0	0	0	2658	0	0	0	0	0	0	0	0	0
CHB Electric Joule-effect	0	0	29	0	254	0	0	84	0	0	30	1864	0	0	0	0	0	0	0	0
CHB Hybrid (gas-electric)	0	401	0	51	0	0	0	1289	0	0	940	0	0	0	0	0	12940	0	0	0
CHB Electric Heat Pump	0	307	0	0	0	0	0	1235	0	0	0	0	0	0	0	0	12347	0	0	0
CHB Gas Heat Pump	0	5472	0	0	0	0	0	0	0	0	0	0	0	0	29	6150	0	0	0	0
CHB micro CHP	0	0	0	566	0	0	0	0	0	0	95	0	0	0	203	0	9	0	0	0
CHB Solar combi (16 m2)	0	0	0	0	0	0	0	684	0	0	3255	0	0	0	0	31740	0	0	0	0
CHB Central Heating boiler < 400 kW																				
SFB Wood Manual	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Coal	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Pellets	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Wood chips	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Solid Fuel Boilers																				
CHAE-S (≤ 400 kW)	0	0	0	0	0	0	0	14262	0	584	250	0	0	0	0	0	0	0	0	0
CHAE-L (> 400 kW)	0	0	0	0	0	0	0	231432	0	9474	4060	0	0	0	0	0	0	0	0	0
CHWE-S (≤ 400 kW)	0	0	0	0	0	0	0	15861	0	649	278	0	0	0	0	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	0	0	0	0	0	0	0	232458	0	9516	4078	0	0	0	0	0	0	0	0	0
CHWE-L (> 1500 kW)	0	0	0	0	0	0	0	416032	0	17030	7299	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	0	0	0	0	0	0	0	46999	0	1924	825	0	0	0	0	0	0	0	0	0
HT PCH-AE-L	0	0	0	0	0	0	0	324134	0	13269	5687	0	0	0	0	0	0	0	0	0
HT PCH-WE-S	0	0	0	0	0	0	0	65005	0	2661	1140	0	0	0	0	0	0	0	0	0
HT PCH-WE-M	0	0	0	0	0	0	0	195015	0	7983	3421	0	0	0	0	0	0	0	0	0
HT PCH-WE-L	0	0	0	0	0	0	0	416032	0	17030	7299	0	0	0	0	0	0	0	0	0
AC rooftop	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
AC splits	0	0	0	0	0	0	0	0	0	0	12580	0	12580	0	0	0	0	0	0	0
AC VRF	0	0	0	0	0	0	0	0	0	0	15648	0	15648	0	0	0	0	0	0	0
AHF	0	0	0	0	0	0	0	0	0	0	6375	0	6375	0	0	0	0	0	0	0
AHC Air Heating & Cooling																				
LH open fireplace	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH closed fireplace/inset	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH wood stove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH coal stove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH cooker	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH SHR stove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH pellet stove	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH Solid fuel																				
LH Electric portable	0	0	0	0	0	0	0	98	0	0	98	325	325	0	0	0	0	0	0	0
LH Electric fixed > 250W	0	0	0	0	0	0	0	224	0	0	224	224	224	0	0	0	0	0	0	0
LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	56	0	0	56	56	56	0	0	0	0	0	0	0
LH Electric storage	0	0	0	0	0	0	0	44	0	0	44	44	44	0	0	0	0	0	0	0
LH Electric underfloor	0	0	0	0	0	0	0	280	0	0	280	1252	1252	0	0	0	0	0	0	0
LH Electric visibly glowing > 1.2 kW	0	0	0	0	0	0	0	195	0	0	195	650	650	0	0	0	0	0	0	0
LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	98	0	0	98	325	325	0	0	0	0	0	0	0
LH Electric Towel Heaters	0	0	0	0	0	0	0	150	0	0	150	150	150	0	0	0	0	0	0	0
LH Electric																				
LH Gas luminous (commercial)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH Gaseous Tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH Gas open front	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Gas closed front	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Gas balanced flue	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Gas flueless	0	0	0	0	0	0	0	7	0	0	0	7	7	0	0	0	0	0	0	0
LH Gaseous fuel																				
LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH Liquid open front	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Liquid closed front	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Liquid balanced flue	0	0	0	0	0	0	0	13	0	0	0	13	13	0	0	0	0	0	0	0
LH Liquid flueless	0	0	0	0	0	0	0	7	0	0	0	7	7	0	0	0	0	0	0	0
LH Liquid fuel																				
LH Local Heaters																				
RAC fixed < 6 kW, cooling	0	0	0	6355	0	0	0	0	0	0	0	615	0	0	0	0	0	0	0	0
RAC fixed 6-12 kW, cooling	0	0	0	14880	0	0	0	0	0	0	0	1440	0	0	0	0	0	0	0	0
RAC portable < 12 kW, cooling	0	0	0	4960	0	0	0	0	0	0	0	480	0	0	0	0	0	0	0	0
RAC Room Air Conditioner																				
CIRC Integrated circulators	35	0	0	147	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CIRC Large standalone circulators	350	0	0	580	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

	LDPE	HDPE	LLDPE	PP	PS	EPS	HI-PS	PVC	SAN	PET	ABS	PA 6	PC	PMMA	Epoxy	Rigid PUR	Flex PUR	Talcum	E-glass	Aramid
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
CIRC Small standalone circulators	35	0	0	132	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CIRC Circulator pumps <2.5 kW																				
R-UVU ≤ 100 m3/h for Extract Spaces	52	0	0	0	0	0	0	233	0	0	14	0	130	0	0	0	70	0	0	0
R-UVU ≤ 100 m3/h for Habitable Spaces	52	0	0	0	0	0	0	233	0	0	14	0	130	0	0	0	70	0	0	0
R-BVU ≤ 100 m3/h for Habitable Spaces	314	0	0	0	0	0	0	1400	0	0	86	0	65	0	0	0	35	0	0	0
R-UVU 100-250 m3/h	279	0	0	0	0	0	0	1244	0	0	76	0	196	0	0	0	104	0	0	0
R-BVU 100-250 m3/h	297	0	0	0	0	0	0	1322	0	0	81	0	326	0	0	0	174	0	0	0
R-UVU 250-1000 m3/h	52	0	0	0	0	0	0	233	0	0	14	0	0	0	0	0	0	0	0	0
R-BVU 250-1000 m3/h	105	0	0	0	0	0	0	467	0	0	29	0	0	0	0	0	0	0	0	0
R-UVU > 1000 m3/h	1414	0	0	0	0	0	0	6300	0	0	386	0	848	0	0	0	452	0	0	0
R-BVU 1000-2500 m3/h	6268	0	0	0	0	0	0	27922	0	0	1710	0	4435	0	0	0	2365	0	0	0
RVU, residential																				
NR-UVU 250-1000 m3/h	52	0	0	0	0	0	0	233	0	0	14	0	0	0	0	0	0	0	0	0
NR-BVU 250-1000 m3/h	105	0	0	0	0	0	0	467	0	0	29	0	0	0	0	0	0	0	0	0
NR-UVU > 1000 m3/h	1414	0	0	0	0	0	0	6300	0	0	386	0	848	0	0	0	452	0	0	0
NR-BVU 1000-2500 m3/h	6268	0	0	0	0	0	0	27922	0	0	1710	0	4435	0	0	0	2365	0	0	0
NR-AHU-S 2500-5500 m3/h	3457	0	0	0	0	0	0	15400	0	0	943	0	1109	0	0	0	591	0	0	0
NR-AHU-M 5500-14500 m3/h	7473	0	0	0	0	0	0	33289	0	0	2038	0	2413	0	0	0	1287	0	0	0
NR-AHU-L > 14500 m3/h	24794	0	0	0	0	0	0	110444	0	0	6762	0	7826	0	0	0	4174	0	0	0
NRVU, non-residential																				
VU Ventilation Units, res + non-res																				
LFL (T12,T8h,T8t,T5,other)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HID (HPM, HPS, MH)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
CFLni (all shapes)	0	0	0	0	0	0	0	0	0	11	0	0	0	0	1	0	0	0	0	0
CFLi (retrofit for GLS, HL)	0	0	0	0	0	0	0	0	0	12	0	0	0	0	2	0	0	0	0	0
GLS (DLS & NDLS)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
GLS from storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
HL (DLS & NDLS, LV & MV)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
HL from storage	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LED replacing LFL (retrofit & luminaire)	0	0	0	0	0	0	0	0	0	0	0	0	28	0	22	0	0	0	0	0
LED replacing HID (retrofit & luminaire)	0	0	0	0	0	0	0	0	0	0	0	0	57	0	46	0	0	0	0	0
LED replacing CFLni (retrofit & lumin.)	0	0	0	0	0	0	0	0	0	0	0	0	12	0	10	0	0	0	0	0
LED replacing DLS (retrofit & luminaire)	0	0	0	0	0	0	0	0	0	0	0	0	14	0	11	0	0	0	0	0
LED replacing NDLS (retrofit & lumin.)	0	0	0	0	0	0	0	0	0	0	0	0	9	0	7	0	0	0	0	0
LS Light Sources																				
DP TV, standard (NoNA)	0	0	0	0	4	0	432	375	0	0	710	108	624	1080	0	0	0	0	72	0
DP TV, LoNA	0	0	0	0	4	0	432	375	0	0	710	108	624	1080	0	0	0	0	72	0
DP TV, HiNA ('Smart')	0	0	0	0	4	0	432	375	0	0	710	108	624	1080	0	0	0	0	72	0
DP Monitor	0	0	0	0	2	0	192	375	0	0	510	48	277	480	0	0	0	0	32	0
DP Electronic Displays																				
SSTB	0	0	0	0	0	0	24	24	0	0	364	0	15	0	0	0	21	0	0	0
CSTB	0	4	0	0	25	0	0	49	0	0	181	15	0	0	0	0	13	0	0	0
STB set top boxes (Complex & Simple)																				
Game consoles > 20 W	0	0	0	0	0	0	0	103	0	0	1279	13	0	0	0	0	0	0	0	0
Game consoles < 20 W	0	0	0	0	0	0	0	51	0	0	640	7	0	0	0	0	0	0	0	0
GC Game consoles																				
ES tower 1-socket traditional	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 1-socket traditional	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 2-socket traditional	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 2-socket cloud	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 4-socket traditional	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 4-socket cloud	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 2-socket resilient trad.	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 2-socket resilient cloud	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 4-socket resilient trad.	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES rack 4-socket resilient cloud	0	316	0	0	206	0	0	237	0	0	560	0	310	0	0	35	2	0	0	0
ES blade 1-socket traditional	0	894	0	0	515	0	0	447	0	0	499	0	52	0	0	0	0	0	0	0
ES blade 2-socket traditional	0	894	0	0	515	0	0	447	0	0	499	0	52	0	0	0	0	0	0	0
ES blade 2-socket cloud	0	894	0	0	515	0	0	447	0	0	499	0	52	0	0	0	0	0	0	0
ES blade 4-socket traditional	0	894	0	0	515	0	0	447	0	0	499	0	52	0	0	0	0	0	0	0
ES blade 4-socket cloud	0	894	0	0	515	0	0	447	0	0	499	0	52	0	0	0	0	0	0	0
ES Enterprise Servers total																				
DS Online 2	0	87	0	18	0	0	0	85	0	39	735	61	650	0	0	0	0	0	0	0
DS Online 3	0	87	0	18	0	0	0	85	0	39	735	61	650	0	0	0	0	0	0	0
DS Online 4	0	87	0	18	0	0	0	85	0	39	735	61	650	0	0	0	0	0	0	0
DS Data Storage products total																				
ES + DS total																				
PC Desktop	211	0	0	0	0	0	0	0	0	0	327	118	226	0	84	0	2	0	0	0
PC Integrated Desktop	176	0	0	0	0	0	0	0	0	0	272	99	189	0	70	0	1	0	0	0
PC Notebook	32	0	0	3	2	38	0	17	0	0	107	211	200	27	2	0	0	0	0	0
PC Tablet/slate	0	0	0	0	0	4	0	0	0	0	13	0	34	0	0	0	0	0	0	0
PC Thin client	25	0	0	0	0	0	0	0	0	0	38	14	26	0	10	0	0	0	0	0
PC Integrated Thin Client	25	0	0	0	0	0	0	0	0	0	38	14	26	0	10	0	0	0	0	0
PC Small-scale Server	369	0	0	0	0	0	0	0	0	0	572	207	396	0	147	0	3	0	0	0
PC Workstation	369	0	0	0	0	0	0	0	0	0	572	207	396	0	147	0	3	0	0	0
PC Personal Computers																				
Inkjet Printer	49	21	0	38	386	26	1175	21	1	0	524	250	100	20	7	45	137	0	18	0
Inkjet MFD	82	34	0	64	645	43	1962	35	2	0	875	205	82	16	6	37	113	0	15	0
EP / Laser Printer mono	121	386	46	86	897	4	0	201	4	0	3109	178	1202	14	11	14	40	0	52	0
EP / Laser Printer colour	665	34	0	689	3700	113	186	127	285	0	2639	2010	1803	5	0	33	20	0	0	0
EP / Laser Copier mono	121	386	46	86	897	4	0	201	4	0	3109	178	1202	14	11	14	40	0	52	0
EP / Laser Copier colour	665	34	0	689	3700	113	186	127	285	0	2639	2010	1803	5	0	33	20	0	0	0
EP / Laser MFD mono	210	936	0	348	10617	333	2409	0	0	0	3591	413	5118	0	28	0	85	0	0	1
EP / Laser MFD colour	131	867	0	74	4470	2707	0	41	0	0	3203	514	8747	0	52	581	272	0	0	0
EP & IJ imaging equipment																				
Regulated only for (networked) standby																				
SB Media players and recorders	0	0	0	0	60	0	0	200	20	0	150	0	0	0	0	0	0	0	0	0

	LDPE	HDPE	LLDPE	PP	PS	EPS	HI-PS	PVC	SAN	PET	ABS	PA 6	PC	PMMA	Epoxy	Rigid PUR	Flex PUR	Talcum	E-glass	Aramid
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
SB Projectors	17	11	0	146	197	0	0	193	0	0	193	0	542	0	17	0	103	0	219	0
SB Home phones	0	0	0	0	0	0	0	20	0	0	142	0	14	4	0	0	1	0	0	0
SB Office phones	0	0	0	0	0	0	0	20	0	0	142	0	14	4	0	0	1	0	0	0
SB Coffee makers (off mode)	0	0	0	706	33	0	0	57	84	0	582	195	5	0	0	0	0	0	90	0
(networked) Standby																				
EPS ≤ 6W, low-V	0	0	0	0	0	0	0	21	0	0	5	1	20	0	0	0	0	0	0	0
EPS 6–10 W	0	0	0	0	0	0	0	27	0	0	6	1	26	0	0	0	0	0	0	0
EPS 10–12 W	0	0	0	0	0	0	0	31	0	0	7	1	30	0	0	0	0	0	0	0
EPS 15–20 W	0	0	0	0	0	0	0	31	0	0	7	1	30	0	0	0	0	0	0	0
EPS 20–30 W	0	0	0	0	0	0	0	27	0	0	28	0	29	0	0	0	0	0	0	0
EPS 30–65 W, multiple-V	1	0	0	1	0	0	0	22	0	0	49	0	28	0	0	0	0	0	0	0
EPS 30-65 W	1	0	0	1	0	0	0	22	0	0	49	0	28	0	0	0	0	0	0	0
EPS 65–120 W	0	0	0	0	0	0	0	44	0	0	0	0	73	0	0	0	0	0	0	0
EPS 65–120 W, multiple-V	0	0	0	0	0	0	0	44	0	0	0	0	73	0	0	0	0	0	0	0
EPS 12–15 W	0	0	0	0	0	0	0	31	0	0	7	1	30	0	0	0	0	0	0	0
EPS External Power Supplies																				
RF Household Refrigerators & freezers	167	124	0	1503	8302	27	0	632	103	0	828	35	15	0	0	9349	0	0	0	0
CF open vert. chilled multi deck (RVC2)	0	583	0	0	2948	0	0	9516	0	0	803	0	1276	14	0	25133	4	0	0	0
CF open horiz. frozen island (RHF4)	0	20	0	1081	176	16886	0	11274	0	0	1643	50	2182	0	0	18858	0	0	0	0
CF other supermarket displ. (non-BCs)	0	322	0	554	1562	8443	0	10431	0	0	1223	25	1729	7	7	21995	2	0	0	0
CF Plug in one door beverage cooler	2	35	0	271	0	0	1166	1264	0	0	1938	0	0	0	12	8514	0	0	0	0
CF Plug in horizontal ice cream freezer	0	33	0	11	8030	0	1175	306	0	0	1175	26	0	0	11	0	0	0	0	0
CF Spiral vending machine	0	37	0	97	845	819	0	3178	0	0	29885	309	0	0	12	4175	0	0	0	0
CF Commercial Refrigeration																				
PF Storage cabinet Chilled Vertical (CV)	3	51	0	1590	0	566	11701	1953	0	0	1179	66	80	0	0	16099	554	0	0	0
PF Storage cabinet Frozen Vertical (FV)	3	56	0	1757	0	626	12933	2159	0	0	1303	73	88	0	0	17794	612	0	0	0
PF Storage cabinet Chilled Horiz. (CH)	1	25	0	795	0	283	5851	977	0	0	590	33	40	0	0	8050	277	0	0	0
PF Storage cabinet Frozen Horiz. (FH)	1	19	0	586	0	209	4311	720	0	0	434	24	29	0	0	5931	204	0	0	0
PF Storage cabinets																				
PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0	0	0	0	713	29	0	13	966	966	0	0	362	121	0	0	0
PF Process Chiller AC MT L > 300 kW	0	0	0	0	0	0	0	2515	103	0	44	3408	3408	0	0	1278	426	0	0	0
PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0	0	0	0	814	33	0	14	1103	1103	0	0	414	138	0	0	0
PF Process Chiller AC LT L > 200 kW	0	0	0	0	0	0	0	2918	119	0	51	3954	3954	0	0	1483	494	0	0	0
PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0	0	0	0	854	35	0	15	1157	1157	0	0	434	145	0	0	0
PF Process Chiller WC MT L > 300 kW	0	0	0	0	0	0	0	2952	121	0	52	3999	3999	0	0	1500	500	0	0	0
PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0	0	0	0	1042	43	0	18	1412	1412	0	0	530	177	0	0	0
PF Process Chiller WC LT L > 200 kW	0	0	0	0	0	0	0	3469	142	0	61	4700	4700	0	0	1762	587	0	0	0
PF Process Chillers MT&LT																				
PF Condensing Unit MT S 0.2-1 kW	0	155	0	103	0	0	0	0	0	0	0	4	0	0	0	0	0	0	0	0
PF Condensing Unit MT M 1-5 kW	0	758	0	505	0	0	0	0	0	0	0	21	0	0	2	0	0	0	0	0
PF Condensing Unit MT L 5-20 kW	0	3000	0	2000	0	0	0	0	0	0	0	85	0	0	7	0	0	0	0	0
PF Condensing Unit MT XL 20-50 kW	0	9186	0	6124	0	0	0	0	0	0	0	260	0	0	21	0	0	0	0	0
PF Condensing Unit LT S 0.1-0.4 kW	0	96	0	64	0	0	0	0	0	0	0	3	0	0	0	0	0	0	0	0
PF Condensing Unit LT M 0.4-2 kW	0	315	0	210	0	0	0	0	0	0	0	9	0	0	1	0	0	0	0	0
PF Condensing Unit LT L 2-8 kW	0	1575	0	1050	0	0	0	0	0	0	0	45	0	0	4	0	0	0	0	0
PF Condensing Unit LT XL 8-20 kW	0	10818	0	7212	0	0	0	0	0	0	0	306	0	0	24	0	0	0	0	0
PF Condensing Units MT&LT																				
PF Professional Refrigeration																				
CA Electric Hobs	25	0	0	25	0	0	0	202	0	0	0	0	0	0	24	0	132	0	0	0
CA Electric Ovens	0	0	0	20	0	0	0	0	0	0	0	498	83	0	0	0	0	0	1532	0
CA Gas Hobs	0	0	0	32	0	0	0	107	0	0	0	119	0	0	0	0	0	0	0	0
CA Gas Ovens	0	0	0	50	0	0	0	20	0	0	0	473	124	0	0	0	0	0	1575	0
CA Range Hoods	52	231	0	0	0	0	0	0	0	0	14	0	169	0	0	0	90	0	0	0
CA Cooking Appliances																				
WM Washing Machines	15	0	0	2000	0	0	0	95	0	22	1740	24	0	172	0	1	0	121	6138	0
WD Washer-Dryers	16	0	0	2155	0	0	0	102	0	24	1874	26	0	185	0	1	0	131	6611	0
WM-WD household Washing																				
DW Household Dishwashers	0	500	0	6393	0	4	0	384	0	1104	856	132	254	69	0	6	356	0	49	0
LD condensing heat pump	0	0	0	10386	509	0	0	155	0	0	2850	349	193	50	0	0	0	0	0	0
LD condensing electric heat element	0	0	0	9564	468	0	0	143	0	0	2625	198	109	28	0	0	0	0	0	0
LD vented electric	0	0	0	6521	572	0	0	157	0	0	2050	247	83	74	0	0	0	0	0	0
LD vented gas	0	0	0	6521	572	0	0	157	0	0	2050	247	83	74	0	0	0	0	0	0
LD household Laundry Dryers																				
VC household	0	303	0	731	0	0	0	207	0	0	2632	0	42	0	80	0	0	120	67	0
VC professional	0	465	0	1121	0	0	0	318	0	0	4038	0	12	0	22	0	0	33	18	0
VC Vacuum Cleaners																				
FAN Axial<300Pa (all FAN types >125W)	0	0	0	0	0	0	0	0	0	0	0	1000	0	0	0	0	0	0	0	0
FAN Axial>300Pa	0	0	0	0	0	0	0	0	0	0	0	1300	0	0	0	0	0	0	0	0
FAN Centr.FC	0	0	0	0	0	0	0	0	0	0	0	300	0	0	0	0	0	0	0	0
FAN Centr.BC-free	0	0	0	0	0	0	0	0	0	0	0	1217	0	0	0	0	0	0	0	0
FAN Centr.BC	0	0	0	0	0	0	0	0	0	0	0	760	0	0	0	0	0	0	0	0
FAN Cross-flow	0	0	0	0	0	0	0	0	0	0	0	400	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W																				
Medium (S) 3-ph 0.75-7.5 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	55	0	0	0	0
Medium (M) 3-ph 7.5-75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1100	220	0	0	0	0
Medium (L) 3-ph 75-375 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5500	1100	0	0	0	0
Total 3ph 0.75-375 kW no VSD																				
Medium (S) 3-ph 0.75-7.5 kW with VSD	0	0	0	0	0	0	0	330	0	0	0	0	0	0	330	55	0	0	0	0
Medium (M) 3-ph 7.5-75 kW with VSD	0	0	0	0	0	0	0	550	0	0	0	0	0	0	1100	220	0	0	0	0
Medium (L) 3-ph 75-375 kW with VSD	0	0	0	0	0	0	0	3300	0	0	0	0	0	0	5500	1100	0	0	0	0
Total 3-ph 0.75-375 kW with VSD																				
Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	193	29	0	0	0	0
Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	148	0	0	0	0	0	0	193	29	0	0	0	0

	LDPE	HDPE	LLDPE	PP	PS	EPS	HI-PS	PVC	SAN	PET	ABS	PA 6	PC	PMMA	Epoxy	Rigid PUR	Flex PUR	Talcum	E-glass	Aramid
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
Total Small 1-ph 0.12-0.75 kW																				
Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	148	22	0	0	0	0
Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	148	0	0	0	0	0	0	148	22	0	0	0	0
Total Small 3-ph 0.12-0.75 kW																				
Large 3-ph LV 375-1000 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0	0	15125	15125	0	0	0	0
Large 3-ph LV 375-1000kW with VSD	0	0	0	0	0	0	0	14850	0	0	0	0	0	0	15125	15125	0	0	0	0
Total Large 3-ph LV 375-1000 kW																				
Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	55	0	0	0	0
Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1100	220	0	0	0	0
Explosion motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5500	1100	0	0	0	0
Total Expl. 0.75-375 kW (no VSD)																				
Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	55	0	0	0	0
Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1100	220	0	0	0	0
Brake motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5500	1100	0	0	0	0
Total Brake 0.75-375 kW (no VSD)																				
8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	330	55	0	0	0	0
8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1100	220	0	0	0	0
8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5500	1100	0	0	0	0
Total 8-pole 0.75-375 kW (no VSD)																				
1-phase motors >0.75 kW (no VSD)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	422	70	0	0	0	0
MT Elec. Motors LV 0.12-1000 kW																				
WP Water pumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	0	0	0
WE Welding Equipment	0	0	0	0	0	865	1430	2880	0	0	8	0	0	0	0	0	0	0	0	0
TRAFO Distribution	0	3157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Industry dry	0	16115	0	0	0	0	0	0	0	0	0	0	0	0	145958	0	0	0	0	0
TRAFO Power	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO DER oil	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	21687
TRAFO DER dry	0	59900	0	0	0	0	0	0	0	0	0	0	0	0	112514	0	0	0	0	0
TRAFO Small	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers																				
Tyres C1, replacement for cars	0	0	0	0	0	0	0	0	0	114	0	114	0	0	0	0	0	0	0	114
Tyres C1, OEM for cars	0	0	0	0	0	0	0	0	0	114	0	114	0	0	0	0	0	0	0	114
Tyres C1, total																				
Tyres C2, replacement for vans	0	0	0	0	0	0	0	0	0	147	0	147	0	0	0	0	0	0	0	147
Tyres C2, OEM for vans	0	0	0	0	0	0	0	0	0	147	0	147	0	0	0	0	0	0	0	147
Tyres C2, total																				
Tyres C3, replacement for trucks/busses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, OEM for trucks/busses	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, total																				
Tyres, total C1+C2+C3																				

Table 13 : Material masses per unit product : Ferro-metals, Non-ferro metals and coatings/platings, in [g] per product

	St sheet galv	St tube/profile	Cast iron	Ferrite	Stainless 18/8 coil	Al sheet/extrusion	Al diecast	Cu winding wire	Cu wire	Cu tube/sheet	CuZn38 cast	ZnAl4 cast	MgZn5 cast	pre-coating coil	powder coating	Cu/Ni/Cr plating	Au/Pt/Pd per g
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
EIWH Electric Instant. < 12 kW	63	0	0	0	17	0	0	0	100	63	65	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW	86	0	0	0	44	0	0	0	66	311	214	0	0	0	0	0	0
EIWHS Electric Instant. Shower	63	0	0	0	17	0	0	0	100	63	65	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L	328	0	0	0	0	0	0	0	0	2571	0	0	0	0	0	0	0
ESWH Electric Storage > 30 L	31051	0	0	0	0	0	0	0	0	2641	0	0	0	0	1922	0	0
GIWH Gas Instant. < 13 L/min	5899	0	245	167	557	0	412	0	0	892	345	0	0	0	0	0	0
GIWH Gas Instant. ≥ 13 L/min	12420	0	516	353	1172	0	868	0	0	1877	727	0	0	0	0	0	0
GSWH Gas Storage, Condensing	77572	0	0	0	0	0	2070	0	0	0	4105	0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	77572	0	0	0	0	0	2070	0	0	0	4105	0	0	0	0	0	0
Dedicated WH Heat Pump	42728	0	0	0	124	360	0	0	0	2560	900	0	0	0	1305	0	0
Dedicated WH Solar (3.5 m2)	59757	0	1209	91	263	7813	233	0	0	16956	2308	0	0	0	0	0	0
DWH Dedicated Water Heater																	
CHB Gas non-condensing	28099	0	0	0	0	0	110	66	0	4469	2551	0	0	0	0	0	0
CHB Gas condensing	23575	0	0	0	6941	0	1963	77	0	2360	3313	0	0	0	0	0	0
CHB Gas Jet burner non-condensing	121202	0	0	0	35684	0	10092	394	0	12131	17032	0	0	0	0	0	0
CHB Gas Jet burner condensing	50900	0	87021	0	3966	0	3403	0	0	1689	0	0	0	0	0	0	0
CHB Oil Jet burner non-condensing	121202	0	0	0	35684	0	10092	394	0	12131	17032	0	0	0	0	0	0
CHB Oil Jet burner condensing	50900	0	87021	0	3966	0	3403	0	0	1689	0	0	0	0	0	0	0
CHB Electric Joule-effect	259	25	0	0	273	0	0	320	0	733	788	0	0	0	0	0	0
CHB Hybrid (gas-electric)	18371	96355	0	0	5409	25695	1530	60	0	31227	2582	0	0	0	0	0	0
CHB Electric Heat Pump	0	92600	0	0	0	14873	0	0	0	37842	1668	0	0	0	0	0	0
CHB Gas Heat Pump	236151	5388	6043	73	43802	33149	366	513	0	6839	0	0	0	0	1407	0	0
CHB micro CHP	19118	36909	38999	668	3449	3848	3422	3551	0	485	1695	0	0	0	0	0	0
CHB Solar combi (16 m2)	5355	0	6983	0	1156	42385	0	1563	0	3597	161074	0	0	0	10645	0	0
CHB Central Heating boiler < 400 kW																	
SFB Wood Manual	69960	0	279840	0	0	0	0	0	0	400	0	0	0	0	400	0	0
SFB Wood Direct Draft	91420	0	365680	0	0	0	0	0	0	6500	0	0	0	0	500	0	0
SFB Coal	92700	0	370800	0	0	0	0	0	0	1400	0	0	0	0	0	0	0
SFB Pellets	86680	0	346720	0	0	0	0	0	0	10800	0	0	0	0	2700	0	0
SFB Wood chips	173340	0	693360	0	0	0	0	0	0	21700	0	0	0	0	5400	0	0
SFB Solid Fuel Boilers																	
CHAE-S (≤ 400 kW)	313476	0	0	0	0	33778	0	0	0	30859	1257	0	0	0	0	0	0
CHAE-L (> 400 kW)	5086864	0	0	0	0	548128	0	0	0	500759	20398	0	0	0	0	0	0
CHWE-S (≤ 400 kW)	348629	0	0	0	0	37566	0	0	0	34320	1398	0	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	5109411	0	0	0	0	550558	0	0	0	502979	20488	0	0	0	0	0	0
CHWE-L (> 1500 kW)	9144360	0	0	0	0	985339	0	0	0	900186	36668	0	0	0	0	0	0
HT PCH-AE-S	1033047	0	0	0	0	111315	0	0	0	101695	4142	0	0	0	0	0	0
HT PCH-AE-L	7124459	0	0	0	0	767687	0	0	0	701344	28568	0	0	0	0	0	0
HT PCH-WE-S	1428806	0	0	0	0	153959	0	0	0	140654	5729	0	0	0	0	0	0
HT PCH-WE-M	4286419	0	0	0	0	461878	0	0	0	421962	17188	0	0	0	0	0	0
HT PCH-WE-L	9144360	0	0	0	0	985339	0	0	0	900186	36668	0	0	0	0	0	0
AC rooftop	0	0	166000	0	176000	111000	0	0	0	82000	0	399000	0	0	0	0	0
AC splits	38128	8215	0	0	0	6121	1458	0	0	17997	0	0	0	0	0	0	0
AC VRF	287863	80588	18018	0	0	31279	25675	0	0	78819	0	0	0	0	7136	0	0
AHF	112553	102956	968	0	0	0	12072	0	0	12072	0	0	0	0	2647	0	0
AHC Air Heating & Cooling																	
LH open fireplace	6266	0	25064	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH closed fireplace/inset	27180	0	108720	0	0	0	0	0	0	0	0	0	0	0	500	0	0
LH wood stove	30500	0	122000	0	0	0	0	0	0	0	0	0	0	0	200	0	0
LH coal stove	30500	0	122000	0	0	0	0	0	0	0	0	0	0	0	200	0	0
LH cooker	28160	0	112640	0	0	0	0	0	0	0	0	0	0	0	500	0	0
LH SHR stove	11140	0	44560	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LH pellet stove	26660	0	106640	0	0	0	0	0	0	1200	0	0	0	0	600	0	0
LH Solid fuel																	
LH Electric portable	98	98	0	0	0	0	98	0	0	98	0	0	0	0	0	0	0
LH Electric fixed > 250W	2627	2627	47	0	0	0	475	0	0	475	0	0	0	0	268	0	0
LH Electric fixed ≤ 250W	657	657	12	0	0	0	119	0	0	119	0	0	0	0	67	0	0
LH Electric storage	8738	8738	0	0	0	0	379	0	0	379	0	0	0	0	100	0	0
LH Electric underfloor	25	25	0	0	0	0	280	0	0	280	0	0	0	0	0	0	0
LH Electric visibly glowing > 1.2 kW	195	195	0	0	0	0	195	0	0	195	0	0	0	0	0	0	0
LH Electric visibly glowing ≤ 1.2 kW	98	98	0	0	0	0	98	0	0	98	0	0	0	0	0	0	0
LH Electric Towel Heaters	1875	1875	0	0	0	0	307	0	0	307	0	0	0	0	311	0	0
LH Electric																	
LH Gas luminous (commercial)	8500	8500	0	0	0	0	0	0	0	0	0	0	0	0	800	0	0
LH Gaseous Tube (commercial < 120 kW)	38054	38054	392	0	0	0	307	0	0	307	0	0	0	0	3600	0	0
LH Gas open front	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Gas closed front	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Gas balanced flue	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Gas flueless	4455	4455	0	0	0	0	198	0	0	198	0	0	0	0	366	0	0
LH Gaseous fuel																	
LH Liquid tube (commercial < 120 kW)	38054	38054	392	0	0	0	307	0	0	307	0	0	0	0	3600	0	0
LH Liquid open front	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Liquid closed front	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Liquid balanced flue	8910	8910	0	0	0	0	396	0	0	396	0	0	0	0	732	0	0
LH Liquid flueless	4455	4455	0	0	0	0	198	0	0	198	0	0	0	0	366	0	0
LH Liquid fuel																	
LH Local Heaters																	

	St sheet galv	St tube/profile	Cast iron	Ferrite	Stainless 18/8 coil	Al sheet/extrusion	Al diecast	Cu winding wire	Cu wire	Cu tube/sheet	CuZn38 cast	ZnAl4 cast	MgZn5 cast	pre-coating coil	powder coating	Cu/Ni/Cr plating	Au/Pt/Pd per g
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
RAC fixed < 6 kW, cooling	0	0	18450	0	0	2870	0	0	0	6970	0	0	0	0	0	0	0
RAC fixed 6-12 kW, cooling	0	0	43200	0	0	6720	0	0	0	16320	0	0	0	0	0	0	0
RAC portable < 12 kW, cooling	0	0	14400	0	0	2240	0	0	0	5440	0	0	0	0	0	0	0
RAC Room Air Conditioner																	
CIRC Integrated circulators	0	0	1391	0	0	0	183	292	0	0	0	0	0	0	0	0	0
CIRC Large standalone circulators	0	0	15100	0	0	0	1450	1400	0	0	0	0	0	0	100	0	0
CIRC Small standalone circulators	0	0	1846	0	0	0	180	302	0	0	0	0	0	0	24	0	0
CIRC Circulator pumps <2.5 kW																	
R-UVU ≤ 100 m3/h for Extract Spaces	463	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R-UVU ≤ 100 m3/h for Habit. Spaces	463	0	37	0	0	0	0	0	0	0	0	0	0	0	0	0	0
R-BVU ≤ 100 m3/h for Habit. Spaces	1297	0	103	0	0	0	102	0	0	94	4	0	0	0	0	0	0
R-UVU 100-250 m3/h	1297	0	103	0	0	0	717	0	0	656	27	0	0	0	0	0	0
R-BVU 100-250 m3/h	2872	0	228	0	0	0	1179	0	0	1078	44	0	0	0	0	0	0
R-UVU 250-1000 m3/h	16955	0	1345	0	0	0	6303	0	0	5763	233	0	0	0	0	0	0
R-BVU 250-1000 m3/h	31409	0	2491	0	0	0	13836	0	0	12651	512	0	0	0	0	0	0
R-UVU > 1000 m3/h	7505	0	595	0	0	0	1230	0	0	1125	46	0	0	0	0	0	0
R-BVU 1000-2500 m3/h	128787	0	10213	0	0	0	8763	0	0	8012	325	0	0	0	0	0	0
RVU, residential																	
NR-UVU 250-1000 m3/h	16955	0	1345	0	0	0	6303	0	0	5763	233	0	0	0	0	0	0
NR-BVU 250-1000 m3/h	31409	0	2491	0	0	0	13836	0	0	12651	512	0	0	0	0	0	0
NR-UVU > 1000 m3/h	7505	0	595	0	0	0	1230	0	0	1125	46	0	0	0	0	0	0
NR-BVU 1000-2500 m3/h	128787	0	10213	0	0	0	8763	0	0	8012	325	0	0	0	0	0	0
NR-AHU-S 2500-5500 m3/h	605000	0	0	0	0	0	65082	0	0	59508	2410	0	0	0	0	0	0
NR-AHU-M 5500-14500 m3/h	1290000	0	0	0	0	0	138875	0	0	126981	5144	0	0	0	0	0	0
NR-AHU-L > 14500 m3/h	4190000	0	0	0	0	0	451473	0	0	412805	16721	0	0	0	0	0	0
NRVU, non-residential																	
VU Ventilation Units, res + non-res																	
LFL (T12,T8h,T8t,T5,other)	0	0	0	0	0	3	0	0	1	0	0	0	0	0	0	0	0
HID (HPM, HPS, MH)	0	0	0	0	4	7	0	0	1	0	19	0	0	0	0	2	0
CFLni (all shapes)	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0
CFLi (retrofit for GLS, HL)	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0
GLS (DLS & NDLS)	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
HL (DLS & NDLS, LV & MV)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
LED replacing LFL (retrofit & luminaire)	0	0	1	0	0	3	108	0	0	12	5	0	0	0	0	0	0
LED replacing HID (retrofit & luminaire)	0	0	2	0	0	7	226	0	0	24	10	0	0	0	0	0	0
LED replacing CFLni (retrofit & lumin.)	0	0	0	0	0	1	47	0	0	5	2	0	0	0	0	0	0
LED replacing DLS (retrofit & lumin.)	0	0	0	0	0	2	19	0	0	6	2	0	0	0	0	0	0
LED replacing NDLS (retrofit & lumin.)	0	0	0	0	0	1	13	0	0	4	2	0	0	0	0	0	0
LS Light Sources																	
DP TV, standard (NoNA)	1600	7	0	0	0	156	0	0	651	0	8	0	0	0	0	0	0
DP TV, LoNA	1600	7	0	0	0	156	0	0	651	0	8	0	0	0	0	0	0
DP TV, HiNA ('Smart')	1600	7	0	0	0	156	0	0	651	0	8	0	0	0	0	0	0
DP Monitor	1489	3	0	0	0	69	0	0	498	0	4	0	0	0	0	0	0
DP Electronic Displays																	
SSTB (simple)	343	0	0	1	7	0	0	0	11	0	16	0	0	0	0	0	0
CSTB (complex)	0	17	0	41	936	81	64	15	54	0	0	0	0	15	0	0	0
STB set top boxes																	
Game consoles > 20 W	386	0	0	0	56	143	0	0	239	0	0	0	0	0	0	0	0
Game consoles < 20 W	193	0	0	0	28	72	0	0	120	0	0	0	0	0	0	0	0
GC Game consoles																	
ES tower 1-socket traditional	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 1-socket traditional	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 2-socket traditional	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 2-socket cloud	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 4-socket traditional	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 4-socket cloud	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 2-socket resilient trad.	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 2-socket resilient cloud	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 4-socket resilient trad.	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES rack 4-socket resilient cloud	14167	0	55	0	66	1827	249	0	90	558	282	49	0	0	0	0	0
ES blade 1-socket traditional	128041	0	137	0	319	7725	0	0	43	2126	32	202	0	0	0	0	3
ES blade 2-socket traditional	128041	0	137	0	319	7725	0	0	43	2126	32	202	0	0	0	0	3
ES blade 2-socket cloud	128041	0	137	0	319	7725	0	0	43	2126	32	202	0	0	0	0	3
ES blade 4-socket traditional	128041	0	137	0	319	7725	0	0	43	2126	32	202	0	0	0	0	3
ES blade 4-socket cloud	128041	0	137	0	319	7725	0	0	43	2126	32	202	0	0	0	0	3
ES Enterprise Servers total																	
DS Online 2	30246	282	138	0	1680	9487	0	0	124	918	0	0	299	0	0	0	0
DS Online 3	30246	282	138	0	1680	9487	0	0	124	918	0	0	299	0	0	0	0
DS Online 4	30246	282	138	0	1680	9487	0	0	124	918	0	0	299	0	0	0	0
DS Data Storage products total																	
ES + DS total																	
PC Desktop	5410	92	414	0	9	270	13	220	286	57	0	0	0	0	2	0	0
PC Integrated Desktop	4509	76	345	0	7	225	11	184	239	48	0	0	0	0	1	0	0
PC Notebook	367	0	0	0	0	29	0	0	45	11	0	0	92	0	0	0	0
PC Tablet/slate	4	0	0	0	0	42	0	0	0	0	0	0	15	0	0	0	0
PC Thin client	631	11	48	0	1	32	2	26	33	7	0	0	0	0	0	0	0
PC Integrated Thin Client	631	11	48	0	1	32	2	26	33	7	0	0	0	0	0	0	0
PC Small-scale Server	9468	161	725	0	15	473	23	386	501	101	0	0	0	0	3	0	0
PC Workstation	9468	161	725	0	15	473	23	386	501	101	0	0	0	0	3	0	0
PC Personal Computers																	
Inkjet Printer	770	0	0	16	11	59	0	32	129	39	1	0	0	0	0	0	0

	St sheet galv	St tube/profile	Cast iron	Ferrite	Stainless 18/8 coil	Al sheet/extrusion	Al diecast	Cu winding wire	Cu wire	Cu tube/sheet	CuZn38 cast	ZnAl4 cast	MgZn5 cast	pre-coating coil	powder coating	Cu/Ni/Cr plating	Au/Pt/Pd per g
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
Inkjet MFD	1228	0	0	25	18	31	0	17	67	20	0	0	0	0	0	0	0
EP / Laser Printer mono	3967	130	2	66	279	129	28	235	58	18	2	19	0	223	223	2	0
EP / Laser Printer colour	7415	13	87	111	420	214	9	142	254	139	11	4	0	0	0	2	0
EP / Laser Copier mono	3967	130	2	66	279	129	28	235	58	18	2	19	0	223	223	2	0
EP / Laser Copier colour	7415	13	87	111	420	214	9	142	254	139	11	4	0	0	0	2	0
EP / Laser MFD mono	35813	2555	0	11	845	982	0	22	827	1036	4	0	0	0	0	0	0
EP / Laser MFD colour	26616	0	0	2	1035	616	70	1518	371	390	0	0	0	0	0	0	0
EP & IJ imaging equipment																	
Regulated only for standby																	
SB Media players and recorders	500	0	0	50	20	0	0	0	50	0	0	0	0	0	0	0	0
SB Projectors	206	5	3	40	5	130	29	0	142	112	44	0	0	0	2	0	0
SB Home phones	0	2	0	0	5	0	0	0	20	0	3	0	0	0	0	0	1
SB Office phones	0	2	0	0	5	0	0	0	20	0	3	0	0	0	0	0	1
SB Coffee makers (off mode)	152	76	0	0	262	14	74	26	70	0	4	257	0	0	0	0	0
(networked) Standby																	
EPS ≤ 6W, low-V	0	0	0	0	1	0	0	0	10	0	4	0	0	0	0	0	0
EPS 6–10 W	0	0	0	0	1	0	0	0	13	0	5	0	0	0	0	0	0
EPS 10–12 W	0	0	0	0	2	0	0	0	16	0	6	0	0	0	0	0	0
EPS 15–20 W	0	0	0	0	2	0	0	0	16	0	6	0	0	0	0	0	0
EPS 20–30 W	1	0	0	0	1	4	2	0	20	0	3	0	0	0	0	0	0
EPS 30–65 W, multiple-V	1	0	0	0	0	8	5	0	23	0	0	0	0	0	0	0	0
EPS 30-65 W	1	0	0	0	0	8	5	0	23	0	0	0	0	0	0	0	0
EPS 65–120 W	0	0	0	0	3	17	0	0	44	32	0	0	0	0	0	0	0
EPS 65–120 W, multiple-V	0	0	0	0	3	17	0	0	44	32	0	0	0	0	0	0	0
EPS 12–15 W	0	0	0	0	2	0	0	0	16	0	6	0	0	0	0	0	0
EPS External Power Supplies																	
RF Household Refrigerators	12838	1923	15468	0	601	1616	0	0	297	1936	0	0	0	0	170	0	0
CF open vert.chilled multi deck (RVC2)	452526	50	4360	3632	2721	15157	6709	1115	2611	23125	418	0	0	10159	11780	0	0
CF open hor. frozen island (RHF4)	432792	6898	3611	3549	10751	34769	1143	888	6803	21592	337	0	0	16802	4755	0	0
CF other supermarket displ. (non-BCs)	444668	3887	5466	6772	6970	25582	3998	1639	4707	23269	378	0	0	13480	8268	0	0
CF Plug in one door beverage cooler	44796	13492	3613	6084	930	7055	240	1303	454	3753	0	0	0	0	900	0	0
CF Plug in horizontal ice cream freezer	9351	2417	2291	5630	321	2966	220	1204	196	1981	0	0	0	0	23709	0	0
CF Spiral vending machine	128107	1242	2583	9194	3132	1861	2230	2404	958	908	0	0	0	76270	0	0	0
CF Commercial Refrigeration																	
PF Storage cab. Chilled Vertical (CV)	13755	19934	5238	11907	309	2337	532	1596	429	201	0	152	0	29422	0	0	0
PF Storage cab Frozen Vertical (FV)	15203	22032	5789	13160	342	2583	588	1764	475	223	0	168	0	32519	0	0	0
PF Storage cab.Chilled Horizontal (CH)	6877	9967	2619	5953	155	1169	266	798	215	101	0	76	0	14711	0	0	0
PF Storage cab.Frozen Horizontal (FH)	5068	7344	1930	4387	114	861	196	588	158	74	0	56	0	10840	0	0	0
PF Storage cabinets																	
PF Process Chiller AC MT S ≤ 300 kW	957837	0	0	0	0	191477	0	0	0	174930	7125	0	0	157928	0	0	0
PF Process Chiller AC MT L > 300 kW	3378238	0	0	0	0	675329	0	0	0	616967	25131	0	0	557005	0	0	0
PF Process Chiller AC LT S ≤ 200 kW	1093165	0	0	0	0	218530	0	0	0	199645	8132	0	0	180241	0	0	0
PF Process Chiller AC LT L > 200 kW	3919395	0	0	0	0	783509	0	0	0	715799	29157	0	0	646231	0	0	0
PF Process Chill. WC MT S ≤ 300 kW	1147110	0	0	0	0	229314	0	0	0	209497	8534	0	0	189136	0	0	0
PF Process Chill. WC MT L > 300 kW	3963901	0	0	0	0	792407	0	0	0	723927	29488	0	0	653569	0	0	0
PF Process Chiller WC LT S ≤ 200 kW	1399784	0	0	0	0	279825	0	0	0	255642	10413	0	0	230797	0	0	0
PF Process Chiller WC LT L > 200 kW	4658540	0	0	0	0	931269	0	0	0	850789	34656	0	0	768101	0	0	0
PF Process Chillers MT&LT																	
PF Condensing Unit MT S 0.2-1 kW	3297	589	2244	4152	0	111	0	193	0	86	0	0	0	74	0	0	0
PF Condensing Unit MT M 1-5 kW	16109	2877	10964	20289	0	542	0	942	0	422	0	0	0	359	0	0	0
PF Condensing Unit MT L 5-20 kW	63751	11385	43392	80296	0	2146	0	3728	0	1672	0	0	0	1422	0	0	0
PF Condensing Unit MT XL 20-50 kW	195180	34857	132849	245833	0	6571	0	11415	0	5118	0	0	0	4354	0	0	0
PF Condensing Unit LT S 0.1-0.4 kW	2037	364	1387	2566	0	69	0	119	0	53	0	0	0	45	0	0	0
PF Condensing Unit LT M 0.4-2 kW	6700	1197	4560	8439	0	226	0	392	0	176	0	0	0	149	0	0	0
PF Condensing Unit LT L 2-8 kW	33459	5975	22774	42142	0	1126	0	1957	0	877	0	0	0	746	0	0	0
PF Condensing Unit LT XL 8-20 kW	229867	41052	156458	289523	0	7739	0	13443	0	6028	0	0	0	5128	0	0	0
PF Condensing Units MT&LT																	
PF Professional Refrigeration																	
CA Electric Hobs	696	506	527	0	126	1170	56	0	0	100	0	0	0	0	0	0	0
CA Electric Ovens	28282	0	0	284	1540	690	0	0	570	0	0	0	600	0	0	50	0
CA Gas Hobs	2230	0	0	1782	1455	0	1000	301	0	250	480	0	0	0	0	0	0
CA Gas Ovens	32929	0	0	370	704	1579	0	0	1028	0	37	0	330	0	0	20	0
CA Range Hoods	8369	0	0	0	0	0	0	0	0	167	0	0	0	0	0	0	0
CA Cooking Appliances																	
WM Washing Machines	7898	866	1779	0	17984	0	2347	1356	379	0	0	0	0	0	0	0	0
WD Washer-Dryers	8506	933	1916	0	19369	0	2527	1460	409	0	0	0	0	0	0	0	0
WM-WD household Washing																	
DW Household Dishwashers	11547	207	0	0	9405	0	0	0	642	0	5189	0	0	0	0	0	0
LD condensing heat pump	4648	17817	0	0	2434	4800	0	0	5100	0	0	0	0	0	0	0	0
LD condensing electric heat element	4908	18812	0	0	2570	2010	0	0	2170	0	0	0	0	0	0	0	0
LD vented electric	3569	15029	0	0	2702	760	0	0	2000	0	0	0	0	0	0	0	0
LD vented gas	3569	15029	0	0	2702	760	0	0	2000	0	0	0	0	0	0	0	0
LD household Laundry Dryers																	
VC household	52	37	614	271	0	58	42	33	220	0	32	0	0	0	0	0	0
VC professional	72	51	849	375	0	201	146	114	768	0	112	0	0	0	0	0	0
VC Vacuum Cleaners																	
FAN Axial<300Pa (all FAN types >125W)	0	35000	0	0	0	0	9000	2000	0	0	0	0	0	0	0	0	0
FAN Axial>300Pa	0	39000	0	0	0	0	12000	2700	0	0	0	0	0	0	0	0	0
FAN Centr.FC	3500	4980	0	0	0	0	890	1000	0	0	0	0	0	0	0	0	0

	St sheet galv	St tube/profile	Cast iron	Ferrite	Stainless 18/8 coil	Al sheet/extrusion	Al diecast	Cu winding wire	Cu wire	Cu tube/sheet	CuZn38 cast	ZnAl4 cast	MgZn5 cast	pre-coating coil	powder coating	Cu/Ni/Cr plating	Au/Pt/Pd per g
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
FAN Centr.BC-free	0	16900	0	0	0	0	17500	3000	0	0	0	0	0	0	0	0	0
FAN Centr.BC	0	39300	13600	13150	0	0	4500	2850	0	0	0	0	0	0	0	0	0
FAN Cross-flow	500	4980	0	0	0	0	890	1000	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W																	
Medium (S) 3-ph 0.75-7.5 kW no VSD	9571	1914	2991	0	0	0	2612	2206	0	0	0	0	0	0	110	0	0
Medium (M) 3-ph 7.5-75 kW no VSD	65689	13685	13685	0	0	0	12827	11263	0	0	0	0	0	0	550	0	0
Medium (L) 3-ph 75-375 kW no VSD	396000	77000	330000	0	0	0	22000	66000	0	0	0	0	0	0	1100	0	0
Total 3ph 0.75-375 kW no VSD																	
Medium (S) 3-ph 0.75-7.5 kW withVSD	10121	1914	2991	0	0	0	3712	2206	0	0	0	0	0	0	110	0	0
Medium (M) 3-ph 7.5-75 kW with VSD	67449	13685	13685	0	0	0	15247	11263	0	0	0	0	0	0	550	0	0
Medium (L) 3-ph 75-375 kW with VSD	401500	77000	330000	0	0	0	23100	66000	0	0	0	0	0	0	1100	0	0
Total 3-ph 0.75-375 kW with VSD																	
Total 3-ph 0.75-375 kW w/wo VSD																	
Small 1 ph 0.12-0.75 kW no VSD	5577	1338	781	0	0	0	1492	858	0	0	0	0	0	0	48	0	0
Small 1 ph 0.12-0.75 kW with VSD	5577	1338	781	0	0	0	1973	858	0	0	0	0	0	0	48	0	0
Total Small 1-ph 0.12-0.75 kW																	
Small 3 ph 0.12-0.75 kW no VSD	4381	876	626	0	0	0	1235	652	0	0	0	0	0	0	44	0	0
Small 3 ph 0.12-0.75 kW with VSD	4381	876	626	0	0	0	1716	652	0	0	0	0	0	0	44	0	0
Total Small 3-ph 0.12-0.75 kW																	
Large 3-ph LV 375-1000 kW no VSD	1303704	162963	733333	0	0	0	55000	220000	0	0	0	0	0	0	3025	0	0
Large 3-ph LV 375-1000kW with VSD	1328454	162963	733333	0	0	0	59950	220000	0	0	0	0	0	0	3025	0	0
Total Large 3-ph LV 375-1000 kW																	
Explosion motors (S) 3-ph 0.75-7.5 kW	9571	1914	2991	0	0	0	2612	2206	0	0	0	0	0	0	110	0	0
Explosion motors (M) 3-ph 7.5-75 kW	65689	13685	13685	0	0	0	12827	11263	0	0	0	0	0	0	550	0	0
Explosion motors (L) 3-ph 75-375 kW	396000	77000	330000	0	0	0	22000	66000	0	0	0	0	0	0	1100	0	0
Total Expl. 0.75-375 kW (no VSD)																	
Brake motors (S) 3-ph 0.75-7.5 kW	9571	1914	2991	0	0	0	2612	2206	0	0	0	0	0	0	110	0	0
Brake motors (M) 3-ph 7.5-75 kW	65689	13685	13685	0	0	0	12827	11263	0	0	0	0	0	0	550	0	0
Brake motors (L) 3-ph 75-375 kW	396000	77000	330000	0	0	0	22000	66000	0	0	0	0	0	0	1100	0	0
Total Brake 0.75-375 kW (no VSD)																	
8-pole motors (S) 3-ph 0.75-7.5 kW	9571	1914	2991	0	0	0	2612	2206	0	0	0	0	0	0	110	0	0
8-pole motors (M) 3-ph 7.5-75 kW	65689	13685	13685	0	0	0	12827	11263	0	0	0	0	0	0	550	0	0
8-pole motors (L) 3-ph 75-375 kW	396000	77000	330000	0	0	0	22000	66000	0	0	0	0	0	0	1100	0	0
Total 8-pole 0.75-375 kW (no VSD)																	
1-phase motors >0.75 kW (no VSD)	12251	2450	3828	0	0	0	3344	2823	0	0	0	0	0	0	141	0	0
MT Elec. Motors LV 0.12-1000 kW																	
WP Water pumps	0	0	12148	0	5648	0	0	0	0	0	0	0	0	0	34	0	0
WE Welding Equipment	93933	6039	1492	0	3	905	0	1500	4412	0	278	0	0	0	30	0	0
TRAFO Distribution	666850	411445	0	0	0	72220	0	240360	0	68634	0	0	0	0	2893	0	0
TRAFO Industry oil	882200	601689	0	0	0	64320	0	364480	0	0	0	0	0	0	4457	0	0
TRAFO Industry dry	1872957	118793	0	0	0	355448	0	104826	0	0	0	0	0	0	1381	0	0
TRAFO Power	39486668	11306995	0	0	0	0	0	17487838	0	1204750	0	0	0	0	391719	0	0
TRAFO DER oil	1715467	1113009	0	0	0	190435	0	542741	0	219001	0	0	0	0	4321	0	0
TRAFO DER dry	3568822	415646	0	0	0	841004	0	0	0	0	0	0	0	0	5556	0	0
TRAFO Small	50000	0	0	0	0	0	0	35000	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers																	
Tyres C1, replacement for cars	0	1026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C1, OEM for cars	0	1026	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C1, total																	
Tyres C2, replacement for vans	0	1320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C2, OEM for vans	0	1320	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C2, total																	
Tyres C3, replacement for trucks/busses	0	13157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, OEM for trucks/busses	0	13157	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, total																	
Tyres, total C1+C2+C3																	

Table 14 : Material masses per unit product : Electronics, in [g] per product

	LCD screen	CRT screen	big caps & coils	slots / ext. ports	large IC	small IC	SMD/ LED's avg.	PWB 1/2 lay 3.75kg/m2	PWB 6 lay 4.5 kg/m2	PWB 6 lay 2 kg/m2	Solder SnAg4Cu0.5	PWB assembly	Controller board
	g	g	g	g	g	g	g	g	g	g	g	g	g
EIWH Electric Instant. < 12 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW	0	17	0	0	0	0	0	0	0	0	0	0	83
EIWHS Electric Instant. Shower	0	0	0	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage ≤ 30 L	0	0	0	0	0	0	0	0	0	0	0	0	74
ESWH Electric Storage > 30 L	0	0	0	0	0	0	0	0	0	0	0	0	64
GIWH Gas Instant. < 13 L/min	0	0	0	0	0	0	0	0	0	0	0	0	144
GIWH Gas Instant. ≥ 13 L/min	0	0	0	0	0	0	0	0	0	0	0	0	304
GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	0	0	0	0	0	0	0	0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	0	0	0	0	0	0	0	0	141
Dedicated WH Solar (3.5 m2)	0	0	33	0	0	0	0	0	0	0	0	0	0
DWH Dedicated Water Heater													
CHB Gas non-condensing	0	0	0	0	0	0	0	0	0	0	0	0	219
CHB Gas condensing	3	0	0	0	0	0	0	0	0	0	0	0	256
CHB Gas Jet burner non-condensing	16	0	0	0	0	0	0	0	0	0	0	0	1314
CHB Gas Jet burner condensing	0	0	0	0	0	0	0	0	0	0	0	0	836
CHB Oil Jet burner non-condensing	16	0	0	0	0	0	0	0	0	0	0	0	1314
CHB Oil Jet burner condensing	0	0	0	0	0	0	0	0	0	0	0	0	836
CHB Electric Joule-effect	52	0	465	48	2	4	7	100	0	0	13	0	0
CHB Hybrid (gas-electric)	2	0	0	0	0	0	0	0	0	0	0	0	199
CHB Electric Heat Pump	0	0	0	0	0	0	0	0	0	0	0	0	0
CHB Gas Heat Pump	0	0	0	0	0	0	0	0	0	0	0	0	5626
CHB micro CHP	0	0	0	0	0	0	0	0	0	0	0	0	285
CHB Solar combi (16 m2)	0	0	0	0	0	0	0	0	0	0	0	0	1839
CHB Central Heating boiler < 400 kW													
SFB Wood Manual	0	0	0	0	0	0	0	0	0	0	0	0	0
SFB Wood Direct Draft	0	0	0	0	0	0	0	0	0	0	0	0	3000
SFB Coal	0	0	0	0	0	0	0	0	0	0	0	0	500
SFB Pellets	0	0	0	0	0	0	0	0	0	0	0	0	2700
SFB Wood chips	0	0	0	0	0	0	0	0	0	0	0	0	5400
SFB Solid Fuel Boilers													
CHAE-S (≤ 400 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0
CHAE-L (> 400 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0
CHWE-S (≤ 400 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0
CHWE-L (> 1500 kW)	0	0	0	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-S	0	0	0	0	0	0	0	0	0	0	0	0	0
HT PCH-AE-L	0	0	0	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-S	0	0	0	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-M	0	0	0	0	0	0	0	0	0	0	0	0	0
HT PCH-WE-L	0	0	0	0	0	0	0	0	0	0	0	0	0
AC rooftop	0	0	0	0	0	0	0	0	0	0	0	0	0
AC splits	0	0	0	0	0	0	0	0	0	0	0	0	2514
AC VRF	0	0	0	0	0	0	0	0	0	0	0	0	29890
AHF	0	0	0	0	0	0	0	0	0	0	0	0	12839
AHC Air Heating & Cooling													
LH open fireplace	0	0	0	0	0	0	0	0	0	0	0	0	0
LH closed fireplace/inset	0	0	0	0	0	0	0	0	0	0	0	0	100
LH wood stove	0	0	0	0	0	0	0	0	0	0	0	0	0
LH coal stove	0	0	0	0	0	0	0	0	0	0	0	0	0
LH cooker	0	0	0	0	0	0	0	0	0	0	0	0	0
LH SHR stove	0	0	0	0	0	0	0	0	0	0	0	0	0
LH pellet stove	0	0	0	0	0	0	0	0	0	0	0	0	900
LH Solid fuel													
LH Electric portable	0	0	0	0	0	0	0	0	0	0	0	0	65
LH Electric fixed > 250W	0	0	0	0	0	0	0	0	0	0	0	0	75
LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0	0	0	0	0	75
LH Electric storage	0	0	0	0	0	0	0	0	0	0	0	0	100
LH Electric underfloor	0	0	0	0	0	0	0	0	0	0	0	0	75
LH Electric visibly glowing > 1.2 kW	0	0	0	0	0	0	0	0	0	0	0	0	130
LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0	0	0	65
LH Electric Towel Heaters	0	0	0	0	0	0	0	0	0	0	0	0	75
LH Electric													
LH Gas luminous (commercial)	0	0	0	0	0	0	0	0	0	0	0	0	400
LH Gaseous Tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0	0	1800
LH Gas open front	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Gas closed front	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Gas balanced flue	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Gas flueless	0	0	0	0	0	0	0	0	0	0	0	0	13
LH Gaseous fuel													
LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0	0	1800
LH Liquid open front	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Liquid closed front	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Liquid balanced flue	0	0	0	0	0	0	0	0	0	0	0	0	25
LH Liquid flueless	0	0	0	0	0	0	0	0	0	0	0	0	13
LH Liquid fuel													

	LCD screen	CRT screen	big caps & coils	slots / ext. ports	large IC	small IC	SMD/ LED's avg.	PWB 1/2 lay 3.75kg/m2	PWB 6 lay 4.5 kg/m2	PWB 6 lay 2 kg/m2	Solder SnAg4Cu0.5	PWB assembly	Controller board
	g	g	g	g	g	g	g	g	g	g	g	g	g
LH Local Heaters													
RAC fixed < 6 kW, cooling	0	0	0	0	0	0	0	0	0	428	0	0	802
RAC fixed 6-12 kW, cooling	0	0	0	0	0	0	0	0	0	1392	0	0	1488
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	214	0	0	746
RAC Room Air Conditioner													
CIRC Integrated circulators	0	0	0	0	0	0	0	0	0	0	0	0	0
CIRC Large standalone circulators	0	0	0	0	0	0	0	0	0	0	0	0	0
CIRC Small standalone circulators	0	0	0	0	0	0	0	0	0	0	0	0	0
CIRC Circulator pumps <2.5 kW													
R-UVU ≤ 100 m3/h for Extract Spaces	0	0	0	0	0	0	0	0	0	0	0	0	0
R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0	0	0	0	0	0
R-BVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0	0	0	0	0	0
R-UVU 100-250 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	100
R-BVU 100-250 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	200
R-UVU 250-1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	600
R-BVU 250-1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	1300
R-UVU > 1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	500
R-BVU 1000-2500 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	800
RVU, residential													
NR-UVU 250-1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	600
NR-BVU 250-1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	1300
NR-UVU > 1000 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	500
NR-BVU 1000-2500 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	800
NR-AHU-S 2500-5500 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	1000
NR-AHU-M 5500-14500 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	1500
NR-AHU-L > 14500 m3/h	0	0	0	0	0	0	0	0	0	0	0	0	2000
NRVU, non-residential													
VU Ventilation Units, res + non-res													
LFL (T12,T8h,T8t,T5,other)	0	0	0	0	0	0	0	0	0	0	0	0	0
HID (HPM, HPS, MH)	0	0	0	0	0	0	0	0	0	0	3	0	0
CFLni (all shapes)	0	0	0	0	0	0	0	0	0	0	0	0	0
CFLi (retrofit for GLS, HL)	0	0	0	0	0	0	0	15	0	0	0	0	0
GLS (DLS & NDLS) incl. from storage	0	0	0	0	0	0	0	0	0	0	0	0	0
GLS from storage	0	0	0	0	0	0	0	0	0	0	0	0	0
HL (DLS & NDLS, LV & MV) incl. storage	0	0	0	0	0	0	0	0	0	0	0	0	0
HL from storage	0	0	0	0	0	0	0	0	0	0	0	0	0
LED replacing LFL (retrofit & luminaire)	0	0	0	0	0	0	6	39	0	0	0	0	0
LED replacing HID (retrofit & luminaire)	0	0	0	0	0	0	13	81	0	0	0	0	0
LED replacing CFLni (retrofit & luminaire)	0	0	0	0	0	0	3	17	0	0	0	0	0
LED replacing DLS (retrofit & luminaire)	0	0	0	0	0	0	3	19	0	0	0	0	0
LED replacing NDLS (retrofit & luminaire)	0	0	0	0	0	0	2	13	0	0	0	0	0
LS Light Sources													
DP TV, standard (NoNA)	986	0	0	0	0	0	0	0	0	0	0	0	430
DP TV, LoNA	986	0	0	0	0	0	0	0	0	0	0	0	430
DP TV, HiNA ('Smart')	986	0	0	0	0	0	0	0	0	0	0	0	430
DP Monitor	438	0	0	0	0	0	0	0	0	0	0	0	191
DP Electronic Displays													
SSTB	0	0	67	32	10	3	25	4	85	0	0	0	0
CSTB	0	0	83	87	7	7	1	160	3	0	8	0	0
STB set top boxes (Complex & Simple)													
Game consoles > 20 W	0	0	501	133	47	31	50	5	77	0	7	0	0
Game consoles < 20 W	0	0	251	67	24	16	25	3	39	0	4	0	0
GC Game consoles													
ES tower 1-socket traditional	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 1-socket traditional	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 2-socket traditional	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 2-socket cloud	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 4-socket traditional	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 4-socket cloud	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 2-socket resilient trad.	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 2-socket resilient cloud	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 4-socket resilient trad.	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES rack 4-socket resilient cloud	0	0	0	0	40	0	0	0	960	21	33	0	2907
ES blade 1-socket traditional	0	0	0	0	322	0	0	0	3240	0	149	0	11794
ES blade 2-socket traditional	0	0	0	0	322	0	0	0	3240	0	149	0	11794
ES blade 2-socket cloud	0	0	0	0	322	0	0	0	3240	0	149	0	11794
ES blade 4-socket traditional	0	0	0	0	322	0	0	0	3240	0	149	0	11794
ES blade 4-socket cloud	0	0	0	0	322	0	0	0	3240	0	149	0	11794
ES Enterprise Servers total													
DS Online 2	0	0	0	0	6	0	0	0	1014	0	0	0	9020
DS Online 3	0	0	0	0	6	0	0	0	1014	0	0	0	9020
DS Online 4	0	0	0	0	6	0	0	0	1014	0	0	0	9020
DS Data Storage products total													
ES + DS total													
PC Desktop	0	0	414	266	59	82	166	67	140	0	41	0	0
PC Integrated Desktop	95	0	345	221	49	69	139	56	116	0	34	0	0
PC Notebook	47	0	376	100	59	38	0	4	58	0	5	0	0
PC Tablet/slate	227	0	0	0	0	0	0	0	0	0	0	0	172
PC Thin client	0	0	48	31	7	10	19	8	16	0	5	0	0

	LCD screen	CRT screen	big caps & coils	slots / ext. ports	large IC	small IC	SMD/ LED's avg.	PWB 1/2 lay 3.75kg/m2	PWB 6 lay 4.5 kg/m2	PWB 6 lay 2 kg/m2	Solder SnAg4Cu0.5	PWB assembly	Controller board
	g	g	g	g	g	g	g	g	g	g	g	g	g
PC Integrated Thin Client	95	0	48	31	7	10	19	8	16	0	5	0	0
PC Small-scale Server	0	0	725	465	104	144	291	117	245	0	72	0	0
PC Workstation	0	0	725	465	104	144	291	117	245	0	72	0	0
PC Personal Computers													
Inkjet Printer	27	0	33	10	1	2	5	39	11	3	2	0	42
Inkjet MFD	88	0	107	33	3	5	16	127	35	8	6	0	137
EP / Laser Printer mono	0	0	203	156	11	16	80	117	173	0	0	0	711
EP / Laser Printer colour	30	0	1116	190	43	43	169	1305	0	0	0	0	440
EP / Laser Copier mono	0	0	203	156	11	16	80	117	173	0	0	0	711
EP / Laser Copier colour	30	0	1116	190	43	43	169	1305	0	0	0	0	440
EP / Laser MFD mono	59	0	935	154	8	60	240	196	503	0	105	0	1916
EP / Laser MFD colour	211	0	0	425	25	82	703	1809	719	16	0	0	2311
EP & IJ imaging equipment													
Regulated only for (networked) standby ((n)sb)													
SB Media players and recorders	0	0	30	45	0	0	35	100	0	0	5	0	0
SB Projectors	0	0	46	0	0	0	0	550	0	0	0	0	0
SB Home phones	6	0	8	10	0	1	1	0	0	0	1	0	47
SB Office phones	6	0	8	10	0	1	1	0	0	0	1	0	47
SB Coffee makers (off mode)	2	0	0	1	0	32	0	7	13	0	0	0	13
(networked) Standby													
EPS ≤ 6W, low-V	0	0	20	1	0	3	0	3	0	0	1	0	0
EPS 6–10 W	0	0	25	1	0	4	1	3	0	0	1	0	0
EPS 10–12 W	0	0	29	2	0	4	1	4	0	0	1	0	0
EPS 15–20 W	0	0	29	2	0	4	1	4	0	0	1	0	0
EPS 20–30 W	0	0	68	7	0	5	5	6	0	0	2	0	0
EPS 30–65 W, multiple-V	0	0	107	13	0	5	10	9	0	0	2	0	0
EPS 30-65 W	0	0	107	13	0	5	10	9	0	0	2	0	0
EPS 65–120 W	0	0	144	13	0	3	1	13	0	0	1	0	0
EPS 65–120 W, multiple-V	0	0	144	13	0	3	1	13	0	0	1	0	0
EPS 12–15 W	0	0	29	2	0	4	1	4	0	0	1	0	0
EPS External Power Supplies													
RF Household Refrigerators & freezers	0	0	15	0	0	0	0	0	0	0	0	0	314
CF open vertical chilled multi deck (RVC2)	0	0	0	0	0	50	100	0	0	0	0	0	0
CF open horizontal frozen island (RHF4)	0	0	0	200	0	201	31	0	0	0	0	0	850
CF other supermarket display (non-BCs)	0	0	0	100	0	126	66	0	0	0	0	0	850
CF Plug in one door beverage cooler	0	0	0	29	0	0	0	35	0	0	0	0	0
CF Plug in horizontal ice cream freezer	0	0	0	0	0	0	0	17	0	0	0	0	0
CF Spiral vending machine	118	0	90	0	450	300	0	90	0	0	0	0	0
CF Commercial Refrigeration													
PF Storage cabinet Chilled Vertical (CV)	38	0	0	38	0	0	0	0	0	0	0	0	0
PF Storage cabinet Frozen Vertical (FV)	42	0	0	42	0	0	0	0	0	0	0	0	0
PF Storage cabinet Chilled Horizontal (CH)	19	0	0	19	0	0	0	0	0	0	0	0	0
PF Storage cabinet Frozen Horizontal (FH)	14	0	0	14	0	0	0	0	0	0	0	0	0
PF Storage cabinets													
PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0	0	0	0	0	0	0	0	0	151
PF Process Chiller AC MT L > 300 kW	0	0	0	0	0	0	0	0	0	0	0	0	533
PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0	0	0	0	0	0	0	0	0	172
PF Process Chiller AC LT L > 200 kW	0	0	0	0	0	0	0	0	0	0	0	0	618
PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0	0	0	0	0	0	0	0	0	181
PF Process Chiller WC MT L > 300 kW	0	0	0	0	0	0	0	0	0	0	0	0	625
PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0	0	0	0	0	0	0	0	0	221
PF Process Chiller WC LT L > 200 kW	0	0	0	0	0	0	0	0	0	0	0	0	734
PF Process Chillers MT&LT													
PF Condensing Unit MT S 0.2-1 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit MT M 1-5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit MT L 5-20 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit MT XL 20-50 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit LT S 0.1-0.4 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit LT M 0.4-2 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit LT L 2-8 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Unit LT XL 8-20 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
PF Condensing Units MT&LT													
PF Professional Refrigeration													
CA Electric Hobs	0	0	0	0	0	0	0	0	0	0	0	0	2028
CA Electric Ovens	0	0	0	0	0	0	0	0	0	0	0	0	162
CA Gas Hobs	0	0	0	0	0	0	0	0	0	0	0	0	0
CA Gas Ovens	0	0	0	0	0	0	0	0	0	0	0	0	0
CA Range Hoods	0	0	0	0	0	0	0	0	0	0	0	0	130
CA Cooking Appliances													
WM Washing Machines	0	0	0	0	0	0	0	0	0	0	0	0	225
WD Washer-Dryers	0	0	0	0	0	0	0	0	0	0	0	0	225
WM-WD household Washing													
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0	0	0	1355
LD condensing heat pump	0	0	0	0	0	0	0	0	0	0	0	0	525
LD condensing electric heat element	0	0	0	0	0	0	0	0	0	0	0	0	405
LD vented electric	0	0	0	0	0	0	0	0	0	0	0	0	405
LD vented gas	0	0	0	0	0	0	0	0	0	0	0	0	405
LD household Laundry Dryers													

	LCD screen	CRT screen	big caps & coils	slots / ext. ports	large IC	small IC	SMD/ LED's avg.	PWB 1/2 lay 3.75kg/m2	PWB 6 lay 4.5 kg/m2	PWB 6 lay 2 kg/m2	Solder SnAg4Cu0.5	PWB assembly	Controller board
	g	g	g	g	g	g	g	g	g	g	g	g	g
VC household	0	0	0	0	0	0	0	0	0	0	0	0	12
VC professional	0	0	0	0	0	0	0	0	0	0	0	0	12
VC Vacuum Cleaners													
FAN Axial<300Pa (all FAN types >125W)	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Axial>300Pa	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Centr.FC	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Centr.BC-free	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Centr.BC	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Cross-flow	0	0	0	0	0	0	0	0	0	0	0	0	0
FAN Industrial Fans >125W *(excl. box/ roof)*													
Medium (S) 3-ph 0.75-7.5 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Medium (M) 3-ph 7.5-75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Medium (L) 3-ph 75-375 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Total 3ph 0.75-375 kW no VSD													
Medium (S) 3-ph 0.75-7.5 kW with VSD	0	0	55	0	0	0	220	220	0	0	0	0	0
Medium (M) 3-ph 7.5-75 kW with VSD	0	0	220	0	0	0	770	330	0	0	0	0	0
Medium (L) 3-ph 75-375 kW with VSD	0	0	3300	0	0	0	4400	1100	0	0	0	0	0
Total 3-ph 0.75-375 kW with VSD													
Total 3-ph 0.75-375 kW w/wo VSD													
Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Small 1 ph 0.12-0.75 kW with VSD	0	0	24	0	0	0	96	96	0	0	0	0	0
Total Small 1-ph 0.12-0.75 kW													
Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Small 3 ph 0.12-0.75 kW with VSD	0	0	24	0	0	0	96	96	0	0	0	0	0
Total Small 3-ph 0.12-0.75 kW													
Large 3-ph LV 375-1000 kW no VSD	0	0	0	0	0	0	0	0	0	0	0	0	0
Large 3-ph LV 375-1000kW with VSD	0	0	14850	0	0	0	19800	4950	0	0	0	0	0
Total Large 3-ph LV 375-1000 kW													
Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Explosion motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Expl. 0.75-375 kW (no VSD)													
Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Brake motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Total Brake 0.75-375 kW (no VSD)													
8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0	0	0	0	0	0
Total 8-pole 0.75-375 kW (no VSD)													
1-phase motors >0.75 kW (no VSD)	0	0	0	0	0	0	0	0	0	0	0	0	0
MT Elec. Motors LV 0.12-1000 kW													
WP Water pumps	0	0	0	0	0	0	0	0	0	0	0	0	0
WE Welding Equipment	0	0	25227	0	0	0	0	0	0	0	0	0	987
TRAFO Distribution	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Industry oil	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Industry dry	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Power	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO DER oil	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO DER dry	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Small	0	0	0	0	0	0	0	0	0	0	0	0	0
TRAFO Utility Transformers													
Tyres C1, replacement for cars	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C1, OEM for cars	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C1, total													
Tyres C2, replacement for vans	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C2, OEM for vans	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C2, total													
Tyres C3, replacement for trucks/busses	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, OEM for trucks/busses	0	0	0	0	0	0	0	0	0	0	0	0	0
Tyres C3, total													
Tyres, total C1+C2+C3													

Table 15 : Material masses per unit product: Miscellaneous and Packaging, in [g] per product

	Glass	Bitumen	Cardboard	Paper	Concrete	Refrigerant	Natural Rubber	Synthetic Rubber	Fillers for Rubber	Other	Cardboard	Paper	LDPE	EPS	Other packaging
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
EIWH Electric Instant. < 12 kW	0	0	0	0	0	0	0	0		0	108	8	0	36	0
EIWH Electric Instant. ≥ 12 kW	0	0	0	0	0	0	0	0		0	130	11	0	506	0
EIWHS Electric Instant. Shower	0	0	0	0	0	0	0	0		0	108	8	0	36	0
ESWH Electric Storage ≤ 30 L	0	0	0	0	0	0	0	0		0	0	0	1700	0	0
ESWH Electric Storage > 30 L	0	0	0	0	0	0	0	0		0	0	0	1599	0	0
GIWH Gas Instant. < 13 L/min	0	0	0	0	0	0	0	0		0	0	0	0	0	0
GIWH Gas Instant. ≥ 13 L/min	0	0	0	0	0	0	0	0		0	0	0	0	0	0
GSWH Gas Storage, Condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
GSWH Gas Storage, Non-condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	0	2230	0	0		0	0	0	1186	0	0
Dedicated WH Solar (3.5 m2)	20338	0	0	0	4783	0	0	0		0	195	0	0	0	0
DWH Dedicated Water Heater															
CHB Gas non-condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Gas condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Gas Jet burner non-condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Gas Jet burner condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Oil Jet burner non-condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Oil Jet burner condensing	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Electric Joule-effect	0	0	0	0	0	0	0	0		0	590	139	0	1422	0
CHB Hybrid (gas-electric)	0	0	0	0	0	1500	0	0		0	0	0	0	0	0
CHB Electric Heat Pump	0	0	0	0	0	1533.3	0	0		0	0	0	2845	0	0
CHB Gas Heat Pump	0	0	0	0	0	4500	0	0		0	0	0	0	0	0
CHB micro CHP	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CHB Solar combi (16 m2)	110340	0	0	0	0	0	0	0		0	0	0	0	3386	0
CHB Central Heating boiler < 400 kW															
SFB Wood Manual	0	0	0	0	0	0	0	0		27400	0	0	0	0	0
SFB Wood Direct Draft	0	0	0	0	0	0	0	0		500	0	0	500	0	0
SFB Coal	0	0	0	0	0	0	0	0		3800	0	0	0	0	0
SFB Pellets	0	0	0	0	0	0	0	0		86700	0	0	0	0	0
SFB Wood chips	0	0	0	0	0	0	0	0		173300	0	0	3500	0	0
SFB Solid Fuel Boilers															
CHAE-S (≤ 400 kW)	0	0	0	0	0	27000	0	0		5934	0	0	0	0	0
CHAE-L (> 400 kW)	0	0	0	0	0	100000	0	0		96285	0	0	0	0	0
CHWE-S (≤ 400 kW)	0	0	0	0	0	15000	0	0		6599	0	0	0	0	0
CHWE-M (> 400 kW; ≤ 1500 kW)	0	0	0	0	0	97500	0	0		96712	0	0	0	0	0
CHWE-L (> 1500 kW)	0	0	0	0	0	180000	0	0		173086	0	0	0	0	0
HT PCH-AE-S	0	0	0	0	0	0	0	0		19554	0	0	0	0	0
HT PCH-AE-L	0	0	0	0	0	0	0	0		134853	0	0	0	0	0
HT PCH-WE-S	0	0	0	0	0	0	0	0		27045	0	0	0	0	0
HT PCH-WE-M	0	0	0	0	0	0	0	0		81134	0	0	0	0	0
HT PCH-WE-L	0	0	0	0	0	0	0	0		173086	0	0	0	0	0
AC rooftop	0	0	0	0	0	20000	0	0		7700	0	0	0	0	0
AC splits	0	0	0	0	0	5600	0	0		38564	5217	0	0	0	0
AC VRF	0	0	0	0	0	25000	0	0		96696	61994	0	0	0	0
AHF	0	0	0	0	0	0	0	0		18729	12122	4	0	0	0
AHC Air Heating & Cooling															
LH open fireplace	0	0	0	0	0	0	0	0		271000	0	0	0	0	0
LH closed fireplace/inset	0	0	0	0	0	0	0	0		30600	0	0	0	0	0
LH wood stove	0	0	0	0	0	0	0	0		8000	0	0	0	0	0
LH coal stove	0	0	0	0	0	0	0	0		8000	0	0	0	0	0
LH cooker	0	0	0	0	0	0	0	0		22600	0	0	0	0	0
LH SHR stove	0	0	0	0	0	0	0	0		1449100	0	0	0	0	0
LH pellet stove	0	0	0	0	0	0	0	0		11500	0	0	0	0	0
LH Solid fuel															
LH Electric portable	0	0	0	0	0	0	0	0		0	244	25	0	14	0
LH Electric fixed > 250W	0	0	0	0	0	0	0	0		1462	956	41	0	127	43
LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0		366	239	41	0	32	11
LH Electric storage	0	0	0	0	0	0	0	0		97569	1548	48	0	324	480
LH Electric underfloor	0	0	0	0	0	0	0	0		225	267	33	0	0	0
LH Electric visibly glowing > 1.2 kW	0	0	0	0	0	0	0	0		0	0	0	0	0	0
LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0		0	0	0	0	0	0
LH Electric Towel Heaters	0	0	0	0	0	0	0	0		0	0	0	0	0	0
LH Electric															
LH Gas luminous (commercial)	0	0	0	0	0	0	0	0		1800	4400	0	0	0	0
LH Gaseous Tube (commercial < 120 kW)	0	0	0	0	0	0	0	0		8100	3268	0	0	0	0
LH Gas open front	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Gas closed front	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Gas balanced flue	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Gas flueless	0	0	0	0	0	0	0	0		173	431	0	0	0	0
LH Gaseous fuel															
LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0		8100	3268	0	0	0	0
LH Liquid open front	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Liquid closed front	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Liquid balanced flue	0	0	0	0	0	0	0	0		346	2436	32	0	0	0
LH Liquid flueless	0	0	0	0	0	0	0	0		173	431	0	0	0	0
LH Liquid fuel															
LH Local Heaters															
RAC fixed < 6 kW, cooling	0	0	0	0	0	980	0	0		3530	0	0	0	0	0
RAC fixed 6-12 kW, cooling	0	0	0	0	0	2010	0	0		8550	0	0	0	0	0

	Glass	Bitumen	Cardboard	Paper	Concrete	Refrigerant	Natural Rubber	Synthetic Rubber	Fillers for Rubber	Other	Cardboard	Paper	LDPE	EPS	Other packaging
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
RAC portable < 12 kW, cooling	0	0	0	0	0	260	0	0		3260	0	0	0	0	0
RAC Room Air Conditioner															
CIRC Integrated circulators	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CIRC Large standalone circulators	0	0	0	0	0	0	0	0		0	750	250	0	0	0
CIRC Small standalone circulators	0	0	0	0	0	0	0	0		0	174	250	0	0	0
CIRC Circulator pumps <2.5 kW															
R-UVU ≤ 100 m3/h for Extract Spaces	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-BVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-UVU 100-250 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-BVU 100-250 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-UVU 250-1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-BVU 250-1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-UVU > 1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
R-BVU 1000-2500 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
RVU, residential															
NR-UVU 250-1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-BVU 250-1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-UVU > 1000 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-BVU 1000-2500 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-AHU-S 2500-5500 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-AHU-M 5500-14500 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NR-AHU-L > 14500 m3/h	0	0	0	0	0	0	0	0		0	0	0	0	0	0
NRVU, non-residential															
VU Ventilation Units, res + non-res															
LFL (T12,T8h,T8t,T5,other)	108	0	0	0	0	0	0	0		3	37	0	0	0	0
HID (HPM, HPS, MH)	94	0	0	0	0	0	0	0		3	57	0	0	0	0
CFLni (all shapes)	34	0	0	0	0	0	0	0		3	45	0	5	0	0
CFLi (retrofit for GLS, HL)	27	0	0	0	0	0	0	0		2	54	0	6	0	0
GLS (DLS & NDLS) incl. from storage	23	0	0	0	0	0	0	0		0	60	0	7	0	0
GLS from storage	23	0	0	0	0	0	0	0		0	60	0	7	0	0
HL (DLS & NDLS, LV & MV) incl. storage	23	0	0	0	0	0	0	0		1	37	0	4	0	0
HL from storage	23	0	0	0	0	0	0	0		1	37	0	4	0	0
LED replacing LFL (retrofit & luminaire)	27	0	0	0	0	0	0	0		0	60	0	7	0	0
LED replacing HID (retrofit & luminaire)	56	0	0	0	0	0	0	0		0	125	0	14	0	0
LED replacing CFLni (retrofit & luminaire)	12	0	0	0	0	0	0	0		0	26	0	3	0	0
LED replacing DLS (retrofit & luminaire)	13	0	0	0	0	0	0	0		0	20	0	2	0	0
LED replacing NDLS (retrofit & luminaire)	9	0	0	0	0	0	0	0		0	20	0	2	0	0
LS Light Sources															
DP TV, standard (NoNA)	1000	0	0	0	0	0	0	0		757	1575	255	0	170	0
DP TV, LoNA	1000	0	0	0	0	0	0	0		757	1575	255	0	170	0
DP TV, HiNA ('Smart')	1000	0	0	0	0	0	0	0		757	1575	255	0	170	0
DP Monitor	444	0	0	0	0	0	0	0		337	700	255	0	76	0
DP Electronic Displays															
SSTB	0	0	0	0	0	0	0	0		0	180	31	4	0	0
CSTB	27	0	0	0	0	0	0	0		0	356	72	0	0	0
STB set top boxes (Complex & Simple)															
Game consoles > 20 W	0	0	0	0	0	0	0	0		0	1688	243	12	0	0
Game consoles < 20 W	0	0	0	0	0	0	0	0		0	844	121	6	0	0
GC Game consoles															
ES tower 1-socket traditional	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 1-socket traditional	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 2-socket traditional	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 2-socket cloud	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 4-socket traditional	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 4-socket cloud	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 2-socket resilient trad.	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 2-socket resilient cloud	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 4-socket resilient trad.	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES rack 4-socket resilient cloud	0	0	0	0	0	0	0	0		0	3629	50	78	1026	0
ES blade 1-socket traditional	0	0	0	0	0	0	0	0		0	14969	245	321	4233	0
ES blade 2-socket traditional	0	0	0	0	0	0	0	0		0	14969	245	321	4233	0
ES blade 2-socket cloud	0	0	0	0	0	0	0	0		0	14969	245	321	4233	0
ES blade 4-socket traditional	0	0	0	0	0	0	0	0		0	14969	245	321	4233	0
ES blade 4-socket cloud	0	0	0	0	0	0	0	0		0	14969	245	321	4233	0
ES Enterprise Servers total															
DS Online 2	0	0	0	0	0	0	0	0		0	3629	0	78	1026	0
DS Online 3	0	0	0	0	0	0	0	0		0	3629	0	78	1026	0
DS Online 4	0	0	0	0	0	0	0	0		0	3629	0	78	1026	0
DS Data Storage products total															
ES + DS total															
PC Desktop	0	0	0	0	0	0	0	0		0	1960	0	0	0	0
PC Integrated Desktop	0	0	0	0	0	0	0	0		0	1634	0	0	0	0
PC Notebook	1	0	0	0	0	0	0	0		272	691	0	0	0	0
PC Tablet/slate	0	0	0	0	0	0	0	0		18	181	0	0	0	0
PC Thin client	0	0	0	0	0	0	0	0		0	229	0	0	0	0
PC Integrated Thin Client	0	0	0	0	0	0	0	0		0	229	0	0	0	0
PC Small-scale Server	0	0	0	0	0	0	0	0		0	3431	0	0	0	0
PC Workstation	0	0	0	0	0	0	0	0		0	3431	0	0	0	0
PC Personal Computers															
Inkjet Printer	137	0	0	0	0	0	0	0		0	190	34	0	0	0
Inkjet MFD	411	0	0	0	0	0	0	0		0	569	102	0	0	0
EP / Laser Printer mono	279	0	0	0	0	0	0	0		0	1780	26	0	0	0

	Glass	Bitumen	Cardboard	Paper	Concrete	Refrigerant	Natural Rubber	Synthetic Rubber	Fillers for Rubber	Other	Cardboard	Paper	LDPE	EPS	Other packaging
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
EP / Laser Printer colour	577	0	0	0	0	0	0	0		0	3685	54	0	0	0
EP / Laser Copier mono	279	0	0	0	0	0	0	0		0	1780	26	0	0	0
EP / Laser Copier colour	577	0	0	0	0	0	0	0		0	3685	54	0	0	0
EP / Laser MFD mono	6488	0	0	0	0	0	0	0		0	15199	190	0	0	0
EP / Laser MFD colour	1286	0	0	0	0	0	0	0		0	8217	120	0	0	0
EP & IJ imaging equipment															
Regulated only for (networked) standby ((n)sb)															
SB Media players and recorders	0	0	0	0	0	0	0	0		0	500	150	0	0	0
SB Projectors	980	0	0	0	0	0	0	0		0	927	0	0	0	0
SB Home phones	0	0	0	0	0	0	0	31		7	93	22	7	0	0
SB Office phones	0	0	0	0	0	0	0	31		7	93	22	7	0	0
SB Coffee makers (off mode)	0	0	0	0	0	0	0	19		193	315	100	0	100	0
(networked) Standby															
EPS ≤ 6W, low-V	0	0	0	0	0	0	0	0		0	11	0	0	0	0
EPS 6–10 W	0	0	0	0	0	0	0	0		0	14	0	0	0	0
EPS 10–12 W	0	0	0	0	0	0	0	0		0	16	0	0	0	0
EPS 15–20 W	0	0	0	0	0	0	0	0		0	16	0	0	0	0
EPS 20–30 W	0	0	0	0	0	0	0	0		0	21	0	0	0	0
EPS 30–65 W, multiple-V	0	0	0	0	0	0	0	0		0	26	0	0	0	0
EPS 30-65 W	0	0	0	0	0	0	0	0		0	26	0	0	0	0
EPS 65–120 W	0	0	0	0	0	0	0	0		0	0	0	0	0	0
EPS 65–120 W, multiple-V	0	0	0	0	0	0	0	0		0	0	0	0	0	0
EPS 12–15 W	0	0	0	0	0	0	0	0		0	16	0	0	0	0
EPS External Power Supplies															
RF Household Refrigerators & freezers	5814	0	0	0	0	51	0	0		341	2430	251	327	1383	43
CF open vertical chilled multi deck (RVC2)	493	0	0	0	0	0	0	0		3408	1363	1031	54	0	32887
CF open horizontal frozen island (RHF4)	102484	0	0	0	0	0	0	0		1389	307	767	325	0	90246
CF other supermarket display (non-BCs)	51489	0	0	0	0	176	0	0		2398	835	899	190	0	61567
CF Plug in one door beverage cooler	19394	0	0	0	0	318	0	0		2141	190	58	0	630	4508
CF Plug in horizontal ice cream freezer	6200	0	0	0	0	220	0	11		1928	576	200	0	0	5158
CF Spiral vending machine	18979	0	0	0	0	343	0	0		651	1780	263	0	0	5650
CF Commercial Refrigeration															
PF Storage cabinet Chilled Vertical (CV)	0	0	0	0	0	443	0	0		5010	0	85	516	1818	7632
PF Storage cabinet Frozen Vertical (FV)	0	0	0	0	0	490	0	0		5537	0	94	570	2009	8435
PF Storage cabinet Chilled Horizontal (CH)	0	0	0	0	0	222	0	0		2505	0	42	258	909	3816
PF Storage cabinet Frozen Horizontal (FH)	0	0	0	0	0	163	0	0		1846	0	31	190	670	2812
PF Storage cabinets															
PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0	0	65000	0	0		17212	0	0	0	0	0
PF Process Chiller AC MT L > 300 kW	0	0	0	0	0	140000	0	0		60706	0	0	0	0	0
PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0	0	60000	0	0		19644	0	0	0	0	0
PF Process Chiller AC LT L > 200 kW	0	0	0	0	0	200000	0	0		70430	0	0	0	0	0
PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0	0	45000	0	0		20613	0	0	0	0	0
PF Process Chiller WC MT L > 300 kW	0	0	0	0	0	80000	0	0		71230	0	0	0	0	0
PF Process Chiller WC LT S ≤ 200 kW	0	0	0	0	0	35000	0	0		25154	0	0	0	0	0
PF Process Chiller WC LT L > 200 kW	0	0	0	0	0	100000	0	0		83713	0	0	0	0	0
PF Process Chillers MT&LT															
PF Condensing Unit MT S 0.2-1 kW	0	0	0	0	0	1000	0	0		853	0	0	0	0	0
PF Condensing Unit MT M 1-5 kW	0	0	0	0	0	3000	0	0		4167	0	0	0	0	0
PF Condensing Unit MT L 5-20 kW	0	0	0	0	0	10000	0	0		16492	0	0	0	0	0
PF Condensing Unit MT XL 20-50 kW	0	0	0	0	0	25000	0	0		50492	0	0	0	0	0
PF Condensing Unit LT S 0.1-0.4 kW	0	0	0	0	0	1000	0	0		527	0	0	0	0	0
PF Condensing Unit LT M 0.4-2 kW	0	0	0	0	0	3000	0	0		1733	0	0	0	0	0
PF Condensing Unit LT L 2-8 kW	0	0	0	0	0	10000	0	0		8656	0	0	0	0	0
PF Condensing Unit LT XL 8-20 kW	0	0	0	0	0	25000	0	0		59466	0	0	0	0	0
PF Condensing Units MT&LT															
PF Professional Refrigeration															
CA Electric Hobs	3837	0	0	0	0	0	0	60		524	0	0	0	0	0
CA Electric Ovens	4560	0	0	0	0	0	0	0		0	0	0	290	840	0
CA Gas Hobs	0	0	0	0	0	0	0	0		39	0	0	0	0	0
CA Gas Ovens	4590	0	0	0	0	0	0	0		0	0	0	290	880	0
CA Range Hoods	0	0	0	0	0	0	0	0		0	0	0	0	0	0
CA Cooking Appliances															
WM Washing Machines	1870	0	0	0	20186	0	0	1468		0	210	66	130	510	2000
WD Washer-Dryers	1870	0	0	0	20186	0	0	1581		0	210	66	130	510	2000
WM-WD household Washing															
DW Household Dishwashers	0	5333	2156	0	0	0	0	402		1	392	499	133	769	0
LD condensing heat pump	0	0	0	0	0	330	0	608		6800	500	250	125	375	1250
LD condensing electric heat element	0	0	0	0	0	0	0	344		2800	500	250	125	375	1250
LD vented electric	0	0	0	0	0	0	0	496		2800	500	250	125	375	1250
LD vented gas	0	0	0	0	0	0	0	496		2800	500	250	125	375	1250
LD household Laundry Dryers															
VC household	0	0	0	0	0	0	0	140		28	1100	100	60	0	0
VC professional	0	0	0	0	0	0	0	215		47	1853	168	101	0	0
VC Vacuum Cleaners															
FAN Axial<300Pa (all FAN types >125W)	0	0	0	0	0	0	0	0		0	0	0	0	0	0
FAN Axial>300Pa	0	0	0	0	0	0	0	0		0	0	0	0	0	0
FAN Centr.FC	0	0	0	0	0	0	0	0		0	0	0	0	0	0
FAN Centr.BC-free	0	0	0	0	0	0	0	0		0	0	0	0	0	0
FAN Centr.BC	0	0	0	0	0	0	0	0		0	3250	0	0	0	0
FAN Cross-flow	0	0	0	0	0	0	0	0		0	0	0	0	0	0
FAN Industrial Fans >125W *(excl. box/ roof)*															

	Glass	Bitumen	Cardboard	Paper	Concrete	Refrigerant	Natural Rubber	Synthetic Rubber	Fillers for Rubber	Other	Cardboard	Paper	LDPE	EPS	Other packaging
	g	g	g	g	g	g	g	g	g	g	g	g	g	g	g
Medium (S) 3-ph 0.75-7.5 kW no VSD	0	0	0	0	0	0	0	0		0	438	150	75	438	0
Medium (M) 3-ph 7.5-75 kW no VSD	0	0	0	0	0	0	0	0		0	4550	300	500	4550	0
Medium (L) 3-ph 75-375 kW no VSD	0	0	0	0	0	0	0	0		0	26750	500	1000	26750	0
Total 3ph 0.75-375 kW no VSD															
Medium (S) 3-ph 0.75-7.5 kW with VSD	0	0	0	0	0	0	0	0		0	438	150	75	438	0
Medium (M) 3-ph 7.5-75 kW with VSD	0	0	0	0	0	0	0	0		0	4550	300	500	4550	0
Medium (L) 3-ph 75-375 kW with VSD	0	0	0	0	0	0	0	0		0	26750	500	1000	26750	0
Total 3-ph 0.75-375 kW with VSD															
Total 3-ph 0.75-375 kW w/wo VSD															
Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0		111	295	100	50	295	0
Small 1 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0		111	295	100	50	295	0
Total Small 1-ph 0.12-0.75 kW															
Small 3 ph 0.12-0.75 kW no VSD	0	0	0	0	0	0	0	0		0	295	100	50	295	0
Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0		0	295	100	50	295	0
Total Small 3-ph 0.12-0.75 kW															
Large 3-ph LV 375-1000 kW no VSD	0	0	0	0	0	0	0	0		84150	25875	750	2500	25875	0
Large 3-ph LV 375-1000kW with VSD	0	0	0	0	0	0	0	0		84150	25875	750	2500	25875	0
Total Large 3-ph LV 375-1000 kW															
Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0		0	438	150	75	438	0
Explosion motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0		0	4550	300	500	4550	0
Explosion motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0		0	26750	500	1000	26750	0
Total Expl. 0.75-375 kW (no VSD)															
Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0		0	438	150	75	438	0
Brake motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0		0	4550	300	500	4550	0
Brake motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0		0	26750	500	1000	26750	0
Total Brake 0.75-375 kW (no VSD)															
8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0		0	438	150	75	438	0
8-pole motors (M) 3-ph 7.5-75 kW	0	0	0	0	0	0	0	0		0	4550	300	500	4550	0
8-pole motors (L) 3-ph 75-375 kW	0	0	0	0	0	0	0	0		0	26750	500	1000	26750	0
Total 8-pole 0.75-375 kW (no VSD)															
1-phase motors >0.75 kW (no VSD)	0	0	0	0	0	0	0	0		0	560	192	96	560	0
MT Elec. Motors LV 0.12-1000 kW															
WP Water pumps	0	0	0	0	0	0	0	0		0	2404	100	421	0	0
WE Welding Equipment	12	0	0	0	0	0	0	0		0	0	0	0	0	0
TRAFO Distribution	9286	0	12402	24679	0	0	0	0		409600	0	0	0	0	0
TRAFO Industry oil	5285	0	8924	25863	0	0	0	0		493900	0	0	0	0	0
TRAFO Industry dry	60778	0	0	0	0	0	0	0		0	0	0	0	0	0
TRAFO Power	472325	0	2672738	504535	0	0	0	0		26848483	0	0	0	0	0
TRAFO DER oil	0	0	10616	10307	0	0	0	0		800304	0	0	0	0	0
TRAFO DER dry	221425	0	0	0	0	0	0	0		0	0	0	0	0	0
TRAFO Small	0	0	0	0	0	0	0	0		0	0	0	0	0	0
TRAFO Utility Transformers															
Tyres C1, replacement for cars	0	0	0	0	0	0	1653	2080	2251	1197	0	0	0	0	0
Tyres C1, OEM for cars	0	0	0	0	0	0	1653	2080	2251	1197	0	0	0	0	0
Tyres C1, total															
Tyres C2, replacement for vans	0	0	0	0	0	0	2127	2677	2897	1540	0	0	0	0	0
Tyres C2, OEM for vans	0	0	0	0	0	0	2127	2677	2897	1540	0	0	0	0	0
Tyres C2, total															
Tyres C3, replacement for trucks/busses	0	0	0	0	0	0	21301	6892	15036	6265	0	0	0	0	0
Tyres C3, OEM for trucks/busses	0	0	0	0	0	0	21301	6892	15036	6265	0	0	0	0	0
Tyres C3, total															
Tyres, total C1+C2+C3															

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