



Ecodesign Impact Accounting

Annual Report 2020

Overview and Status Report

Prepared by VAN HOLSTEIJN EN KEMNA (VHK)
May — 2021



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Ecodesign Impact Accounting

Annual Report 2020

Overview and Status Report

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Contents

The Ecodesign Impact Accounting (EIA) Annual Report 2020 consists of two parts that can be read separately: the Overview Report and the Status Report.

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.

Overview Report



ECODESIGN IMPACT ACCOUNTING

OVERVIEW REPORT **2020**

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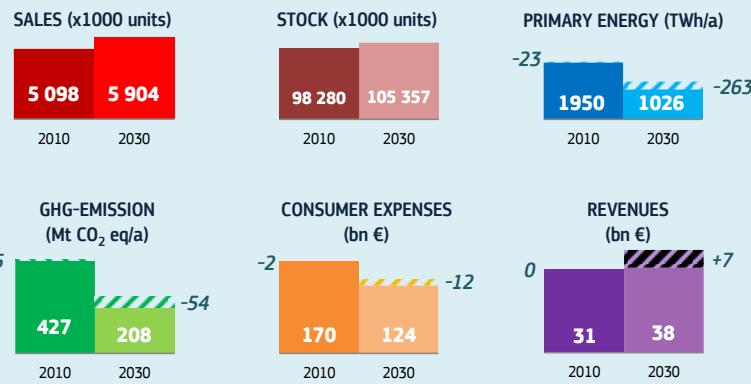
Abbreviations

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
hh	household
HT	High temperature
IA	Impact Assessment
kt	kilotonne (10^3 tonnes)
ktoe	kilotonne of oil equivalent
LT	Low temperature
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 and Figures

FACTS & FIGURES

Product: [CHC] Central Heating Combi, space heating
Measures: CR (EU) No. 813/2013 and CDR (EU) No. 811/2013



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.

Executive Summary

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 299 base case products from 41 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 2019 energy consumption of products included in EIA represents 57% of the EU27 primary energy consumption reported in the Eurostat Energy Balance, 48% of the final energy, close to 100% of electricity, and 33% of non-electric final energy consumption (EIA: fuel).

Energy totals in EIA are compatible with those in Eurostat and PRIMES [1] 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 (EIA: coal). Due to scope limitations (products regulated in Ecodesign, Energy Labelling, ENERGY STAR and Tyre Labelling), the coverage is lower for industry and transport. District heating (derived heat), ambient heat used by e.g. heat pumps, and solar heat is not accounted in EIA, while coverage of renewables/biomass (EIA: wood) is partial.

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 and POTEEnCIA [2].

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' (not updated since the first issue in 2016).

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 [3] developed the EIA-methodology (explained in the separate Status report) and applied the accounting method in the reports of May 2014 and December 2015 [4, 5].

The Ecodesign Impact Accounting was continued in the 2015-2018 EIA II study [6], 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 [7]. 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 [8] study 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 reports (status December 2019) were issued in June 2020 [9]. The current document is part of the EIA2020 reporting (status December 2020), and the first with data for EU27, excluding the UK.

* 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.

Executive Summary

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 [10], and corrects for double counting in a transparent manner [11].

The EIA methodology is explained in detail in chapter 2 of the Status report.

MAIN CHANGES IN THIS EDITION

The present document is part of the 2020 Annual Report of the EIA III study (status December 2020) and includes important updates compared to the 2019 report:

- **Conversion of EU28 to EU27 data:**

The United Kingdom has left the European Union in 2020 (Brexit) and consequently all EIA data have been converted from EU28 (incl. UK) to EU27 (excl. UK), for the entire accounting period 1990-2050.

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

- **Update of data on existing measures:**

For several product groups, review studies have provided new information and new insights in product development and use. This information has been used to update the EIA scenarios. New measures proposed in the studies were not yet considered (because not finalised in December 2020). The updates regard the following product groups:

- Central Heating Boilers (space heating),
- Central Heating Combis (water heating),
- Dedicated Water Heaters,
- Local Space Heaters operating on electricity, gas, or liquid fuel,
- Room Air-Conditioners,
- Circulators,
- Ventilation Units,
- Games Consoles,
- Personal Computers,
- Laundry Dryers.

- **Comparison with Eurostat and PRIMES:**

The comparison of EIA data with Eurostat's Energy Balance (for EU27) has been enhanced, adding a comparison per fuel type (natural gas, oil, solid fuels, renewables/biomass).

A detailed comparison between EIA and product data underlying the PRIMES model has been made. The results have been discussed with the Commission but are not reported in this document. The intention is to further detail and extend the reporting on EIA-PRIMES differences in the EIA edition of May 2022.

- **Households:**

A new section has been added to EIA with information per average EU27 household. For years 1990, 2010, 2020, 2030, 2050, this section provides data per household on product sales, stock, electricity, fuel, final energy, primary energy, GHG-emissions, and user expense.

Executive Summary

MAIN RESULTS

Table 1 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). See the Summary section for additional information.

The primary energy savings due to ecodesign and labelling measures are 1037 TWh in 2020 and 1533 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 2019.

Due to the measures taken, the GHG-emissions decrease by 170 Mt CO₂eq (-10% vs BAU) in 2020 and 266 Mt CO₂eq (-18% vs BAU) in 2030. The reduction is respectively 4.5% (2020) and 7% (2030) of the EU27 total emissions in 2018 (3764 Mt CO₂). Additional reductions result for NO_x, CO, OGC and PM (Table 1) [12].

Due to the measures for washing machines and dishwashers, in 2020 consumers save 1507 million m³ (> 50%) of (drinking) water (1885 Mm³ 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 € 60 bn (5%) saving in 2020 on consumer expenditure (76 bn euros energy cost saving, 7 bn euros consumables saved, 23 bn euros extra acquisition costs). In 2030 this increases to 118 bn euros (9%). 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).

Business revenues increase by 21 bn euros in 2020 and 29 bn euros in 2030 (5-6%), implying an increase of 324 thousand direct jobs in 2020 and 430 thousand in 2030.

Table 1: 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 %

	unit	2020		2030*	
		Saving vs. BAU	Saving vs. BAU (%)	Saving vs. BAU	Saving vs. BAU (%)
Primary Energy <i>(PEF 2.5 in 2020; 2.1 in 2030)</i>	TWh	1037		1533	
	PJ	3734	10%	5520	18%
	Mtoe	89		132	
Electricity	TWh	334		532	
	PJ	1202	12%	1914	18%
	Mtoe	29		46	
Final Fuel <i>(non-electric final energy)</i>	TWh	202		417	
	PJ	728	7%	1501	17%
	Mtoe	17		36	
Final Energy <i>(excl. energy sector)</i>	TWh	531		932	
	PJ	1910	9%	3355	17%
	Mtoe	46		80	
Energy related GHG-emissions	Mt CO ₂ eq	170	10%	266	18%
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	-23	-6%	-32	-7%
Energy costs	bn euros	76	11%	138	18%
Consumable costs	bn euros	7	19%	12	30%
Total user expense	bn euros	60	5%	118	9%
Business revenues	bn euros	21	5%	29	6%
Associated jobs	thousands	324	5%	430	6%

* The cumulative primary energy savings (with PEF 2.5 until 2020, PEF 2.1 from 2021 onwards) are:

- Period 2021-2030 (10 years): 12952 TWh
- Period 2011-2030 (20 years): 19149 TWh

Executive Summary

RESULTS PER HOUSEHOLD

The average EU27 household in 2020:

- Bought 11 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 530 kg CO₂eq of greenhouse gas emissions in 2020 compared a scenario without Ecodesign and Labelling measures. In 2030 this is projected to increase to almost 700 kg CO₂eq/household.
- Saved 210 euros (7%) in user expenditure in 2020, expected to increase to 350 euros per year per household in 2030 (11%) 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.

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COMPARISON WITH EUROSTAT AND PRIMES

At a high level of aggregation, energy totals in EIA are compatible with those in Eurostat and PRIMES, when considering the differences in scope. The Status Report section 3.8 contains an extensive reporting on the agreements and differences between EIA and Eurostat.

As an example, Table 2 shows the comparison for the residential sector in 2018 [13]. Except for 'heat' (derived heat, district heating) which is not in the EIA scope, and 'rnw' (renewables/biomass) which is only partially in the EIA scope (wood-fired solid fuel boilers and local space heaters), the agreement between EIA and Eurostat is excellent. For all end-uses in the residential sector, the difference is 12% for electricity, 9% for 'solid' fuels (EIA: coal), 3% for 'oil' (liquid fuels) and 2% for natural gas consumption.

For residential space heating, there is a 73% difference on electricity consumption, meaning that EIA is too high or Eurostat too low. The difference comes mainly from electric local space heaters, which have recently been reviewed and updated in EIA2020.

For residential water heating, the differences on 'solid' fuels and 'oil' are due to EIA scope limitations. For gas and electricity, EIA and Eurostat match.

For residential cooking, EIA does not account 'solid' fuels and 'oil', because this is not in scope of the regulations. But there is a rather large difference also for electric cooking and gas cooking. This is a point for further work, on both sides.

The 105 TWh (26%) electricity difference for lighting and appliances is caused for a major part by the absence in EIA of ironing, small appliances (except standby), and a part of the information, communication, and entertainment equipment, which has been estimated to contribute 81 TWh, explaining large part of the difference.

In general, the comparison exercise shows that there is a potential, also with regards to other modelling tools used for policy such as PRIMES and POTEEnCIA, for further work to realise consistent 'bottom-up' and 'top-down' analyses between the datasets. First contacts between the EIA and PRIMES teams have been made and work is ongoing.

Table 2: Comparison for the 2018 residential sector between final energy consumption in EIA and in Eurostat (ESTAT), split per type of energy carrier [21]

TWh/a in 2018		solid	gas	oil	rnw	elec	heat	total
All uses	ESTAT	101	925	331	559	708	245	2870
	EIA	93	902	320	254	624	0	2193
	dif	-9	-23	-10	-305	-84	-245	-676
	dif %	-9%	-2%	-3%	-55%	-12%	-100%	-24%
Space Heating	ESTAT	93	698	257	492	95	191	1827
	EIA	93	700	288	254	165	0	1500
	dif	0	1	31	-238	70	-191	-326
	dif %	0%	0%	12%	-48%	73%	-100%	-18%
Space Cooling	ESTAT	0	0	0	0	11	0	11
	EIA	0	0.0	0	0	10	0	10
	dif	0	0	0	0	-1	0	-1
	dif %	0%	0%	0%	0%	-8%	0%	-8%
Water Heating	ESTAT	8	173	47	55	87	55	424
	EIA	0	177	32	0	79	0	288
	dif	-8	4	-15	-55	-9	-55	-137
	dif %	-100%	3%	-32%	-100%	-10%	-100%	-32%
Cooking	ESTAT	1	55	23	10	86	0	175
	EIA	0	26	0	0	63	0	88
	dif	-1	-29	-23	-10	-23	0	-86
	dif %	-100%	-53%	-100%	-100%	-27%	0%	-49%
Lighting & Apps	ESTAT	0	0	0	0	405	0	405
	EIA	0	0	0	0	300	0	300
	dif	0	0	0	0	-105	0	-105
	dif %	0%	0%	0%	0%	-26%	0%	-26%
Other end-uses	ESTAT	0	0	3	2	24	0	28
	EIA	0	0	0	0	8	0	8
	dif	0	0	-3	-2	-16	0	-21
	dif %	0%	0%	-100%	-100%	-68%	0%	-73%

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SENSITIVITY ANALYSES

The results for greenhouse gas emissions reported in EIA are for the traditional EIA set of Global Warming Potential factors for electricity generation and distribution, based on the MEErP. When using the alternate set of GWP factors of the PRIMES 2016 reference scenario, the avoided emissions due to ecodesign and labelling regulations are reduced from 170 to 129 Mt CO₂eq in 2020, and from 266 to 191 Mt CO₂eq in 2030. These data show the importance of agreeing on a common set of GWP-factors for electricity to be used in all ecodesign studies, and more in general in the models used for EU policy purposes.

The results for energy costs and total user expenses in EIA are for the traditional EIA set of energy rates, based on Eurostat until 2019 and applying an annual escalation rate in later years. Using the rates for electricity and natural gas from the PRIMES 2015f reference scenario, the 2020 user expense savings of 60 bn euros do not change, while the 2030 savings reduce from 118 bn to 111 bn euros. Larger differences are found in 2050 (147 bn vs. 114 bn euros).

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) [11], 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, EIA2020 continues to use the 10% lost savings, for all years and all products, for the sensitivity analysis.

CHANGES IN RESULTS BETWEEN EIA2019 AND EIA2020

Primary energy savings have decreased in the EIA2020 edition compared to the EIA2019 edition (see Table 3). In part this is due to Brexit (-254 TWh in 2020 and -379 TWh in 2030), but a major part of the decrease (-486 TWh in 2020 and -806 TWh in 2030) is due to the EIA2020 product updates, and in particular those for space heating using central heating boilers (CHB) and water heating using central heating combis (CHC) and dedicated water heaters (DWH).

The EIA2019 data for CHB, CHC and DWH were based on the 2013 impact assessments, which in turn used the data from the 2007 preparatory studies. These studies used extensive and reliable 2004-2006 market information, and projections for e.g. heat pumps that were certainly acceptable in that period. At the same time, the UK mandated the use of condensing boilers (which was quite spectacular at the time) and there was a general optimism that energy-saving devices would be easily absorbed by the market.

The unforeseen 2008 financial crisis drastically changed this. The building construction sector collapsed and never recovered to pre-2008 levels (Figure 2). The heat pump market stagnated, approximately remaining on the same level of sales from 2008 to 2014 [14]. The strong increase in heat pump sales that was previously projected to start from 2006, took place only from 2015-2016 onwards. The crisis had a similar effect on all central heating boilers: in 2004, 22% of the boilers was sold in new housing, while this went down to 14% in 2014. In parallel, the replacement market for boilers went up from 60% in 2004 to 78% in 2014 [15], replacement boilers being typically less efficient than boilers for new dwellings/buildings.

The 2008 crisis also changed the expenditure behaviour of people: replacements were postponed and average product life increased, further slowing down the efficiency-improvements. Consumers also turned out to be more conservative than previously assumed. In particular the oil-fired boiler stock hardly changed. Many users preferred

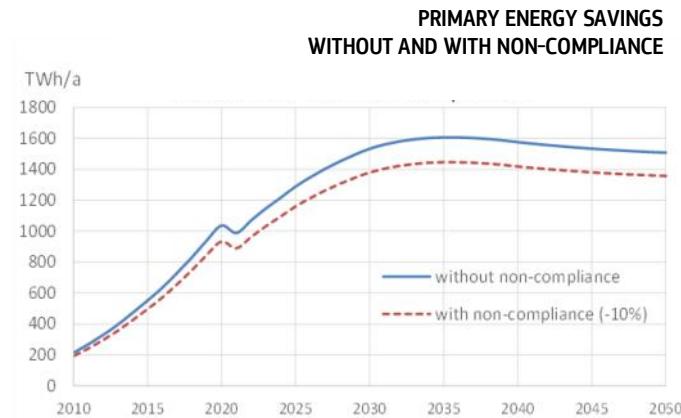


Figure 1. Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

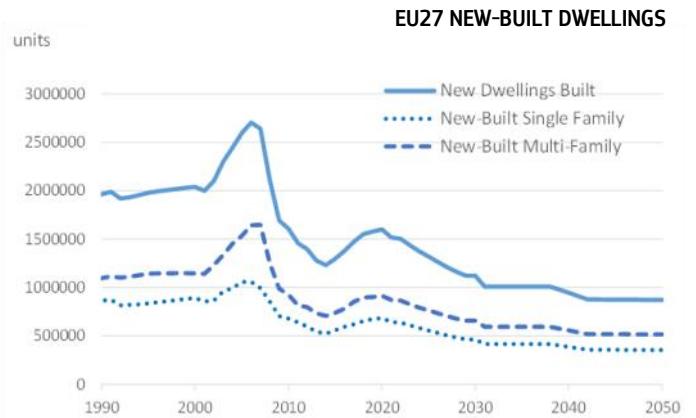


Figure 2. The 2008 financial crisis caused an unforeseen collapse in the number of new-built dwellings, affecting the projections made in pre-2008 studies on space heating, water heating and ventilation units. Source: review study on ventilation units [16]

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to repair or try to fit a new jet burner in an old heat exchanger, instead of buying a new more efficient boiler. Gas-fired boilers also continue to be popular.

In parallel, water consumption also changed. Until 2008 there was a strong increasing trend in water consumption by households, due to an increase in the number of showers, without a corresponding decrease in the number of baths. Measured data on water consumption were rare in 2006, but there was a strong push from some utilities (e.g. France, Norway) to convince people to buy large (400 litres or more for an average family) electric storage water heaters (ESWHs).

After 2008 this trend stopped, and the consumption of warm water even decreased [17] (leading to complaints of some utilities on lower revenues). The utilities started to measure the (warm) water consumption per type of end-use, and the 2019 review study for the first

time had access to reliable data on the overall water consumption per Member State and good estimates for the warm water consumption. In particular for the ESWHs the difference is large: in France and Norway the water consumption is half of what was assumed in the 2007 preparatory studies. Other new information is that water consumption is low in several of the Baltic and Eastern Europe states.

The large changes described above occurred over a period of more than a decennium but are now implemented in EIA in a single update, leading to large changes in impacts. If the market studies on space heating by BRG Building Solutions, the most reliable source of information for central space heating and water heating, would be performed annually, the EIA updates would be more gradual and the check of policy targets against reality could be annual. For central space heating and water heating this does not seem excessive.

Table 3. Main differences between EIA2020 and EIA2019

	Primary Energy Savings (TWh)		User Expense Savings (bn euros 2015)		Extra Business Revenues (bn euros 2015)	
	2020 (PEF 2.5)	2030 (PEF 2.1)	2020	2030	2020	2030
EIA 2019 for EU28	1777	2718	64	150	64	91
EIA 2019 for EU27	1523	2339	55	130	55	77
EIA 2020 for EU27	1037	1533	60	118	21	29

1. 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
2. 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>
3. SPECIFIC CONTRACT No ENER/C3/412-2010/FV575-2012/12/SI2.657835 (EIA I study)
4. 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
5. ECODESIGN IMPACT ACCOUNTING Part 2 – Status May 2015, VHK December 2015 for the European Commission
6. 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)"
7. 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>
8. 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')" (current ongoing study)
9. Ecodesign Impact Accounting – Status Report 2019 – VHK for the European Commission, June 2020, <https://www.vhk.nl/research/eia.htm>
10. 'EU action on Ecodesign and Energy Labelling: important contribution to greater energy efficiency reduced by significant delays and non-compliance', Special Report O1, 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
11. 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).
12. NO_x: nitrogen oxides (acidifying agent), CO: carbon monoxide, OGC: Organic Gaseous Compounds, PM: particulate matter
13. Source for Eurostat: 'Disaggregated final energy consumption in households – quantities [nrg_d_hhq]', accessed April 2021. Data for year 2018 (data for other years are incomplete in Eurostat). Data converted from TJ to TWh NCV by VHK.
14. Approximately 800 thousand units per year in 21 EU countries, see <https://www.ehpa.org/market-data/>
15. Space and combination heaters, Ecodesign and Energy Labelling, Review study Final report Task 2, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019 (tables 6 and 7)
16. Ventilation Units, Ecodesign and Energy Labelling, Review study Final Report Tasks 1-7, VHK, Delft (NL), for the European Commission, DG GROW, August 2020
17. Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review study Final Report Task 3, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019



EIA 2020 Summary

Primary Energy

Product Energy Consumption

Emissions

Expenditure

Business Revenues and Jobs

Material Resources

SUMMARY

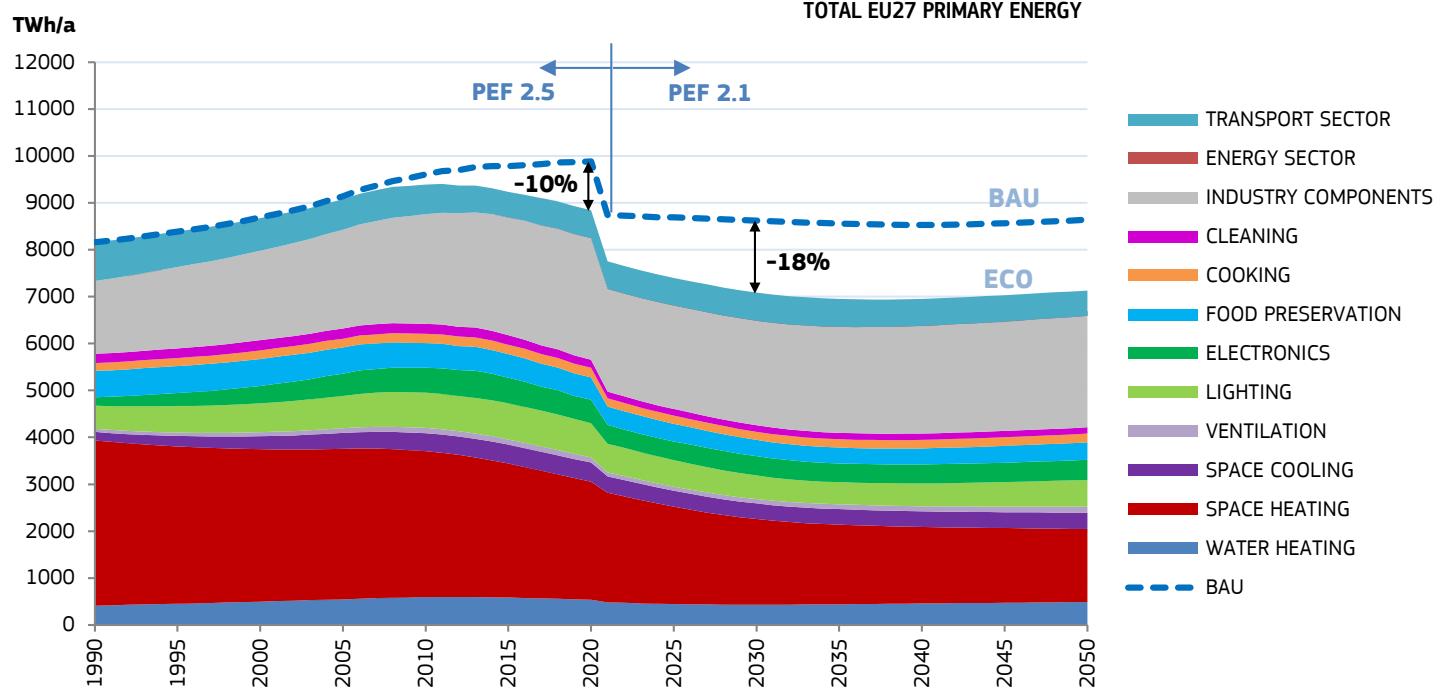
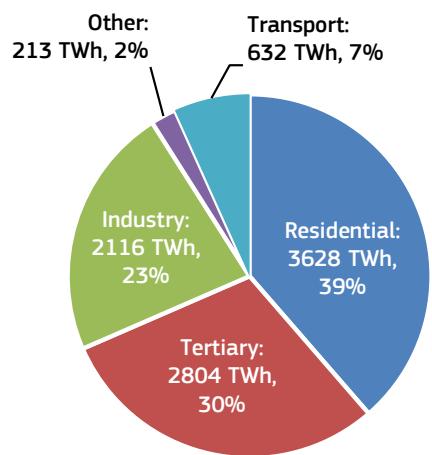
Primary Energy

PRIMARY ENERGY 2010

In 2010 the products included in the accounting represent 9393 TWh (808 Mtoe, 33,817 PJ) of direct and indirect primary energy consumption. This is 55% of the total EU27 primary energy consumption in 2010 (1485 Mtoe, source: Eurostat Energy Balance, February 2021). 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, 23% for industry, 7% for transport (rolling resistance losses for tyres only), and 2% for other sectors (e.g. agriculture, forestry, fishing).

ECO PRIMARY ENERGY PER SECTOR (2010)



ASSUMPTIONS

- Net calorific 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

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 1037 TWh (89 Mtoe, 3734 PJ), i.e. a saving of 10% versus BAU 2020 for the average product in scope (with PEF=2.5).

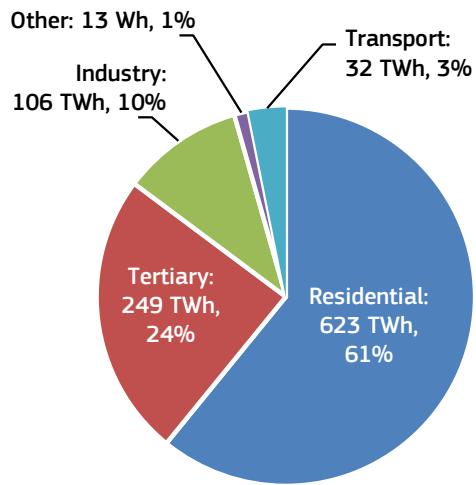
This primary energy saving is due to saving 328 TWh (28 Mtoe, 1182 PJ) of electricity, and 202 TWh (17 Mtoe, 728 PJ) is direct fuel saving. The sum of electricity saving and direct fuel saving ('final' energy saving) is 531 TWh (46 Mtoe).

Over 60% of the 2020 savings comes from the residential sector, 24% from the tertiary sector, 10% from the industry sector and 4% from transport and other sectors (agriculture, forestry, tyres).

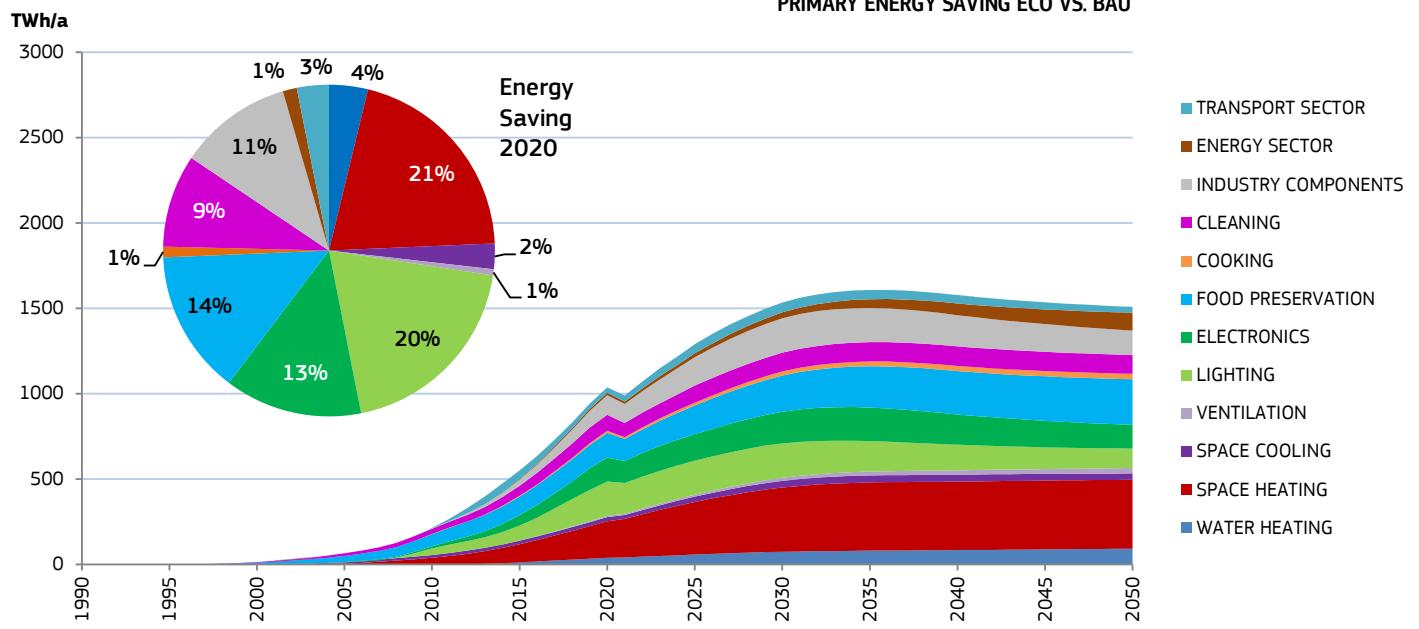
In 2030 the primary energy savings increase to 1533 TWh (132 Mtoe, 5520 PJ), i.e. a saving of 18% versus BAU 2030 for the average product (with PEF=2.1 in 2030).

The savings represent 6.5% (in 2020) or 10% (in 2030) of the total EU27 primary energy consumption in 2019 (1352 Mtoe).

PRIMARY ENERGY SAVINGS PER SECTOR (2020)



PRIMARY ENERGY SAVING ECO VS. BAU

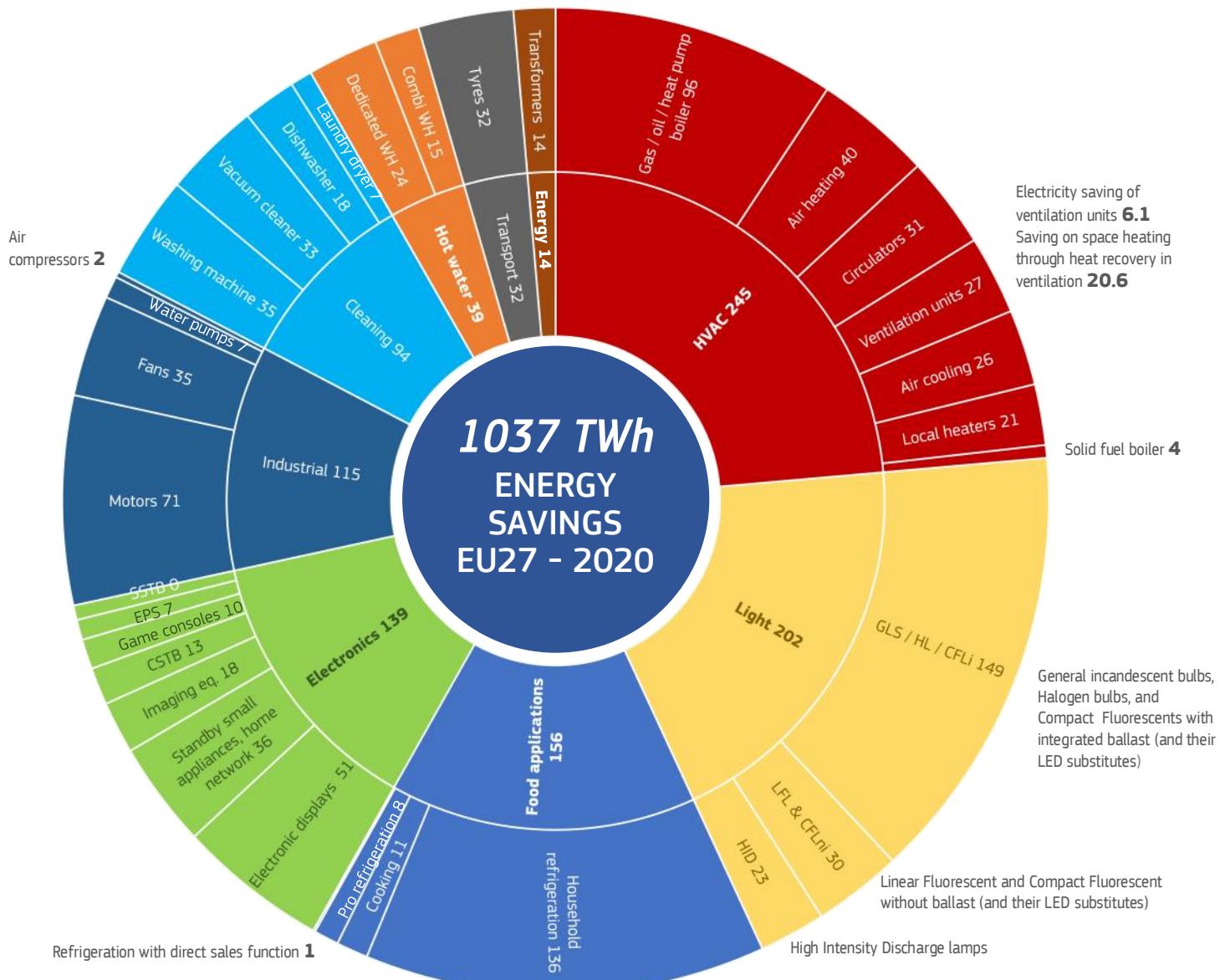


SUMMARY

Primary Energy

2020

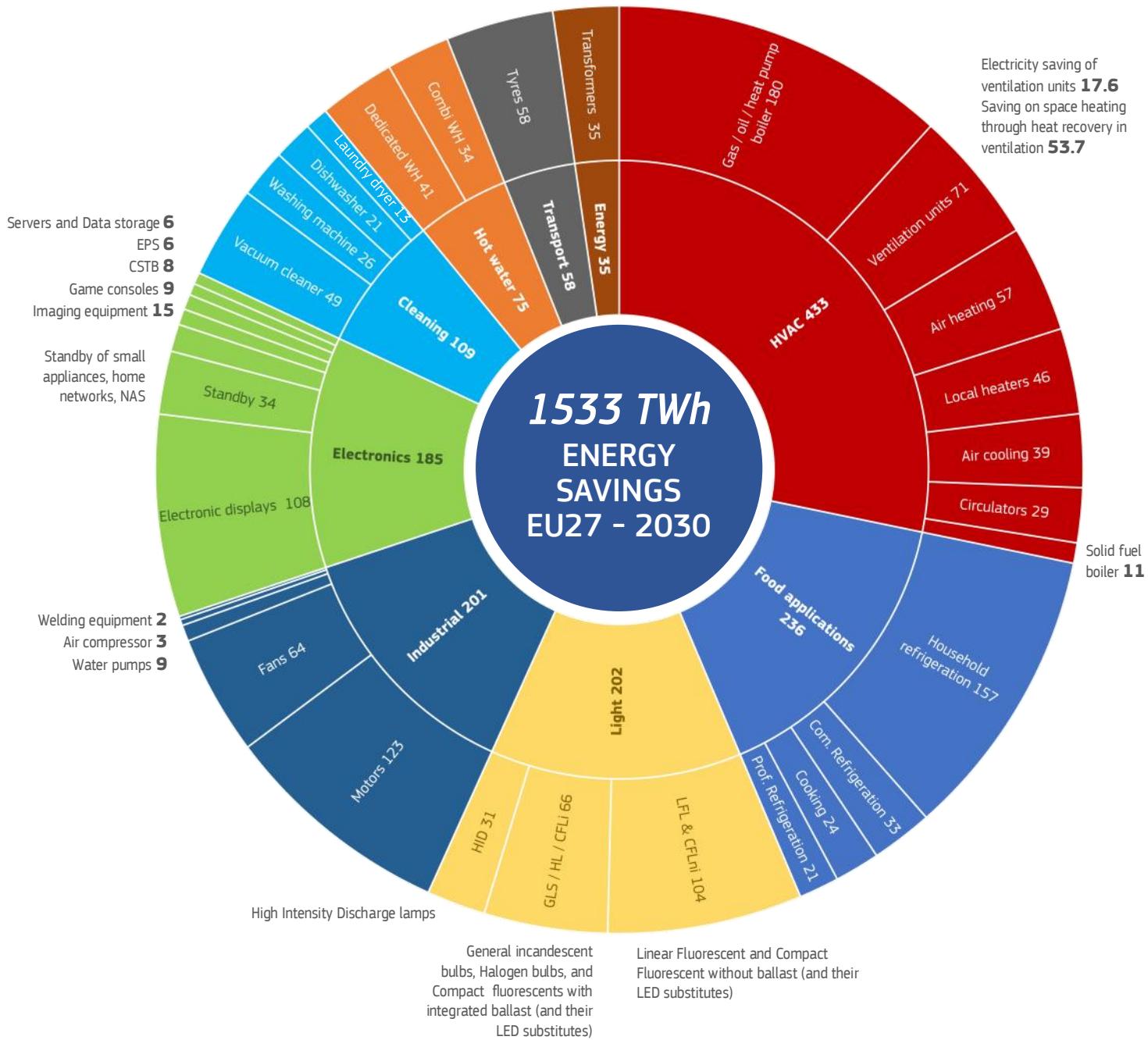
PRIMARY ENERGY SAVINGS (AT PRIMARY ENERGY FACTOR 2.5) WITH ECODSIGN AND ENERGY LABEL VS. BUSINESS-AS-USUAL (BAU) FOR EU27



Primary Energy

2030

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

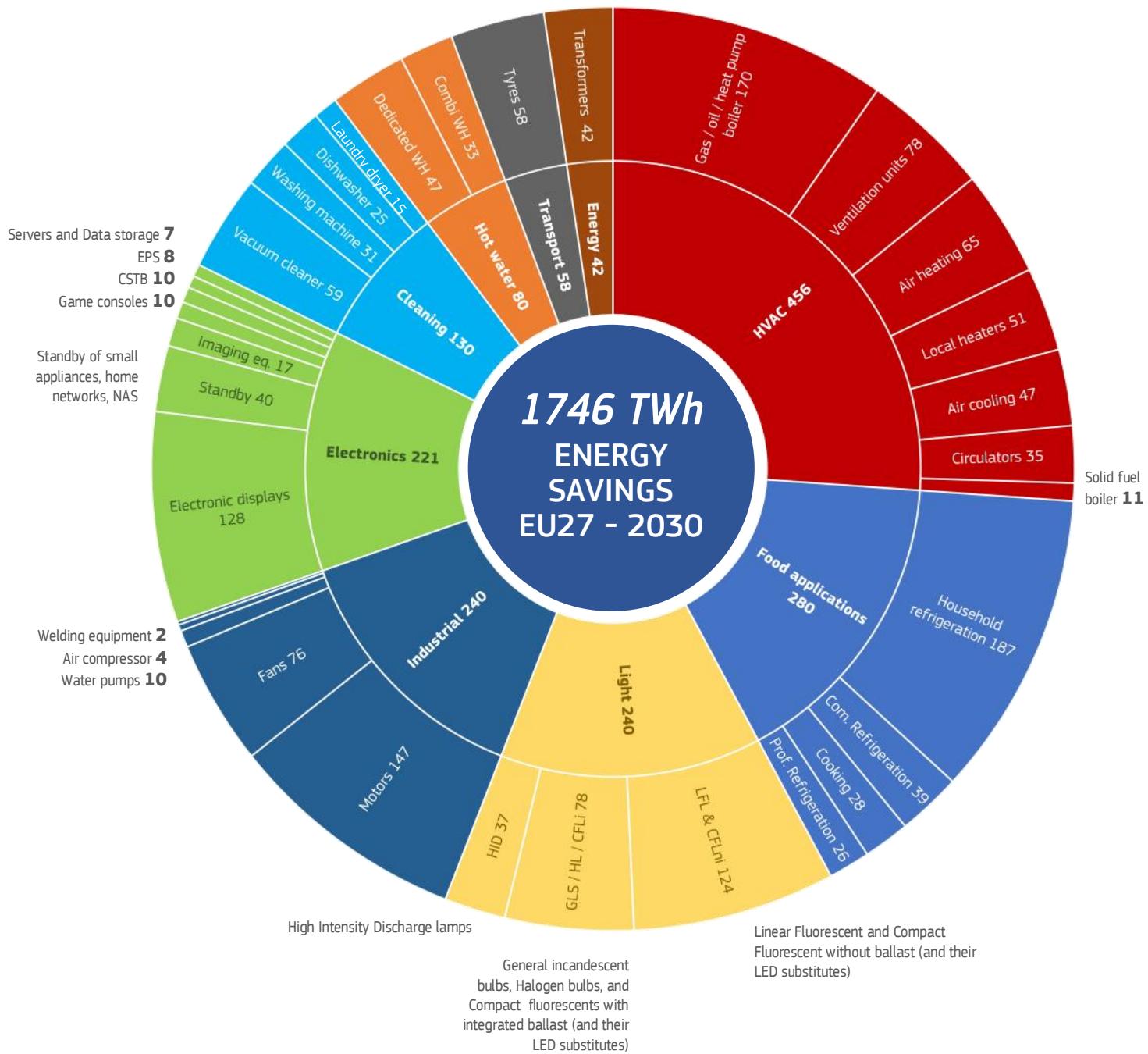


SUMMARY

Primary Energy

2030

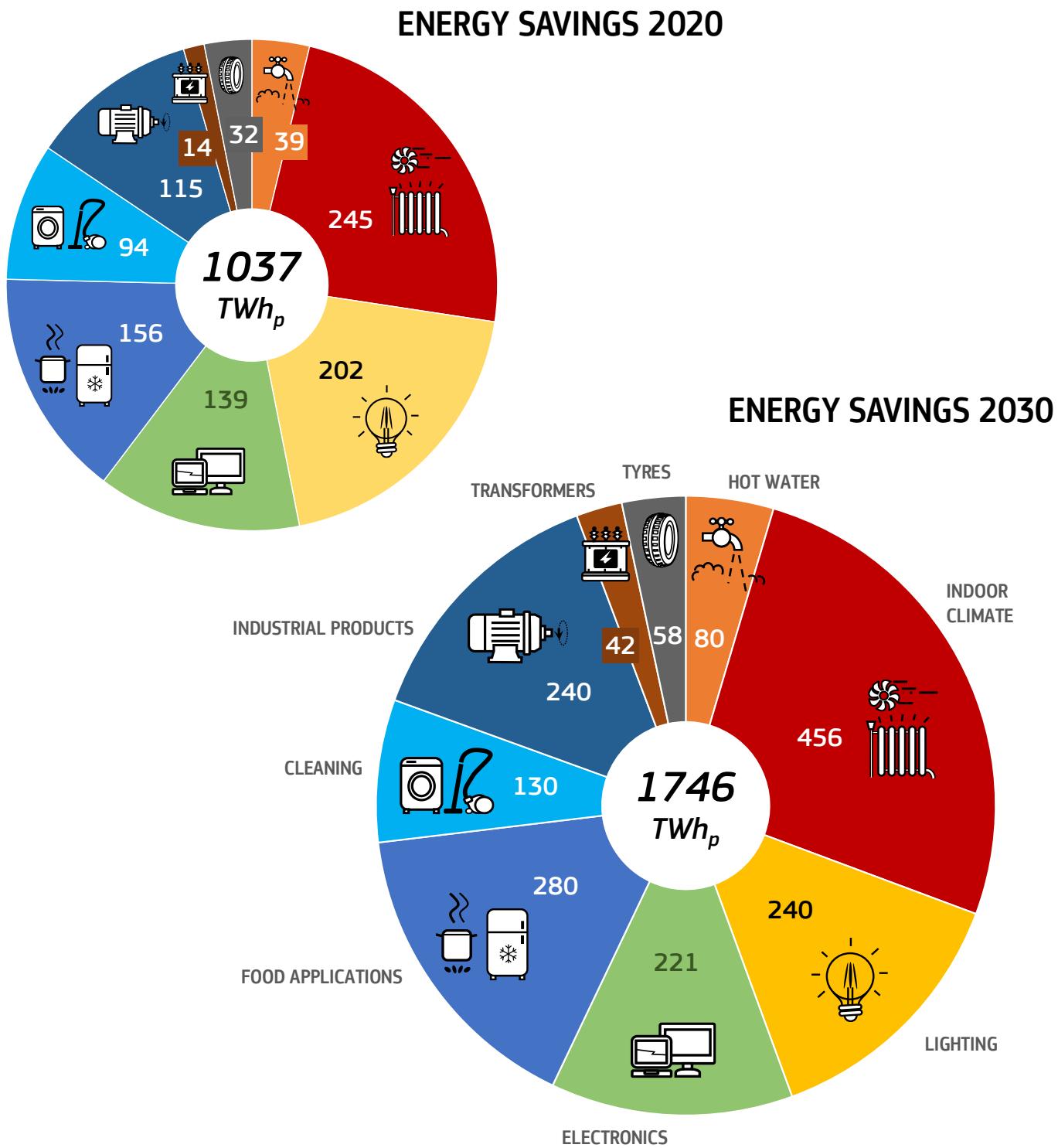
PRIMARY ENERGY SAVINGS (AT PRIMARY ENERGY FACTOR 2.5) WITH ECODSIGN AND ENERGY LABEL VS. BUSINESS-AS-USUAL (BAU) FOR EU27



Primary Energy

EU27 ENERGY SAVINGS 2020 & 2030 FROM ECODESIGN AND ENERGY LABELLING

ALL AMOUNTS EXPRESSED IN TWh PRIMARY ENERGY AT PRIMARY ENERGY FACTOR 2.5

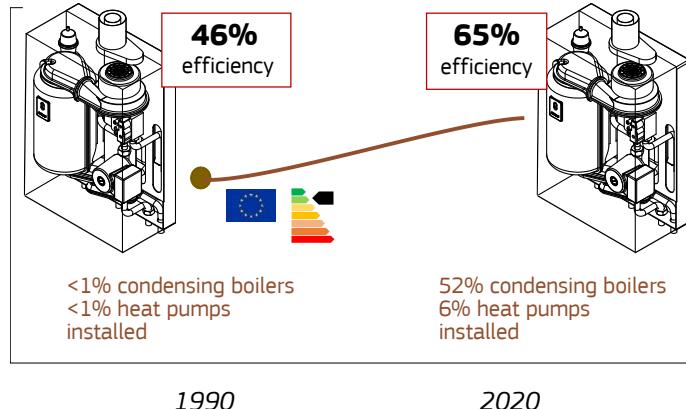


SUMMARY

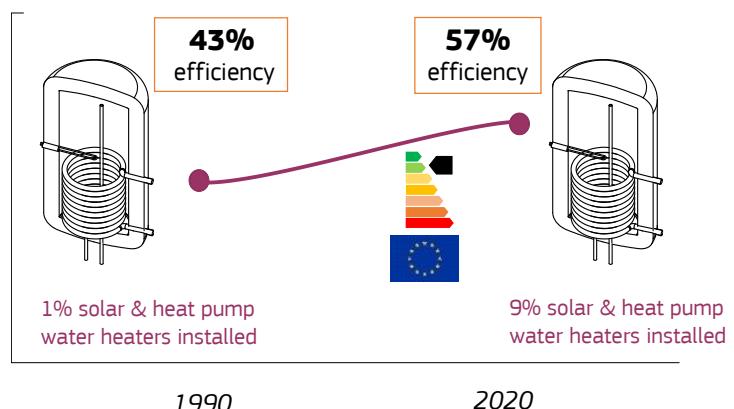
Product Energy Consumption

EFFECT OF ECODESIGN AND ENERGY LABEL ON PRODUCT ENERGY CONSUMPTION

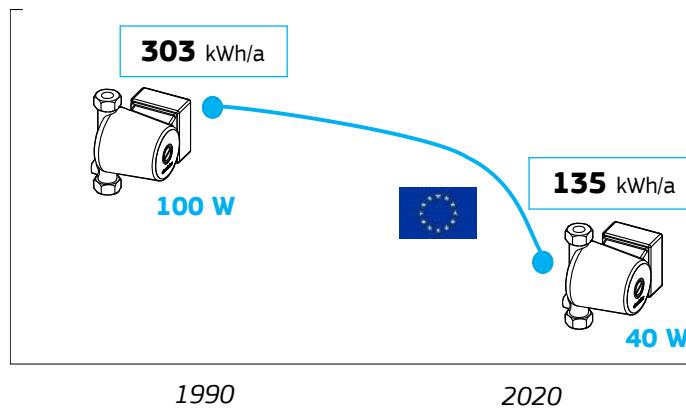
Hydronic central space heaters < 400 kW (excl. solid fuel)



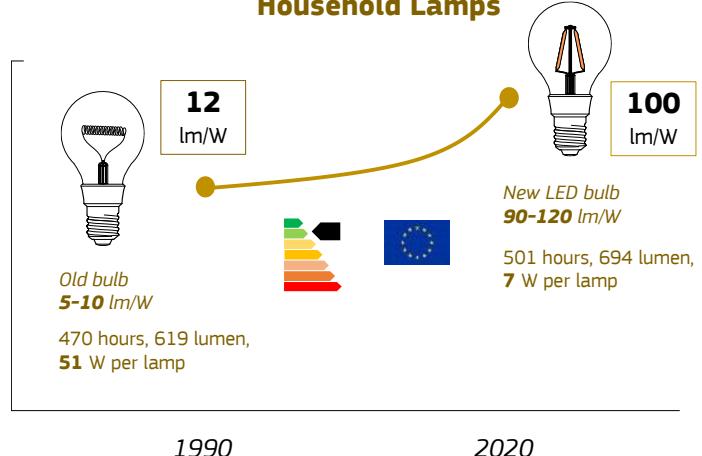
Water heaters (combi & dedicated)



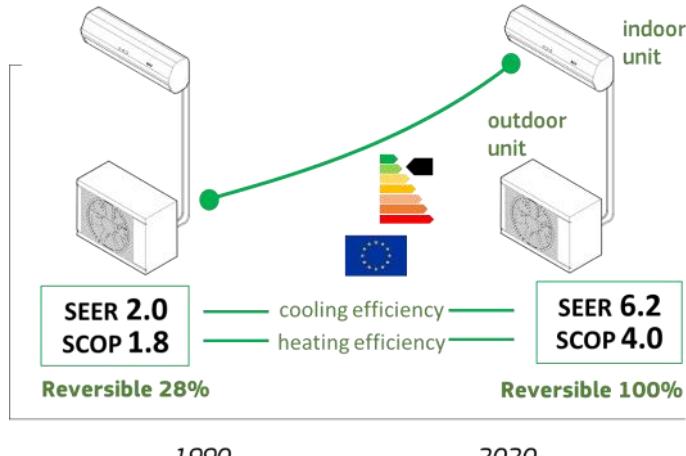
Integrated Circulator (central heating pump)



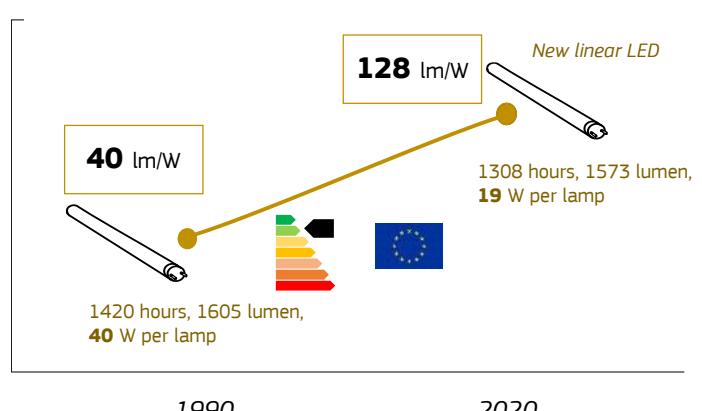
Household Lamps



Room Air Conditioners <12 kW

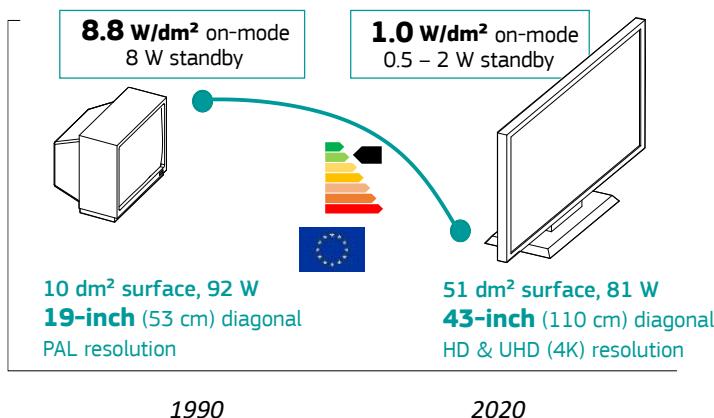


Non-Household Lamps

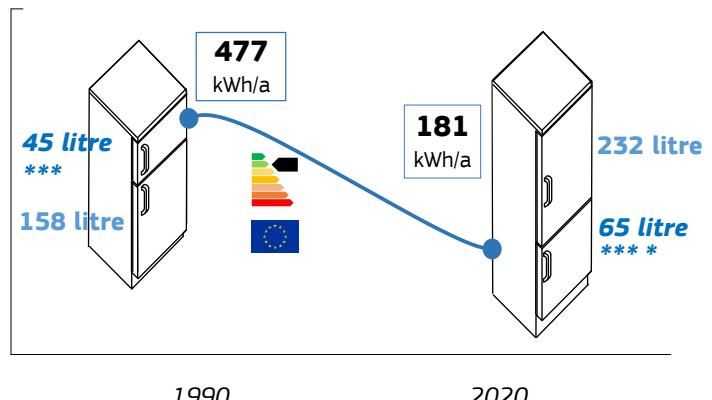


Product Energy Consumption

Televisions



Refrigerator - Freezer



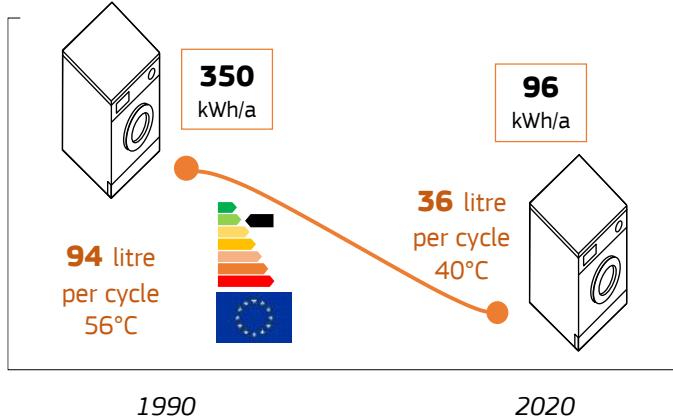
1990

2020

1990

2020

Washing Machine



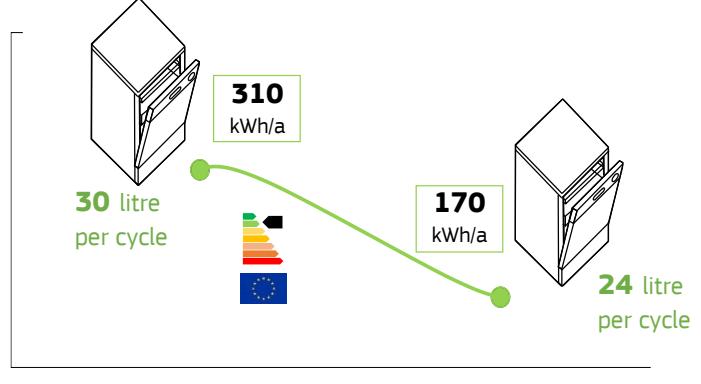
1990

2020

1990

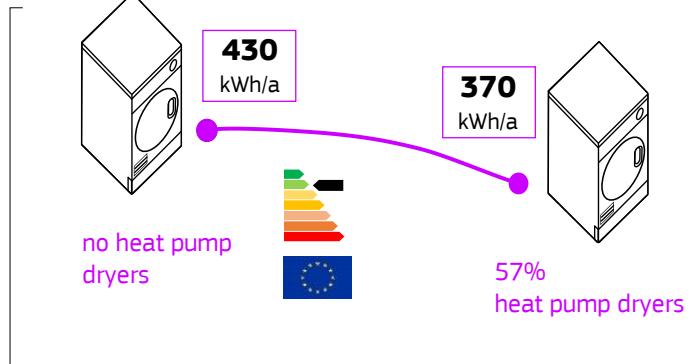
2020

Dishwasher



Laundry Dryer

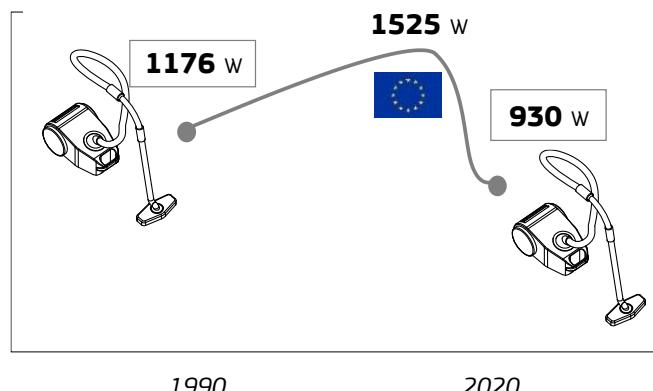
Electricity consumptions at 160 cycles per year



1990

2020

Vacuum Cleaner

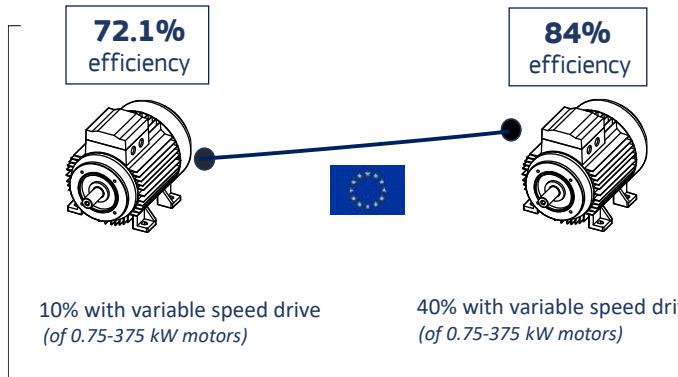


1990

2020

Product Energy Consumption

Electric motors 0.12 – 1000 kW



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 CO₂-equivalent).

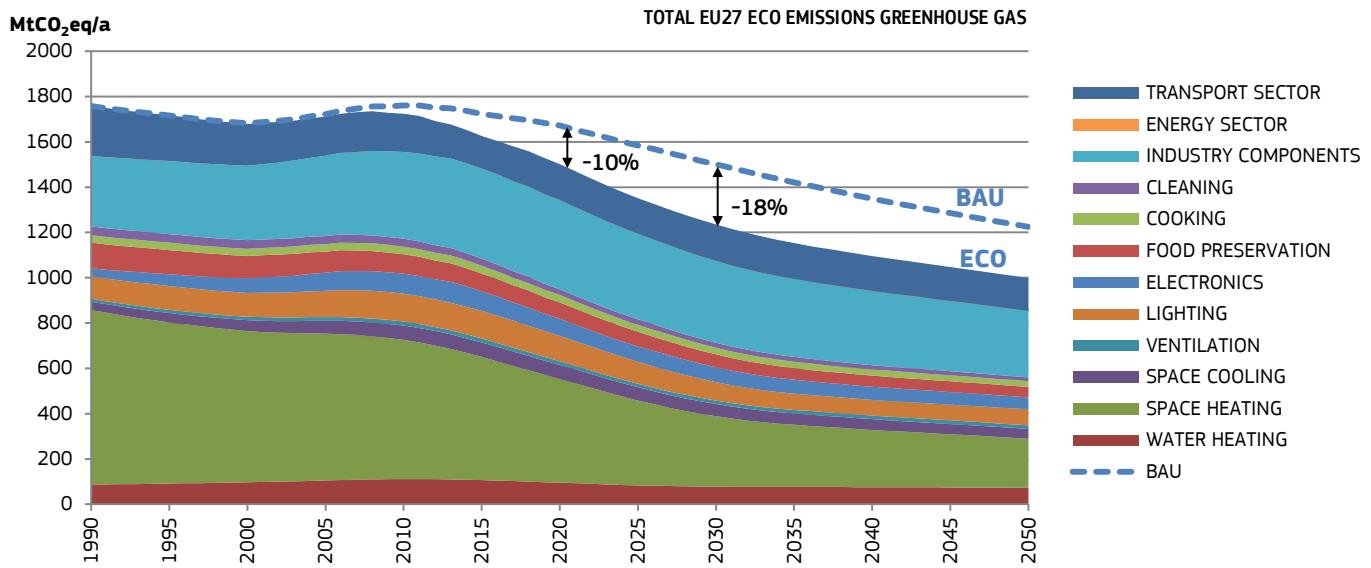
In 2010 the products included in the accounting for EU27 were responsible for 1724 Mt CO₂eq of GHG-emissions. This was 41% of the total EU27 emissions of 4188 Mt CO₂eq (source: EEA 2020, Annual European Union greenhouse gas inventory 1990–2018, excl. LULUCF).

In 2020 the reduction in GHG-emissions due to Ecodesign and Energy

Labelling measures (ECO 2020 versus BAU 2020) is 170 Mt CO₂eq, i.e. a saving of 10% versus BAU 2020 for the average product. The reduction is 4.5% of the EU total emissions in 2018 (3764 Mt CO₂eq, EEA 2020).

In 2030 the emission reduction increases to 266 Mt CO₂eq, i.e. a saving of 18% versus BAU 2030 for the average product. The reduction is 7% of the EU total in 2018.

For electricity the GWP (in kg CO₂-equivalent/kWh) is assumed decreasing from 0.41 in 2010 to 0.34 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:

- NitrogenOxides (NO_x): -128 kt SO₂equivalent (2.0% of EU-total in 2018)
- CarbonMonoxide (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)

COSTS

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 2015 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. Until 2018, rates are based on Eurostat data; in later years a 1-2% increase per year is assumed. 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.

SUMMARY

Expenditure

EXPENSE AND SAVINGS

In 2010, users spent 1080 billion euros for EIA-products, of which 355 bn for acquisition, 629 bn for energy, 50 bn for maintenance and 45 bn for consumables.

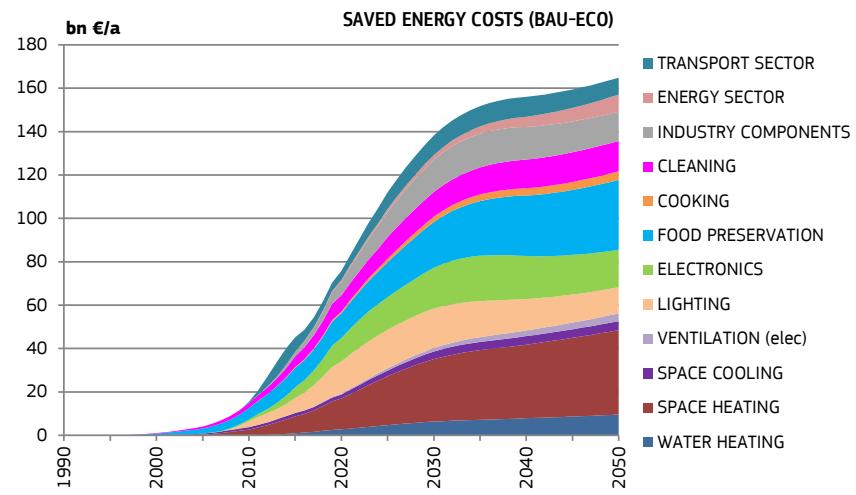
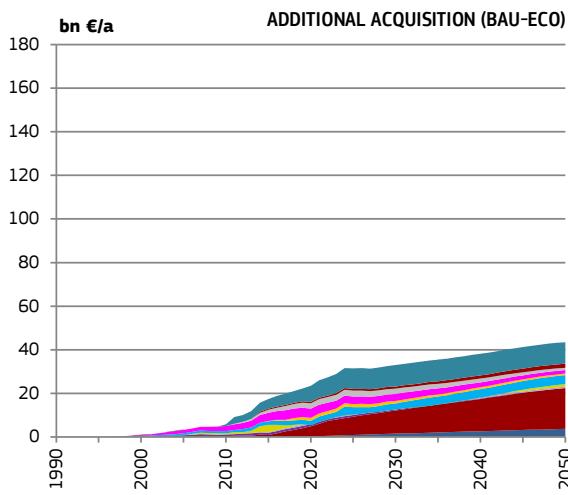
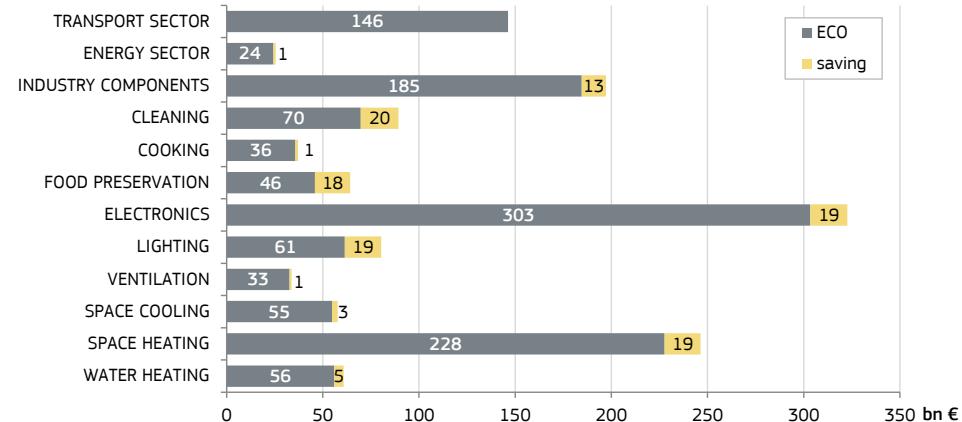
Without measures, by 2020 this would increase to 1166 bn euros, but due to Ecodesign and Labelling regulations this is expected to be limited to 1106 bn euros. The saving of 60 bn is the balance of 23 bn euros additional acquisition costs (for better products) and 82 bn euros savings on costs for energy and consumables (e.g. 1507 million m³ drinking water and 0.2 Mt printer paper saving). By 2030 the total expense savings are expected to increase to 116 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 Cleaning (20 bn euros), Space Heating, Lighting and Electronics (19 bn euros each), followed by Food Preservation and Industry components.

EXPENSES (in bn €)

	2010		2020		inc.	2030		inc.
	BAU		BAU	ECO		BAU	ECO	
Acquisition	355		395	418	23	476	509	32
Energy Cost	629		673	598	-75	753	615	-138
Maintenance	50		60	60	0	66	66	0
Consumables	45		39	31	-7	40	28	-12
Total Expense	1 080		1 166	1 106	-60	1 335	1 217	-118

USER EXPENDITURE
ECO SCENARIO AND SAVING VS. BAU 2030 (in bn €)



Business Revenue and Jobs

REVENUES 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 21 billion euros and this can increase to 29 billion euros by 2030. The related jobs increase by 324 thousand in 2020 to 430 thousand in 2030.

TOTAL REVENUE BY FUNCTIONAL GROUP (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	10	13	13	0	13	13	0	14	15	1
SPACE HEATING	35	51	52	1	51	55	4	55	64	9
SPACE COOLING	3	14	15	1	19	20	1	25	25	0
VENTILATION	5	17	17	0	19	20	1	22	23	1
LIGHTING	7	15	16	0	19	18	-1	18	17	-1
ELECTRONICS	45	171	171	0	180	180	0	231	231	0
FOOD PRESERVATION	10	11	12	1	12	13	2	12	15	2
COOKING	9	13	13	0	14	15	1	15	16	1
CLEANING	9	19	21	2	27	31	4	29	32	3
INDUSTRY COMPONENTS	8	14	14	0	17	19	2	19	21	2
ENERGY SECTOR	3	4	4	0	5	6	1	7	8	1
TRANSPORT SECTOR	19	24	25	1	31	38	7	40	49	9
TOTAL in bn euros	163	367	372	5	409	430	21	487	516	29

TOTAL REVENUE BY SECTOR (in bn €)

sector	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	68	174	176	2	193	204	11	232	246	14
Wholesale	14	29	30	0	33	35	2	38	40	3
Retail	37	84	86	2	93	99	6	118	125	7
Installation	19	35	35	0	37	39	2	41	47	6
Maintenance	24	45	45	0	53	53	0	58	57	0
TOTAL in bn euros	163	367	372	5	409	430	21	487	516	29

TOTAL DIRECT JOBS BY SECTOR (in 1000 jobs)

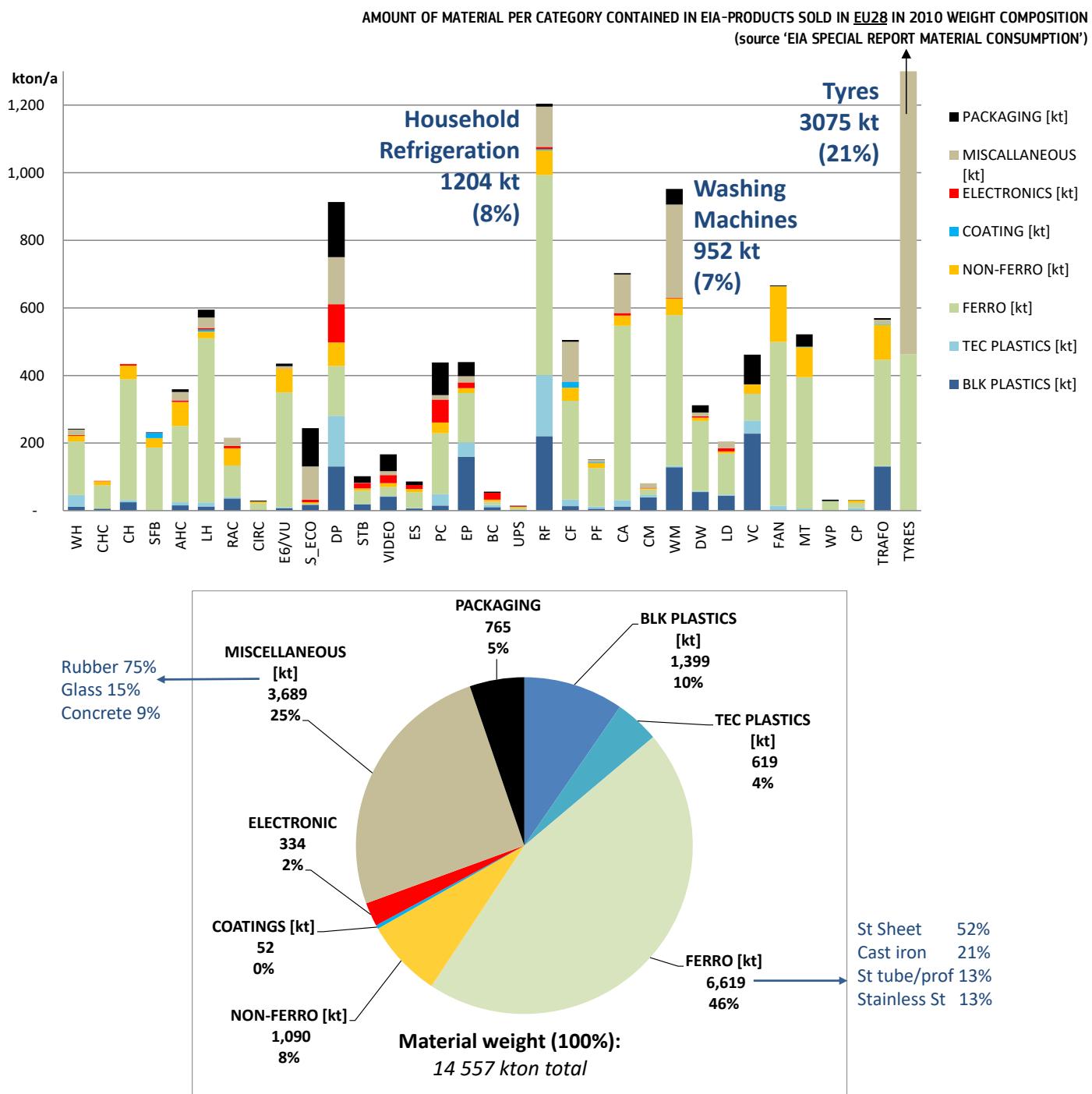
sector	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry (incl. OEM & business services)	1263	3216	3258	42	3568	3775	207	4305	4564	259
Wholesale	52	108	109	2	123	128	6	140	149	9
Retail	577	1300	1327	27	1442	1530	88	1814	1924	110
Installation	175	324	328	4	341	363	22	380	434	54
Maintenance	225	416	417	0	491	491	0	535	532	-3
TOTAL in 1000 jobs	2292	5363	5439	76	5963	6287	324	7175	7604	430

Material Resources

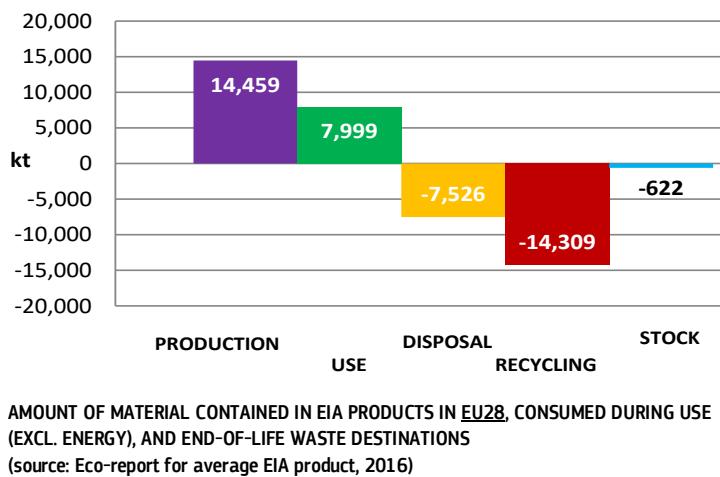
EIA SPECIAL REPORT ON MATERIALS

In the Ecodesign preparatory studies, Bills of Materials (BoM) have been defined for typical products. Multiplying the BoM weights per material category (metals, plastics, electronics, etc.) by the EIA-sales or -stock, the total amount of materials contained in sold or installed 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 Consumption' (VHK, 2016) provides material resource data for one given year (around 2010) in EU28, which is presented here.

The total weight of EIA-products sold in 2010 is 14.6 Mt. This is 4.6% of the total EU consumption of plastics, metals, glass, cardboard and rubber. The 'heaviest' product groups are Tyres (3075 kt, 21% of total), Household Refrigerators (1204 kt, 8%) and Washing Machines (952 kt). Ferrous metals (galvanised steel sheet, cast iron, steel tubes and profiles, stainless steel) represent 46% of the total weight. Plastics (bulk and technical) account for 14%, and non-ferrous metals (e.g. aluminium, copper) for 8%. The 'miscellaneous' category mainly consists of rubber for the tyres (natural and synthetic).



Material Resources



In addition to the 14.6 Mt of materials contained in EIA products sold in 2010, 8 Mt per year of spare parts, consumables and refrigerants are 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).

ECOREPORT

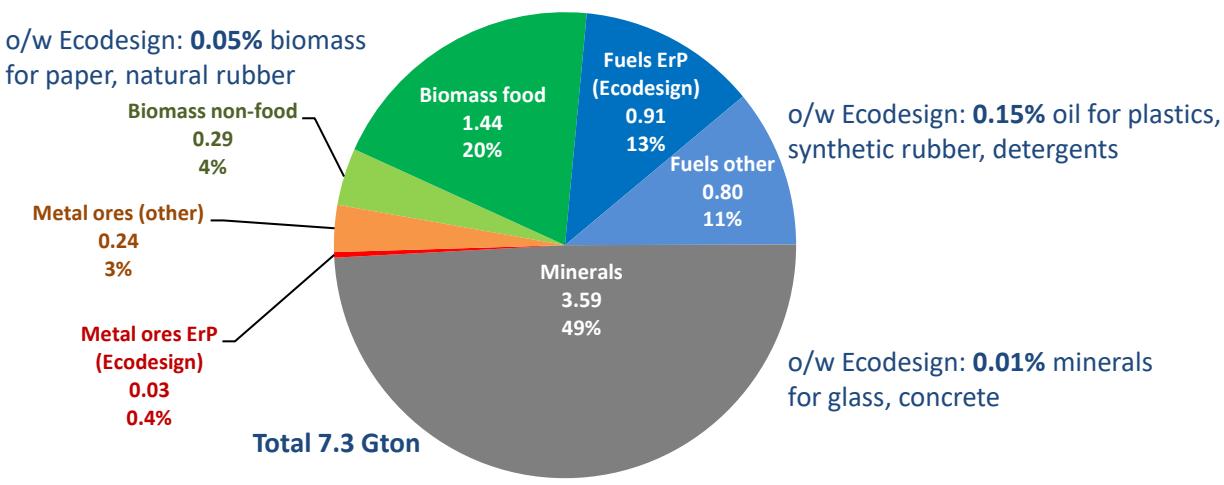
The EcoReport is a standard Excel tool to assess life cycle environmental and economic impacts of products. It has been developed as part of the 'Methodology for the Ecodesign of Energy-related Products' (MEErP).

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

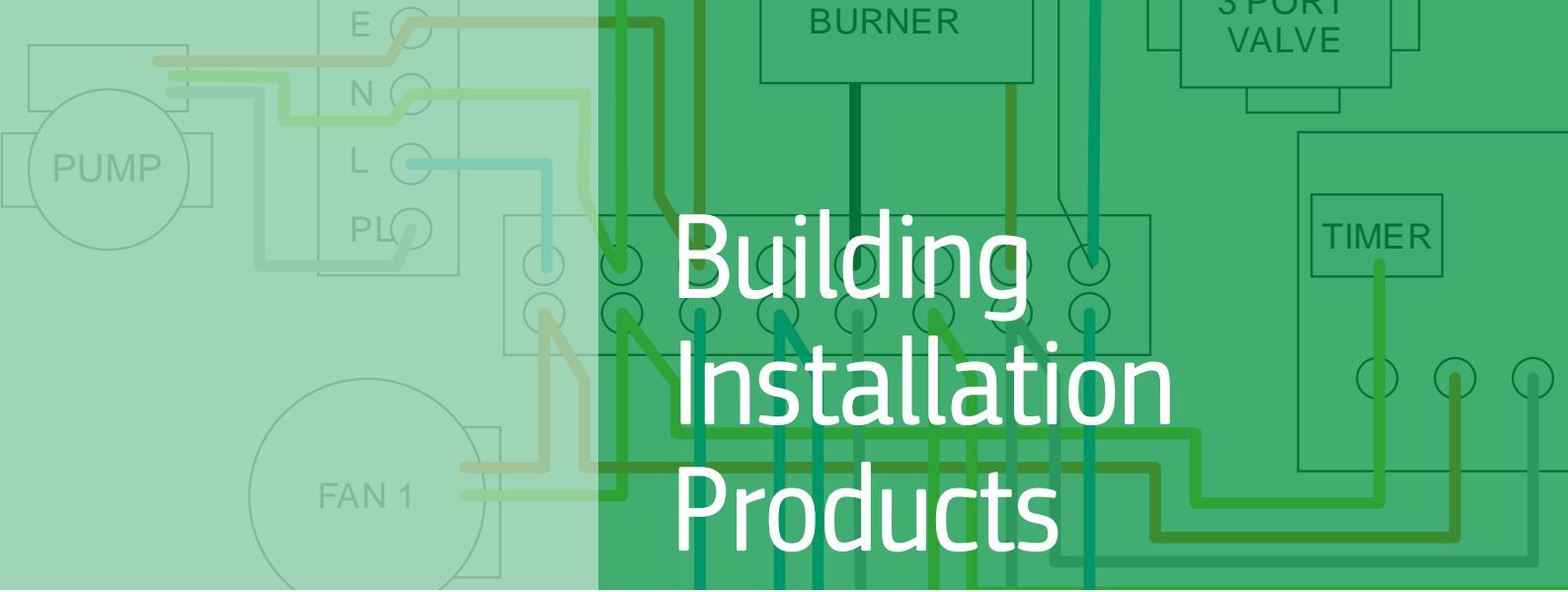
distribution of materials over 'disposal' and 'recycling', on the energy and emissions due to materials processing, manufacturing, distribution and end-of-life phases, and on waste caused by materials processing, manufacturing and energy generation. For details see the 'EcoReport for the average EIA 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.



SUMMARY

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Building Installation Products

Overview

Central Space Heating

Water Heating

Circulators

Solid Fuel Boilers

Local Space Heaters

Air Heating and Cooling

Room Air Conditioners

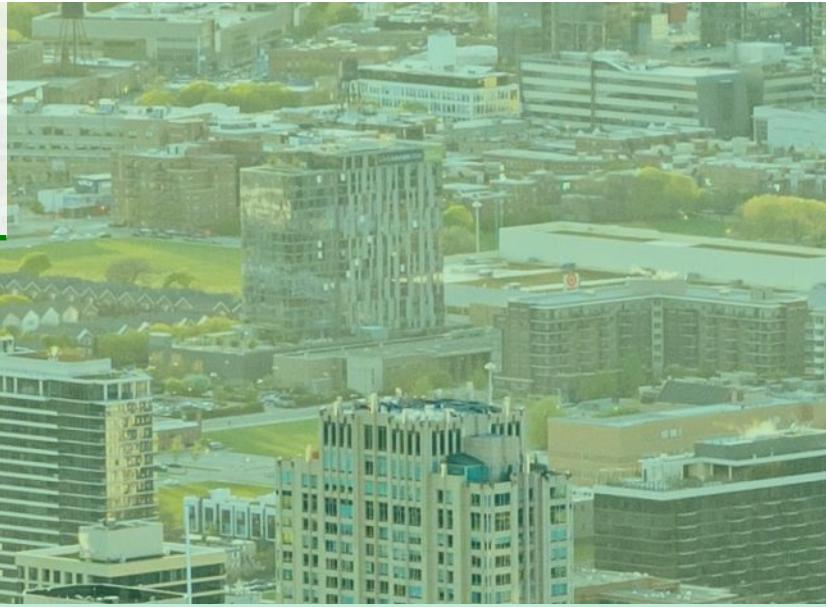
Lighting

Ventilation Units

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



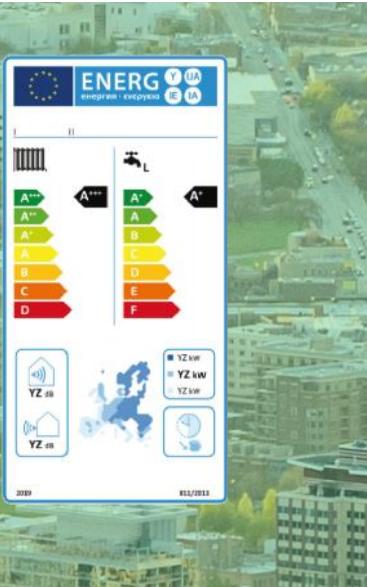
Ventilation units



Light sources

BUILDING INSTALLATION PRODUCTS

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).

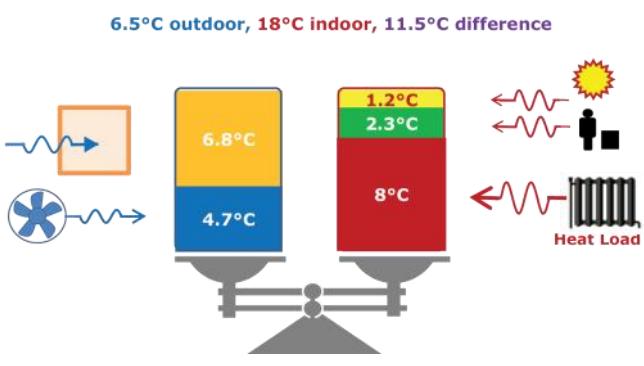


Three indicative heating season zones as defined by EC

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.

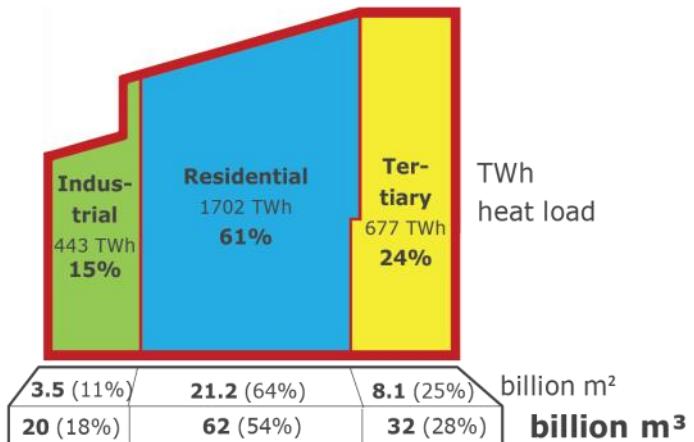


EU building stock heat balance

Overview

BUILDING STOCK

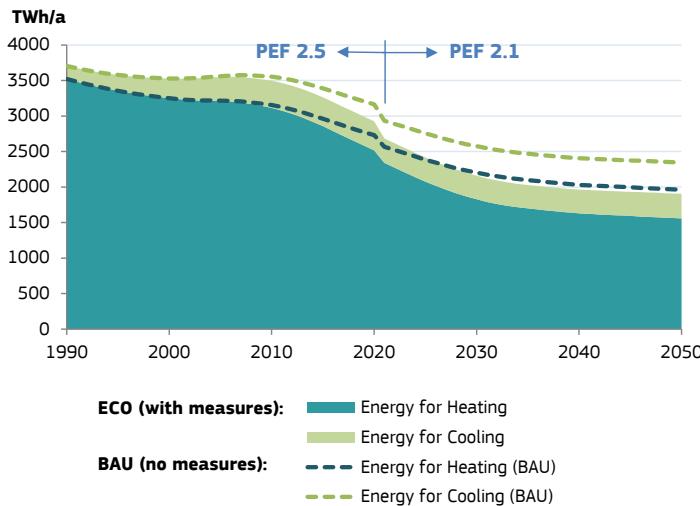
The total heat output that is required from heating and cooling appliances depends first of all on the size and the geometry of the buildings. For EU28 in 2010 the total heated surface area of all buildings is approximately 32 800 km² (32.8 billion m²). Spread out at ground floor level, this surface 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.



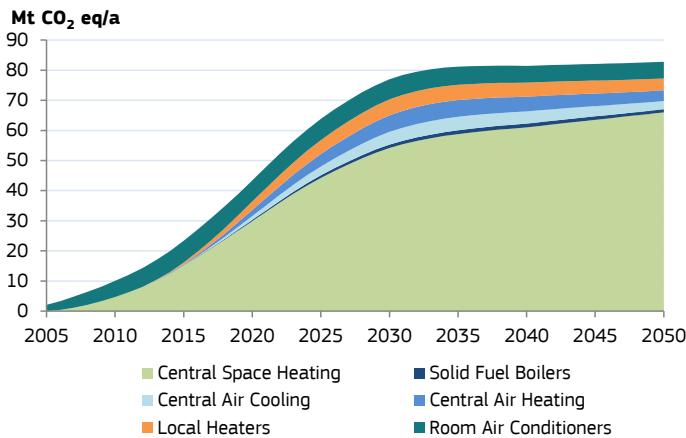
EU28 building heat load by sector in 2010

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



TOTAL EU27 GREENHOUSE GAS EMISSION SAVING 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.

EMISSIONS

Reduced energy consumption also causes less greenhouse gas emissions. The combined 2020 GHG-emissions for space heating and cooling amount to 520 Mt CO₂eq/a. This is 14% of the total EU GHG-emissions (3 764 Mt CO₂eq/a in 2018). Through Ecodesign and Energy Label measures a saving of 44 Mt CO₂eq/a is accounted for 2020. In 2030, these savings rise to 77 Mt CO₂eq/a, which would then be 29% 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

DETACHED

$8 \times 10 \times 5 \text{ m}$ (mix bungalow/2 storey)
shell surface area 340 m^2
block volume 400 m^3
Surface/volume ratio ca. **0.85**
 $1.6 \text{ floors} \rightarrow 128 \text{ m}^2$ heated floor area

SEMI-DETACHED

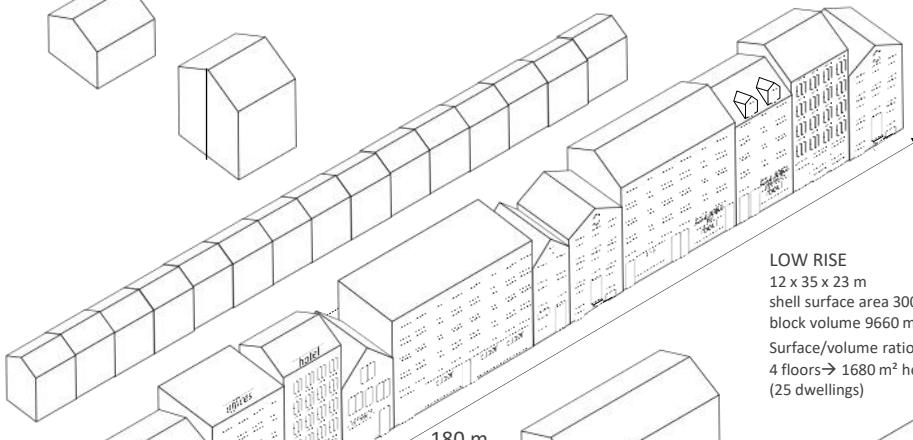
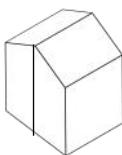
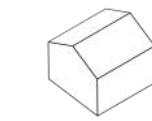
$12 \times 9 \times 7.5 \text{ m}$ (2 dwellings/house)
shell surface area 495 m^2
block volume 810 m^3
Surface/volume ratio ca. **0.61**
 $2.5 \text{ floors} \rightarrow 128 \text{ m}^2$ heated floor area

TERRACED

$90 \times 7.5 \times 7.5 \text{ m}$ (15 dwellings)
shell surface area 3712 m^2
block volume 6750 m^3
Surface/volume ratio ca. **0.55**
 $2.5 \text{ floors} \rightarrow 128 \text{ m}^2$ heated floor area

23 m
12 m

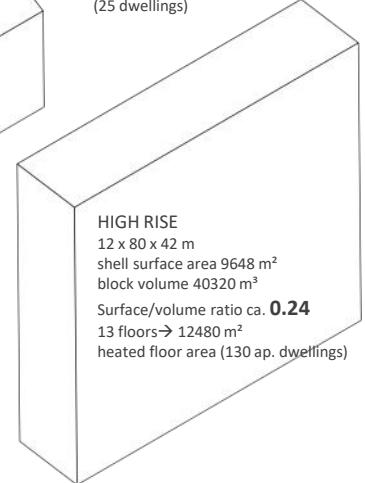
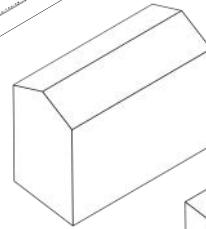
CITY BLOCK
block shell surface area 13152 m^2
block volume 49680 m^3
Surface/volume ratio ca. **0.28**
(corrected for slant roof, otherwise 0.264)



OVERALL SURFACE/VOLUME RATIO **0.51**

LOW RISE

$12 \times 35 \times 23 \text{ m}$
shell surface area 3002 m^2
block volume 9660 m^3
Surface/volume ratio ca. **0.31**
 $4 \text{ floors} \rightarrow 1680 \text{ m}^2$ heated floor area
(25 dwellings)



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 $\rightarrow 12960 \text{ m}^2$ 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

RETIREMENT HOME

$36 \times 37 \times 13$
shell surface area 4195 m^2
block volume 11750 m^3
Surface/volume ratio ca. **0.36**
4 floors $\rightarrow 3916 \text{ m}^2$ floor area

LARGE OFFICE

$109 \times 11.5 \times 36 \text{ m}$
shell surface area 11154 m^2
block volume 45000 m^3
Surface/volume ratio ca. **0.25**
 $12 \text{ floors} \rightarrow 15000 \text{ m}^2$ floor area

NON-RESIDENTIAL SURFACE/VOLUME RATIOS

HYPERMART

FACTORY
WAREHOUSE
 $100 \times 60 \times 7 \text{ m}$ (sales, store, office area)
shell surface area 14240 m^2
block volume 42000 m^3
Surface/volume ratio ca. **0.34**
 $1 \text{ floor} \rightarrow 6000 \text{ m}^2$ floor area

FACTORY

WAREHOUSE

$100 \times 60 \times 7 \text{ m}$ (sales, store, office area)
shell surface area 14240 m^2
block volume 42000 m^3
Surface/volume ratio ca. **0.34**
 $1 \text{ floor} \rightarrow 6000 \text{ m}^2$ floor area

WAREHOUSE

$100 \times 60 \times 7 \text{ m}$ (sales, store, office area)
shell surface area 14240 m^2
block volume 42000 m^3
Surface/volume ratio ca. **0.34**
 $1 \text{ floor} \rightarrow 6000 \text{ m}^2$ floor area

HOTEL

$61(23) \times 35(14) \times 17(3)$ L-shape
shell surface area 4428 m^2
block volume 9832 m^3
Surface/volume ratio ca. **0.45**
 $4 \text{ floors} \rightarrow 3668 \text{ m}^2$ floor area

HOSPITAL

$138 \times 54 \times 17 \text{ m}$ (400 beds)
block shell surface area 21102 m^2
block volume 91035 m^3
Surface/volume ratio ca. **0.23**
 $5 \text{ floors} \rightarrow 30345 \text{ m}^2$ floor area

MEDIUM OFFICE

SECONDARY SCHOOL
 $18 \times 69 \times 12 \text{ m}$
shell surface area 4598 m^2
block volume 15000 m^3
Surface/volume ratio ca. **0.31**
 $4 \text{ floors} \rightarrow 5000 \text{ m}^2$ floor area

SHOPPING MALL

LARGE FACTORY
 $500 \times 24 \times 7 \text{ m}$ (shops, cinema, hall)
shell surface area 33816 m^2
block volume 93430 m^3
Surface/volume ratio ca. **0.36**
 $1 \text{ floor} \rightarrow 12940 \text{ m}^2$ floor area

LARGE FACTORY

$500 \times 24 \times 7 \text{ m}$ (shops, cinema, hall)
shell surface area 33816 m^2
block volume 93430 m^3
Surface/volume ratio ca. **0.36**
 $1 \text{ floor} \rightarrow 12940 \text{ m}^2$ floor area

SMALL OFFICE

PRIMARY SCHOOL
 $36 \times 14 \times 6 \text{ m}$
shell surface area 1451 m^2
block volume 2721 m^3
Surface/volume ratio ca. **0.53**
 $2 \text{ floors} \rightarrow 1008 \text{ m}^2$ floor area

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 308 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.

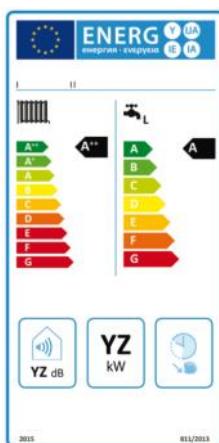
INTRODUCTION

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 $\leq 400 \text{ kW}$ ($\leq 70 \text{ kW}$ for the Energy Label) as well as cogeneration boilers producing both heat and electricity having a maximum electric output $\leq 50 \text{ kW}$.

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-

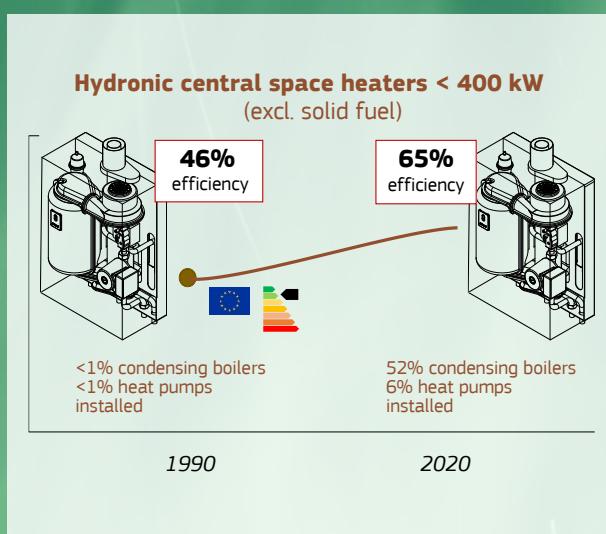


Energy label for a Central Heating combi-boiler, showing space heating efficiency class and (sanitary) water heating efficiency class



BUILDING INSTALLATION PRODUCTS

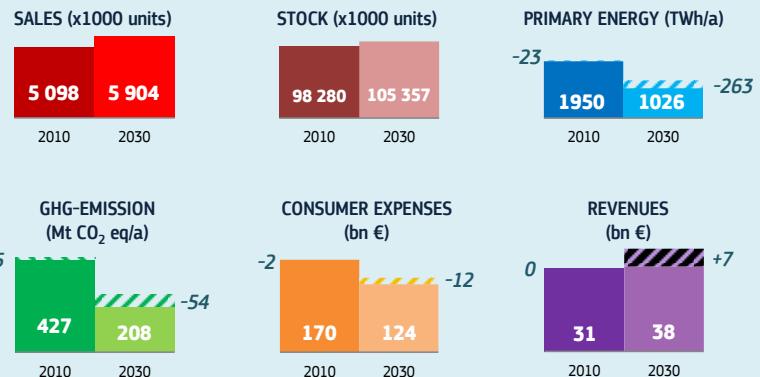
Central Space Heating



FACTS & FIGURES

Product: [CHC] Central Heating Combi, space heating

Measures: CR (EU) No. 813/2013 and CDR (EU) No. 811/2013



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.

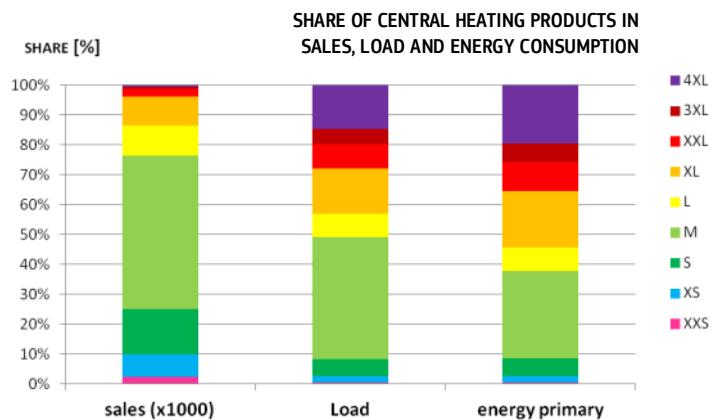
The preparation of the new Ecodesign and Energy Label measures for CH-boilers took 7 years, involving a myriad of stakeholders and their experts. It is probably the most ambitious and innovative piece of legislation ever

developed in the field of space heating, and firmly places the sector in the 21st century, far ahead of other continents.

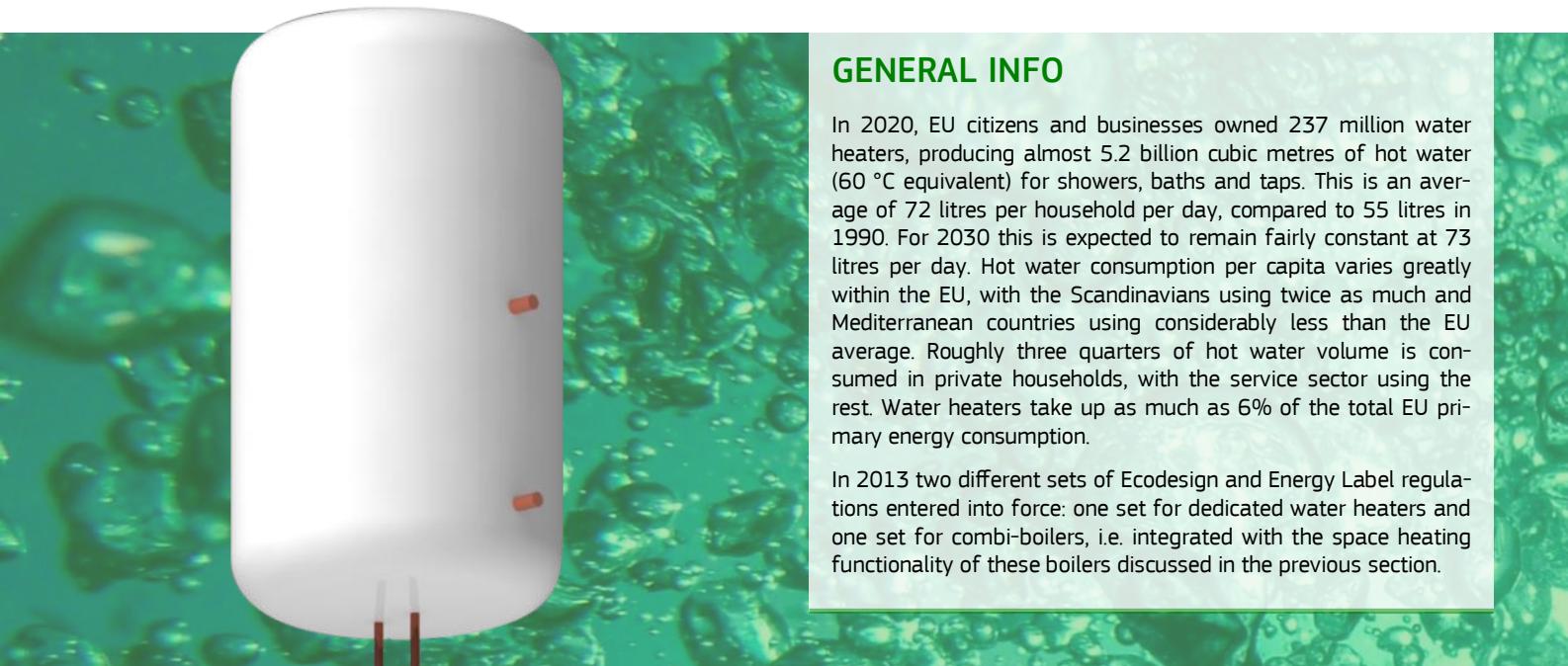
The implementation of the measures, i.e. the obligation to display the labelling information and phase out less efficient products, started only in 2015 and will probably take many years for consumers and other market actors to get used to. The European Commission has anticipated that process and has 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

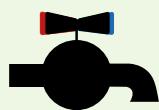


GENERAL INFO

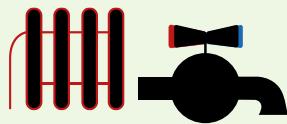
In 2020, EU citizens and businesses owned 237 million water heaters, producing almost 5.2 billion cubic metres of hot water (60 °C equivalent) for showers, baths and taps. This is an average of 72 litres per household per day, compared to 55 litres in 1990. For 2030 this is expected to remain fairly 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



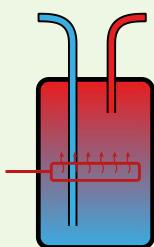
liquid and gas



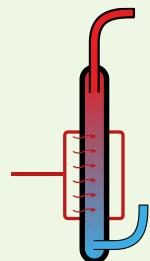
electricity

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



FACTS & FIGURES

Product: [WH] Dedicated Water Heaters

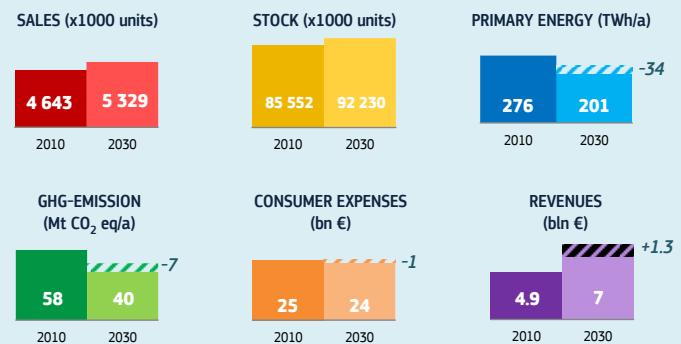
Measures: CR (EU) No. 814/2013; CDR (EU) No. 812/2013



FACTS & FIGURES

Product: [CHC] Central Heating Combi, water heating

Measures: CR (EU) No. 813/2013; CDR (EU) No. 811/2013

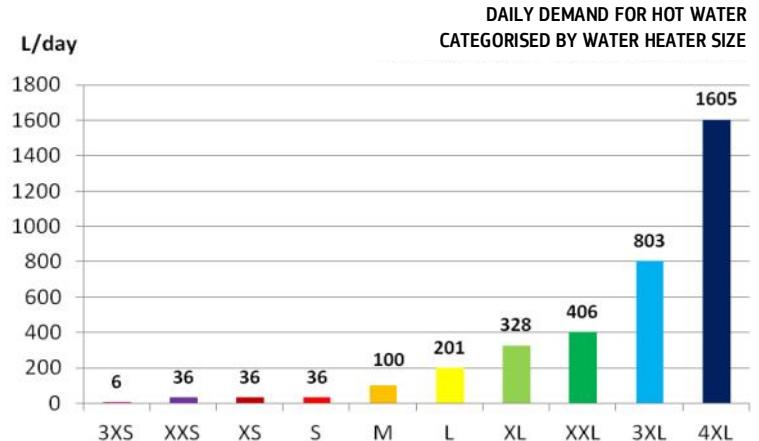


SIZE

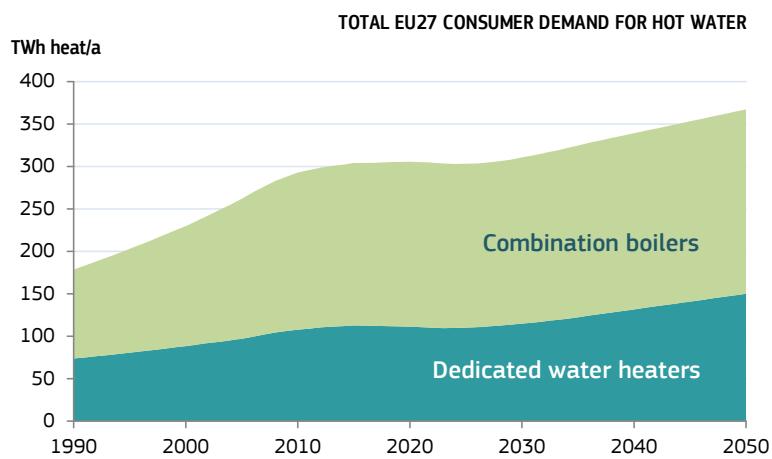
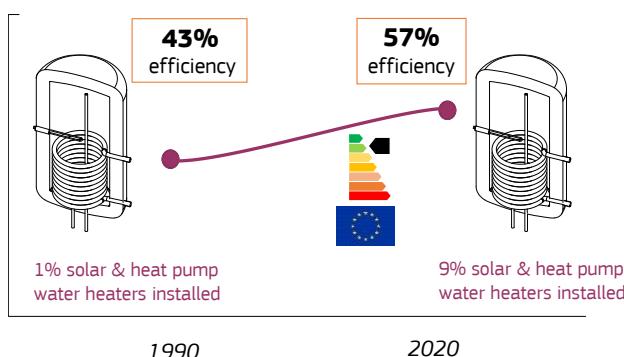
The EU Energy Label introduced –for the first time after 20 years of struggle at the level of standards– a reference for the capacity ('size') of water heaters that helps consumers to make the right choice.

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.



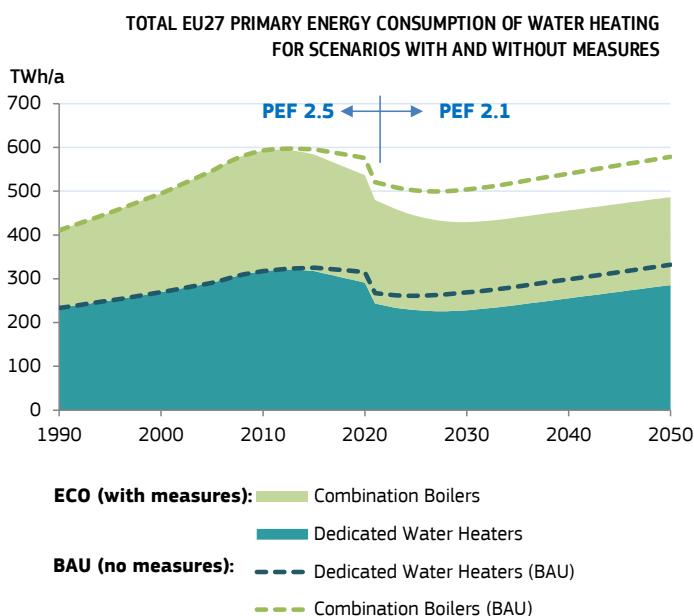
Water heaters (combi & dedicated)



Water Heating

ENERGY

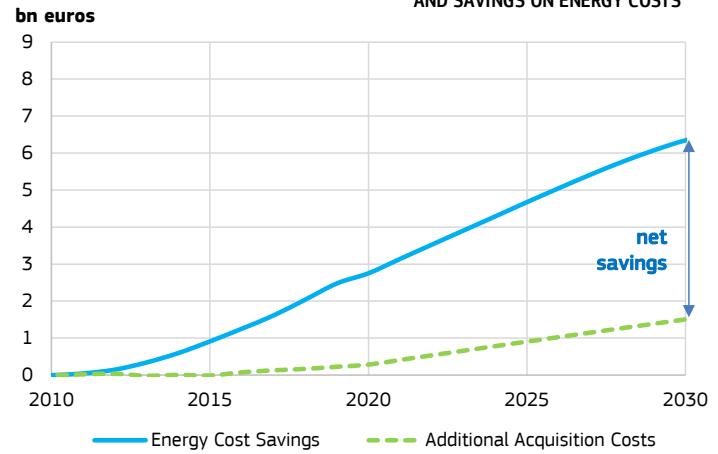
In 2020, despite a 31% higher hot water use, the energy consumption per capita increased only by 1% with respect to 1990. With a continued growth of hot water use, energy consumption per capita is expected to be lower than in 1990 because primary energy efficiency of new water heaters will have more 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.

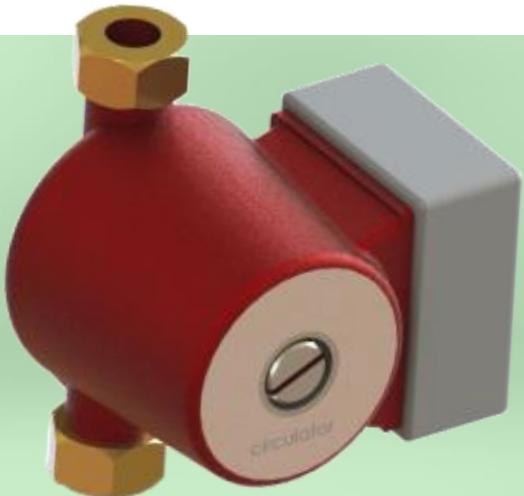
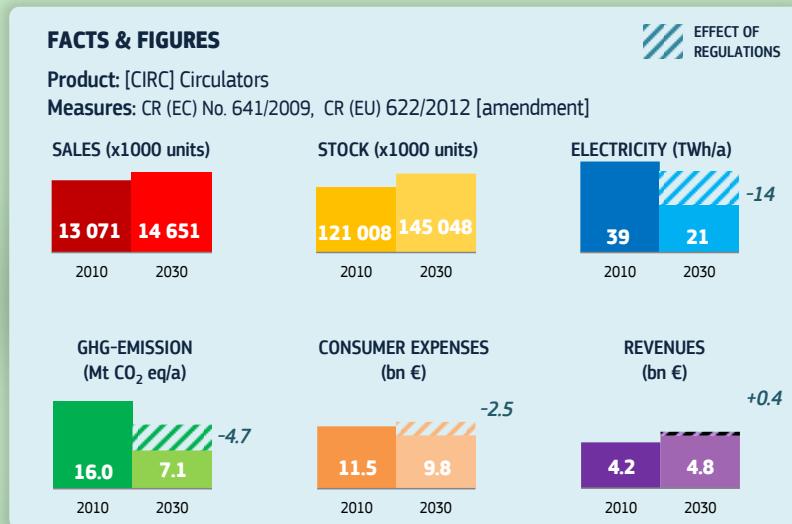


CONSUMER EXPENDITURE

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 2.5 billion euros in 2020 compared to a 'Business-as-Usual' scenario without those measures. In 2030 this is projected to increase to 4.9 bn euros. The direct annual savings per household are 10 euros in 2020 and 18 euros in 2030.

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





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 reported in EIA, but not considered in EIA totals, because they are already included in the data for 'Central Heating Boilers' *.

ELECTRICITY CONSUMPTION

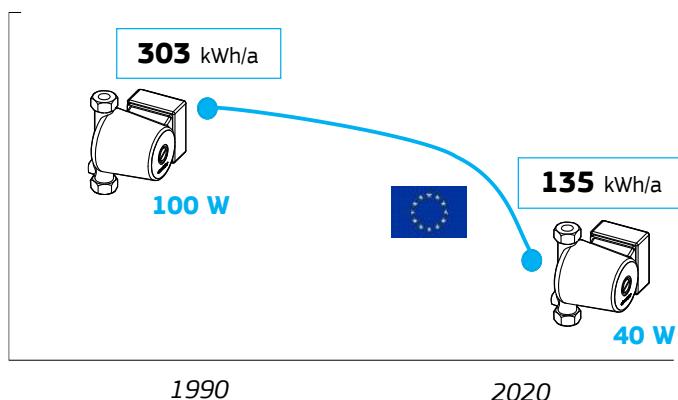
Circulators are a typical example where forward-looking manufacturers, WILO and Grundfos, pressed the Commission to investigate the eligibility for an Ecodesign regulation for their products, because they believe that ambitious standards in energy efficiency are not only good for the environment but 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 CO₂ emissions, while at the same time the product contributed in achieving a higher and more even heating comfort.

Integrated Circulator (central heating pump)



* For standalone circulators this is not completely true: it is preliminarily estimated that 62% of their electricity consumption is not yet counted under central heating boilers. This would increase the total EIA ECO electricity consumption in 2020 and 2030 by approximately 7 TWh (0.3%) and the electricity savings by approximately 4 TWh (around 1%). This will be corrected in the EIA edition of May 2022.

Solid Fuel Boilers

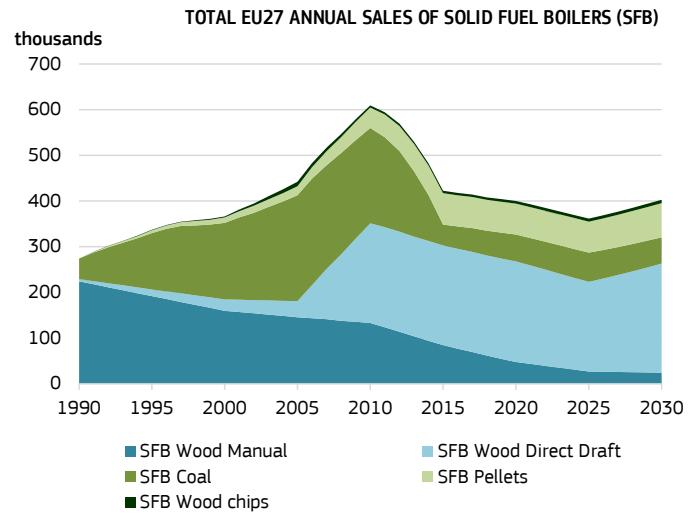
GENERAL INFO

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.



SALES

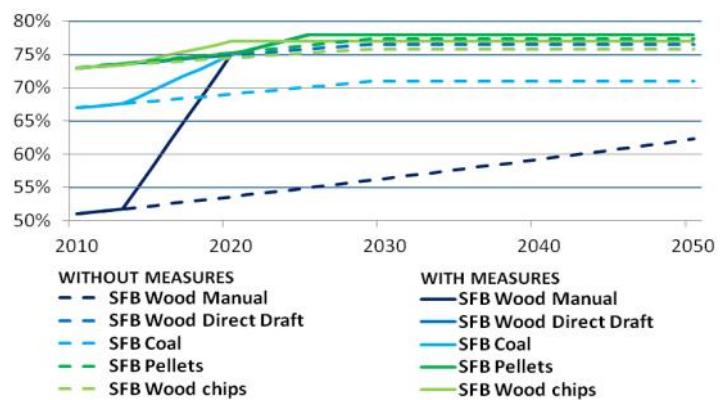
The market for solid fuel boilers (SFB) has been variable over the last two decades. Their use was mainly popular in Eastern European countries. At the beginning of the 21st century, modern SFBs came onto the market, e.g. more efficient automatic wood boilers and pellet boilers, which led to a peak annual 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.



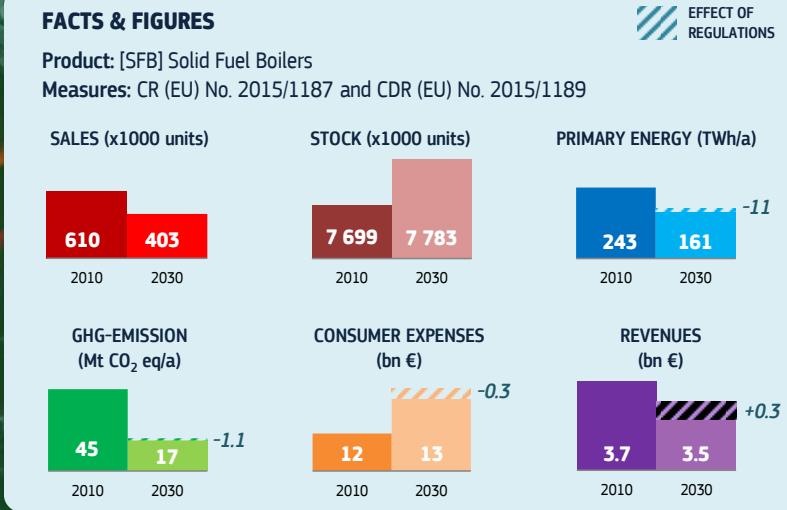
ENERGY EFFICIENCIES

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 CO₂eq/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 CO₂eq/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



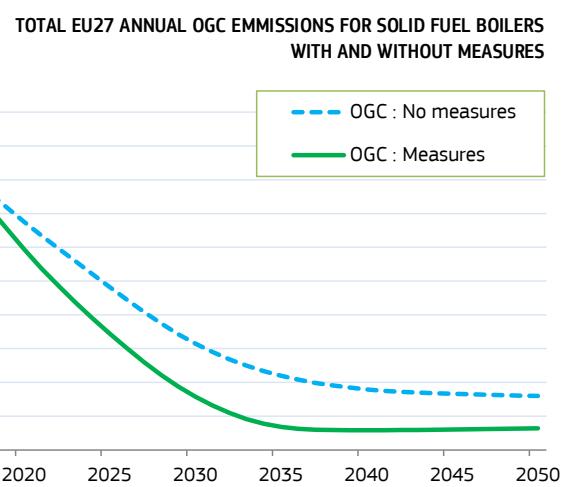
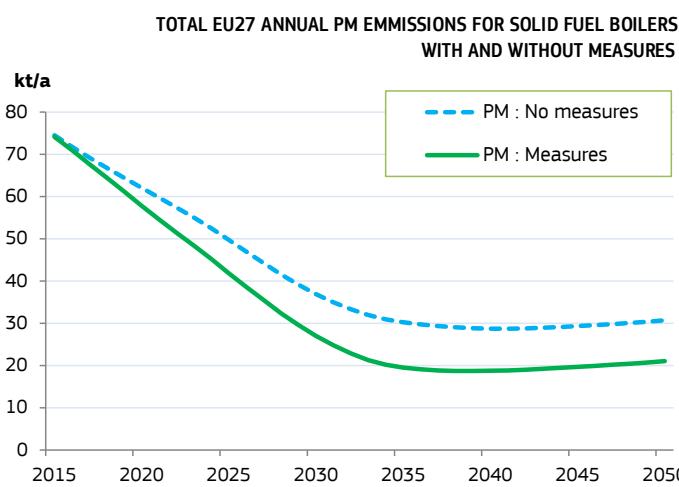
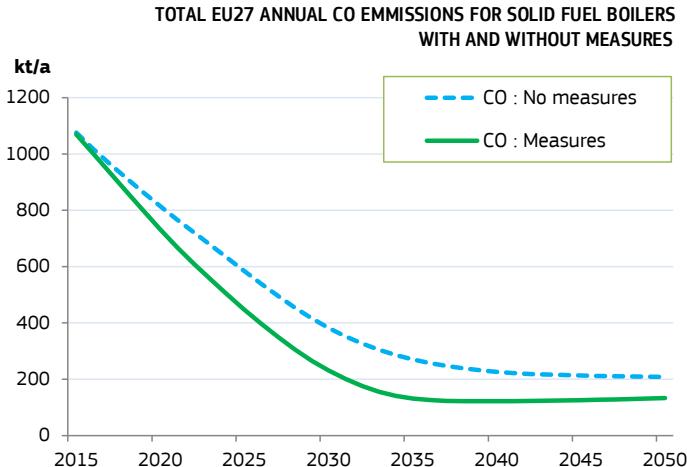
Solid Fuel Boilers



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).



Local Space Heaters



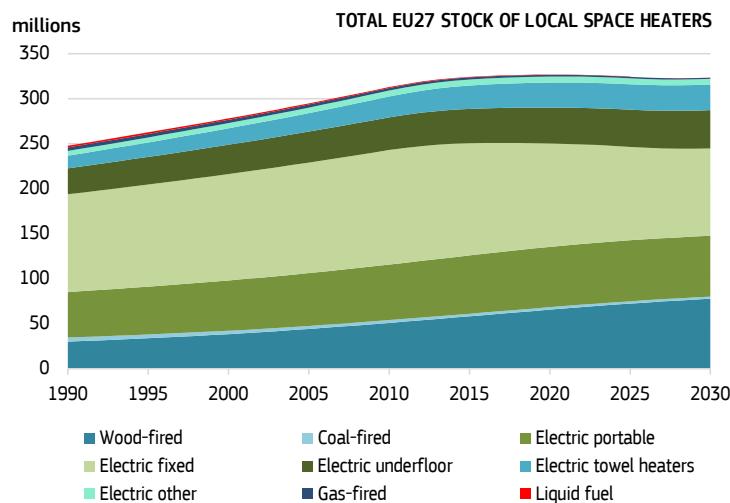
GENERAL INFO

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.

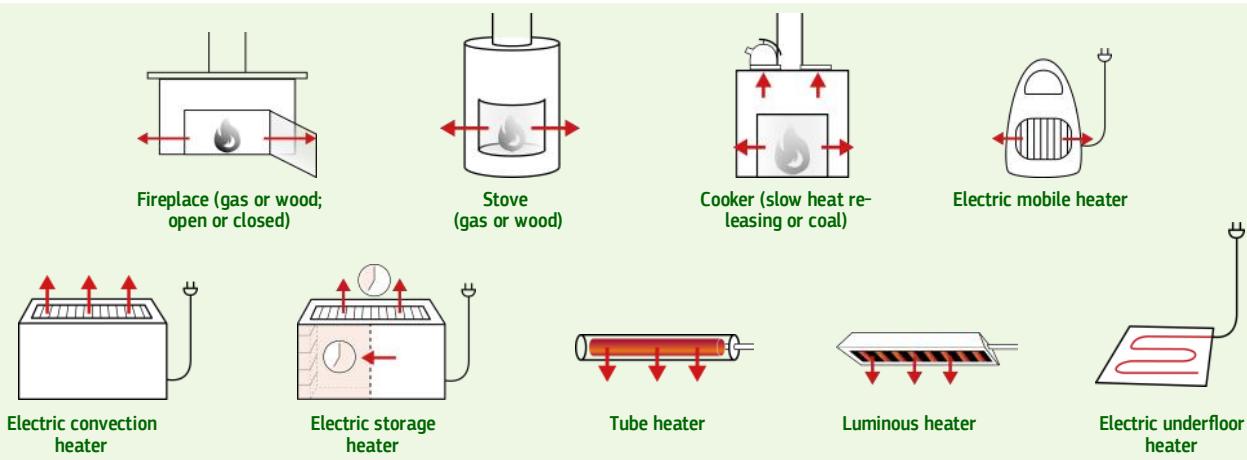
STOCK

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.

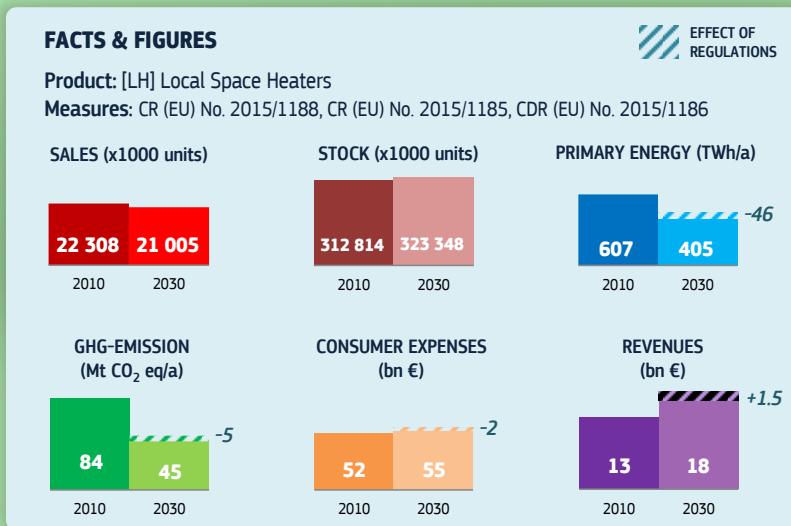


LOCAL HEATER TYPES



BUILDING INSTALLATION PRODUCTS

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

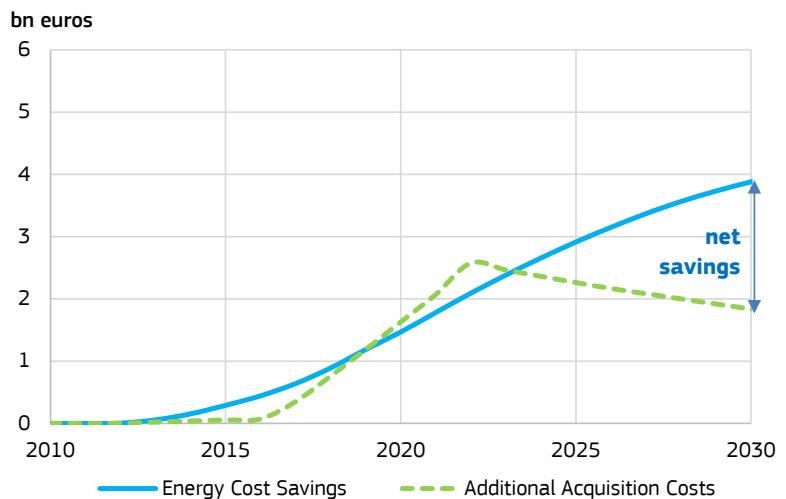
of installed LH (75%). Most opportunities for improvements are found in electric convector appliances (accounting for 38% of the expected 2030 LH energy savings). A fifth of the energy savings on LH come from increased use of (improved) ventilation units which lower the heat load.

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 (2.6 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 2 billion euros.

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



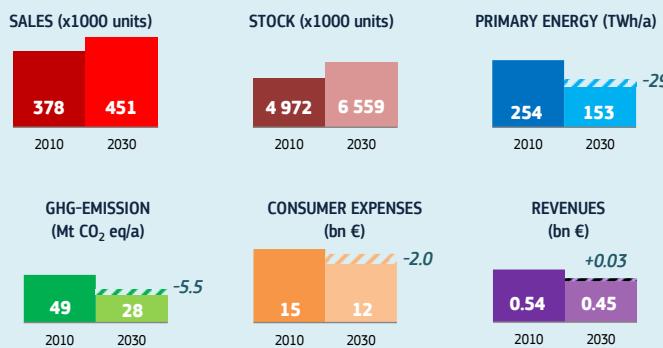
Air Heating and Cooling



FACTS & FIGURES

Product: [AHC] Central Air Heating
Measure: CR (EU) No. 2016/2281

EFFECT OF REGULATIONS



EFFECT OF REGULATIONS

FACTS & FIGURES

Product: [AHC] Central Air Cooling
Measure: CR (EU) No. 2016/2281



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

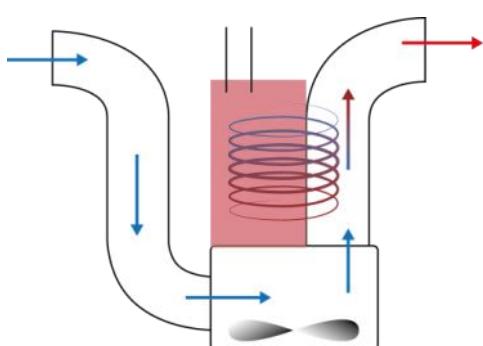
The Chillers use a liquid (water or brine) as the cooling medium, which distinguishes them from the AC. They are used in systems that cool spaces to provide thermal comfort to human beings.

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.

BUILDING INSTALLATION PRODUCTS

Air Heating and Cooling



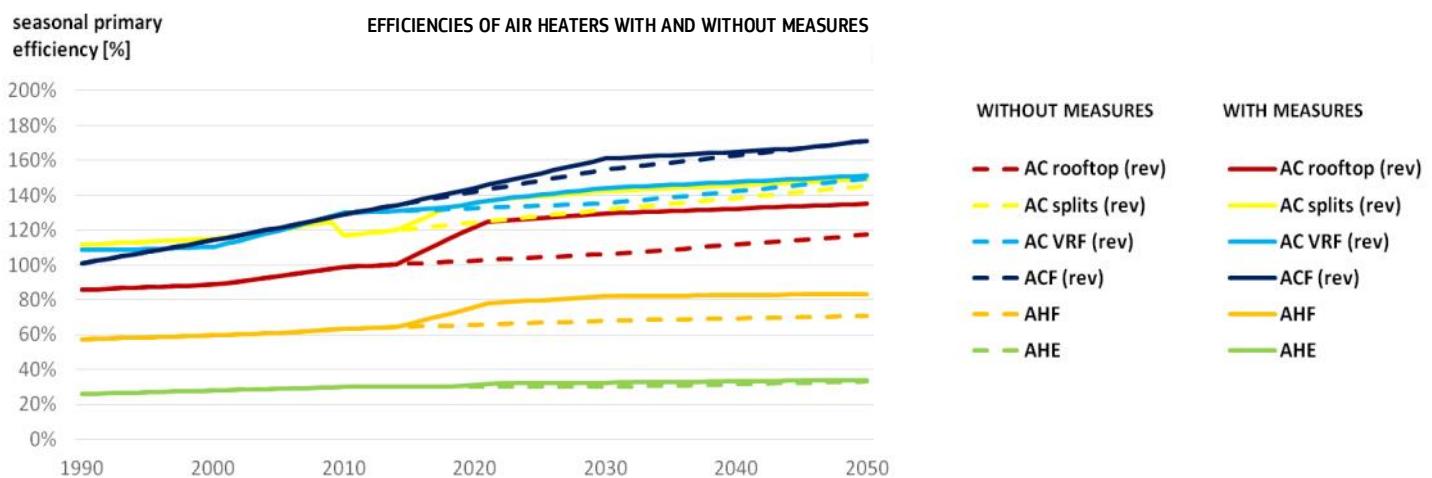
Airflow in an electric heater:
Fresh, outside air is sucked in by a fan and led through a heating chamber. In the heating chamber a heating element is placed which heats the cold air. This warm air is then released to the indoor environment.

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).

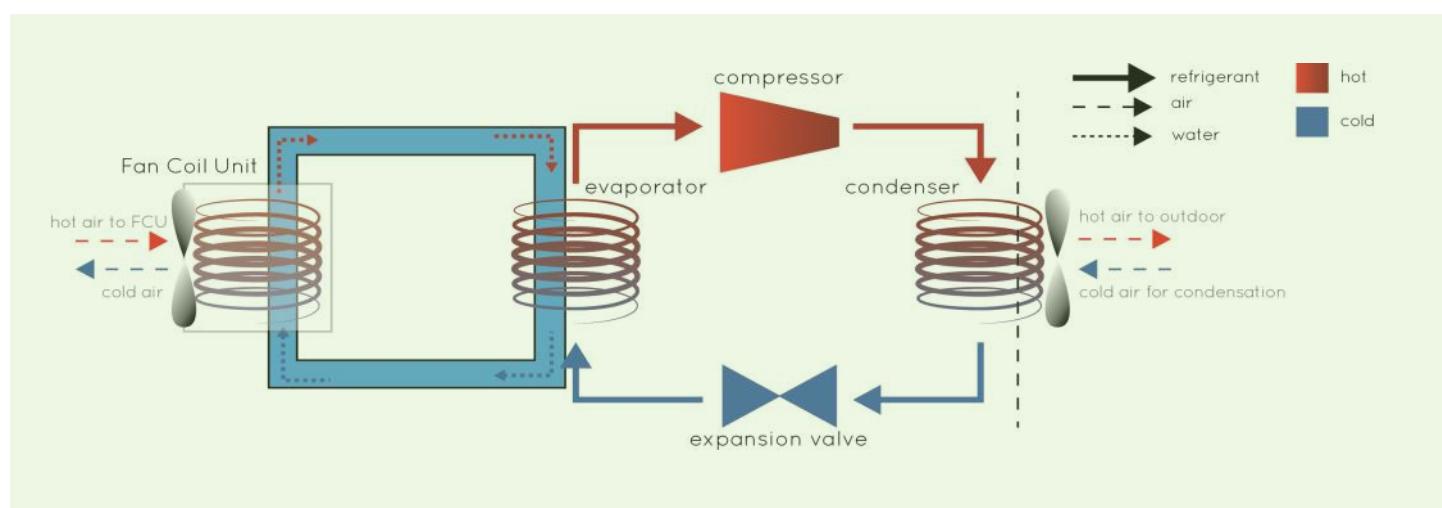
Variable refrigerant flow systems (AC VRF rev) are the only air heating products with increasing stock (0.9 mln in 2015 to 2.2 mln in 2030). Their average efficiency will increase from 131% in 2015 to 144% in 2030, with a contribution of 4.6 TWh/a (16%) to the total primary energy savings in 2030.

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.



BUILDING INSTALLATION PRODUCTS

Air Heating and Cooling

SPACE COOLING, LARGE AIR CONDITIONERS

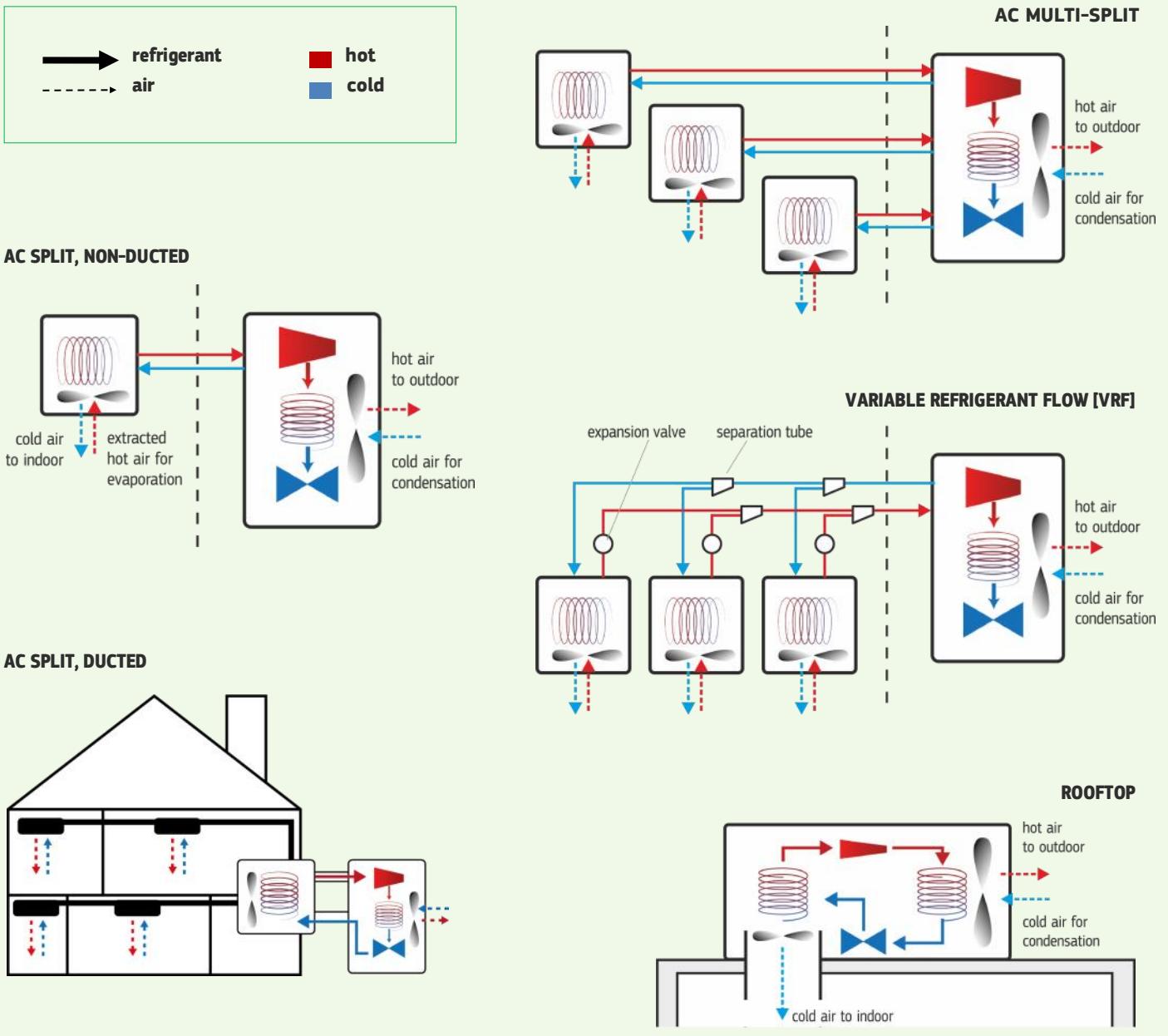
The proposed regulation targets air conditioners (AC) with a rated cooling capacity above 12 kW. This excludes the smaller Room Air Conditioners (RAC) that are separately regulated in CR (EU) No 206/2012 (see Room Air Conditioners).

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)

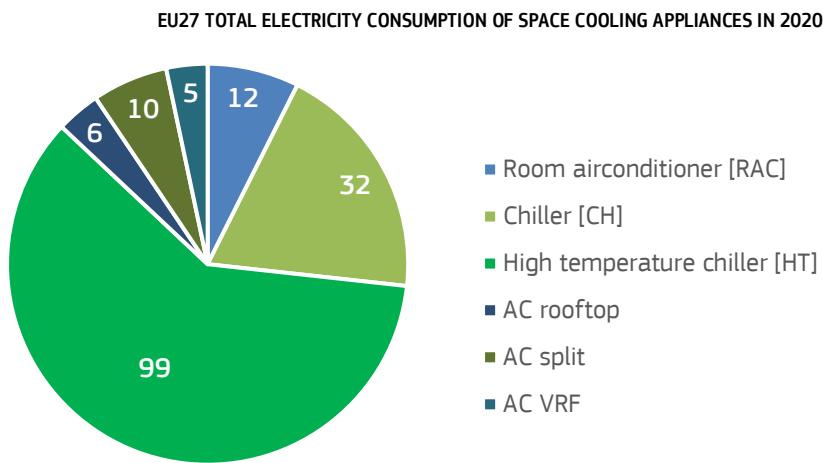
By far the most numerous (4.5 mln units installed in 2020) are relatively small 'split' units in the range of 12-23 kW cooling capacity. These units are 'split' between an indoor and an outdoor unit with a refrigerant feed- and return-tube inbetween. There is a distinction between single split and multi-split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



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.

BUILDING INSTALLATION PRODUCTS

Air Heating and Cooling

SPACE COOLING, EMISSIONS

The total GHG emissions due to cooling products covered by the regulation were 58 Mt CO₂eq/a in 2020. (An additional 5 Mt CO₂eq/a is due to the separately regulated RACs.)

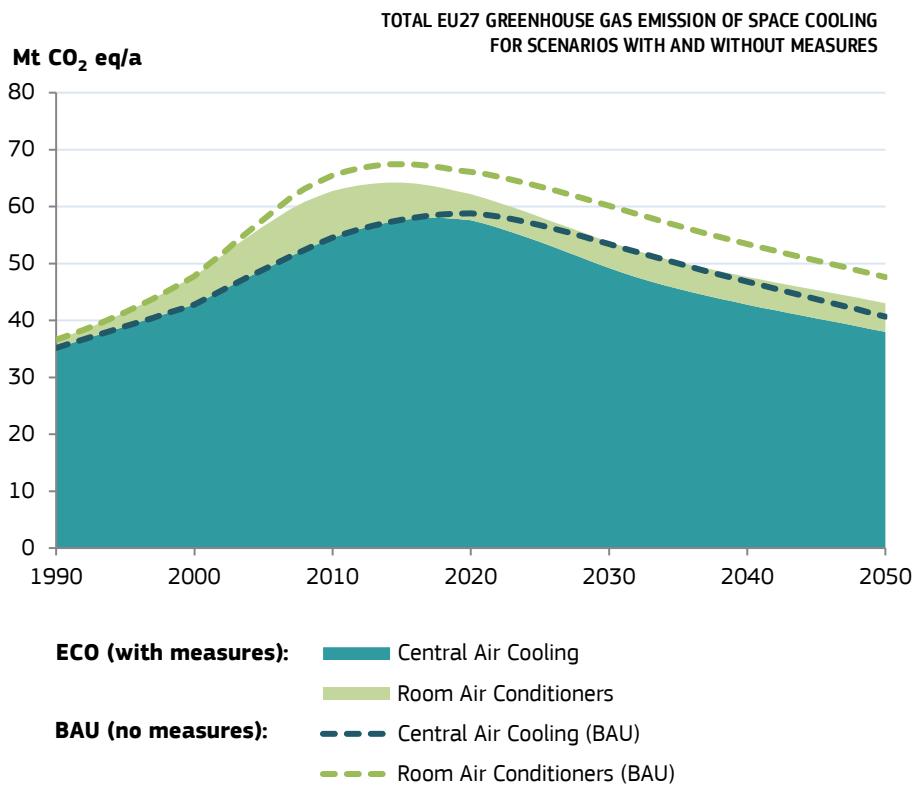
GHG emissions due to energy use are calculated by multiplying the energy consumption (kWh) by the Global Warming Potential of the fuel or of the electricity (GWP in kg CO₂-equivalent / kWh energy).

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

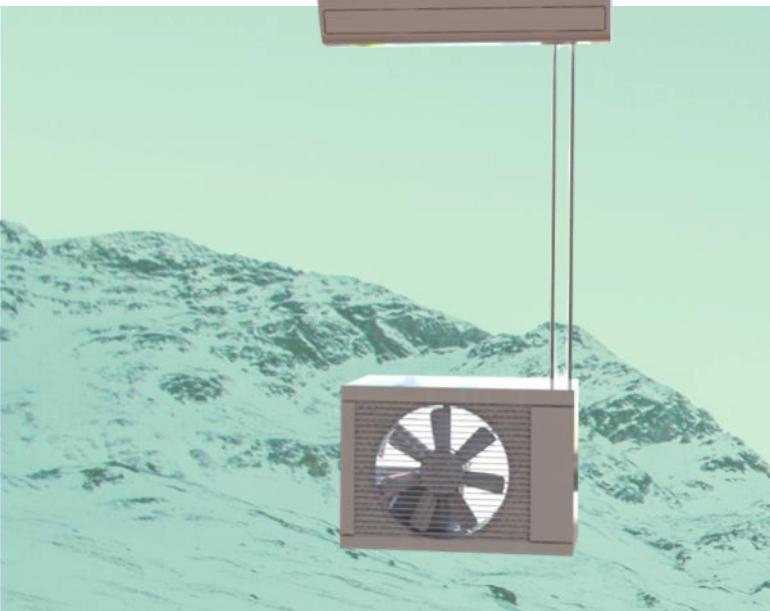
Starting from EIA 2019, these refrigerant contributions to the GHG-emissions are no longer accounted, because they are not regulated by Ecodesign.

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 CO₂-emissions during electricity generation, the GHG-emissions are expected to be lower in 2030 (49 Mt CO₂eq/a) than in 2020 (58 Mt).



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.

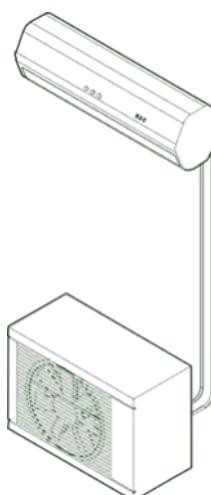
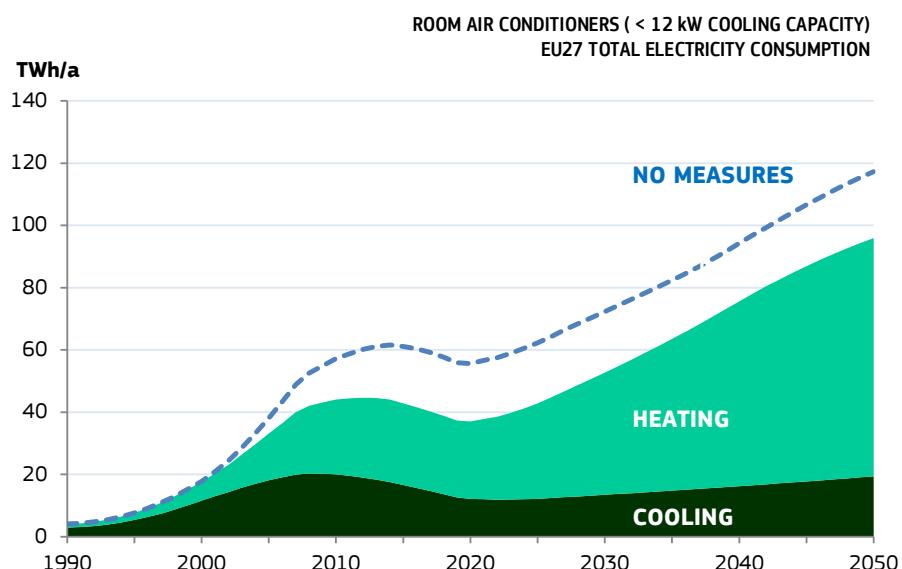
While in 1990 less than 5 million room air conditioners (RACs) were installed, this number has increased to over 46 million in 2020. A conservative estimate for 2030 is that over 59 million RACs will be installed. Put into perspective, this equals to 16% of the European households having 1 RAC for space 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.

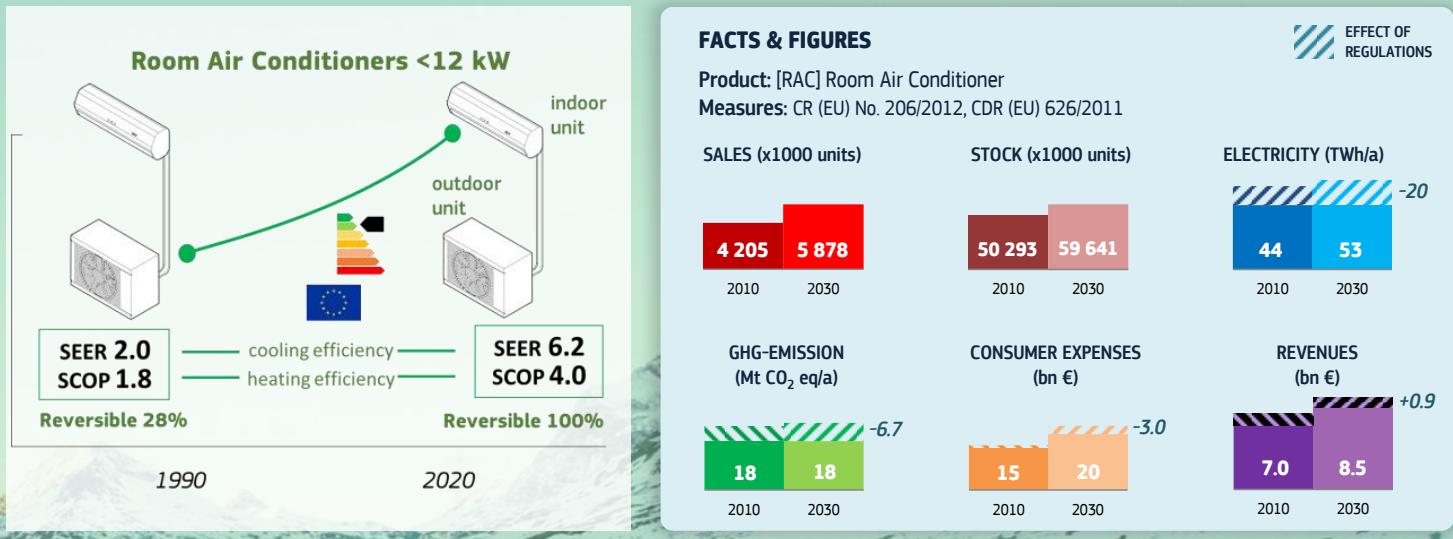


Single-split unit room air conditioner. Upper part: in-house cooling unit; Lower part: external heat-rejection unit.

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](#).

BUILDING INSTALLATION PRODUCTS

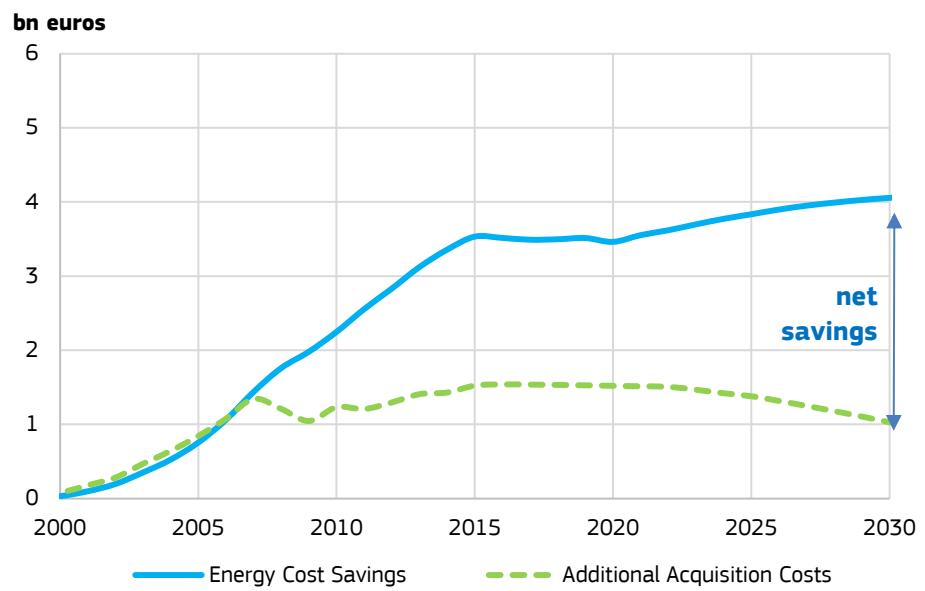
Room Air Conditioners



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 2015 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



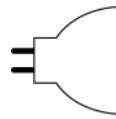
Lighting

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).



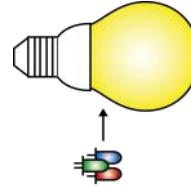
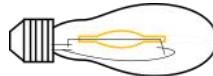
TYPES



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).

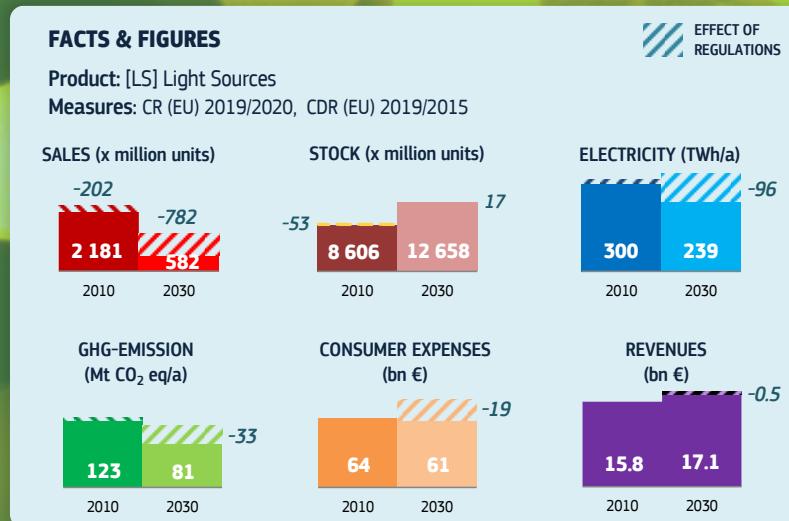
CFL = Compact fluorescent lamp. In a fluorescent lamp an electric current passes through a gas containing some milligrams of mercury vapour. Excited by the current, this vapour emits an ultraviolet light, that is converted to visible white light by a phosphor coating on the inside of the glass tube (fluorescence). 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.



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.

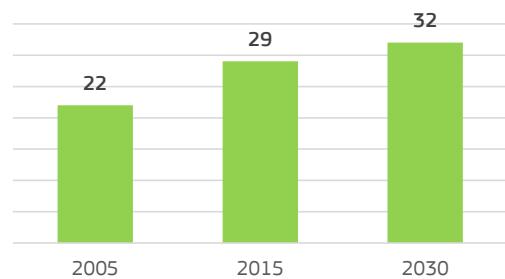
RESIDENTIAL LIGHTING

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).

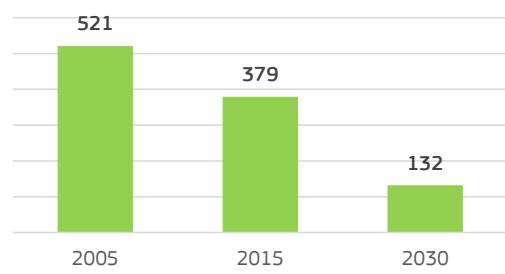
In 2015 around 5.1 bln lamps were installed in the EU27 residential sector (29 lamps per hh), consuming 72 TWh/a electricity (376 kWh/a/hh). Without measures this would have been 92 TWh/a. 70% of these lamps were CFL or HL, 10% was still GLS, and less than 8% was already LED.

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

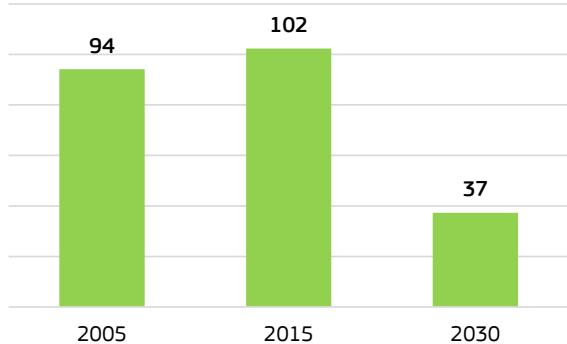


EU27 ANNUAL ELECTRICITY CONSUMPTION FOR RESIDENTIAL LIGHTING PER HOUSEHOLD WITH MEASURES (kWh/a/hh)



Lighting

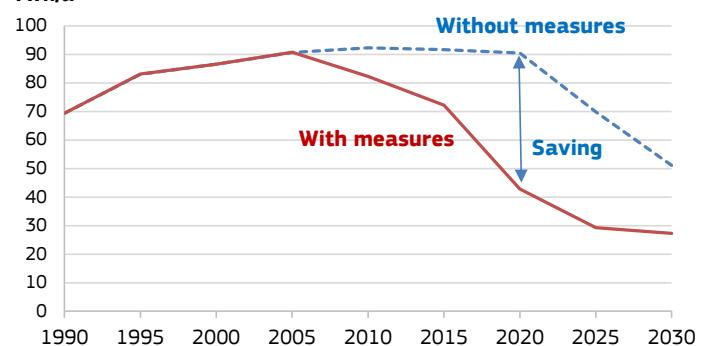
EU27 ANNUAL CONSUMER EXPENSE FOR RESIDENTIAL LIGHTING PER HOUSEHOLD
(euro/a/hh, fixed euros 2015, incl. VAT)



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

RESIDENTIAL LIGHTING ELECTRICITY, EU27 TOTAL
TWh/a



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 16 bln euros (incl. VAT) for lighting their homes (94 euros/hh), of which 2.5 bln euros for light source acquisition and 13.5 bln euros for electricity costs. In 2015 this rose to 20 bn euros (102 euros/hh), of which 6 bln euros for light source acquisition and 14 bln euros for electricity costs.

In 2030 total residential expenses for lighting are expected to decrease to 8 bln euros (37 euros/hh), of which 1 bln euros for acquisition and 7 bln euros for electricity (based on 1%/a escalation for electricity prices).

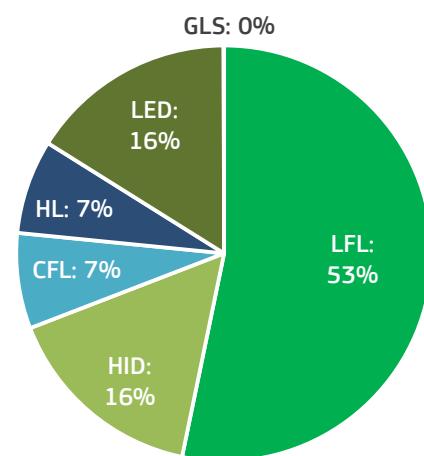
NON-RESIDENTIAL LIGHTING

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.

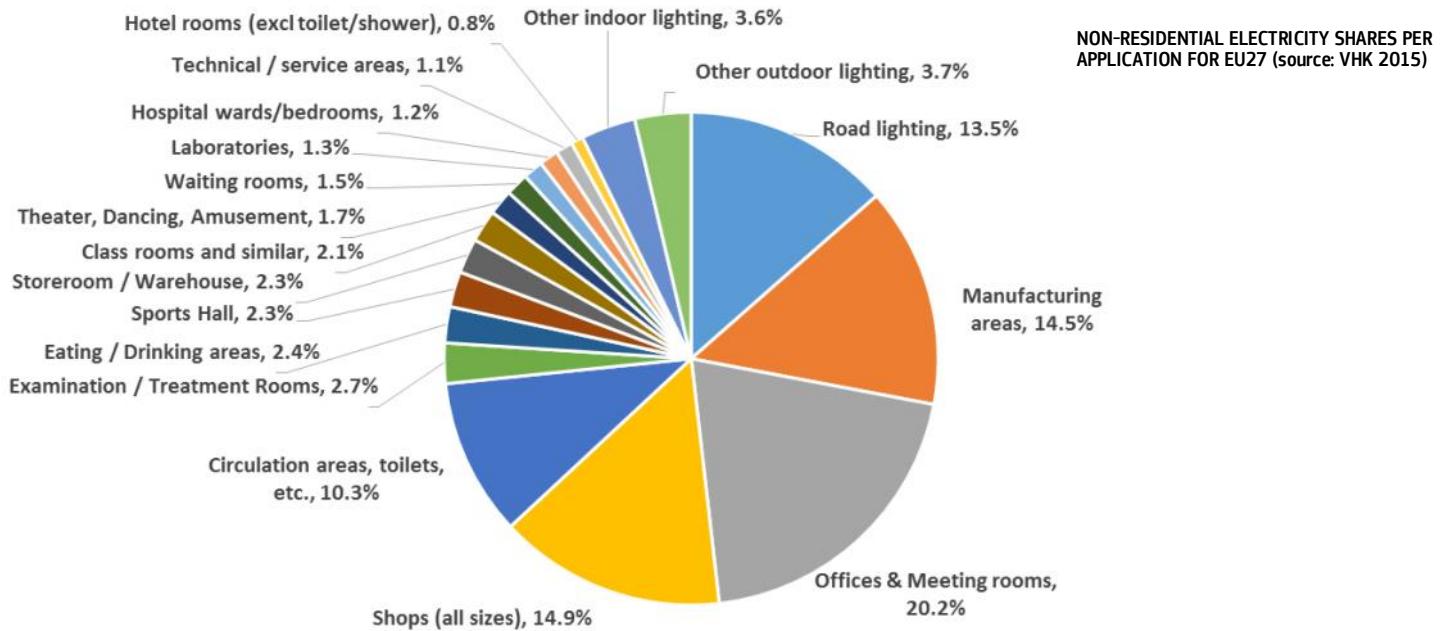
In 2030 the quantity of NRES light sources is expected to increase to 6.1 bln (+28% vs. 2020) while electricity consumption is expected to decrease to 239 TWh/a (-5% vs. 2020). This positive effect is mainly due to LFL and HID being substituted by LED lighting products, which is the ongoing trend.

EU27 NON-RESIDENTIAL LIGHTING ELECTRICITY SHARES
PER TECHNOLOGY



BUILDING INSTALLATION PRODUCTS

Lighting

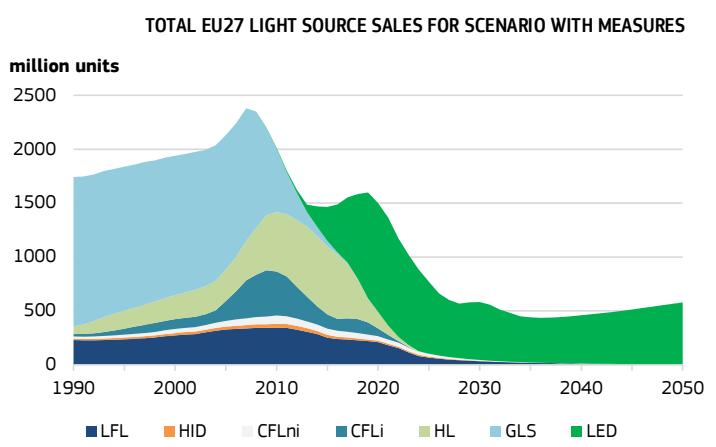
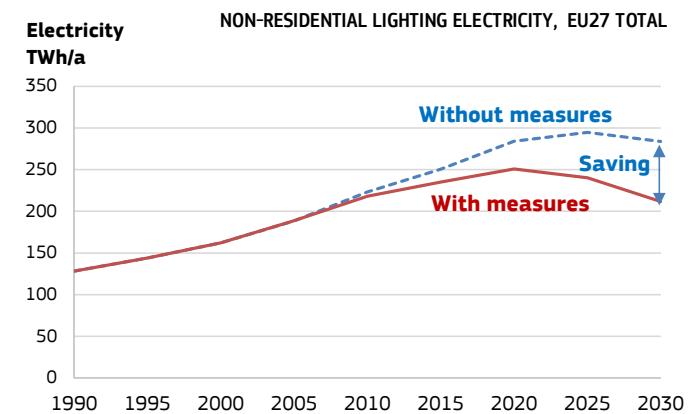


This trend is accelerated by Ecodesign regulation 2019/2020 that phases out the most common types of LFL T8 from 2023. The regulation continues to allow CFLni, LFL T5 and HID lamps on the market, considering that:

- 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 (RoHS regulation).
 - 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.



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

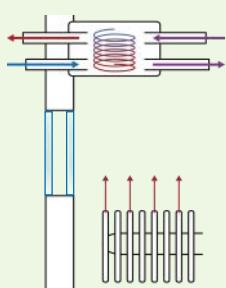
reduction of the space heating load and associated reduction of energy consumed by space heating products.

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.

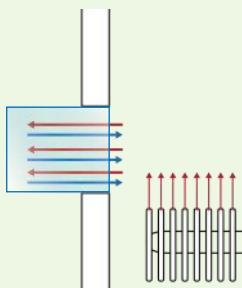
In the Ecodesign Impact Accounting both aspects are taken into account (see details in the EIA Status report).

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.



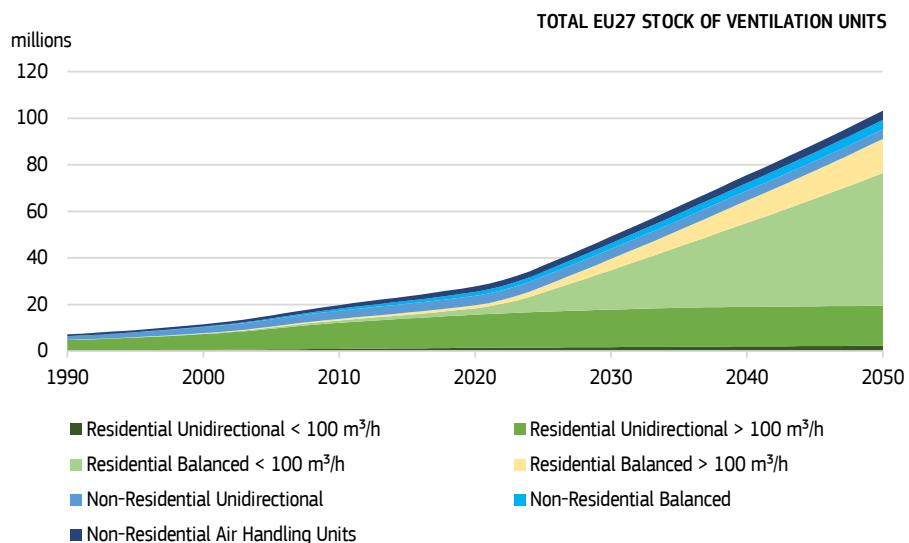
Using natural ventilation (opening windows), cold fresh air enters a room and warm stale air goes out. The heat of the outgoing air is lost and needs to be reintroduced by space heating.

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.

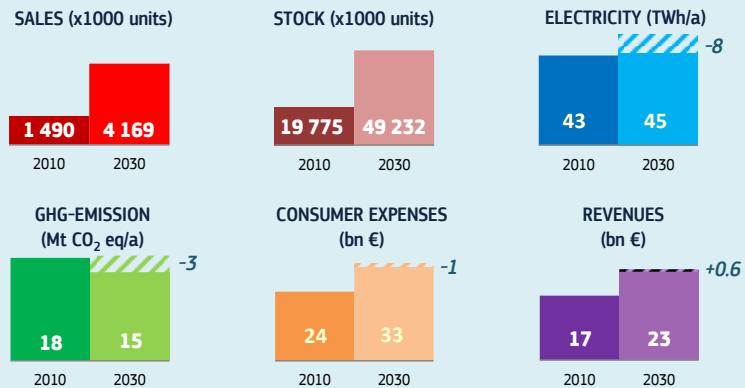
FACTS & FIGURES

EFFECT OF REGULATIONS

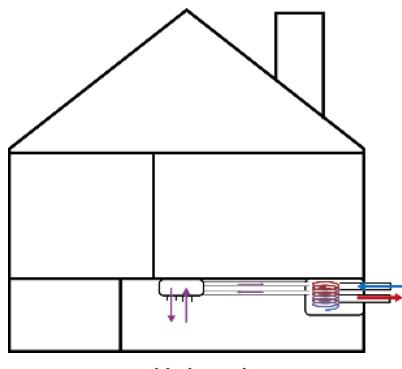
Product: [VENT] Ventilation units

Measures: CR (EU) No. 1253/2014, CR (EU) 1254/2014

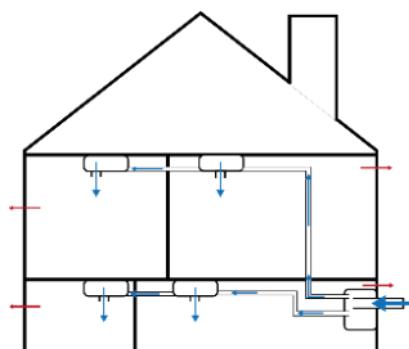
(data exclude additional savings on space heating already counted there)



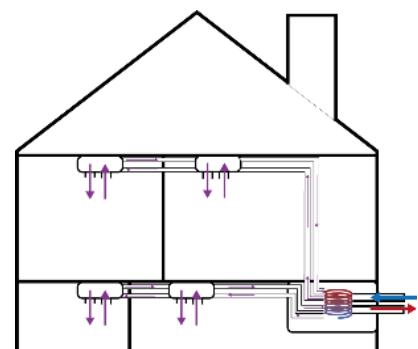
MECHANICAL VENTILATION SYSTEMS



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

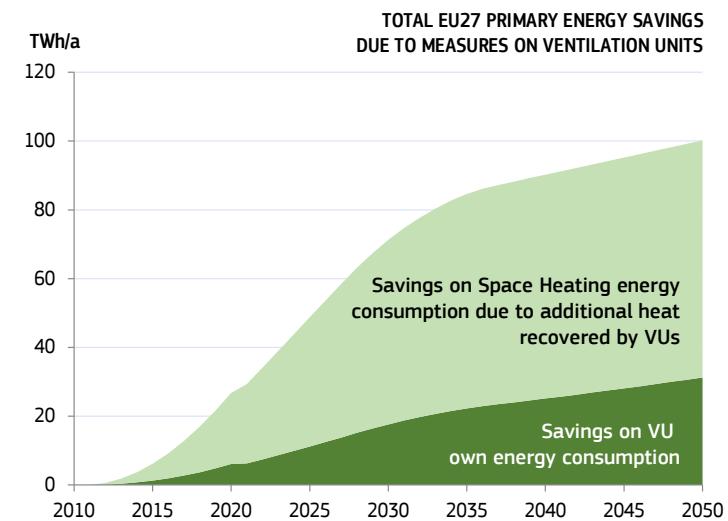
In 2015, VUs consumed 44 TWh/a of electricity for a total ventilated airflow of 113 Tm³/a, implying an average consumption of 0.39 Wh/m³. In 2030, without measures, VUs would consume 53 TWh/a of electricity for a total ventilated airflow of 162 Tm³/a, with an average consumption of 0.33 Wh/m³. Due to the measures the electricity consumption can be further reduced to 45 TWh/a or 0.28 Wh/m³ (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 Tm³/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 Tm³/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 Tm³/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 3 Mt CO₂eq/a. An additional 9 Mt CO₂eq/a come from induced savings on space heating.

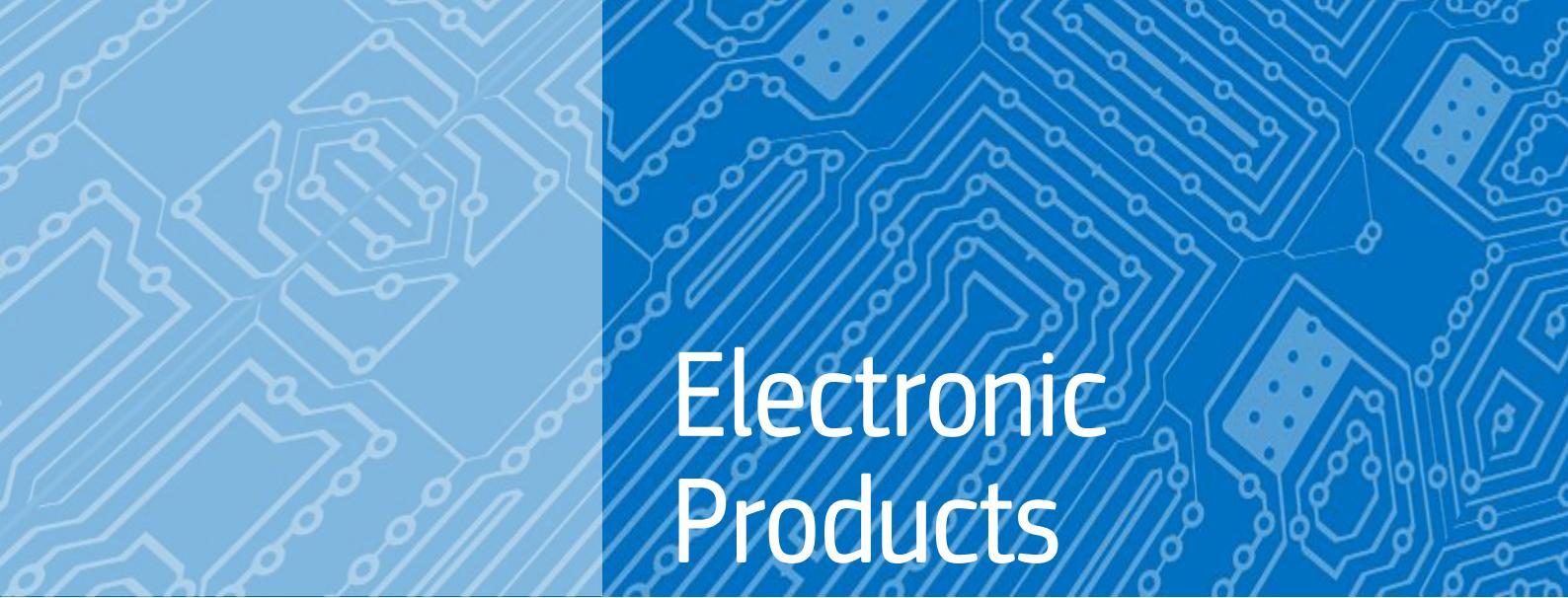


SAVINGS ON EXPENSES

In 2015, the EU27 spent 17 bn euros on purchase and installation of ventilation units (of which 16 bn euros in the non-residential sector). Without Ecodesign measures this would increase to 20 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 (1.6 bn euros due to lower electricity costs for VUs and 4.3 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 10 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

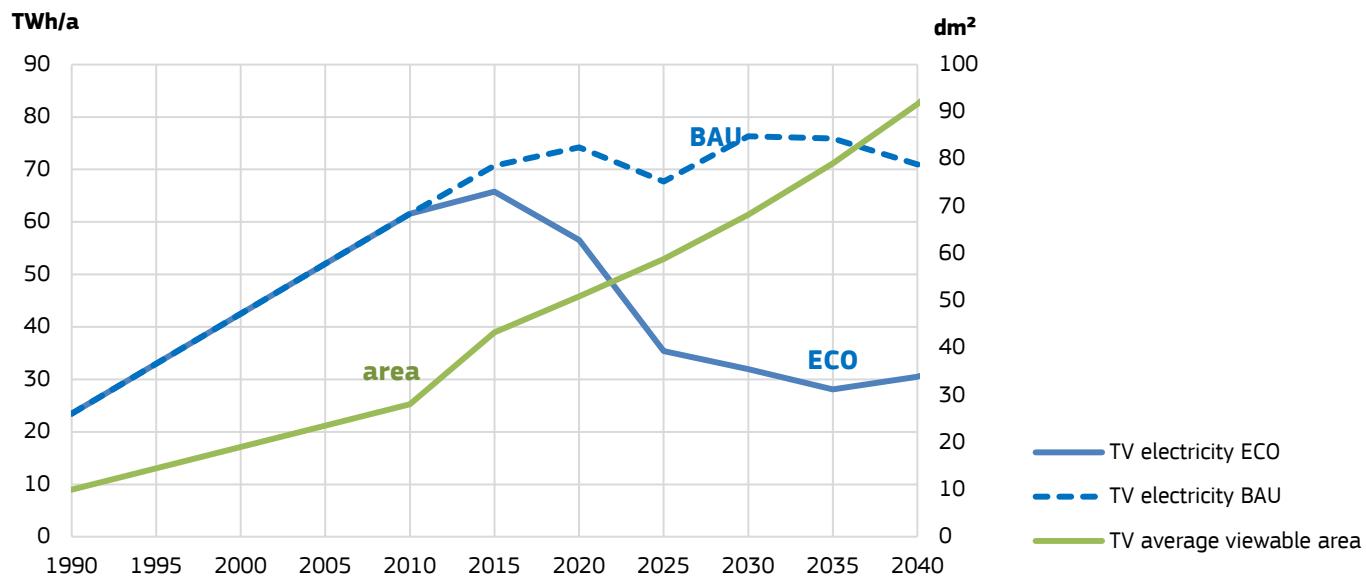


GENERAL INFO

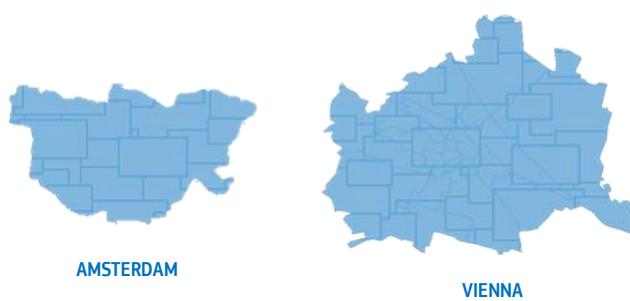
The December 2019 regulation revision expands the scope from televisions to electronic displays in general, including also computer displays (monitors) and signage displays. Excluded are e.g. small displays (<100 cm²), digital photo frames, projectors, medical displays and status displays.

ELECTRICITY CONSUMPTION

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

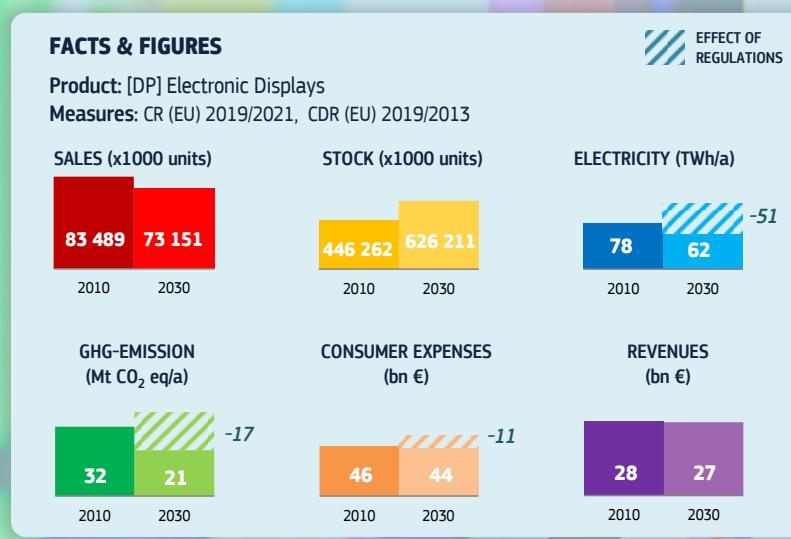


The total demand for displays in Europe is rapidly growing. The total viewing area of televisions and pc monitors in 2020 was 242 km², larger than the surface area of the city of Amsterdam. In 2030, this viewing surface area is expected to increase to 398 km², and comparable with the surface area of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



ELECTRONIC PRODUCTS

Electronic Displays



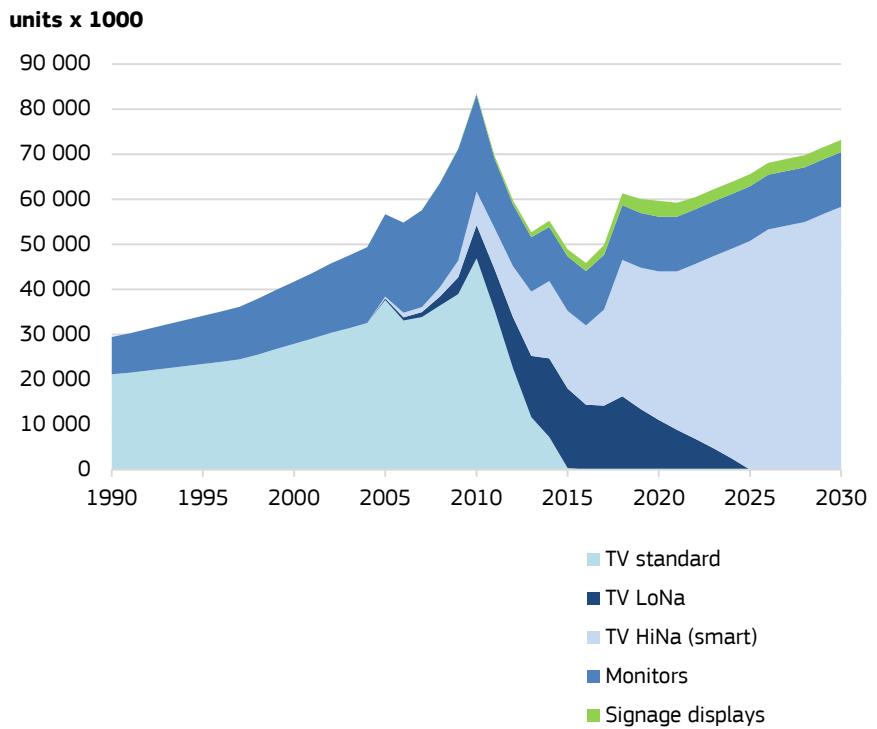
SALES

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



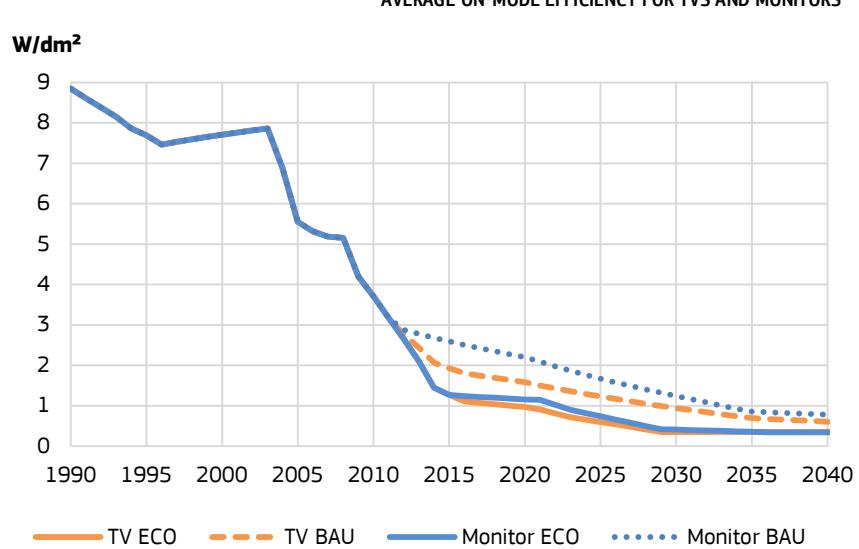
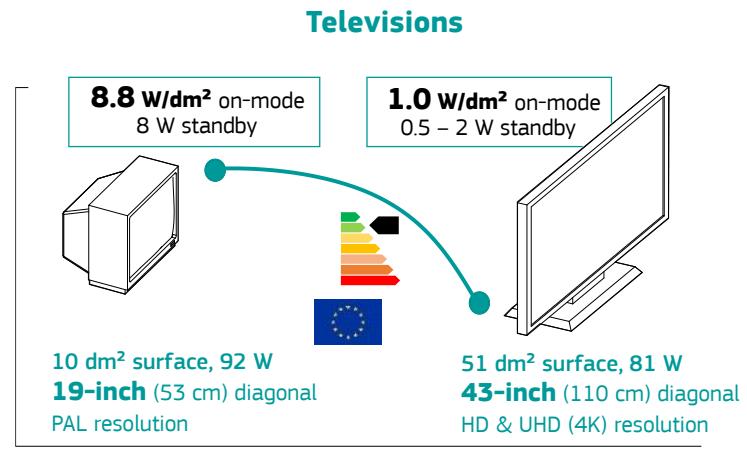
Electronic Displays

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.



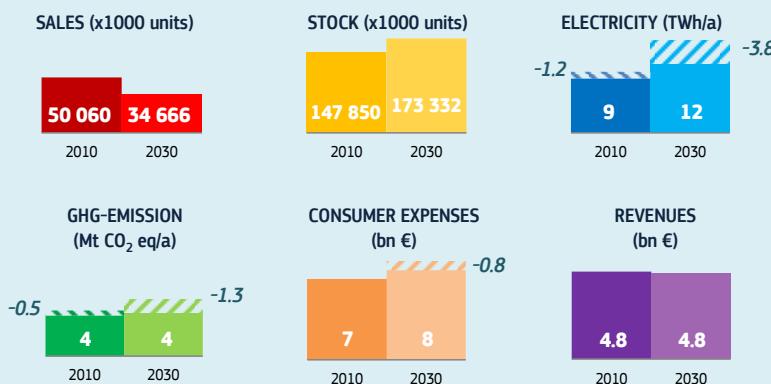
ELECTRONIC PRODUCTS

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>).

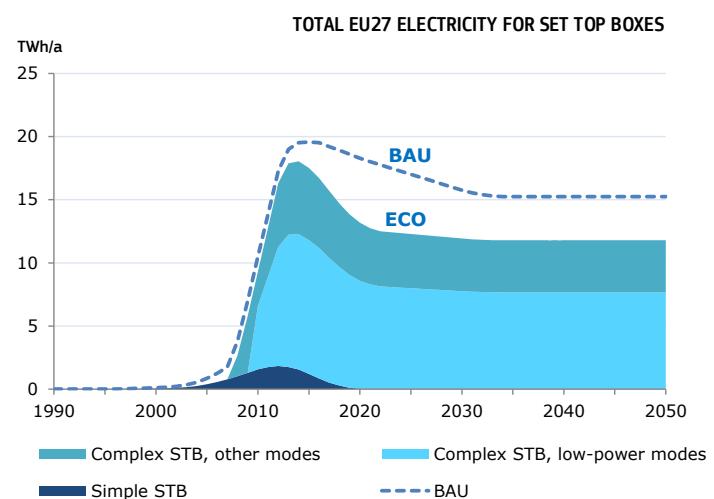
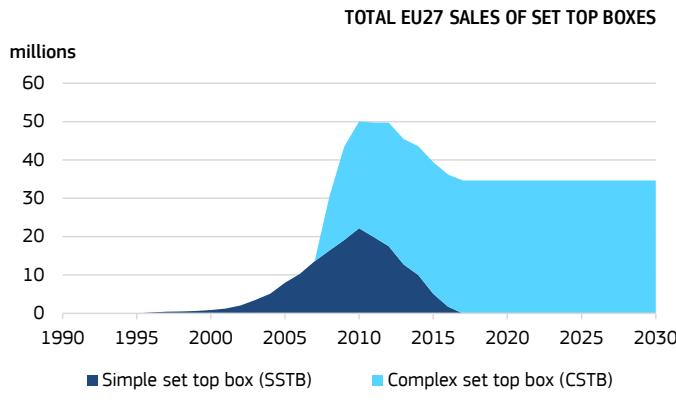
SALES

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.

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%).



Computers



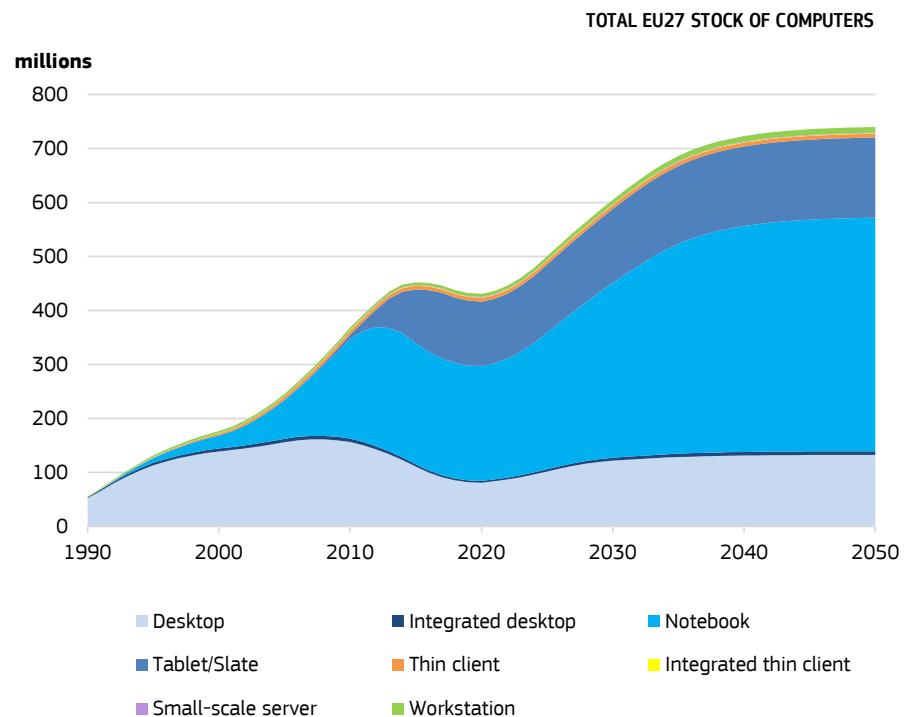
GENERAL INFO

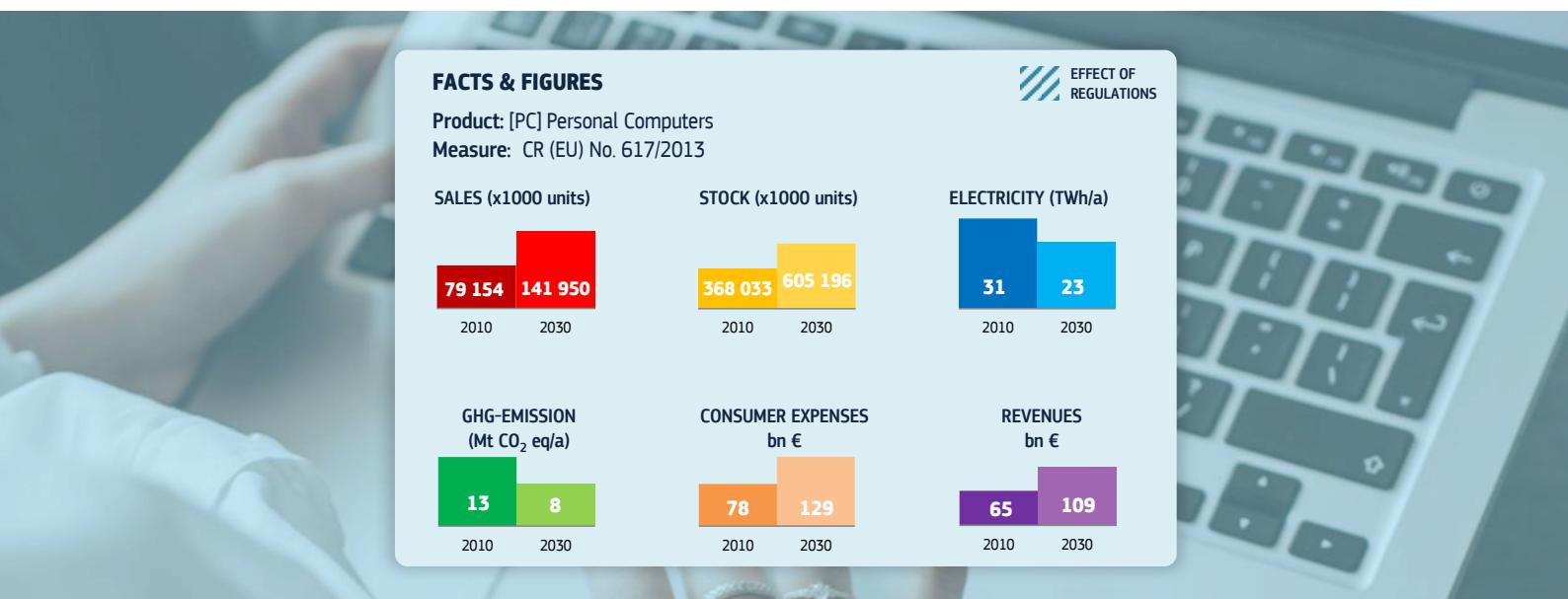
Personal computers (PCs) comprise desktops, notebooks, tablets, thin clients and workstations. Technology and consumer habits in this product group are changing very quickly, making it difficult to regulate. Currently, energy efficiency measures are implemented amongst others through Ecodesign and the 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%.





ELECTRICITY

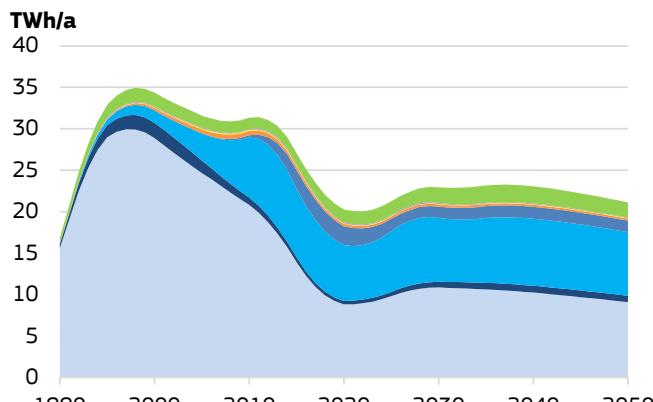
In the years from 1990 to the early 2000s, the sales of desktop computers increased to its peak. After this peak in desktop sales, laptops gained popularity. Since the average energy consumption of laptops is approximately a third of a desktop, the total electricity consumption is decreasing. A similar 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.

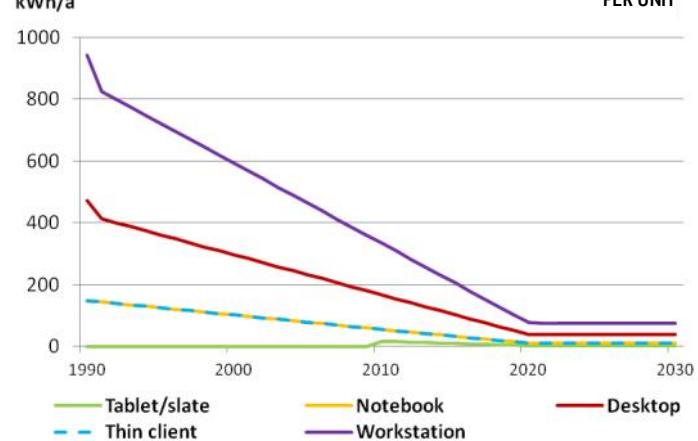
Despite a tenfold growth in numbers since 1990, the total EU27 electricity consumption in 2020 (20 TWh/a) is barely 18% more than in 1990 (17 TWh/a). For 2030 an additional rise of +3 TWh/a electricity consumption is foreseen for a stock growing with +40%.

TOTAL EU27 ELECTRICITY CONSUMPTION OF COMPUTERS



- Desktop
- Notebook
- Thin client
- Small-scale server
- Integrated desktop
- Tablet/Slate
- Integrated thin client
- Workstation
- Tablet/slate
- Notebook
- Thin client
- Workstation

AVERAGE ANNUAL ELECTRICITY CONSUMPTION OF COMPUTERS PER UNIT



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).

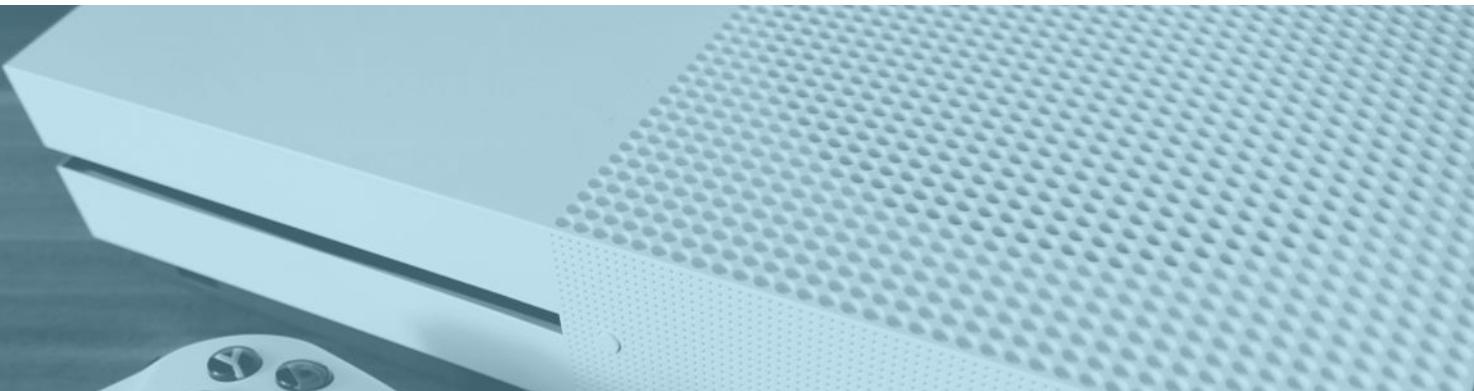
For other power consumptions, game consoles are regulated under the Ecodesign Self-Regulatory Initiative that started in 2015. This SRI sets requirements for the auto-power down (APD) function and for the maximum power during console operation in navigation or media-playback mode. The power for gaming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

SALES AND STOCK

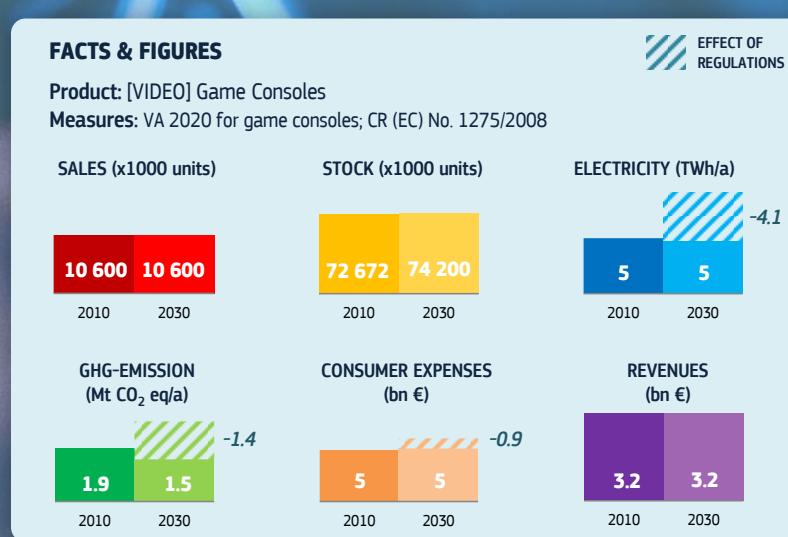
Sales of game consoles are expected to remain stable at 10.6 mln units per year, corresponding to an installed stock of 74 mln units. Every few years new models are introduced and many consumers tend to substitute their console with the 'next generation' model.

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.



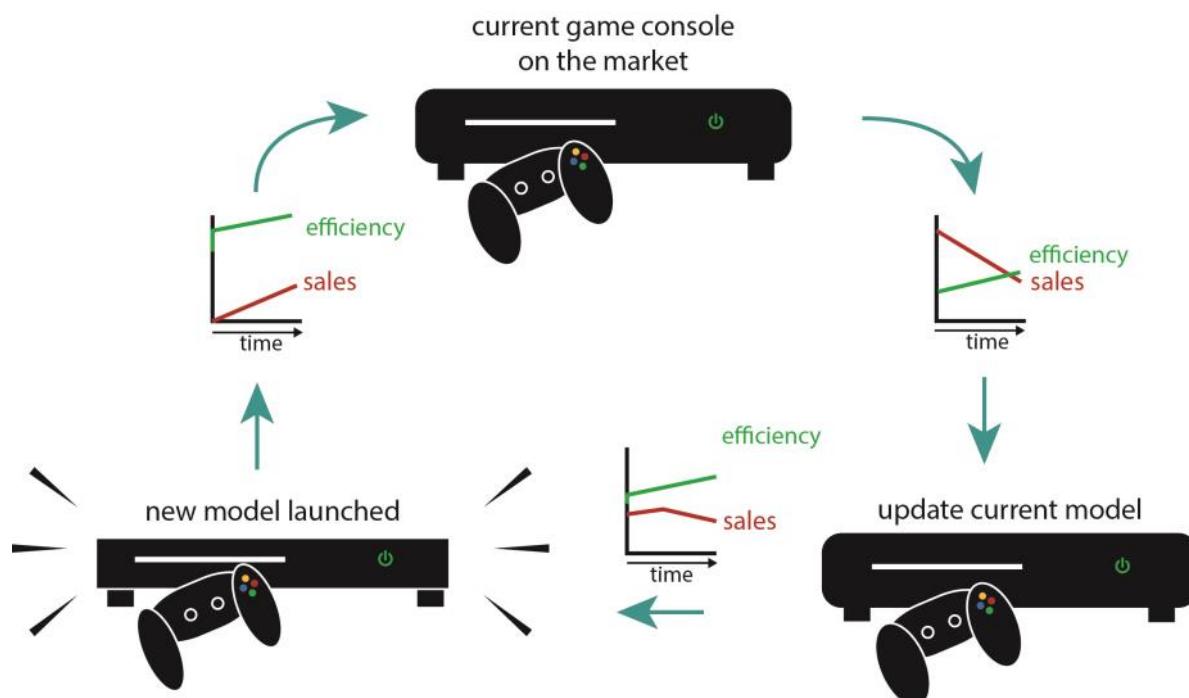
Video (Game Consoles)



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.

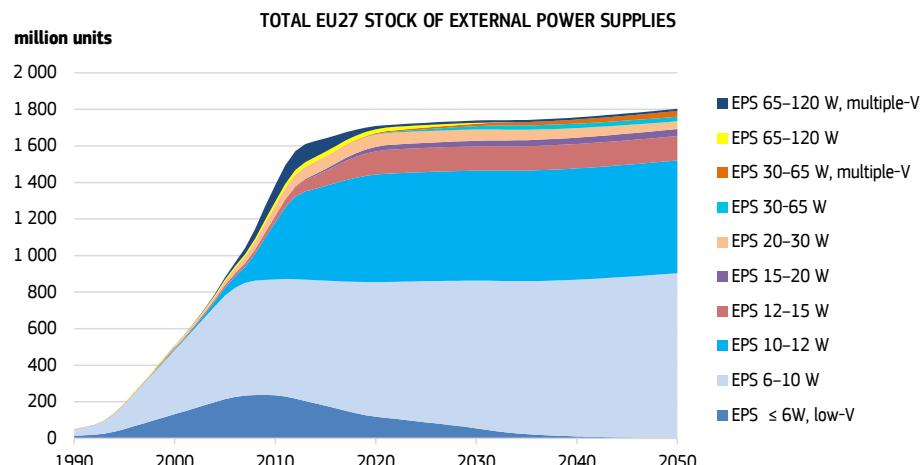
REGULATION REVIEW

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.



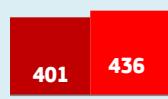
External Power Supplies

FACTS & FIGURES

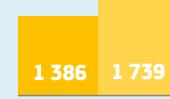
Product: [EPS] External Power Supplies

Measure: CR (EU) 2019/1782

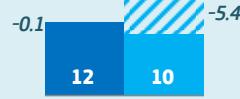
SALES (x million units)



STOCK (x million units)



ELECTRICITY (TWh/a)



EFFECT OF REGULATIONS

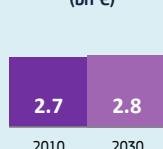
GHG-EMISSION (Mt CO₂ eq/a)



CONSUMER EXPENSES (bn €)



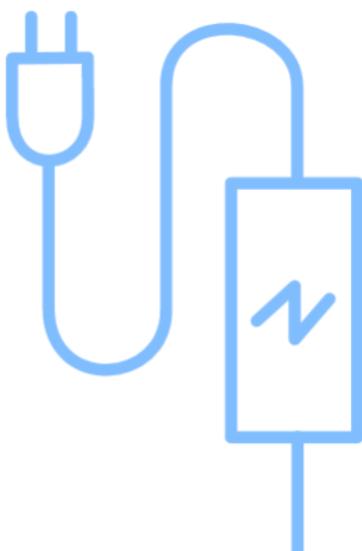
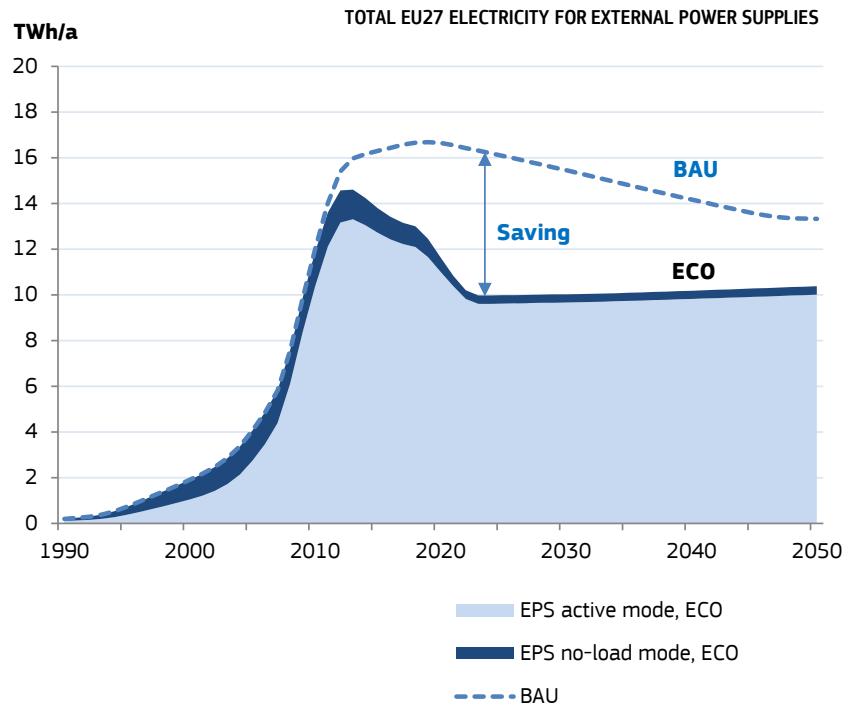
REVENUES (bn €)



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.



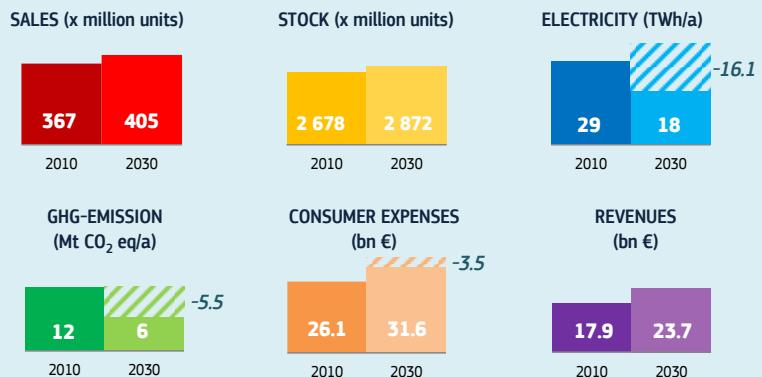
(Networked) Standby



FACTS & FIGURES

Product: [SB] (networked) Stand-By, EXCL. DOUBLE COUNTED

Measure: CR (EC) 1275/2008, as amended



GENERAL INFO

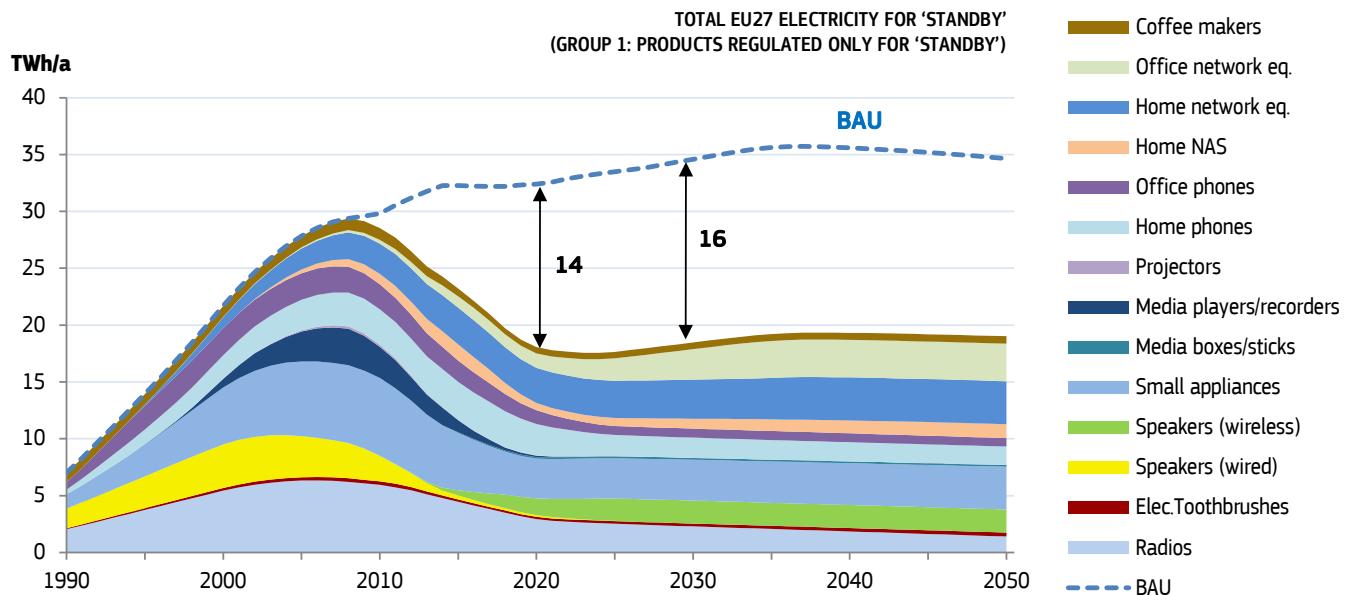
The 2008 Ecodesign regulation on energy consumption in 'off' and various 'standby' modes was designed as a horizontal piece of legislation, covering a myriad of relevant electronic and electrical products. In 2013 the regulation was updated to include also 'networked standby' and add rules on standby 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):

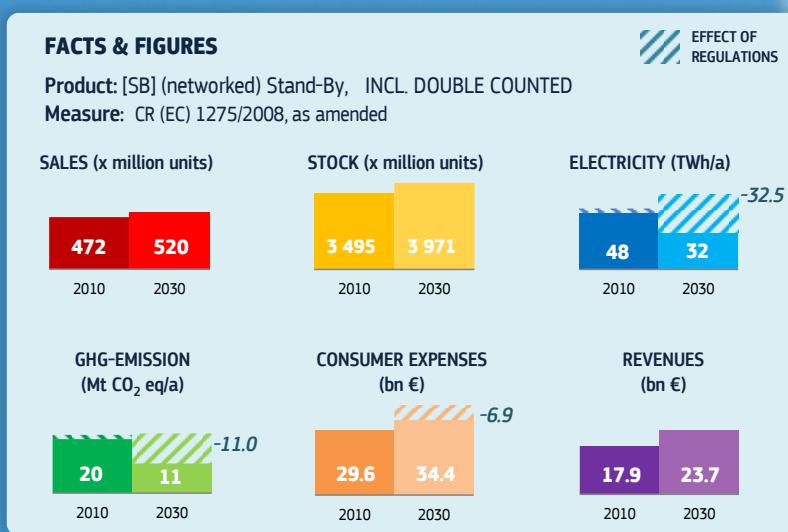
(1) Products for which only 'standby' is regulated in Ecodesign. Data for these products are reported directly under the SB heading and accounted in EIA totals as normally (excluding double-counted).

(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).



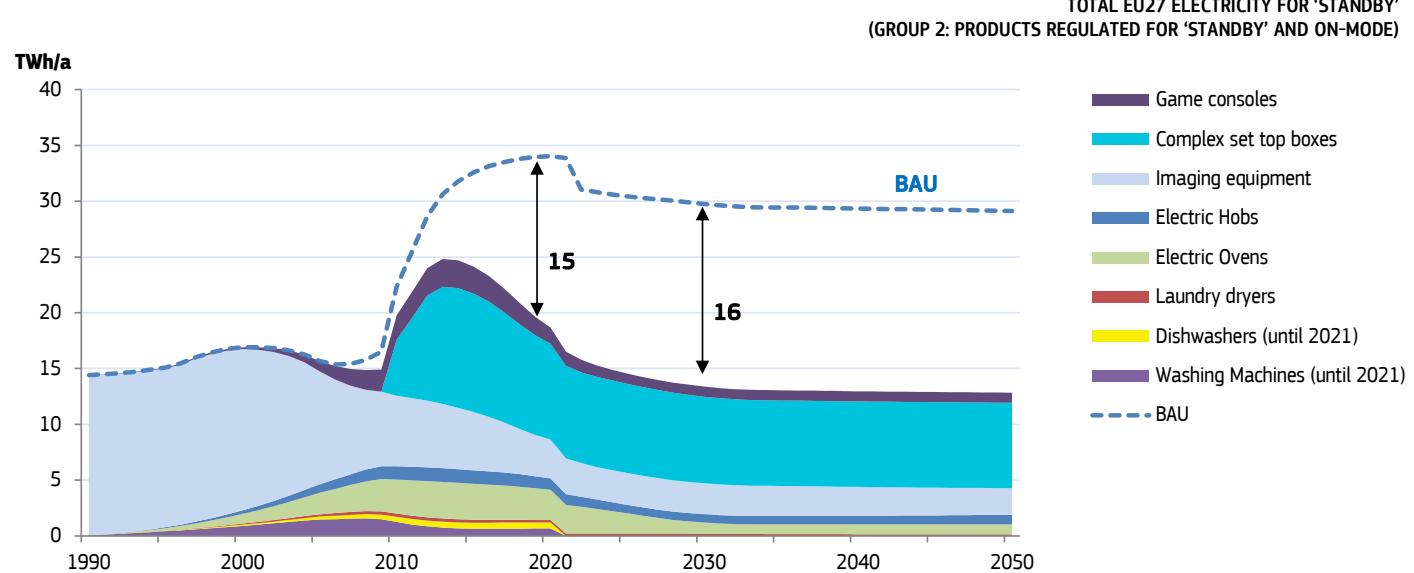
ELECTRONIC PRODUCTS (Networked) Standby



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).



Imaging Equipment

GENERAL INFO

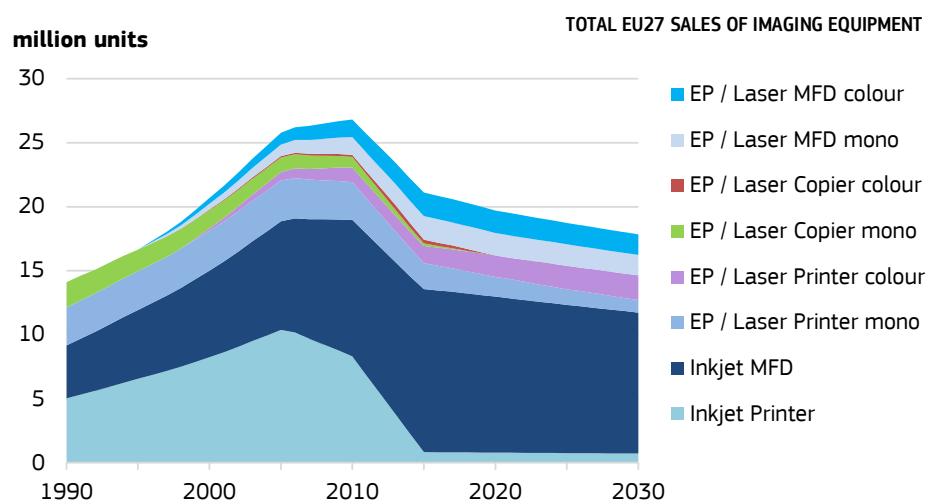
Imaging equipment includes single functionality devices (SFD) such as printers and copiers as well as multi-functional devices (MFD). Main printing technologies are electrophotography (EP or 'laser') and inkjet (IJ). Imaging equipment is subject to an Ecodesign Voluntary Agreement (EuroVAPrint.org) and 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.

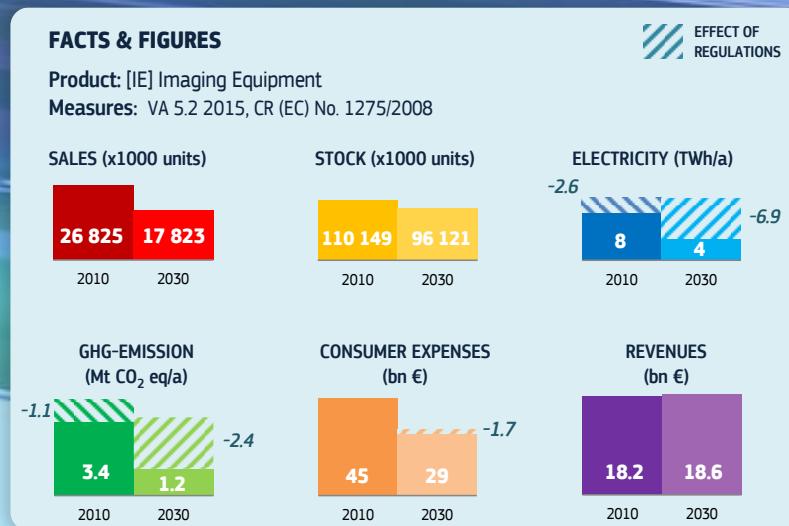


OPERATIONAL COSTS

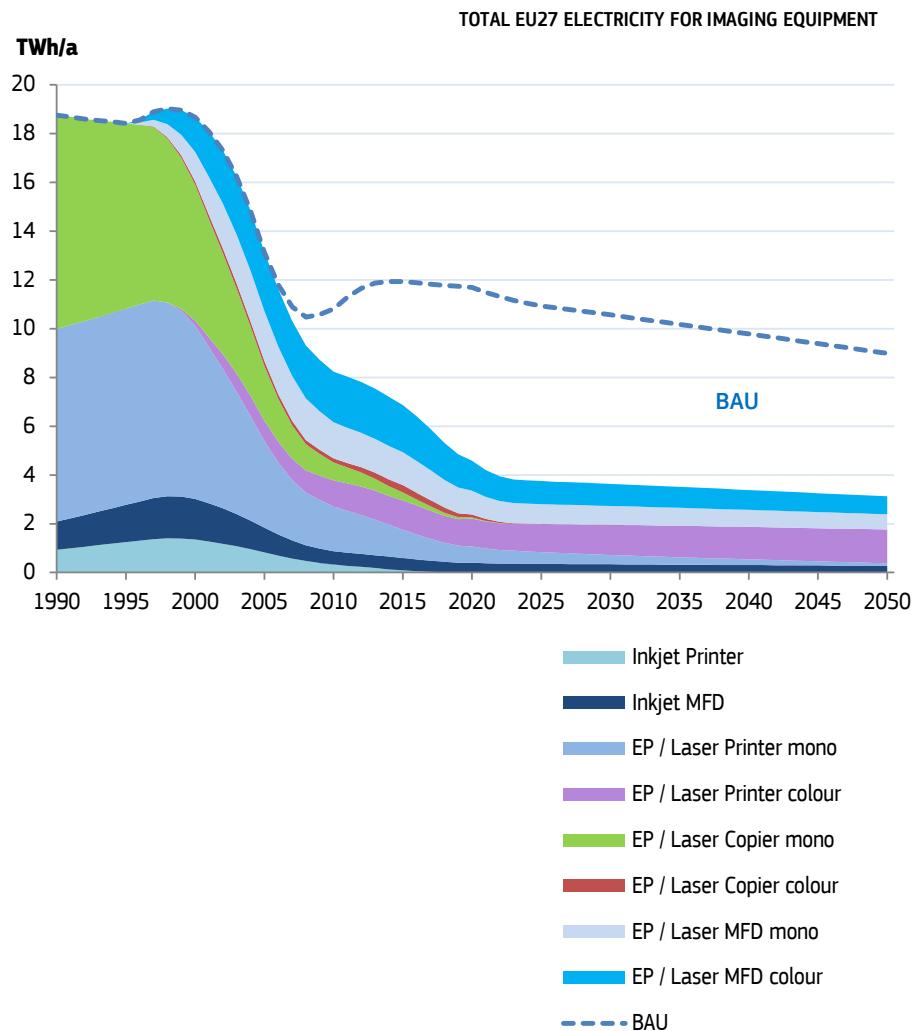
In 2020, user expenses related to imaging equipment amount to 35 bn euros (€327 per device), of which 12.2 bn euros for acquisition of the equipment and 23 bn euros (66%) for running costs. Of the latter, 10.5 bn euros were spent for ink and toner, 3.5 bn euros for paper, 8.3 bn euros for repair and maintenance and 'only' 0.8 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



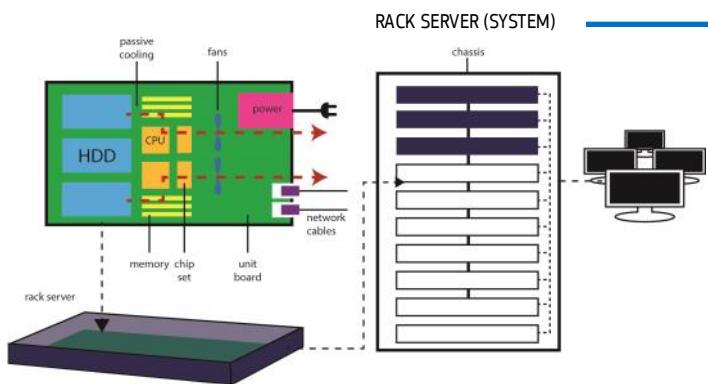
GENERAL INFO

'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.

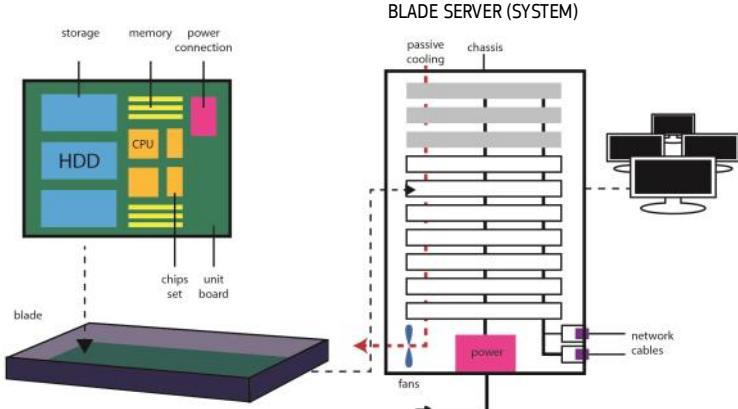
Some servers were covered by CR 617/2013 (Computers), but since 2019

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).

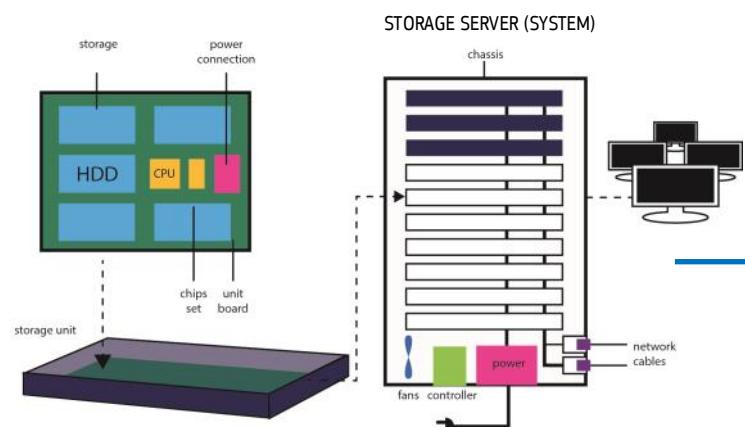
EIA base cases for servers depend on their configuration (tower, rack, blade), number of sockets (1, 2, 4), resilience (yes/no, extensive reliability, availability, serviceability, scalability), and access type (traditional or cloud). Rack-, blade- and data storage servers are shortly and schematically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



Rack 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.

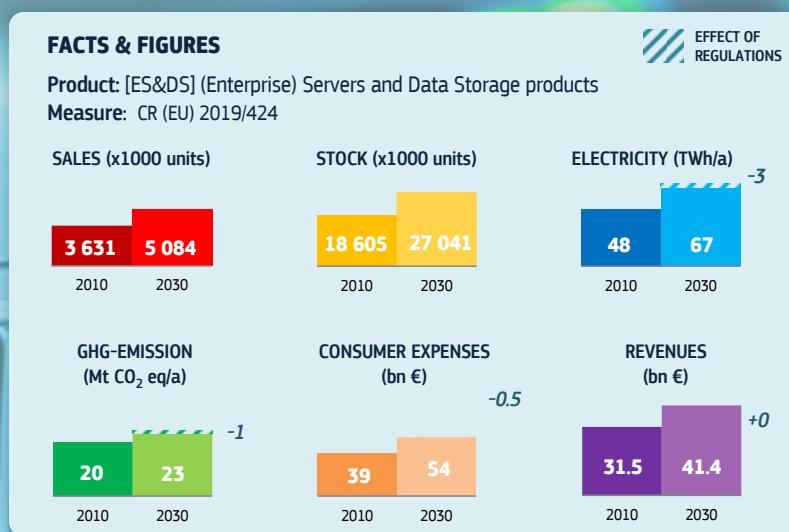


Blade servers consist of a single chassis and multiple blades. Blades comprise only part of the essential server components, such as CPUs, memory and storage. Other components, e.g. power supply, cooling and interconnectivity, are mounted in the chassis, and shared by the various blades. The blades are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



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.

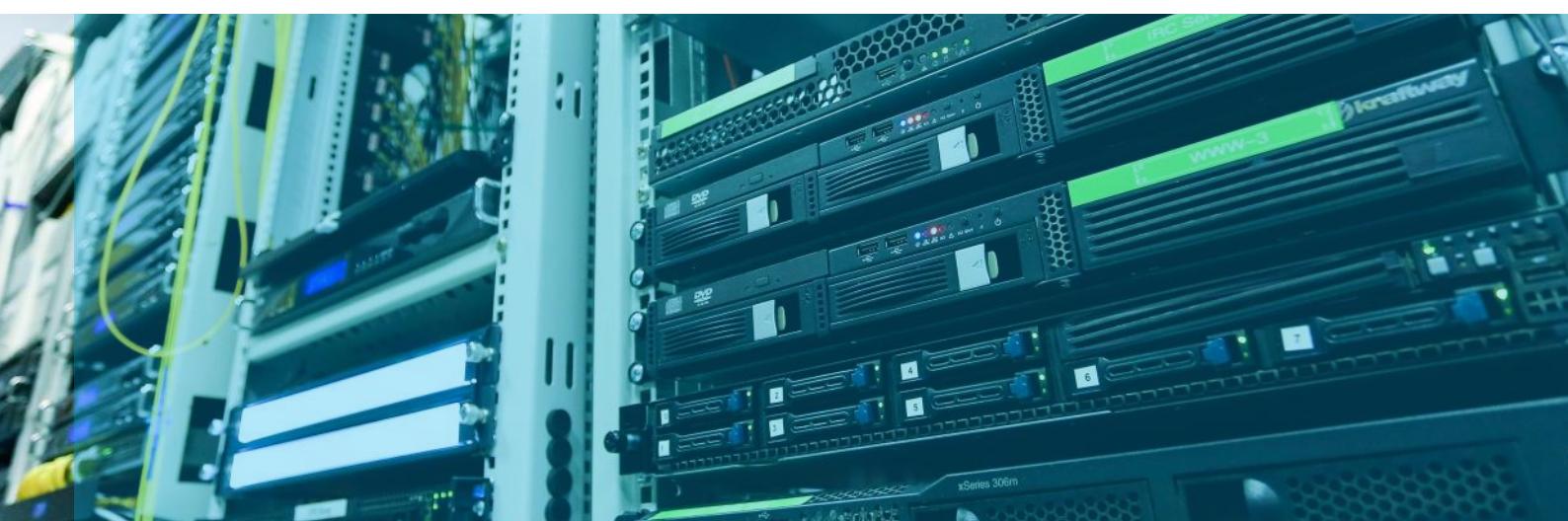
In addition, for most server types, there is a requirement on the maximum power consumption in 'idle state' (server operational, but not performing any useful work).

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.

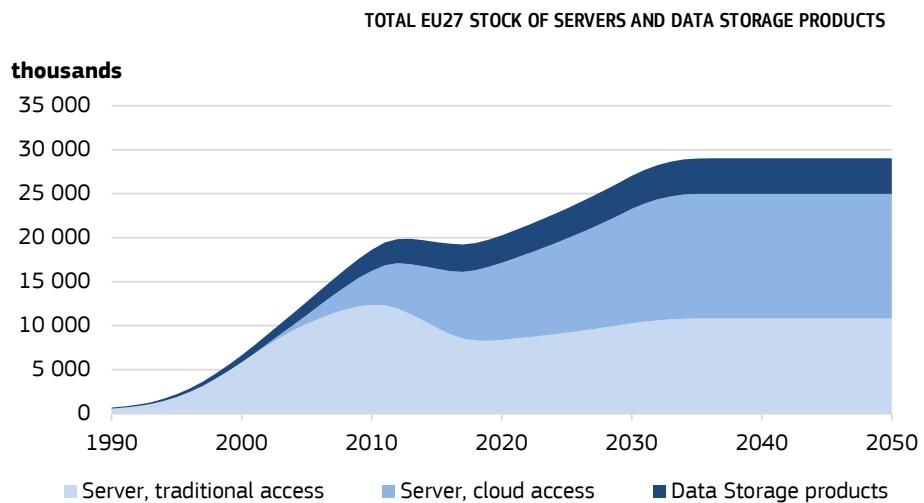
EIA considers only the direct effects of the measures on the energy consumption of ES and DS. The indirect infrastructural effects (i.e. reduction of cooling demand of data centres) is not included.



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).

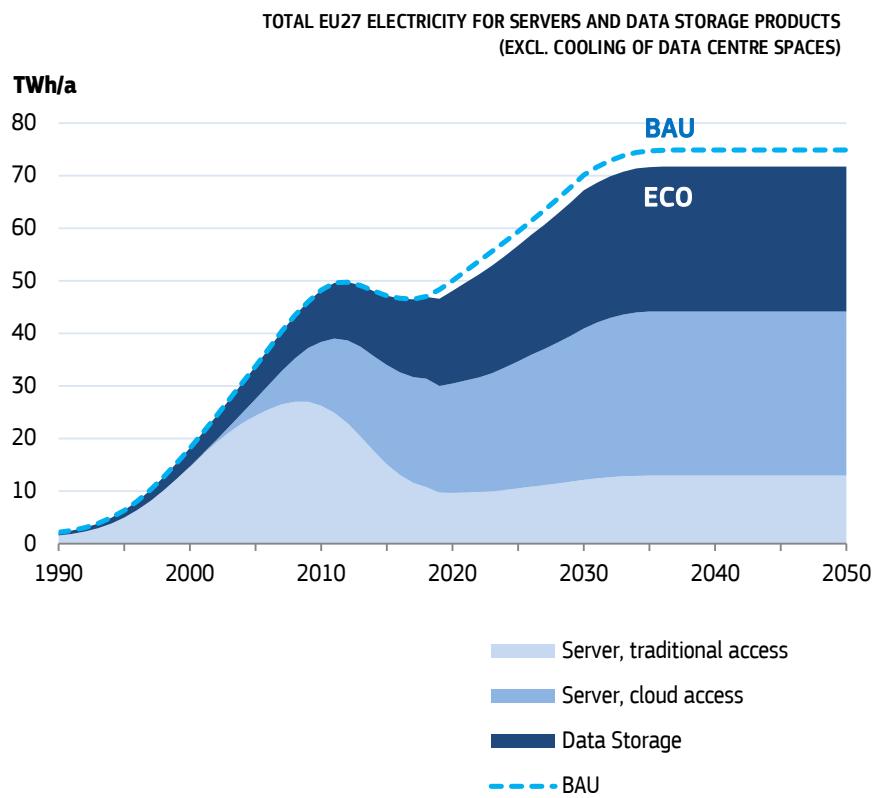


SAVINGS

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 1 Mt CO₂eq/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 0.5 bn euros in 2030 are equal to the expense savings (-1%).





Appliances

Household Refrigeration

Refrigeration with direct sales function

Professional Refrigeration

Cooking Appliances

Washing Machines

Dishwashers

Laundry Dryers

Vacuum Cleaners

Household Refrigeration



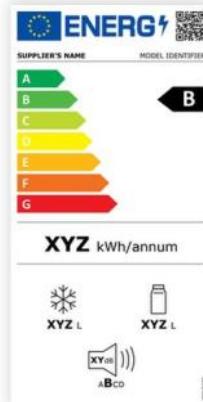
GENERAL INFO

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%).

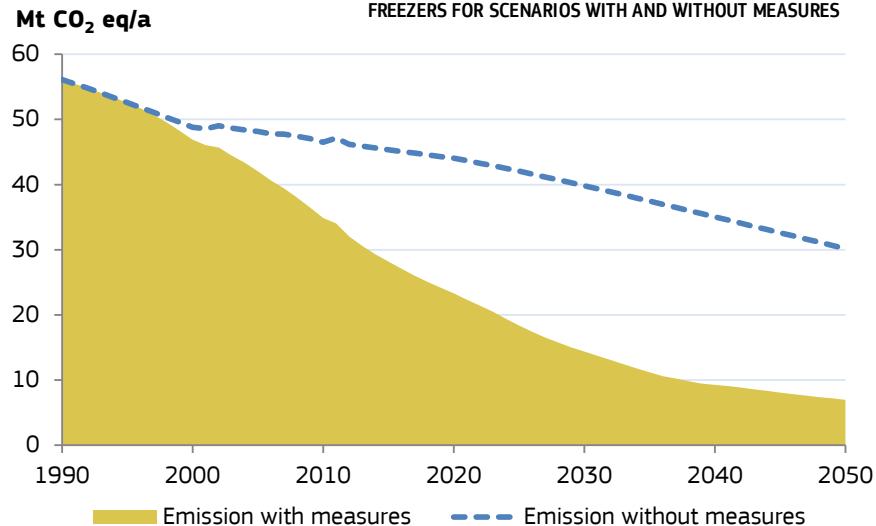


EMISSIONS

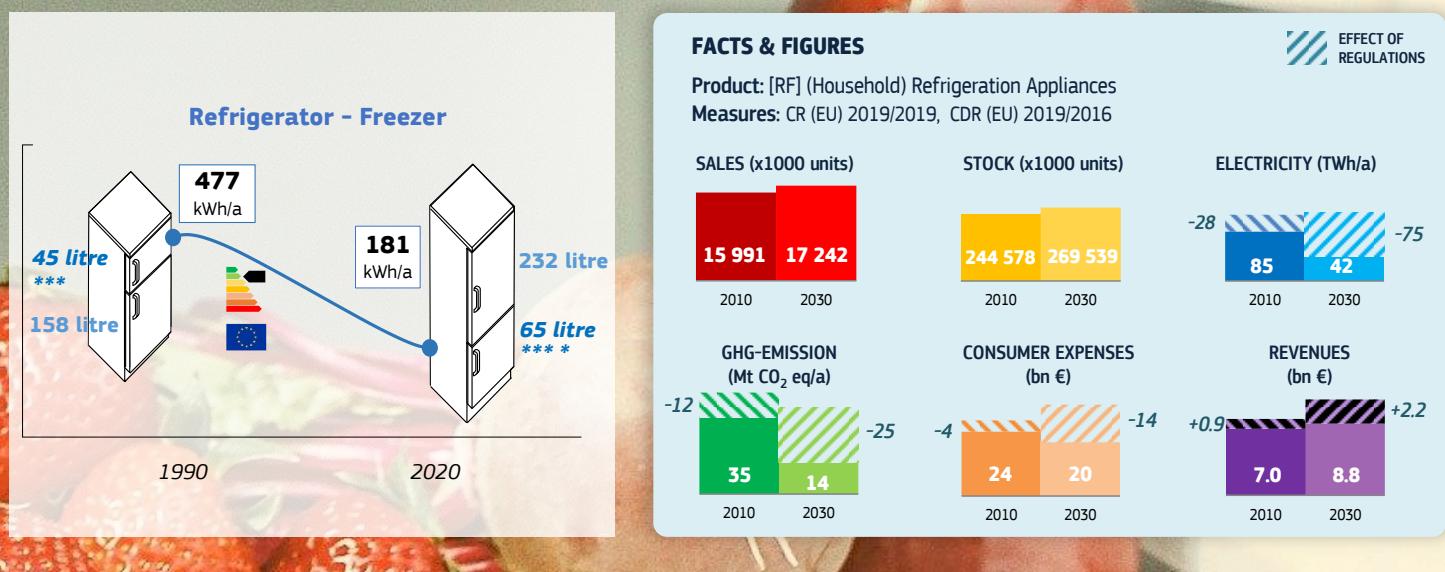
The increased efficiency of refrigeration appliances compensates for the increased product stock. The total GHG emissions for refrigerating are decreasing since the 1990s, but introduction of measures accelerated the reduction.

In 2020 total EU27 GHG-emissions due to household refrigeration were 23 Mt CO₂-equivalent (with the effect of measures included). By 2030 this is expected to be almost halved to 14 Mt. Without measures, the 2030-emissions were projected to be 40 Mt CO₂eq/a. Hence, the effect of Ecodesign and Energy Labelling measures is 65% less emissions in 2030.

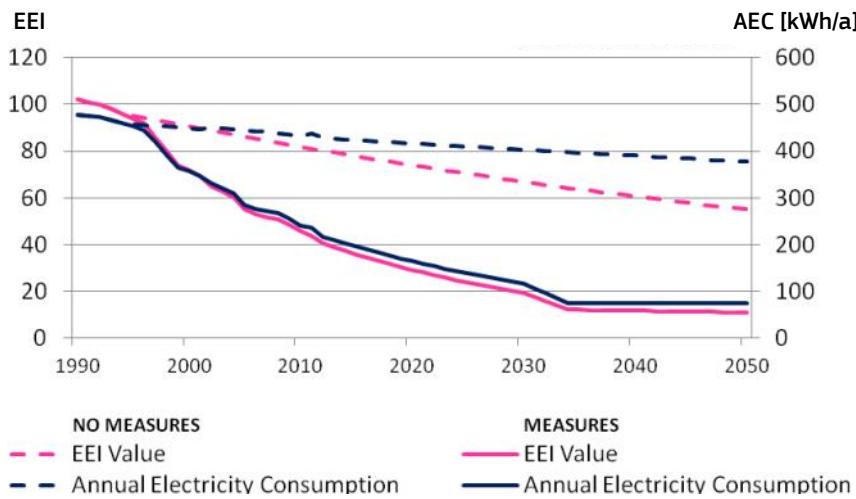
TOTAL EU27 ANNUAL GHG EMISSION OF HOUSEHOLD REFRIGERATORS AND FREEZERS FOR SCENARIOS WITH AND WITHOUT MEASURES



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, equaling 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



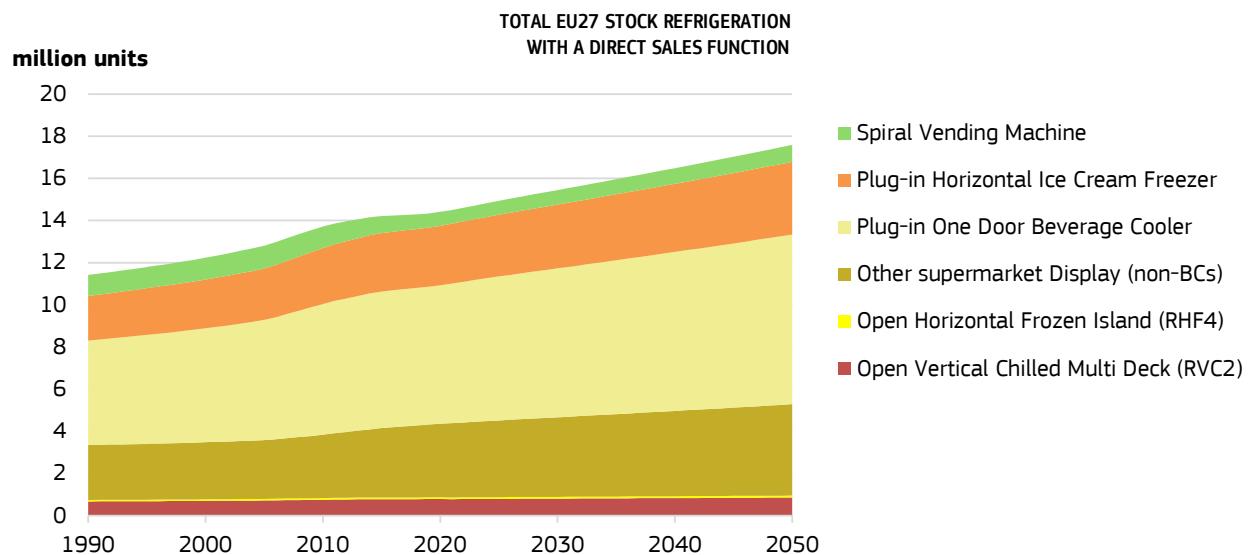
PRODUCT SCOPE

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.

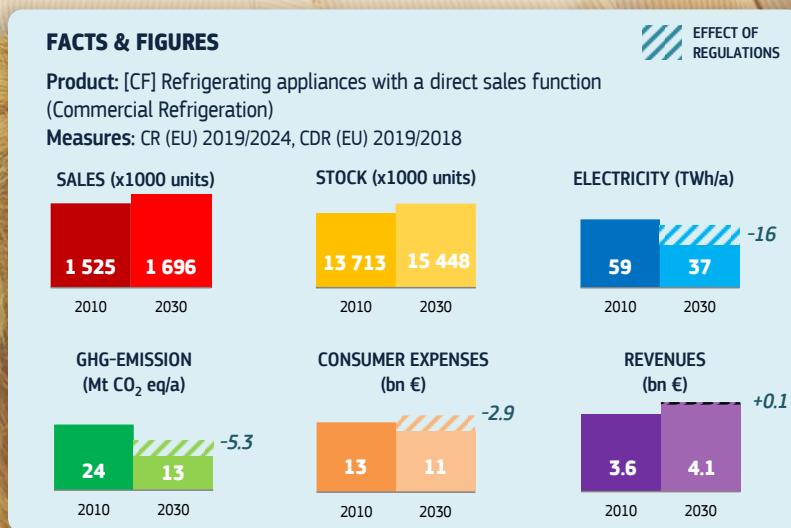
Many supermarket models are vertical cabinets with various shelves from which people take e.g. their milk, butter, cheese. Others are more like horizontal chests, e.g. for ice-cream, pizzas, meat. Refrigerated models can be open (direct access) or closed (typically by glass doors or lids); freezers are 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

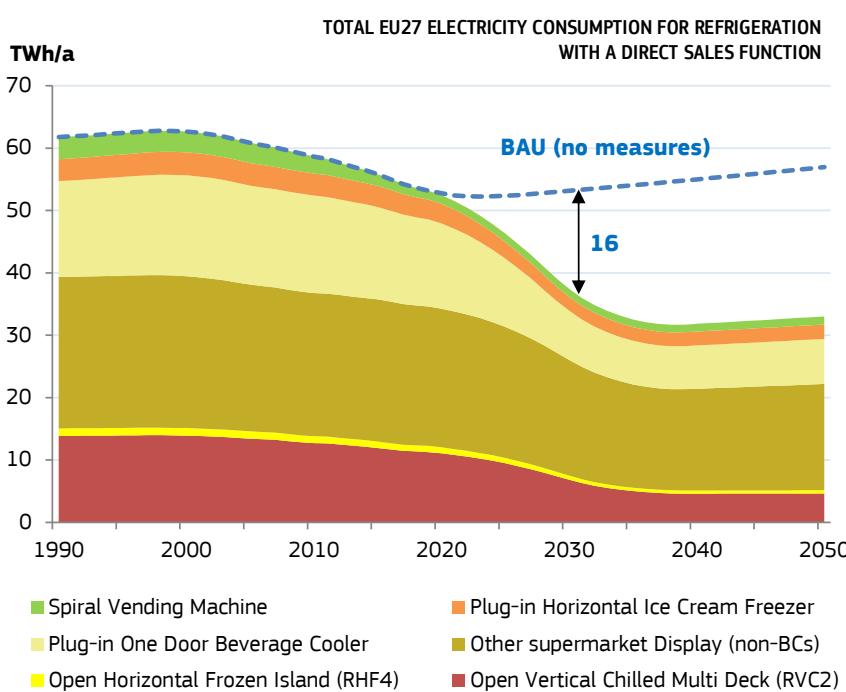


GREENHOUSE GAS EMISSIONS

In 2010, total EU27 GHG-emissions due to use of CF-appliances amounted to 24 Mt CO₂equivalent, not including refrigerant losses. By 2020 this is expected to decrease to 20 Mt CO₂eq/a, notwithstanding the increase in stock. Introducing Ecodesign and Labelling measures the total 2030 GHG-emissions can be further reduced to 13 Mt (-35%), 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

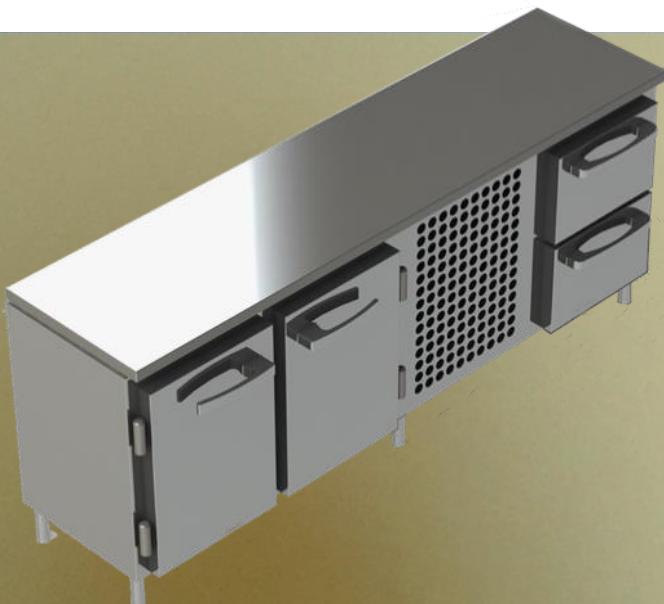


In 2020, 14.4 million CF-appliances were installed in EU27 and this number is expected to increase to 15.4 mln (+7%) by 2030. Around 45% are beverage coolers. A minority (30%) of the appliances is installed in supermarkets.

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

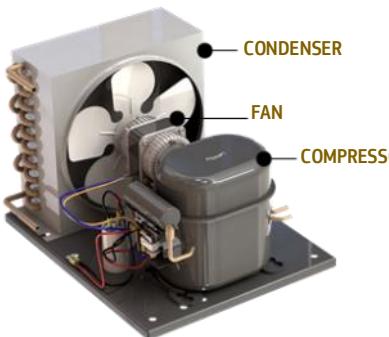


GENERAL INFO

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



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).

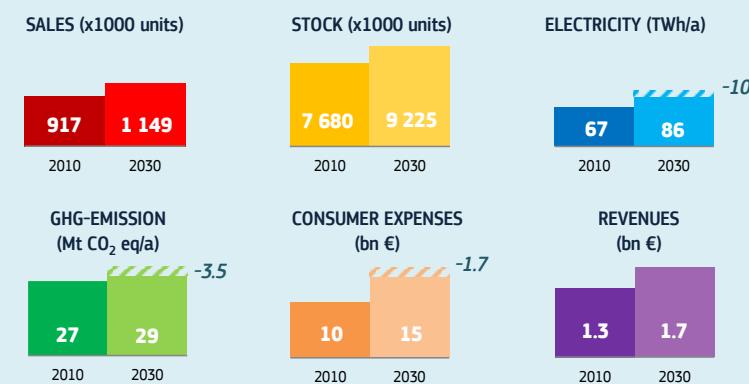
In 2020 around 632 thousand MT/LT condensing units were sold in EU27 (expected 733 thousand by 2030) and 4.8 million units were installed (expected 5.6 million by 2030).

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

FACTS & FIGURES

Product: [PF] Professional Refrigeration
Measures: CR (EU) No. 2015/2095, CDR (EU) No. 2015/1094



EEI AND LABEL FOR STORAGE CABINETS

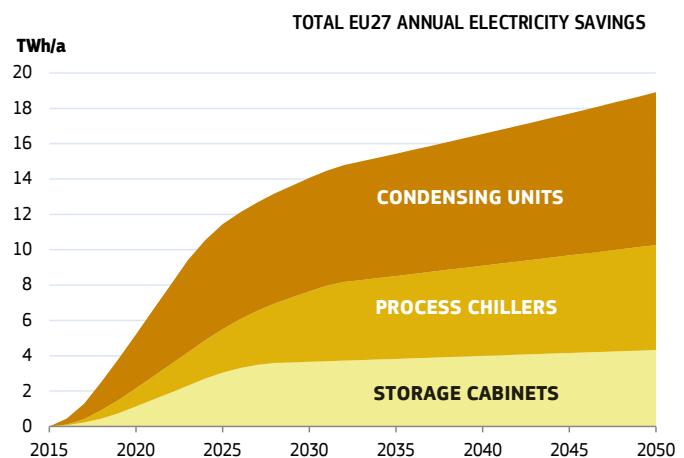
The energy efficiency of storage cabinets is defined using an energy efficiency index (EEI), just as for commercial and household refrigerators. The EEI thresholds for label classes range from >95 (G) to <25 (A) or <5 (A+++). Label 1 (G-A++) is mandatory from July 2016. Label 2 (G-A++) is optional from 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 3.5 Mt CO₂eq/a in 2030. PF-users will save 1.7 billion euros in 2030, due to lower electricity costs.



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).

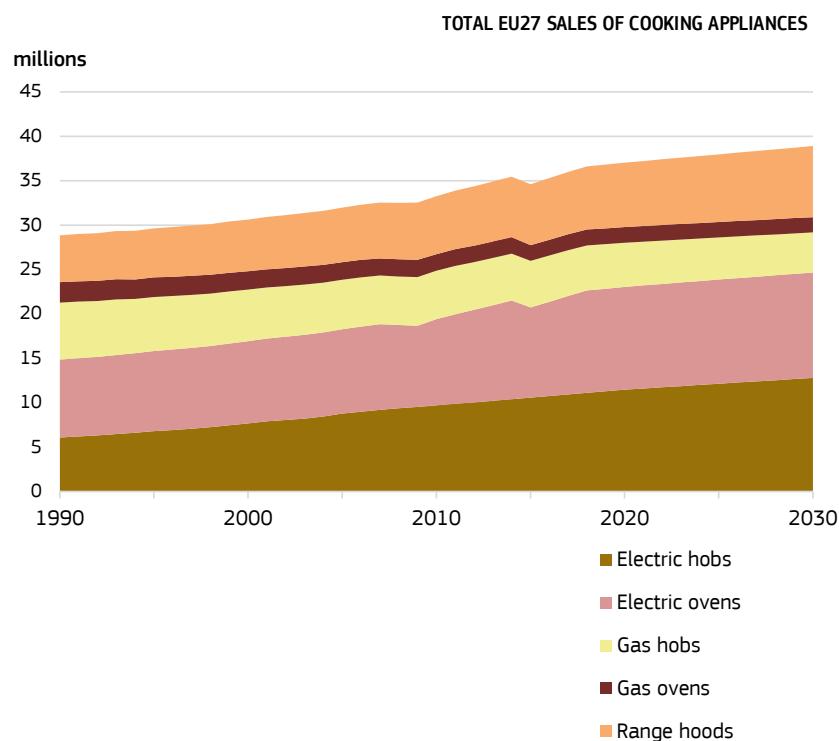
SALES AND STOCK

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).

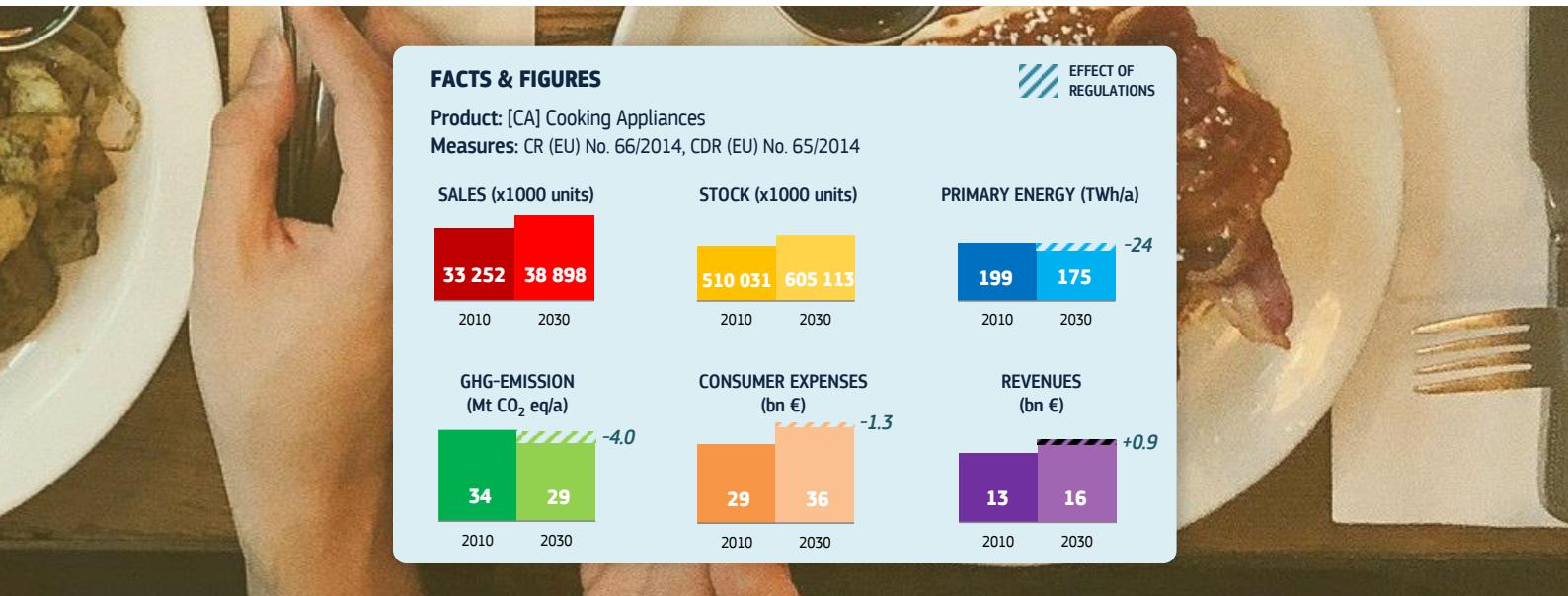
For **ovens** the picture is similar, with 230 mln installed in 2020 (84% electric and 16% gas). Sales of electric ovens are slightly increasing from 11.6 mln in 2020 to 11.9 mln in 2030 (+2.5%), while those of gas ovens decrease from 1.77 to 1.72 mln (-3%). The result is an increase in the stock of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



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.

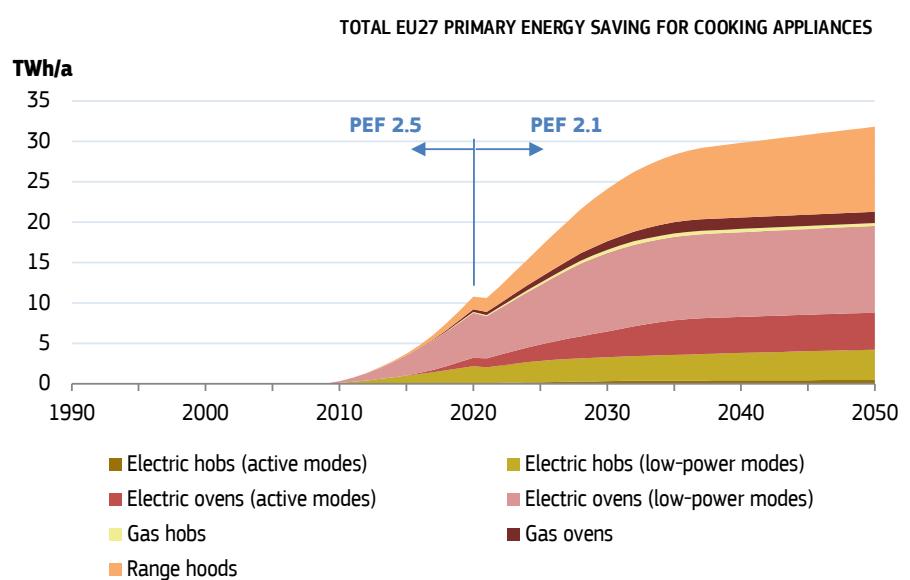
The variation in consumer expenses due to the Ecodesign measures on cooking appliances shows additional expenses up to 2024, with a peak of 0.5 billion euros extra around 2020. Following 2024, consumers will start to save money (1.3 bn euros in 2030), in particular due to lower energy costs for electric 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 33 Mt CO₂eq/a (without measures) to 29 Mt CO₂eq/a.



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.

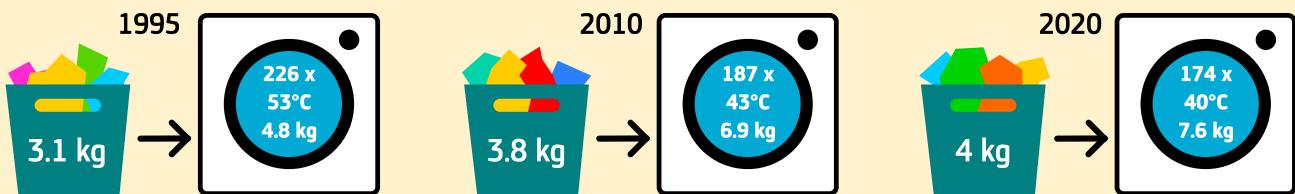
The 2019 regulations revise the basis for labelling and requirements again, requiring WM and washer-dryers (WD) to have an 'eco 40-60' washing cycle, able to clean normally soiled cotton declared washable at 40°C or 60°C, together in the same cycle, and a washing cycle called '20°C', which is able to 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.

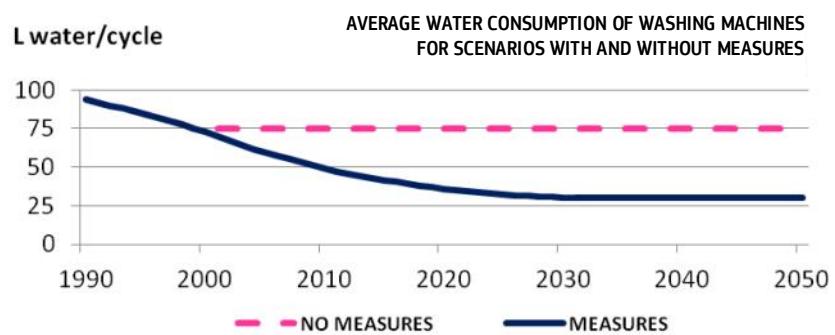
In parallel, the average number of washing cycles per year per WM decreased from 226 in 1995, to 174 by 2030. Combining these data

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.

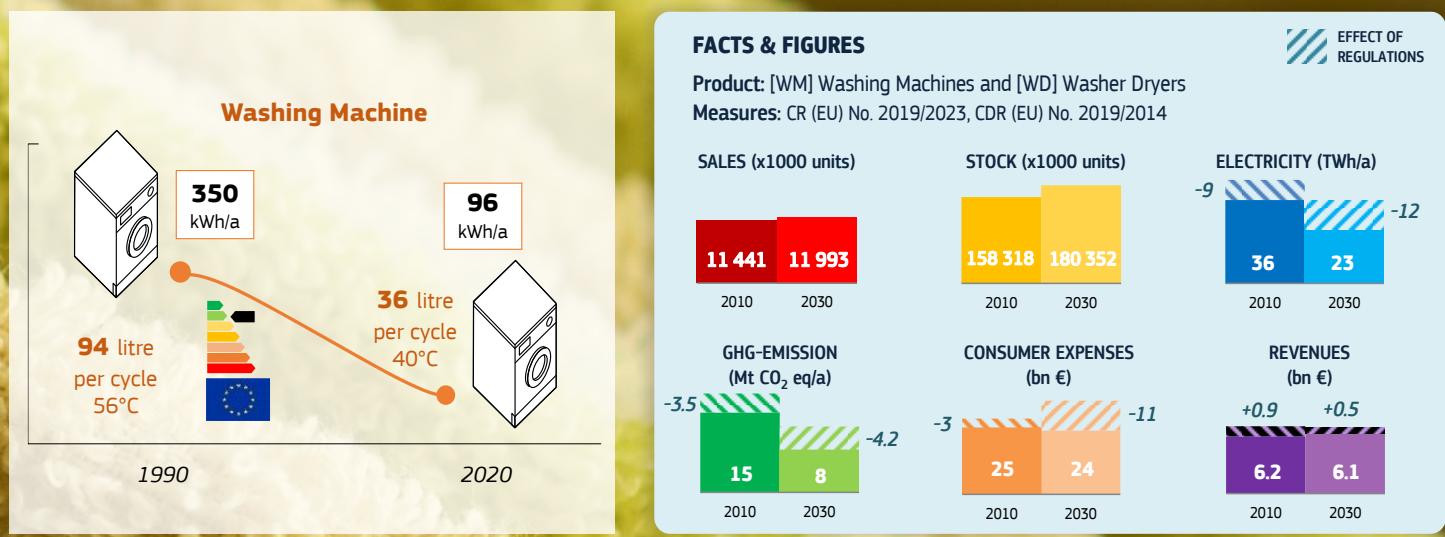


WATER

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

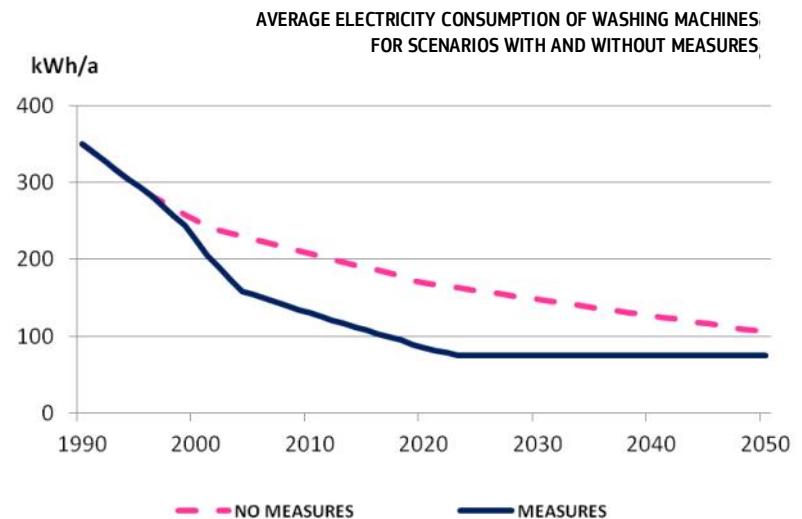
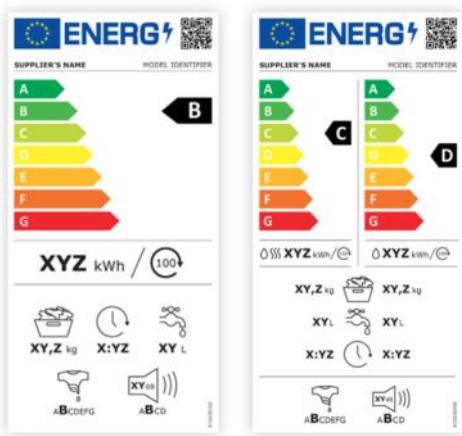


At EU27 level the **water saving** is 1042 million m³ of water per year in 2015 and roughly the same at 1050 million m³ in 2030, the latter equalling a 0.4 m deep pool with the size of Luxemburg (2586 km²).

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%).



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

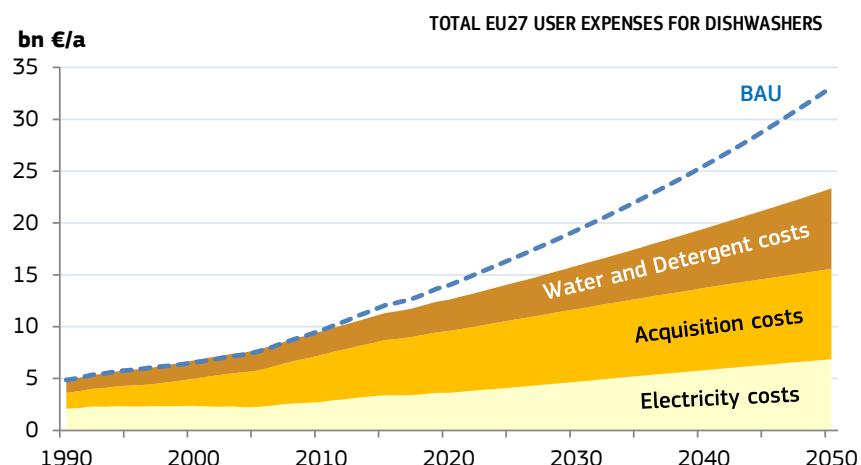
The capacity of dishwashers (DW) is expressed in place settings (ps), which is a defined set of crockery, glass and cutlery for use by one person. The average rated capacity of EU dishwashers is fairly constant, varying from 12.1 ps in 1995 to 12.8 ps in 2030. The average amount of place settings actually 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.

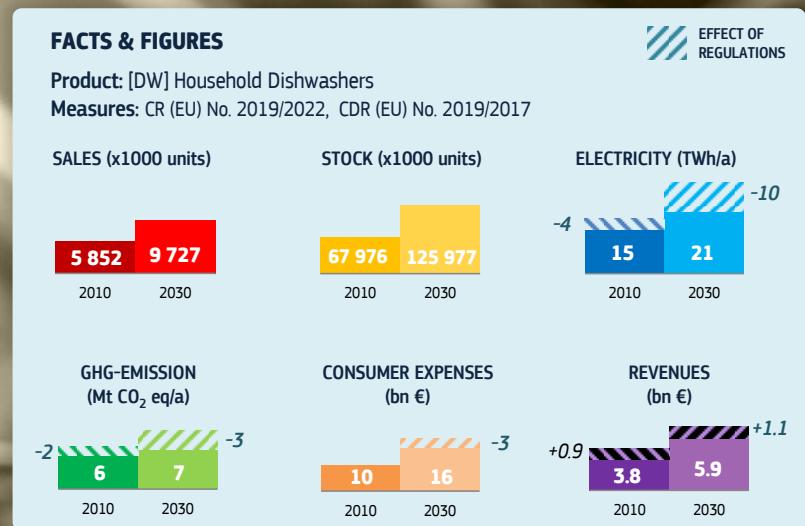
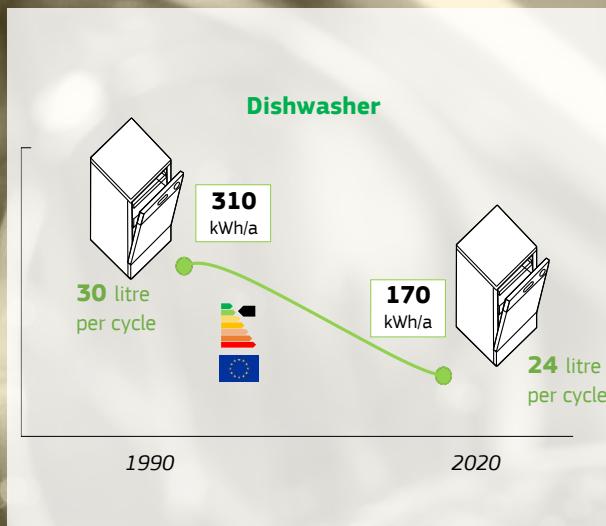
EXPENSES

More efficient DWs have higher acquisition cost. In 2020 EU-consumers spent 1.4 bn euros extra buying such DWs, but this was compensated for with 1.4 bn euros lower electricity costs and 1.3 bn euros lower water and detergent costs, for a net expenditure savings of 1.4 bn euros. In 2030, these savings are expected to be 3.4 billion euros, of which 2.5 bn on water and detergents.



APPLIANCES

Dishwashers

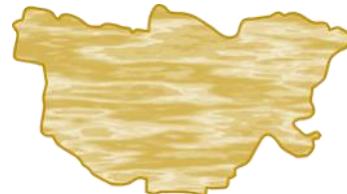


WATER CONSUMPTION

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.

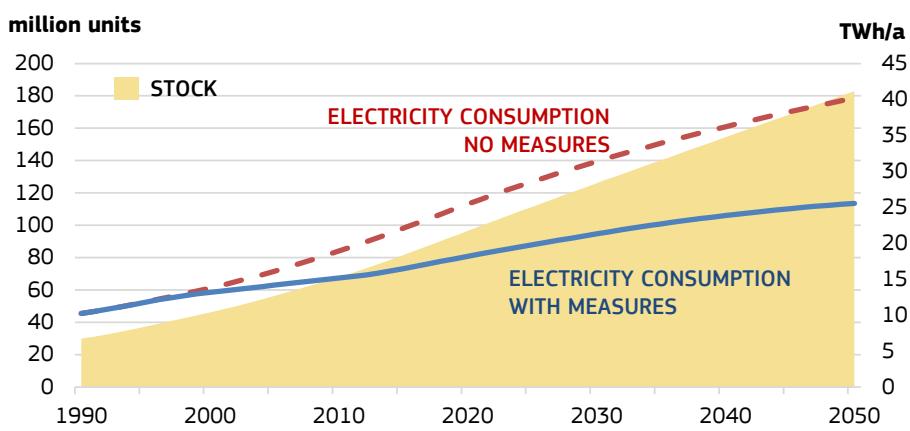
At EU level this enabled saving 295 million m³ of water per year in 2020 and expected 421 million m³ per year in 2030, the latter approximately equalling 168 thousand Olympic swimming pools (of 2 meters deep) or a swimming pool with the size of Amsterdam (219 km²).



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.

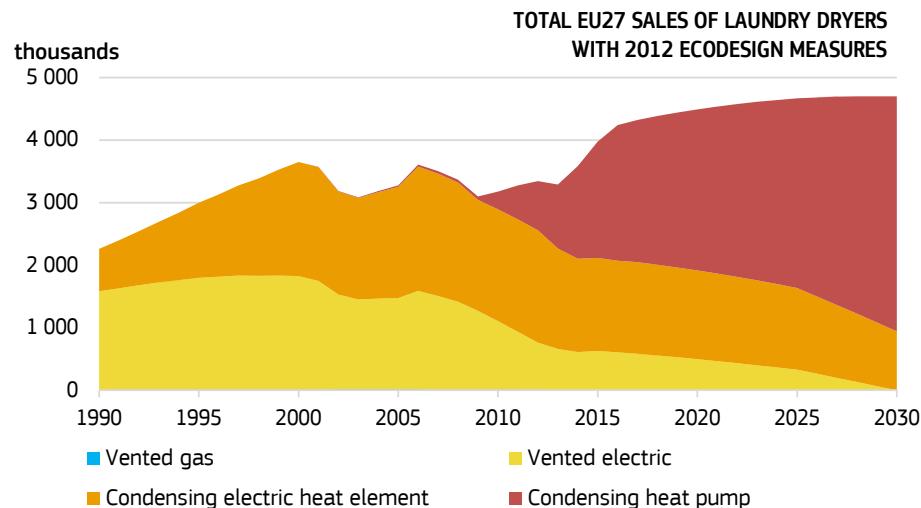
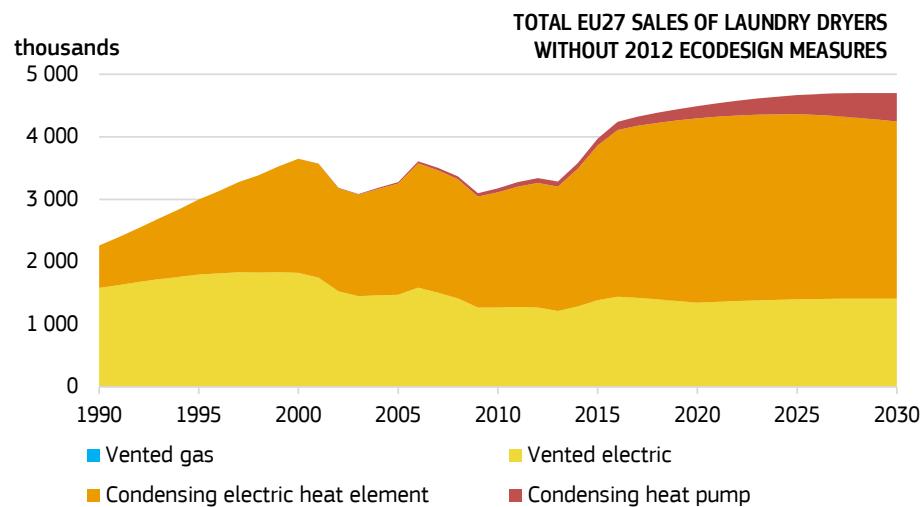
There are two main types of LD: Air-vented dryers and Condenser dryers. Air-vented dryers draw air from the room in which they are installed, heat it and lead it through the humid clothing in the drum to evaporate the moisture. The humid air is then expelled to the external environment. Air-vented dryers 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

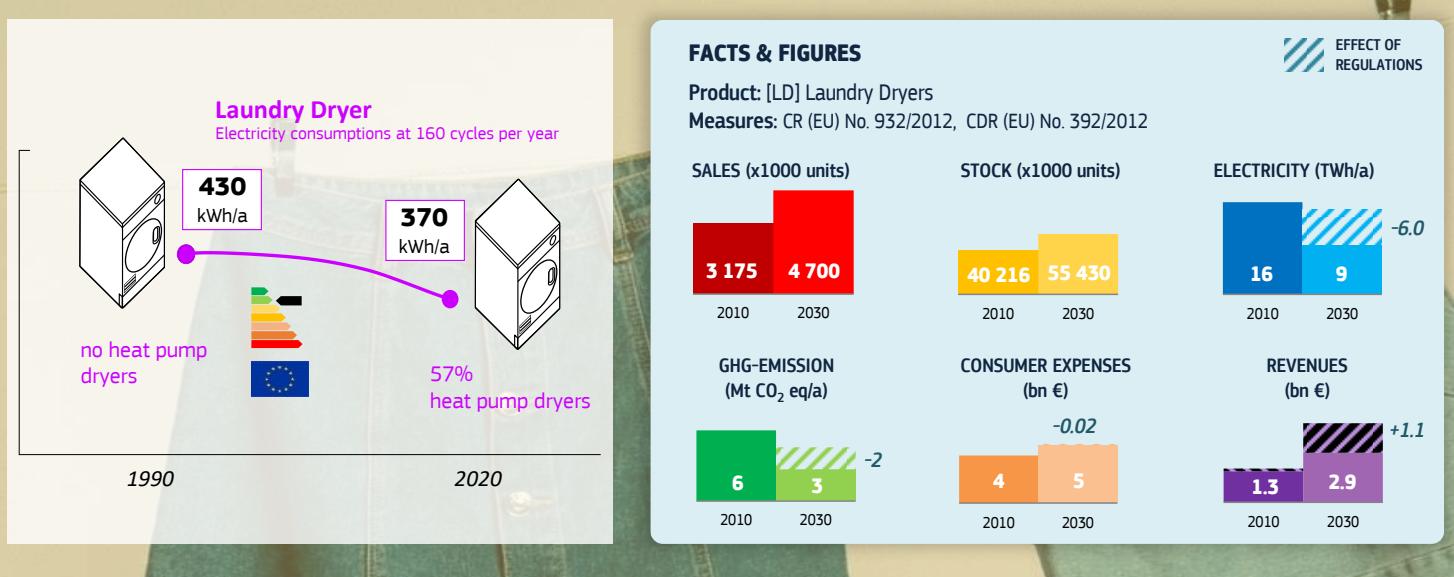
In 2020, 4.5 million LDs were sold in EU27 of which 11% electric air-vented dryers and 89% condenser dryers. Sales of gas-fired air-vented dryers are negligible. Due to the 2012 Ecodesign measures, and due to a reduction in price, the sales of heat pump condenser dryers have been rapidly increasing, 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.



Laundry Dryers

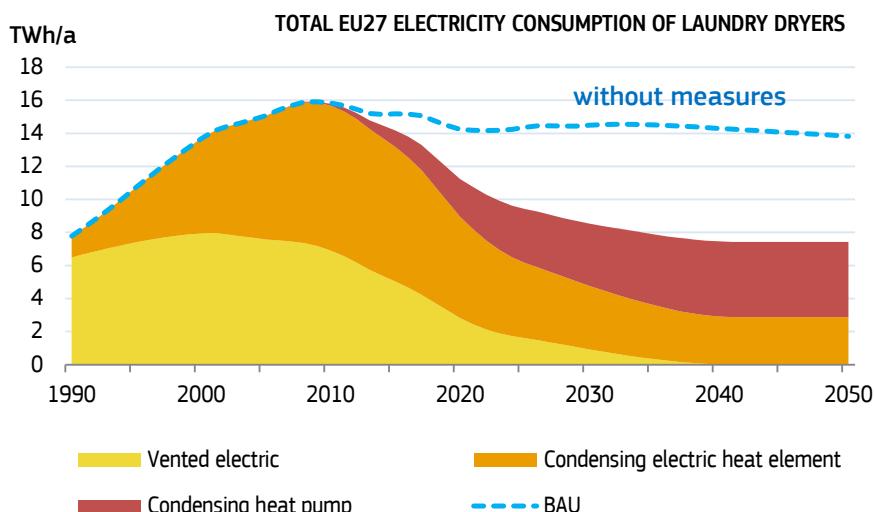


LOAD

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.

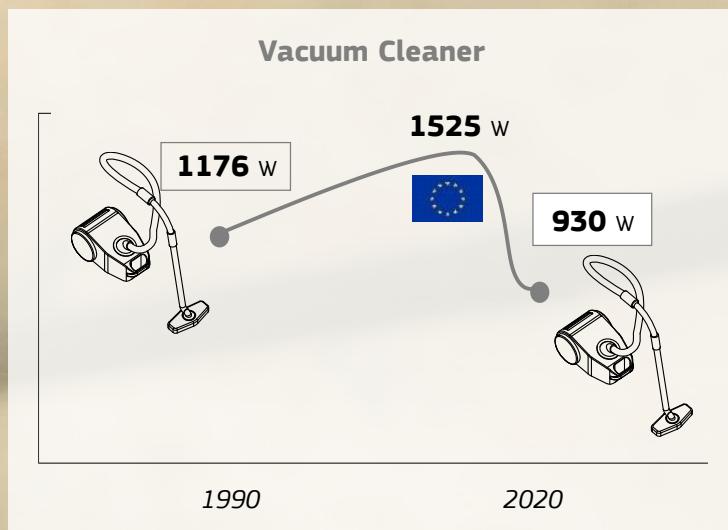
EFFICIENCY AND ELECTRICITY



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 the 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 elements.

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 1300 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 LABELING FOR VACUUM CLEANERS IN EIA

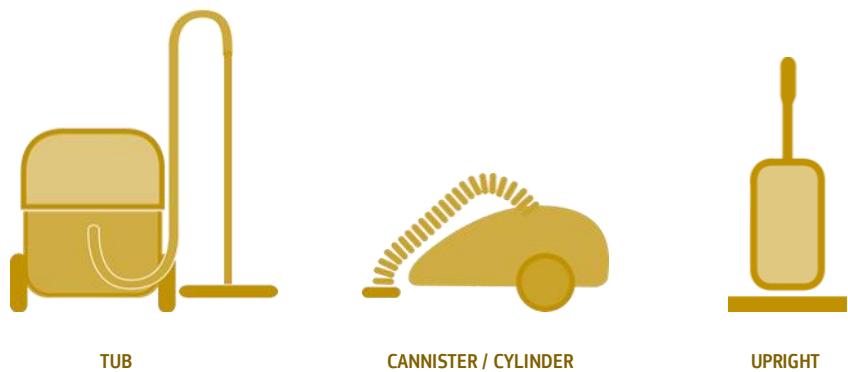
Measurements for an energy label formerly required an empty vacuum cleaner bag. Dyson, a manufacturer of bagless vacuum cleaners, filed and won a lawsuit against the regulation at the European Court of Justice in Luxembourg (Dyson ruling – Case T-544/13 RENV).

As a result, this voided and annulled EU Regulation (EU) 665/2013. Awaiting the results of a review study (started in 2021), and of ongoing work on new test standards, EIA data do not consider the impacts of this annulment.

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, 128 million VCs were in use in EU27, increasing to 354 mln in 2020. A further increase to 428 mln units is expected by 2030.

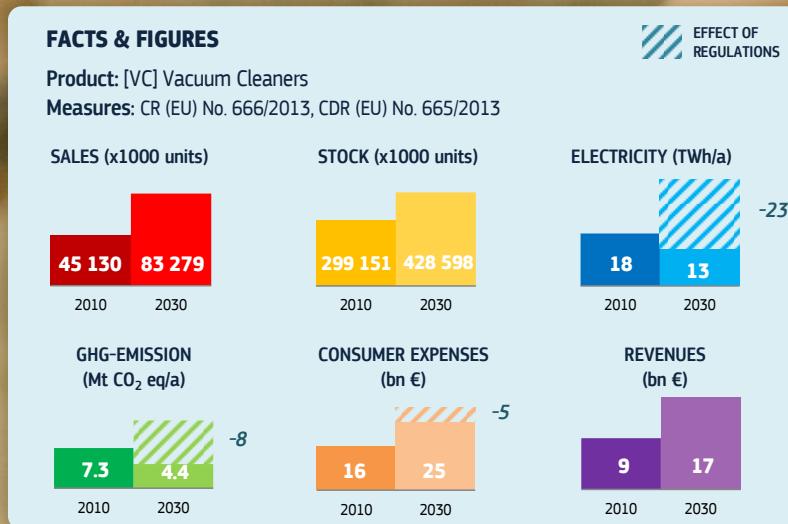


TUB

CANNISTER / CYLINDER

UPRIGHT

Vacuum Cleaners



CLEANING SURFACE 2020



EU-LOAD

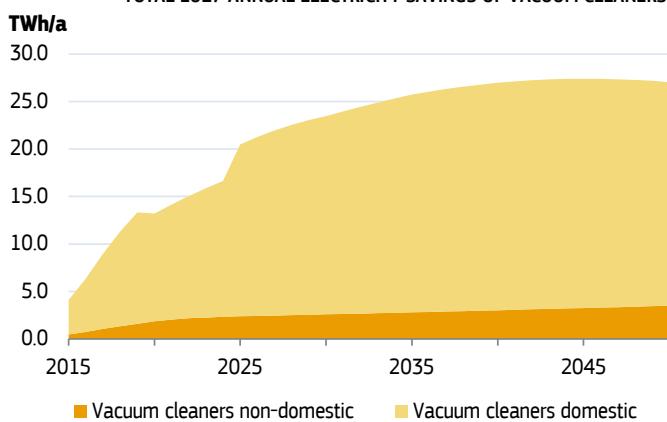
The EU-load represents the total demand for vacuum cleaner 'output' in EU27. It is expressed in the annual floor surface area to be cleaned. In 2020, this was 1.1 million km², which equals the combined land surface areas of France, Germany and the Benelux. This surface area is expected to increase slightly to 1.12 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.

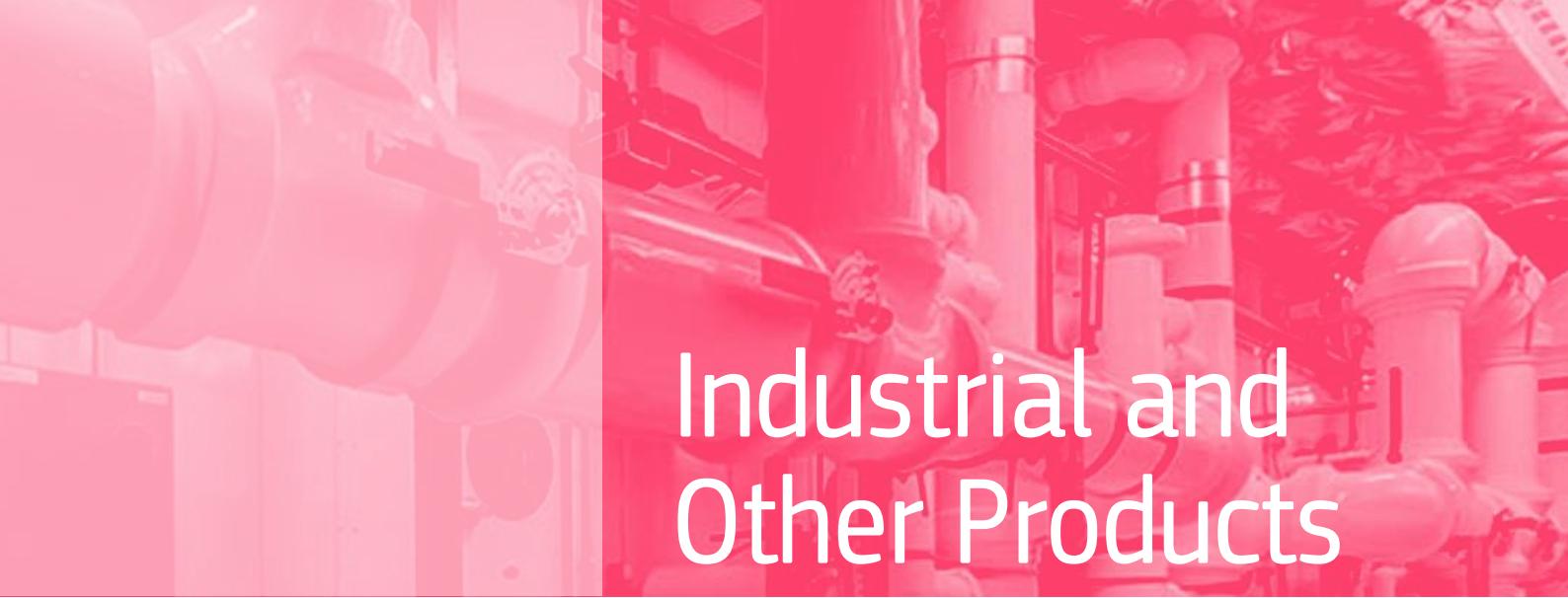
Without measures, total EU27 electricity consumption by VCs would have been 25 TWh/a in 2020 and 36 TWh/a in 2030. Due to measures this was reduced to 12 TWh/a in 2020 (-52%) and an expected 13 TWh/a in 2030 (-64%).

TOTAL EU27 ANNUAL ELECTRICITY SAVINGS OF VACUUM CLEANERS



APPLIANCES

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Industrial and Other Products

Industrial Fans

Electric Motors

Welding Equipment

Water Pumps (clean water)

Compressors (standard air)

Utility Transformers

Tyres

Industrial Fans



FACTS & FIGURES

Product: [FAN] Industrial Fans

Measure: CR (EU) No. 327/2011

SALES (x1000 units)

13 256	16 626
2010	2030

STOCK (x1000 units)

164 698	244 105
2010	2030

EFFECT OF REGULATIONS

ELECTRICITY (TWh/a)

excl. double counted

115	142
2010	2030

-31

GHG-EMISSION
(Mt CO₂ eq/a)

47	48
2010	2030

-10

CONSUMER EXPENSES
(bn €)

21	31
2010	2030

-4

REVENUES
(bn €)

3.6	5.8
2010	2030

+1

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.

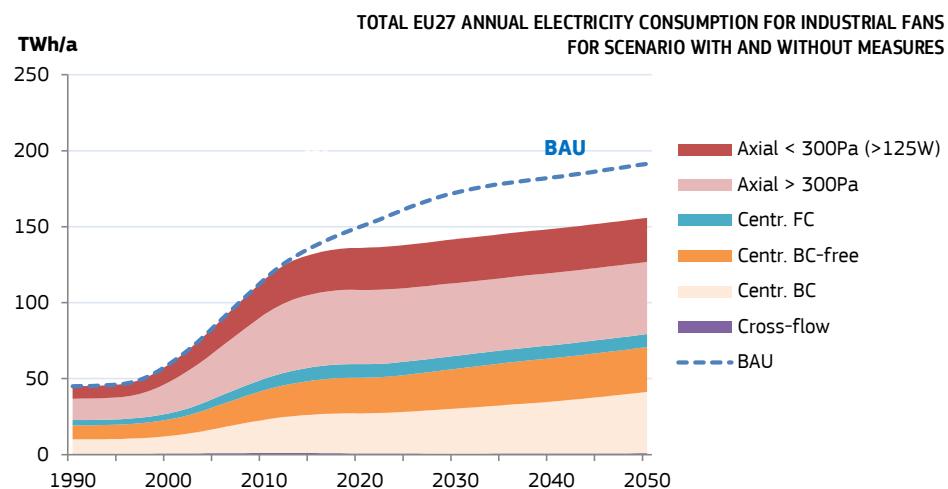
Smaller fans (< 125 W) are often integrated in products that are already regulated (or for which regulation is judged not effective), and therefore excluded here. They represent more than 90% of all installed units but use only 10% of total fan electricity.

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.

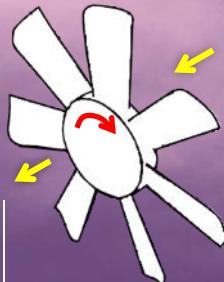
ELECTRICITY

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).

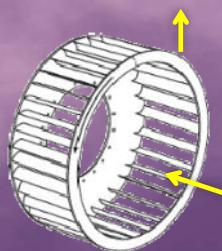
Almost half of the 2030 savings come from improvements on axial fans. Another 35% comes from centrifugal backward curved fans, 11% from centrifugal forward curved fans and 4% from cross-flow fans.



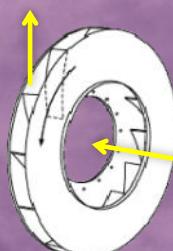
Industrial Fans



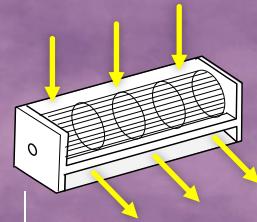
Axial-propeller
2020 sales: 11.8 mln (72%)
Efficiency: 31-37%
Improveable to: 39-44%



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



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



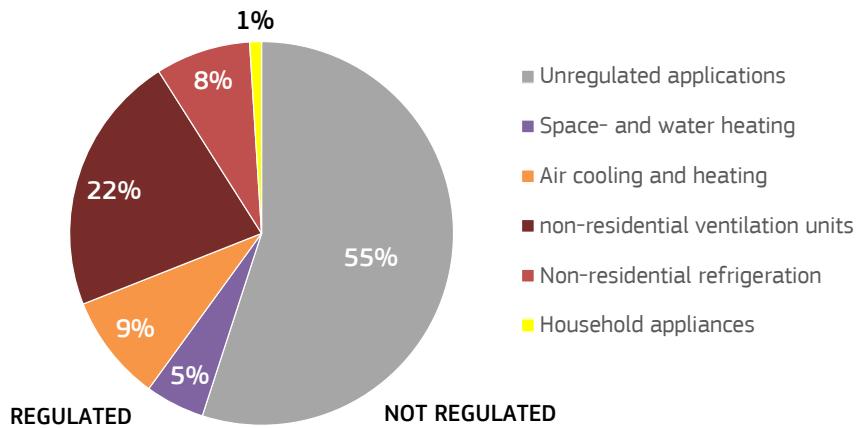
Cross-flow
2020 sales: 0.6 mln (4%)
Efficiency: 7%
Improveable to: 21%

DOUBLE-COUNTING

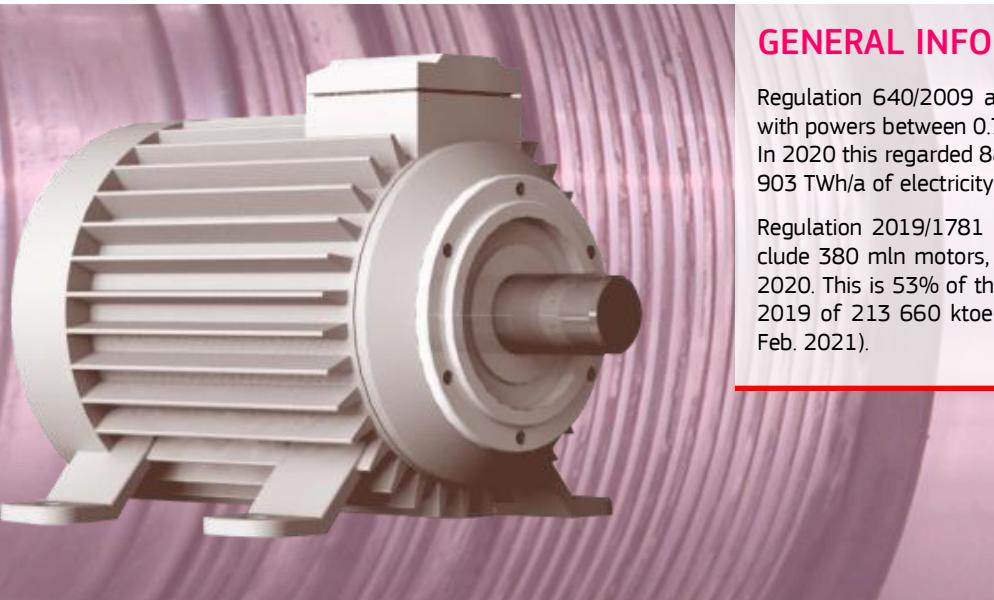
The fans in the scope of the fan-regulation may be included in products for which a separate regulation exists. In that case energy and savings in EIA could be counted twice. To resolve this, EIA first reports the full data for each fan type (for transparency reasons and to enable comparison with the 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 53% of the final electricity consumption in EU27 in 2019 of 213 660 ktoe = 2485 TWh (Eurostat Energy Balance, Feb. 2021).

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.

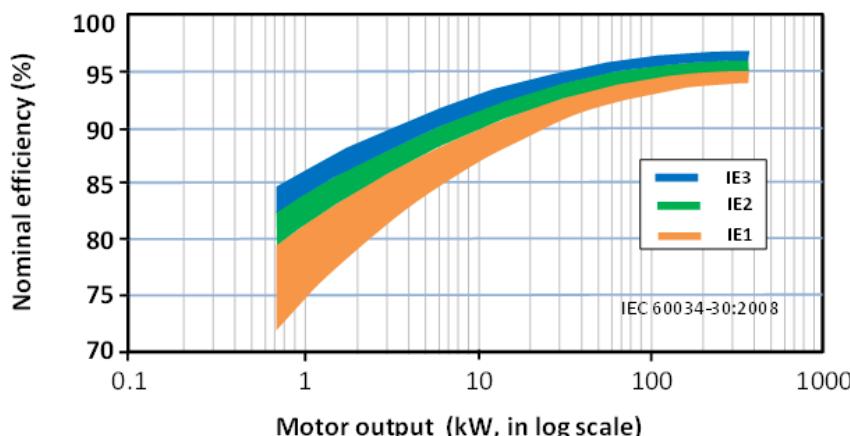
The 2019 regulation involves a scope extension, covering:

- 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)

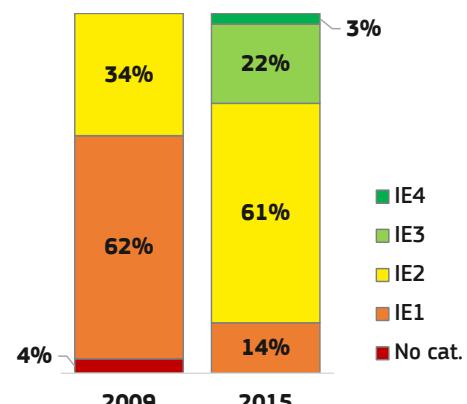
With this extension the 2020 stock to consider increases more than 4 fold, from 88 mln to 380 mln. The corresponding electricity consumption increases by 45% from 903 to 1326 TWh/a (including double counted). EIA data reflect the final 2019 regulation, as voted.

The efficiency of electric motors is indicated using classes (IE1, IE2, IE3) according to IEC60034-30: 2008.

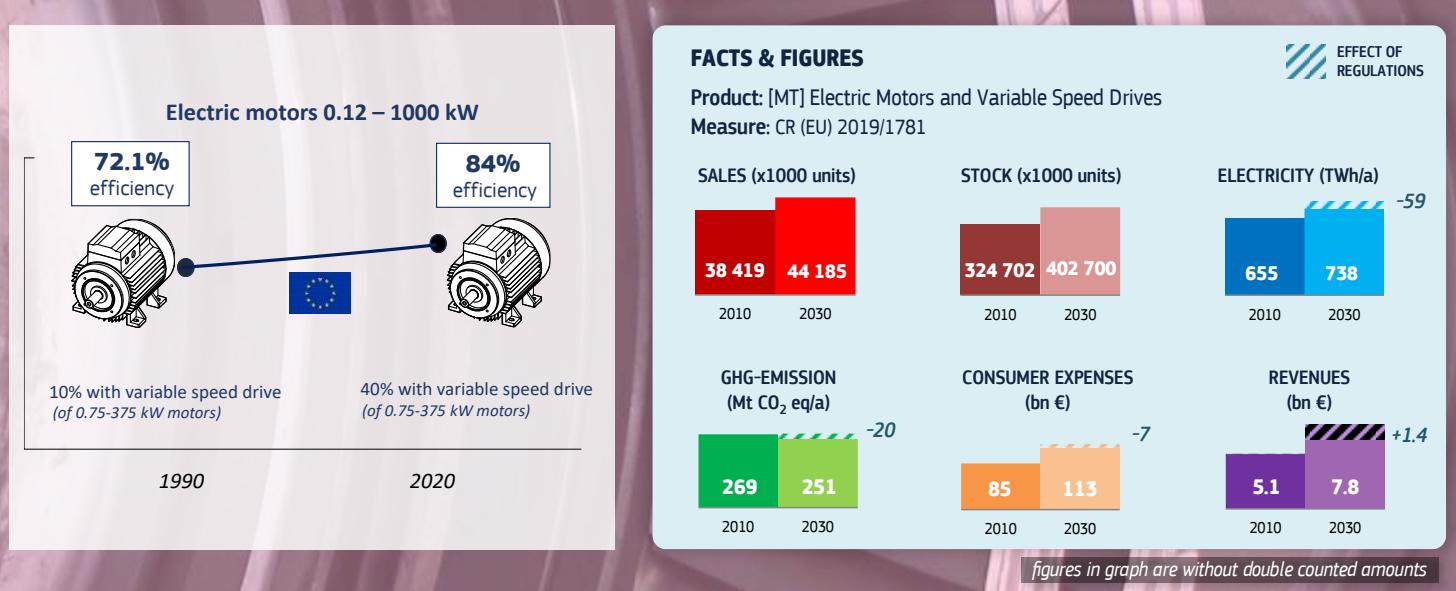
In the same class, the efficiency depends on the motor output power, e.g. an IE3 motor of 1 kW output has an efficiency around 85%, but an IE3 motor of 100 kW output has an efficiency around 96%.



EU MARKET SHARE MOTOR EFFICIENCY CLASSES IN 2009 AND 2015



Electric Motors



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.

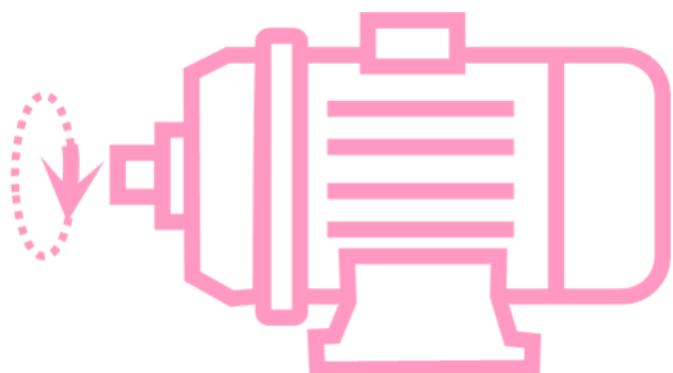
Regulation 640/2009 therefore promoted the use of VSDs in variable load applications. The 2019 regulation no longer has this promotion, but sets efficiency requirements also for VSDs.

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.



INDUSTRIAL AND OTHER PRODUCTS

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.

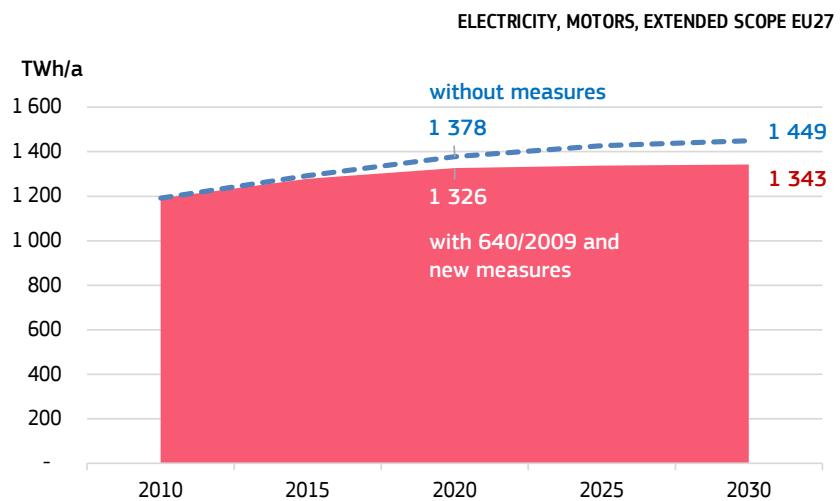
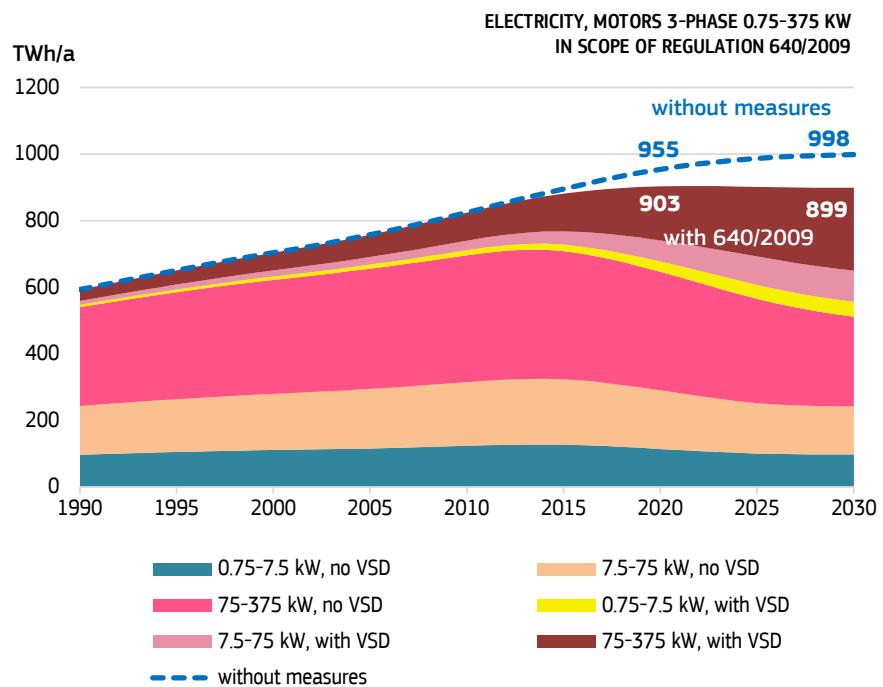
Due to the existing motor regulation (640/2009), the average efficiency of 0.75-375 kW AC 3-phase motors increased from 77.5% in 2009 to 82.1% in 2016. In parallel the share of motors sold with VSD increased from 17% in 2009 to 30% in 2016. These trends were expected to continue, even without the new 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 36 Mt CO₂eq/a in 2030, compared to a scenario without any regulation.

In 2030, considering 2.4 bn euros additional acquisition costs for higher efficiency motors and for VSDs, and 15.3 bn euros lower electricity costs, the net savings on total EU27 expenses for electric motors in scope of the revised regulation are 12.8 bn euros.



INDUSTRIAL AND OTHER PRODUCTS

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.

FACTS & FIGURES

Product: [WELD] Welding Equipment

Measure: CR (EU) No. 2019/1784



SALES (x1000 units)

479	497
2010	2030

STOCK (x1000 units)

2 969	3 111
2010	2030

ELECTRICITY (TWh/a)

6.4	5.6
2010	2030

GHG-EMISSION (Mt CO₂ eq/a)

2.6	1.9
2010	2030

CONSUMER EXPENSES (bn €)

3.4	3.3
2010	2030

REVENUES (bn €)

0.6	0.6
2010	2030

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.

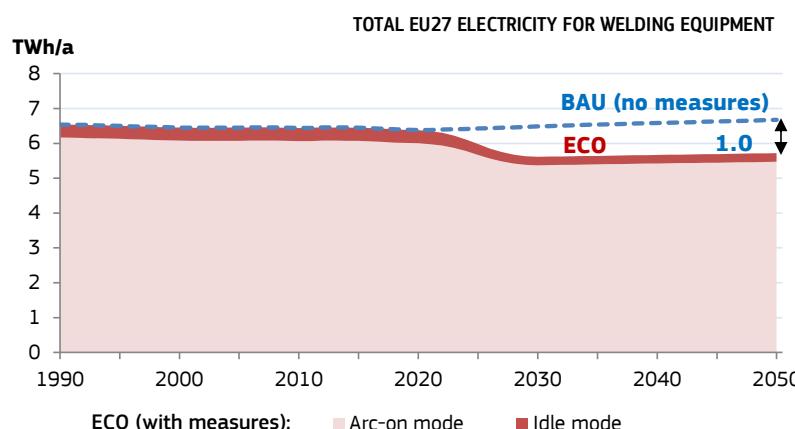
CONSUMABLES

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 35 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.



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.

The most important use of clean water pumps is in the agricultural sector (41% 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.

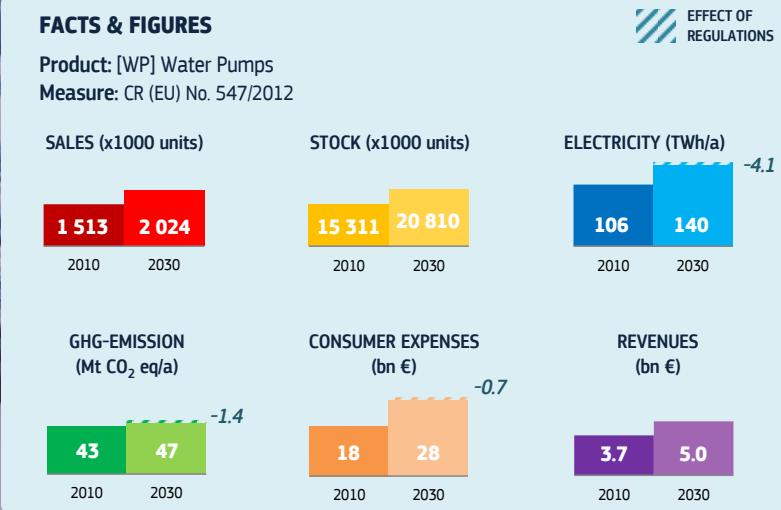
EFFICIENCY

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). $\text{MEI}=0$ indicates poor design and manufacturing quality. $\text{MEI}>0.7$ 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 $\text{MEI}=0.4$, meaning that 40% of the products on the market will need to improve their efficiency level.

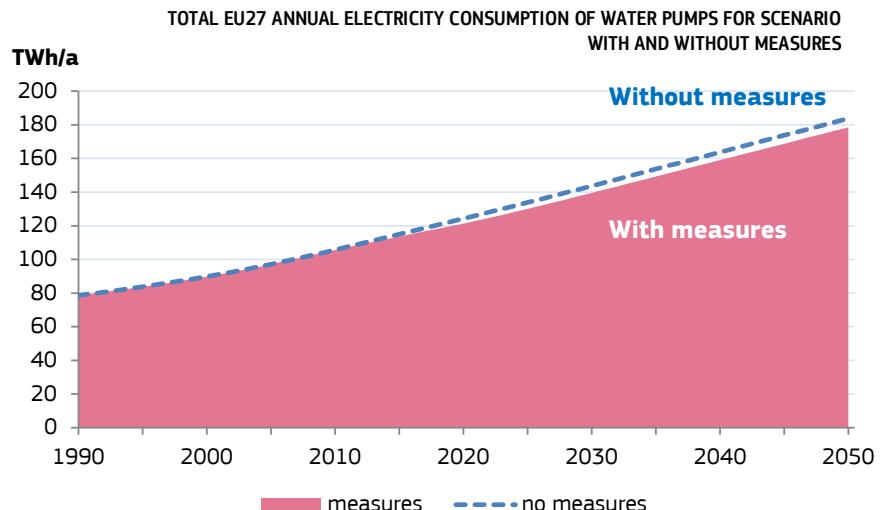
In 2008 the average hydraulic efficiency of clean water pumps in scope of the regulation was 66.5% and without measures this was not expected to change. Due to Ecodesign measures the efficiency has increased to 68.5% from 2020 onwards.

Water Pumps



SAVINGS

In 2020, clean water pumps consumed 121 TWh/a of electricity (input energy to motors driving the pumps), corresponding to 46 Mt CO₂eq/a of GHG emissions. Due to an increasing stock this would have increased to 140 TWh/a and 47 Mt CO₂eq/a in 2030. Measures are expected to realise savings of 4 TWh/a and 1.4 Mt CO₂eq/a in 2030.



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 5 TWh/a savings of the current regulation this approach, with extended scope, is expected to deliver 43 TWh/a savings by 2030.

Review study data are not considered in EIA yet.

Compressors



GENERAL INFO

Compressed air is so widely used in industry that it is often regarded as the fourth utility after electricity, natural gas and water. Some of the benefits of using compressed air when compared to other utilities are easy storage, no sparks or fire hazards, a high power density, no interference with electronic monitoring equipment, or simply because no other utility would be able to do the task (air as soft transport medium, air for breathing). But compressed air is also more expensive when evaluated per unit of energy delivered. Therefore the production and use of compressed air needs to be prudent, especially from an environmental point-of-view.

REGULATION

Most compressed air for industrial purposes is produced by “standard air” compressor packages. A draft EU-regulation for these products has been proposed (2014) but is not finally accepted yet. EIA data are based on this proposal.

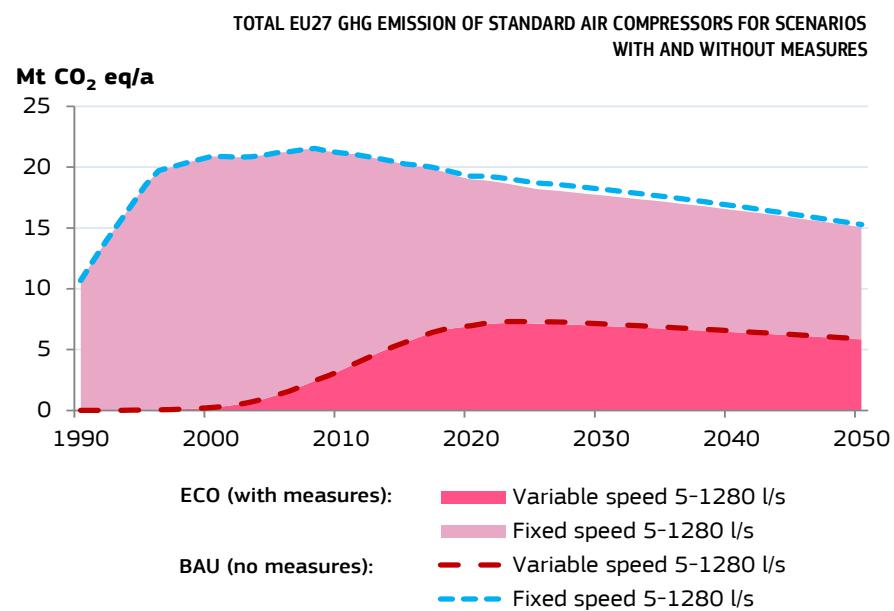
Minimum energy efficiency requirements for “standard air” compressors have already been implemented in China in 2009, and a regulation has been proposed in the USA in May 2016 (partially based on the EU Lot 31 study). These extra-EU regulations more or less constrain the EU to take action as well, to avoid becoming a dumping ground for under-performing air compressors.

STOCK AND ELECTRICITY

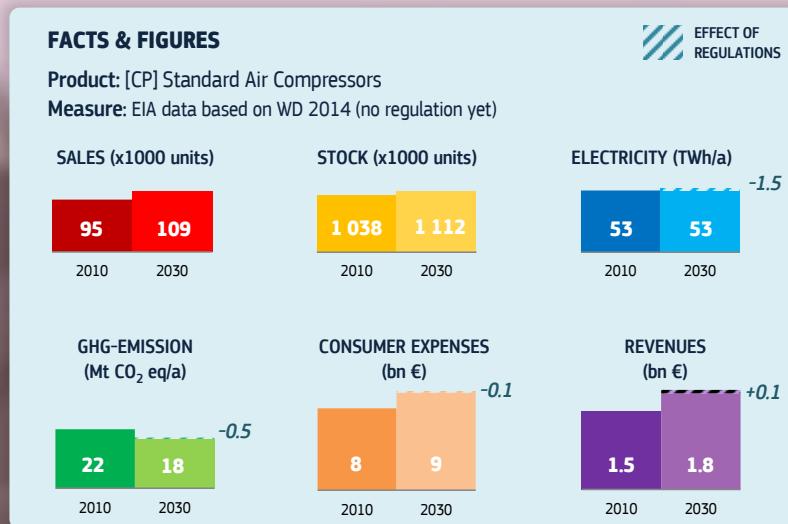
In 2020, annual sales of “standard air” compressors were 102 thousand units, and a total of 1.03 million was operating in EU27. These compressors consumed 53 TWh/a of electricity, almost 2% of the total EU27 electricity consumption.

Piston compressors form 43% of the 2020 EU stock, but are relatively small and consume only around 2% of the overall compressor electricity. Fixed speed rotary compressors represent 44% of the stock, but are responsible for 60% of the electricity. Variable speed compressors represent 13% of stock and 38% of electricity.

GREENHOUSE GAS EMISSIONS



Compressors



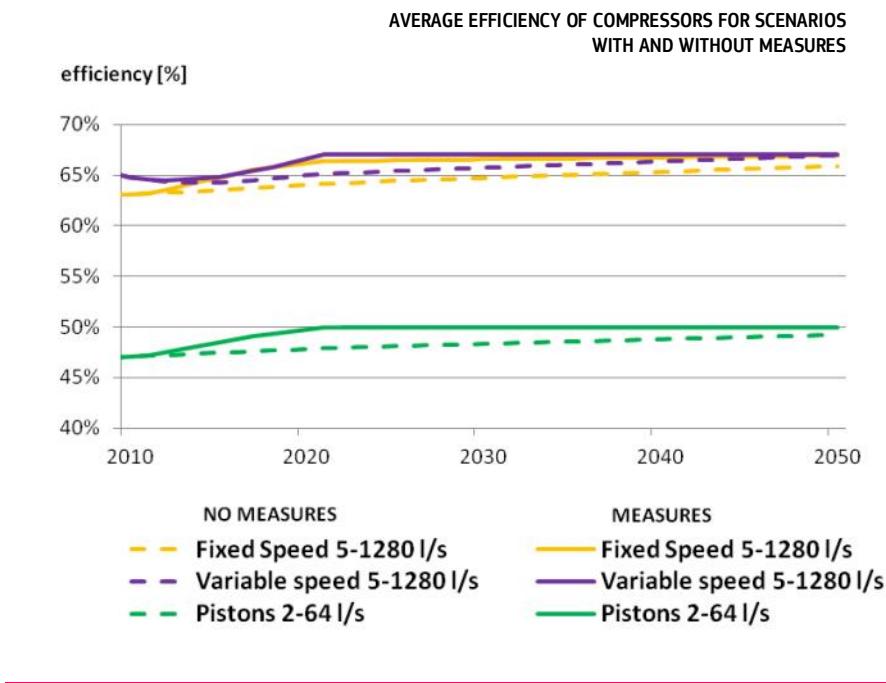
EFFICIENCY AND TYPES

The (isentropic) efficiency of compressors is defined as the output power, in terms of pressure and volume flow rate of the compressed air, divided by the electric input power to the motor driving the compressor (so it includes also motor efficiency).

In general the efficiency increases with the capacity of the compressor (larger = more efficient); the requirements in the proposed regulation therefore vary with the volume flow rate (higher limits for larger compressors). In the 2nd tier (2020) the proposed regulation aims at removing from the market the compressors that are less efficient than the current average. The 1st tier (2018) phases out a smaller part of least efficient compressors.

For compactness reasons, EIA reports data for 3 aggregated compressor groups: **fixed speed rotary**, **variable speed rotary**, and **piston compressors**. The characteristics for these groups (including efficiency) are weighted averages of those for the various volume flow classes, and therefore rather 'artificial' values.

The average efficiency of new fixed speed rotary compressors in 2010 was 63.1%. Without measures this is expected to increase to 64.7% by 2030; with measures to 66.6%. For variable speed rotary compressors these values are 64.8% (2010), 65.7% (2030) and 67.0% (2030 with measures). Piston-types have lower average efficiency: 47.0% (2010), 48.3% (2030) and 50.0% (2030 with measures).



SAVINGS

Without measures, the electricity consumption of "standard air" compressors is expected to increase to 54.9 TWh/a in 2030. Introduction of the measures could decrease this to 53.3 TWh/a (-1.5 TWh, -2.7%). Two-thirds of these savings are obtained on the fixed speed rotary compressors. The savings could be increased if the measure promotes recovery

of the heat generated during the compression.

The associated savings on greenhouse gas emissions are 0.5 Mt CO₂eq/a in 2030. Expected savings on expenses are 0.7 billion euros in the same year.

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.

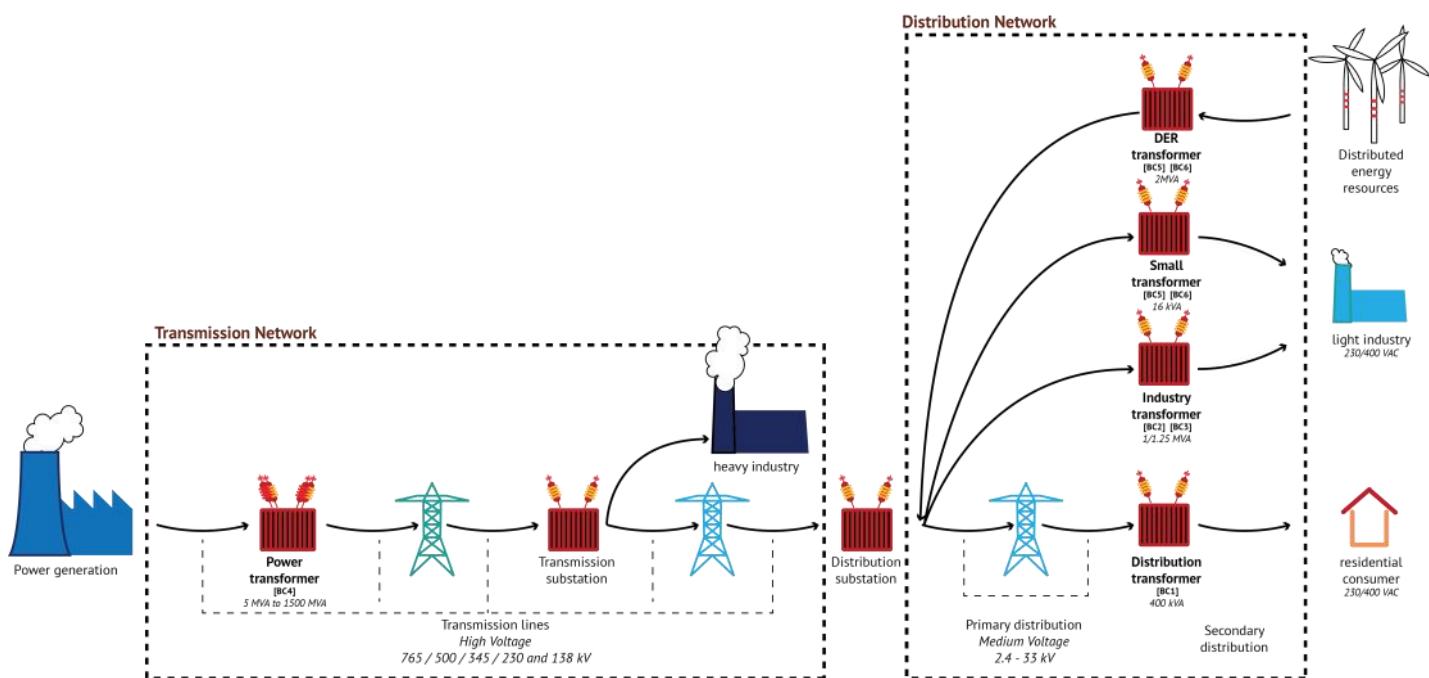
TRAFOs are used in the transmission and Distribution of electricity, between the point of generation and the point of use. The associated losses are already considered in EIA as part of the efficiency assumed for electricity generation and distribution (PEF). This PEF is used when determining the primary 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.

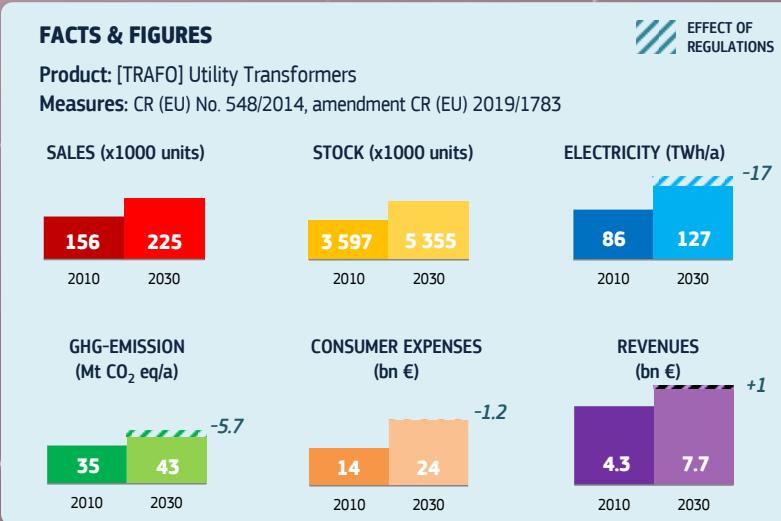
Utility transformers supply electricity for residential use (230 V). Higher power Industry transformers (either oil filled or dry) supply industrial consumers with low voltage electricity. DER-transformers (oil-filled or dry) connect Distributed Energy Resources (e.g. wind turbines, solar panels) to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

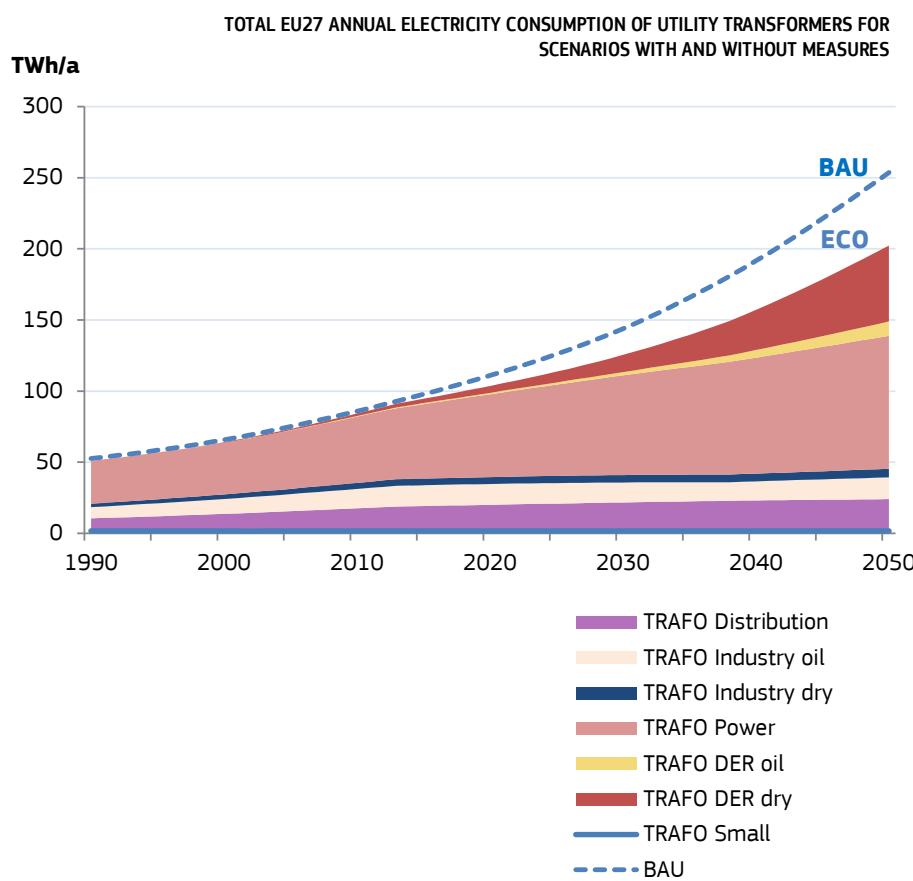


INDUSTRIAL AND OTHER PRODUCTS

Utility Transformers



STOCK, LOSSES AND SAVINGS



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.

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 CO₂ 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

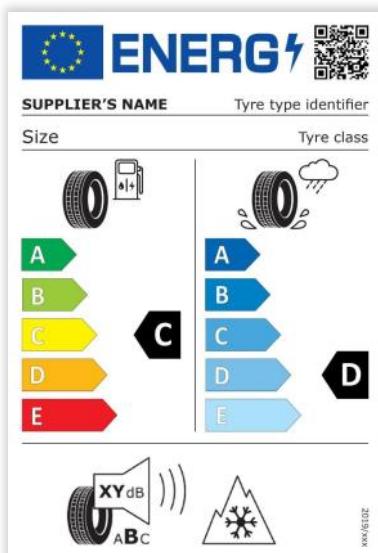
The EU adopted in 2009 two sets of rules relating to tyres:

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 will enter into force in 2021 under Regulation 2020/740.



ENERGY LABELLING

The new label for tyres, to be used from 2020, 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.

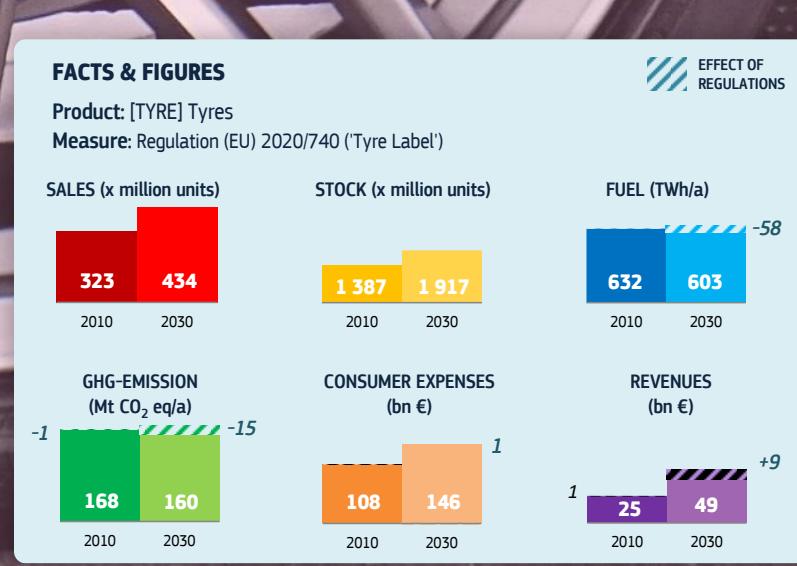
The fuel efficiency label class is determined based on the 'rolling resistance coefficient' (RRC) which is measured according to UNECE Regulation 117 and subsequent amendments. The RRC is expressed in kg rolling resistance per ton of vehicle weight, kg/t.

TYRE TYPES

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

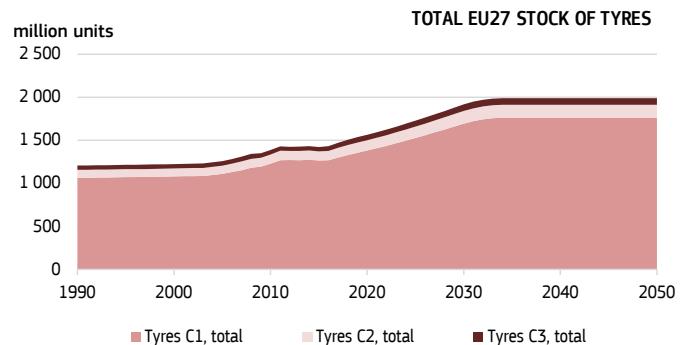
Labelling applies to replacement tyres and to OEM-tyres mounted under vehicles being sold. The revised regulation will also apply to re-treaded tyres once a suitable testing method for such tyres is in place. Re-treading of tyres is frequently applied for C3 tyres. It is a reworking process in which 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.



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%).



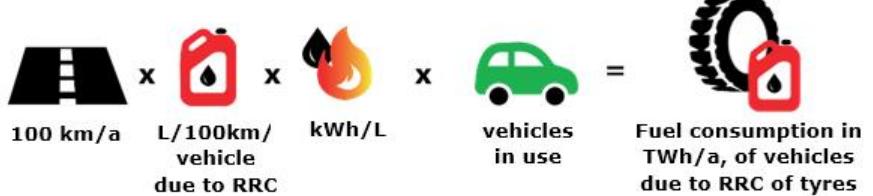
ENERGY CALCULATION

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.

INDUSTRIAL AND OTHER PRODUCTS

Tyres

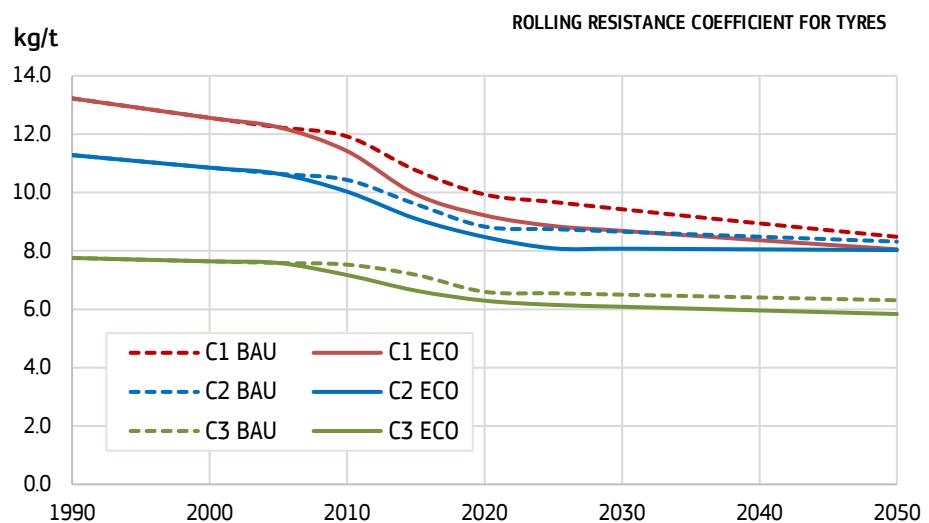
TYRE EFFICIENCY

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).



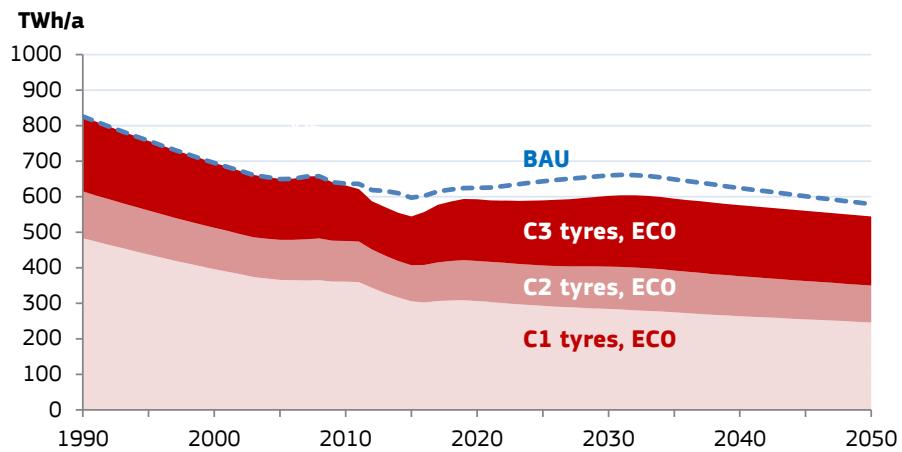
SAVINGS

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 CO₂eq/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

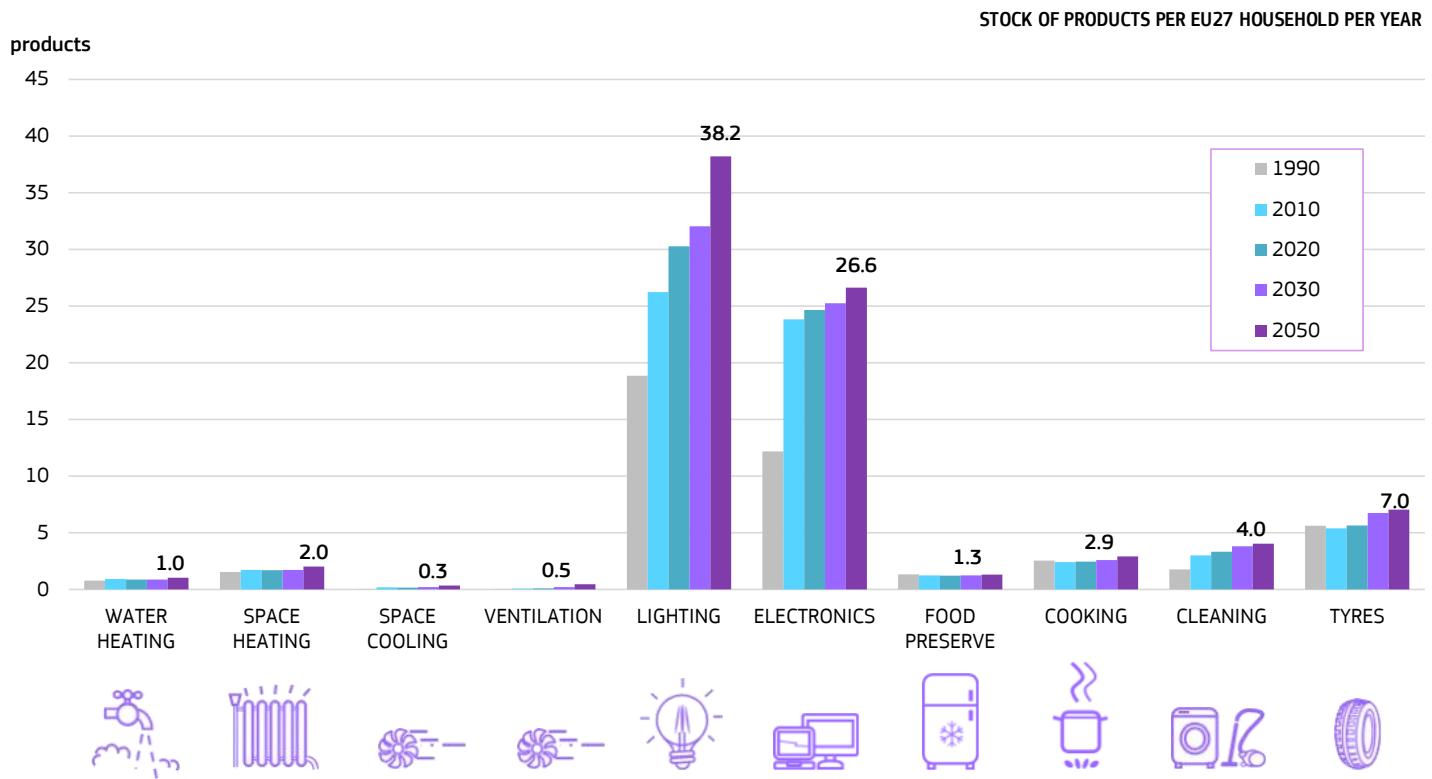
Sales and Stock

Energy Consumption

Expense Savings

Sales and Stock

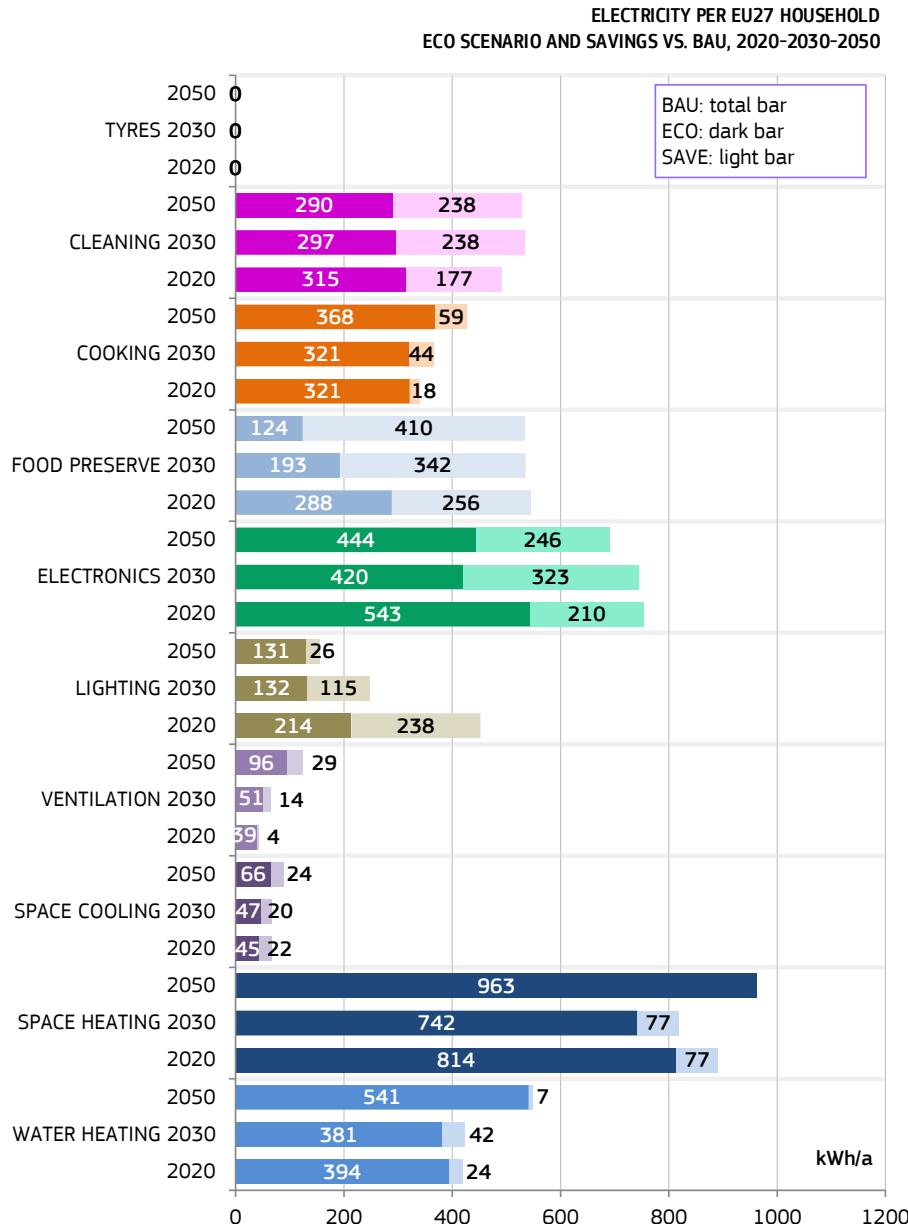
In 2020, the average EU27 household bought 11 products that are regulated by Ecodesign or Energy Labelling, of which 4 light sources, 4 electronics products and 1 tyre. On average a household used 70 regulated products in 2020, of which 30 light sources and 25 electronics products.



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



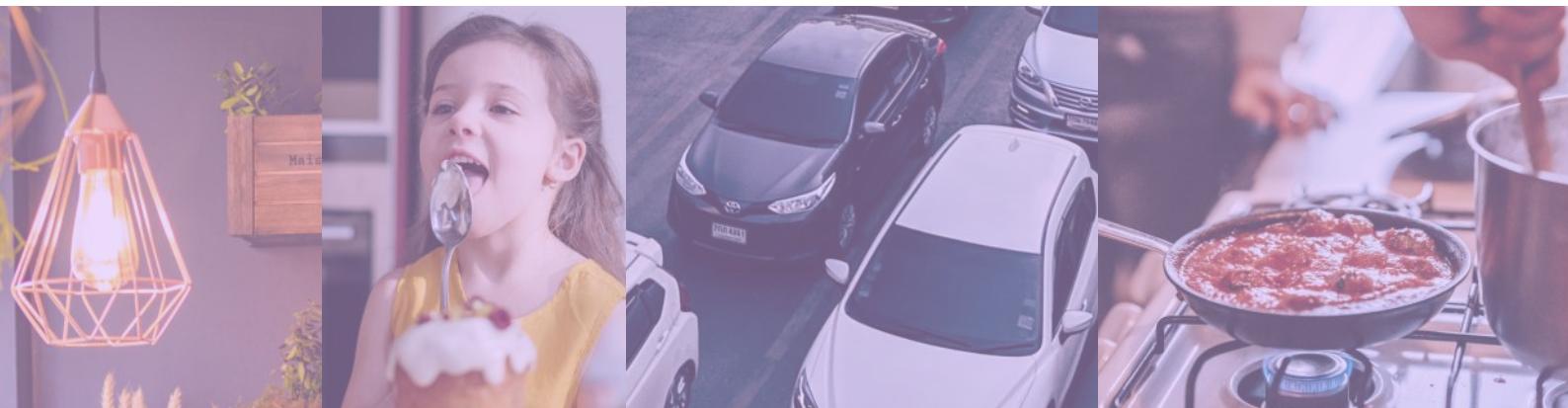
In 2020, due to Ecodesign and Energy Labelling regulations, the average EU27 household saved 1000 kWh/a of electricity, projected to grow in 2030 to 1200 kWh/a. This is respectively 27% (2020) and 33% (2030) of the total annual electricity consumption of the average household in 2019.

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 2019. 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 530 kg CO₂-equivalent of greenhouse gases in 2020. In 2030 this is projected to increase to almost 700 kg CO₂eq/household.



Expense Savings

In 2020, the average EU27 household spent 2760 euros for the acquisition, installation, operation, and maintenance of regulated products. Without the Ecodesign and Energy Labelling regulation this would have been 2970 euros: a saving of 210 euros per year per household, or a saving of 8% compared to the situation without measures.

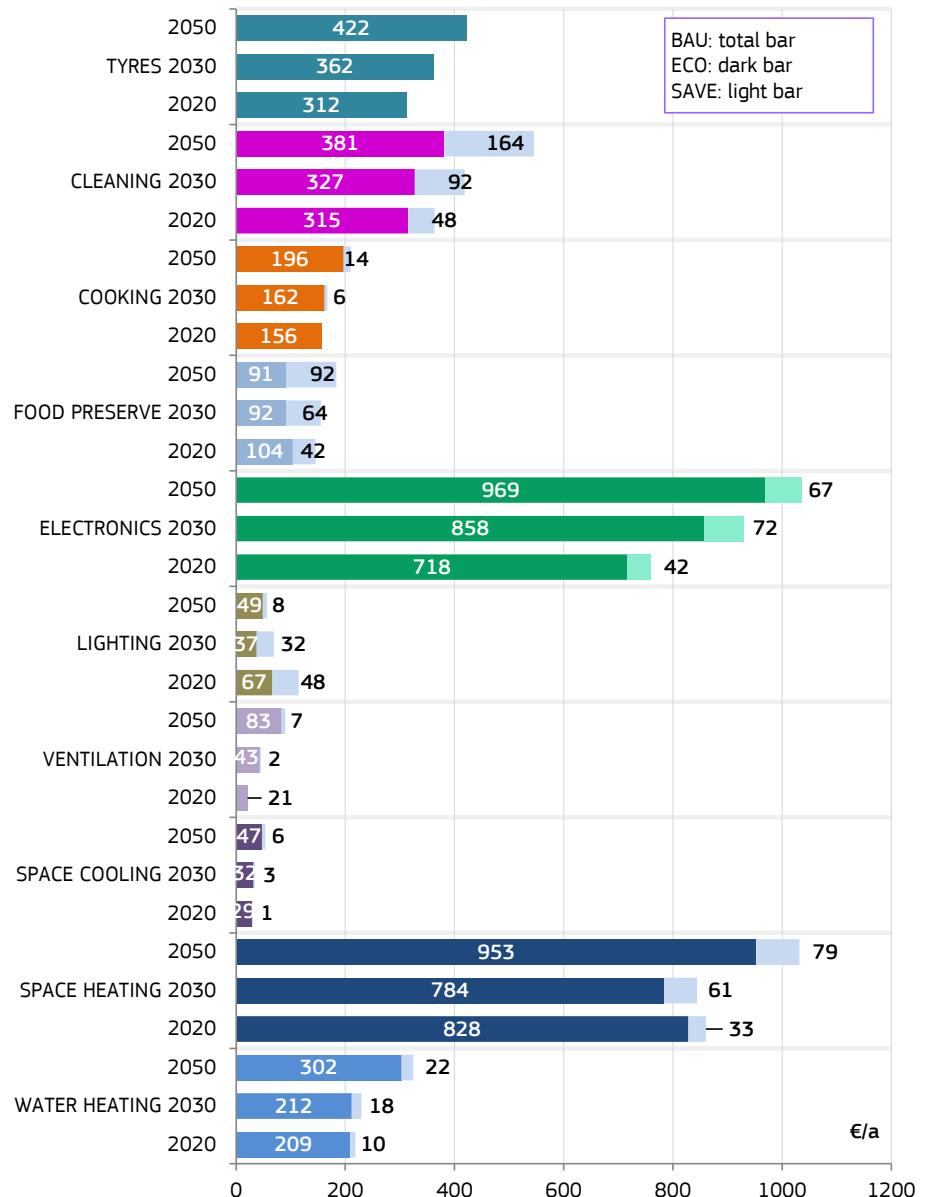
Direct savings are only on products used in the households themselves, and a breakdown is shown on the right.

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 93 euros.

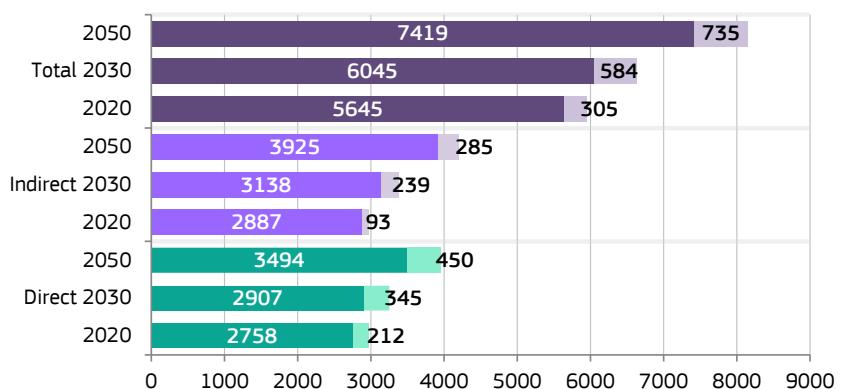
Summarising, the total expense savings in 2020 are between 210 and 300 euros per household. In 2030, this is projected to increase to between 350 and 580 euros per household.



DIRECT USER EXPENSE PER EU27 HOUSEHOLD (incl. VAT, 2015 EUROS)
ECO SCENARIO AND SAVINGS VS. BAU, 2020-2030-2050



TOTAL USER EXPENSES EU27 HOUSEHOLDS
(incl. VAT, 2015 EUROS)





Key Facts Summary Tables

KEY FACTS SUMMARY TABLES

CHC Central Heating Combi,

water heating	unit	1990	2010			2020			2030		
Sales	'000	3 362	4 643			5 092			5 329		
Stock	'000	49 793	85 552			90 621			92 230		
Effective heat output per unit	kWh/a	2 106	2 163			2 143			2 120		
EU effective heat output	TWh heat/a	105	185			194			196		
EU hot water (60 °C) use	M m³/a	1 797	3 172			3 329			3 353		
	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
GWP emissions	MtCO₂/a	40	58	58	0	53	50	-3	47	40	-7
Total expenditure	bn €	14	25	25	0	24	23	-1	25	24	-1
Revenue Total	bn €	3.9	4.9	4.9	0.0	5.1	5.3	0.2	5.4	7	1.3
Jobs Total	'000 jobs	43	53	53	0	56	58	3	59	73	14

CH Central Heating boiler,

space heating	unit	1990	2010			2020			2030		
Sales	'000	4 121	5 098			5 548			5 904		
Stock	'000	61 069	98 280			102 939			105 357		
Effective heat output per unit	kWh/a	14 599	10 825			9 339			8 131		
EU effective heat output	TWh heat/a	892	1 064			961			857		
	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
GWP emissions	MtCO₂/a	459	432	427	-5	338	308	-30	262	208	-54
Total expenditure	bn €	123	171	170	-2	142	134	-8	136	124	-12
Revenue Total	bn €	24	31	31	0	29	31	2	31	38	7
Jobs Total	'000 jobs	267	334	334	0	319	340	21	341	419	77

WH Dedicated Water Heaters

	unit	1990	2010			2020			2030		
Sales volume	'000	8 395	9 499			9 303			10 514		
Stock of units in use	'000	116 775	149 821			146 884			150 516		
Effective heat output per unit	kWh/a	632	719			758			764		
EU effective heat output	TWh heat/a	74	108			111			115		
EU hot water (60 °C) use	M m³/a	1 264	1 847			1 909			1 972		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a	234	317	317	0	315	291	-24	269	228	-41
o/w electricity	TWh elec/a	75	108	108	0	113	105	-7	116	100	-16
o/w fuel	TWh fuel/a	46	47	47	0	34	28	-6	25	17	-7
GWP emissions	MtCO₂/a	47	54	54	0	49	46	-4	44	38	-7
Total expenditure	bn €	24	31	31	0	33	31	-2	36	32	-4
Revenue Total	bn €	6.2	8	8	0	8	8	0	9	9	0.0
Jobs Total	'000 jobs	65	87	87	0	84	84	0	91	91	0

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 fuel	TWh fuel/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	-1.1	
Total expenditure	bn €	18		12	12	0	13	13	0	13	13	
Revenue Total	bn €	1.7		3.7	3.7	0.0	3.0	3.2	0.2	3.2	3.5	
Jobs Total	'000 jobs	23		56	56	0	45	48	3	49	53	
LH Local 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		
	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 fuel	TWh fuel/a	117	148	148	0	173	170	-3	190	172	-17	
GWP emissions from energy	MtCO ₂ /a	112	84	84	0	67	64	-3	50	45	-5	
Total expenditure	bn €	52		52	52	0	56	56	0	57	55	
Revenue Total	bn €	8.8		13.3	13	0.0	15.3	16.6	1.4	16.4	18	
Jobs Total	'000 jobs	122		186	186	0	211	231	20	225	247	
Note: This includes all double counted amounts (otherwise everything would be zero)												
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		
	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	0.0	37	24	-13	35	21	-14	
GWP emissions	MtCO ₂ /a	14	16	16.0	0.0	14	9	-5	12	7.1	-4.7	
Total expenditure	bn €	8		12	11.5	0	12	11	-2	12	9.8	
Revenue Total	bn €	2.6		4.2	4.2	0.0	4.5	5.3	0.8	4.5	4.8	
Jobs Total	'000 jobs	34		55	55	0	58	68	10	57	62	
AHC Central Air Cooling												
	unit	1990		2010			2020			2030		
Sales, Total Central Air Cooling	'000	124		526			620			684		
Stock comfort chillers & reversibles	'000	1471		6539			8793			10 113		
	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	
GWP emissions from energy & refrigerant loss	MtCO ₂ /a	35	55	55	0	59	58	-1	53	49	-4.2	
o/w GWP emissions from energy	MtCO ₂ /a	0	0	0	0	0	0	0	0	0	0.0	
o/w GWP emissions refrigerant loss	MtCO ₂ /a	0	0	0	0	0	0	0	0	0	0.0	
Total expenditure	bn €	14		31	31	0	41	41	-1	49	47	
Revenue Total	bn €	2		11	11	0	16	16	0	21	21	
Jobs Total	'000 jobs	30		140	140	0	202	202	0	258	259	

KEY FACTS SUMMARY TABLES

AHC Central Air Heating		unit	1990		2010		2020		2030		
Sales air heaters & reversible AC's	'000		185		378		432		451		
Stock	'000		2 172		4 972		5 945		6 559		
Scenario			BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy	TWh prim/a		233	254	254	0	230	219	-11	182	153
o/w electricity	TWh elec/a		16	45	45	0	50	47	-2	48	42
o/w fuel	TWh fuel/a		194	141	141	0	106	100	-6	82	66
GWP emissions from energy	MtCO ₂ /a		49	49	49	0	41	39	-2	34	28
Total expenditure (excl. acq & maint rev AC)	bn €		11	15	15	0	14	13	-1	14	12
Revenue Total	bn €		0.77	0.54	0.54	0.00	0.47	0.51	0.04	0.42	0.45
Jobs Total	'000 jobs		10	7	7	0	6	7	1	5	6
RAC Room Air Conditioner		unit	1990		2010		2020		2030		
Sales	'000		373		4 205		4 377		5 878		
Stock	'000		4 376		50 293		46 089		59 641		
Scenario			BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy total (100% electric)	TWh prim/a		10.1	143	110	-33	139	93	-46	152	111
Electricity total	TWh elec/a		4.1	57	44	-13	56	37	-18	72	53
o/w electricity cooling	TWh elec/a		2.9	27	20	-7	19	12	-7	20	13
o/w electricity heating	TWh elec/a		1.1	31	24	-6	36	25	-11	53	39
GWP emissions total	MtCO ₂ /a		2.0	23	18	-5.4	21	14	-7	25	18
o/w GWP emissions for cooling	MtCO ₂ /a		1.5	10.9	8.2	-2.7	7.3	4.6	-2.7	6.7	4.6
o/w GWP emissions for heating	MtCO ₂ /a		0.6	12.5	9.9	-2.7	13.8	9.5	-4.3	17.9	13.4
o/w GWP emissions refrigerant loss	MtCO ₂ /a		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total expenditure	bn €		1	16	15	-1	17	15	-2	24	20
Revenue Total	bn €		0.5	5.9	7.0	1.1	5.8	7.1	1.4	7.5	8.5
Jobs Total	'000 jobs		5	65	78	13	64	80	16	84	95
LS Light Sources		unit	1990		2010		2020		2030		
			BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Sales	m		1 743	2 383	2 181	-202	2 310	1 509	-801	1 364	582
Stock	m		4 620	8 659	8 606	-53	10 767	10 793	26	12 641	12 658
EU output capacity in lm	Tlm		4.6	8.9	8.9	0.0	12.7	13.0	0.3	16.2	16.7
EU accumulated operating hours total	Th/a		3.9	7.4	7.4	0.0	9.4	9.4	0.1	11.5	11.7
(incl. CG and sb; excl. SPL and ctrl)	Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy	TWh prim/a		494	789	751	-38	936	734	-202	703	502
o/w electricity	TWh elec/a		198	316	300	-15	375	294	-81	335	239
GWP emissions	MtCO ₂ /a		99	129	123	-6	142	112	-31	114	81
Total expenditure	bn €		44	66	64	-2	84	68	-16	80	61
Revenue Total	bn €		7.3	15.4	15.8	0.4	19.4	18.3	-1.0	17.7	17.1
Jobs Total	'000 jobs		91	188	194	6	251	246	-5	224	224

VU Ventilation Units

(residential & non-residential)	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			
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy (elec. & heat effects)	TWh prim/a	66	108	108	0	113	86	-27	112	41	-71
o/w electricity	TWh elec/a	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 prim/a	0	0	0	0	0	-16	-16	0	-44	-44
GWP emissions (from electricity; excl. heat effects)	MtCO ₂ /a	13	18	18	0	17	16	-1	18	15	-3
Total expenditure (from elec. + acq. + maint.; excl. from heat savings)	bn €	10	24	24	0	28	28	0	34	33	-1
Revenue Total	bn €	5	17	17	0	19	20	1	22	23	1
Jobs Total	'000 jobs	58	206	206	0	239	250	11	277	287	10

DP Electronic Displays

	unit	1990		2010		2020		2030			
Sales	'000	29 455		83 489		59 668		73 151			
Stock	'000	185 717		446 262		521 649		626 211			
Viewable area per TV	dm ²	10		28		51		68			
Viewable area per monitor	dm ²	16		46		84		113			
EU electronic displays viewable area	km ²	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 electricity	TWh elec/a	27	78	78	0	106	85	-20	113	62	-51
GWP emissions	MtCO ₂ /a	14	32	32	0	40	32	-8	39	21	-17
Total expenditure	bn €	24	46	46	0	46	42	-4	55	44	-11
Revenue Total	bn €	16	28	28	0	22	22	0	27	27	0
Jobs Total	'000 jobs	256	439	439	0	349	349	0	427	427	0

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			
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a	0	26	23	-2.9	46	33	-12.7	33	25	-8.0
o/w electricity	TWh elec/a	0	10	9	-1.2	18	13	-5.1	16	12	-3.8
GWP emissions	MtCO ₂ /a	0	4	4	-0.5	7	5	-1.9	5	4	-1.3
Total expenditure	bn €	0	8	7	-0.2	9	8	-1.0	9	8	-0.8
Revenue Total	bn €	0.0	4.8	4.8	0.0	4.8	4.8	0.0	4.8	4.8	0.0
Jobs Total	'000 jobs	0	68	68	0.0	66	66	0.0	66	66	0.0

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	0.0	51	51	0.0	48	48	0.0
o/w electricity	TWh elec/a	17	31	31	0.0	20	20	0.0	23	23	0.0
GWP emissions	MtCO ₂ /a	8	13	13	0.0	8	8	0.0	8	8	0.0
Total expenditure	bn €	16	78	78	0.0	88	88	0.0	129	129	0.0
Revenue Total	bn €	12	65	65	0.0	74	74	0.0	109	109	0.0
Jobs Total	'000 jobs	186	1042	1042	0.0	1192	1192	0.0	1758	1758	0.0

KEY FACTS SUMMARY TABLES

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		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy	TWh prim/a	0.0	12	12	-0.1	23	13	-10.1	18	10	-8.6		
o/w electricity	TWh elec/a	0.0	5	5	0.0	9	5	-4.0	9	5	-4.1		
GWP emissions	MtCO ₂ /a	0.0	2.0	1.9	0.0	3.5	2.0	-1.5	2.9	1.5	-1.4		
Total expenditure	bn €	0.2	5	5	0.0	6	5	-0.8	6	5	-0.9		
Revenue Total	bn €	0.1	3.2	3.2	0.0	3.2	3.2	0.0	3.2	3.2	0.0		
Jobs Total	'000 jobs	2.4	52	52	0.0	52	52	0.0	52	52	0.0		

Note: video players and recorders and projectors removed in EIA 2019. Standby still included under standby heading.

EPS External Power Supplies	unit	1990			2010			2020			2030		
Sales	'000 000	19			401			430			436		
Stock	'000 000	51			1 386			1 709			1 739		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy	TWh prim/a	0	30	30	-0.3	42	29	-12.5	32	21	-11.4		
o/w electricity	TWh elec/a	0	12	12	-0.1	17	12	-5.0	15	10	-5.4		
GWP emissions	MtCO ₂ /a	0.1	4.9	4.9	-0.1	6.3	4.4	-1.9	5.3	3.4	-1.8		
Total expenditure	bn €	0.2	6.3	6.3	0.0	7.42	6.52	-0.91	7.7	6.5	-1.1		
Revenue Total	bn €	0.1	2.7	2.7	0.0	2.7	2.7	0.0	2.8	2.8	0.0		
Jobs Total	'000 jobs	1	41	41	0	41	41	1	42	42	0		

SB (networked) Stand-by (EXCL. DOUBLE COUNTING)	unit	1990			2010			2020			2030		
Sales	'000 000	237			367			387			405		
Stock	'000 000	1 685			2 678			2 791			2 872		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
Primary energy	TWh prim/a	18	75	71	-3.2	81	45	-35.9	73	39	-33.8		
o/w electricity	TWh elec/a	7	30	29	-1.3	32	18	-14.3	35	18	-16.1		
GWP emissions	MtCO ₂ /a	4	12	12	-0.5	12	7	-5.4	12	6	-5.5		
Total expenditure	bn €	13.2	26.4	26.1	-0.2	31.0	28.2	-2.8	35.0	31.6	-3.5		
Revenue Total	bn €	9.9	17.9	17.9	0.0	21.1	21.1	0.0	23.7	23.7	0.0		
Jobs Total	'000 jobs	139	252	252	0.0	296	296	0.0	333	333	0.0		

SB (networked) Stand-By (INCL. DOUBLE COUNTING)	unit	1990	2010	2020			2030						
Sales	'000 000	279	472	500			520						
Stock	'000 000	2 128	3 495	3 810			3 971						
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO			
Primary energy	TWh prim/a	54	130	121	-9.6	166	92	-74.3	135	67	-68.2		
o/w electricity	TWh elec/a	21	52	48	-3.8	66	37	-29.7	64	32	-32.5		
GWP emissions	MtCO ₂ /a	11	21	20	-1.6	25	14	-11.3	22	11	-11.0		
Total expenditure	bn €	15.8	30.3	29.6	-0.7	37.6	31.9	-5.7	41.4	34.4	-6.9		
Revenue Total	bn €	9.9	17.9	17.9	0.0	21.1	21.1	0.0	23.7	23.7	0.0		
Jobs Total	'000 jobs	139	252	252	0.0	296	296	0.0	333	333	0.0		

IE 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			
EU output, images per year (ipy)	bn ipy	595		832		505		322			
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy for electricity	TWh prim/a	47	27	21	-6.4	29	11	-17.8	22	8	-14.6
o/w electricity	TWh elec/a	19	11	8	-2.6	12	5	-7.1	11	4	-6.9
Primary Energy (for paper, ink, toner)	TWh prim/a	21	29	28	-0.9	18	15	-2.6	11	10	-1.7
GWP emissions (from electricity)	MtCO ₂ /a	9	4.4	3.4	-1.1	4.4	1.7	-2.7	3.6	1.2	-2.4
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
EU total weight of paper used per year	Mt/a	1.9	2.6	2.5	-0.1	1.6	1.3	-0.2	1.0	0.9	-0.1
Consumable resources	bn €	0	0	0	0.0	0	0	0.0	0	0	0.0
o/w paper	bn €	4.8	6.7	6.5	-0.2	4.1	3.5	-0.6	2.6	2.2	-0.4
o/w toner	bn €	11.2	18.3	18.3	0.0	10.5	10.5	0.0	6.8	6.8	0.0
Total expenditure (incl. consumables)	bn €	25	45	45	-0.6	37	35	-1.9	30	29	-1.7
Revenue Total (excl. consumables)	bn €	5.8	18.2	18.2	0.0	20.2	20.2	0.0	18.6	18.6	0.0
Jobs Total (excl. consumables)	'000 jobs	84	250	250	0.0	265	265	0.0	242	242	0.0
ES Enterprise Servers and Data											
Storage Products	unit	1990		2010		2020		2030			
Sales	'000	171		3 631		3 771		5 084			
Stock	'000	707		18 605		20 263		27 041			
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
GWP emissions	MtCO ₂ /a	1	20	20	0.0	19	18	-0.7	24	23	-1
Total expenditure	bn €	2	39	39	0.0	40	39	-0.3	54	54	-0.5
Revenue Total	bn €	1.4	31.5	31.5	0.0	31.3	31.3	0.0	41.4	41.4	0.0
Jobs Total	'000 jobs	26	583	583	0.0	580	580	0.0	766	766	0.0
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			
EU freezer net volume RF	M m ³ @ -18°C	10		14		17		20			
EU refrigerator net volume RF	M m ³ @ 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
GWP emissions	MtCO ₂ /a	56	47	35	-12	44	23	-21	40	14	-25
Total expenditure	bn €	29	28	24	-4	31	22	-9	34	20	-14
Revenue Total	bn €	5.5	6.1	7.0	0.9	6.4	8.1	1.6	6.6	8.8	2.2
Jobs Total	'000 jobs	91	102	117	15	106	133	27	109	146	37

KEY FACTS SUMMARY TABLES

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 m ³ @ -18/-15°C	1			1			2			2			
EU refrigerator net volume CF	M m ³ @ -1/+7°C	8			9			10			10			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a	154	147	147	0.0	132	131	-1	112	79	-33			
o/w electricity	TWh elec/a	62	59	59	0.0	53	52	-0.3	53	37	-16			
GWP emissions	MtCO ₂ /a	31	24	24	0.0	20	20	-0.1	18	13	-5.3			
Total expenditure	bn €	14	13	13	0.0	13	13	-0.1	14	11	-2.9			
Revenue Total	bn €	3.1	3.6	3.6	0.0	3.8	3.8	0.0	4.0	4.1	0.1			
Jobs Total	'000 jobs	38	44	44	0.0	46	46	0.0	49	51	1.5			

Note: This is without double counted amounts for CUs

Professional refrigeration products	unit	1990			2010			2020			2030			
Sales	'000	939			917			1 011			1 149			
Stock	'000	7 778			7 680			8 122			9 225			
EU freezer net volume Storage cabinets	M m ³ @ -18°C°	0.3			0.4			0.5			0.5			
EU refrigerator net volume Storage cabinets	M m ³ @ 5°C	0.7			1.0			1.1			1.2			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy (CU double count excluded)	TWh prim/a	128	167	167	0	201	193	-8	203	181	-21			
o/w electricity (CU double count excluded)	TWh elec/a	51	67	67	0	80	77	-3	96	86	-10			
GWP emissions (CU double count excluded)	MtCO ₂ /a	26	27	27	0.0	31	29	-1.3	33	29	-3.5			
o/w due to refrigerant leakage	MtCO ₂ /a	0	0	0	0.0	0	0	0.0	0	0	0.0			
Total expenditure (CU double count excluded)	bn €	9	10	10	0.0	13	12	-0.4	17	15	-1.7			
Revenue Total	bn €	1.1	1.3	1.3	0.0	1.4	1.5	0.1	1.7	1.7	0.0			
Jobs Total	'000 jobs	16	19	19	0.0	22	23	1.2	25	25	0.0			

Note: From EIA 2019, CA data include low-power modes

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 ovens, no. of cycles (= oven dishes)	bn cyc/a	23			24			25			27			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a	166	200	199	-0.3	216	205	-10.8	199	175	-24			
o/w electricity	TWh elec/a	49	66	66	-0.1	74	70	-4.1	81	71	-10.8			
o/w fuel	TWh fuel/a	43	34	34	0.0	31	31	-0.4	28	26	-1.5			
GWP emissions	MtCO ₂ /a	33	34	34	-0.1	34	33	-1.7	33	29	-4.0			
Total expenditure	bn €	24	29	29	0.0	33	34	0.5	37	36	-1.3			
Revenue Total	bn €	9	13	13	0.0	14	15	1.1	15	16	0.9			
Jobs Total	'000 jobs	156	213	213	0.0	236	255	18.9	242	257	15.7			

Coffee Makers

This product group has been removed in EIA 2019 because the on-mode is not regulated. Standby data (not including keep-warm) remained in EIA but are included under the Standby heading.

KEY FACTS SUMMARY TABLES

WM Household Washing Machines		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	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			
GWP emissions	MtCO ₂ /a		25	18	15	-3.5	15	10	-5.4	12	8	-4.2			
Total expenditure	bn €		25	28	25	-3	31	24	-7	34	24	-11			
Revenue Total	bn €		3.6	5.3	6.2	0.9	5.8	6.8	1.1	5.6	6.1	0.5			
Jobs Total	'000 jobs		57	84	99	15	91	109	18	88	98	9			
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	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			
GWP emissions	MtCO ₂ /a		5	8	6	-2	10	7	-3	11	7	-3			
Total expenditure	bn €		5	10	10	0	14	13	-1	19	16	-3			
Revenue Total	bn €		1.3	2.9	3.8	0.9	3.9	5.0	1.2	4.8	5.9	1.1			
Jobs Total	'000 jobs		21	48	63	16	64	83	19	79	98	19			
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	BAU	ECO	inc
Primary energy	TWh prim/a		19	40	40	-0.1	36	28	-7	30	18	-13			
o/w electricity	TWh elec/a		8	16	16	0.0	14	11	-3	14	9	-6.0			
GWP emissions	MtCO ₂ /a		4	7	6	0.0	5	4	-1.1	5	3	-2			
Total expenditure	bn €		2	4	4	0.1	5	5	0.4	5	5	-0.02			
Revenue Total	bn €		0.7	1.1	1.3	0.1	1.8	2.7	0.9	1.8	2.9	1.1			
Jobs Total	'000 jobs		11	17	19	1.8	28	42	14.3	28	46	18.3			
VC Vacuum Cleaners		unit	1990			2010			2020			2030			
Sales	'000		14 517			45 130			77 477			83 279			
Stock	'000		127 940			299 151			354 431			428 598			
EU surface vacumed	1000 km ² /a		750			983			1 092			1 117			
Scenario			BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Primary energy	TWh prim/a		27	45	45	0.0	63	30	-33	77	27	-49			
o/w electricity	TWh elec/a		11	18	18	0.0	25	12	-13	36	13	-23			
GWP emissions	MtCO ₂ /a		5.4	7.3	7.3	0.0	9.6	4.5	-5.0	12.4	4.4	-8			
Total expenditure	bn €		7.6	16	16	0	25.7	23.6	-2.1	30.2	25	-5			
Revenue Total	bn €		4	9	9	0.0	16	16	0.5	17	17	0.0			
Jobs Total	'000 jobs		58	155	155	0.0	261	269	7	281	281	0			

KEY FACTS SUMMARY TABLES

Note: This is without 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			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc		
Primary energy	TWh prim/a	112	288	288	0.0	375	340	-35	362	298	-64		
o/w electricity	TWh elec/a	45	115	115	0.0	150	136	-14	172	142	-31		
GWP emissions	MtCO ₂ /a	22	47	47	0.0	57	52	-5	59	48	-10		
Total expenditure	bn €	9	21	21	0.0	28	27	-0.9	35	31	-4		
Revenue Total	bn €	1.2	3.6	3.6	0.0	4.5	5.8	1.3	4.8	5.8	1.0		
Jobs Total	'000 jobs	16	47	47	0.0	59	78	18	63	77	14		

Note: This is without double counted amounts

MT Motors AC, LV, 0.12-1000 kW	unit	1990			2010			2020			2030		
Sales	'000	25 819		38 419			42 449			44 185			
Stock	'000	219 077		324 702			380 084			402 700			
	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		
o/w electricity	TWh elec/a	469	655	655	0	758	729	-28	797	738	-59		
GWP emissions	MtCO ₂ /a	235	269	269	0	288	277	-11	271	251	-20		
Total expenditure	bn €	69	85	85	0	104	101	-3	120	113	-7		
Revenue Total	bn €	2.5	5.0	5.1	0.0	5.9	7.0	1.1	6.4	7.8	1.4		
Jobs Total	'000 jobs	32	65	65	0	76	90	14	82	100	18		

WE Welding Equipment	unit	1990			2010			2020			2030		
Sales	'000	422		479			486			497			
Stock	'000	2 611		2 969			3 049			3 111			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc		
Primary energy	TWh prim/a	16.4	16.1	16.1	0.0	16.0	16.0	0.0	13.6	11.8	-1.8		
o/w electricity	TWh elec/a	6.5	6.4	6.4	0.0	6.4	6.4	0.0	6.5	5.6	-0.9		
GWP emissions	MtCO ₂ /a	3.3	2.6	2.6	0.0	2.4	2.4	0.0	2.2	1.9	-0.3		
Total expenditure	bn €	3.2	3.4	3.4	0.0	3.5	3.5	0.0	3.6	3.3	-0.3		
Revenue Total	bn €	0.5	0.6	0.6	0.0	0.6	0.6	0.0	0.6	0.6	0.0		
Jobs Total	'000 jobs	6.8	7.7	7.7	0.0	7.8	7.8	0.0	8.0	8.1	0.1		

WP Water Pumps	unit	1990			2010			2020			2030		
Sales	'000	1 099		1 513			1 760			2 024			
Stock	'000	11 220		15 311			18 001			20 810			
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc		
Primary energy (for 100% electricity)	TWh prim/a	197	264	264	-0.3	311	303	-7.5	302	293	-9		
o/w electricity	TWh elec/a	79	106	106	-0.1	124	121	-3.0	144	140	-4.1		
GWP emissions	MtCO ₂ /a	39	43	43	-0.1	47	46	-1.1	49	47	-1.4		
Total expenditure	bn €	15	18	18	0.0	23	23	-0.4	29	28	-0.7		
Revenue Total	bn €	2.7	3.7	3.7	0.0	4.3	4.3	0.0	5.0	5.0	0.0		
Jobs Total	'000 jobs	31	43	43	0.0	50	50	0.0	58	58	0.0		

KEY FACTS SUMMARY TABLES

CP Standard Air Compressors	unit	1990		2010		2020		2030					
		Sales '000	89	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Sales	'000	598		1 038				1 028			1 112		
Stock	'000												
Primary energy (for 100% electricity)	TWh prim/a	56	132	132	0.0	130	128	-1.9	115	112	-3.2		
o/w electricity	TWh elec/a	22	53	53	0.0	52	51	-0.8	55	53	-1.5		
GWP emissions	MtCO ₂ /a	11	22	22	0.0	20	19	-0.3	19	18	-0.5		
Total expenditure	bn €	4	8	8	0.0	8	8	0.0	9	9	-0.1		
Revenue Total	bn €	0.9	1.5	1.5	0.0	1.6	1.7	0.1	1.8	1.8	0.1		
Jobs Total	'000 jobs	12	19	19	0.0	21	22	1.2	23	24	1.1		
TRAFO Utility Transformers		unit	1990	2010		2020		2030					
Sales	'000	107		156				184			225		
Stock	'000	2 387		3 597				4 401			5 355		
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		
GWP emissions	MtCO ₂ /a	26	35	35	0	42	40	-2	49	43	-5.7		
Total expenditure	bn €	9	14	14	0	18	18	0	26	24	-1.2		
Revenue Total	bn €	2.6	4.3	4.3	0.0	5.3	5.9	0.6	6.8	7.7	1.0		
Jobs Total	'000 jobs	44	73	73	0	89	99	11	113	129	16		
TYRE Replacement Tyres		unit	1990	2010		2020		2030					
Sales	m	263		323				353			434		
Stock	m	1 207		1 387				1 564			1 917		
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		
GWP emissions	MtCO ₂ /a	220	169	168	-1	166	158	-9	176	160	-15		
Total expenditure	bn €	92	108	108	0	114	117	3	145	146	1		
Revenue Total	bn €	19	24	25	1	31	38	7	40	49	9		
Jobs Total	'000 jobs	293	377	385	9	488	592	104	626	765	139		

EIA

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Status Report



Ecodesign Impact Accounting

STATUS REPORT 2020



Prepared by
VHK for the European Commission
May 2021 (status December 2020)

The information and views set out in this study are those of the author(s) and do not necessarily reflect the official opinion of the European Commission

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SPECIFIC CONTRACT No ENER/C3/FV 2018-445/06/FWC 2016-542/06/SI2.805274

Acronyms & accounting units

../a	.. per annum (year)	DWH	Dedicated Water Heater
€	Euro	EC	European Commission
AC	Air-Cooled (refrigeration)	ECA	European Court of Auditors
AC	Air Conditioning (electric)	ECO	Ecodesign (scenario)
ACF	Air Conditioning, Fossil fuel fired	ED	Ecodesign
AHC	Air Heating & Cooling equipment	EEI	Energy efficiency index
AHE	Air Heaters, Electric	EFN	Efficiency of new sold products (EU average of sales)
AHF	Air Heaters, Fossil fuel fired	EFS	Efficiency of the stock of products in use (EU average of stock)
BAU	Business as usual (scenario)	EIA	Ecodesign Impact Accounting
BC	Base Case	EL	Energy Labelling
BC	Backward curved (fan)	elec	(as column header) electricity-related share in primary energy
bn	billion (10^9)	ELEC	Electric energy
BW	Black and white (copier, printer)	EP	Electrophotographic ('laser')
C1	Tyres designed primarily for vehicles of cat. M1, N1, O1 and O2 ('passenger cars')	EPS	External Power Supply
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 $\geq N$ ('vans')	eq.	equivalent
C3	Tyres designed primarily for vehicles of categories M2, M3, N, O3, O4 with specific load capacity indices ('trucks', 'busses')	ES	Energy Star; Enterprise Servers
CA	Cooking appliances	ESTAT	Eurostat
CC	electricity to primary energy Conversion Coefficient (CC= 1 /PEF); efficiency of electricity generation and distribution in %	FC	Forward curved (fan)
CDR	Commission Delegated Regulation	FNRG	Final energy, sum of ELEC and FUEL
CEXH	Central exhaust VU	FUEL	Non-electric energy (gas, petroleum products, wood, coal, etc.)
CF	Commercial refrigeration (Refrigeration appliances with a direct sales function)	GCV	Gross calorific value
CFL	Compact fluorescent light source	GHG	Greenhouse gas emissions
CH	Central heating	GJ	Giga Joule = 10^9 J
CHAE-L	Chiller, Air-cooled, Electric, Large	GLS	General lighting service ('incandescent')
CHAE-S	Chiller, Air-cooled, Electric, Small	GSR	General Safety Regulation (vehicles, tyres)
CHC	Central heating combi (boiler)	GWh	Giga watt hours= 10^9 Wh
CHF	Chiller combustion engine driven	GWP	Global warming potential (GWP-100)
CHWE-L	Chiller, Water-cooled, Electric, Large	h on/d	Hours 'on' per day
CHWE-M	Chiller, Water-cooled, Electric, Medium	h sb/d	Hours 'standby' per day
CHWE-S	Chiller, Water-cooled, Electric, Small	hh	household
CIRC	Circulator	h/a	annual (operating) hours
CM	Coffee maker	HICP	harmonized index of consumer prices (inflation from Eurostat)
CO	Carbon Monoxide (emission)	HID	High intensity discharge lamp
CO ₂	Carbon Dioxide	HiNA	High network availability
CP	Compressor	HT PC	High Temperature Process Chiller
CR	Commission Regulation	IA	Impact Assessment
CSTB	Complex set-up box	IE	Imaging Equipment
ctrl	controls (e.g. for lighting)	IJ	Ink jet
CU	Condensing Unit	IM	Imaging Equipment
cyc	Cycles	IND	Industry (manufacturing) sector
dB(A)	Decibel (A)	ipm	Images per minute
dm ²	square decimetre (surface area)	ipy	Images per year
DP	Electronic Display	kg	Kilogrammes
DS	Data Storage product	km ²	square kilometre
DW	Dishwasher	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 ($P=\Delta p \cdot Q$ with P power in W; Δp pressure difference in Pa; Q flow in m^3/s)	R...1	Rate (price per unit), residential customers
kWh heat	kWh heating output ($P=\Delta T \cdot V \cdot c$ with P power in W; ΔT temperature difference in K; V volume in m^3 (or mass in kg), c specific heat capacity in $Wh/m^3.K$ (or $Wh/kg.K$))	R...2	Rate (price per unit), industry customers
kWh output	kWh output (for motors: $P=\Omega \cdot \tau$ with P power in W; Ω angular speed in rad/s; τ torque in Nm)	R...3	Rate (price per unit), tertiary sector
kWh prim	kWh primary energy consumption in -- unless indicated differently-- Net Calorific Value of the fuel(s) used	R...4	Rate (price per unit), other sector
LD	Laundry dryer	RAC	Room air conditioner
LED	Light emitting diode	RES	Residential (domestic) sector
LFL	linear fluorescent lamps	rpm	Rotations per minute
LH	Local heaters	RR	Rolling resistance
LIFE	Lifetime	RRC	Rolling resistance coefficient
lm	Lumen	RVU	Residential VU
LoNA	Low network availability	SAE	Standard Annual Energy consumption
LS	Light source	SB, sb	Standby
LSH	Local Space Heater	SCOP	Seasonal coefficient of performance (for space heating of heat pump)
LT	Low-Temperature (refrigeration)	SEER	Seasonal energy efficiency ratio (for space cooling of heat pump)
ltr	Liters	SFB	Solid fuel boilers
m, mln	million	SFD	Single function device
m €	million euro	SHR	Slow Heat Release (stoves)
max.	maximum	SPL	Special Purpose Lamp
MELISA	Model for European Light Sources Analysis	SRI	Self-Regulatory Initiative (same as VA)
MeNA	Medium network availability	SSTB	Simple set-up box
MFD	Multi-function device	STB	Set-up box
mg	milligrams (0.001 grams)	T	metric tonne (1000 kg)
min.	minimum	TEC	Typical or Test Energy Consumption
MT	Medium-Temperature (refrigeration)	TER	Tertiary (services) sector
MT	Industrial motors	Th	Tera (10^{12}) hours
Mt	Mega tonnes (10^9 kg)	Th on	Tera hours 'on'
mtoe	mega tonne oil equivalent	Th sb	Tera hours 'standby'
MVU	Mechanical Ventilation Unit	TL, TLR	Tyre Labelling (Regulation)
MWh	Megawatt hours (1000 kWh)	Tlm	Tera lumen
NAS	Network attached storage	Tm³	Tera cubic metre
NCV	Net calorific value	toe	Tonne of oil equivalent
NMVOC	Non-Methane Volatile Organic Compound	TRAFO	Distribution transformer
NOx	Nitrogen Oxides (emission)	TWh	Terawatt hours= $10^{12} Wh = 10^9 kWh$
NRG	Primary energy (ELEC / CC + FUEL)	TYRE	Replacement Tyre
NRVU	Non-residential VU	UPS	Uninterruptable Power Supply
NSB, nsb	Networked standby	UV, UVA, UVB, UVC	Ultraviolet, types A, B, C (radiation)
OEM	Original Equipment Manufacturer	VA	Voluntary Agreement (same as SRI)
OGC	Organic Gaseous Carbon (emission)	VAT	Value Added Tax
OTH	Other sector (all except RES, TER and IND, e.g. agriculture, forestry, fishing)	VC	Vacuum cleaner
PC	Personal computer	VRF	Variable Refrigerant Flow (AC)
PEF	Primary Energy Factor (inverse of CC)	VSD	Variable Speed Drive
PF	Professional refrigeration products	VU	Ventilation unit
PJ	Peta Joule = $10^{15} J$	W	Watt
PM	Particulate Matter (emission)	WC	Water-Cooled (refrigeration)
ps	Place setting (dishwasher load unit, consisting of a defined set of different plates, cutlery, etc.)	WE	Welding Equipment
		WH	Water heater
		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

EBBT code	Product	unit	TJ (NCV)	ktoe (NCV)	
G3000	Natural gas	1 TJ GCV	0.9	0.021	note 2
	Natural gas	1 kt	48.0	1.146	
	Methane	1 kt	50.0	1.194	
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.xls, 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, 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 299 base case products from 41 product groups, organized 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, loads¹, energy consumption (electricity, fuel, final energy, primary energy), energy-related GHG-emissions, user expenses (for purchase, installation, energy, maintenance), business revenues, and associated jobs. Subtotals are provided per usage sector (residential, services, industry, other²), per functional group, per product group, and per base case product. EIA also includes data per average EU27 household.

The 2019 energy consumption of products included in EIA represents 57% of the EU27 primary energy consumption reported in the Eurostat Energy Balance sheets³, 48% of the final energy, close to 100% of electricity, and 33% of non-electric final energy consumption (EIA: fuel).

Energy totals in EIA are compatible with those in Eurostat and PRIMES⁴ 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 (EIA: coal). Due to scope limitations (products regulated in Ecodesign, Energy Labelling, Energy Star and Tyre Labelling), the coverage is lower for industry and transport. District heating (derived heat), ambient heat used by e.g. heat pumps, and solar heat is not accounted in EIA, while coverage of renewables/biomass (EIA: wood) is partial.

This EIA2020 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.

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 and POTEnCIA⁵.

1 The ‘load’ in EIA indicates the user demand for product output.

2 The ‘other’ sector in EIA includes e.g. agriculture, forestry and fishing

3 Eurostat Energy Balance nrg_bal_c, ed. February 2021

4 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

5 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>

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 study⁶ developed the EIA-methodology (explained in this report) and applied the accounting method in the reports of May 2014 and December 2015^{7 8}.

The Ecodesign Impact Accounting was continued in the 2015-2018 EIA II study⁹, 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 published¹⁰. 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 study¹¹ 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 reports (status December 2019) were issued in June 2020¹². The current document is the EIA2020 report (status December 2020), and the first with data for EU27, excl. UK.

Methodology aspects

The EIA methodology is explained 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 (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. 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

- 6 SPECIFIC CONTRACT No ENER/C3/412-2010/FV575-2012/12/SI2.657835 (EIA I study)
- 7 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
- 8 ECODESIGN IMPACT ACCOUNTING Part 2 - Status May 2015, VHK December 2015 for the European Commission
- 9 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)"
- 10 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>
- 11 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')" (current ongoing study)
- 12 Ecodesign Impact Accounting – Status Report 2019 – VHK for the European Commission, June 2020,
<https://www.vhk.nl/research/eia.htm>

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, and corrects for double counting in a transparent manner (section 2.7).

Following comments on EIA methodology from the European Court of Auditors ¹³:

- 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 ¹⁴.

These new guidelines have been implemented starting from EIA2019.

Main changes in this edition

The present document is the 2020 Annual Report of the EIA III study (status December 2020) and includes important updates compared to the 2019 report:

- Conversion of EU28 to EU27 data:

The United Kingdom has left the European Union in 2020 (Brexit) and consequently 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 to the product sales ¹⁵. Generic Brexit factors have been derived by comparing Eurostat Energy Balance sheets for EU28 and EU27. They differ per usage sector (residential, tertiary, industry, other), per fuel type (e.g. electricity, gas, oil, solid fuel), and per year. Where specific Brexit factors per product group were available, these have been used instead of the generic factors.

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

13 '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.

14 An exemption are Standard Air Compressors, where existing EIA data have been maintained, because the regulatory process is still ongoing.

15 All other product parameters, e.g. stock, energy consumption, emissions, costs, revenues, follow the changes in sales automatically. Average loads, efficiencies, product prices have not been changed for the Brexit.

- Update of data on existing measures:

For several product groups, review studies have provided new information and new insights in product development and use. This information has been used to update the EIA scenarios. New measures proposed in the studies were not yet considered (because not finalized in December 2020). The updates regard the following product groups:

- Central Heating Boilers (space heating),
- Central Heating Combis (water heating)
- Dedicated Water Heaters,
- Local Space Heaters operating on electricity, gas, or liquid fuel,
- Room Air-Conditioners,
- Circulators,
- Ventilation Units,
- Games Consoles,
- Personal Computers,
- Laundry Dryers.

- Comparison with Eurostat and PRIMES:

The comparison of EIA data with Eurostat's Energy Balance Sheets (for EU27) has been enhanced, adding a comparison per fuel type (natural gas, oil, solid fuels, renewables/biomass). Following this comparison, sales for coal-fired solid fuel boilers have been modified in EIA to match the Eurostat data more closely.

A detailed comparison between EIA and product data underlying the PRIMES model has been made. The results are not reported in this document but have been discussed with the EC policy officer responsible for the PRIMES model.

- Households:

A new section has been added to EIA with information per average EU27 household. For years 1990, 2010, 2020, 2030, 2050, this section provides data per household on product sales, stock, electricity, fuel, final energy, primary energy, GHG-emissions and user expense.

- Additional user-options:

The EIA2020 Master-file has new user-options:

- Choice of the set of rates to use for electricity and natural gas (traditional EIA set, or rates from PRIMES 2015f reference scenario),
- Choice of the set of Global Warming Potential factors for electricity generation and distribution (traditional EIA set, factors from PRIMES 2015f reference scenario, or user-defined set).

These two choices have been used to perform sensitivity analyses.

- Choice to activate or deactivate the space heating load reduction due to ECO-improvements in Ventilation Units. This choice has been used to accurately report the space heating effects of ventilation units.

Main results

In year 2019 the products included in the accounting represent 8930 TWh (32 147 PJ, 768 Mtoe) of primary energy consumption (Figure 1). This is 57% of the total EU27 primary energy consumption in 2019 (1352 Mtoe)¹⁶.

For these products, the main results for the EU27 in 2020 and 2030 (ECO versus BAU, savings/reductions) are reported in Table 1.

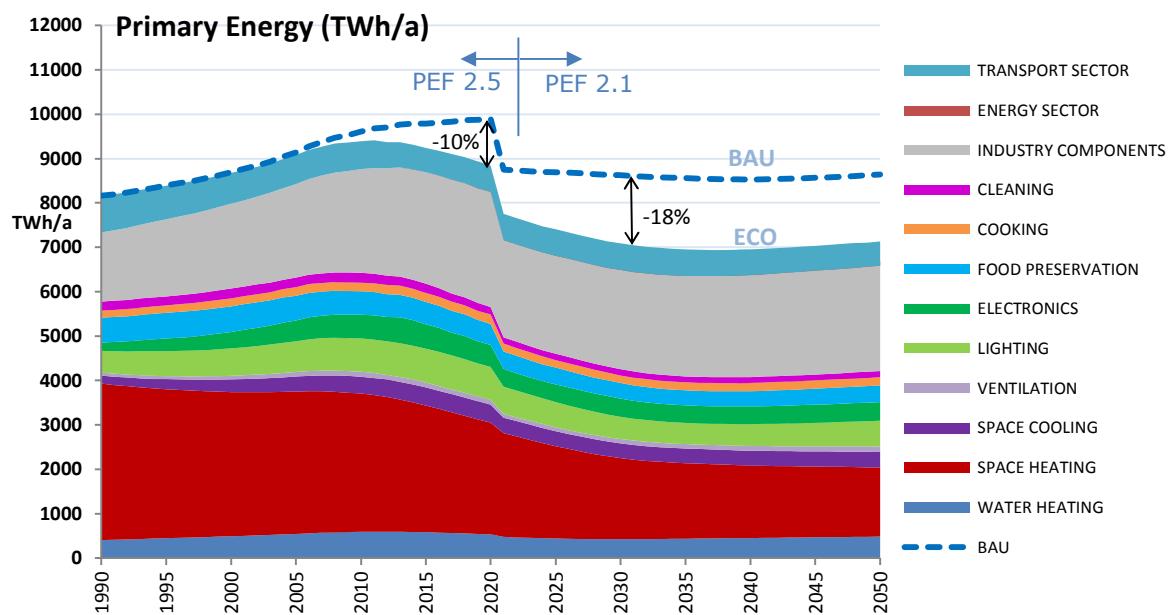


Figure 1. Primary energy consumption of products included in ecodesign impact accounting, status 31 December 2020 (energy sector not shown)

The primary energy savings due to ecodesign and labelling measures are 1037 TWh (3734 PJ, 89 mtoe) in 2020 and 1533 TWh (5520 PJ, 132 mtoe) in 2030 (Figure 2). 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 2019 (1352 mtoe¹⁶).

In 2020, 80% of the primary energy savings comes from electricity savings (using PEF 2.5¹⁷) and 20% from direct fuel savings. In 2030 (with PEF 2.1), this is respectively 73% (electricity) and 27% (fuel).

The distribution of the primary energy savings over the functional groups is shown in Figure 3. The major contributions to the savings come from space heating, lighting, food preservation, electronics, industrial components, and cleaning appliances.

The primary energy savings derive for 61% (2020) or 51% (2030) from the residential sector, 24% (2020) or 31% (2030) from the services sector, 10% (2020) or 13% (2030) from industry, 3-4% transport, and 1% other sector.

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

16 Eurostat Energy Balance nrg_bal_c, ed. February 2021, PEC Europe 2020-2030

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

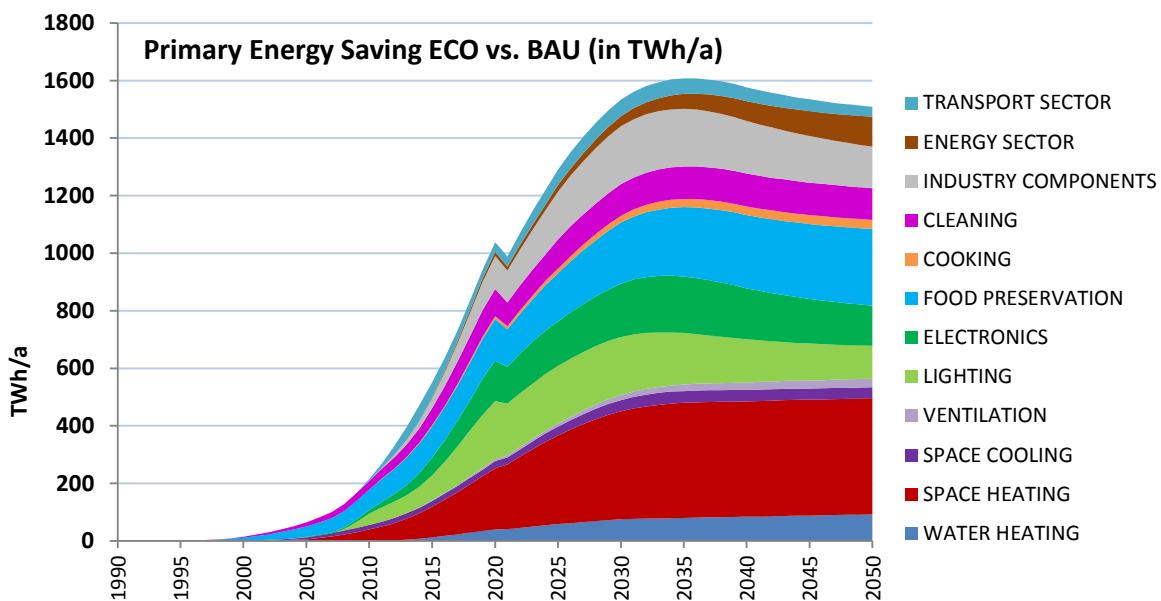


Figure 2. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 31 December 2020

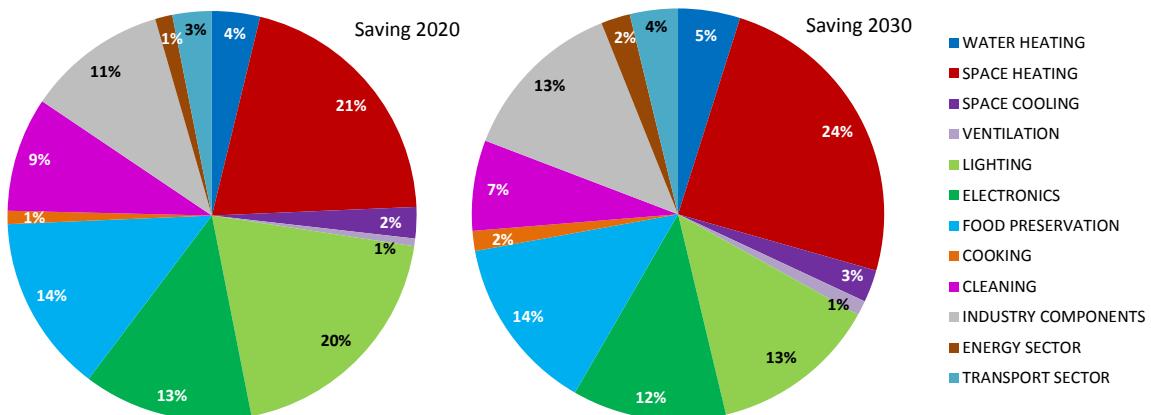


Figure 3. Share of primary energy saving per functional group, in 2020 and 2030.

Due to the measures taken, the greenhouse gas emissions decrease by 170 MtCO₂eq (-10% vs BAU) in 2020 and 266 MtCO₂eq (-18% vs BAU) in 2030. The reduction is respectively 4.5% (2020) and 7% (2030) of the EU27 total emissions in 2018 (3764 Mt CO₂ ¹⁸). Additional reductions result for NOx, CO, OGC and PM (Table 1) ¹⁹.

Due to the measures for washing machines and dishwashers, in 2020 consumers save 1507 million m³ (> 50%) of (drinking) water (1885 Mm³ in 2030). The measures on imaging equipment (duplexing, N-print) save 0.23 million ton (15%) of graphic paper

-
- 18 Source: ‘Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020, Submission to the UNFCCC Secretariat, 27 May 2020, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), and <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>.
- 19 NOx: nitrogen oxides (acidifying agent), CO: carbon monoxide, OGC: Organic Gaseous Compounds, PM: particulate matter

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 € 60 bn (5%) saving in 2020 on consumer expenditure (€ 76 bn energy cost saving, € 7 bn consumables saved, € 23 bn extra acquisition costs). In 2030 this increases to € 118 bn (9%). The consumer's monetary saving is 0.4% (in 2020) and 0.9% (in 2030) of the GDP of the European Union (€ 13300 bn in 2020²⁰).

Business revenues increase by 21 bn euros in 2020 and 29 bn euros in 2030 (5-6%), implying an increase of 324 thousand direct jobs in 2020 and 430 thousand in 2030.

Table 1: 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 %.

	unit	2020		2030	
		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	1037 3734 89	10%	1533 5520 132	18%
Electricity	TWh PJ mtoe	334 1202 29	12%	532 1914 46	18%
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 1910 46	9%	932 3355 80	17%
Energy related GHG-emissions	Mt CO2 eq	170	10%	266	18%
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	-23	-6%	-32	-7%
Energy costs	bn euros	76	11%	138	18%
Consumable costs	bn euros	7	19%	12	30%
Total user expense	bn euros	60	5%	118	9%
Business revenues	bn euros	21	5%	29	6%
Associated jobs	thousands	324	5%	430	6%

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

Results per household

The average EU27 household in 2020:

- Bought 11 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 530 kgCO₂eq of greenhouse gas emissions in 2020 compared to the situation without Ecodesign and Labelling measures. In 2030 this is projected to increase to almost 700 kgCO₂eq/household.
- Saved 210 euros (7%) in user expenditure in 2020, expected to increase to 350 euros per year per household in 2030 (11%) compared to the situation 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.

Comparison with Eurostat and PRIMES

At a high level of aggregation, energy totals in EIA are compatible with those in Eurostat and PRIMES, when considering the differences in scope (see earlier remarks above). This document contains an extensive reporting on the agreements and differences between EIA and Eurostat (section 3.8).

As an example, Table 2 shows the comparison for the residential sector in 2018 ²¹. Except for 'heat' (derived heat, district heating) which is not in the EIA scope, and 'rnw' (renewables/biomass) which is only partially in the EIA scope (wood-fired solid fuel boilers and local space heaters), the agreement between EIA and Eurostat is excellent. For all end-uses in the residential sector, the difference is 12% for electricity, 9% for 'solid' fuels (EIA:coal), 3% for 'oil' (liquid fuels) and 2% for natural gas consumption.

For residential space heating, there is a 73% difference on electricity consumption, meaning that EIA is too high or Eurostat too low. The difference comes mainly from electric local space heaters, which have recently been reviewed and updated in EIA2020.

For residential water heating, the differences on 'solid' fuels and 'oil' are due to EIA scope limitations. For gas and electricity, EIA and Eurostat match.

For residential cooking, EIA does not account 'solid' fuels and 'oil', because this is not in scope of the regulations. But there is a rather large difference also for electric cooking and gas cooking. This is a point for further work, on both sides.

The 105 TWh (26%) electricity difference for lighting and appliances is caused for a major part by the absence in EIA of ironing, small appliances (except standby), and a part of the information, communication, and entertainment equipment, which has been estimated to contribute 81 TWh, explaining large part of the difference.

²¹ Source for Eurostat: 'Disaggregated final energy consumption in households - quantities [nrg_d_hhq]', accessed April 2021. Data for year 2018 (data for other years are incomplete in Eurostat). Data converted from TJ to TWh NCV by VHK.

In general, the comparison exercise shows that there is a potential, also with regards to other modelling tools used for policy such as PRIMES and POTENCIA, for further work to realize consistent 'bottom-up' and 'top-down' analyses between the datasets. First contacts between the EIA and PRIMES teams have been made and work is ongoing.

Table 2: Comparison for the 2018 residential sector between final energy consumption in EIA and in Eurostat (ESTAT), split per type of energy carrier²¹

TWh/a in 2018		solid	gas	oil	rnw	elec	heat	total
All uses	ESTAT	101	925	331	559	708	245	2870
	EIA	93	902	320	254	624	0	2193
	dif	-9	-23	-10	-305	-84	-245	-676
	dif %	-9%	-2%	-3%	-55%	-12%	-100%	-24%
Space Heating	ESTAT	93	698	257	492	95	191	1827
	EIA	93	700	288	254	165	0	1500
	dif	0	1	31	-238	70	-191	-326
	dif %	0%	0%	12%	-48%	73%	-100%	-18%
Space Cooling	ESTAT	0	0	0	0	11	0	11
	EIA	0	0.0	0	0	10	0	10
	dif	0	0	0	0	-1	0	-1
	dif %	0%	0%	0%	0%	-8%	0%	-8%
Water Heating	ESTAT	8	173	47	55	87	55	424
	EIA	0	177	32	0	79	0	288
	dif	-8	4	-15	-55	-9	-55	-137
	dif %	-100%	3%	-32%	-100%	-10%	-100%	-32%
Cooking	ESTAT	1	55	23	10	86	0	175
	EIA	0	26	0	0	63	0	88
	dif	-1	-29	-23	-10	-23	0	-86
	dif %	-100%	-53%	-100%	-100%	-27%	0%	-49%
Lighting & Apps	ESTAT	0	0	0	0	405	0	405
	EIA	0	0	0	0	300	0	300
	dif	0	0	0	0	-105	0	-105
	dif %	0%	0%	0%	0%	-26%	0%	-26%
Other end-uses	ESTAT	0	0	3	2	24	0	28
	EIA	0	0	0	0	8	0	8
	dif	0	0	-3	-2	-16	0	-21
	dif %	0%	0%	-100%	-100%	-68%	0%	-73%

Sensitivity analyses

The results for greenhouse gas emissions reported in EIA are for the traditional EIA set of Global Warming Potential factors for electricity generation and distribution, based on the MEErP. When using the alternate set of GWP factors of the PRIMES 2016 reference scenario, the avoided emissions due to ecodesign and labelling regulations reduce from 170 to 129 MtCO₂eq in 2020, and from 266 to 191 MtCO₂eq in 2030. See section 3.6.1 for details. These data show the importance of agreeing on a common set of GWP-factors for electricity to be used in all Ecodesign studies, and more in general in the models used for EU policy purposes.

The results for energy costs and total user expenses in EIA are for the traditional EIA set of energy rates, based on Eurostat until 2019 and applying an annual escalation rate in later years. Using the rates for electricity and natural gas from the PRIMES 2015f reference scenario, the 2020 user expense savings of € 60 bn do not change, while the 2030 savings reduce from € 118 bn to € 111 bn. Larger differences are found in 2050 (€ 147 bn vs. € 114 bn). See section 3.6.2 for details.

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)¹³, 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, EIA2020 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 3.6.3 for further information.

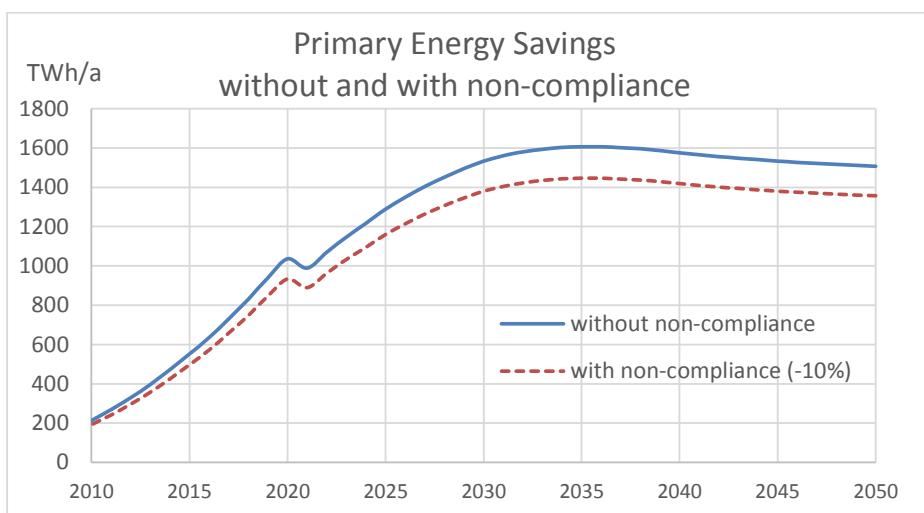


Figure 4. Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

Changes in results between EIA2019 and EIA2020

Primary energy savings have decreased in the EIA2020 edition compared to the EIA2019 edition (Table 3). In part this is due to Brexit (-254 TWh in 2020 and -379 TWh in 2030), but a major part of the decrease (-486 TWh in 2020 and -806 TWh) is due to the EIA2020 product updates, and in particular those for space heating using central heating boilers (CHB) and water heating using central heating combis (CHC) and dedicated water heaters (DWH).

The EIA2019 data for CHB, CHC and DWH were based on the 2013 impact assessments, which in turn used the data from the 2007 preparatory studies. These studies used extensive and reliable 2004-2006 market information, and projections for e.g. heat pumps that were certainly acceptable in that period. At the same time, the UK mandated the use of condensing boilers (which was quite spectacular at the time) and there was a general optimism that energy-saving devices would be easily absorbed by the market.

The unforeseen 2008 financial crisis drastically changed this. The building construction sector collapsed and never recovered to pre-2008 levels (Figure 5). The heat pump market stagnated, approximately remaining on the same level of sales from 2008 to

2014²². The strong increase in heat pump sales that was previously projected to start from 2006, took place only from 2015-2016 onwards. The crisis had a similar effect on all central heating boilers: in 2004, 22% of the boilers was sold in new housing, while this went down to 14% in 2014. In parallel, the replacement market for boilers went up from 60% in 2004 to 78% in 2014²³, replacement boilers being typically less efficient than boilers for new dwellings/buildings.

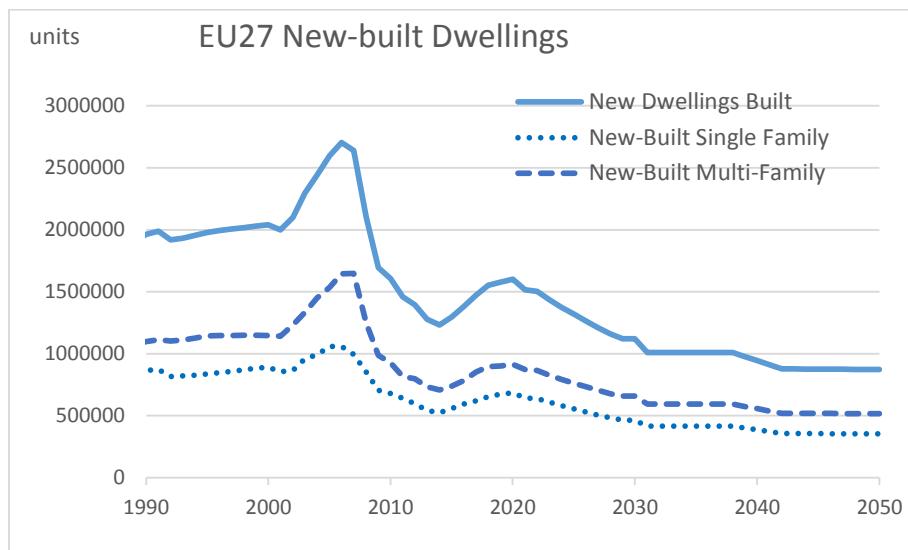


Figure 5. The 2008 financial crisis caused an unforeseen collapse in the number of new-built dwellings, affecting the projections made in pre-2008 studies on space heating, water heating and ventilation units. Source: review study on ventilation units⁶¹.

The 2008 crisis also changed the expenditure behaviour of people: replacements were postponed and average product life increased, further slowing down the efficiency-improvements. Consumers also turned out to be more conservative than previously assumed. In particular the oil-fired boiler stock hardly changed. Many users preferred to repair or try to fit a new jet burner in an old heat exchanger, instead of buying a new more efficient boiler. Gas-fired boilers also continue to be popular.

In parallel, water consumption also changed. Until 2008 there was a strong increasing trend in water consumption by households, due to an increase in the number of showers, without a corresponding decrease in the number of baths. Measured data on water consumption were rare in 2006, but there was a strong push from some utilities (e.g. France, Norway) to convince people to buy large (400 litres or more for an average family) electric storage water heaters (ESWHs).

After 2008 this trend stopped, and the consumption of warm water even decreased²⁴ (leading to complaints of some utilities on lower revenues). The utilities started to measure the (warm) water consumption per type of end-use, and the 2019 review study for the first time had access to reliable data on the overall water consumption per Member State and good estimates for the warm water consumption. In particular for the ESWHs the difference is large: in France and Norway the water consumption is half

22 Approximately 800 thousand units per year in 21 EU countries, see <https://www.ehpa.org/market-data/>

23 Space and combination heaters, Ecodesign and Energy Labelling, Review study Final report Task 2, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019 (tables 6 and 7)

24 Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review study Final Report Task 3, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019

of what was assumed in the 2007 preparatory studies. Other new information is that water consumption is low in several of the Baltic and Eastern Europe states.

The large changes described above occurred over a period of more than a decennium but are now implemented in EIA in a single update, leading to large changes in impacts. If the market studies on space heating by BRG Building Solutions, the most reliable source of information for central space heating and water heating, would be performed annually, the EIA updates would be more gradual and the check of policy targets against reality could be annual. For central space heating and water heating this does not seem excessive.

For details, see sections 3.7 and 1.6.10 of this report.

Table 3 Main differences between EIA2020 and EIA2019

	Primary Energy Savings (TWh)		User Expense Savings (bn euros 2015)		Extra Business Revenues (bn euros 2015)	
	2020 (PEF 2.5)	2030 (PEF 2.1)	2020	2030	2020	2030
EIA 2019 for EU28	1777	2718	64	150	64	91
EIA 2019 for EU27	1523	2339	55	130	55	77
EIA 2020 for EU27	1037	1533	60	118	21	29

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1. Introduction

1.1. Background

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*’.

The European Commission (EC) is charged with reporting on the progress towards the European 2020 and 2030 policy goals on energy efficiency of reducing final and primary energy consumption by respectively 20% and 32.5% in relation to projections. These goals are included in the Energy Efficiency Directive ²⁵ and in the Governance of the Energy Union Regulation ²⁶ which are part of a broader set of energy and climate policy goals including on renewables and reduction of GHG, which are complementary and mutually reinforcing. In September 2020, the Commission launched the Climate Target Plan, including a proposal to cut greenhouse gas emissions by at least 55% by 2030 compared to 1990 levels, to set Europe on a responsible path to becoming climate neutral by 2050 ²⁷. Implementing measures, *inter alia* the dual and related legislations on Energy Labelling ('EL') and Ecodesign ('ED'), are important tools to meet aforementioned policy targets. The EC is charged with following up the member states' implementation of framework legislation in national legislation, and coordination and monitoring of market surveillance. The EC has reviewed the EL Directive in 2017 ²⁸.

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), 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.
-

25 DIRECTIVE (EU) 2018/2002 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 amending Directive 2012/27/EU on energy efficiency, OJ L 328/210, 21.12.2018

26 REGULATION (EU) 2018/1999 OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 11 December 2018 on the Governance of the Energy Union and Climate Action, amending Regulations (EC) No 663/2009 and (EC) No 715/2009 of the European Parliament and of the Council, Directives 94/22/EC, 98/70/EC, 2009/31/EC, 2009/73/EC, 2010/31/EU, 2012/27/EU and 2013/30/EU of the European Parliament and of the Council, Council Directives 2009/119/EC and (EU) 2015/652 and repealing Regulation (EU) No 525/2013 of the European Parliament and of the Council

27 COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS, Stepping up Europe's 2030 climate ambition, Investing in a climate-neutral future for the benefit of our people, Brussels, 17.9.2020 COM(2020) 562 final.

The 55% GHG emission reduction target represents a significant increase compared to the previous 40%. In April 2021, an agreement was reached between Member States and the EU Parliament on the 55% target.

28 Regulation (EU) 2017/1369 of the European Parliament and of the Council of 4 July 2017 setting a framework for energy labelling and repealing Directive 2010/30/EU

- Forecasting, based on scenarios considered versus the business-as-usual scenario (baseline).
- Capacity building on reporting.

The first issue of the Ecodesign Impact Accounting of May 2014 was extensively used during the preparation for a possible review of the EL- and ED-Directives and provided important insights²⁹.

1.2. History

The Ecodesign Impact Accounting (EIA) methodology was developed under contract No ENER/C3/412-2010/FV575-2012/12/SI2.657835 during the period September 2013 to November 2015. That study also applied the accounting method to the existing Ecodesign preparatory studies and impact assessment reports and the results were published in two reports:

- Part 1 report³⁰ of May 2014, taking into account the information available on 1 November 2013;
- Part 2 report³¹ of December 2015, covering the information available on 1 May 2015.

The EIA-work was continued under contract No ENER/C3/2013-523/09/FV2015-543/SI2.722015 during the period December 2015 to December 2018. Four (sets of) reports have been issued under this second contract:

- EIA II Interim Report of June 2016, considering the information available on 1 January 2016³²;
- EIA II Annual Report 2016 of December 2016, covering information available on 1 September 2016³³;
- EIA II Annual Report 2017 of December 2017 (revised March 2018), covering information available on 1 October 2017³⁴;
- EIA II Annual Report 2018 of December 2018 (revised January 2019), covering information available on 1 October 2018³⁵;

On a one time basis, in 2016, a 'Special Report Material Inputs for Production' and an 'EcoReport for the average EIA product' were published³⁶. These reports provide insight in the non-energy resources (material resources) associated with the products

29 'Assistance to the Impact Assessment for the Review of the Energy Labelling Directive and certain aspects of the Ecodesign Directive', prepared by VHK for the EC, September 2014, and used as a source of information for the EC's 'Proposal for a Regulation of the European Parliament and of the Council setting a framework for energy efficiency labelling and repealing Directive 2010/30/EU' swd_2015_0139

30 Ecodesign Impact Accounting Part 1 – Status Nov. 2013, VHK for the European Commission, May 2014,

31 Ecodesign Impact Accounting Part 2 - Status May 2015, VHK for the European Commission, Dec. 2015

32 Ecodesign Impact Accounting – Status Report January 2016 – VHK for the European Commission, June 2016,

33 Ecodesign Impact Accounting – Status Report September 2016 – VHK for the European Commission, December 2016

34 Ecodesign Impact Accounting – Status Report 2017 – VHK for the European Commission, Dec. 2017

35 Ecodesign Impact Accounting – Status Report 2018 – VHK for the European Commission, December 2018, <https://ec.europa.eu/energy/en/studies/ecodesign-impact-accounting-0>

36 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>

accounted in EIA, and in the energy use and emissions for the production, distribution, and end-of-life phases (non-use phases).

The Ecodesign Impact Accounting is being continued under contract No ENER/C3/FV 2018-445/06/FWC 2016-542/06/SI2.805274³⁷ (EIA III) for a period of three years starting from May 2019. Existing data will be updated following Ecodesign review studies, new product groups will be added to EIA, and the accounting method will be detailed and enhanced if necessary. A first update was issued in 2020:

- EIA III Annual Report 2019 of June 2020 (revised October 2020), covering information available on 1 December 2019³⁸;

The current document is the second Status report being issued under the EIA III contract. In parallel the 2020 EIA Overview report is published.

The EIA Annual Status reports are mainly intended for experts and analysts. These reports describe the accounting methodology in detail, indicate the differences with earlier issues, and contain a listing per accounting parameter (e.g. sales, stock, load, efficiency, energy, prices, user expenses, business revenues) for all product base cases, for year 1990 and for the period 2010-2050 at five year intervals.

Starting from 2016, the annual EIA reporting also includes an Overview report³⁹. These reports are less technical and intended for a wider audience of non-experts. They present a summary per product group of the most relevant information.

The description of the methodology is included in chapter 2 of this 2020 Annual Status Report. A survey of the main differences between this report and the 2019 Annual Report can be found in section 3.7.

1.3. Tasks

The follow-up study (EIA III) is performed under contract No ENER/C3/FV 2018-445/06/FWC2016-542/06/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')*". The study foresees the following tasks:

1. Impact accounting for existing and new regulated products for the period 2019-2022. The contract distinguishes 3 clusters of product groups:
 - Product groups recently updated under the previous EIA contract and for which no major changes in EIA are expected in the period 2019-2022 (10 groups);
 - Product groups expected to need an update or a new insertion in the period 2019-2020 (15 groups);

³⁷ 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')" (current ongoing study)

³⁸ Ecodesign Impact Accounting – Status Report 2019 – VHK for the European Commission, June 2020, <https://www.vhk.nl/research/eia.htm>

³⁹ Ecodesign Impact Accounting, Overview Report 2018, – VHK for the European Commission, December 2018, <https://ec.europa.eu/energy/en/studies/ecodesign-impact-accounting-0>

- Product groups expected to need an update (7 groups) or potentially a new insertion (16 groups) in the period 2021-2022.
2. Methodology development regarding the calculation method and consistency with Eurostat and other EU policy sources. This task is a continuation of methodological changes initiated under previous EIA studies, but the contract specifically mentions:
 - 2.1 Harmonisation of the EIA outcome with other sources for EU-policy such as PRIMES and the Eurostat energy balances;
 - 2.2 Integration of relevant material flows (Circular Economy) into the EIA methodology.
 3. Development of means of communication related to the impact accounting.
 - 3.1 Short-term communication
The contract foresees the development of concise information and infographics regarding the impact of Ecodesign and Energy Labelling, in relation to the European elections of 23 to 26 May 2019.
 - 3.2 Long-term communication
This task aims at improving the communication on the impacts of Ecodesign and Energy Labelling (and of the mere existence of the EIA data) within the Commission services, to stakeholders, and to the larger public. It foresees that the contractor will communicate not just with the Commission's policy officers but also with the EC communication department to improve the communication. The contract reserves a (small) budget for the production of at least three different web-based visuals (videos, slideshows) to improve communication on energy savings. The visuals do not have to be complete but should provide enough insight for a possible continuation, if successful, in a separate specific contract.

1.4. Deliverables

The EIA III contract foresees the deliverables and timing listed below.

Within 4 months after signature of the contract⁴⁰:

- Draft communication report reflecting the first part of Task 3.

Within 12 months after signature of the contract:

- Three web-based visuals and a concise communication plan reflecting the second part of Task 3.
- EIA Annual Overview Report in pdf and Word format, targeted at a wider, non-technical audience and with an updated contents similar to the Overview Reports issued by the EIA II study:
 - Executive summary and overview of new developments in the past period;
 - EIA summaries for at least primary energy, emissions, user expenses, revenues and jobs, and material resources;

⁴⁰ Timings are relative to the date of signature of the contract, which was 20 May 2019.

- Illustrated examples and possibly case histories, for all product groups covered by the accounting;
- Summary of key facts for each product group with reference years 1990, 2010, 2020 and 2030.
- EIA Annual Presentation in ppt format, targeted at a wider, non-technical audience, entailing a slide presentation of the main results, to further communicate the study and its results;
- EIA Annual Status Report in pdf and Word format, targeted at expert users and interested analysts, and with an updated contents similar to the Status Reports issued by the EIA II study:
 - Executive summary and overview of new developments in the past period;
 - EIA background, purpose, history, and major changes compared to previous issue;
 - Detailed explanation of the accounting method;
 - Presentation and discussion of the main results;
 - Annex with all parameter values for 1990 and for the period 2010-2050 in five year intervals;
 - Annex with Key facts per product group;
 - Annex with a summary of Business Revenues;
 - Annex with a summary of Direct Employment impacts;
 - Annexes with up-to-date lists of regulated products (including their base cases), relevant legislation, preparatory studies, and impact assessments;
 - Annexes with acronyms, references, etc.
- Update of Report regarding Task 3, if necessary, in pdf and Word format, and related Excel files if any;
- Full Masterfile in Excel with all data and calculations for a 1-year interval for 1990-2050 and appropriate built-up period (typically 1965-1990); the Excel spreadsheets shall be fully accessible without any hidden procedure or code restriction and may include instructions to follow calculations if appropriate;
- Extract Printfile in Excel with fixed data, without calculations, for 1990 and for the period 2010-2050 in 5-year intervals (same data as inserted in the Annex of the Status Report).

Within 24 months after signature of the contract, the contractor will deliver the updated/extended version of the set of documents and spreadsheet files of the above interim-report.

Within 36 months after signature of the contract, the contractor will deliver the updated/extended version of the set of documents and spreadsheet files of the above interim-report, in the form of a final report.

1.5. Planning

The European Commission sent out a Request for services, ENER.c.3.dir (2019) 979099 (Ref. Ares(2019)1096247), on 21 February 2019.

VHK's proposal for services was sent in 7 March 2019.

The signature date of the contract and start of the project was 20 May 2019.

Planning milestones:

- Kick-off meeting within 10 working days following the signature of the contract, to determine details of the study. Actual date was 15 July 2019⁴¹.
- Draft communication report: 20 September 2019 (signature date + 4 months)
- Web-based visuals and concise communication plan: 20 May 2020
- Update of Task 3 report: 20 May 2020
- Annual report 2019: 20 May 2020
- Annual report 2020: 20 May 2021
- Annual report 2021: 20 May 2022
- Project end: 20 May 2022 (duration of contract 36 months)

An average of three progress meetings per year is foreseen between the contractor and the European Commission, in addition to the annual presentations and the meetings with the EC communication department.

Figure 6 gives an overview of the original contractual time-plan. Due to the late start of the project (20 May 2019 instead of the assumed 1 March 2019), the actual planning is shifted forward by almost 3 months (as reflected in the dates listed above).

Due to the late project start, the contents of Task 3.1, which was related to the European elections of 23-26 May 2019, was reformulated in agreement between the parties during the kick-off meeting, replacing the draft communication report by the delivery of a series of infographics, see details in par. 1.6.

On request of the EC policy officer for EIA, and later due to the corona-virus lock-down, and due to changes in personnel in DG ENER unit C4, meetings with the EC communication department were postponed.

41 The delay in the kick-off meeting was due to a change in EC policy officer for EIA and to comments from the European Court of Auditors on Ecodesign and Energy Labelling, also involving EIA.

Time plan		2019												2020												2022													
Year	Month	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4	5	6	7	8	9	10	11	12	1	2	3	4										
		J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A	M	J	J	A	S	O	N	D	J	F	M	A										
Task 1																																							
Task 2																																							
Task 3.1																																							
Task 3.2																																							
Reports														DIR FIR													DIR FIR												
														(CR1)													DFR FR												
Meetings														CR2													(UCR)												
														ko cm													pm												
														adp													pm												
Legend:	DIR=Draft Interim Report; FIR=Final Interim Report; DFR=Draft Final report; FR=Final report CR1=Communication Report (Task 3.1, if confirmed); CR2=Communication Report (Task 3.2); UCR=Update Communication Report (if required) ko=kick-off meeting; cm=communications meeting; pm=progress meeting; adp=annual discussion and presentation																																						

Figure 6 Original time-plan for the EIA III project. Real work projected to be shifted forwards by 3 months. Tasks refer to par. 1.3.

1.6. Activities for the Annual Report 2020

1.6.1. Meetings and information exchange

Due to the corona-virus lock-down, no face-to-face meetings were held between the contractor VHK and the EC policy officer for EIA: all communication was by e-mail, telephone calls and on-line meetings. On July 1st 2020, the EC policy officer responsible for EIA changed from George Paunescu to Serena Pontoglio, who occupied this function until December 1st 2020.

1.6.2. Activities for Task 3.1: short-term communication

The contractual Task 3.1 (see par.1.3) refers to infographics to be used in the context of the European elections of 23-26 May 2019. Due to the delayed start of the EIA III project (20 May 2019) this was no longer relevant. It was agreed with the EIA policy officer during the project kick-off meeting to substitute this task by the delivery of a set of infographics. VHK provided these infographics and iteratively adapted them following comments from the Commission's policy officer ⁴². This responds to the deliverable requested by the contract within four months of the start of the project.

The infographics have been updated in EIA2020 and can be found in the Overview Report.

1.6.3. Activities for Task 3.2: long-term communication

The contractual Task 3.2 (see par.1.3) foresees web-based visuals to improve the communication of EIA data. During the project kick-off meeting, as a first draft and just to give an idea, VHK presented three example videos. The EC found the approach interesting, and VHK offered to further enhance these examples. At that point, the videos could be distributed in the Commission Services (including communications department) for further discussion.

During the 12 February 2020 progress meeting, VHK shortly explained its ideas on the use of animations to clarify EIA data. This would be a lot of work and it would be preferable to agree with DG Communication first, to avoid doing work for nothing. The

42 The final version of the infographics was accepted by the EIA policy officer by mail of 23/04/2020.

EIA policy officer preferred to have a DG ENER internal brainstorming first, between the ecodesign team in DG ENER and VHK.

Further progress on this Task was delayed, first by the corona-virus lock-down and later by changes in personnel in the DG ENER C4 unit.

As regards communication on EIA within the Commission services, progress was made in improving the data exchange between EIA and PRIMES, see next paragraph.

1.6.4. Activities for Task 2.1: EIA-PRIMES comparison

Following-up on the activities on EIA-PRIMES comparison in December 2019 and spring 2020, by email of 23/11/2020 the EIA policy officer supplied VHK with detailed product input data underlying the PRIMES model for the residential and services sectors, with the request to compare these data with EIA.

VHK issued detailed dedicated notes on the EIA-PRIMES comparison for space heating, water heating, cooking and lighting & appliances. On a high level of aggregation, and considering scope differences⁴³, there is a good agreement between energy totals in EIA, PRIMES and Eurostat. Differences appear when looking at the data per usage sector (residential, services), per fuel type (electricity, gas, liquid fuel, solid fuel, renewables/biomass), per end-use application (space heating, space cooling, water heating, cooking, lighting & appliances) or per product group.

The data on comparison between EIA and PRIMES are not reported in this document, because the disaggregated PRIMES data are still confidential. Communication between the EIA and PRIMES teams is ongoing (April 2021).

1.6.5. Activities for Task 2.1: EIA-Eurostat comparison per fuel type

In EIA2020, the FUELECO sheet has been extended with a section providing a split of the energy consumption per type of fuel, for natural gas, oil and petroleum products, solid fuels (EIA: coal) and renewables / biomass (EIA: wood). This allows a more detailed comparison with data from the Eurostat Energy Balance sheets and facilitates the EIA-PRIMES comparison (previous paragraph).

The sheet SHARES in Annex A, in addition to the usage shares per sector, now provides a quick reference for the type of fuel used by each EIA base case.

See section 3.8 for the results of the EIA-Eurostat comparison per fuel type.

1.6.6. Activities for Task 2.2: integration of material resources in EIA

During the 12/2/2020 progress meeting, it was agreed not to insert material flows in EIA2019 yet. There should be more clarity on the methodology to be followed first.

No change for EIA2020.

⁴³ 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 by solid fuels, ironing, and part of the energy consumed by small appliances, 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. PRIMES and Eurostat cover the energy consumption of all products together. This difference in scope was taken into account during the comparison.

1.6.7. Other Task 2 activities: EIA data per household

EIA already had a breakdown of energy- and emission-totals per usage sector (residential, tertiary/services, industry, other). For the residential sector, such a breakdown has now been added also for the monetary sheets.

In the EIA Masterfile, separate ACQ_RES, NRGCOST_RES, MAINT_RES and EXPENS_RES sheets (for BAU and ECO) have been created for 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 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, and this information has already been used in EIA2020 to limit the sales for vacuum cleaners in later years (see section 1.6.10.13).

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. The HOUSEHOLD sheet is inserted in Annex A⁴⁴. See also information on households in the EIA2020 Overview report.

1.6.8. Activities related to European Court of Auditors' comments

The final comments of the European Court of Auditors (ECA) on EIA were published in January 2020⁴⁵ 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 3.6.3);
- EIA no longer reports data on product groups / operational modes for which no Ecodesign or Energy Labelling regulation exists⁴⁶.

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.

⁴⁴ For shortness' sake, the ACQBAU_RES, ACQEKO_RES, NRGCOSTBAU_RES, NRGCOSTECO_RES, MAINTBAU_RES, MAINTECO_RES, EXPENSBAU_RES and EXPENSECO_RES sheets (with data for each base case product) have not been inserted in Annex A, but the residential totals per functional group are displayed near the bottom of the overall ACQ, NRGCOST and EXPENS sheets.

⁴⁵ '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

⁴⁶ An exemption are Standard Air Compressors, where existing EIA data have been maintained, because the regulatory process is still ongoing.

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, see section 2.11.

1.6.9. Activities and changes related to Task 1: general updates.

1.6.9.1. Brexit

The United Kingdom has left the European Union in 2020 (Brexit) and consequently 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 factors⁴⁷, defined as:

$$\text{Brexit factor} = (\text{EU28 value} - \text{EU27 value}) / \text{EU28 value} (\%).$$

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

$$\text{EU27 value} = (1 - \text{Brexit factor}) * \text{EU28 value}$$

Generic Brexit factors have been derived by comparing Eurostat Energy Balance sheets for EU28 and EU27⁴⁸. 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 A⁴⁹. 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, e.g. inflation indices, electricity and gas rates, EU energy consumption, population, households, dwellings, and buildings) has also been updated from EU28 to EU27.

47 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.

48 <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.

49 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.

1.6.9.2. Energy rate updates

Rates for electricity and natural gas have been updated with the latest information from Eurostat (for EU27). For these rates, an additional user-option has been introduced in the EIA Masterfile, to allow quick selection of the traditional EIA-projection, or the projection of the PRIMES reference scenario 2015f. Figure 7 shows the differences between these projections. For details and references, see sheets General_1 and _2 in Annex A. All monetary data in Annex A are for the traditional EIA rates. The additional user-option has been used by the EIA team to present sensitivity data in paragraph 3.6.2.

For other rates, of minor impact, the EIA2019 values have been maintained in EIA2020, but their inflation corrected values (sheet General_1) slightly changed anyway because inflation rates have been updated for EU27 (see HICP on sheet General_2).

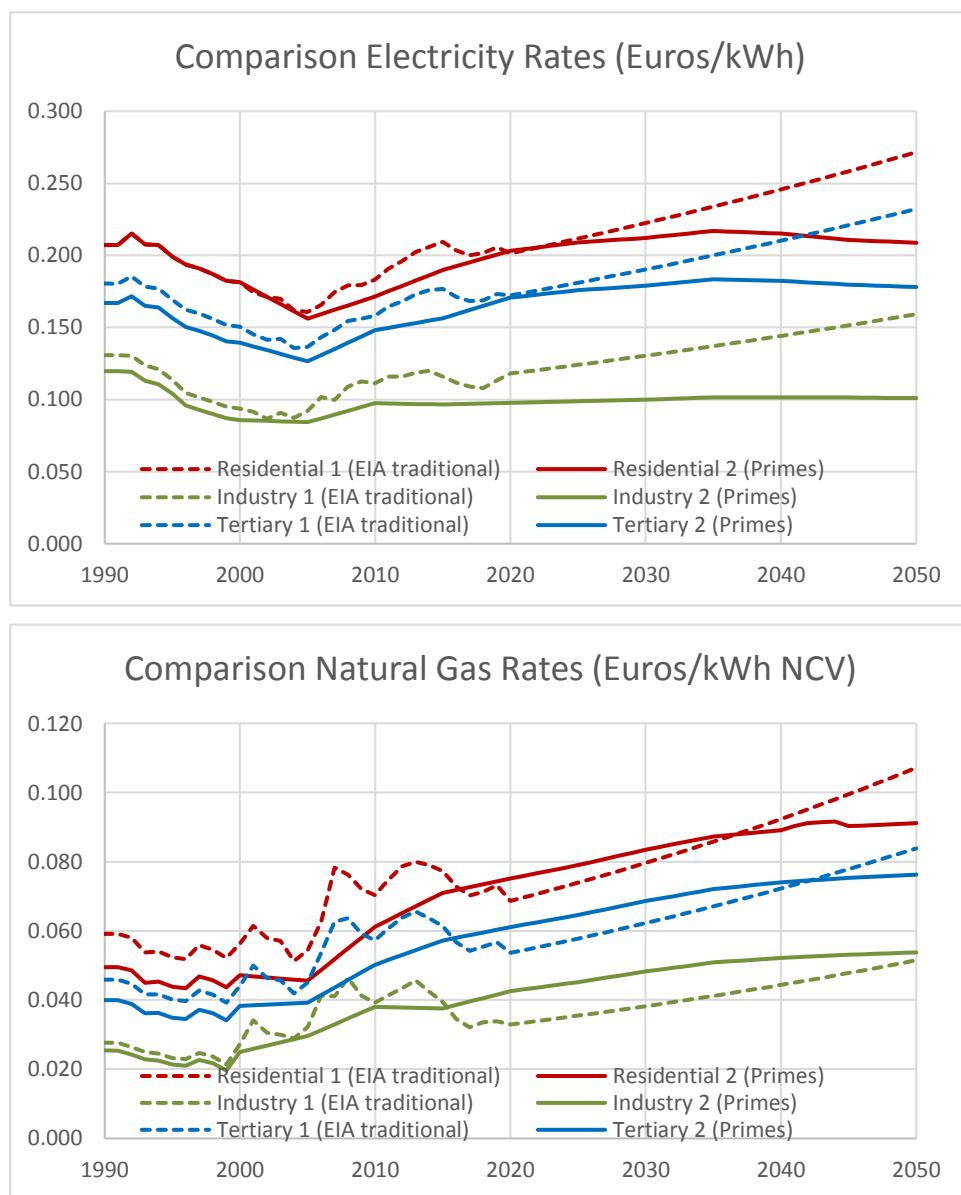


Figure 7: Comparison of rates for electricity (€/kWh electric) and natural gas (€/kWh NCV) for EIA traditional and PRIMES 2015f reference scenario, for residential, industry and tertiary/services sector (in 2015 euros, incl. VAT for residential). See sheets General_1 and General_2 in Annex A for details and references.

1.6.9.3. Inflation index update

The Harmonized Index of Consumer Prices (HICP) has been updated with the latest information from Eurostat, for EU27. The new values differ slightly from those for EU28, entailing also minor changes in inflation-corrected energy and non-energy rates. For details, see sheet General_2 in Annex A.

1.6.9.4. Global Warming Potential updates

The GWP-100 factors for electricity generation and distribution traditionally used in EIA are based on the MEErP, and relatively old. More recent data and projections, from the PRIMES 2016 reference scenario and from the European Environmental Agency, lead to lower values (Figure 8).

A user-option has been introduced in the EIA Masterfile, to allow quick selection of the traditional EIA set of GWP factors, the PRIMES 2016 set, or a third set definable by the user, now with data from the EEA. For details and references, see sheet General_1 in Annex A. All GHG emission data in Annex A are for the traditional EIA set. The new user option has been used by the EIA team to present sensitivity data in paragraph 3.6.1 (see references there).

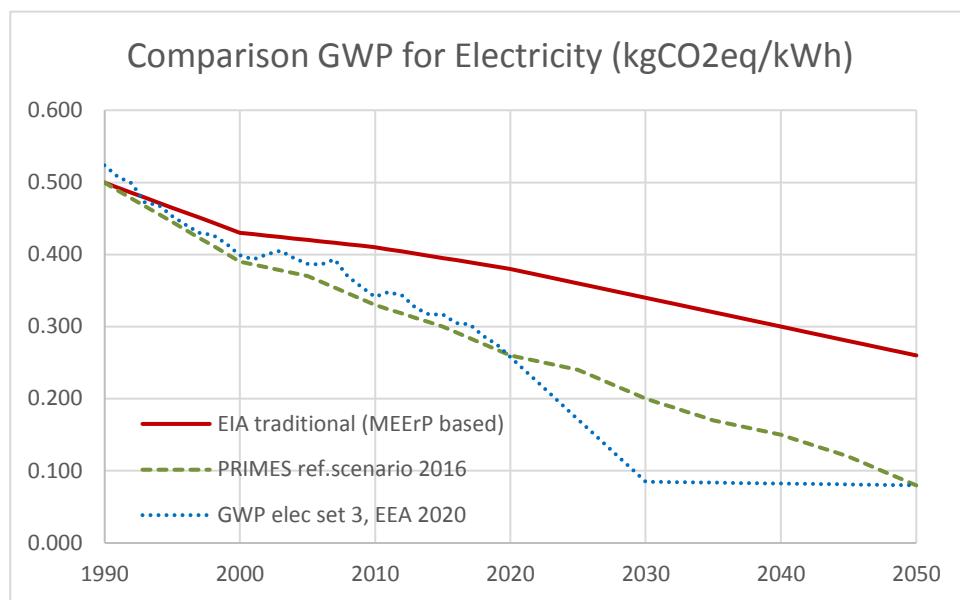


Figure 8: Comparison of GWP-100 factors for electricity generation and distribution (kgCO2eq/kWh electric) for EIA traditional (MEErP), PRIMES 2016 reference scenario, and EEA 2020. See sheet General_1 in Annex A for details and references.

1.6.10. Activities and changes related to Task 1: product updates.

1.6.10.1. General information on product updates

No new Ecodesign or Energy Labelling measures were published in 2020.

As far as could be verified, the so-called Omnibus amendments^{50 51} on the regulations published in 2019 did not require an update of EIA data.

Several preparatory studies on products not yet present in EIA completed in 2020 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 1.6.8.

In addition, several review studies on ecodesign and energy labelling regulations were completed in 2020 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 EIA2020 BAU scenario (without any measures, typically called BAU0 in the review studies) and the EIA2020 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 scenarios in those studies) have not been considered for EIA yet, because they were not finalized in December 2020. This is in line with the 2020 ECA comments (section 1.6.8). 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.

Most review studies provide data for EU28. EIA applied Brexit factors to convert data to EU27 (excl. UK), see section 1.6.9.1.

1.6.10.2. Economic context for the change in impacts due to product updates

The EIA2020 product updates introduced in the following sections have a considerable impact on the energy savings accounted in EIA. It is important to understand the socio-economic context that caused these large changes. A part of the information provided in section 3.7.2 (survey of changes in impacts) is therefore anticipated here.

The primary energy savings in EIA2020 are smaller than in EIA2019: -32% in 2020 and -34% in 2030. This is mainly due to the EIA2020 updates for space heating using central heating boilers (CHB) and water heating using central heating combis (CHC) and dedicated water heaters (DWH).

50 COMMISSION DELEGATED REGULATION (EU) 2021/340 of 17 December 2020 amending Delegated Regulations (EU) 2019/2013, (EU) 2019/2014, (EU) 2019/2015, (EU) 2019/2016, (EU) 2019/2017 and (EU) 2019/2018 with regard to energy labelling requirements for electronic displays, household washing machines and household washer-dryers, light sources, refrigerating appliances, household dishwashers, and refrigerating appliances with a direct sales function

51 COMMISSION REGULATION (EU) 2021/341 of 23 February 2021 amending Regulations (EU) 2019/424, (EU) 2019/1781, (EU) 2019/2019, (EU) 2019/2020, (EU) 2019/2021, (EU) 2019/2022, (EU) 2019/2023 and (EU) 2019/2024 with regard to ecodesign requirements for servers and data storage products, electric motors and variable speed drives, refrigerating appliances, light sources and separate control gears, electronic displays, household dishwashers, household washing machines and household washer-dryers and refrigerating appliances with a direct sales function

The EIA2019 data for CHB, CHC and DWH were based on the 2013 impact assessments, which in turn used the data from the 2007 preparatory studies. These studies used extensive and reliable 2004-2006 market information, and projections for e.g. heat pumps that were certainly acceptable in that period. At the same time, the UK mandated the use of condensing boilers (which was quite spectacular at the time) and there was a general optimism that energy-saving devices would be easily absorbed by the market.

The unforeseen 2008 financial crisis drastically changed this. The building construction sector collapsed and never recovered to pre-2008 levels (Figure 9). The heat pump market stagnated, approximately remaining on the same level of sales from 2008 to 2014⁵². The strong increase in heat pump sales that was previously projected to start from 2006, took place only from 2015-2016 onwards. The crisis had a similar effect on all central heating boilers: in 2004, 22% of the boilers was sold in new housing, while this went down to 14% in 2014. In parallel, the replacement market for boilers went up from 60% in 2004 to 78% in 2014⁵³, replacement boilers being typically less efficient than boilers for new dwellings/buildings.

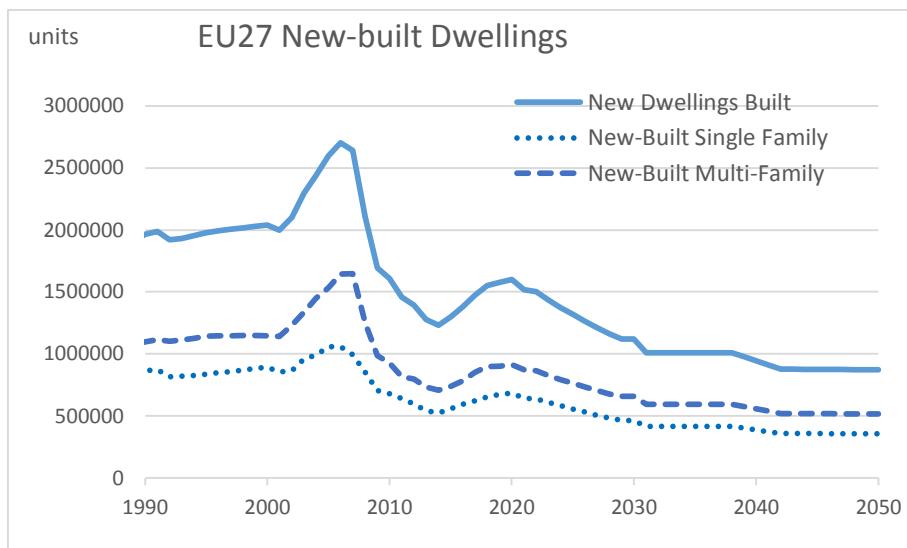


Figure 9. The 2008 financial crisis caused an unforeseen collapse in the number of new-built dwellings, affecting the projections made in pre-2008 studies on space heating, water heating and ventilation units. Source: review study on ventilation units⁶¹.

The 2008 crisis also changed the expenditure behaviour of people: replacements were postponed and average product life increased, further slowing down the efficiency-improvements. Consumers also turned out to be more conservative than previously assumed. In particular the oil-fired boiler stock hardly changed. Many users preferred to repair or try to fit a new jet burner in an old heat exchanger, instead of buying a new more efficient boiler. Gas-fired boilers also continue to be popular.

In parallel, water consumption also changed. Until 2008 there was a strong increasing trend in water consumption by households, due to an increase in the number of showers, without a corresponding decrease in the number of baths. Measured data on water consumption were rare in 2006, but there was a strong push from some utilities (e.g.

52 Approximately 800 thousand units per year in 21 EU countries, see <https://www.ehpa.org/market-data/>

53 Space and combination heaters, Ecodesign and Energy Labelling, Review study Final report Task 2, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019 (tables 6 and 7)

France, Norway) to convince people to buy large (400 litres or more for an average family) electric storage water heaters (ESWHs).

After 2008 this trend stopped, and the consumption of warm water even decreased⁵⁴ (leading to complaints of some utilities on lower revenues). The utilities started to measure the (warm) water consumption per type of end-use, and the 2019 review study for the first time had access to reliable data on the overall water consumption per Member State and good estimates for the warm water consumption. In particular for the ESWHs the difference is large: in France and Norway the water consumption is half of what was assumed in the 2007 preparatory studies. Other new information is that water consumption is low in several of the Baltic and Eastern Europe states.

The large changes described above occurred over a period of more than a decennium but are now implemented in EIA in a single update, leading to large changes in impacts. If the market studies on space heating by BRG Building Solutions, the most reliable source of information for central space heating and water heating, would be performed annually, the EIA updates would be more gradual and the check of policy targets against reality could be annual. For central space heating and water heating this does not seem excessive.

1.6.10.3. Central Heating Boilers, space heating (CHB)

EIA scenarios for space heating by central heating boilers have been updated according to the 2019 review study⁵⁵ and subsequent information from the ongoing (in December 2020) impact assessment phase. New proposed measures have not been considered yet (see par. 1.6.10.1).

The review study uses a more detailed breakdown in CHB base cases than in existing EIA data, enabling an improved and more transparent modelling of the shift from non-condensing to condensing boilers and from gas-fired appliances to electric heat pumps and hybrid solutions. The review study uses recent data and insights, while existing EIA2019 data originated from sources going back to 2004-2005 (before the 2008 economic crisis).

The update has a large impact on the primary energy savings due to ED and EL measures on space heating by CHBs, which reduce in 2030 from 846 TWh/a for EU28 in EIA2019 to 260 TWh/a for EU27 in EIA2020. Several factors contribute to this reduction:

- Approximately 16% of the reduction in savings is due to Brexit.
- Approximately 6% of the reduction in savings is due to a lower estimate for the overall EU space heating demand. This reduction was applied in the review study also considering Eurostat energy data for residential space heating⁵⁶.
- The difference between average primary energy efficiency of CHBs⁵⁷ between BAU and ECO changed from 49%-points in EIA2019 to 15%-points in EIA2020, due especially to the much slower introduction of heat pumps following the 2008

⁵⁴ Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review study Final Report Task 3, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019

⁵⁵ Space and combination heaters, Ecodesign and Energy Labelling, Review study Final report Tasks 1-7, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019

⁵⁶ In EIA2019, the EU28 stock of CHBs in 2030 supplied 1088 TWh heat (EULOADBAU). Subtracting 16% for Brexit this would have been 914 TWh heat in EU27. The new heat demand in EIA2020 is 857 TWh heat, 6% less. The 6% EULOAD reduction results from a 16% reduction in CHB stock and a 10% higher heat load per unit.

⁵⁷ Stock average, using fuel in NCV and PEF 2.1 for electricity. Computed as EU heat load / primary energy.

economic crisis (see section 1.6.10.2). The lower increase in ECO-efficiency is the main reason for the reduction in energy savings.

1.6.10.4. Central Heating Combis (CHC) and Dedicated Water Heaters (DWH)

EIA scenarios for water heating have been updated according to the 2019 review study⁵⁸ and subsequent information from the ongoing (in December 2020) impact assessment phase. The study covers Dedicated Water Heaters (DWHs) and water heating by Central Heating Combis (CHCs). New proposed measures have not been considered yet (see par. 1.6.10.1).

The review study uses a more detailed breakdown in DWH and CHC base cases than in existing EIA data, enabling an improved and more transparent modelling of the shift from fuel-fired CHCs to electric heat pumps and hybrid solutions (similar to the shifts for CHBs, see previous paragraph). For DWHs, the distinction between electric and gas-fired appliances is now clearer. The review study uses recent data and insights, while existing EIA2019 data originated from sources going back to 2004-2005 (before the 2008 economic crisis).

The update has a large impact on the primary energy savings due to ED and EL measures on water heating. For CHCs the 2030 savings reduce from 173 TWh/a for EU28 in EIA2019 to 34 TWh/a for EU27 in EIA2020. For DWHs the reduction is from 256 TWh/a for EU28 in EIA2019 to 41 TWh/a for EU27 in EIA2020. Several factors contribute to this reduction:

- Approximately 14% of the reduction in savings is due to Brexit. The Brexit factor is lower for electric heaters and heat pumps (6-7%) and higher for gas-fired heaters (22-24%).
- For DWHs, approximately 55% of the reduction in savings is due to a lower estimate for the water heating demand. For CHCs this is 12%. The reductions in heat demand were applied in the review study considering new data on water consumption (see section 1.6.10.2) and new Eurostat energy data for residential water heating⁵⁹. For DWHs, the review study set the new load per unit (kWh heat/a) lower than that corresponding to the tapping pattern for which the products are marketed.
- The difference between average primary energy efficiency⁶⁰ between BAU and ECO changed from 23%-points in EIA2019 to 7%-points in EIA2020 for DWHs, and from 26%-points to 15%-points for CHCs. This is due to the lower partial load on which DWHs work and due to the much slower introduction of heat pumps (section 1.6.10.2). The lower increase in ECO-efficiency is an additional reason for the reduction in energy savings.

⁵⁸ 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

⁵⁹ Taking into account the Brexit factor of 14%, the 2030 stock of water heaters has not changed from EIA2019 to EIA2020, so the reduction in EULOAD is entirely due to a reduction in load per unit.

⁶⁰ Stock average, using fuel in NCV and PEF 2.1 for electricity. Computed as EU heat load / primary energy.

1.6.10.5. Ventilation Units (VU)

EIA scenarios for ventilation units have been updated according to the 2020 review study⁶¹. New proposed measures have not been considered yet (see par. 1.6.10.1).

The review study uses a more detailed breakdown in VU base cases than in existing EIA data, enabling an improved modelling. The study is based on a model for EU buildings and dwellings, distinguishing between VUs installed in new buildings/ dwellings, in renovated buildings/dwellings, and VUs replacing older VUs. It also relates the use of VUs to the building/dwelling surface areas (see EIA STOCK sheets), takes into account the indoor air quality reached due to VUs, and considers the average airtightness of buildings/dwellings (n50 value). The derivation of average loads and efficiencies in the review study is detailed and complex, and this could not be copied in EIA, where the end results of the derivation are used as fixed input values (LOAD and EFN sheets). See further information on the LoadNotes sheet in Annex A and in the review study itself.

As regards the electricity consumption of VUs themselves, the 2030 savings decrease from 25 TWh/a for EU28 in EIA2019 (corresponding to 22 TWh/a in EU27⁶²) to 8 TWh/a for EU27 in EIA2020. For NRVUs, the reduction in EU27 2030 electricity savings is approximately from 12 to 5 TWh, and results from an increase in total air ventilated, but with higher efficiency than in EIA2019. For RVUs the reduction is approximately from 10 to 3 TWh, and results from a decrease in total air ventilated, but with efficiencies comparable to those in EIA2019. The effects of the 2008 financial crisis (section 1.6.10.2), with the strong decrease in number of new-built dwellings/buildings, also affected the projections for ventilation units.

As regards the 2030 primary energy savings on space heating due to improved heat recovery by VUs (see also section 2.6.2), these savings reduce from 166 TWh/a for EU28 in EIA2019 (corresponding to 148 TWh/a in EU27) to 54 TWh/a for EU27 in EIA2020. The decrease in savings is related to changes in ventilated airflow during the heating season, changes in the share of VUs performing heat recovery, changes in heat recovery efficiency of these VUs, changes in the average efficiency of space heating products, and the strong decrease in number of new-built dwellings/buildings (section 1.6.10.2).

The sheet EULOADVAR provides details on the heat recovered by VUs. The difference in heat recovery between the BAU and the ECO scenarios is distributed as a heat load reduction over all space heating base cases (details in section 2.6.2).

In the EIA Masterfile, a user setting on the sheet EULOADVAR allows to activate or deactivate the heat load reduction due to VUs. This has been used by the EIA team to report the exact savings on space heating due to ECO VU-improvements. For the data in Annex A of this report, the heat load distribution is activated.

1.6.10.6. Local Space Heaters (LSH)

EIA scenarios for local space heaters have been updated according to the 2019 review study⁶³ and subsequent information from the impact assessment phase. New proposed measures have not been considered yet (see par. 1.6.10.1). The study covers local

61 Ventilation Units, Ecodesign and Energy Labelling, Review study Final Report Tasks 1-7, VHK, Delft (NL), for the European Commission, DG GROW, August 2020

62 The Brexit factor for this product group is approximately 12%.

63 Review study on Local Space Heaters, Final Report, Viegand Maagøe and Danish Technical Institute, May 2019

space heaters operating on electricity, gas, or liquid fuels. The review study, and the EIA update, do not regard local space heaters using solid fuels⁶⁴.

The EIA update reduces the EU27 primary energy savings in 2030 due to ED and EL measures on (non-solid) local space heaters from approximately 51 TWh to 29 TWh⁶⁵.

The largest change occurs for fixed electric LSHs, where 2030 primary energy savings reduce from 31 TWh (for EU27) in EIA2019 to 18 TWh in EIA2020. The reduction of savings for portable electric LSH and electric underfloor heaters is 4 TWh each. The reduction in savings is in part due to the assumption in the review study 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.

1.6.10.7. Room Air-Conditioners (RAC)

EIA scenarios have been updated according to the 2018 review study⁶⁶ and subsequent information from the impact assessment phase. New proposed measures have not been considered yet (see par. 1.6.10.1).

The review study distinguishes three base case: fixed RACs < 6 kW, fixed RACs 6-12 kW and portable RACs < 12 kW. The share of fixed RACs that is reversible (close to 100% in 2020 and later), and the share of those that is being used by owners for heating purposes (increasing with the years) is reported on the EIA Sales sheets. The review study considered portable RACs only for cooling, and the same is done in EIA.

The BAU0 scenario in the review study (corresponding to the BAU scenario in EIA2020) is without the effects of the 2002 labelling directive on RACs⁶⁷, while in EIA2019 the BAU scenario included the effects of this directive. Combined with differences in cooling and heating load and in average SEER and SCOP efficiencies, this leads to a higher electricity consumption in BAU in 2010 (57 TWh in EIA2020 vs 34 TWh in EIA2019 for EU27). In addition, electricity savings now start from 2002 (due to the labelling directive) instead of 2012, and savings in 2020 consequently are also higher (18 TWh in EIA2020 vs 9 TWh in EIA2019 for EU27). These effects from the old labelling directive reduce in 2030, where the change in electricity savings is smaller (20 TWh in EIA2020 vs 16 TWh in EIA2019 for EU27)⁶⁸.

64 LSH using solid fuels have their own separate ecodesign regulation CR 1185/2015 and therefore were not considered in the review study, which regards CR 1188/2015.

65 In EIA2019, the primary energy savings in 2030 due to ED and EL measures on local space heaters were 84 TWh for EU28. Excluding savings on solid fuel LSHs (not considered in the review study and thus not involved in the EIA update), this reduces to 59 TWh, of which 53 TWh on electric LSH and 6 TWh on gas/oil LSH. For electric LSHs, the Brexit factor is low, around 6%, but for gas/oil LSHs the available data indicate a Brexit factor around 70%. This means that 2030 savings in EIA2019 for EU27 would have been around 51 TWh. The new primary energy savings in EIA2020, based on the review study, are 29 TWh/a in 2030 for EU27 (not counting savings on solid fuel LSH).

66 Review of Regulation 206/2012 and 626/2011 Air conditioners and comfort fans, Final Report Tasks 1-7, Viegand Maagøe and ARMINES, May 2018

67 COMMISSION DIRECTIVE 2002/31/EC of 22 March 2002 implementing Council Directive 92/75/EEC with regard to energy labelling of household air-conditioners, OJ L 86/26, 03.04.2002

68 In EIA2019, the primary energy savings in 2030 due to ED and EL measures on room air-conditioners were 40 TWh for EU28. For EU27 the EIA2019 savings would have been 35 TWh (\approx 13 TWh on cooling, 22 TWh on heating). The new primary energy savings in EIA2020, based on the review study, are 41 TWh/a in 2030 for EU27 (13 TWh on cooling, 28 TWh on heating).

1.6.10.8. Circulators (CIRC)

EIA scenarios for circulators have been updated according to the 2018 review study⁶⁹. New proposed measures have not been considered yet (see par. 1.6.10.1).

The review study distinguishes three base cases: large stand-alone, small stand-alone and integrated circulators. This distinction was not present in EIA2019, but considering the sales quantities, it looks like EIA2019 considered only the integrated circulators.

The EIA update increases the EU27 primary energy savings in 2030 due to ED and EL measures on CIRCs, from 24 to 29 TWh/a⁷⁰. However, the energy consumption of circulators is already considered in EIA in the auxiliary energy for central heating boilers, and therefore not counted (again) in the EIA totals (double counting factor is 1, see also section 2.7.2). This approach has not changed in EIA2020⁷¹.

1.6.10.9. Personal Computers (PC)

EIA scenarios for personal computers have been updated according to the 2017 review study⁷² and the 2020 ICT study⁷³. New proposed measures have not been considered yet (see par. 1.6.10.1).

In EIA2019, the electricity consumption by PCs was 6 TWh in 2030 for EU28. Following the EIA2020 update, the 2030 electricity consumption is 23 TWh for EU27, so almost a factor 4 higher.

For PCs, 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. This has not changed in the EIA2020 update.

1.6.10.10. Games Consoles (GC)

In 2020, a new version of the Self-Regulatory Initiative (SRI, or Voluntary Agreement, VA) on games consoles was published⁷⁴. Most games consoles are also subject to the standby regulation CR 1275/2008, as amended. The EIA2020 update for GCs reflects the new SRI and is based on data from the 2019 review study by CSES et al⁷⁵, the

69 Review study on Circulators, Final report, Viegand Maagøe A/S, April 2018

70 In EIA2019, the primary energy savings in 2030 due to ED and EL measures on circulators were 27 TWh for EU28. The Brexit factor for this product group is estimated 12%. For EU27 the EIA2019 savings would have been 24 TWh. The new primary energy savings in EIA2020, based on the review study, are 29 TWh/a in 2030 for EU27.

71 As regards the energy consumption, the 100% double counting should be correct. There is some doubt if acquisition and maintenance costs for stand-alone circulators are also covered in the costs of central heating boilers. For the moment, the 100% double counting is applied also there.

72 Preparatory study on the Review of Regulation 617/2013 (Lot 3) Computers and Computer Servers, VITO NV and Viegand Maagøe A/S, February 2017

73 ICT Impact study, DRAFT FINAL REPORT, VHK and Viegand Maagøe for the European Commission, June 2020

74 Energy Efficiency of Games Consoles, Self-Regulatory Initiative to further improve the energy efficiency of Games Consoles, Version 3.0 of March 2020, Sony Interactive Entertainment Inc., Microsoft Corporation, Nintendo Co., Ltd.

75 Review Study of the Ecodesign Voluntary Agreement for the Product Group “Videogames Consoles”, Final Report, CSES, Ökopol & TU Wien, August – 2019

2017 review study by the GC manufacturers⁷⁶, and a 2014 doctoral dissertation by A. Webb⁷⁷.

Games consoles are a complex product group for scenario modelling, due to varying sales, varying powers, uncertain lifetime, uncertain usage times in the various operating modes, and an interaction between active modes and non-active modes due to the Auto-Power Down (APD) requirements, with a not-well-defined and non-regulated 'rest' mode in between. This situation is further explained in Annex A on the sheet LoadNotes.

As a result, the BAU scenario, and consequently the savings, must be considered uncertain. The savings further depend on an assumed shift in times from active modes to non-active modes due to the APD requirements.

In EIA2019 the electricity savings in 2030 due to the combined ecodesign measures on games consoles were 1.7 TWh for EU28, approximately half on active modes, and half on non-active modes (standby). Following the EIA2020 update, the 2030 savings are now 4.1 TWh for EU27, of which 1.8 TWh on active modes and 2.3 TWh on non-active modes. As stated above, these savings are uncertain.

1.6.10.11. Laundry Dryers (LD)

EIA scenarios for laundry dryers have been updated according to the 2019 review study⁷⁸. New proposed measures have not been considered yet (see par. 1.6.10.1).

EIA2019 had a single base case for condensing LDs. Following the review study, EIA2020 now splits this in condensing heat pump dryers (HP) and condensing dryers with electric heating element (HE). This allows an improved and more transparent modelling of the shift in sales towards HP dryers, which by now are the most sold type. Due to a decrease in price, the shift in sales towards HP dryers has been faster than assumed in previous studies.

Following the review study, the actual user loading per cycle is now 4.4 kg of laundry and kept constant from 2010 onwards. Previous studies assumed a gradual increase in load/cycle, following the increase in average maximum capacity of the LDs.

A major issue is the number of drying cycles per year. Previous studies, the regulations (CR 932/2012 and CDR 392/2012), and EIA2019, used 160 cycles/a. The review study now found 107 cycles/a in 2018. 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 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. See the LoadNotes sheet in Annex A for further information.

In EIA2019 the electricity savings in 2030 due to ED and EL measures on laundry dryers were 9 TWh for EU28. Considering a Brexit factor around 16%, this corresponds to 8 TWh in EU27. Following the EIA2020 update, the 2030 savings are now 6 TWh for EU27. The reduction in savings is mainly due to the lower number of drying cycles per year,

76 REPORT ON THE 2017 REVIEW OF THE GAME CONSOLE SELF-REGULATORY INITIATIVE, Final report: July 5th, 2017, Sony Interactive Entertainment Inc., Microsoft Corporation, Nintendo Co.

77 Evaluating Games Console Electricity Use: Technologies and Policy Options to Improve Energy Efficiency, Doctoral dissertation by Amanda Elizabeth Webb, University of Surrey, June 2014

78 Review study on household tumble driers, Final report, Viegand Maagøe A/S, June 2019

with an additional contribution from the lower load per cycle. The reduction occurs notwithstanding a faster introduction of condensing heat pump dryers.

1.6.10.12. Solid fuel boilers (SFB)

During the comparison of EIA data per fuel type with data from Eurostat's Energy Balance sheets and PRIMES for the residential and services sectors, it was noticed that coal-consumption in EIA was much lower. This was caused by a low stock for coal-fired SFBs in EIA2019: 0.6-0.7 million units in 2015-2017. This is a factor 5 lower than in other recent literature sources⁷⁹. It could not (yet) be clarified if a similar underestimation of the stock applies also to EIA's coal-fired Local Heaters⁸⁰.

EIA sales data for coal-fired SFBs have been adapted to reflect the higher stock data from EHI and Fraunhofer and to get a closer match with Eurostat data for solid fuels.

1.6.10.13. Vacuum Cleaners (VC)

The new calculation of stocks of products per household (see sheet HOUSEHOLDS in Annex A) showed an average of 3 vacuum cleaners per household (hh) in 2050. This number resulted from extrapolating sales trends from the studies underlying EIA towards 2050. An average stock of 3 VCs/hh was considered too high. In EIA2020, sales in later years have been adapted such to limit the stock to approximately 2 VCs/hh.

1.7. Reporting

This EIA III Annual Report 2020 uses the same layout as the 2016-2019 editions. As requested by the contract, 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).

Except for the additions presented in sections 1.6.5 (split per fuel type), 1.6.7 (data per household) and 1.6.9 (Brexit and additional user-options for rates and GWP factors), the accounting methodology has hardly changed in the EIA2020 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 2020, 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.

The 'EcoReport for the average EIA product' and the 'Special Report Materials' that accompanied the 2016 EIA issue, have not been updated: existing versions remain valid.

⁷⁹ EHI (EHI Heating Market report 2020) reports a stock of 3.6 mln coal-fired boilers in Central and Eastern Europe in 2015-2017.

Fraunhofer et al ('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)) report a EU28 stock of 3.4 mln for coal-fired boilers, probably between 2012 and 2015.

⁸⁰ The review study on local space heaters, see section 1.6.10.6, did not cover solid-fuel LSHs, so no new information was available. Sales and stock for solid fuel LSHs were not changed in EIA2020.

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 product⁸¹. 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,

⁸¹ Note that for the first products with an Energy Label like household refrigerators and washing machines this may go back to 1992-1993.

where the new BAU-scenario in EIA, based on new data and insights, is different from the previously used BAU-scenario. The same has been done in EIA2020 for most of the product updates listed in section 1.6.10, 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 new⁸².

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. 1.6.8), 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 IA⁸³.

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

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- 82 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.
- 83 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.

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 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 1.6.8, 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 classes⁸⁴. 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 3.8⁸⁵.

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).

84 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).

85 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. See also par.1.3, 1.6.4 and 1.6.5).

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. 1.6.8), 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. 1.6.8, and observations further above on considering the differences between the IA and the final regulation.

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.⁸⁶

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.

86 For instance, there is no savings for PCs, because it was not possible to quantify them with the data available.

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. As requested by the EIA policy officer, 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 1.6.9.2;
- for space heating and cooling load of buildings, the historical trends are extrapolated using the same percentage for the BAU and ECO scenario⁸⁷;
- the BAU and the ECO scenario use the same performance/load, only the product's efficiency differs⁸⁸.

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 2015, inflation corrected) and the annual price escalation rates beyond inflation;

⁸⁷ 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.

⁸⁸ 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.

- 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 CO₂ equivalent (for electricity, fuels, refrigerants);
- Employment parameters;
- Brexit factor;
- EU population and households;
- EU buildings and dwellings.

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 year⁸⁹. For some products, fractional years are used for the lifetime, for computation of the stock and of the average stock efficiency⁹⁰. 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 1996-2019 (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 2015 euros (see sections on rates below) and to convert product prices, maintenance costs, consumables' costs, etc. from 2010 euros (earlier EIA issues) to 2015 euros (recent EIA issues).

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.

⁸⁹ Users of the Masterfile can unhide columns to access data in intermediate years

⁹⁰ 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.

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 from 1990 to 2016 - or 2017/2018/2019 where available - 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:

$$\text{Tertiary rate} = (100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$$

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, $x=65\%$ is recommended, and for natural gas $x=58\%$, 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, the sheet General_2 also contains nominal rates for water, printer paper, detergents, and vacuum cleaner bags. 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.

2.3.6. Real rates (inflation corrected to 2015 euros)

The inflation corrected rates, i.e. whereby all rates are recalculated to fixed 2015 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.

Up to 2016-2019, the real rates are derived from the nominal rates considering the inflation from Eurostat's HICP (see par. 2.3.3). From 2016-2019 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 and natural gas rates, an additional user-option has been introduced in the EIA2020 Masterfile, to allow quick selection of the traditional EIA-projection, or the projection of the PRIMES reference scenario 2015f, see par. 1.6.9.2.

For the printed figures in this report, an escalation rate of 1%/a for electricity, 1.5%/a for natural gas, gas oil for heating, and LPG, 2%/a for wood, and 4%/a for coal has been used. These values are an approximation of the values used in the PRIMES 2015f reference scenario. For petrol and diesel for vehicles, an escalation rate of 2%/a is used, following the approach in the Impact Assessment for Tyres.

The escalation rate for water (incl. sewage levies) is 3%, whereas for the other resources the escalation rate is 0% (meaning that their average annual price increase equals inflation).

2.3.7. Efficiency of electricity generation and distribution (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. As requested by the EIA policy officer, 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 Directive⁹¹, 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 3 sets of CC values: constant 40% (PEF=2.5), constant 47.6% (PEF=2.1), or variable with the years (used in this report). The values used inside these sets can also be adapted, if desired.

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 energy directly used by products (FUEL), final energy (FNRG), greenhouse gas emissions (EMISS) or energy costs (NRGCOST)⁹².

If the user chooses an approach where the PEF varies with the years (CCset3 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_l) 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 oil⁹³. 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

91 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, <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A02012L0027-20210101>

92 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).

93 An exception has been made in EIA2020 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.

correction, depending on the fuel, between 5 and 10%⁹⁴. 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 RAC Ecodesign regulation applies to RACs using refrigerants with a low-GWP value. This 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).

The GWP-100 emission rates for electricity production are in accordance with MEErP and given on sheet General_1 (with a linked copy on EMISSRATES).

In EIA2020, a user-option has been introduced in the EIA Masterfile, to allow quick selection of the traditional EIA set of GWP factors, the PRIMES 2016 set, or a third set definable by the user, now with data from the EEA (section 1.6.9.4). For details and references, see sheet General_1 in Annex A. All GHG emission data in Annex A are for the traditional EIA set.

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 CO₂ 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-

⁹⁴ 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).

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 2018, the 'wages' are expressed in 2015 euros (as all other monetary data in EIA) 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):
0.054 m euro/employee overall.
For manufacturing alone, the 'wage' would be 0.162 m euro/employee ($\pm 10\%$). 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 0.054 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):
0.270 m euro/employee ($\pm 20\%$);
- RetailWages: Retailer's 'wages' (used with retail revenue):
0.065 m euro/employee ($\pm 20\%$);
- InstallWages: Installer's 'wages' (used with install revenue):
0.108 m euro/employee ($\pm 20\%$);
- MaintWages: Maintenance & Repair 'wages' (used with maintenance revenue):
0.108 m euro/employee ($\pm 20\%$);

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 ⁹⁵, defined as:

$$\text{Brexit factor} = (\text{EU28 value} - \text{EU27 value}) / \text{EU28 value} (\%).$$

⁹⁵ 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.

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

$$\text{EU27 value} = (1 - \text{Brexit factor}) * \text{EU28 value}$$

Generic Brexit factors have been derived by comparing Eurostat Energy Balance sheets for EU28 and EU27⁹⁶. 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 A⁹⁷. 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, 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.

96 <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.

97 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.

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, FNNG, 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 (see also section 1.6.7), 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, 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 update (section 1.6.10). 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 – household vacuum cleaners 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 vacuum cleaners, 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 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 standardised tapping pattern,
- m³ of ventilation air per m² building surface with a certain effectiveness and heat recovery,
- lumens (lm) emitted by light sources over a certain period of time,
- dm² 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,
- m³ 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 kilometres 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 dm² 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'⁹⁸ 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 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

⁹⁸ 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.

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/dm² 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 NO_x, 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 2015 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.

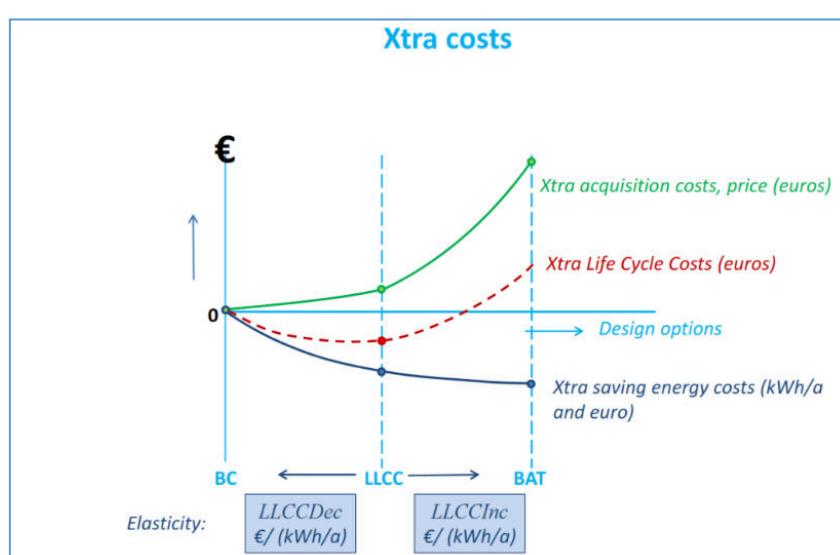


Figure 10. Illustration of anchor points in the calculation of the Least Life Cycle Costs.

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. Share of 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 sheet⁹⁹:

- 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 2015 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).

$$Stock_0 = \sum_{t=0}^{-\text{Life}} Sales_t \quad [1]$$

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).

⁹⁹ 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.

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 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.

$$EULOAD_0 = LOAD_0 \times Stock_0 \quad [2]$$

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 VUs⁶¹.
- 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) ¹⁰⁰.

- 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 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 m ³ /h/unit (from LOAD),
HCair	Heat capacity of air, 0.000344 kWh/m ³ /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

¹⁰⁰ 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.

by VUs. For this purpose, the EIA Masterfile has a control parameter on sheet EULOADVAR, enabling to activate or deactivate the heat load reduction ¹⁰¹.

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 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 EFNBBAU) and EFSECO (calculated from SALESECO and EFNECO), in the same measuring unit as EFN:

$$EFS_0 = \frac{\sum_{t=0}^{\text{Life}} Sales_t \times EFN_t}{\sum_{t=0}^{\text{Life}} Sales_t} \quad [3]$$

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):

$$ELEC_0 = Stock_0 \times LOAD_0 / EFS_0 \times ElecShare \quad [4a]$$

$$FUEL_0 = Stock_0 \times LOAD_0 / EFS_0 \times (1-ElecShare) \quad [5a]$$

$$ELEC_0 = Stock_0 \times LOAD_0 \times EFS_0 \times ElecShare \quad [4b]$$

$$FUEL_0 = Stock_0 \times LOAD_0 \times EFS_0 \times (1-ElecShare) \quad [5b]$$

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).

¹⁰¹ 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, FNRECO, NRGEKO, EMISSECO, NRGCOSTECO, EXPENSECO, and save them as fixed values one row higher (this is not visible in the printed version in Annex A).

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 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 NRGEKO (based on ELECECO and FUELECO). Sheets FNRSAVE 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 and PRIMES (see section 3.8.4).

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:

$$EMISS_0 = ELEC_0 \times GWPelec + FUEL_0 \times GWPfuel \quad [8]$$

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 EMISSSECO (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:

$$EMISS_0 = FUEL_0 \times EMISSrate \times UnitConversionFactor \quad [9]$$

Where EMISSrate is the applicable stock average emission rate specified for the type of emission on sheet EMISSRATES for the BAU or ECO scenario. NO_x 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 toner for imaging equipment, water and detergents for washing machines and dishwashers, bags 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 PRICEECO 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 time¹⁰².

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:

$$ACQ_0 = SALES_0 \times UnitPrice_0 \quad [10]$$

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.

¹⁰² 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.

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:

$$\begin{aligned} NRGCOST_0 = & ELEC_0 \times \sum_{sectors} SectorShare_i \times SectorElecRate_i \\ & + FUEL_0 \times \sum_{sectors} SectorShare_i \times SectorFuelRate_i \end{aligned} \quad [11]$$

The sector shares are the usage-sector shares from sheet SHARES (par. 2.4).

The sector rates are the usage-sector real rates (2015 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.

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:

$$RUN_{\theta} = NRGCOST_{\theta} + MAINT_{\theta} + ResourceCost_{\theta} \quad [13]$$

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:

$$EXPENSE_{\theta} = ACQ_{\theta} + RUN_{\theta} \quad [14]$$

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):

$$REV_{Industry_0} = ACQ_0 \times (1 - InstFrac) \times ManuFrac \quad [15]$$

$$REV_{Wholesale_0} = ACQ_0 \times (1 - InstFrac) \times WholeFrac \quad [16]$$

$$REV_{Retail_0} = ACQ_0 \times (1 - Instfrac) \times Retailfrac \quad [17]$$

$$REV_{Inst_0} = ACQ_0 \times Instfrac / (1 + VATavg\%) \quad [18]$$

$$REV_{Maint_0} = MAINT_0 / (1 + VATavg\%) \quad [19]$$

Values for the BAU scenario are based on ACQBAU and MAINTBAU; for the ECO scenario on ACQEKO 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:

$$JOB_{Industry_0} = REV_{Industry_0} / ManuWages \quad (\text{incl. OEM and Service jobs}) \quad [20]$$

$$JOB_{Whole_0} = REV_{Whole_0} / WholeWages \quad [21]$$

$$JOB_{Retail_0} = REV_{Retail_0} / RetailWages \quad [22]$$

$$JOB_{Install_0} = REV_{Install_0} / InstallWages \quad [23]$$

$$JOB_{Maint_0} = REV_{Maint_0} / MaintWages \quad [24]$$

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:

- circulators ($db=1$, 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 ¹⁰³.

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).

¹⁰³ 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.

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) heating¹⁰⁴. This split is done in the ACQBAU and ACQEKO sheets.

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.

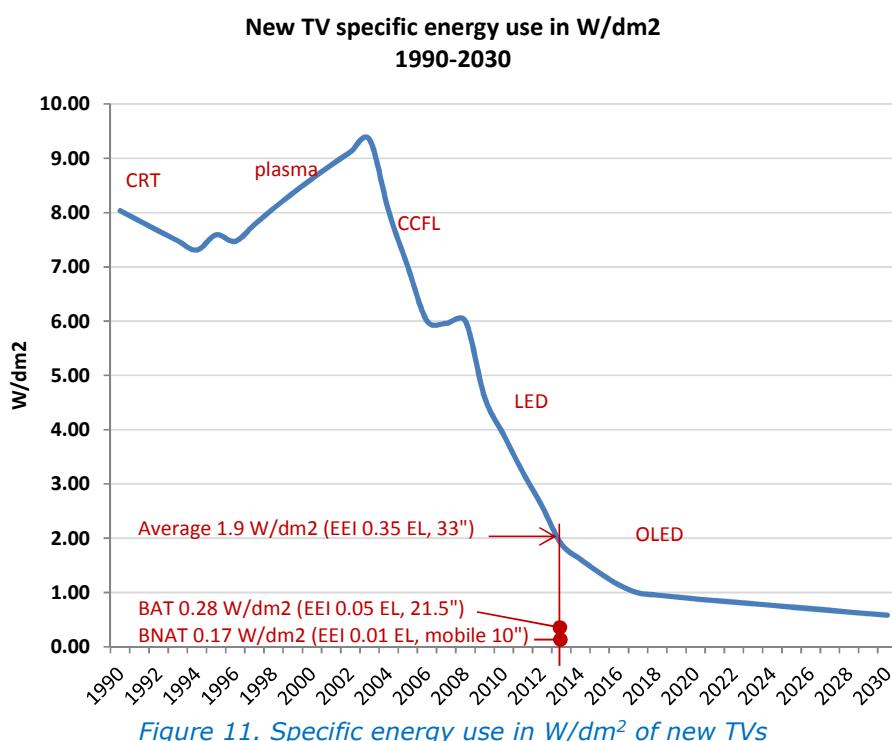
Both the BAU and ECO scenarios are –in most underlying studies- dynamic in the assumptions on market demand and increase in performance. Population is growing and the trend is towards more and bigger appliances, lamps, computers, televisions, etc. in households. For a small part this is a 'rebound' effect, 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

¹⁰⁴ Equation e.g. $\text{PRICE_COOL} = \text{PRICE} * \text{COOL_SALES} / (\text{COOL_SALES} + \text{HEAT_SALES})$ and $\text{PRICE_HEAT} = \text{PRICE} * \text{HEAT_SALES} / (\text{COOL_SALES} + \text{HEAT_SALES})$

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 11). 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'¹⁰⁵, are assumed the same.



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 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 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

¹⁰⁵ There has been a convergence of functionality between TVs and (non-integrated) computer monitors. Therefore the latest Commission Regulations combine them as 'electronic displays'.

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 summary per product group in Annex E gives a short overview of these trends.

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 miniaturisation 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 dm² of viewable area, of around a factor 16.

EU27 Televisions:

Viewable screen area and energy use 1990-2010-2030
according to 3 efficiency scenarios

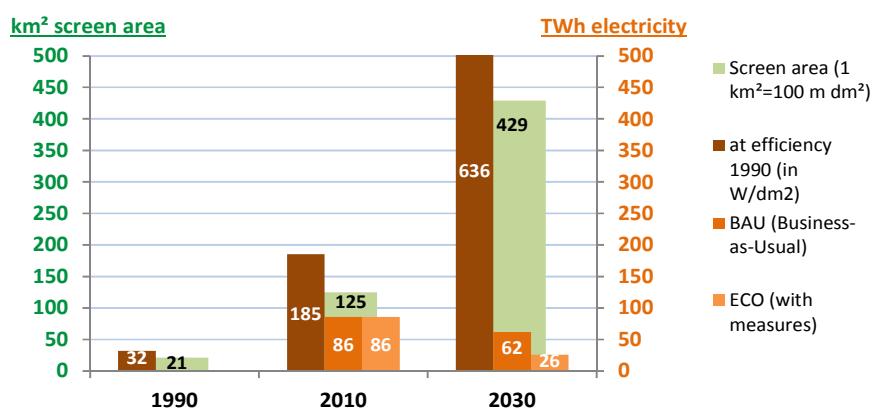


Figure 12. EU-28 television 1990-2030. Evolution of the load as well as the energy consumption according to ‘freeze’, BAU and ECO scenarios ¹⁰⁶

¹⁰⁶ Graphs for BAU and ECO scenario are based on EIA2017 data and may slightly differ from EIA 2020 data reported in the Annexes.

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 data¹⁰⁷, 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 and PRIMES. Reference data from Eurostat data have been updated in EIA2020 (for EU27).

For a comparison between EIA and Eurostat results, see section 3.8.

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

¹⁰⁷ 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.

the vehicles, but only the parts related to the rolling resistance (this is different from the approach in the impact assessment for tyres).

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.

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)¹⁰⁸, 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-compliance¹⁰⁸. This is based on information from the Commission and from other stakeholders¹⁰⁹. 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, FNKG, NRG, EMISS, NRGCOST and EXPENS (results without non-compliance).
- Next, the reduction in savings due to non-compliance is computed, multiplying the parameter NCloss (%) by the SAVE-total.

¹⁰⁸ '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

¹⁰⁹ - 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>

- 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 confusion¹¹⁰.

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 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.

¹¹⁰ 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 favourable) 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 31.12.2020

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 2020, 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).

Since 2019, EIA does no longer include data on products for which a final regulation has not been published (sections 1.6.8 and 2.2) ¹¹¹.

Table 4 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 299 base cases of 41 product groups, accounted in 12 functional groups.

Table 4 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	WH	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	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

¹¹¹ with the exception of standard air compressors, where the regulatory process is still ongoing

Lot	Acronym	Product Group	BCs
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	2
Industrial Components functional group			
11	FAN	Industrial Fans	6
11/30	MT	Electric Motors and Variable Speed Drives	22
11	WP	Water Pumps	1
31	CP	Standard Air Compressors	3
G5	WE	Welding Equipment	2
Energy Sector functional group			
G2	TRAFO	Utility Transformers	7
Transport Sector functional group			
T	TYRE	Tyres	6
Total		41 product groups	299

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 2020. 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 harmonising 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 reported at the start of Annex A. The order of the products on each sheet corresponds to the order in Table 4. 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 2015 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 13 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 calculation 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.
- 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 CO₂ eq./kWh. Data related to the emissions of NO_x, 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 CO₂ 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.

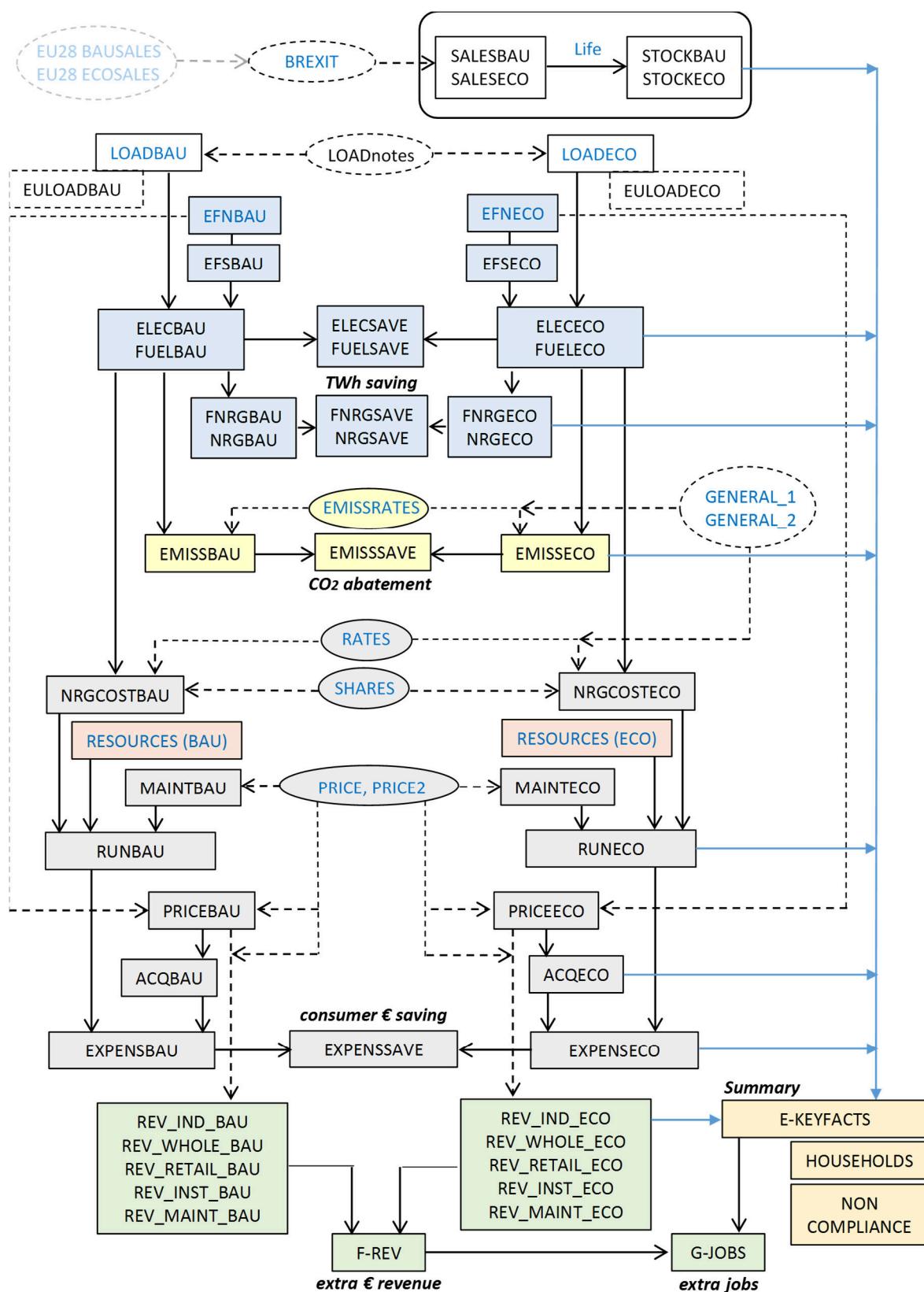


Figure 13. Structure of Annex A and of the EIA core calculation.

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 will contain 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 3.8).

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 3.6.3. 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 for the agreed PEF (section 2.3.7), for the traditional EIA sets of energy rates (sections 1.6.9.2, 2.3.5, 2.3.6), and global warming potential factors (sections 1.6.9.4, 2.3.9), and do not include the possible effects of product non-compliance (sections 1.6.8, 2.11). A sensitivity analysis for different electricity and gas rates, for different GWP factors for electricity, and for non-compliance can be found in section 3.6.

3.4.2. Energy

In year 2019 the products included in the accounting represent 8930 TWh (32 147 PJ, 768 Mtoe) of primary energy consumption (Figure 14). This is 57% of the total EU27 primary energy consumption in 2019 (1352 Mtoe)¹¹².

In **2020**, the primary energy saving due to Ecodesign, Energy Labelling, Energy Star and Tyre Labelling regulations (ECO versus BAU) is 1027 TWh (3734 PJ, 89 mtoe), i.e. a saving of 10% versus Business-As-Usual (Figure 15).

Of this, 80% (3006 PJ, 72 mtoe, 835 TWh) is primary energy saving due to saving 334 TWh (29 mtoe, 1202 PJ) of electricity (with PEF 2.5), and 20% (728 PJ, 17 mtoe, 202 TWh) is direct fuel saving. The sum of electricity and direct fuel saving (final energy saving) is 536 TWh (46 mtoe).

The 2020 primary energy savings come for 21% from space heating, 20% from lighting, 14% from food preservation, 13% from electronics, 11% from industrial components and 9% from cleaning appliances (Figure 16).

In **2030**, the primary energy saving increases to 1533 TWh (5520 PJ, 132 mtoe), which represents a saving of 18% versus BAU (Figure 15) and is 48% higher than in 2020, notwithstanding the use of a lower PEF for electricity in 2030.

Of this, 73% (4019 PJ, 96 mtoe, 1116 TWh) is primary energy saving due to saving 532 TWh (46 mtoe, 1914 PJ) of electricity (with PEF 2.1), and 27% (1501 PJ, 36 mtoe, 417 TWh) is direct fuel saving. The sum of electricity and direct fuel saving (final energy saving) is 949 TWh (82 mtoe). The smaller ‘weight’ of electricity in the primary energy savings compared to 2020 (73% vs. 80%) 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 24% from space heating, 13% from lighting, 14% from food preservation, 12% from electronics, 13% from industrial components and 7% from cleaning appliances (Figure 16). The smaller contribution of lighting to the primary energy savings compared to 2020 (13% vs. 20%) 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 6.6% of the total EU27 primary energy consumption (1352 mtoe in 2019¹¹²). In 2030 this is projected to grow to 10% of the 2019 EU27 energy consumption.

The graphs below, taken from the summary at the end of sheets NRGEKO and NRGSAVE (Annex A), show the primary energy consumption time series for the period 1990-2050.

Figure 14 demonstrates 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).

¹¹² Eurostat Energy Balance nrg_bal_c, ed. February 2021, PEC (Europe 2020-2030)

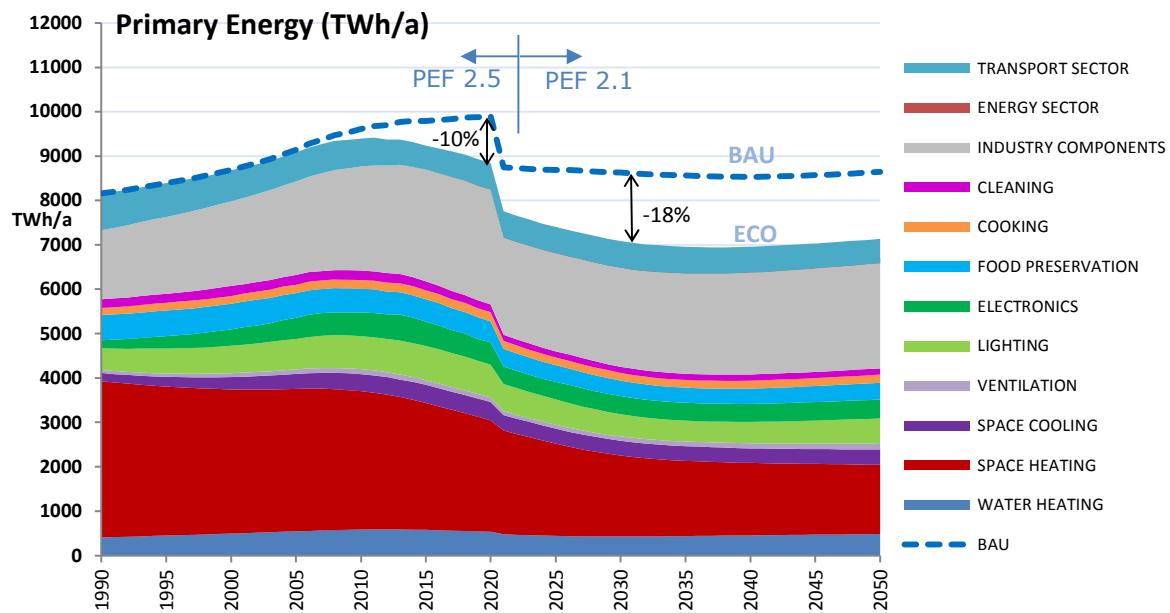


Figure 14. Primary energy consumption of products included in ecodesign impact accounting, status 31 December 2020 (energy sector impact not shown)

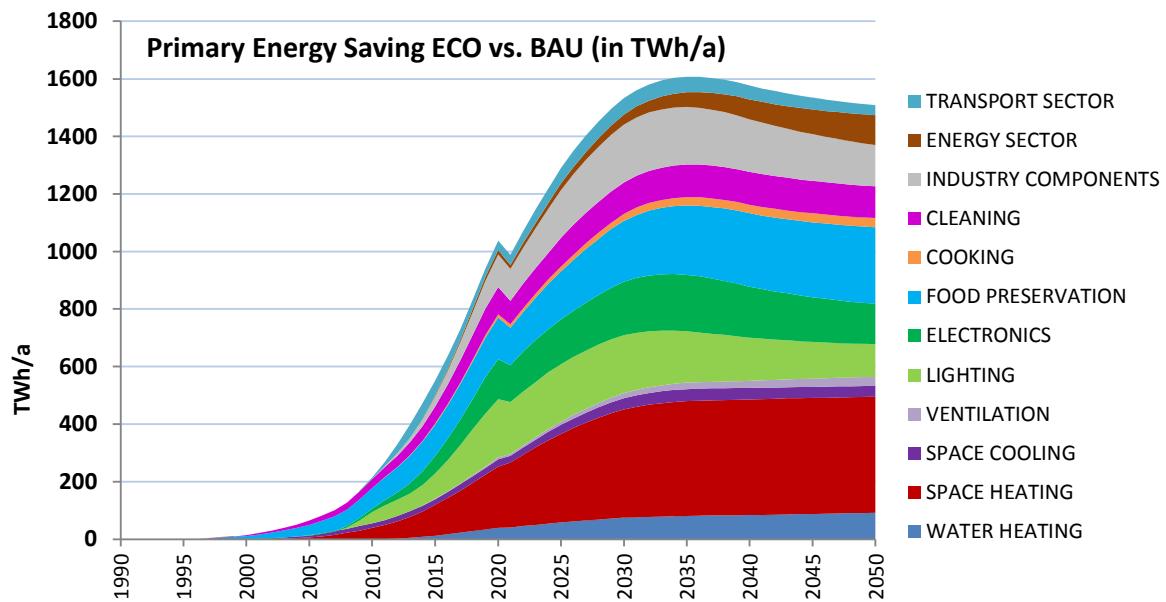


Figure 15. Primary energy saving of ECO versus BAU of products in ecodesign impact accounting, status 31 December 2020

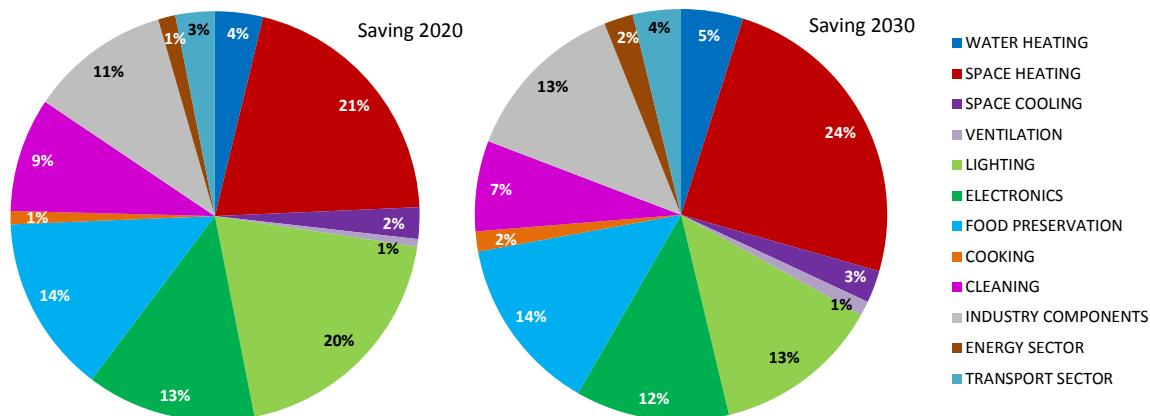


Figure 16. Share of primary energy saving per functional group, in 2020 and 2030.

Sector subdivision

EIA provides the subdivision of energy consumption over the usage-sectors: residential, tertiary, industry and other ¹¹³. 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-, FNFG- 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 17 shows the 2010 ECO Primary Energy consumption per sector (total is 9393 TWh/a). The sectors contributed for respectively 39% (residential), 30% (tertiary), 23% (industry), 7% (transport) and 2% (other).

The residential sector is the major energy consumer for water heating, space heating, electronics, cooking, and cleaning (Table 5). 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 5 is approximately valid also for other years, although overall the share of the residential sector tends to decrease (from 39% in 2010 to 30% in 2030) while the share of industry increases (from 23% in 2010 to 27% in 2030).

¹¹³ 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.

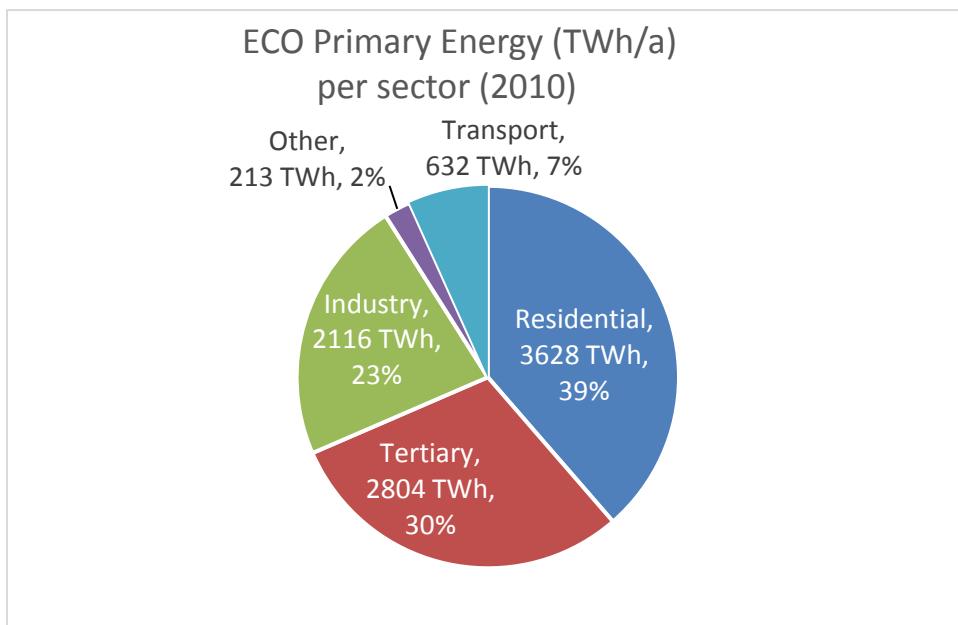


Figure 17. Subdivision per sector of the ECO primary energy consumption in 2010, for products in scope of the ecodesign impact accounting.

Table 5 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%	26%	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	92%	8%	1%	0%
INDUSTRY COMPONENTS	0%	27%	69%	4%
TRANSPORT SECTOR* (separate)	46%	34%	17%	3%

* Energy losses due to rolling resistance of tyres.

The 2020 primary energy savings of 1023 TWh/a (excl. Energy sector) derive for 61% from the residential sector, 24% tertiary, 10% industry, 3% transport and 1% other sector (Figure 18).

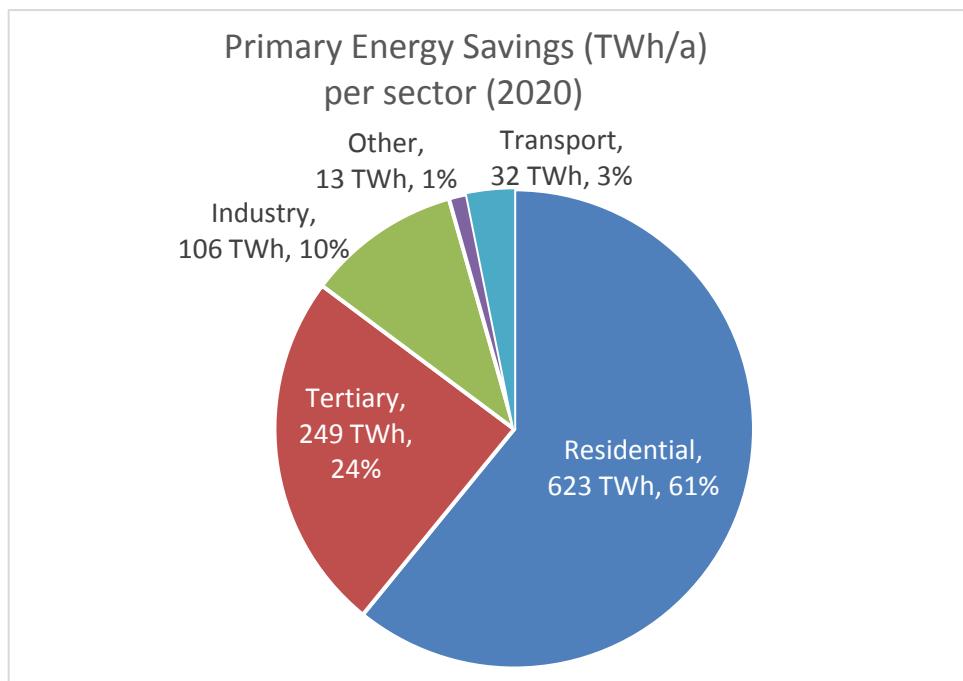


Figure 18. Subdivision per sector of the primary energy savings in 2020 (Energy sector not shown).

Space heating load

In the EU Building Heat Demand (BHD) report¹¹⁴, 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, and 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 EIA2020, 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 sector, and lower for industry.

3.4.3. Emissions

The reduction of greenhouse gas emissions in the EU27 in 2020, due to energy-related CO₂¹¹⁵, amounts to 170 Mt CO₂ equivalent (ECO versus BAU). This is 10% of the BAU 2020 total emissions of the products included in EIA and 4.5% of the EU27 total

¹¹⁴ “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

¹¹⁵ 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.

emissions in 2018 (3764 Mt CO₂¹¹⁶). For 2030 a reduction of 266 Mt CO₂ equivalent is projected. This is an 18% reduction for the average included EIA product (Figure 19) and 7% of the EU27 total in 2018.

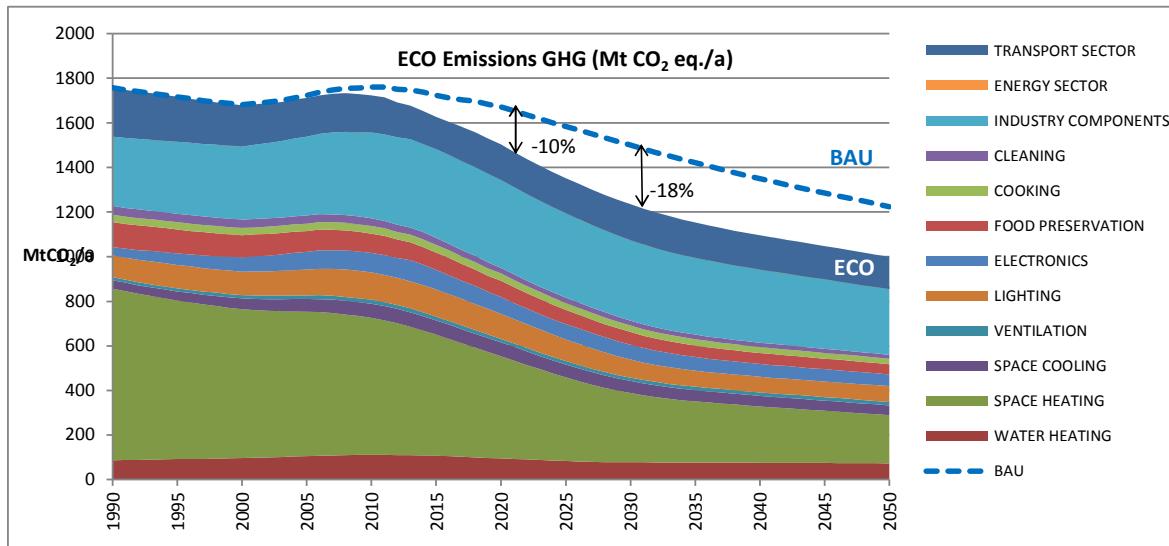


Figure 19. Greenhouse gas emissions due to energy consumption of products included in the ecodesign impact accounting, status 31 December 2020

The reduction of nitrogen-oxides (NO_x) emissions (acidifying agent and ozone precursor, smog) is 83 kt SO₂ equivalent¹¹⁷ in 2020 (ca. 2% of EU27 total NO_x emissions in 2018¹¹⁸). This is a result from the Ecodesign emission limits set for 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 2018 the total EU27 CO-emissions were 17 900 kt/a¹¹⁹.

116 Source: ‘Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020 , Submission to the UNFCCC Secretariat, 27 May 2020, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), and <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>.

117 Equals 119 kt NOx. (factor 0.7)

118 6146 kt NOx 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 3.6 (EU28 minus UK, adjusted data)).

119 17892 kton 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 3.14 (EU28 minus UK)).

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 2018 the total European NMVOC-emissions were 5760 kt/a¹²⁰.

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/a¹²¹.

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 total¹²²).

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 equipment¹²³).

More details can be found in the RESOURCES sheet, Annex A.

3.4.5. User expenditure

In 2020 approximately € 60 bn (in 2015 euros) will be saved by end-users resulting from Ecodesign and labelling measures (Table 6). This is the result from a € 82 bn saving on running costs (€ 75 bn energy costs, € 7 bn consumables) and € 23 bn extra acquisition costs for more efficient products. Given the BAU-total in the EU27 in 2020 of € 1166 bn spent on running costs (€ 772 bn) and acquisition costs (€ 395 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 price¹²⁴ will rise by 6% for these products.

In 2030 the expense saving (ECO versus BAU) is projected to grow to € 118 bn, saving the EU consumers nearly 9% on total costs versus the situation without measures. Figure 20 gives the total expenditure in the ECO scenario (running + acquisition costs) per product group and –in orange—the saving versus the BAU scenario.

120 5760 kton NMVOC in EU27 in 2018. Source: 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). NMVOC= Non-Methane Volatile Organic Compounds, similar to OGC but without the methane contribution.

121 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).

122 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 %.

123 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%.

124 Prices include installation and VAT for residential and are all expressed in fixed euros 2015. The energy escalation rate (real annual increase above inflation) is assumed 1-4% (similar to PRIMES, see sheet General_1).

The highest expense savings in 2030 (€ 20 bn) come from the cleaning group, followed closely by electronics, lighting and space heating (€ 19 bn each), and food preservation (€ 18 bn). Moderate expense savings are found for industry components (€ 13 bn). Lower expense savings are projected for water heating (€ 5 bn), space cooling (€ 3 bn), ventilation and cooking (€ 1 bn each), and the energy sector (€ 1 bn). With the assumed 2%/a escalation of petrol and diesel rates, 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.

<i>Table 6 Breakdown of total user expenses and savings for years 2010, 2020 and 2030, in bn euros 2015</i>								
	2010		2020			2030		
	BAU	BAU	ECO	inc.	BAU	ECO	inc.	
Acquisition	355	395	418	23	476	508	32	
Energy Cost	629	673	598	-75	753	615	-138	
Maintenance	50	60	60	0	66	66	0	
Consumables	45	39	31	-7	40	28	-12	
Total Expense	1080	1166	1106	-60	1335	1217	-118	

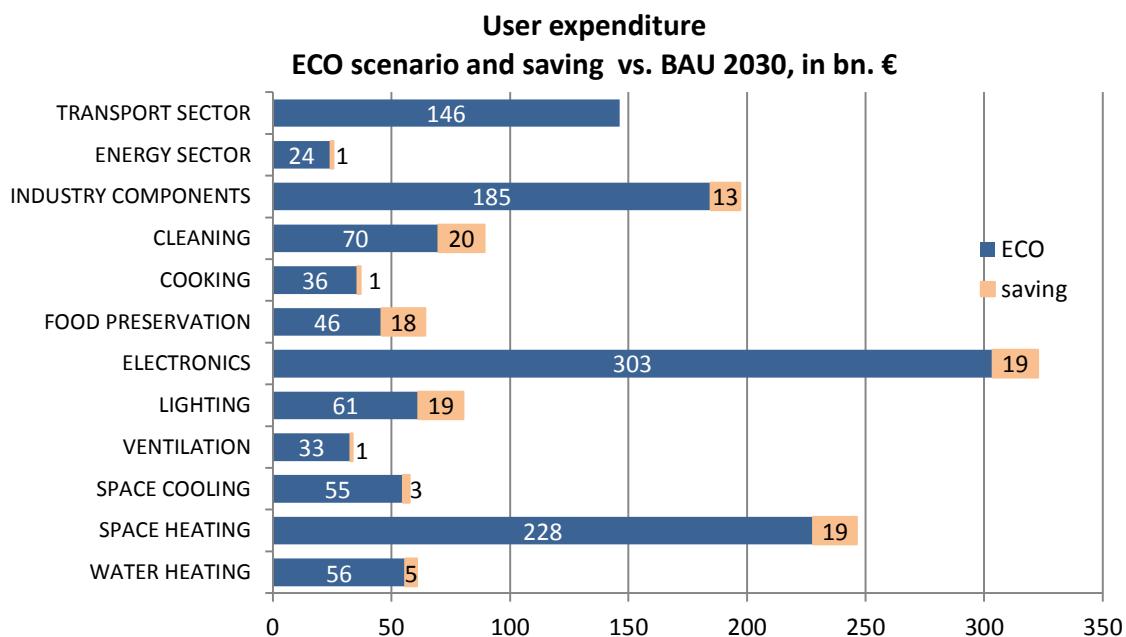


Figure 20. EU27 total user expenditure in 2030 on products included in the accounting.

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 € 21 bn and for 2030 it will grow to € 29 bn compared to a situation without measures. Approximately 50% of the extra revenue in 2030 will go to industry, 8% to wholesale, 26% to retail, 15% 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 324 thousand additional direct jobs due to the measures are calculated in 2020, and 430 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 (new 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 11 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 21). 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 1000 kWh/a of electricity**, projected to grow in 2030 to 1200 kWh/a. This is respectively 27% (2020) and 33% (2030) of the total annual electricity consumption of the average household in 2019 ¹²⁵. The major savings (Figure 22) 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%

¹²⁵ According to the Eurostat Energy Balance ed. Feb. 2021, the EU27 households in 2019 consumed 61 mtoe of final electricity, corresponding to 706 TWh. Dividing this by 195 mln households, the average annual electricity consumption per household in 2019 was 3620 kWh/a.

(2030) of the total annual fuel consumption of the average household in 2019¹²⁶. 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 530 kg CO₂-equivalent of greenhouse gases in 2020**. In 2030 this is projected to increase to almost 700 kg CO₂ eq/household.

Expense savings per household

In 2020, the average EU27 household spent 2760 euros for the acquisition, installation, operation, and maintenance of regulated products. Although difficult to compare, this order of magnitude is in line with Eurostat data¹²⁷. Without the Ecodesign and Energy Labelling regulation this would have been 2970 euros: a saving of 210 euros per year per household, or a saving of 8% compared to the situation without measures. A breakdown of the savings over the functional groups is provided in Figure 23. These direct savings are only on products used in the households themselves.

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 23 as indirect savings per household, which should be considered as maximum values. In 2020 the maximum additional indirect savings per household are 93 euros.

Summarizing, the **total expense savings in 2020 are between 210 and 300 euros per household**. In 2030, this is projected to increase to between 350 and 580 euros per household.

126 According to the Eurostat Energy Balance ed. Feb. 2021, the EU27 households in 2019 consumed 186 mtoe of non-electric final energy, corresponding to 2159 TWh. Dividing this by 195 mln households, the average annual ‘fuel’ consumption per household in 2019 was around 11000 kWh/a (not including transport).

127 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.

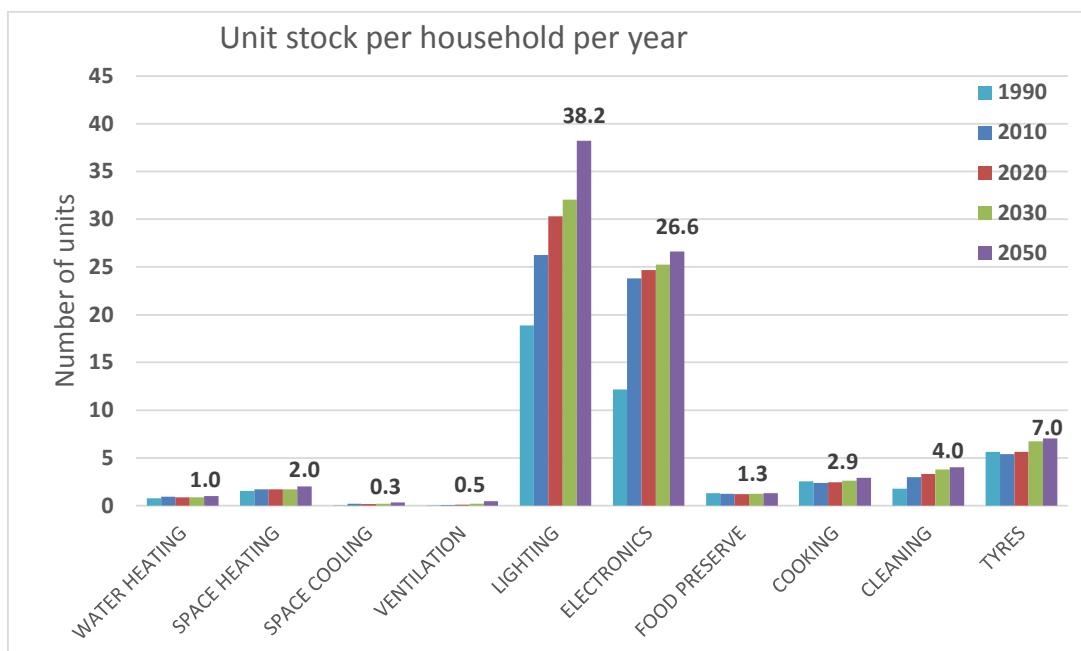


Figure 21. Stock of products regulated by Ecodesign or Energy Labelling in the average EU27 household. Source: EIA sheet Households

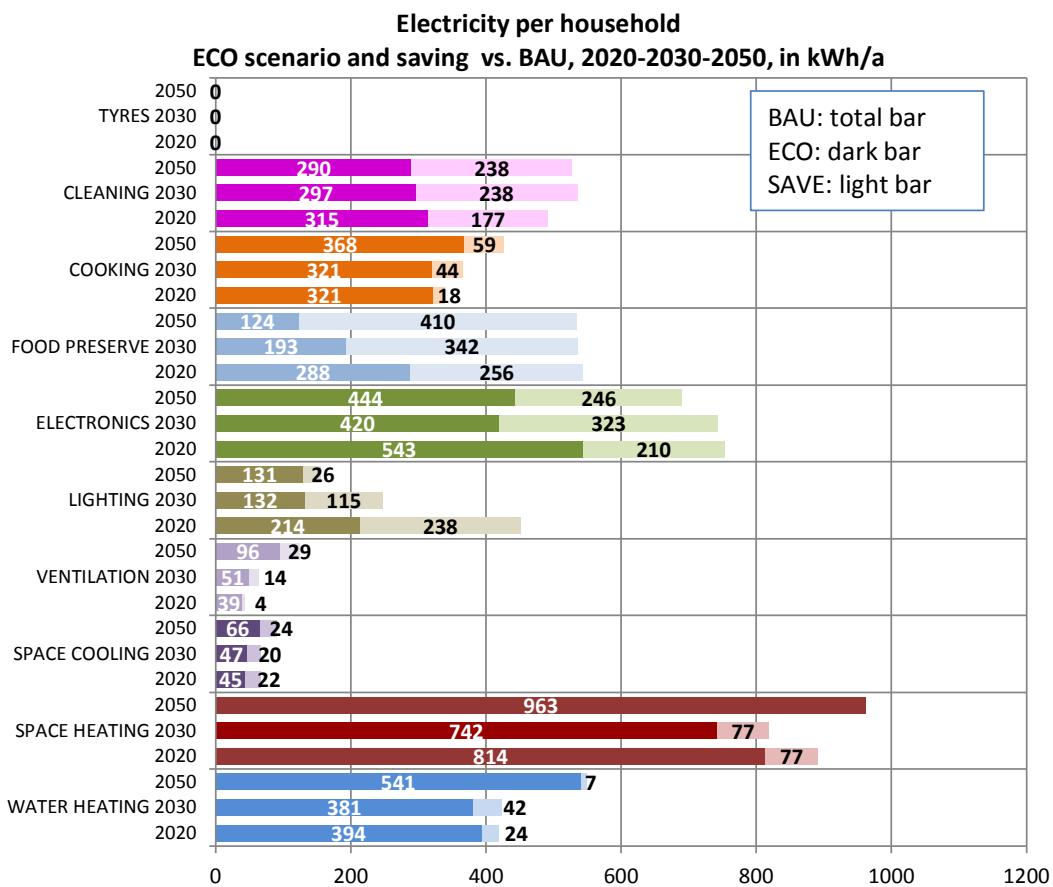


Figure 22. Electricity consumption per average EU27 household in kWh/a for regulated products (included in EIA). Consumption in the ECO-scenario (with impacts of measures), and savings vs. BAU (without measures). Source: EIA sheet Households

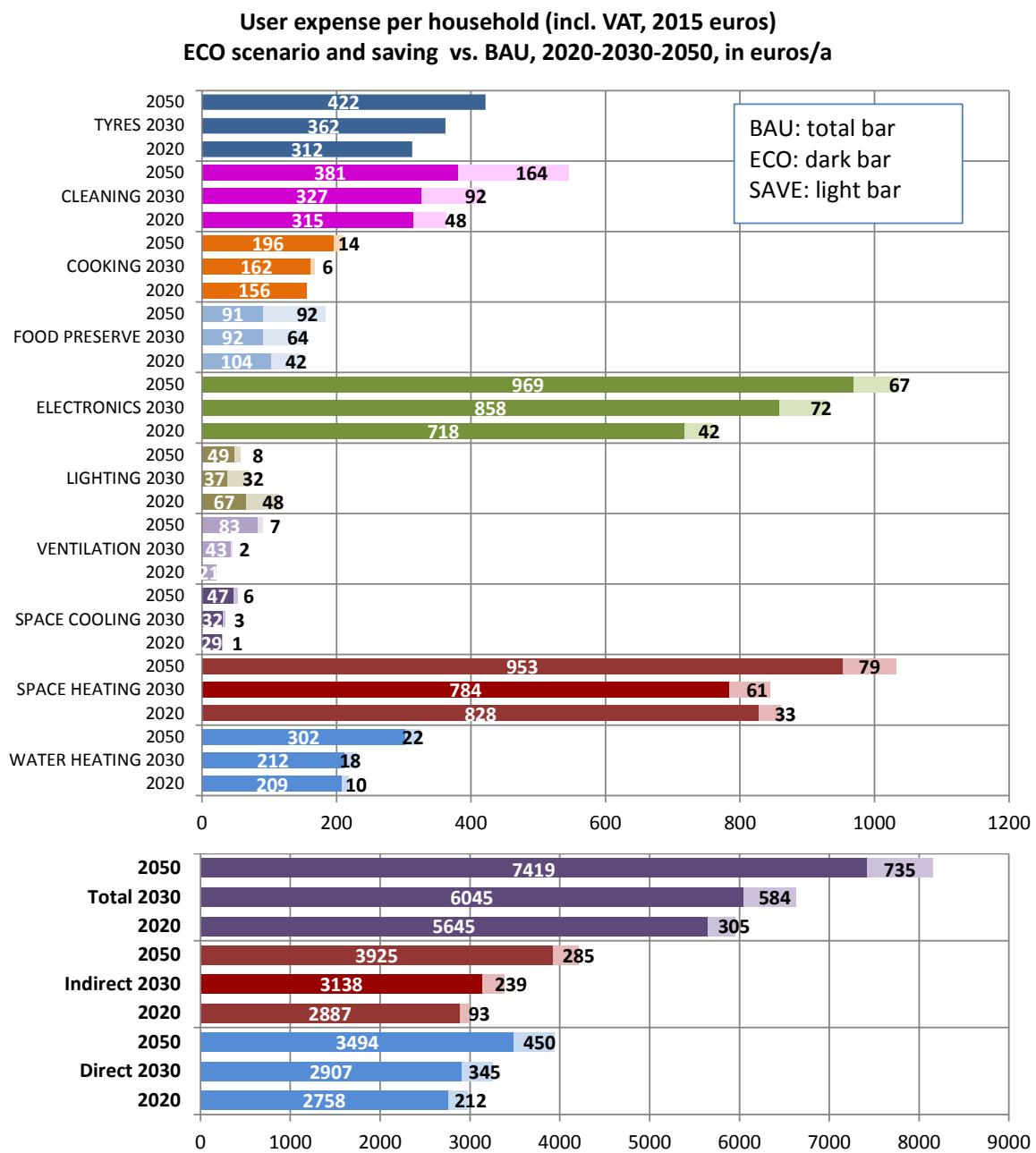


Figure 23. User expenses per average EU27 household in 2015 euros/a (incl. VAT) for regulated products (included in EIA). Includes product purchase, installation, energy costs, and maintenance and repair. Expenses in the ECO-scenario (with impacts of measures), and savings vs. BAU (without measures). 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

3.6.1. Sensitivity of GHG-emissions to changes in GWP factors.

As anticipated in section 1.6.9.4, the GWP-100 factors for electricity generation and distribution traditionally used in EIA are based on the MEErP, and relatively old. More recent data and projections, from the PRIMES 2016 reference scenario and from the European Environmental Agency, lead to lower values (Figure 24) ¹²⁸.

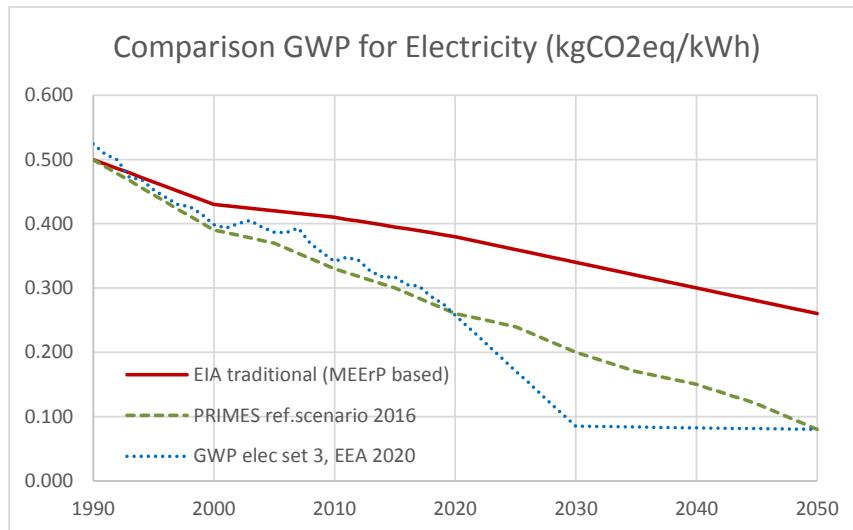


Figure 24: Comparison of GWP-100 factors for electricity generation and distribution (kgCO₂eq/kWh electric) for EIA traditional (MEErP), PRIMES 2016 reference scenario, and EEA 2020.

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 2016 set, or a third set definable by the user, now with data from the EEA. The option has been used by the EIA team to present the sensitivity data reported below.

As shown in Annex A on the EMISS-sheets and reported in section 3.4.3, when using the traditional EIA set of GWP factors for electricity (set 1 based on the MEErP), the reduction of GHG-emissions due to Ecodesign and Energy Labelling measures is 170 MtCO₂eq/a in 2020 and 266 MtCO₂eq/a in 2030. With the other sets of GWP factors (from PRIMES 2016 or EEA 2020), the 2020 emission savings reduce from 170 to 129

128 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 the EIA2019 and earlier editions.

Values for GWP electricity set 2 for years 2000-2050 (in 5-year steps) are from the PRIMES reference scenario 2016, as reported in 'Primes 2016 ref scenario - AppendixRefSce.xlsx' on sheet EU28-B row 70 for 'Electricity and Steam production'. Value for 1990 assumed identical to set 1. Values in intermediate years interpolated linearly.

Values for GWP electricity set 3 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-6#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111, 'European level — Greenhouse gas emission intensity of electricity generation'. Annual values defined until 2019 (0.275) with projection between 0.097 and 0.075 for year 2030 (average used). Value for 2050 assumed identical to set 2. Linear interpolation 2019-2030 and 2030-2050.

MtCO₂eq/a (24% less savings). In 2030, the savings reduce from 266 to 191 MtCO₂eq for the PRIMES set (-28%), and to 130 MtCO₂eq/a for the EEA set (-51%) (Table 7).

These data show the importance of agreeing on a common set of GWP-factors for electricity to be used in all Ecodesign studies, and more in general in the models used for EU policy purposes.

Table 7 Comparison of total EU27 GHG-emissions (in MtCO₂eq/a) due to energy use by EIA products for three different sets of GWP-factors for electricity generation and distribution.

EU27 total GHG-emissions in Mt CO ₂ eq/a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
GWP factors Set 1 (MEErP, EIA traditional) BAU	1758	1761	1723	1672	1584	1501	1421	1349	1285	1225
ECO	1758	1724	1626	1502	1351	1235	1153	1096	1047	999
SAVE	0	37	96	170	233	266	268	253	238	226
GWP factors Set 2 (PRIMES ref. 2016)	1758	1560	1468	1336	1241	1094	981	904	802	669
ECO	1758	1529	1388	1207	1063	902	794	727	641	525
SAVE	0	31	80	129	178	191	187	177	161	144
GWP factors Set 3 (EEA 2020)	1798	1587	1514	1330	1044	759	727	703	685	669
ECO	1798	1556	1430	1201	898	629	588	561	542	525
SAVE	0	31	83	129	146	130	140	142	143	144

3.6.2. Sensitivity of User expenses to changes in energy rates.

The EIA sets of rates for electricity and natural gas are based on Eurostat data for EU27 until year 2019. For later years, an annual increase of 1% (on top of inflation) is assumed for electricity, and 1.5% for natural gas. See details in sections 2.3.5 and 2.3.6, and in the notes on sheets General_1 and General_2 in Annex A.

Although the EIA rates aim to approximate those used in the PRIMES reference scenario 2015f¹²⁹, there are differences (Figure 25). In 2019 and earlier, these differences are probably due to the use of another Eurostat reference consumption band in PRIMES (for some of the Member States). After 2019 it is due to a slight difference in projection.

As anticipated in section 1.6.9.2, a user-option in the EIA Masterfile on sheet General_1 allows quick selection of the traditional EIA sets for electricity and natural gas rates, or the sets used in the PRIMES reference scenario 2015f. The option has been used by the EIA team to present the sensitivity data reported below.

The data on the EXPENS- and HOUSEHOLDS-sheets in Annex A and the data reported in sections 3.4.5 and 3.5 are for the traditional EIA electricity and gas rates (set 1).

¹²⁹ The PRIMES' rates for electricity and natural gas come from a dedicated Excel file '2017 11 09 VEU28REF2015fdetinfo.xlsx', supplied to the EIA team by the EC policy officer in 2018.

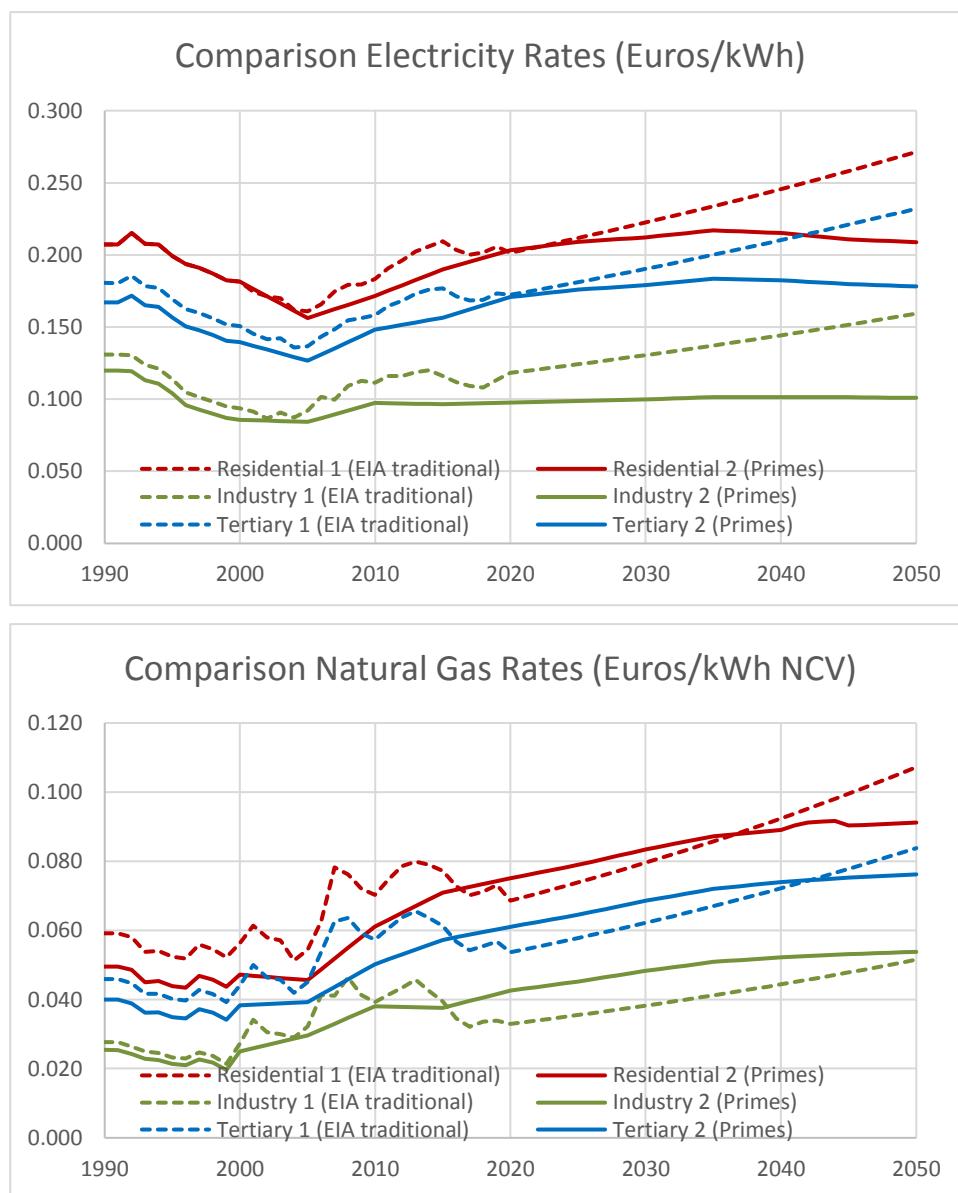


Figure 25: Comparison of rates for electricity (€/kWh electric) and natural gas (€/kWh NCV) for EIA traditional and PRIMES 2015f reference scenario, for residential, industry and tertiary/services sector (in 2015 euros, incl. VAT for residential). See sheets General_1 and General_2 in Annex A for details and references.

In 2020, the two sets of rates for electricity and natural gas yield the same savings (Table 8): 76 bn euros of energy costs savings and 60 bn euros of user expense savings. The user expense savings per household in 2020 are almost the same: 217 euros/a/hh with PRIMES' rates (set 2) versus 212 euros/a/hh with EIA rates (set 1).

In 2030, the savings are slightly smaller when using the PRIMES' rates: 132 vs. 138 bn euros for energy costs, 111 vs 118 bn euros for total user expense, and 337 vs. 345 euros/a/hh for the savings per household. A negligible difference of 2%.

Higher differences appear in 2050. The energy cost savings decrease from 165 (EIA rates) to 132 bn euros (PRIMES' rates) and the total user expense savings from 147 (EIA) to 114 bn euros (PRIMES). The expense savings per household decrease from 450 (EIA) to 364 euros/a/hh (PRIMES), a difference around 19%.

Table 8 Comparison of total EU27 energy costs, total user expenses (in bn euros/a) and expense savings per household (in euros/a/hh) for EIA products for two different sets of rates for electricity and natural gas (EIA traditional and PRIMES 2015f).

		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Set 1 (EIA traditional electricity and gas rates)											
Energy costs, EU27 total, bn euros	BAU	490	629	682	673	711	753	795	841	896	958
	ECO	490	614	637	597	599	615	643	685	736	793
	SAVE	0	15	45	76	112	138	152	156	159	165
Total user expense, EU27 total, bn euros	BAU	702	1080	1144	1166	1246	1335	1405	1473	1548	1630
	ECO	702	1067	1110	1106	1156	1217	1274	1337	1408	1483
	SAVE	0	13	33	60	90	118	131	136	140	147
User expense per household (euros/a/hh)	SAVE				212		345				450
Set 2 (PRIMES 2015f electricity and gas rates)											
Energy costs, EU27 total, bn euros	BAU	468	587	621	663	686	707	730	739	749	766
	ECO	468	573	579	587	577	576	589	600	615	633
	SAVE	0	14	41	76	110	132	141	139	135	132
Total user expense, EU27 total, bn euros	BAU	679	1038	1083	1156	1221	1290	1341	1371	1401	1438
	ECO	679	1026	1053	1096	1133	1178	1220	1252	1287	1323
	SAVE	0	12	30	60	88	111	121	119	115	114
User expense per household (euros/a/hh)	SAVE				217		337				364

3.6.3. 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, FNFG, NRG, EMISS and NRGCOST. Variations in total user expense (EXPENS) are the same as variations in energy costs.

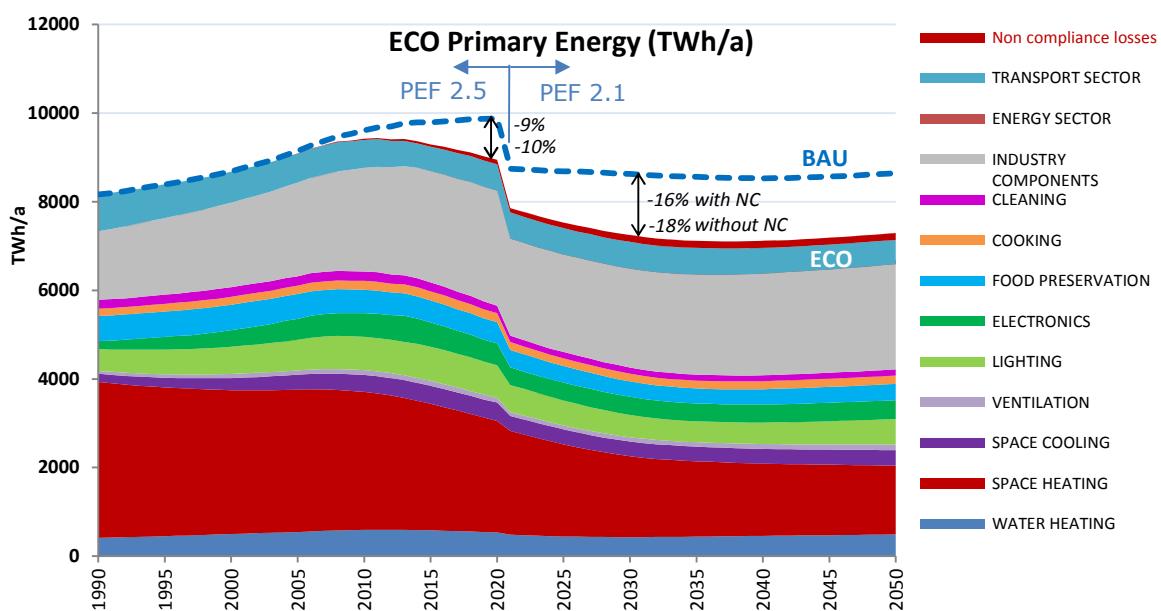


Figure 26. Primary energy consumption of products included in ecodesign impact accounting, status 31 December 2020 (energy sector impact not shown). The graph also indicates the possible reduction of the savings by 10% due to a share of non-compliant (NC) products.

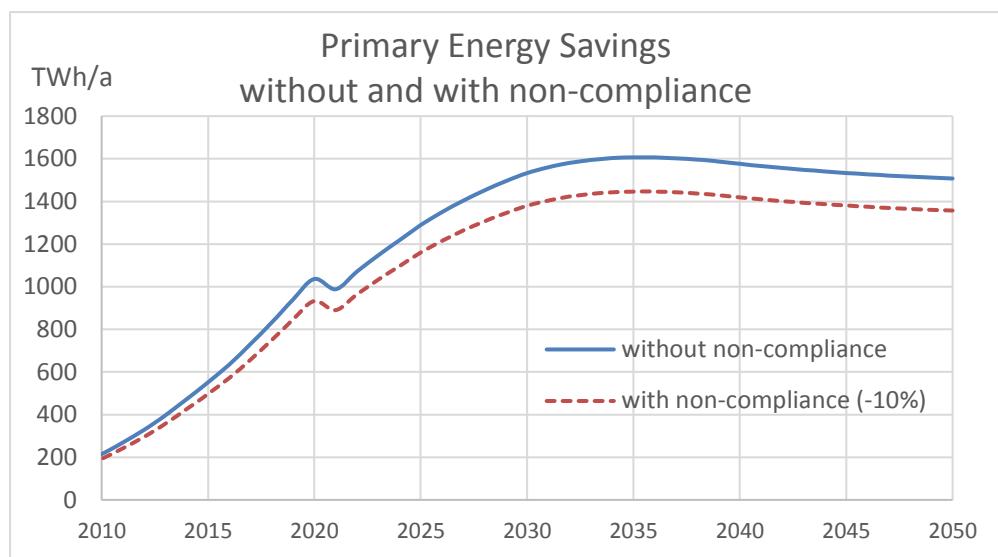


Figure 27. Reduction of primary energy savings by 10% due to a share of products entering the market being non-compliant with Ecodesign and Energy Labelling regulations.

Table 9: 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)	2798	2464	2497	334	301	33
Final Fuel (TWh/a)	2888	2686	2706	202	182	20
Final Energy (TWh/a)	5685	5155	5208	531	477	53
Primary Energy (TWh/a)	9882	8845	8948	1037	933	104
GHG-emissions (MtCO2eq/a)	1672	1502	1519	170	153	17
Energy costs (bn euros/a)	673	597	605	76	68	8
User expense (bn euros/a)	1166	1106	1114	60	52	8
2030						
	BAU	ECO no NC	ECO with NC	SAVE no NC	SAVE with NC	loss due to NC
Electricity (TWh/a)	2909	2377	2430	532	478	53
Final Fuel (TWh/a)	2516	2099	2141	417	375	42
Final Energy (TWh/a)	5424	4493	4586	932	839	93
Primary Energy (TWh/a)	8624	7091	7244	1533	1380	153
GHG-emissions (MtCO2eq/a)	1501	1235	1261	266	239	27
Energy costs (bn euros/a)	753	615	628	138	124	14
User expense (bn euros/a)	1335	1217	1231	118	104	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.

3.7. Differences in results with previous EIA editions

3.7.1. Differences due to Brexit

As explained in sections 1.6.9.1 and 2.3.11, EIA2020 presents data for EU27 excl. UK¹³⁰. The previous EIA2019 edition still presented data for EU28 incl. UK. The shift to EU27 changes all EIA parameters that depend on sales or stock quantities, for all products, and for all years. The differences due to this shift have been registered separately from differences due to other EIA updates (and prior to these other updates) and are reported in Table 10.

Due to the shift from EU28 to EU27, the savings reported in EIA2020 on energy, emissions and user expenses reduce by 13-16% compared to EIA2019, depending on the parameter and on the year. The primary energy savings on products accounted in EIA decrease by 254 TWh/a in 2020 and 379 TWh/a in 2030 due to Brexit.

Table 10: Differences in savings between EIA2020 and EIA2019 due to Brexit, prior to any other updates in EIA2020¹³¹ ()

Savings / reductions	2020				2030			
	EU28 (EIA2019)	EU27 (EIA2020)	EU28 minus EU27	Overall Brexit factor	EU28 (EIA2019)	EU27 (EIA2020)	EU28 minus EU27	Overall Brexit factor
Electricity (TWh/a)	440	381	59	13.4%	718	629	89	12.4%
Final Fuel (TWh/a)	678	570	108	15.9%	1210	1018	192	15.9%
Final Energy (TWh/a)*	1111	945	166	14.9%	1909	1630	279	14.6%
Primary Energy (TWh/a) °	1777	1523	254	14.3%	2718	2339	379	13.9%
GHG-emissions (MtCO ₂ eq/a)	311	265	45	14.5%	498	426	71	14.3%
User expense (bn euros/a)	64	55	9	13.8%	150	130	19	13.0%

* Final Energy does not count savings for Distribution Transformers.

° Primary Energy: PEF 2.5 in 2020; PEF 2.1 in 2030

3.7.2. Differences due to other EIA2020 updates

Table 11 gives an overview of the changes in energy impact due to product updates implemented in EIA2020 (status December 2020) compared to EIA2019 (status December 2019). The changes are based on new information from review studies, see section 1.6.10 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 EIA2020 data are reported for EU27 as 'is' values. The EIA2019 data are reported for EU27 and EU28 as 'was' values.

The total EU27 primary energy consumption in 2010 is 204 TWh (2%) lower than previously accounted. Table 11 provides the breakdown. The reduction is mainly due to Dedicated Water Heaters (-394 TWh, -55%) and results from a reduction in the load (demand for hot water), see section 1.6.10.4 and information on water consumption further below.

Other large relative changes in 2010 primary energy consumption occur for ventilation units, room air conditioners, circulators, and solid fuel boilers. For VUs, the new stock is lower, especially in earlier years (section 1.6.10.5), leading to a lower mechanically ventilated airflow in 2010 especially for the residential sector. For RACs the change

130 See sheet BREXIT in Annex A for the Brexit factors applied to each EIA base case.

131 the savings in this table do not include the effects of other updates in EIA2020, and thus are not the final savings of EIA2020, see also data in section 3.7.2

results from using a different BAU scenario, without the effects of the 2002 labelling directive (section 1.6.10.7). For circulators it is due mainly to including data for stand-alone circulators (section 1.6.10.8), while for SFB it is due to the update of sales and stock for coal-fired SFBs, following the comparison of EIA data with Eurostat/PRIMES (section 1.6.10.12).

The primary energy savings in EIA2020 are smaller than in EIA2019: -486 TWh (-32%) in 2020 and -806 TWh (-34%) in 2030. This is due mainly to the EIA2020 updates for space heating using central heating boilers (CHB) and water heating using central heating combis (CHC) and dedicated water heaters (DWH).

The EIA2019 data for CHB, CHC and DWH were based on the 2013 impact assessments, which in turn used the data from the 2007 preparatory studies. These studies used extensive and reliable 2004-2006 market information, and projections for e.g. heat pumps that were certainly acceptable in that period. At the same time, the UK mandated the use of condensing boilers (which was quite spectacular at the time) and there was a general optimism that energy-saving devices would be easily absorbed by the market.

The unforeseen **2008 financial crisis** drastically changed this. The building construction sector collapsed and never really recovered to pre-2008 levels (Figure 28). The heat pump market stagnated, approximately remaining on the same level of sales from 2008 to 2014¹³². The strong increase in heat pump sales that was previously projected to start from 2006, took place only from 2015-2016 onwards. The crisis had a similar effect on all central heating boilers: in 2004, 22% of the boilers was sold in new housing, while this went down to 14% in 2014. In parallel, the replacement market for boilers went up from 60% in 2004 to 78% in 2014¹³³, replacement boilers being typically less efficient than boilers for new dwellings/buildings.

The 2008 crisis also changed the expenditure behaviour of people: replacements were postponed and average product life increased, further slowing the efficiency-improvements. Consumers also turned out to be more conservative than previously assumed. In particular the oil-fired boiler stock hardly changes. Many users prefer to repair or try to fit a new jet burner in an old heat exchanger, instead of buying a new more efficient boiler. Gas-fired boilers also continue to be popular.

In parallel, **water consumption** also changed. Until 2008 there was a strong increasing trend in water consumption by households, due to an increase in the number of showers, without a corresponding decrease in the number of baths. Measured data on water consumption were rare in 2006, but there was a strong push from some utilities (e.g. France, Norway) to convince people to buy large (400 litres or more for an average family) electric storage water heaters (ESWHs).

After 2008 this trend stopped, and the consumption of warm water even decreased¹³⁴ (leading to complaints of some utilities on lower revenues). The utilities started to measure the (warm) water consumption per type of end-use, and the 2019 review study for the first time had access to reliable data on the overall water consumption per Member State and good estimates for the warm water consumption. In particular for the ESWHs the difference is large: in France and Norway the water consumption is half

¹³² Approximately 800 thousand units per year in 21 EU countries, see <https://www.ehpa.org/market-data/>

¹³³ Space and combination heaters, Ecodesign and Energy Labelling, Review study Final report Task 2, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019 (tables 6 and 7)

¹³⁴ Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review study Final Report Task 3, VHK, Delft (NL), for the European Commission, DG ENER C.3, July 2019

of what was assumed in the 2007 preparatory studies. Other new information is that water consumption is low in several of the Baltic and Eastern Europe states.

The large changes described above occurred over a period of more than a decennium but are now implemented in EIA in a single update, leading to large changes in impacts. If the market studies on space heating by BRG Building Solutions, the most reliable source of information for central space heating and water heating, would be performed annually, the EIA updates would be more gradually and the check of policy targets against reality could be annual. For central space heating and water heating this does not seem excessive.

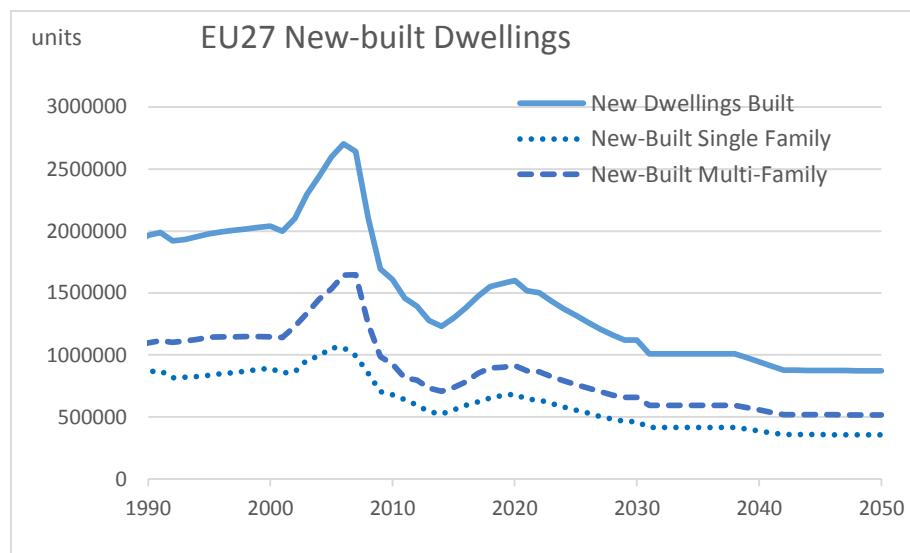


Figure 28. The 2008 financial crisis caused an unforeseen collapse in the number of new-built dwellings, affecting the projections made in pre-2008 studies on space heating, water heating and ventilation units. Source: review study on ventilation units⁶¹.

Table 11 List of energy impact changes in EIA2020 (for EU27, 'is') compared to EIA2019 (for EU28 and EU27, 'was'). BAU primary energy for year 2010, and primary energy savings for 2020 and 2030. Indicated variations are for EU27. See text above for comments.

Product Group updated in EIA2020	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 in savings
Central Heating Boilers (CHB), space heating	was (EU28): 2318 was (EU27): 1895 is (EU27): 1973 Variation: +78	was (EU28): 519 was (EU27): 433 is (EU27): 148 Variation: -285	was (EU28): 846 was (EU27): 706 is (EU27): 263 Variation: -443	Update for existing measures, following review study (section 1.6.10.3)
Central Heating Combis (CHC), water heating	was (EU28): 416 was (EU27): 330 is (EU27): 276 Variation: -54	was (EU28): 74 was (EU27): 59 is (EU27): 15 Variation: -44	was (EU28): 173 was (EU27): 139 is (EU27): 34 Variation: -105	Update for existing measures, following review study (section 1.6.10.4)
Dedicated Water Heaters (DWH)	was (EU28): 801 was (EU27): 711 is (EU27): 317 Variation: -394	was (EU28): 177 was (EU27): 160 is (EU27): 24 Variation: -136	was (EU28): 256 was (EU27): 231 is (EU27): 41 Variation: -190	Update for existing measures, following review study (section 1.6.10.4)
Ventilation Units (VU) (own electricity)	was (EU28): 194 was (EU27): 168 is (EU27): 108 Variation: -60	was (EU28): 27 was (EU27): 24 is (EU27): 6 Variation: -18	was (EU28): 53 was (EU27): 47 is (EU27): 18 Variation: -29	Update for existing measures, following review study (section 1.6.10.5)
Local Space heaters (LSH)	was (EU28): 603 was (EU27): 526 is (EU27): 607 Variation: +81	was (EU28): 49 was (EU27): 43 is (EU27): 21 Variation: -22	was (EU28): 84 was (EU27): 75 is (EU27): 46 Variation: -29	Update for existing measures, following review study (section 1.6.10.6)
Central Air Heaters (AHC)	was (EU28): 291 was (EU27): 254 is (EU27): 254 Variation: 0	was (EU28): 21 was (EU27): 19 is (EU27): 11 Variation: -8	was (EU28): 44 was (EU27): 40 is (EU27): 29 Variation: -11	Change in heat load reduction due to update VUs (section 1.6.10.5)
Room Air Conditioners (RAC)	was (EU28): 102 was (EU27): 86 is (EU27): 143 Variation: +57	was (EU28): 26 was (EU27): 22 is (EU27): 46 Variation: +24	was (EU28): 40 was (EU27): 35 is (EU27): 41 Variation: +6	Update for existing measures, following review study (section 1.6.10.7)
Circulators (CIRC)	was (EU28): 52 was (EU27): 45 is (EU27): 98 Variation: +53	was (EU28): 28 was (EU27): 25 is (EU27): 31 Variation: +6	was (EU28): 27 was (EU27): 24 is (EU27): 29 Variation: +5	Update for existing measures, following review study (section 1.6.10.8) (all double counted with CHB)
Personal Computers (PC)	was (EU28): 76 was (EU27): 64 is (EU27): 78 Variation: +14	was (EU28): 0 was (EU27): 0 is (EU27): 0 Variation: 0	was (EU28): 0 was (EU27): 0 is (EU27): 0 Variation: 0	Update for existing measures, following review study and ICT-study (section 1.6.10.9) (no savings for PCs)
Games Consoles (GC)	was (EU28): 11 was (EU27): 9 is (EU27): 12 Variation: +3	was (EU28): 4 was (EU27): 4 is (EU27): 10 Variation: +6	was (EU28): 4 was (EU27): 3 is (EU27): 9 Variation: +6	Update for SRI v3.0, following review study (section 1.6.10.10)
Laundry Dryers (LD)	was (EU28): 63 was (EU27): 52 is (EU27): 40 Variation: -12	was (EU28): 9 was (EU27): 7 is (EU27): 7 Variation: 0	was (EU28): 18 was (EU27): 15 is (EU27): 13 Variation: -2	Update for existing measures, following review study (section 1.6.10.11)
Solid Fuel Boilers (SFB)	was (EU28): 168 was (EU27): 163 is (EU27): 243 Variation: +80	was (EU28): 8 was (EU27): 7 is (EU27): 4 Variation: -3	was (EU28): 15 was (EU27): 14 is (EU27): 11 Variation: -3	Update following comparison with Eurostat/PRIMES (section 1.6.10.12) (update for coal only)
Vacuum Cleaners (VC)	was (EU28): 54 was (EU27): 45 is (EU27): 45 Variation: 0	was (EU28): 39 was (EU27): 33 is (EU27): 33 Variation: 0	was (EU28): 62 was (EU27): 53 is (EU27): 49 Variation: -4	Limitation stock to 2 per household (section 1.6.10.13)
Sum all products	was (EU28): 11405 was (EU27): 9812 is (EU27): 9608 Variation: -204	was (EU28): 1777 was (EU27): 1523 is (EU27): 1037 Variation: -486	was (EU28): 2718 was (EU27): 2339 is (EU27): 1533 Variation: -806	Total for all EIA products Variation sum of those above (except circulators, double)

3.7.3. Differences between the last five EIA editions

Table 12 provides the differences between the last five 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 of 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.

For the differences between EIA2020 and EIA2019, see Table 11 and text above.

<i>Table 12 Main recent changes in EIA results ¹³⁵</i>						
	Primary Energy Savings (TWh, mtoe)		User Expense Savings (bn euros 2015)		Extra Business Revenues (bn euros 2015)	
	2020	2030	2020	2030	2020	2030
EIA2016 for EU28	1918 TWh 165 mtoe	3206 TWh 276 mtoe	121	365	62	80
EIA2017 for EU28	1788 TWh 154 mtoe	3064 TWh 264 mtoe	112	349	63	81
EIA2018 for EU28	1748 TWh 150 mtoe	2988 TWh 257 mtoe	63	152	66	91
EIA2019 for EU28	1777 TWh 153 mtoe	3005 TWh 258 mtoe (PEF 2.5) ¹³⁶ 2718 TWh 234 mtoe (PEF 2.1)	64	150	64	91
EIA2019 for EU27 ¹³⁷	1523 TWh 131 mtoe	2339 TWh 201 mtoe (PEF 2.1)	55	130	55	77
EIA2020 for EU27	1037 TWh 89 mtoe	1533 TWh 132 mtoe (PEF 2.1)	60	118	21	29

¹³⁵ For 2016 and 2017, original EIA amounts in 2010 euros have been converted to 2015 euros (factor 1.08) for ease of comparison with the 2018 - 2020 data.

¹³⁶ 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 also reported for PEF 2.5.

¹³⁷These data were saved in the EIA Masterfile after applying the Brexit factors, but before performing any product updates.

3.8. Comparison between EIA and Eurostat / PRIMES

The comparison between EIA and Eurostat results presented below is based on data from the EIA ECO scenario and on data from the February 2021 edition of the Eurostat Energy Balance¹³⁸, which provides information up to year 2019.

The comparison is made for:

- Primary energy, total over all usage sectors (3.8.1),
- Final energy, total over all usage sectors, and split per sector (3.8.2)
- Electricity, total over all usage sectors, and split per sector (3.8.3)
- Fuel, total over all usage sectors, split per sector, and split per fuel type for the residential and services sector (3.8.4)
- Split per final energy type and per end-use application for the residential sector in year 2018¹³⁹ (3.8.5)
- Comparison of EIA data with PRIMES (3.8.6)
- Conclusions and comments (3.8.7)

3.8.1. EIA – Eurostat comparison for primary energy

Figure 29 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. The difference is due to EIA scope limitations: only products regulated in Ecodesign, Energy Labelling, Energy Star or Tyre Labelling are included in EIA. In particular, 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 EIA, while coverage of renewables/biomass is partial.

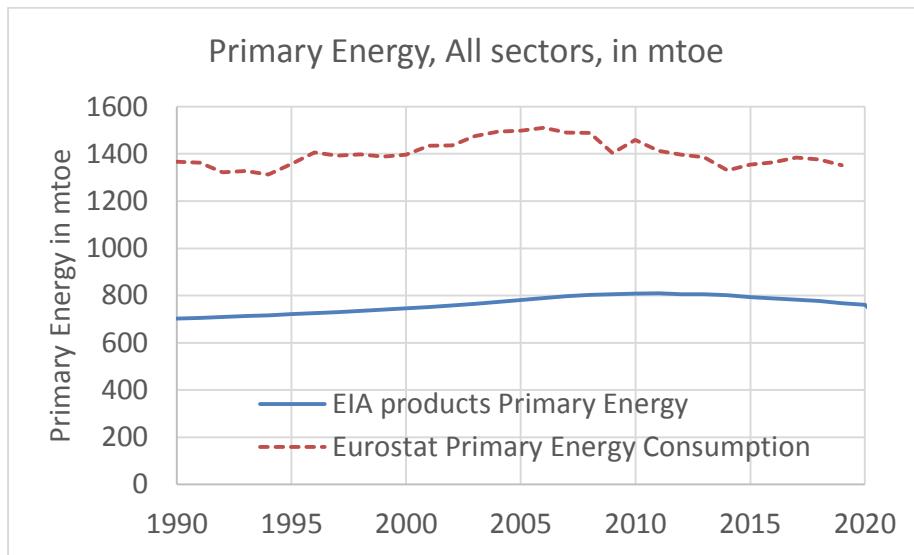


Figure 29 Comparison of total EU27 primary energy in the EIA ECO scenario with primary energy consumption (PEC Europe 2020-2030) as reported in Eurostat Energy Balance sheets. Eurostat data available until 2019. EIA data use PEF 2.5 for electricity for the period 1990-2020.

138 Eurostat Energy Balance nrg_bal_c, ed. February 2021

139 Eurostat data from online data code nrg_d_hhq, accessed April 2021

3.8.2. EIA – Eurostat comparison for final energy

Figure 30 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. The difference is due to EIA scope limitations (see also previous paragraph). As shown in the breakdown per sector in Figure 31, the EIA coverage is high for the residential and services sectors, and much lower for the industry, (road) transport, and ‘other’ sectors¹⁴⁰. The EIA final energy for the residential sector is slightly lower than in Eurostat, which is reasonable considering some differences in scope¹⁴¹. For the services sector, the EIA final energy matches the Eurostat data (but there could be some scope differences also there).

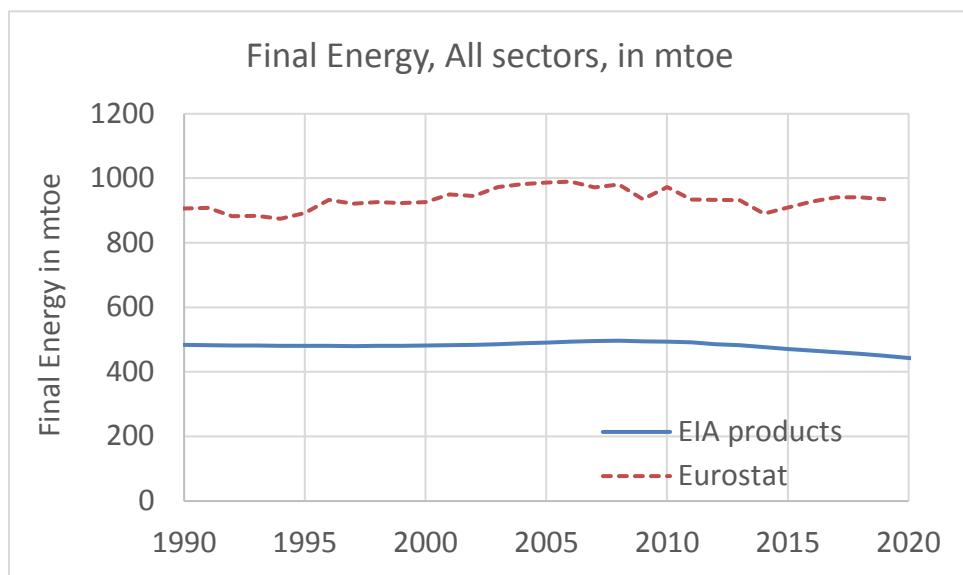
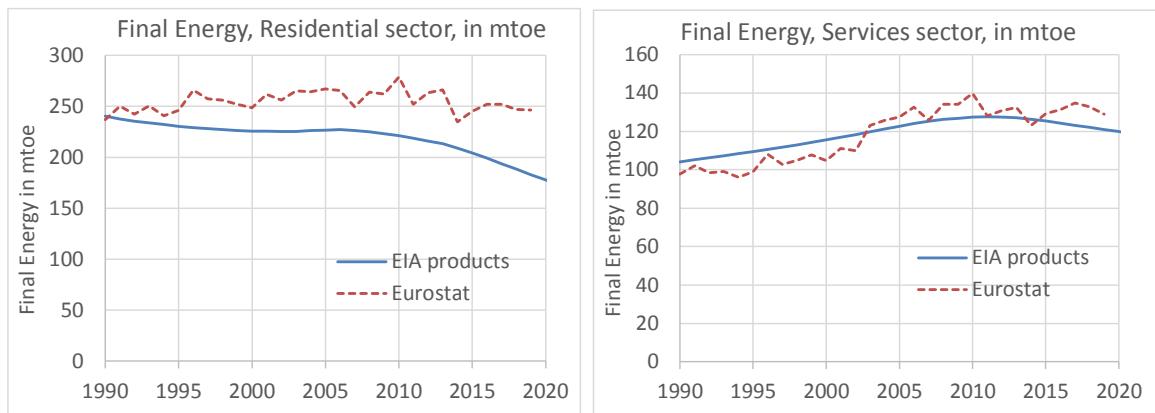


Figure 30 Comparison of total EU27 final energy in the EIA ECO scenario with final energy consumption reported in Eurostat Energy Balance sheets. Eurostat data available until 2019.



¹⁴⁰ The ‘other’ sector in EIA covers e.g. agriculture, forestry and fishing.

¹⁴¹ E.g. ironing, small appliances (except standby), and a part of ICT-products are not accounted in EIA. It is estimated that these products represent around 81 TWh (7 mtoe) of additional final energy consumption.

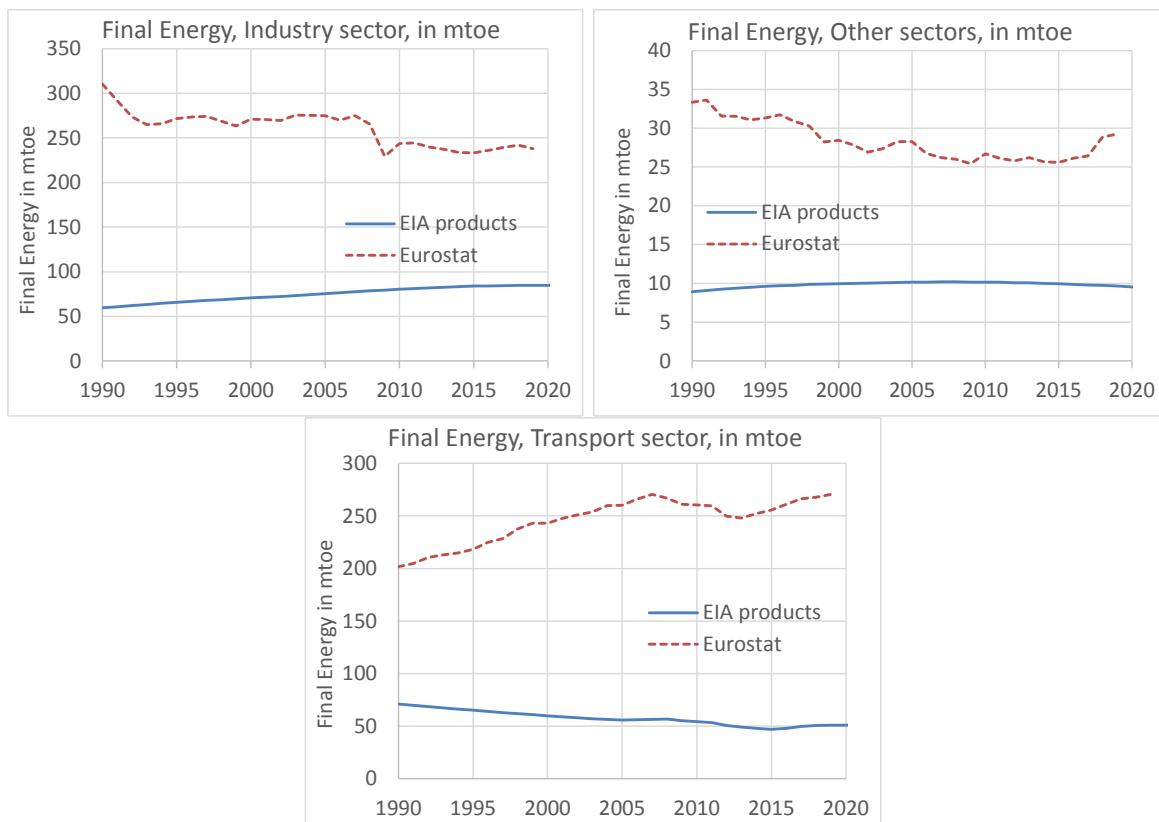


Figure 31 Comparison per usage sector of total EU27 final energy in the EIA ECO scenario with final energy consumption reported in Eurostat Energy Balance sheets (Eurostat data for transport are for road transport only).

3.8.3. EIA – Eurostat comparison for electricity consumption

Figure 32 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.

Over the period 2008-2019, the electricity consumption of EIA products matches the total EU electricity consumption. As shown in the breakdown per sector in Figure 33, EIA is high for electricity in the services and ‘other’ sectors¹⁴², while there is good match for the residential sector, even when considering some differences in scope¹⁴³. For the industry sector, the EIA electricity is lower than in Eurostat, due to the partial EIA coverage in this sector.

¹⁴² The ‘other’ sector in 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 0.5% share to 0.4% would change the electricity consumption in this sector by 20%.

¹⁴³ E.g. ironing, small appliances (except standby), and a part of ICT-products are not accounted in EIA. It is estimated that these products represent around 81 TWh (7 mtoe) of electricity consumption.

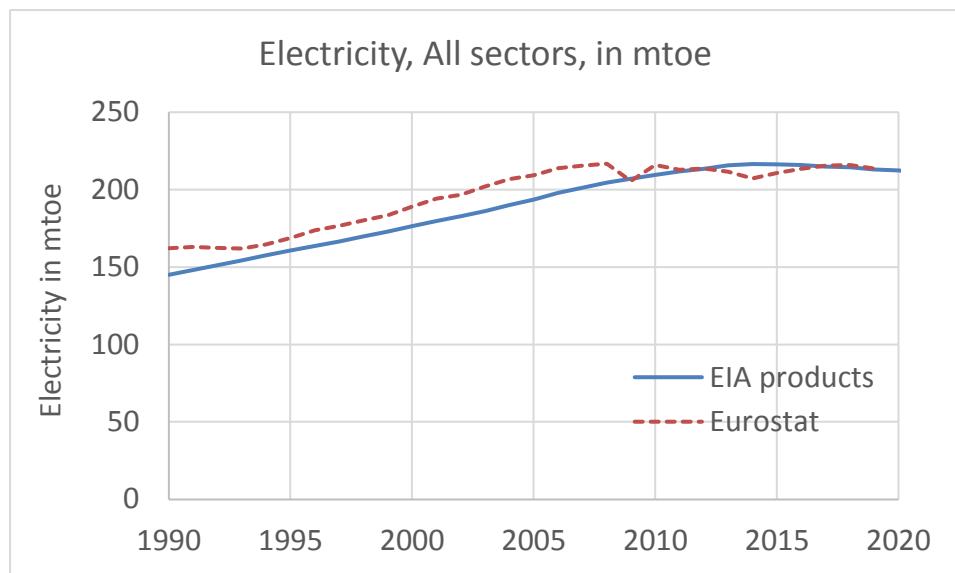


Figure 32 Comparison of total EU27 electricity consumption in the EIA ECO scenario with electricity consumption reported in Eurostat Energy Balance sheets. Eurostat data available until 2019.

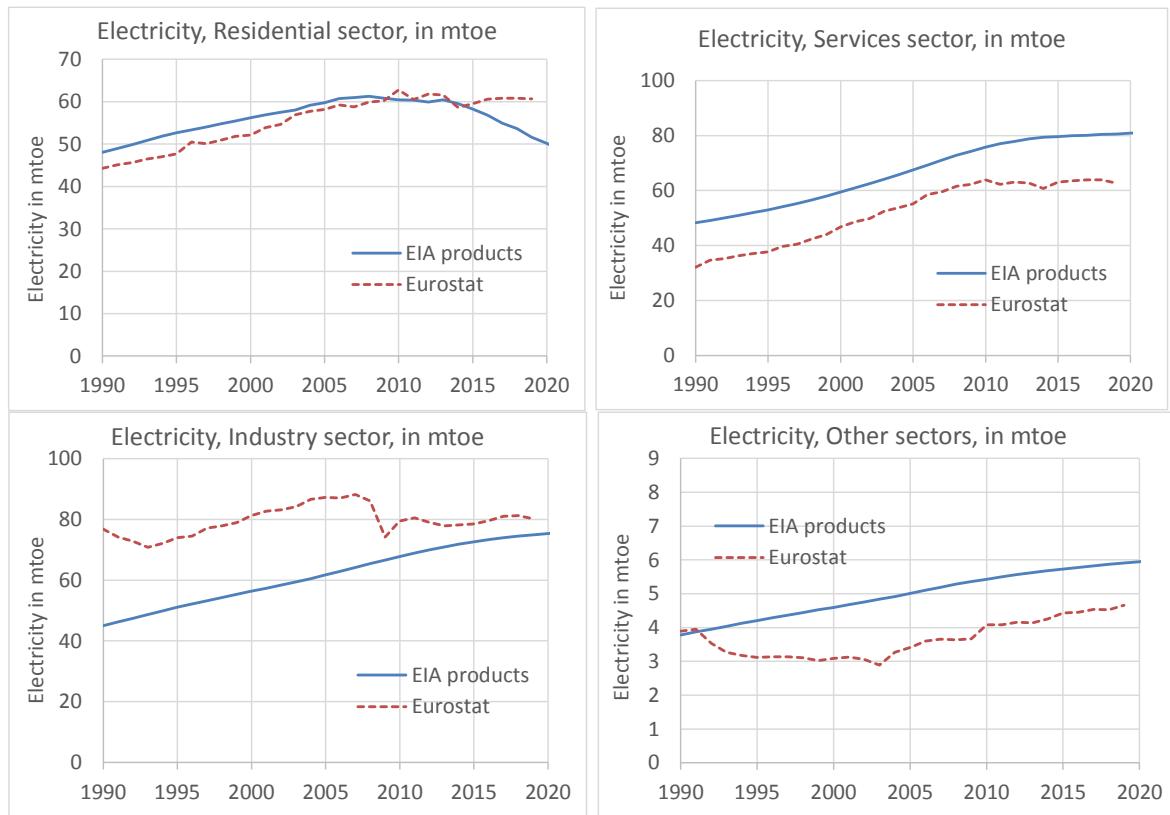


Figure 33 Comparison per usage sector of total EU27 electricity in the EIA ECO scenario with electricity consumption reported in Eurostat Energy Balance sheets.

3.8.4. EIA – Eurostat comparison for fuel consumption

Fuel in EIA indicates all final energy input to products that is not electricity. Figure 34 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 2019, the final fuel consumed by EIA products represents 33% of the total EU non-electric final energy consumption. As shown in the breakdown per sector in Figure 35, the EIA coverage is low for the industry, (road) transport, and 'other' sectors¹⁴⁴. 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 36 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 34 and Figure 35.

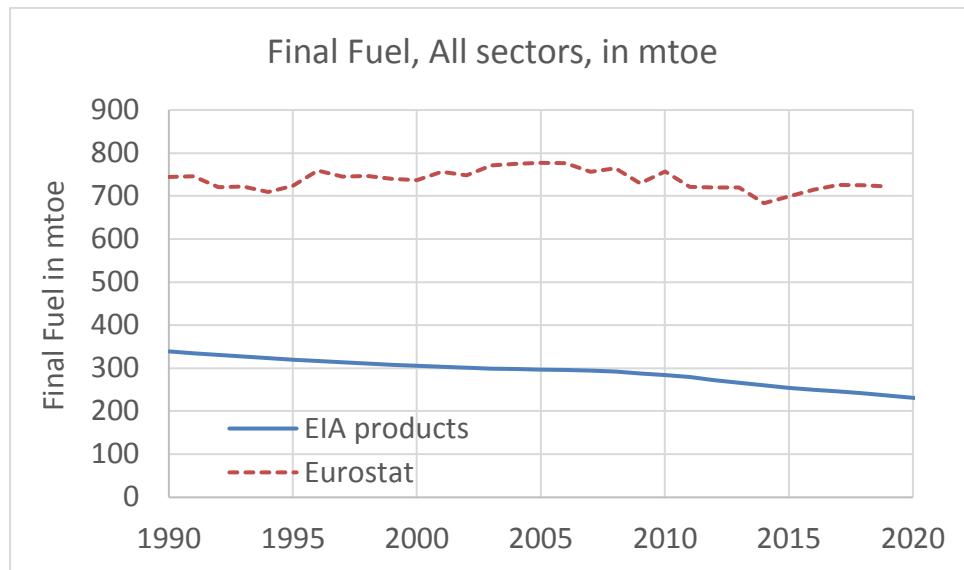


Figure 34 Comparison of total EU27 fuel consumption in the EIA ECO scenario with non-electric final energy consumption reported in Eurostat Energy Balance sheets.

¹⁴⁴ The 'other' sector in 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 0.5% share to 0.4% would change the fuel consumption in this sector by 20%.

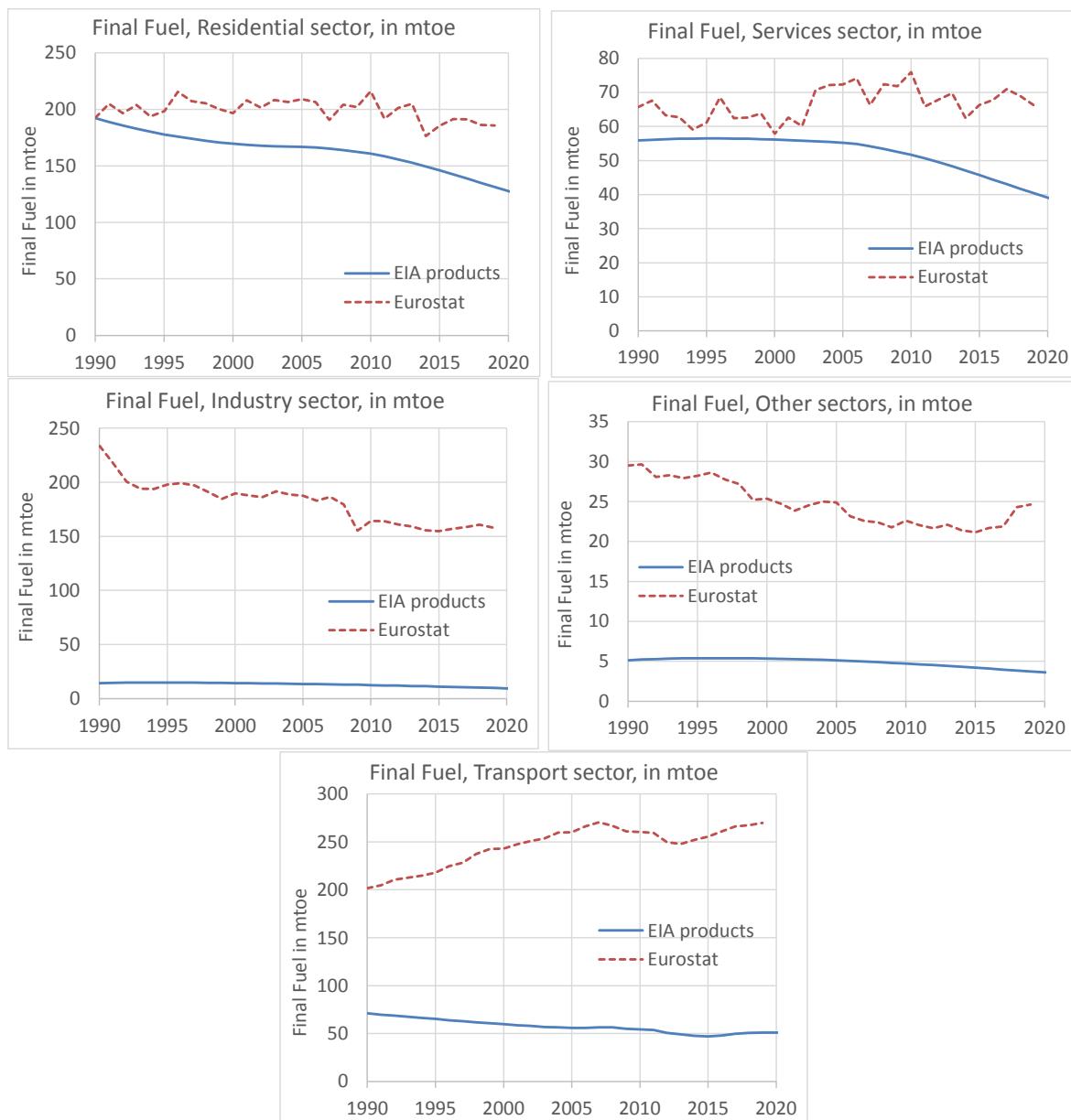


Figure 35 Comparison per usage sector of total EU27 fuel in the EIA ECO scenario with non-electric final energy consumption reported in Eurostat Energy Balance sheets (Eurostat data for transport are for road transport only)

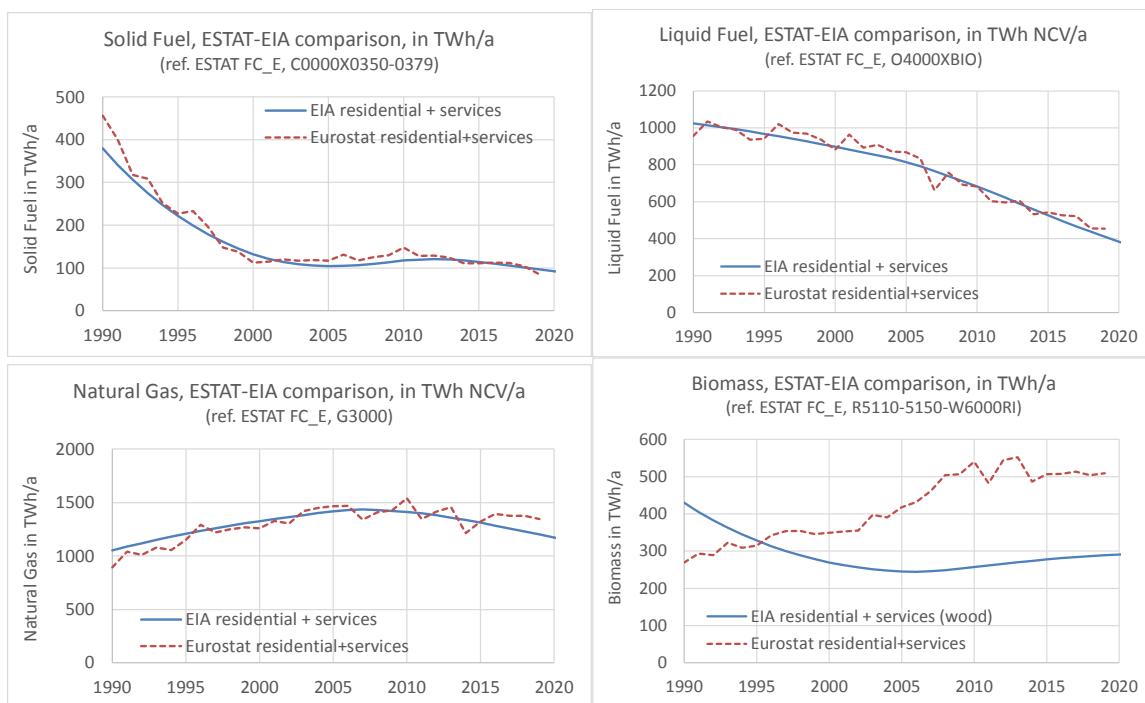


Figure 36 Comparison for the sum of residential and services sectors of EU27 fuel consumption per fuel type in the EIA ECO scenario with the comparable consumption reported in Eurostat Energy Balance sheets (ESTAT reference codes in graph titles).

3.8.5. EIA – Eurostat comparison for households in 2018

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 EIA. Table 13 shows these details for year 2018¹⁴⁵. A short discussion follows the table.

Remarks on Table 13 (applies to residential sector, year 2018, EU27 totals):

- The final energy consumption in EIA is 676 TWh (24%) lower than in Eurostat. This difference derives for 326 TWh (48%) from space heating, 137 TWh (20%) from water heating, 97 TWh (14%) from lighting and appliances and for 86 TWh (13%) from cooking.
- The electricity consumption in EIA is 84 TWh (12%) lower than in Eurostat. However, electricity consumption in EIA is higher than Eurostat for space heating (+70 TWh), and lower for lighting and appliances (-97 TWh), cooking (-24 TWh) and other end-uses (-24 TWh).
- The fuel consumption in EIA is 592 TWh (27%) lower than in Eurostat. This difference derives for 396 TWh (67%) from space heating, for 128 TWh (22%) from water heating, and for 63 TWh (11%) from cooking.
- For space heating, the final energy consumption in EIA is 326 TWh (18%) lower than in Eurostat. The electricity consumption in EIA is 70 TWh (73%) higher; the fuel consumption 396 TWh (23%) lower.

¹⁴⁵ Source for Eurostat data is online data code nrg_d_hhq, accessed in April 2021. EU totals are provided only for 2018. In other years contributions for some countries are missing in Eurostat. Data converted from TJ to TWh NCV by VHK.

- The electricity consumption for space heating in EIA of 165 TWh derives for 104 TWh (63%) 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 2018 are around 3 TWh, so if there is any overestimation of savings or any non-compliance, the effect of this on EIA totals will be negligible¹⁴⁶.

Another 44 TWh (27%) of electricity consumption comes from central heating boilers. This includes electric Joule-effect boilers and electric heat pumps, but almost half of the electricity is consumed by 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 EIA and Eurostat of 396 TWh derives for 238 TWh from heaters using solid fuels and renewables and for 191 TWh from the use of derived heat. Central heating boilers operating on gas or oil have almost the same consumption as in Eurostat (3% difference).
- 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 238 TWh missing in EIA compared to Eurostat are mainly due to products being out-of-scope for Ecodesign and Energy labelling.

In addition, Ecodesign regulations do not apply to installations using derived heat (district heating), so EIA does not include the corresponding 191 TWh of Eurostat.

- For water heating, the final energy consumption in EIA is 137 TWh (32%) lower than in Eurostat, of which 128 TWh are due to a lower fuel consumption. Of these, 55 TWh come from derived heat (district heating) and 61 TWh from solid fuels and renewables, which are not being accounted in EIA because out-of-scope of the regulations.
- For cooking, the final energy consumption in EIA is 86 TWh (49%) lower than in Eurostat. The electricity consumption is 23 TWh (27%) lower, while the fuel consumption 63 TWh (71%) lower.
- As regards electricity for cooking, EIA considers electric hobs, ovens and range hoods, including their consumption in standby. 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 23 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, EIA considers only devices using gas (others excluded from Ecodesign). Hence, the corresponding 34 TWh of Eurostat for other fuels are not accounted in 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, Ecodesign regulation does not cover e.g. cookers designed only for 3rd family gases (propane, butane); covered gas burners; gas burners < 1.16 kW.

¹⁴⁶The 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. See also section 1.6.10.6

- For lighting and appliances, the electricity consumption in EIA is 97 TWh (24%) 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 EIA and in Eurostat is practically the same (10-11 TWh).

Table 13 Comparison of final energy between Eurostat and EIA for the residential sector in year 2018, divided per end-use and type of energy input. EIA values indicated for ECO scenario (without and with 10% non-compliance) and for BAU scenario. Values for EU27 in TWh NCV/a.

Residential sector, year 2018		Eurostat (1)	EIA ECO (2)	EIA ECO-NC (3)	EIA BAU (4)	difference (2) - (1) (5)	ratio (2) / (1) (6)
Values for EU27 in TWh NCV/a							
Residential sector, all uses	Final Energy	2870	2193	2219	2454	-676	76%
Space Heating	FNRG	1827	1500	1509	1591	-326	82%
Space Cooling	FNRG	11	10	10	14	-1	92%
Water Heating	FNRG	424	288	289	303	-137	68%
Cooking	FNRG	175	88	89	91	-86	51%
Lighting and Appliances	FNRG	405	308	322	455	-97	76%
Other End uses	FNRG	28	0	0	0	-28	0%
Residential sector, all uses	Electricity	708	624	641	795	-84	88%
Space Heating	ELEC	95	165	167	178	70	173%
Space Cooling	ELEC	11	10	10	14	-1	92%
Water Heating	ELEC	87	79	79	82	-9	90%
Cooking	ELEC	86	63	63	65	-23	73%
Lighting and Appliances	ELEC	405	307	322	455	-97	76%
Other End uses	ELEC	24	0	0	0	-24	0%
Residential sector, all uses	(Final) Fuel	2162	1570	1579	1660	-592	73%
Space Heating	FUEL	1731	1335	1342	1413	-396	77%
Space Cooling	FUEL	0	0	0	0	0	
Water Heating	FUEL	337	209	210	221	-128	62%
Cooking	FUEL	89	26	26	26	-63	29%
Lighting and Appliances	FUEL	0	0	0	0	0	
Other End uses	FUEL	5	0	0	0	-5	0%
Space Heating	FNRG	1827	1500	1509	1591	-326	82%
Space Heating	ELEC	95	165	167	178	70	173%
Central Heating Boilers	ELEC		44				
Air Heaters	ELEC		1				
Local Heaters	ELEC		104				
reversible RAC	ELEC		16				

Residential sector, year 2018		Eurostat (1)	EIA ECO (2)	EIA ECO-NC (3)	EIA BAU (4)	difference (2) - (1) (5)	ratio (2) / (1) (6)
Values for EU27 in TWh NCV/a							
Space Heating	FUEL	1731	1335	1342	1413	-396	77%
<i>Space Heating</i>	<i>GAS/OIL</i>	<i>956</i>	<i>988</i>	<i>995</i>	<i>1063</i>	<i>32</i>	<i>103%</i>
Central Heating Boilers	GAS/OIL		981	988	1055		
Air Heaters	GAS/OIL		2	2	2		
Local Heaters	GAS/OIL		5	5	5		
Space Heating	SOLID&RNW	585	347	347	350	-238	59%
Solid Fuel Boilers	SOLID&RNW		196	196	198		
Local Heaters (stoves)	SOLID&RNW		151	151	152		
Space Heating	Derived Heat	191	0	0	0	-191	0%
Water Heating	FNRG	424	288	289	303	-137	68%
<i>Water Heating</i>	<i>ELEC</i>	<i>87</i>	<i>79</i>	<i>79</i>	<i>82</i>	<i>-9</i>	<i>90%</i>
Water Heating	FUEL	337	209	210	221	-128	62%
Water Heating	GAS/OIL	220	209	210	221	-11	95%
Water Heating	SOLID&RNW	62	0	0	0	-62	0%
Water Heating	Derived Heat	55	0	0	0	-55	0%
Cooking	FNRG	175	88	89	91	-86	51%
<i>Cooking</i>	<i>ELEC</i>	<i>86</i>	<i>63</i>	<i>63</i>	<i>65</i>	<i>-23</i>	<i>73%</i>
Cooking	FUEL	89	26	26	26	-63	29%
Cooking	GAS	55	26	26	26	-29	47%
Cooking	Other Fuel	34	0	0	0	-34	0%
Lighting and Appliances	ELEC	405	307	322	455	-97	76%
Light sources	ELEC		57	60	94		
Electronics	ELEC		117	120	148		
Food preservation	ELEC		60	64	106		
Cleaning	ELEC		66	69	98		
Ventilation (electricity use)	ELEC		8	8	8		

Column (1): Eurostat data from online data code nrg_d_hhq for year 2018 (accessed April 2021).

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 (1)

Column (6): Ratio in % computed as EIA ECO (2) divided by Eurostat (1)

FNRG= final energy; ELEC=electricity; NC=non-compliance; RNW=renewables and waste.

3.8.6. EIA – PRIMES comparison

The PRIMES model is an EU energy system model which simulates energy consumption and the energy supply system. It is a partial equilibrium modelling system that simulates an energy market equilibrium in the European Union and each of its Member States. This includes consistent EU carbon price trajectories. It 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 ¹⁴⁷.

Energy rates from the PRIMES 2015f/2016 reference scenarios were used in EIA2018 to adjust the rates, and to introduce a separate rate for the tertiary sector. In EIA2020, for electricity and natural gas rates, a user-option was added in EIA allowing a quick

147 For details see https://ec.europa.eu/clima/policies/strategies/analysis/models_en

selection of traditional EIA rates or PRIMES 2015f rates (see also section 1.6.9.2). A similar option was also introduced to choose between traditional EIA GWP-factors for electricity (based on the MEErP) or PRIMES' factors (section 1.6.9.4). These options have been used for the presentation of sensitivity data in sections 3.6.1 and 3.6.2.

In November 2019, the Commission policy officer for EIA provided a set of product input-data used in PRIMES, with the request to compare these with EIA data. VHK supplied this comparison, leading to a December 2019 presentation of EIA to various EC policy officers, including those responsible for the PRIMES model.

The comparison EIA-PRIMES was repeated in December 2020, based on a new set of product input-data used in PRIMES, for the residential and services sectors. VHK supplied detailed comparison notes for space heating, water heating, cooking, and lighting & appliances to the policy officers for EIA and PRIMES, leading to a presentation of the results of the comparison in April 2021.

At a high level of aggregation, PRIMES uses Eurostat data as a reference, and consequently the comparison EIA-Eurostat made in the preceding paragraphs is valid also as a comparison with PRIMES.

At a lower level of aggregation, for single product groups, (sometimes large) differences have been found between stocks, efficiencies, and energy consumption in PRIMES and in EIA. As PRIMES' input data at this level are not public, these differences are not presented in this report, but it is believed that the unique EIA collection of product data should be used to further improve the demand-side of the PRIMES model. Work on this is ongoing.

Another model used for scenario analysis of EU policy options is POTEEnCIA¹⁴⁸. Product data from EIA were supplied to the JRC-team preparing POTEEnCIA in 2014.

3.8.7. EIA – Eurostat comparison: conclusion and comments

At a high level of aggregation, energy totals in EIA are compatible with those in Eurostat and PRIMES, when considering the differences in scope. The EIA scope is limited to products regulated in Ecodesign, Energy Labelling, Energy Star or Tyre Labelling. 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 EIA, while coverage of renewables/biomass is partial in EIA.

As a result, in 2019 EIA represents 57% of the EU27 primary energy consumption reported in the Eurostat Energy Balance sheets, 48% of the final energy, close to 100% of electricity, and 33% of non-electric final energy consumption (EIA: fuel).

For the residential sector, EIA electricity consumption matches Eurostat, even when considering differences in scope. For the services sector EIA electricity is higher than in Eurostat, which remains an issue for further work.

For the sum of residential and services sectors, EIA fuel consumption matches that of Eurostat for natural gas, liquid fuels, and solid fuels (EIA: coal). Differences appear for the consumption of renewables / biomass (EIA: wood), due to EIA scope limitations (e.g. appliances for non-woody biomass are not regulated by Ecodesign).

148 <https://ec.europa.eu/jrc/en/potencia>

The comparison-work done in 2020 clarified the agreements and differences between EIA and Eurostat/PRIMES, and the EIA2020 product updates (section 1.6.10) reduced the differences.

In general, the comparison exercise shows that there is a potential, also with regards to other modelling tools used for policy such as PRIMES and POTENCIA, for further work to realize consistent 'bottom-up' and 'top-down' analyses between the datasets. First contacts between the EIA and PRIMES teams have been made and work is ongoing.

Appendices

ANNEX A: Ecodesign Impact Accounting by Parameter

CONTENTS

<i>worksheet</i>	<i>description</i>
GENERAL_1	general, non product-specific input data (PEF (CC), GWP, rates in 2015 euros (inflation corrected), annual escalation % for rates, employment parameters, EU population, households, dwellings, buildings)
GENERAL_2	general, non product-specific input data (inflation, nominal rates, factor for tertiary rates, sources for rates)
<i>Market & performance</i>	
SHARES	sector subdivision data (share residential, tertiary, industry, other)
BREXIT	brexit factors to convert EU28 (incl. UK) data (not in print file) in EU27 (excl. UK)
SALESBAU	sales data in 000 units (mln units for lighting and tyres), for BAU scenario (for EU27 excl. UK)
SALESECO	sales data in 000 units (mln units for lighting and tyres), for ECO scenario (for EU27; printed only if different from BAU)
STOCKBAU	stock calculated from product life and SALES in 000 units (mln units for lighting and tyres), BAU scenario (EU27 excl. UK)
STOCKECO	stock in 000 units (mln units for lighting and tyres), ECO scenario (EU27; printed only if different from BAU)
LOADnotes	Notes on functional performance per unit; descripton of test- & calculation method:
LOADBAU	Unit functional performance, product output characterization, consumer demand for product function, BAU scenario
LOADECO	Unit functional performance, consumer demand for product function, ECO scenario (printed only if different from BAU)
EULOADBAU	EU functional performance of total products, calculated from STOCK and LOAD, for BAU scenario
EULOADVAR	Variation of EULOAD due to ECO measures, heat savings due to Ventilation Units (printed only if not zero)
EULOADECO	EU functional performance of total products, for ECO scenario (printed only if different from BAU)
<i>Energy</i>	
EFNBAU	Efficiency of New products, Business-As-Usual (no measures) scenario
EFNECO	Efficiency of New products, Ecodesign (with all measures) scenario
EFBSAU	Efficiency of products in Stock (in use), derived from EFNBAU and product life (STOCK), in % or kWh/a, BAU scenario
EFSECO	Efficiency of products in Stock (in use), derived from EFNECO and product life (STOCK), in % or kWh/a, ECO scenario
ELECBAU	Total electricity use in TWh electricity, for BAU scenario, derived from Load, Stock, Efficiency and share electrici
ELECECO	Total electricity use in TWh electricity, for ECO scenario, derived from Load, Stock, Efficiency and share electri
ELECSAVE	ELECBAU - ELECECO, TWh electric energy savings due to ecodesign measures
FUELBAU	Total non-electric energy use in TWh primary (NCV), for BAU, derived from Load, Stock, Efficiency and share non-electri
FUELECO	Total non-electric energy use in TWh primary (NCV), for ECO, derived from Load, Stock, Efficiency and share non-electri
FUELSAVE	FUELBAU - FUELECO, TWh non-electric energy savings due to ecodesign measures
FNRGBAU	Total final energy use in TWh, sum of ELEC and FUEL, for BAU scenario
FNRGECO	Total final energy use in TWh, sum of ELEC and FUEL, for ECO scenario
FNRGSAVE	FNRGBAU - FNRGECO, TWh final energy savings due to ecodesign measures
NRGBAU	Total primary energy use in TWh, derived as ELEC*PEF + FUEL, for BAU scenario
NRGECO	Total primary energy use in TWh, derived as ELEC*PEF + FUEL, for ECO scenario
NRGSAVE	NRGBAU - NRGECO, TWh primary energy savings due to ecodesign measures
<i>Emissions</i>	
EMISSRATES	Emission rates of greenhouse gases (e.g. in kg CO ₂ eq./kWh or for refrigerants in kg CO ₂ eq./a) and NOx, CO, OGC, PM; Noise
EMISSBAU	Total emissions of greenhouse gases (GHG), from energy use and from F-gases, in Mt CO ₂ -eq.; Emissions of NO _x ; BAU
EMISSECO	Total emissions of greenhouse gases (GHG), from energy use and from F-gases, in Mt CO ₂ -eq.; Emissions of NO _x ; ECO
EMISSSAVE	EMISSBAU - EMISSECO, avoided GHG emissions due to ecodesign measures
<i>Consumer expenditure</i>	
PRICE	Unit price defined in function of efficiency for 3 efficiency/price anchor points (BaseCase, a Midpoint and BAT
PRICE2	Unit price split, between unit/kit/install/other, and between VAT/retailer/wholesale/manufacturer/install/maintenance
PRICEBAU	Unit price for BAU efficiency of each year, interpolated between the 3 efficiency/price anchor point
PRICEECO	Unit price for ECO efficiency of each year , interpolated between the 3 efficiency/price anchor point
ACQBAU	Total acquisition costs in bn euros, from PRICEBAU and SALES, BAU scenario
ACQEKO	Total acquisition costs in bn euros, from PRICEECO and SALES, ECO scenario
ACQADD	ACQEKO-ACQBAU, additional acquisition costs due to ecodesign measures
RATES	Energy and consumable rates in euro/kWh, etc., inflation corrected (in Euro 2015), as used in calculation:
NRGCOSTBAU	Total annual energy costs, from ELECBAU, FUELBAU, PRICE2, RATES, in bn euros, BAU scenario
NRGCOSTECO	Total annual energy costs, from ELECECO, FUELECO, PRICE2, RATES, in bn euros, ECO scenario
NRGCOSTSAVE	NRGCOSTBAU - NRGCOSTECO, energy cost savings in bn euros due to ecodesign measures
MAINTBAU	Total annual maintenance costs INCL VAT, in m euros (for BAU stock)
MAINTECO	Total annual maintenance costs INCL VAT, in m euros (for ECO stock)
RESOURCES	Total annual quantity and costs of water and other consumables (both for BAU and ECO), in bn euros and in Volume
RUNBAU	Total running costs in bn euros, from NRGCOSTBAU, MAINTBAU and RESOURCES, BAU scenario
RUNECO	Total running costs in bn euros, from NRGCOSTECO, MAINTECO and RESOURCES, ECO scenario
EXPENSBAU	Total customer expenditure, from RUNBAU+ACQBAU, in bn euros
EXPENSECO	Total customer expenditure, from RUNECO+ACQEKO, in bn euros
EXPENSSAVE	EXPENSBAU - EXPENSECO, total consumer expense savings in bn euros due to ecodesign measures

A-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 Cost:

GENERAL_1

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 background
 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:	CCset3	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, user value	CCset2	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%	47.6%
CCset3: variable, user values	CCset3	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%	40%	40%	40%	48%	48%	48%	48%	48%	48%

Global Warming Potential (GWP-100) for electricity generation and distribution, in kg CO2 eq/kWh											
Choose set to use:	GWPel1	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 ref. scenario 2016 [2b]	GWPel2	0.500	0.330	0.300	0.260	0.240	0.200	0.170	0.150	0.120	0.080
GWPel3: free user input [2c]	GWPel3	0.524	0.341	0.317	0.258	0.171	0.085	0.084	0.083	0.081	0.080
GWP electricity active, now in use:	GWPact	0.500	0.410	0.395	0.380	0.360	0.340	0.320	0.300	0.280	0.260
(for GWP-values for fuels and refrigerants, see sheet EMISRATES)											

Energy Rates

All rates presented on this sheet are in 2015-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 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. The PRIMES reference scenario 2015f uses much lower and variable escalation rates (0-1%).

For electricity rates and natural gas rates, instead of using the traditional EIA rates, derived from those on sheet 'General_2' (inflation corrected, and extrapolated with the x%/a increase), the user has the option to apply the rates from the PRIMES 2015f reference scenario (see choices below).

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 levies

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:	EIA traditional
---------------------------------	-----------------

EIA traditional											
inflation corrected, 2015 euros											
Electricity Rates 1 (€/kWh)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1%	0.207	0.183	0.210	0.201	0.212	0.222	0.234	0.246	0.258	0.271
Industry sector	1%	0.131	0.111	0.116	0.118	0.124	0.131	0.137	0.144	0.152	0.159
Tertiary/Services & Other sector	1%	0.180	0.158	0.177	0.172	0.181	0.190	0.200	0.210	0.221	0.232

PRIMES 2015f ref.scenario										
inflation corrected, 2015 euros										
Electricity Rates 2 (€/kWh) [3]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	0.207	0.172	0.190	0.203	0.209	0.212	0.217	0.215	0.211	0.209
Industry sector	0.120	0.097	0.096	0.098	0.099	0.100	0.101	0.101	0.101	0.101
Tertiary/Services & Other sector	0.167	0.148	0.156	0.171	0.176	0.179	0.184	0.182	0.180	0.178

(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	0.207	0.183	0.210	0.201	0.212	0.222	0.234	0.246	0.258	0.271
Industry sector	0.131	0.111	0.116	0.118	0.124	0.131	0.137	0.144	0.152	0.159
Tertiary/Services & Other sector	0.180	0.158	0.177	0.172	0.181	0.190	0.200	0.210	0.221	0.232

GENERAL_1

Choose Natural Gas Rate to use:	EIA traditional
---------------------------------	-----------------

EIA traditional		inflation corrected, 2015 euros									
Natural Gas Rates 1 (€/kWh NCV)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	1.5%	0.059	0.070	0.077	0.069	0.074	0.080	0.086	0.092	0.100	0.107
Industry sector	1.5%	0.028	0.039	0.039	0.033	0.035	0.038	0.041	0.044	0.048	0.051
Tertiary/Services & Other sector	1.5%	0.046	0.057	0.061	0.054	0.058	0.062	0.067	0.072	0.078	0.084

PRIMES 2015f ref.scenario		inflation corrected, 2015 euros									
Natural Gas Rates 2 (€/kWh) [3]	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		0.050	0.061	0.071	0.075	0.079	0.083	0.087	0.089	0.090	0.091
Industry sector		0.025	0.038	0.038	0.043	0.045	0.048	0.051	0.052	0.053	0.054
Tertiary/Services & Other sector		0.040	0.050	0.057	0.061	0.065	0.069	0.072	0.074	0.075	0.076

(Active, now used in EIA)		(these data are copied to sheet Rates)									
Natural Gas Rates Active (€/kWh)	x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		0.059	0.070	0.077	0.069	0.074	0.080	0.086	0.092	0.100	0.107
Industry sector		0.028	0.039	0.039	0.033	0.035	0.038	0.041	0.044	0.048	0.051
Tertiary/Services & Other sector		0.046	0.057	0.061	0.054	0.058	0.062	0.067	0.072	0.078	0.084

(inflation corrected, 2015-euros)												
Heating Oil Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		1.5%	0.042	0.079	0.069	0.077	0.083	0.090	0.097	0.104	0.112	0.121
Industry sector		1.5%	0.036	0.065	0.057	0.064	0.069	0.075	0.081	0.087	0.093	0.101
Tertiary/Services & Other sector		1.5%	0.036	0.065	0.057	0.064	0.069	0.075	0.081	0.087	0.093	0.101

(inflation corrected, 2015-euros)												
LPG Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		1.5%	0.060	0.099	0.085	0.084	0.090	0.097	0.105	0.113	0.121	0.131
Industry sector		1.5%	0.052	0.083	0.071	0.070	0.075	0.081	0.087	0.094	0.101	0.109
Tertiary/Services & Other sector		1.5%	0.052	0.083	0.071	0.070	0.075	0.081	0.087	0.094	0.101	0.109

(inflation corrected, 2015-euros)												
Petrol (auto) Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		2%	0.119	0.157	0.154	0.151	0.167	0.184	0.203	0.225	0.248	0.274
Industry sector		2%	0.101	0.131	0.128	0.126	0.139	0.153	0.169	0.187	0.207	0.228
Tertiary/Services & Other sector		2%	0.101	0.131	0.128	0.126	0.139	0.153	0.169	0.187	0.207	0.228

(inflation corrected, 2015-euros)												
Diesel (auto) Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		2%	0.078	0.129	0.126	0.133	0.147	0.162	0.179	0.197	0.218	0.240
Industry sector		2%	0.066	0.107	0.105	0.111	0.122	0.135	0.149	0.164	0.181	0.200
Tertiary/Services & Other sector		2%	0.066	0.107	0.105	0.111	0.122	0.135	0.149	0.164	0.181	0.200

(inflation corrected, 2015-euros)												
Firewood (logs) Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		2%	0.029	0.033	0.049	0.051	0.057	0.063	0.069	0.076	0.084	0.093
Industry sector		2%	0.024	0.027	0.041	0.043	0.047	0.052	0.058	0.064	0.070	0.078
Tertiary/Services & Other sector		2%	0.024	0.027	0.041	0.043	0.047	0.052	0.058	0.064	0.070	0.078

(inflation corrected, 2015-euros)												
Wood pellets Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		2%	0.044	0.050	0.053	0.056	0.061	0.068	0.075	0.083	0.091	0.101
Industry sector		2%	0.037	0.042	0.045	0.046	0.051	0.057	0.062	0.069	0.076	0.084
Tertiary/Services & Other sector		2%	0.037	0.042	0.045	0.046	0.051	0.057	0.062	0.069	0.076	0.084

(inflation corrected, 2015-euros)												
Wood chips Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		2%	0.021	0.030	0.034	0.036	0.040	0.044	0.049	0.054	0.060	0.066
Industry sector		2%	0.018	0.025	0.028	0.030	0.033	0.037	0.041	0.045	0.050	0.055
Tertiary/Services & Other sector		2%	0.018	0.025	0.028	0.030	0.033	0.037	0.041	0.045	0.050	0.055

(inflation corrected, 2015-euros)												
Coal Rates (€/kWh NCV)		x% /a	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector		4%	0.017	0.031	0.018	0.029	0.035	0.043	0.052	0.064	0.078	0.094
Industry sector		4%	0.014	0.026	0.015	0.024	0.029	0.036	0.044	0.053	0.065	0.079
Tertiary/Services & Other sector		4%	0.014	0.026	0.015	0.024	0.029	0.036	0.044	0.053	0.065	0.079

GENERAL 1

(inflation corrected, 2015-euros)

Fossil Fuel Rates (€/kWh NCV) [4]		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Residential sector	share	0.056	0.072	0.076	0.070	0.076	0.082	0.088	0.095	0.102	0.110
Industry sector	gas:	0.029	0.044	0.043	0.039	0.042	0.046	0.049	0.053	0.057	0.061
Tertiary/Services & Other sector	80%	0.044	0.059	0.061	0.056	0.060	0.065	0.070	0.075	0.081	0.087

Non-Energy Rates (for consumables)

All rates presented on this sheet are in 2015-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 %/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 2017 edition, EIA used 3%/a for water and 0% for other consumables.

(inflation corrected, 2015-euros)

Employment parameters (million 2015-euros of sector revenue per employee) [5]

Manufacturer's 'wages'	[6]	0.054
Wholesale 'wages'	[7]	0.270
Retail 'wages'	[7]	0.065
Installation 'wages'	[7]	0.108
Maintenance 'wages'	[7]	0.108

Brexit factor [8]

Sales reduction due to Brexit

No longer used, see sheet BREXIT for the values applied

EU population and household

EU27 population (in millions)	[10]	418	441	444	448	449	449	448	447	444	441
EU27 households (in millions)	[11]	152	182	191	196	200	201	201	202	201	200

EU dwellings and buildings [12]

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 use 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 (now 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.

In the context of the review of the EED (2018), lower values for PEF have been proposed, ranging from 2.0 to 2.3. The values for CCset2 are by default set to 48% efficiency ($\text{PEF}=2.1$), but this value can be changed by the user to examine the effects of variations in PEF.

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. CCset3 can be used if efficiency values variable with the years are desired. CCset3 in EIA2020 uses PEF=2.5 until 2020 (inclusive) and PEF 2.1 from 2021 onwards, in agreement with the EC policy officer for EIA.

When changing values for CCset3 remember that some years (columns) are hidden. For hidden years, by default the sheet will interpolate linearly between values for the displayed years. If this is not desired, columns should be unhidden and values changed manually.

GENERAL_1

For products where the efficiency (EFN) is expressed in terms of primary energy (mainly space- and water-heating products), the usual EIA energy calculation of Load*Stock / Efficiency (or Load*Stock*Efficiency , depending on how efficiency is defined) yields an amount of primary energy. In these cases, any included electricity-part is first calculated as (Load*Stock / Efficiency) * electricity part * 40%, because the original EFN was based on a CC=40%. Any included final fuel-part is calculated as (Load*Stock / Efficiency) * (1-electricity part). Next, primary energy is always computed as Final Fuel + Electricity/CC, where CC depends on the user-selected CCset. Consequently, a change in CC 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 the EIA2019 and earlier editions.
- [2b] Values for GWP electricity set 2 for years 2000-2050 (in 5-year steps) are from the PRIMES reference scenario 2016, as reported in 'Primes 2016 ref scenario - AppendixRefSce.xlsx' on sheet EU28-B row 70 for 'Electricity and Steam production'. Value for 1990 assumed identical to set 1. Values in intermediate years interpolated linearly.
- [2c] Values for GWP electricity set 3 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-6#tab-googlechartid_googlechartid_googlechartid_googlechartid_chart_11111, 'European level — Greenhouse gas emission intensity of electricity generation'. Annual values defined until 2019 (0.275) with projection between 0.097 and 0.075 for year 2030 (average used). Value for 2050 assumed identical to set 2. Linear interpolation 2019-2030 and 2030-2050.

When changing values for GWP electricity remember that some years (columns) are hidden. These hidden values may not update automatically.

- [3] The PRIMES' rates for electricity and natural gas come from a dedicated Excel file '2017 11 09 VEU28REF2015fdetinfo.xlsx', supplied to the EIA team by the EC policy officer. Original values in €/toe have been converted to €/kWh using 11630 kWh/toe. PRIMES' data are supplied from 2005 to 2050 in 5-year steps. Linear interpolation has been applied in intermediate years. Before 2005, the same trend has been used as in the EIA traditional data. Differences before 2015 between PRIMES' rates and EIA traditional rates probably derive from using a different mix of rate-bands: EIA uses a single reference consumption band, while PRIMES probably diversifies the band per member state. For industry and tertiary sector rates there may also be a difference in included taxes and levies (although VAT is always excluded for these sectors). For gas rates, EIA2020 uses Eurostat data for EU27 excl. UK, which are higher than those for EU28 incl. UK. PRIMES 2015f data still refer to EU28 incl. UK.
- [4] 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 used for several water- and space-heating appliances. Traditionally, EIA used 80% gas and 20% oil (z=80%).
- [5] 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)
- [6] Manufacturer's 'wages': 0.15 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 0.05 m euro/employee, which is the quantity used in EIA. Currently no distinction is made if these jobs are inside or outside EU.
- [7] Wholesale, Retail, Installation and Maintenance 'wages': m euro/employee ±20%.
- [8] Brexit factor: This factor can be used to roughly simulate the effects of Brexit on the Ecodesign Impact Accounting. All product sales quantities will be reduced by the user-supplied percentage. The same % reduction is applied for all products. It is assumed that other data, such as average load, average efficiency, average price and average energy rates, do not change. Where EIA data are compared to Eurostat or EEA data for EU-28, these reference data are NOT corrected for the Brexit factor. If used, a value of 13-15% is recommended, see reference data below. If not used, set to 0%.
For reference:
UK 2019 population was 13.0% of EU28 population; in 2010 this was 12.4% (Eurostat [demo_pjan])
UK 2019 households were 13.1% of EU28 households; in 2010 this was 13.0% (Eurostat [lfs_hhnhtych])
UK 2019 GDP at current prices was 15.3% of total EU28 GDP; in 2010 this was 14.5%; in 2015 17.8% (Eurostat [tec00001])
EIA 2019 referred to the status of December 2019 when UK was still part of EU28, so all EIA 2019 data were for EU28 incl. UK.
EIA 2020 data are for EU27 (2020), without UK.
- [9] 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. Normally there would be no need to change them.
- [10] 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
- [11] Source for 2005 to 2018: Eurostat, Number of private households by household composition, number of children and age of youngest child (1 000) [lfs_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 [lfs_hhanwhtc].
Source for 1991 and 2001: Eurostat, Households by size (number of persons) [cens_hndwsize]; interpolation in intermediate years.
- [12] 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_2

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 background
 See notes [x] at the end of the sheet for further information

Harmonized Index of Consumer Prices (Inflation) [1]											
	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
Eurostat HICP (2015=100)	61.0	67.5	73.1	83.5	93.03	100.0	100.2	101.7	103.6	105.0	105.8
corresponding % inflation per year		2.0%	1.9%	2.3%	1.8%	0.1%	0.2%	1.6%	1.8%	1.4%	0.7%

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 2015-euros (inflation corrected) and for the projection beyond 2017/2020.

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 levies

For the tertiary/services sector the rates are interpolated between residential rate and industry rate using a user-supplied factor (settable below).

The rate for tertiary is determined as $(100-x\%) \cdot \text{Industry rate} + x\% \cdot \text{Residential rate}$

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
Choose factor for Tertiary sector:	65%										
Residential sector	[2]	0.126	0.134	0.133	0.134	0.170	0.210	0.204	0.204	0.209	0.216
Industry sector	[3]	0.080	0.077	0.069	0.077	0.104	0.116	0.112	0.111	0.112	0.119
Tertiary/Services & Other sector	[4]	0.110	0.114	0.110	0.114	0.147	0.177	0.172	0.171	0.175	0.182

(nominal (not inflation corrected))											
Natural Gas Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	2020
Choose factor for Tertiary sector:	58%										
Residential sector	[5]	0.036	0.035	0.041	0.045	0.065	0.077	0.073	0.071	0.074	0.077
Industry sector	[6]	0.017	0.016	0.020	0.027	0.036	0.039	0.035	0.033	0.035	0.035
Tertiary/Services & Other sector	[7]	0.028	0.027	0.032	0.038	0.053	0.061	0.057	0.055	0.057	0.060

(nominal (not inflation corrected))											
Gas Oil for Heating Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
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
Industry sector	[9]	0.022	0.030	0.039	0.050	0.061	0.057	0.049	0.056	0.067	0.067
Tertiary/Services & Other sector	[10]	0.022	0.030	0.039	0.050	0.061	0.057	0.049	0.056	0.067	0.067

(nominal (not inflation corrected))											
LPG Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[11]	0.037	0.051	0.064	0.078	0.092	0.085	0.075	0.085	0.091	0.087
Industry sector	[12]	0.031	0.043	0.054	0.065	0.077	0.071	0.063	0.071	0.076	0.072
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

(nominal (not inflation corrected))											
Petrol (automotive) Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[14]	0.072	0.091	0.109	0.128	0.146	0.154	0.142	0.148	0.157	0.156
Industry sector	[15]	0.062	0.077	0.091	0.107	0.122	0.128	0.118	0.124	0.131	0.130
Tertiary/Services & Other sector	[16]	0.062	0.077	0.091	0.107	0.122	0.128	0.118	0.124	0.131	0.130

(nominal (not inflation corrected))											
Diesel (automotive) Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[14]	0.047	0.067	0.086	0.106	0.120	0.126	0.115	0.124	0.137	0.137
Industry sector	[15]	0.040	0.056	0.072	0.088	0.100	0.105	0.096	0.103	0.114	0.114
Tertiary/Services & Other sector	[16]	0.040	0.056	0.072	0.088	0.100	0.105	0.096	0.103	0.114	0.114

(nominal (not inflation corrected))											
Firewood (logs) Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[17]	0.017	0.019	0.021	0.023	0.030	0.049	0.048			
Industry sector	[18]	0.014	0.016	0.018	0.020	0.025	0.041	0.040			
Tertiary/Services & Other sector	[19]	0.014	0.016	0.018	0.020	0.025	0.041	0.040			

(nominal (not inflation corrected))											
Wood pellets Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[17]	0.027	0.030	0.033	0.036	0.047	0.053	0.052			
Industry sector	[18]	0.022	0.025	0.027	0.030	0.039	0.045	0.043			
Tertiary/Services & Other sector	[19]	0.022	0.025	0.027	0.030	0.039	0.045	0.043			

(nominal (not inflation corrected))											
Wood chips Rates (€/kWh NCV)	1990	1995	2000	2005	2010	2015	2016	2017	2018	2019	
Choose factor for Tertiary sector:	0%										
Residential sector	[17]	0.013	0.014	0.016	0.017	0.028	0.034	0.034			
Industry sector	[18]	0.011	0.012	0.013	0.014	0.023	0.028	0.028			
Tertiary/Services & Other sector	[19]	0.011	0.012	0.013	0.014	0.023	0.028	0.028			

GENERAL_2

(nominal (not inflation corrected)

Coal Rates (€/kWh NCV)		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
Choose factor for Tertiary sector:	0%										
Residential sector	[20]	0.011	0.012	0.011	0.019	0.029	0.018	0.019	0.026		
Industry sector	[21]	0.009	0.010	0.009	0.016	0.024	0.015	0.016	0.022		
Tertiary/Services & Other sector	[22]	0.009	0.010	0.009	0.016	0.024	0.015	0.016	0.022		

Nominal Rates for Non-energy Consumables (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 2015-euros (inflation corrected) and for the projection beyond 2017/2018.

(nominal (not inflation corrected)

Non-energy Rates		1990	1995	2000	2005	2010	2015	2016	2017	2018	2019
water & sewage, residential, €/m3	[23]	1.84	2.13	2.47	2.85	3.48	4.09	4.13	4.19		
paper for copier/printer, all sectors, €/page	[25]	0.008	0.009	0.009	0.011	0.012					
detergent dishwasher, residential, €/cycle	[26]	0.059	0.065	0.071	0.081	0.090					
detergent wash.machine, residential, €/cycle	[26]	0.098	0.109	0.118	0.135	0.150					
bags for vacuum cleaner, residential, €/year	[27]	4.59	5.08	5.50	6.28	7.00					
shielding gas for welding, €/kg Argon	[28]	1.33	1.47	1.59	1.81	2.02	2.17	2.18	2.21		
filler wire and electrodes for welding, €/kg	[29]	0.26	0.28	0.31	0.35	0.39	0.42	0.42	0.43		

Notes:

- [1] Source for years 1996-2020: Eurostat HICP (2015 = 100) - annual average index [prc_hicp_aind], over all items, for EU27 (2020). Data extracted 07/04/2021. For years < 1996, rate of change set to 2%/a.
- [2] Residential electricity rate. Eurostat data extracted on 07/04/21. 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); 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 on 07/04/21. 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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. User can choose the value for 'x'. For reference: In PRIMES scenario REF2015f, the factor x is around 60% in earlier years and 70% in later years.
- [5] Residential natural gas rate. Eurostat data extracted on 07/04/21. 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 (excl. UK). Rates excl. UK are higher than incl. UK. This probably leads to a price discontinuity around 2006-2007.
- [6] Industry natural gas rate. Eurostat data extracted on 07/04/21. 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 (excl. UK).
- [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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. User can choose the value for 'x'. For reference: In PRIMES scenario REF2015f, the factor x is 57-60%.
- [8] Residential rate for gas oil for heating. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. 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 EU-28 average. For these years, the rates already present in EIA2017 have been scaled by factor 1.2 to create approximate continuity with Oil Bulletin rates in 2005.
- [9] Industry rate for gas oil for heating. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. Data for year taken as average over all available weekly prices. Oil Bulletin price inclusive of duties and taxes has been used, but subtracting 20% VAT. 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 EU-28 average. For these years, the rates already present in EIA2017 have been scaled by factor 1.2 to create approximate continuity with Oil Bulletin rates in 2005.
- [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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. 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%.
- [11] Residential rate for LPG. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. 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 EU-28 average. For these years, the rates already present in EIA2017 have been scaled by factor 0.95 to create approximate continuity with Oil Bulletin rates in 2005.

GENERAL_2

- [12] Industry rate for LPG. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. Data for year taken as average over all available weekly prices. Oil Bulletin price inclusive of duties and taxes has been used, but subtracting 20% VAT. 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 EU-28 average. For these years, the rates already present in EIA2017 have been scaled by factor 0.95 to create approximate continuity with Oil Bulletin rates in 2005.

- [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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. 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 $x=0\%$.

- [14] Residential rate automotive Petrol (Euro Super 95) and Diesel. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. 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, EIA2017 rates have been scaled by factor 1.15 for approximate continuity with Oil Bulletin rates in 2005.

- [15] Industry rate for automotive Petrol (Euro Super 95) and Diesel. Oil Bulletin data (<https://ec.europa.eu/energy/en/data-analysis/weekly-oil-bulletin>) extracted on 03/06/20. Data for year taken as average over all available weekly prices. Oil Bulletin price inclusive of duties and taxes has been used, but subtracting 20% VAT. 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, EIA2017 rates have been scaled by factor 1.15 for approximate continuity with Oil Bulletin rates in 2005.

- [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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$.

- [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 following 2005, data sources included: <https://www.woodfuels.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; https://ec.europa.eu/eurostat/statistics-explained/index.php?title=File:Sales_price_of_wood_in_chips_or_particles,_EU-28,_2005-2015.png&oldid=351688.
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.

- [18] Industry rate for Firewood logs and Wood pellets (of minor importance) derived from residential rate subtracting 20% VAT. For wood chips, the base rate is the non-residential one and the residential one has been derived adding 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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. User can choose the value for 'x'. For reference: In PRIMES scenario REF2015f for solid fuels, tertiary/services rates are around 80% of the residential rates. For biomass, services rates are 73-90% of 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 with the years according to the CIF prices for coal reported in 'BP Statistical review of world energy 2018', <https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/coal/coal-prices.html>
Before year 1997 a 2%/a decrease in prices has been assumed.

- [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 $(100-x\%)*\text{Industry rate} + x\%*\text{Residential rate}$. For reference: In PRIMES scenario REF2015f 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_aинд], for items: water supply and sewerage collection, data extracted 26.09.2018.
For years before 2000, an average annual price decrease of 3%/a has been applied.

- [25] Average paper cost 0.012 €/page in 2010; variation with inflation.

- [26] Detergent (inc. salt, rinsing agent, etc.) costs/cycle in 2010; variation with inflation.
Household dishwasher €0.09 per cycle
Household washing machine €0.15 per cycle

- [27] Vacuum cleaner bags and filters, per year (57h use/year), in 2010; variation with inflation.
Average household VC (1/3 bagless, 2/3 bags & filter at €12/a) => € 7.00
Note: The bag price is for 57 h operation. This is 1 year for a household with a single vacuum cleaner. For households with multiple VCs the bag costs per VC are less.
For professional VCs the bag costs are more (proportional to the number of hours operation)

- [28] 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 2015 euros. From quick on-line research in 2019, a typical Argon price is \$2-3/kg, so the calculated 2.17 euros is reasonable.

- [29] 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 2015 euros.

SHARES

Lot	Shares per usage sector and fuel type	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood
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	GSHW Gas Storage, Condensing	65%	31%	3%	1%	0.01	0.99			
2	GSHW 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)									
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	

SHARES

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood
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)										
<i>LS, indicative shares, not constant over years</i>										
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				

SHARES

Lot	Shares per usage sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood
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 4-socket resilient trad.	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									
<i>Regulated only for (networked) standby ((n)sb)</i>										
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				
<i>Regulated also for (networked) standby ((n)sb)</i>										
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				

SHARES

Lot	Shares per sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood
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				
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 household	100%	0%	0%	0%	1.00				
17	VC professional	0%	86%	12%	2%	1.00				
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									

SHARES

Lot	Shares per sector	% RES	% TER	% IND	% OTH	elec	gas	oil	solid	wood
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	WP Water pumps	0%	29%	41%	30%	1.00				
31	CP Fixed Speed 5-1280 l/s	0%	1%	94%	5%	1.00				
31	CP Variable speed 5-1280 l/s	0%	0%	100%	0%	1.00				
31	CP Pistons 2-64 l/s	0%	80%	20%	0%	1.00				
31	CP Standard Air Compressors									
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

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EU28 value - EU27 value) / EU28 value										
EIWH Electric Instant. < 12 kW (secondary)	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
EIWH Electric Instant. ≥ 12 kW (primary)	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
EIWHS Electric Instant. Shower (secondary)	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
ESWH Electric Storage ≤ 30 L (secondary)	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
ESWH Electric Storage > 30 L (primary)	9%	8%	7%	7%	7%	7%	7%	7%	7%	7%
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 m ²)	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 m ²)	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 m ²)	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

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%
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

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%
<i>Regulated only for (networked) standby ((n)sb)</i>										
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%
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>										
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 ≤ 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

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%						
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%							
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%							
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%								
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%							
DW Household Dishwashers	19%	17%	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 household	19%	17%	17%	16%	16%	16%	16%	16%	16%	16%
VC professional	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
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%
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%

BREXIT

BREXIT factors	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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%
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%
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%
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%
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%
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%
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%
Single phase motors > 0.75 kW (no VSD)	11%	10%	9%							
WP Water pumps	11%	10%	9%							
CP Fixed Speed 5-1280 l/s	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
CP Variable speed 5-1280 l/s	10%	10%	9%	9%	9%	9%	9%	9%	9%	9%
CP Pistons 2-64 l/s	15%	11%	11%	11%	11%	11%	11%	11%	11%	11%
WE Welding Equipment	10%	10%	9%							
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%
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 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 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%

SALESBAU

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)	230	340	376	416	416	416	416	416	416	416
2	EIWH Electric Instant. ≥ 12 kW (primary)	662	571	565	589	652	714	777	840	902	965
2	EIWHS Electric Instant. Shower (secondary)	942	1242	1223	1206	1281	1356	1431	1506	1581	1656
2	ESWH Electric Storage ≤ 30 L (secondary)	1483	1677	1692	1771	1894	2016	2138	2260	2382	2504
2	ESWH Electric Storage > 30 L (primary)	3253	3864	3556	3722	3978	4235	4491	4748	5004	5260
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	8395	9499	9083	9303	9909	10514	11120	11726	12332	12937
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

SALESBAU

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						
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
	<i>RAC Share reversible</i>	<i>28%</i>	<i>83%</i>	<i>96%</i>	<i>100%</i>						
	<i>RAC Share of reversible used for heating</i>	<i>30%</i>	<i>46%</i>	<i>50%</i>	<i>60%</i>	<i>70%</i>	<i>80%</i>	<i>90%</i>	<i>100%</i>	<i>100%</i>	<i>100%</i>
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

SALESBAU

Lot	SALESBAU, 000 units (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
8 /9 /19	<i>LS: BAU, million units</i>										
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

SALESBAU

Lot	SALESBAU, 000 units (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Regulated only for (networked) standby ((n)sb)</i>											
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
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>											
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	496962	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	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

SALESBAU

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 household	13574	43987	62146	76207	83061	81879	83230	83066	82554	82065
17	VC professional	943	1142	1204	1270	1335	1400	1464	1529	1594	1659
17	VC Vacuum Cleaners	14517	45130	63350	77477	84396	83279	84695	84596	84148	83724
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	6	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
11	WP Water pumps	1099	1513	1636	1760	1892	2024	2156	2288	2420	2552
31	CP Fixed Speed 5-1280 l/s	46	41	39	40	41	42	44	45	46	48
31	CP Variable speed 5-1280 l/s	0	8	12	13	13	14	14	15	15	16
31	CP Pistons 2-64 l/s	42	46	48	50	51	53	55	56	58	60
31	CP Standard Air Compressors	89	95	98	102	106	109	113	116	120	123
E5	WE Welding Equipment	422	479	483	486	491	497	500	504	508	512

SALESBAU

Lot	SALESBAU, 000 units (light, tyres m units)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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

SALESECO

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

SALESECO

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

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	3,223	4,158	4,693	5,419	6,020	6,307	6,401	6,401	6,401	6,401
EIWH Electric Instant. ≥ 12 kW (primary)	18.0	10,950	12,424	11,794	11,084	10,748	11,187	12,101	13,198	14,323	15,449
EIWS Electric Instant. Shower (secondary)	15.0	12,918	18,097	18,911	18,509	18,339	18,906	19,884	21,009	22,135	23,260
ESWH Electric Storage ≤ 30 L (secondary)	15.4	20,824	26,138	26,294	26,333	26,997	28,466	30,210	32,089	33,968	35,847
ESWH Electric Storage > 30 L (primary)	15.0	44,593	58,375	58,499	57,605	55,961	58,388	61,985	65,831	69,677	73,522
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 m ²)	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		116,775	149,821	149,860	146,884	145,067	150,516	158,573	167,938	177,342	186,747
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 m ²)	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 m ²)	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

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
<i>LS: BAU, million units</i>											
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

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							
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
<i>Regulated only for (networked) standby ((n)sb)</i>											
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

STOCKBAU (000 units, LS&tyre m units)	Life	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>												
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		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

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 household		122,355	292,509	318,317	347,003	403,753	420,394	416,533	415,647	413,783	411,293	
VC professional	6	5,585	6,642	7,029	7,428	7,815	8,204	8,593	8,981	9,370	9,759	
VC Vacuum Cleaners		127,940	299,151	325,346	354,431	411,568	428,598	425,126	424,628	423,153	421,052	
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 3-ph 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
WP Water pumps	11	11,220	15,311	16,649	18,001	19,384	20,810	22,262	23,714	25,166	26,618	
CP Fixed Speed 5-1280 l/s	12	257	554	501	456	459	474	490	506	521	537	
CP Variable speed 5-1280 l/s	12	-	41	89	132	155	163	169	174	180	185	
CP Pistons 2-64 l/s	9	340	443	436	440	458	474	490	505	521	536	
CP Standard Air Compressors		598	1,038	1,026	1,028	1,072	1,112	1,149	1,185	1,221	1,258	
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	

STOCKBAU

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
VCLIFE	9.4	6.8	6.0	4.9	5.0	5.1	5.0	5.0	5.0	5.0
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
<u>LS: ECO, million units</u>											
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 7.5-7.5 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 3-ph 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 7.5-7.5 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 7.5-7.5 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 7.5-7.5 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 7.5-7.5 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		<p>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.</p> <p>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.</p>
WH dedicated Water Heater	kWh heat/a	<p>Measurement unit for performance is the energy content of the useful hot water delivered, expressed in kWh heat.</p> <p>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.</p> <p>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.</p> <p>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.</p> <p>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).</p> <p>[1] Water Heaters and Storage Tanks, Ecodesign and Energy Label, Review Study Final reports Tasks 1-7, VHK for the European Commission, July 2019.</p> <p>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, FNRC, 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).</p> <p>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)</p>
CHC Central Heating combi, water heat	kWh heat/a	<p>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.</p> <p>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.</p>
CH Central Heating boiler, space heat	kWh heat/a	<p>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).</p> <p>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.</p> <p>The actual energy consumption of the boiler is determined through testing and calculation. The testing entails measurements at the following test points:</p> <ul style="list-style-type: none"> (a) 100% and 30% load heating efficiency (η_{100} and η_{30} 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) <p>Also minimum and maximum auxiliary electricity is measured. The solar collector efficiency, which is an input for the calculation of a possible solar contribution, is derived from testing (4 different water inlet temperatures over the operating range, 4 test samples).</p> <p>The basic seasonal efficiency (η_s) equation for conventional gas- and oil-boilers as well as micro-cogeneration boilers is $\eta_s = 0.85 * \eta_{30} + 0.15 * \eta_{100} - \sum F$</p>

ΣF 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_s , 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 (η_n , 100%) and partial (η_p , 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.

LOADnotes

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	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 (\leq 400 kW)	kWh cool/a	44	600	1%
CHAE-L ($>$ 400 kW)	kWh cool/a	714	600	1%
CHWE-S (\leq 400 kW)	kWh cool/a	61	600	1%
CHWE-M ($< 400 \leq 1500$ 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

<u>Heating</u>		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		Annual HeatDec
				in 2018		
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%	

LOADnotes

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 $N_{cool} / (N_{cool} + N_{heat})$ and $N_{heat} / (N_{cool} + N_{heat})$, 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 cooling demand constant over years
RAC fixed 6-12 kW, cooling	kWh cool	7.1	350		2485	SEER	
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 annual heat load variation compared to 2015: 0.85%
RAC fixed 6-12 kW rev., heating	kWh heat	5.6	1400	see text	7840	SCOP	
RAC portable < 12 kW rev., heating	kWh heat			heating function not considered		n/a	

LOADnotes

CIRC Circulator pumps <2.5 kW kWh flow/a Test=weighted avg. of 4 part load tests= 40%*%+30%*%+20%*% +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):

$$EEI = \frac{P_{L,avg}}{P_{ref}} \cdot C_{20\%}, \text{ where } C_{20\%} = 0.49$$

$$P_{ref} = 1.7 \cdot P_{hyd} + 17 \cdot (1 - e^{-0.3 \cdot P_{hyd}})$$

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 PLavg [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%

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
	Qinf rate	1.30 0.85 0.65 0.45 0.45
		[-] approximate m³/h/m²
	Qinf	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).

LOADnotes

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 Qin 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) * Qin 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, Qin 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	Aref	NRVU Non-Residential Ventilation Units	Qnom
	m3/h	m2		m3/h
R-UVU ≤ 100 m3/h, ES	60	33	NR-UVU 250-1000 m3/h	720
R-UVU ≤ 100 m3/h, HS	60	33	NR-BVU 250-1000 m3/h	400
R-BVU ≤ 100 m3/h, HS	60	33	NR-UVU > 1000 m3/h	1440
R-UVU 100-250 m3/h	180	100	NR-BVU 1000-2500 m3/h	500
R-BVU 100-250 m3/h	180	100	NR-AHU-S 2500-5500 m3/h	3780
R-UVU 250-1000 m3/h	720	400	NR-AHU-M 5500-14500 m3/h	9000
R-BVU 250-1000 m3/h	720	400	NR-AHU-L > 14500 m3/h	25200
R-UVU > 1000 m3/h	1500	833		7000
R-BVU 1000-2500 m3/h	2250	1250		

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:

$$q_{refcorr} = 1.36 * q_{effective} \quad (\text{includes } CTRL_{on} = 0.8), \quad q_{net} = 1.3 \text{ m}^3/\text{h}$$

$$q_{effective} = Q_{nom} / MISC,$$

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.

$$AHS = SHE * (q_{nom} / MISC) * [1.36 - MISC * CTRL_{on} * CTRL_{var} * (1 - \eta_h)] - Q_{defrost}$$

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

$$\text{SEC} = t_a \cdot pef \cdot q_{net} \cdot MISC \cdot CTRL^x \cdot SPI - t_h \cdot \Delta T_h \cdot \eta_h^{-1} \cdot c_{air} \cdot (q_{ref} - q_{net} \cdot CTRL \cdot MISC \cdot (1 - \eta_t)) + Q_{defr}$$

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; $MISC$ = 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%
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:

$$EEI = \frac{(P_{measured} + 1)}{(3 \times [90 \times \tanh(0.02 + 0.004 \times (A - 11)) + 4] + 3) + corr_{lum}}$$

(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, terrestrial, 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 initially 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 smoothing 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.

LOADnotes

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: $E_{TEC} = 8.76 \times (T_{off} P_{off} + T_{sleep} P_{sleep} + T_{long_idle} P_{long_idle} + T_{short_idle} P_{short_idle})$ 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.

LOADnotes

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	$V_{eq} = \sum V_c \times (25-T_c)/20 \times FFC \times CC \times BI \approx (V_{freeze_net} \times 2.15 + V_{fridge_net}) \times 1.1$, with V_{freeze_net} (-18 °C)=22% x Vnet, rest is V_{fridge_net} ($T_c=+5$ °C). So $V_{eq} = 1.353 \times V_{net}$ 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 $AEc = E24h \times 365$, where $E24h$ is 24h energy consumption tested according to EN 62552: 2013. $SAEc = V_{eq} \times M + N + CH$, 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 %). $AE = 365 \times Edaily$ (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. $SAE = 365 \times P \times (M + N \times Y) \times C$, 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 m².

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 $SAE * EEI * \text{real-life factor}$. 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 can differ from data in the IA.

	M	N	P	C	TDA (m ²) or eq. volume (dm ³)	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 Refrigerator

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 consequently 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, $EEI = (AEC/SAEC) \times 100$. $AEC = E24h \times af \times 365$, 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)). $SAEC = (N + M \times Vn) \times 365$, 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

LOADnotes

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 EE= 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 .

LOADnotes

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 P _{bep} , and 2 h lighting operation daily, during 365 days per year. The electric power consumption (in W) of the extraction fan P _{bep} 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 water-use-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:

In the 2010 regulations, an Energy Efficiency Index derived from annual energy consumption (inc SAfc=47c +51.7 (SAfc= Standard Annual Energy Consumption, calculated from c=capacity, in kg)

EEI=AE_c/SAE_c. (EEI=Energy Efficiency Index)

$$\Delta E_{\text{FC}} = 220 * [(3 * E60 + 2 * E60\%) + 2 * E40\%] / 7 +$$

AEC=220 [($E_{60} + 2 \cdot E_{60\%} + 2 \cdot E_{40\%}) / 7 + E_{S0}]$, AEC is Annual Energy Consumption (measured); E_{S0} is standby energy (small, see regulation); E₆₀ E60% and E40% 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):

Energy Efficiency Index (EEIw) for 'eco 40-60' washing cycle:

Energy Efficiency (Watt/kWh) for eco 40-60 washing cycle

SCEW = $0.0025 \cdot e^2 + 0.0846 \cdot e + 0.3029$ SCEW: standard cycle energy consumption (computed) in kWh/b

SCEW = -0.0025 * c₂ + 0.0848 * 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

$$A = -0,0391 * c + 0,6918; \quad B = -0,0109 * c + 0,3582; \quad C = ?$$

Energy Efficiency Index (EEI_{wd}) for 'wash and dry' cycle

SCEwd = -0,0502 * d² + 1,1742 * d - 0,644 SCEwd is the standard cycle energy consumption (computed) in kWh

$$E_{wd} = (3 * E_d(\text{full}) + 2 * E_d(1/2)) / 5$$

E_{wd} is the weighted cycle energy consumption.

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:

$$CR = 1,35 + 0,025 \times ps \text{ when } ps \geq 10, \text{ or } CR = 0,45 + 0,09 \times ps \text{ when } ps \leq 9.$$

In the 2010 regulations, an Energy Efficiency Index derived from annual energy consumption (including standby) was used:

$$SAEc = 7 * ps + 378 \text{ (normal size) or } 25.2 * ps + 126 \text{ (compact)}$$

$$EEI = AEC / SAEc$$

$AEC = 280 * Ecyc + Esb$, 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) --> $SAEc = 22.5 * ps + 164 \text{ kWh/a}$ (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:

$$EEI = (EPEC / SPEC) \times 100$$

EPEC = eco programme energy consumption of the DW measured in kWh/cycle

SPEC = standard programme energy consumption of the DW, computed in kWh/cycle:

$$SPEC = 0,025 \times ps + 1,350 \text{ for DW with rated capacity } ps \geq 10 \text{ and width} > 50 \text{ cm}$$

$$SPEC = 0,090 \times ps + 0,450 \text{ for DW with rated capacity } ps \leq 9 \text{ or width} \leq 50 \text{ cm, where ps is the number of place settings.}$$

On average, assuming 14% \leq ps and 86% \geq 10 ps (source: IA 2019), approx. $SPEC = 0,034 \times ps + 1,224 \text{ kWh/cyc}$ (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.

LOADnotes

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) $SAEc = 140 \times \text{capacity}^{0.8}$

LD SAEc vented (EEI=100) $SAEc = 140 \times \text{capacity}^{0.8} - 30 \times (\text{programme time}/60)$, 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

VC dom (87 m ² /h)	h/a	The annual electricity consumption (AE) is calculated with 2 double strokes per surface area -->factor 4. Surface area is 87 m ² (average m ² /dwelling), cleaned in 50 one-hour tasks per year. The average specific energy (ASE) in Wh/m ² is determined for hard floor (hf), carpet (c) and general purpose (50% hf and 50% c) vacuum cleaners. The actual test is done with 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 0.5 m/s). The same tests establishes dust pick-up (dpu) for carpets and hard floors of the model.
VC non-dom	h/a	In formula: $AE = 4 \times 87 \times 50 \times ASE \times (1-0.2/dpu-0.2)$, established specifically for carpets and/or hard floors (suffixes 'c' or 'hf' for AE, ASE, dpu).

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 * m³/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: $2.74 \times \ln(Pe) - 6.33 + N$ (Pe:0.125-10kW); $0.78 \times \ln(Pe) - 1.88 + N$ (Pe:10-500kW).

Centrifugal backwards curved (BC): $4.56 \ln(Pe) - 10.5 + N$ (Pe:0.125-10kW); $1.1 \times \ln(Pe) - 2.6 + N$ (Pe:10-500kW).

Cross-flow: $1.14 \times \ln(Pe) - 2.6 + N$ (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 -	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
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LOADnotes

Med. (S) 3-ph 0.75-7.5 kW no VSD	1756	1.1	2800	0.57	it is also the same in BAU and in ECO (but in ECO share using VSD may be higher than in BAU)
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	use of VSD is assumed to reduce load by 40%
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	Source for data: IA Motors of October 2017
Med. (L) 3-ph 75-375 kW with VSD	240240	110	7000	0.31	Motor efficiency is measured according to IEC60032-30.
Small 1 ph 0.12-0.75 kW no VSD	59	0.37	400	0.40	Efficiencies on EFNBAU/ECO are copied from IA motors,
Small 1 ph 0.12-0.75 kW with VSD	36	0.37	400	0.24	but ECO efficiencies updated for final voted regulation.
Small 3 ph 0.12-0.75 kW no VSD	296	0.37	2000	0.40	Motor efficiencies for different IE-classes based on
Small 3 ph 0.12-0.75 kW with VSD	178	0.37	2000	0.24	minimum values for 4-pole 50 Hz from EN 60034-30-1
Large 3-ph LV 375-1000 kW no VSD	1716000	550	6000	0.52	for the ref. nominal output power of each base case
Large 3-ph LV 375-1000kW with VSD	1188000	550	6000	0.36	(except for 8-pole motors where 8-pole data are used)
Explosion mt (S) 3-ph 0.75-7.5 kW	1411	1.1	2250	0.57	For each scenario/year a distribution of sales over the
Explosion mt (M) 3-ph 7.5-75 kW	17160	11	3000	0.52	IE-classes is assumed and MT efficiency calculated as
Explosion mt (L) 3-ph 75-375 kW	343200	110	6000	0.52	weighted average over the IE-class efficiencies.
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	VSD losses (90% max speed; 100% torque) for IE1-class
Brake motors (L) 3-ph 75-375 kW	137280	110	2400	0.52	based on max loss values from regulation Annex.
8-pole motors (S) 3-ph 0.75-7.5 kW	1411	1.1	2250	0.57	For IE0, losses 25% higher; IE2 25% lower; IE3 50% lower.
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	For each scenario/year a distribution of sales over the
1-phase motors >0.75 kW (no VSD)	440	1.1	800	0.50	IE-classes assumed and VSD losses calculated as
					weighted average over the IE-class losses.
CP Standard Air Compressors	kWh flow/a				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).
Rotary fixed speed					The EIA ECO scenario reflects the final CR 2019/1781.
Rotary variable speed					The LOAD results more or less constant over the years, varying from 53392 kWh/a in 2000 to 44255 kWh/a in 2030. Indicatively this average load corresponds to a compressor with a volume flow of 70 l/s and an efficiency of 63%.
Pistons					The LOAD is decreasing in time, varying from 155526 kWh/a in 2000 to 83763 kWh/a in 2030. The reason for this decrease is that variable speeds are increasingly applied to lower capacity models. For example in 2000 the average variable speed compressor sold has 180 l/s while in 2030 this has decreased to 86 l/s. Both with an average efficiency around 65-66%.
Efficiencies					The LOAD results more or less constant over the years, varying from 1377 to 1391 kWh/a. Indicatively this average load corresponds to a compressor with a volume flow of 7 l/s and an efficiency of 47%.
WE Welding Equipment					The efficiencies in EIA (both EFNBAU and EFNECO) are the sales-weighted isentropic efficiencies over the various volume flow classes in each base case. The efficiencies per volume flow class have been taken from the Excel sheets underlying the Impact Assessment, using Ecodesign Option A with Averaged replacement. See Annex E for further information on efficiencies.
TRAFO Distribution	TEC				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.
TRAFO Industry oil	TEC				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.
TRAFO Industry dry	TEC				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.
TRAFO Power	TEC				
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:

$$\text{Fuel consumption change (\%)} = K * \frac{RRC_{old} - RRC_{new}}{RRC_{old}} * 100\%$$

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:

$$(\text{Litres}/100km/vehicle due to RRC) * (\text{annual km driven} / 100) * (\text{EU vehicle stock in mln}) * (\text{kWh/litre}) * 1E-3$$

(Litres/100km/vehicle due to RRC) is the efficiency parameter, reported on sheets EFNBBAU 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, FNNG 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	The value for C3 replacement is lower than for C3 OEM because retreaded tyres (not considered here)
vehicles with C3 OEM	13.1	have been excluded.

LOADnotes

(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	OEM	replacement	OEM	replacement	OEM
	tyres	tyres	tyres	tyres	tyres	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	OEM	replacement	OEM	replacement	OEM
	tyres	tyres	tyres	tyres	tyres	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	OEM	replacement	OEM	replacement	OEM
	tyres	tyres	tyres	tyres	tyres	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

LOADBAU

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
EIWSH 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
GSHW Gas Storage, Condensing	kWh heat/a	3130	3426	3543	3543	3543	3543	3543	3543	3543	3543
GSHW 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 m ²)	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 m ²)	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 m ²)	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

LOADBAU

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

LOADBAU

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
<i>LS, stock average unit capacities in lm</i>											
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
<i>LS, unit fpe-hours in h/a (see LoadNotes)</i>											
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	2118	2121
LED replacing HID (retrofit & luminaire)	h/a		4000	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)	dm ²	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	dm ²	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	dm ²	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

LOADBAU

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Stock average PSU output for ES&DS (8760 h/a)</i>											
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
<i>images printed per year per device</i>											
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
<i>(further details on sheet RESOURCES)</i>											
<i>Regulated only for (networked) standby ((n)sb)</i>											
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
<i>Regulated also for (networked) standby ((n)sb)</i>											
<i>(already accounted elsewhere; here for info only)</i>											
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

LOADBAU

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>EPS Active output energy per unit per year</i>											
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
<i>EPS No-load hours per unit per year</i>											
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									
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									
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									
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

LOADBAU

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	°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 initial 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%
<i>LD correction factor for initial moisture</i>	-	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 dom (87 m²/h)	h/a	57	33	31	31	28	25	23	20	18	16
VC nondom	h/a	500	500	500	500	500	500	500	500	500	500
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
<i>MT motors</i>											
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
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
WP Water pumps (load)	kWh flow/a	4593	4,593	4,593	4,593	4,593	4,593	4,593	4,593	4,593	4,593
CP Fixed Speed 5-1280 l/s	kWh flow/a	47845	49377	46677	45050	44284	44255	44226	44197	44168	44139
CP Variable speed 5-1280 l/s	kWh flow/a	183425	129646	104486	90069	84355	83763	83172	82581	81990	81399
CP Pistons 2-64 l/s	kWh flow/a	1379	1391	1384	1382	1380	1377	1373	1369	1366	1362

LOADBAU

LOAD, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
<i>(annual km driven per vehicle / 100)</i>											
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

LOADECO

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

LOADECO

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

LOADECO

LOAD, ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, stock average unit capacities in lm</i>											
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
<i>LS, unit fpe-hours in h/a (see LoadNotes)</i>											
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
<i>Stock average PSU output for ES&DS (8760 h/a)</i>											
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	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											

EULOADBAU

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	0	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	TWh heat/a	4	5	5	5	5	5	6	6	6	7
EIWS Electric Instant. Shower (secondary)	TWh heat/a	5	8	9	9	9	9	10	11	11	11
ESWH Electric Storage ≤ 30 L (secondary)	TWh heat/a	4	6	6	6	6	7	7	8	8	9
ESWH Electric Storage > 30 L (primary)	TWh heat/a	41	58	60	59	58	60	64	68	72	76
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
GSHW Gas Storage, Condensing	TWh heat/a	0	0	0	0	0	1	1	1	1	1
GSHW 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 m ²)	TWh heat/a	1	9	13	14	14	14	13	14	14	15
WH dedicated Water Heater	TWh heat/a	74	108	113	111	110	115	122	132	141	150
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 m ²)	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 m ²)	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

EULOADBAU

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						
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						
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

EULOADBAU

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	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									
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									
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										
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

EULOADBAU

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, total EU capacity in Tlm</i>											
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
LS Lighting	Tlm	4.6	8.9	10.7	12.7	14.5	16.2	18.2	20.3	22.6	25.2
<i>LS, total EU fpe-hours in Th/a</i>											
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	0.9
LED replacing NDLS (retrofit & luminaire)	Th/a			0.0	0.0	0.4	1.3	2.2	3.1	3.7	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)	km ²	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	km ²	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	km ²	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							
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

EULOADBAU

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
<i>images printed per year by EU stock</i>											
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
<i>Regulated only for (networked) standby ((n)sb)</i>											
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
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>											
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								
<i>EU Active output energy per year</i>											
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
<i>EU No-load hours per year</i>											
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 @ -18°C°	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

EULOLOADBAU

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 m³	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 LTS 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 Laundry 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 dom (87m ² x 50 times/a=4350 m ² -->/57h=76.3m ³ /h)	1000 km ² /a	537	729	758	809	848	804	723	649	574	498
VC nondom (76.3 m ² /h)	1000 km ² /a	213	253	268	283	298	313	328	343	357	372
VC Vacuum Cleaners	1000 km²/a	750	983	1,026	1,092	1,146	1,117	1,051	992	931	870
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

EULOADBAU

LOAD EU Total, BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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								
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
WP Water pumps	TWh flow/a	52	70	76	83	89	96	102	109	116	122
CP Fixed Speed 5-1280 l/s	TWh flow/a	12.3	27.3	23.4	20.6	20.3	21.0	21.7	22.3	23.0	23.7
CP Variable speed 5-1280 l/s	TWh flow/a	0.0	5.3	9.2	11.8	13.1	13.7	14.1	14.4	14.7	15.1
CP Pistons 2-64 l/s	TWh flow/a	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7
CP Standard Air Compressors	TWh flow/a	12.8	33.3	33.2	33.0	34.0	35.3	36.4	37.4	38.5	39.5
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
<i>(annual km driven by all vehicles with tyre type)</i>											
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

EULOADVAR

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 m ²)	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

EULOADVAR

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

EU LOAD VAR

LOAD EU, Variation (BAU-ECO)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, total EU capacity variation (BAU-ECO) in TWh</i>											
LFL (T12,T8h,T8t,T5,other)	TWh	0.0	0.0	0.0	0.2	1.1	2.3	2.7	2.5	2.1	1.7
HID (HPM, HPS, MH)	TWh	0.0	0.0	0.1	0.3	0.4	0.4	0.3	0.2	0.1	0.1
CFLni (all shapes)	TWh	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)	TWh	0.0	-0.3	-0.3	0.1	0.9	1.0	0.8	0.5	0.3	0.2
GLS (DLS & NDLS)	TWh	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)	TWh	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)	TWh	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)	TWh	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)	TWh	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)	TWh	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)	TWh	0.0	0.0	-0.2	-1.6	-2.2	-1.8	-1.2	-0.8	-0.5	-0.4
LS Lighting	TWh	0.0	0.0	-0.2	-0.3	-0.4	-0.5	-0.4	-0.4	-0.3	-0.3
<i>LS, total EU fpe-hours variation (BAU - ECO) in Th/a</i>											
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									
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									
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									

EULOLOADVAR

LOAD EU, Variation (BAU-ECO)	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>MT motors load variation (BAU-ECO) due to increased use of VSDs</i>											
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									
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									
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									
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									
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									
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									
1-phase motors >0.75 kW (no VSD)	TWh output/a	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 EULOLOADBAU 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

EULOADECO

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
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	0	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						
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

EULOADECO

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

EU LOAD ECO

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										
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	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	6.7
LS Lighting	Tlm	5	9	11	13	15	17	19	21	23	26
LS, total EU fpe-hours in Th/a	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	0.9	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
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							
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

EU LOAD ECO

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								
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
<i>DWH Primary efficiency in GCV using PEF 2.1</i>											
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%	37%	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%
<i>CHB Primary WH efficiency in GCV using PEF 2.1</i>											
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%
<i>CHB Primary efficiency in GCV using PEF 2.1</i>											
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%	70%	71%	71%
AHE	%	26%	30%	30%	30%	30%	31%	32%	32%	33%	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%
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%

EFNBAU

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
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%
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%

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, sales average efficiency incl. control gear</i>											
LFL (T12,T8,h,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
DP TV on-mode power (avg. all types)	W/dm ²	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/dm ²	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/dm ²	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/dm ²	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
<i>PSU efficiency for ES&DS</i>											
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%
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
<i>Regulated only for (networked) standby ((n)sb)</i>											
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

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>											
SB Washing Machines (sb & off modes)											
SB Dishwashers (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 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
<i>EPS Average Active Efficiency</i>											
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%
<i>EPS Average No-load power</i>											
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
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<	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<	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	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	
CA Electric Ovens (active modes)	kWh/a	133	97	90	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	
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
<i>LD at current cycles and user loading</i>											
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

EFNBAU

EFFICIENCY SALES BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
VC dom	W	1275	1739	2016	2337	2711	3085	3459	3833	4207	4580
VC nondom	W	929	1293	1393	1500	1500	1500	1500	1500	1500	1500
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%
<i>MT motors</i>											
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%
WP Water pumps (load)	%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
CP Fixed Speed 5-1280 l/s	%	58.8%	63.1%	63.5%	64.0%	64.4%	64.7%	65.0%	65.3%	65.6%	65.9%
CP Variable speed 5-1280 l/s	%	58.9%	64.8%	64.3%	65.0%	65.4%	65.7%	66.0%	66.3%	66.7%	67.0%
CP Pistons 2-64 l/s	%	43.8%	47.0%	47.5%	47.8%	48.1%	48.3%	48.6%	48.8%	49.0%	49.2%
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
<i>(Fuel losses due to RRC in L/100km/vehicle)</i>											
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)

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
<i>DWH Primary efficiency in GCV using PEF 2.1</i>											
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%
<i>CHB Primary WH efficiency in GCV using PEF 2.1</i>											
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%
<i>CHB Primary efficiency in GCV using PEF 2.1</i>											
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%	83%	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%
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%

EFNECO

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
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%
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%	81%	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%

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, sales average efficiency incl. control gear</i>											
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
LED replacing NDLS (retrofit & luminaire)	lm/W			26	85	103	142	160	160	160	160
DP TV on-mode power (avg. all types)	W/dm ²	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/dm ²	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/dm ²	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/dm ²	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
<i>PSU efficiency for ES&DS</i>											
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%
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	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
<i>Regulated only for (networked) standby ((n)sb)</i>											
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

EFNECO

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Regulated also for (networked) standby ((n)sb)</i>											
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
<i>EPS Average Active Efficiency</i>											
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%	88.6%	88.6%	88.6%	88.6%	88.6%
EPS 65–120 W	%	83.6%	85.4%	87.5%	88.5%	88.5%	88.6%	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%
<i>EPS Average No-load power</i>											
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
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						
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						
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						
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

EFFICIENCY SALES ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
LD Household Laundry Dryers											
VC dom	W	1275	1739	1192	948	925	902	879	856	834	811
VC nondom	W	929	1293	1071	905	883	861	839	817	796	774
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%	92.3%	92.4%	92.5%	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%
WP Water pumps (load)	%	66.5%	67.1%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
CP Fixed Speed 5-1280 l/s	%	58.8%	63.1%	64.7%	66.2%	66.5%	66.6%	66.7%	66.7%	66.8%	66.9%
CP Variable speed 5-1280 l/s	%	58.9%	64.8%	64.8%	66.6%	67.0%	67.0%	67.0%	67.0%	67.0%	67.0%
CP Pistons 2-64 l/s	%	43.8%	47.0%	48.4%	49.8%	50.0%	50.0%	50.0%	50.0%	50.0%	50.0%
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
<i>(Fuel losses due to RRC in L/100km/vehicle)</i>											
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
<i>DWH Primary efficiency in GCV using PEF 2.1</i>											
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%
EIWSH 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%	38%	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 m ²)	%GCV,PEF2.1	72%	78%	80%	81%	83%	86%	89%	92%	95%	97%
<i>CHB Primary WH efficiency in GCV using PEF 2.1</i>											
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 m ²)	%GCV,PEF2.1	171%	199%	213%	227%	240%	250%	258%	265%	272%	280%
<i>CHB Primary efficiency in GCV using PEF 2.1</i>											
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%	63%	63%	64%	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 m ²)	%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%	77%
SFB Wood chips	kWh/a	71%	72%	73%	74%	75%	75%	76%	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 VRV	%	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%	31%	32%	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%	74%	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%	93%
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%

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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%	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%	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
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

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-AHU-M 5500-14500 m3/h											
Unit annual electricity consumption	kWh/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	kWh/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
<i>LS, stock average efficiency incl. control gear</i>											
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	113
DP TV on-mode power (avg. all types)	W/dm ²	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/dm ²	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/dm ²		8.0	4.2	2.6	1.9	1.6	1.3	1.0	0.9	0.7
DP Signage standby power	W/dm ²		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
<i>PSU efficiency for ES&DS</i>											
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%
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	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	267
EP / Laser MFD colour	kWh/a	360	336	315	315	315	315	315	315	315	315

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Regulated only for (networked) standby ((n)sb)</i>											
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	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
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
<i>Regulated also for (networked) standby ((n)sb) (already accounted elsewhere; here for info only)</i>											
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									
<i>EPS Average Active Efficiency (of stock)</i>											
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%	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%
<i>EPS Average No-load power (of stock)</i>											
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
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<	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<	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

EFFICIENCY STOCK BAU	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
<i>LD at current cycles and user loading</i>											
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
VC dom	W	1176	1442	1888	1865	2564	2877	3309	3683	4057	4431
VC nondom	W	929	1247	1343	1447	1500	1500	1500	1500	1500	1500
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%
<i>MT motors</i>											
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%
WP Water pumps (load)	%	65.6%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%	66.5%
CP Fixed Speed 5-1280 l/s	%	57.5%	62.7%	63.1%	63.5%	64.0%	64.4%	64.7%	65.0%	65.3%	65.6%
CP Variable speed 5-1280 l/s	%	58.9%	66.3%	65.0%	64.6%	64.9%	65.3%	65.7%	66.0%	66.3%	66.6%
CP Pistons 2-64 l/s	%	42.8%	46.6%	47.1%	47.5%	47.9%	48.1%	48.4%	48.6%	48.8%	49.1%
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	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
<i>(Fuel losses due to RRC in L/100km/vehicle)</i>											
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
<i>DWH Primary efficiency in GCV using PEF 2.1</i>											
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%	39%	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%
<i>CHB Primary WH efficiency in GCV using PEF 2.1</i>											
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%
<i>CHB Primary efficiency in GCV using PEF 2.1</i>											
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%	86%	86%	86%
LH pellet stove	%	83%	85%	87%	90%	93%	94%	94%	94%	94%	94%
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%

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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%	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%	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
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

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
<i>LS, stock average efficiency incl. control gear</i>											
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	78
LED replacing NDLS (retrofit & luminaire)	lm/W			24	76	96	107	112	116	118	123
DP TV on-mode power (avg. all types)	W/dm ²	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				
DP TV HiNA ('Smart') standby power	W			0.0	5.1	5.6	5.0	4.4	3.9	3.4	2.9
DP Monitor on-mode power	W/dm ²	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/dm ²		8.0	4.2	2.6	1.8	1.3	0.9	0.7	0.7	0.7
DP Signage standby power	W/dm ²		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
<i>PSU efficiency for ES&DS</i>											
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	79
EP / Laser MFD colour	kWh/a	302	201	113	92	92	92	92	92	92	92

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Regulated only for (networked) standby ((n)sb)</i>											
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					
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
<i>Regulated also for (networked) standby ((n)sb)</i>											
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									
<i>EPS Average Active Efficiency (of stock)</i>											
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%	88.5%	88.5%	88.5%
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%	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%
<i>EPS Average No-load power (of stock)</i>											
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	0.18	0.18	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<	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<	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

EFFICIENCY STOCK ECO	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
<i>LD at current cycles and user loading</i>											
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	251	251
LD vented gas	kWh gas /a	432	492	509	484	417	374	374	374	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
VC dom	W	1176	1442	1524	794	934	893	888	865	843	820
VC nondom	W	929	1247	1208	951	894	871	850	828	807	785
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%
<i>MT motors</i>											
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%
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%
Total WP Water Pumps	%	65.6%	66.6%	67.3%	68.2%	68.5%	68.5%	68.5%	68.5%	68.5%	68.5%
CP Fixed Speed 5-1280 l/s	%	57.5%	62.7%	63.3%	64.7%	66.0%	66.4%	66.6%	66.7%	66.7%	66.8%
CP Variable speed 5-1280 l/s	%	58.9%	66.3%	65.2%	65.3%	66.2%	66.9%	67.0%	67.0%	67.0%	67.0%
CP Pistons 2-64 l/s	%	42.8%	46.6%	47.4%	48.7%	49.7%	50.0%	50.0%	50.0%	50.0%	50.0%
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	35515
TRAFO DER dry	kWh/a	62415	59204	53910	50715	48765	47595	47109	47109	47109	47109
TRAFO Small	kWh/a	2523	2523	2523	2523	2523	2523	2523	2523	2523	2523
<i>(Fuel losses due to RRC in L/100km/vehicle)</i>											
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

ELECBAU

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	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	7	7	7	6	7	7	8	8	8	9
EIWHS Electric Instant. Shower (secondary)	1.00	8	12	13	12	12	13	13	14	14	14	15
ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	8	8	8	8	8	9	9	9	9	10
ESWH Electric Storage > 30 L (primary)	1.00	53	75	78	76	74	77	81	86	90	90	95
GIWH Gas Instant. < 13 L/min (secondary)	0.003	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
GSWH Gas Storage, Condensing	0.010	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
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	6
WH dedicated Water Heater		75	108	113	113	111	116	124	132	141	149	
CHB Gas Combi Instant. WH	0.04	1	3	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	1
CHB Jet Burner Gas + Cyl. WH	0.04	0	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	0
CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1	1
CHB Hybrid Gas/Electric WH	0.10	0	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	0
CHB Gas mCHP + Cyl. WH	0.02	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
CHC Central Heating combi, water heating		5	9	10	11	11	12	13	14	15	16	
TOTAL WATER HEATING		80	117	123	123	123	128	136	146	155	165	
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	14	13
CHB Gas Jet burner non-condensing	0.04	2	1	1	1	0	0	0	0	0	0	0
CHB Gas Jet burner condensing	0.04	0	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	1
CHB Oil Jet burner condensing	0.04	0	0	0	1	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	0
CHB micro CHP	0.04	0	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	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	0
SFB Wood Direct Draft	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
SFB Pellets	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
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	1
CHWE-M (> 400 kW; ≤ 1500 kW)	1	1	3	3	3	3	3	3	2	2	2	2
CHWE-L (> 1500 kW)	1	1	2	2	2	2	2	2	2	2	2	1
CHF	0.05	0	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	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	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	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	

ELECBAU

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	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	7	
LH Electric sum			193	179	168	152	134	122	115	110	105	100	
LH Gaseous fuel sum			0										
LH Liquid fuel sum			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	
1 CIRC Large standalone circulators		1	8	12	11	10	9	8	7	6	6	6	
1 CIRC Small standalone circulators		1	6	9	8	7	7	6	5	5	5	4	
1 CIRC Circulator pumps <2.5 kW		1	27	39	38	37	36	35	33	31	30	28	
TOTAL SPACE HEATING			264	319	319	306	297	291	292	295	300	304	
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	
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	

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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
<i>ES & DS, without effects on infrastructure</i>												
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 blade 1-socket traditional		1		0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
ES blade 2-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 cloud		1	0.5	5.9	3.0	1.9	2.3	2.7	2.9	2.9	2.9	2.9
ES blade 4-socket traditional		1		3.3	5.0	6.1	7.1	8.5	9.2	9.2	9.2	9.2
ES blade 4-socket cloud		1	0.1	0.7	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4
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	22	21	

ELECBAU

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
	<i>of which for modes under CR 1275/2008</i>		14	8	9	9	8	8	8	7	7	7
	<i>Products regulated only for (networked) standby</i>											
	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
	<i>Products regulated also for (networked) standby</i>											
	<i>(already accounted elsewhere; here for info only)</i>											
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	<i>EPS Active mode (electricity losses)</i>											
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	<i>EPS No-load mode</i>											
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
	Total RF household Refrigerators & Freezers	1	112	113	115	116	117	117	117	116	116	116

ELECBAU

db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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		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		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	5	5	5	6	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		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		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		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	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
	VC dom	1	8	14	19	20	29	30	31	31	30	29
	VC nondom	1	3	4	5	5	6	6	7	7	7	7
	Total VC Vacuum Cleaner		11	18	23	25	34	36	38	38	36	36
	TOTAL CLEANING		79	97	104	105	115	118	119	119	119	117

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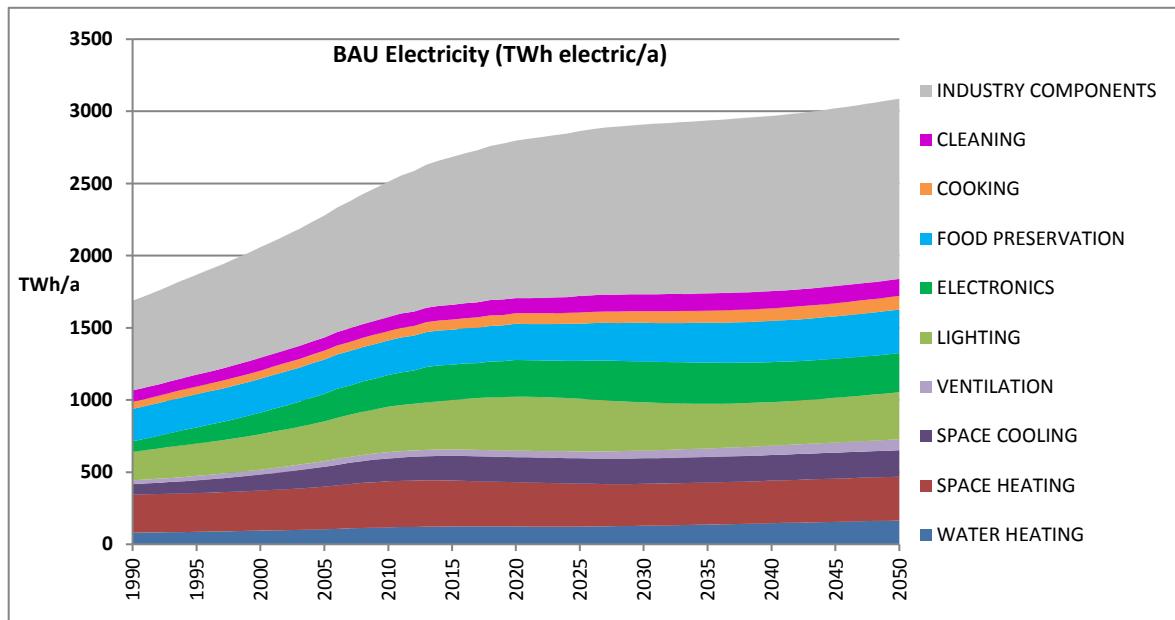
db	BAU Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	55	62	68	72	73	73	73	73
0.5	FAN Axial>300Pa	1	28	85	98	104	109	112	113	113	113	113
0.5	FAN Centr.FC	1	7	15	18	21	23	24	24	24	24	24
0.5	FAN Centr.BC-free	1	18	39	47	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
	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
	Total 3-ph 0.75-375 kW with VSD		52	128	160	198	237	280	328	383	440	490
	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
	Total Small 1-ph 0.12-0.75 kW		7	10	11	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
	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
	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
	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
	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
	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
	Total WP Water Pumps	1	79	106	115	124	134	144	154	164	174	184
	CP Fixed Speed 5-1280 l/s	1	21	44	37	32	32	33	33	34	35	36
	CP Variable speed 5-1280 l/s	1	0	8	14	18	20	21	21	22	22	23
	CP Pistons 2-64 l/s	1	1	1	1	1	1	1	1	1	1	1
	Total CP Standard Air Compressors		22	53	53	52	53	55	56	58	59	60
	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		622	936	1022	1090	1141	1175	1196	1213	1229	1249
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	8	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))		0									
	(not final energy: distribution losses)											
	TOTAL TRANSPORT SECTOR		0									
	BAU Electricity, Total excl. Energy Sector, in TWh		1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
	BAU Electricity, Total excl. Energy Sector, in PJ		6079	9042	9657	10071	10309	10471	10570	10686	10872	11116
	BAU Electricity, Total excl. Energy Sector, in mtoe		145	216	231	241	246	250	252	255	260	266

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BAU Electricity Summary, TWh	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	80	117	123	123	123	128	136	146	155	165
SPACE HEATING	264	319	319	306	297	291	292	295	300	304
SPACE COOLING	73	160	171	174	176	177	177	178	180	183
VENTILATION	26	43	44	45	48	53	59	65	70	76
<i>Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)</i>	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	79	97	104	105	115	118	119	119	119	117
INDUSTRY COMPONENTS	622	936	1022	1090	1141	1175	1196	1213	1229	1249
ENERGY SECTOR (see separate below)	0									
TRANSPORT SECTOR	0									
BAU Electricity, Total excl. Energy Sector, in TWh	1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
BAU Electricity, Total excl. Energy Sector, in PJ	6079	9042	9657	10071	10309	10471	10570	10686	10872	11116
BAU Electricity, Total excl. Energy Sector, in mtoe	145	216	231	241	246	250	252	255	260	266

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									
BAU Electricity, Total incl. Energy Sector, in TWh	1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
BAU Electricity, Total incl. Energy Sector, in PJ	6079	9042	9657	10071	10309	10471	10570	10686	10872	11116



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	4	4	4	4	4	4	4	5	5
SPACE HEATING	13	17	17	16	15	14	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	0	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	440	645	697	741	771	788	799	806	813	822
BAU Electricity, Industry, in TWh	524	791	858	916	955	977	991	1004	1019	1037
BAU Electricity, Industry, in PJ	1886	2846	3088	3296	3438	3519	3569	3614	3668	3734
BAU Electricity, Industry, in mtoe	45	68	74	79	82	84	85	86	88	89

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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	24	35	37	36	36	38	40	43	46	48
SPACE HEATING	81	113	116	114	111	110	109	109	110	110
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	5	7	8	8	9	9	10	10	10	11
INDUSTRY COMPONENTS	151	250	279	301	319	332	340	346	353	360
BAU Electricity, Services, in TWh	562	894	963	1023	1064	1084	1090	1102	1125	1156
BAU Electricity, Services, in PJ	2022	3220	3467	3684	3831	3902	3925	3967	4049	4161
BAU Electricity, Services, in mtOE	48	77	83	88	91	93	94	95	97	99
BAU Electricity (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	53	78	82	82	82	85	91	97	103	110
SPACE HEATING	168	186	184	175	168	165	167	170	174	178
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	74	89	95	96	105	108	109	108	107	105
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Electricity, Residential, in TWh	559	763	793	786	768	767	770	774	785	799
BAU Electricity, Residential, in PJ	2013	2746	2856	2829	2763	2760	2773	2788	2824	2875
BAU Electricity, Residential, in mtOE	48	66	68	68	66	66	67	67	67	69
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	2	2
SPACE HEATING	2	3	3	3	3	2	2	2	2	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	30	42	45	48	51	54	58	61	64	67
BAU Electricity, Other sectors, in TWh	44	64	68	73	77	81	84	88	92	96
BAU Electricity, Other sectors, in PJ	158	230	246	263	277	290	303	317	331	346
BAU Electricity, Other sectors, in mtOE	4	5	6	6	7	7	7	8	8	8

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BAU Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	80	117	123	123	123	128	136	146	155	165
Residential		53	78	82	82	82	85	91	97	103	110
Tertiary / Services		24	35	37	36	36	38	40	43	46	48
Industry		2	4	4	4	4	4	4	4	5	5
Other		1	1	1	1	1	1	1	1	2	2
SPACE HEATING.	All sectors, TWh	264	319	319	306	297	291	292	295	300	304
Residential		168	186	184	175	168	165	167	170	174	178
Tertiary / Services		81	113	116	114	111	110	109	109	110	110
Industry		13	17	17	16	15	14	14	14	14	14
Other		2	3	3	3	3	2	2	2	2	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	3	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	79	97	104	105	115	118	119	119	119	117
Residential		74	89	95	96	105	108	109	108	107	105
Tertiary / Services		5	7	8	8	9	9	10	10	10	11
Industry		0	0	1	1	1	1	1	1	1	1
Other		0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	622	936	1022	1090	1141	1175	1196	1213	1229	1249
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		151	250	279	301	319	332	340	346	353	360
Industry		440	645	697	741	771	788	799	806	813	822
Other		30	42	45	48	51	54	58	61	64	67
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	1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
Residential		559	763	793	786	768	767	770	774	785	799
Tertiary / Services		562	894	963	1023	1064	1084	1090	1102	1125	1156
Industry		524	791	858	916	955	977	991	1004	1019	1037
Other		44	64	68	73	77	81	84	88	92	96
Transport		0	0	0	0	0	0	0	0	0	0

ELECBAU

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%	30%	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%	35%	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		93%	92%	92%	91%	92%	91%	91%	91%	90%	90%
Tertiary / Services		6%	7%	7%	8%	8%	8%	8%	8%	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		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tertiary / Services		24%	27%	27%	28%	28%	28%	28%	29%	29%	29%
Industry		71%	69%	68%	68%	68%	67%	67%	66%	66%	66%
Other		5%	4%	4%	4%	4%	5%	5%	5%	5%	5%
TYRES.											
Residential transport											
Tertiary / Services transport											
Industry transport											
Other transport											
ALL PRODUCTS.											
Residential		33%	30%	30%	28%	27%	26%	26%	26%	26%	26%
Tertiary / Services		33%	36%	36%	37%	37%	37%	37%	37%	37%	37%
Industry		31%	31%	32%	33%	33%	34%	34%	34%	34%	34%
Other		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Transport		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

ELECECO

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	0	1	1	1	1	1	1	1
	EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	7	7	6	5	5	6	6	7	7
	EIWS Electric Instant. Shower (secondary)	1.00	8	12	12	11	10	10	10	11	11	12
	ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	8	8	8	8	8	8	9	9	10
	ESWH Electric Storage > 30 L (primary)	1.00	53	75	77	73	68	69	73	77	82	87
	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 m ²)	0.80	1	5	6	6	5	5	5	5	5	5
	WH dedicated Water Heater		75	108	111	105	99	100	107	114	122	129
	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 m ²)	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		80	117	121	116	111	114	124	136	147	158
	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 m ²)	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

ELECECO

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									
	LH Liquid fuel sum		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
1	CIRC Large standalone circulators	1	8	12	10	7	6	5	5	5	5	5
1	CIRC Small standalone circulators	1	6	9	7	4	3	3	3	3	3	3
1	CIRC Circulator pumps <2.5 kW		27	39	33	24	21	21	21	20	20	20
	TOTAL SPACE HEATING		264	312	304	281	265	261	273	289	305	318
	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	<i>Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)</i>		-	-	-1	-3	-6	-9	-12	-13	-14	-15
	<i>LS, electricity incl. control gear</i>											
	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
	<i>Standby (estimate)</i>	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

ELECECO

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
<i>ES&DS only, without effects on infrastructure</i>												
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	22	21	21

ELECECO

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
	<i>Products regulated only for (networked) standby</i>											
	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
	<i>Products regulated also for (networked) standby</i>											
	(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	0.6	0.6	0.7	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	<i>EPS Active mode (electricity losses)</i>											
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	<i>EPS No-load mode</i>											
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
	Total RF household Refrigerators & Freezers	1	112	85	71	61	51	42	35	31	29	27

ELECECO

db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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		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		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	3	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		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		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	0.6	0.6	0.6	0.7	0.7
	Total DW household Dishwasher		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	7
	LD Laundry Dryers, low-power modes	1	0.0	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer		8	16	14	11	9	9	8	7	7	7
	VC dom	1	8	14	15	8	10	9	8	7	6	5
	VC nondom	1	3	4	4	4	3	4	4	4	4	4
	Total VC Vacuum Cleaner		11	18	19	12	14	13	12	11	10	9
	TOTAL CLEANING		79	85	80	68	67	66	65	65	65	65

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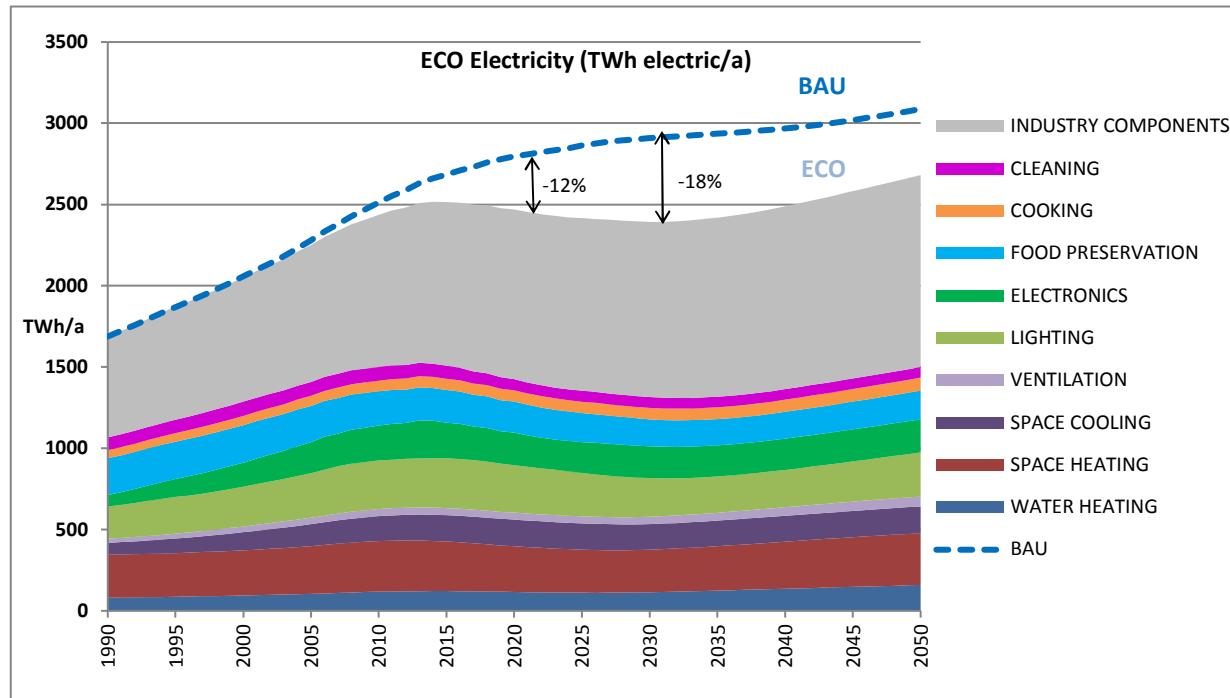
db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	1	16	46	53	55	57	58	58	58	58	58
0.5	FAN Axial>300Pa	1	28	85	96	98	97	96	95	95	95	95
0.5	FAN Centr.FC	1	7	15	18	18	17	17	17	17	17	17
0.5	FAN Centr.BC-free	1	18	39	45	47	49	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
	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
	Total 3-ph 0.75-375 kW with VSD		52	128	173	257	337	388	416	443	471	495
	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
	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
	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
	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
	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
	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
	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
	Total WP Water Pumps		1	79	106	114	121	130	140	149	159	169
	CP Fixed Speed 5-1280 l/s	1	21	44	37	32	31	32	33	34	34	35
	CP Variable speed 5-1280 l/s	1	0	8	14	18	20	20	21	21	22	22
	CP Pistons 2-64 l/s	1	1	1	1	1	1	1	1	1	1	1
	Total CP Standard Air Compressors		22	53	52	51	52	53	55	56	58	59
	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		622	935	1008	1044	1062	1079	1101	1126	1152	1181
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	6	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

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db	ECO Electricity (in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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	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	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	0
	Tyres, total C1+C2+C3	0	0	0	0	0	0	0	0	0	0	0
	TOTAL TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	0
	ECO Electricity, Total excl. Energy Sector, in TWh		1689	2436	2515	2469	2416	2394	2419	2489	2581	2680
	ECO Electricity, Total excl. Energy Sector, in PJ		6079	8770	9054	8889	8697	8618	8708	8962	9293	9648
	ECO Electricity, Total excl. Energy Sector, in mtoe		145	209	216	212	208	206	208	214	222	230
	ECO Electricity Summary, TWh		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING		80	117	121	116	111	114	124	136	147	158
	SPACE HEATING		264	312	304	281	265	261	273	289	305	318
	SPACE COOLING		73	153	162	164	161	158	157	159	162	165
	VENTILATION		26	43	44	43	43	45	49	53	57	61
1	<i>Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)</i>		<i>0</i>	<i>0</i>	<i>-1</i>	<i>-3</i>	<i>-6</i>	<i>-9</i>	<i>-12</i>	<i>-13</i>	<i>-14</i>	<i>-15</i>
	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		79	85	80	68	67	66	65	65	65	65
	INDUSTRY COMPONENTS		622	935	1008	1044	1062	1079	1101	1126	1152	1181
	ENERGY SECTOR (see separate below)		0									
	TRANSPORT SECTOR		0									
	ECO Electricity, Total excl. Energy Sector, in TWh		1689	2436	2515	2469	2416	2394	2419	2489	2581	2680
	ECO Electricity, Total excl. Energy Sector, in PJ		6079	8770	9054	8889	8697	8618	8708	8962	9293	9648
	ECO Electricity, Total excl. Energy Sector, in mtoe		145	209	216	212	208	206	208	214	222	230
	For comparison: Eurostat Energy Balance ed. Feb. 2021, Final Electricity EU27 (2020) (in mtoe)		162	216	211							

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	1689	2436	2513	2464	2405	2377	2395	2457	2541	2630
ECO Electricity, Total incl. Energy Sector, in PJ	6079	8770	9048	8869	8659	8557	8620	8844	9146	9469
ECO Electricity, Total incl. Energy Sector, in mtoe	145	209	216	212	207	204	206	211	218	226



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

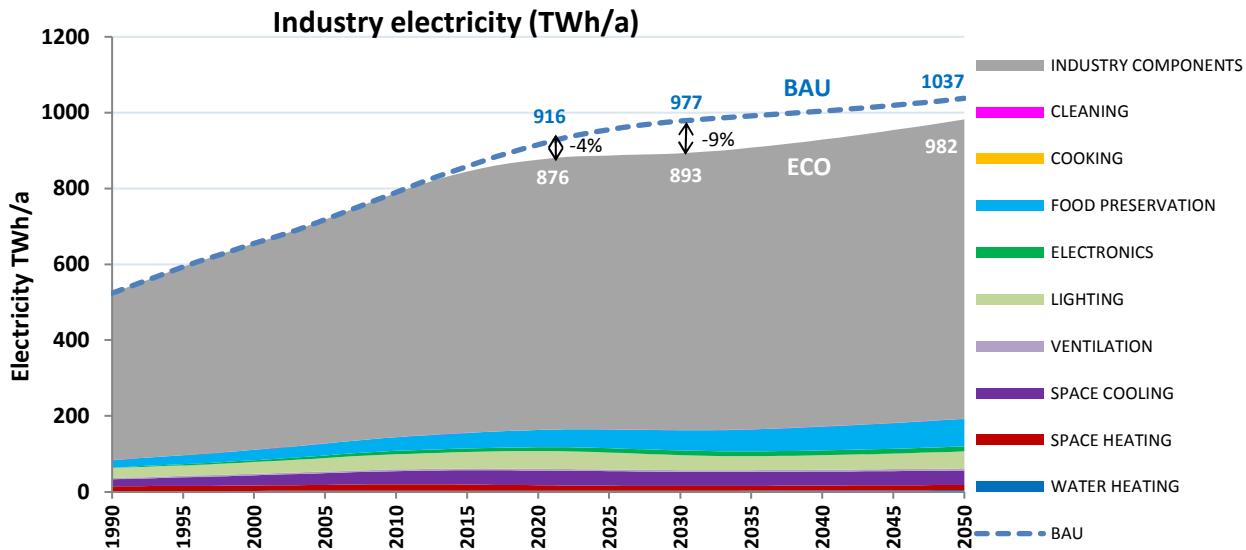
Lighting: includes energy consumption by control gears and estimate for standby

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	4	4	3	3	3	4	4	4	5
SPACE HEATING	13	17	16	14	13	12	12	13	13	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	0	1	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	440	644	689	713	723	731	743	757	773	790
ECO Electricity, Industry, in TWh	524	788	845	876	887	893	908	929	954	982
ECO Electricity, Industry, in PJ	1886	2838	3041	3155	3194	3215	3268	3344	3435	3535
ECO Electricity, Industry, in mtoe	45	68	73	75	76	77	78	80	82	84
For comparison: Eurostat Energy Balance ed. Feb. 2021, Final	77	80	79							
Electricity EU27 (2020) Industry (in mtoe)										

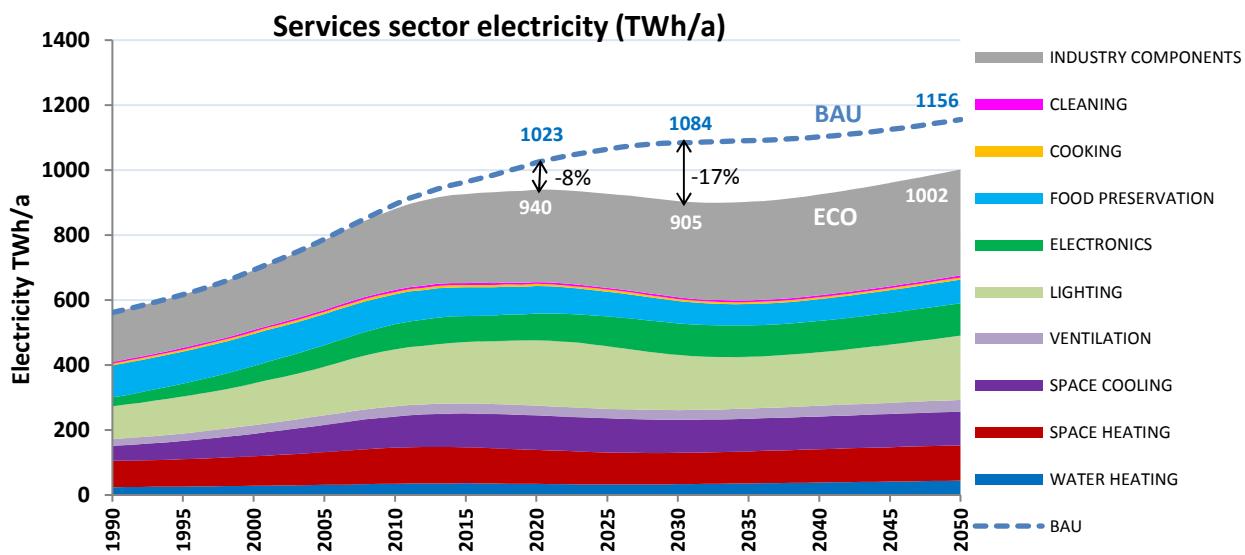
-4% -9%



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

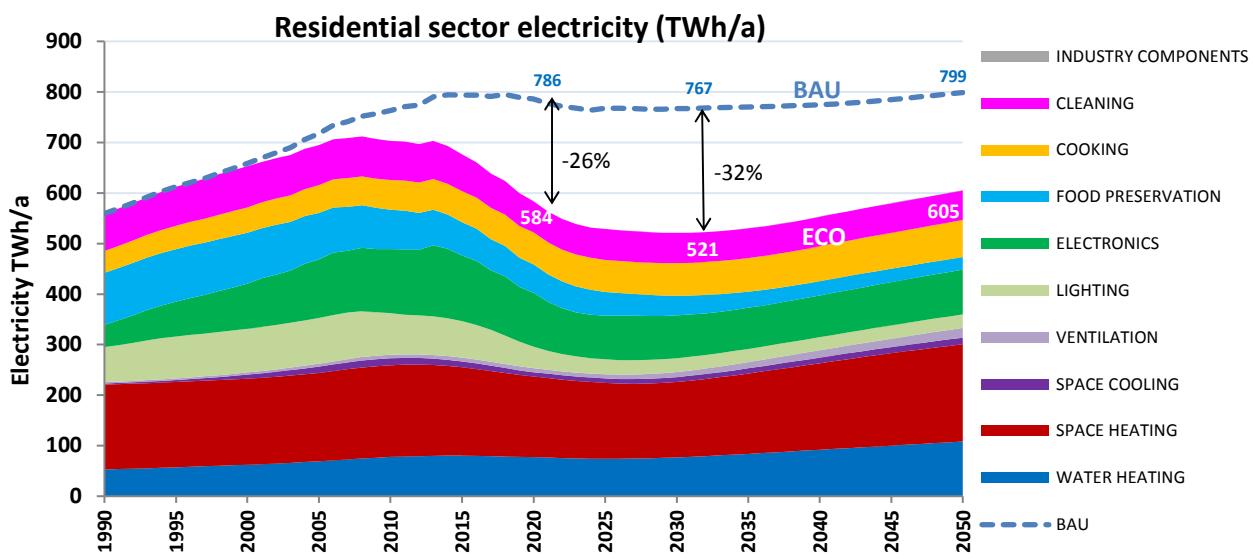
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ECO Electricity (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	24	35	36	34	32	33	36	38	41	44
SPACE HEATING	81	111	111	105	99	97	99	102	106	108
SPACE COOLING	47	96	104	106	105	102	100	101	102	104
VENTILATION	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	5	6	6	6	6	6	6	6	6	6
INDUSTRY COMPONENTS	151	250	274	284	290	296	303	310	318	326
ECO Electricity, Services, in TWh	562	881	927	940	928	905	902	925	961	1002
ECO Electricity, Services, in PJ	2022	3172	3336	3385	3340	3258	3249	3330	3459	3607
ECO Electricity, Services, in mtoe	48	76	80	81	80	78	78	80	83	86
For comparison: Eurostat Energy Balance ed. Feb. 2021, Final Electricity EU27 (2020) Services (in mtoe)	32	64	63							



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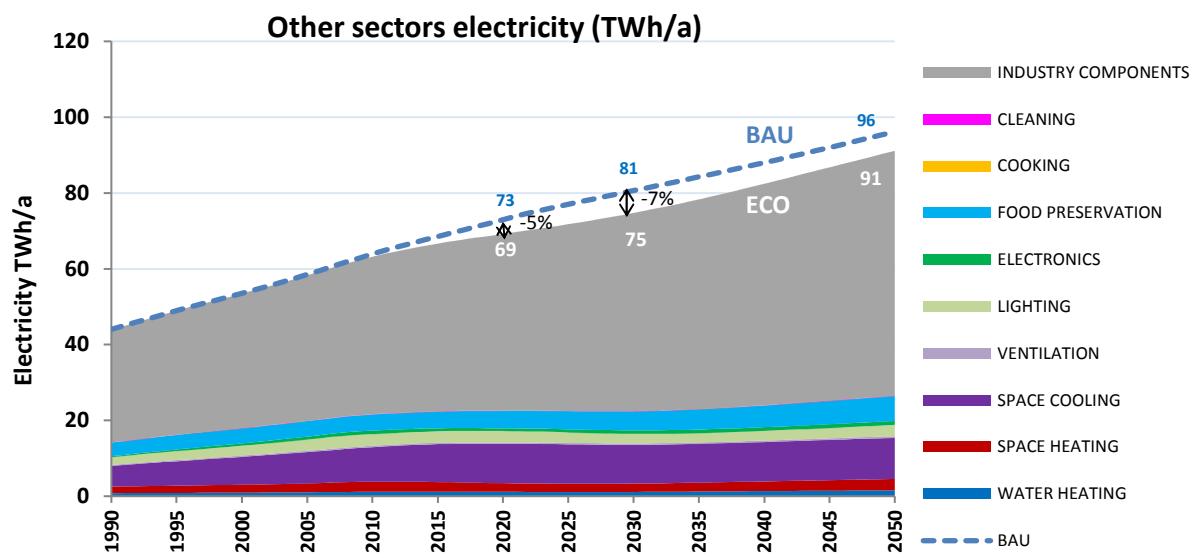
-26% -32%



(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	2
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	30	42	44	47	49	52	55	58	62	65
ECO Electricity, Other sectors, in TWh	44	63	67	69	72	75	78	82	87	91
ECO Electricity, Other sectors, in PJ	158	227	240	249	258	269	282	297	312	328
ECO Electricity, Other sectors, in mtoe	4	5	6	6	6	6	7	7	7	8
For comparison: Eurostat Energy Balance ed. Feb. 2021, Final Electricity EU27 (2020) Other (in mtoe)	4	4	4							

-5% -7%



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ECO Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	80	117	121	116	111	114	124	136	147	158
Residential		53	78	80	77	74	77	84	92	100	108
Tertiary / Services		24	35	36	34	32	33	36	38	41	44
Industry		2	4	4	3	3	3	4	4	4	5
Other		1	1	1	1	1	1	1	1	1	2
SPACE HEATING.	All sectors, TWh	264	312	304	281	265	261	273	289	305	318
Residential		168	182	175	160	150	149	159	171	183	192
Tertiary / Services		81	111	111	105	99	97	99	102	106	108
Industry		13	17	16	14	13	12	12	13	13	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	79	85	80	68	67	66	65	65	65	65
Residential		74	78	73	62	61	60	59	58	58	58
Tertiary / Services		5	6	6	6	6	6	6	6	6	6
Industry		0	0	1	0	0	0	0	0	0	0
Other		0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	622	935	1008	1044	1062	1079	1101	1126	1152	1181
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		151	250	274	284	290	296	303	310	318	326
Industry		440	644	689	713	723	731	743	757	773	790
Other		30	42	44	47	49	52	55	58	62	65
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	1689	2436	2515	2469	2416	2394	2419	2489	2581	2680
Residential		559	703	677	584	529	521	530	553	580	605
Tertiary / Services		562	881	927	940	928	905	902	925	961	1002
Industry		524	788	845	876	887	893	908	929	954	982
Other		44	63	67	69	72	75	78	82	87	91
Transport		0	0	0	0	0	0	0	0	0	0

ELECECO

ECO Electricity (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
Residential		66%	66%	66%	67%	67%	67%	67%	68%	68%	68%
Tertiary / Services		30%	30%	30%	29%	29%	29%	29%	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%	36%	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		93%	92%	91%	91%	91%	91%	90%	90%	90%	90%
Tertiary / Services		6%	8%	8%	8%	8%	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		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tertiary / Services		24%	27%	27%	27%	27%	27%	28%	28%	28%	28%
Industry		71%	69%	68%	68%	68%	68%	67%	67%	67%	67%
Other		5%	4%	4%	4%	5%	5%	5%	5%	5%	5%
TYRES.											
Residential transport											
Tertiary / Services transport											
Industry transport											
Other transport											
ALL PRODUCTS.											
Residential		33%	29%	27%	24%	22%	22%	22%	22%	22%	23%
Tertiary / Services		33%	36%	37%	38%	38%	38%	37%	37%	37%	37%
Industry		31%	32%	34%	35%	37%	37%	38%	37%	37%	37%
Other		3%	3%	3%	3%	3%	3%	3%	3%	3%	3%
Transport		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

ELECSAVE

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	0.1	0.1	0.1	0.1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0.0	0.0	0.2	0.6	1.0	1.3	1.5	1.6	1.7	1.8	
EIWHS Electric Instant. Shower (secondary)	1.00	0.0	0.0	0.6	1.6	2.4	2.8	2.9	3.0	3.1	3.2	
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	0.0
ESWH Electric Storage > 30 L (primary)	1.00	0.0	0.0	0.6	3.3	5.8	7.8	8.0	8.1	8.3	8.3	
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	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	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	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	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 m ²)	0.80	0.0	0.0	0.2	0.5	0.8	1.0	1.0	1.0	0.9	0.9	0.9
WH dedicated Water Heater		0	0	2	7	12	16	17	18	19	20	
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 m ²)	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	7	12	14	12	10	8	6	
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	0	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 m ²)	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	0.1	0.2	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	

ELECSAVE

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						
LH Liquid fuel sum			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
¹ 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
¹ 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
¹ CIRC Circulator pumps <2.5 kW		1	0	0	5	13	15	14	12	11	9	8
TOTAL SPACE HEATING			0	7	15	26	33	31	20	6	-5	-13
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	⁻	¹	³	⁶	⁹	¹²	¹³	¹⁴	¹⁵
<i>LS, incl. control gear (BAU-ECO)</i>												
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
CFLni (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
<i>Standby (estimate)</i>		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

ELECSAVE

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									
	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
	<i>ES&DS only, without effects on infrastructure</i>											
	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									

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
	<i>Products regulated only for (networked) standby</i>											
	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
	<i>Products regulated also for (networked) standby</i>											
	(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	<i>EPS Active mode (for electricity losses)</i>											
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	<i>EPS No-load mode</i>											
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

ELECSAVE

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	0.3	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	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	
	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	
	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	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	0.0		
	LD Laundry Dryers, sum active modes			0.0	0.0	0.9	2.8	4.7	5.7	6.3	6.5	6.1	
	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	
	Total LD household Laundry Dryer			0.0	0.0	1.0	3.0	4.9	6.0	6.6	6.8	6.4	
	VC dom	1	0	0	3.6	11.4	18.1	20.9	23.0	24.0	24.2	23.6	
	VC nondom	1	0	0	0.5	1.8	2.4	2.6	2.8	3.0	3.3	3.5	
	Total VC Vacuum Cleaner		0	0	4	13	20	23	26	27	27	27	
	TOTAL CLEANING		0	12	24	38	48	52	54	54	54	52	

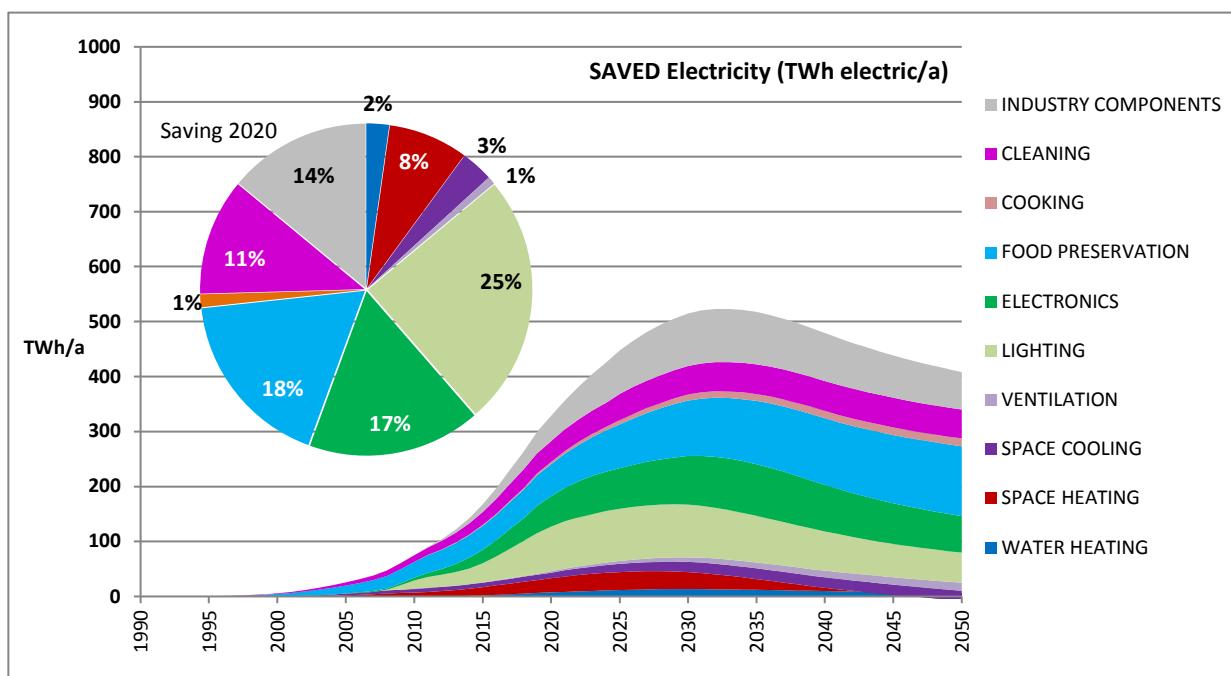
db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
0.5	FAN Axial<300Pa (all FAN types >125W)	1	0	0	2.1	6.3	11.2	14.2	15.2	15.2	15.2	15.2	
0.5	FAN Axial>300Pa	1	0	0	1.9	6.6	12.4	16.3	17.8	17.8	17.8	17.8	
0.5	FAN Centr.FC	1	0	0	0.7	2.8	5.1	6.7	7.1	7.1	7.1	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	
	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	
	Total 3-ph 0.75-375 kW with VSD		0	0	-12	-59	-99	-107	-88	-60	-30	-4	
	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	
	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	
	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	
	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	
	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	
	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	
	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	
	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 including double counted amounts		0	0	8	28	49	59	55	46	36	25	
	Total WP Water Pumps		1	0	0	1	3	4	4	5	5	5	
	CP Fixed Speed 5-1280 l/s	1	0	0	0.1	0.6	0.9	1.0	0.9	0.8	0.8	0.7	
	CP Variable speed 5-1280 l/s	1	0	0	0.0	0.2	0.4	0.5	0.4	0.3	0.2	0.1	
	CP Pistons 2-64 l/s	1	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
	Total CP Standard Air Compressors		0	0	0.2	0.8	1.4	1.5	1.4	1.2	1.0	0.8	
	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	46	79	96	95	87	77	68	
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	

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db	SAVED Electricity (BAU-ECO, in TWh elec)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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	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	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	0
	Tyres, total C1+C2+C3	0	0	0	0	0	0	0	0	0	0	0
	TOTAL TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	0
	SAVED Electricity, Total excl. Energy Sector, in TWh	0	76	168	328	448	515	517	479	438	408	
	SAVED Electricity, Total excl. Energy Sector, in PJ	0	272	604	1182	1612	1853	1862	1724	1578	1468	
	SAVED Electricity, Total excl. Energy Sector, in mtoe	0	6	14	28	39	44	44	41	38	35	
db	SAVED Electricity (BAU-ECO, summary in TWh elec)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	0	0	2	7	12	14	12	10	8	6	
	SPACE HEATING	0	7	15	26	33	31	20	6	-5	-13	
	SPACE COOLING	0	7	8	10	15	19	20	19	18	18	
	VENTILATION	0	0	1	2	5	8	11	12	13	15	
1	<i>Impact vs. BAU of VU on SH electricity (already accounted under Space Heating)</i>	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	24	38	48	52	54	54	54	52	
	INDUSTRY COMPONENTS	0	0	14	46	79	96	95	87	77	68	
	ENERGY SECTOR (see separate below)	0	0	0	0	0	0	0	0	0	0	
	TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	
	SAVED Electricity, Total excl. Energy Sector, in TWh	0	76	168	328	448	515	517	479	438	408	
	SAVED Electricity, Total excl. Energy Sector, in PJ	0	272	604	1182	1612	1853	1862	1724	1578	1468	
	SAVED Electricity, Total excl. Energy Sector, in mtoe	0	6	14	28	39	44	44	41	38	35	

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	76	169	334	459	532	542	512	479	458
SAVED Electricity, Total incl. Energy Sector, in PJ	0	272	609	1202	1651	1914	1950	1842	1726	1648
SAVED Electricity, Total incl. Energy Sector, in mtoe	0	6	15	29	39	46	47	44	41	39
trafo ELEC save / total Eco ELEC	0.00%	0.00%	0.06%	0.23%	0.44%	0.70%	1.01%	1.32%	1.59%	1.86%
Saving in % versus BAU (from 1990=0)	0.0%	3.0%	6.3%	11.7%	15.6%	17.7%	17.6%	16.1%	14.5%	13.2%
Saving In % versus BAU (from 2010=0)	-4.5%	0.0%	3.4%	9.0%	13.0%	15.1%	15.0%	13.6%	12.0%	10.8%



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	1	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	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	8	28	48	58	56	49	40	33
SAVED Electricity, Industry, in TWh	0	2	13	39	68	85	84	75	65	55
SAVED Electricity, Industry, in PJ	0	8	47	141	244	304	301	270	233	199
SAVED Electricity, Industry, in mtoe	0	0	1	3	6	7	7	6	6	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	1	2	4	5	5	4	4	4
SPACE HEATING	0	2	5	9	12	13	11	7	4	1
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	1	3	3	4	4	4	4	4
INDUSTRY COMPONENTS	0	0	5	17	29	36	37	36	35	33
SAVED Electricity, Services, in TWh	0	13	36	83	136	179	188	177	164	154
SAVED Electricity, Services, in PJ	0	47	131	299	491	644	676	637	590	554
SAVED Electricity, Services, in mtoe	0	1	3	7	12	15	16	15	14	13
SAVED Electricity (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	5	7	8	7	5	3	1
SPACE HEATING	0	5	9	15	18	15	8	-1	-9	-14
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	22	35	44	48	50	50	49	47
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Electricity, Residential, in TWh	0	59	117	202	239	245	240	221	205	194
SAVED Electricity, Residential, in PJ	0	214	419	728	859	884	863	797	737	698
SAVED Electricity, Residential, in mtoe	0	5	10	17	21	21	21	19	18	17

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(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	1	1	2	2	2	2	2	2
SAVED Electricity, Other sectors, in TWh	0	1	2	4	5	6	6	6	5	5
SAVED Electricity, Other sectors, in PJ	0	2	6	13	19	21	21	20	19	18
SAVED Electricity, Other sectors, in mtoe	0	0	0	0	0	1	1	0	0	0

ELECSAVE

SAVED Electricity (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	2	7	12	14	12	10	8	6
Residential		0	0	1	5	7	8	7	5	3	1
Tertiary / Services		0	0	1	2	4	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
SPACE HEATING.	All sectors, TWh	0	7	15	26	33	31	20	6	-5	-13
Residential		0	5	9	15	18	15	8	-1	-9	-14
Tertiary / Services		0	2	5	9	12	13	11	7	4	1
Industry		0	0	1	1	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	24	38	48	52	54	54	54	52
Residential		0	12	22	35	44	48	50	50	49	47
Tertiary / Services		0	1	1	3	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
INDUSTRY COMP.	All sectors, TWh	0	0	14	46	79	96	95	87	77	68
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		0	0	5	17	29	36	37	36	35	33
Industry		0	0	8	28	48	58	56	49	40	33
Other		0	0	1	1	2	2	2	2	2	2
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	76	168	328	448	515	517	479	438	408
Residential		0	59	117	202	239	245	240	221	205	194
Tertiary / Services		0	13	36	83	136	179	188	177	164	154
Industry		0	2	13	39	68	85	84	75	65	55
Other		0	1	2	4	5	6	6	6	5	5
Transport		0	0	0	0	0	0	0	0	0	0

ELECSAVE

SAVED Electricity (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
Residential			65%	65%	64%	62%	58%	51%	41%	25%	
Tertiary / Services			31%	31%	32%	34%	38%	45%	55%	71%	
Industry			3%	3%	3%	3%	3%	3%	3%	3%	
Other			1%	1%	1%	1%	1%	1%	1%	1%	
SPACE HEATING.											
Residential			62%	62%	59%	56%	50%	39%	-25%		
Tertiary / Services			32%	33%	35%	38%	43%	54%	114%		
Industry			5%	5%	5%	5%	6%	7%	13%		
Other			1%	1%	1%	1%	1%	0%	-2%		
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%	94%	92%	92%	92%	92%	92%	91%	91%
	Tertiary / Services		4%	5%	7%	7%	7%	7%	7%	8%	9%
	Industry		0%	0%	1%	1%	1%	1%	1%	1%	1%
	Other		0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential		0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services		23%	39%	37%	37%	37%	39%	41%	45%	49%
	Industry		65%	57%	60%	61%	60%	58%	56%	52%	48%
	Other		12%	4%	3%	2%	2%	2%	3%	3%	3%
TYRES.											
	Residential transport										
	Tertiary / Services transport										
	Industry transport										
	Other transport										
ALL PRODUCTS.											
	Residential		79%	69%	62%	53%	48%	46%	46%	47%	48%
	Tertiary / Services		17%	22%	25%	30%	35%	36%	37%	37%	38%
	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%

FUELBAU

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 m ²)	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 m ²)	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 m ²)	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

FUELBAU

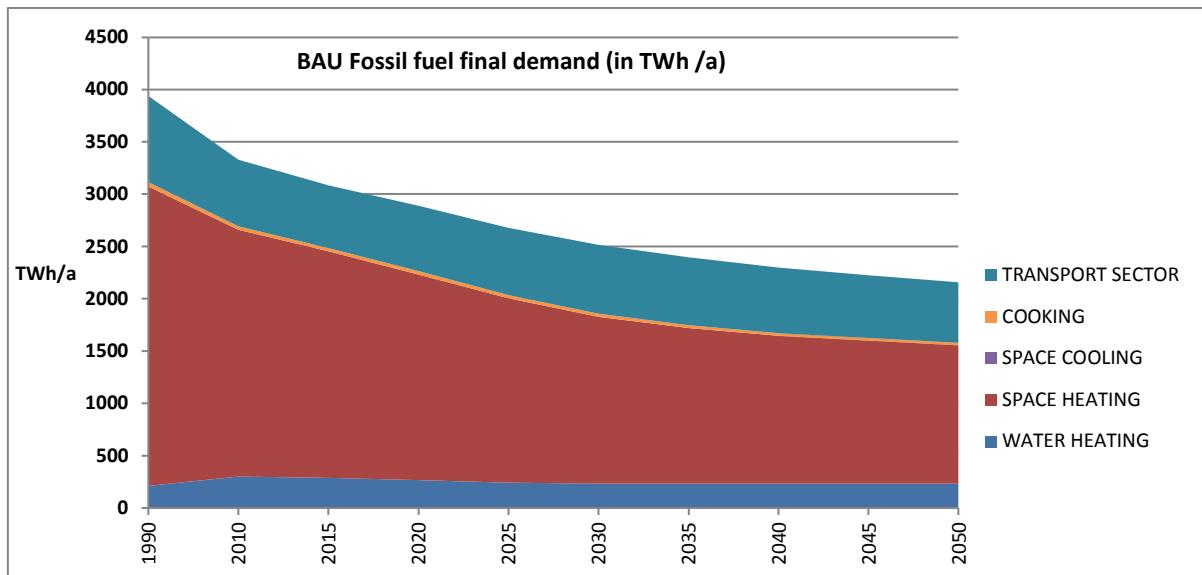
db	BAU Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0	14	18	19	20	20	20	20	20	20	20	20
LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60	60
LH wood stove	0	38	37	37	37	37	38	38	37	36	36	36
LH coal stove	0	23	13	11	10	9	8	6	5	4	3	3
LH cooker	0	7	11	12	14	15	15	15	15	15	15	14
LH SHR stove	0	16	21	22	24	27	29	32	33	34	34	34
LH pellet stove	0	0	8	11	14	16	17	17	17	17	17	17
LH Solid fuel sum		117	148	161	173	184	190	192	191	188	184	184
LH Electric sum		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	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	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	0.5	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	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	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	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	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	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	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	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	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	0
RAC < 12 kW total, heating mode		0	0	0	0	0	0	0	0	0	0	0
RAC Room Air Conditioner		0	0	0	0	0	0	0	0	0	0	0
1 CIRC Circulator pumps <2.5 kW	1	0	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)		-	-	-	-	-	-	-	-	-	-	-
<i>Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)</i>		-	-	-	-	-	-	-	-	-	-	-
TOTAL LIGHTING		0	0	0	0	0	0	0	0	0	0	0
TOTAL ELECTRONICS		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 (sum all modes)	1	0	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	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	6
CA Range Hoods	1	0	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	0
Total DW household Dishwasher	1	0	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	0.0
Total VC Vacuum Cleaner		0	0	0	0	0	0	0	0	0	0	0
TOTAL CLEANING		0	-	-	-	-						
TOTAL INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0	0
TOTAL ENERGY SECTOR (BAU taken as reference =0) (not final energy: distribution losses)		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	9639.2	9057.2	8621.4	8268.2	8012.1	7767.4	
BAU Final Fuel, Total excl. Energy Sector, in mtoe		339	286	265	248	230	216	206	197	191	186	

FUELBAU

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	<i>Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)</i>		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



FUELBAU

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

FUELBAU

(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

FUELBAU

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

FUELBAU

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%
	Tertiary / Services	88%	88%	88%	88%	88%	88%	88%	88%	88%
	Industry	7%	7%	7%	7%	7%	7%	7%	7%	7%
	Other	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%
	Tertiary / Services	17%	17%	18%	18%	18%	18%	18%	18%	18%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	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%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	20%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.										
	Residential	57%	57%	57%	55%	54%	53%	52%	52%	53%
	Tertiary / Services	16%	18%	18%	17%	16%	16%	16%	15%	15%
	Industry	4%	4%	4%	4%	4%	4%	4%	4%	4%
	Other	2%	2%	2%	2%	2%	1%	1%	1%	1%
	Transport	21%	19%	19%	22%	24%	26%	27%	27%	27%

FUELECO

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	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	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	0
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	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	0
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5	5
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	7	6	5	4	4	4	4	4	4
GSHW Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1	1
GSHW Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	3	3	2
Dedicated WH Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0	0
Dedicated WH Solar (3.5 m ²)	0.80	0	2	3	3	3	2	2	2	2	2	2
WH dedicated Water Heater		46	47	39	28	20	17	16	16	15	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 m ²)	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 m ²)	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	

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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										
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	0.1	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	0	
RAC < 12 kW total, heating mode	0	0	0	0	0	0	0	0	0	0	0	
RAC Room Air Conditioner	0	0	0	0	0	0	0	0	0	0	0	
1 CIRC Circulator pumps <2.5 kW	1	0										
TOTAL SPACE HEATING		2860	2336	2095	1815	1522	1280	1126	1024	953	890	
TOTAL SPACE COOLING		0										
TOTAL VENTILATION (VU own fuel)		-	-	-	-	-	-	-	-	-	-	
<i>Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)</i>	-	-	-	-3	-13	-25	-35	-38	-38	-37	-37	
TOTAL LIGHTING (incl. standby)		0										
TOTAL ELECTRONICS		0										
TOTAL FOOD PRESERVATION		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	-	-	-							
TOTAL INDUSTRY COMPONENTS		0										
TOTAL ENERGY SECTOR (only improvement over BAU) (not final energy: distribution losses)		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 mtce		339	284	254	231	202	180	166	154	146	138	

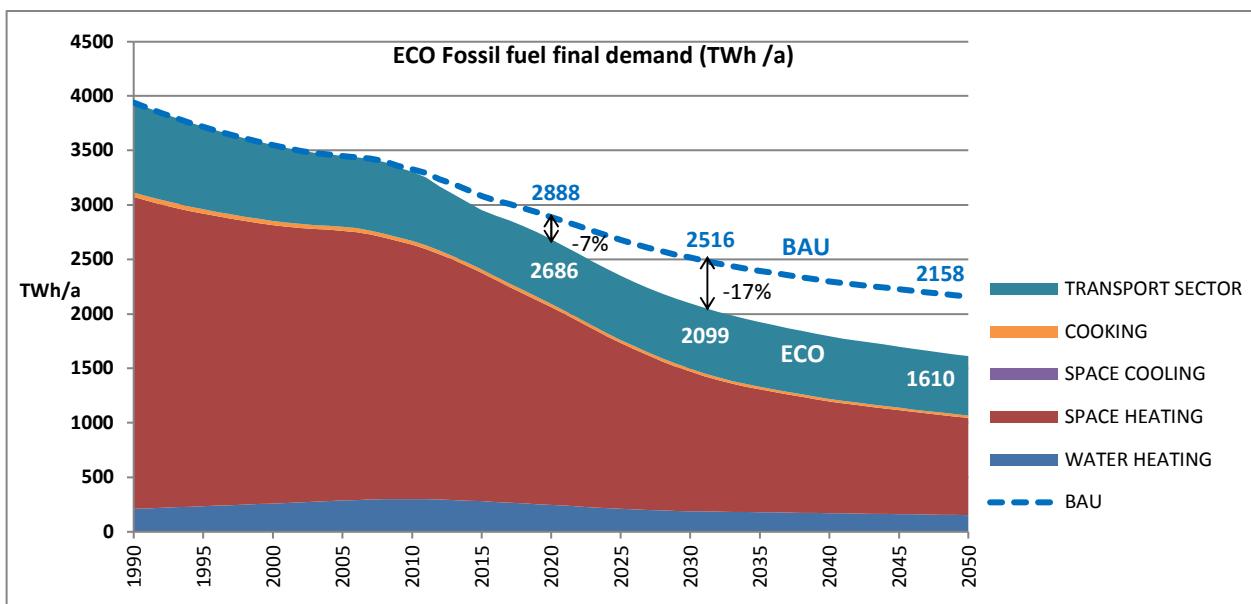
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db	ECO Fuel Summary, TWh	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING		211	301	281	247	211	189	179	171	163	154
	SPACE HEATING		2860	2336	2095	1815	1522	1280	1126	1024	953	890
	SPACE COOLING		0	0	0	0	0	0	0	0	0	0
	VENTILATION		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. Feb. 2021, Final Energy except Electricity (in mtoe for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat		744	757	699							

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

-7% -17%



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

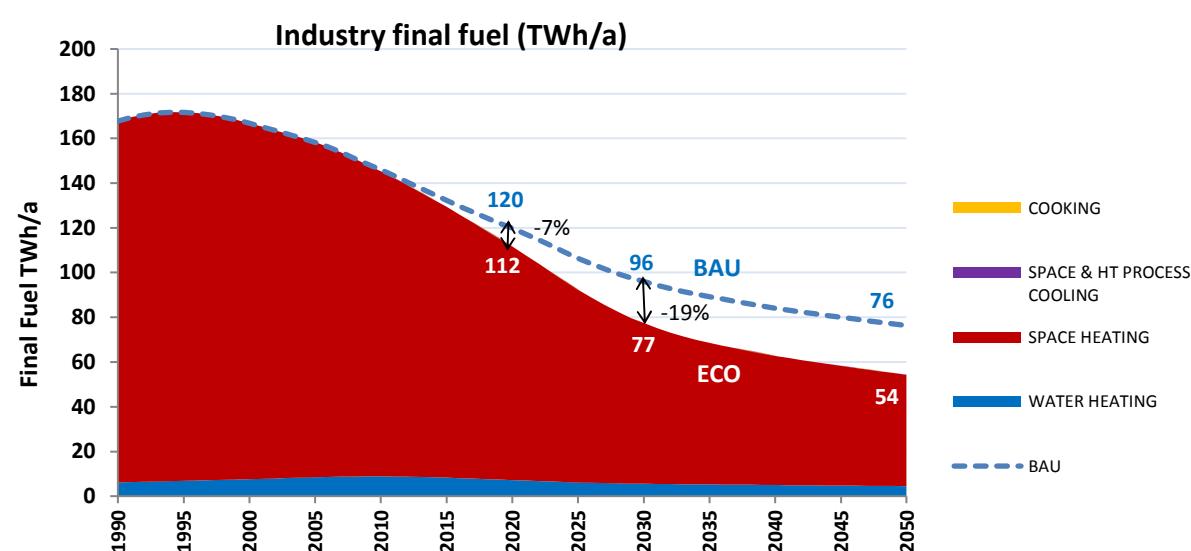
Lighting: includes energy consumption by control gears and estimate for standby

Energy Sector: see separate reporting above; not included in other sector totals

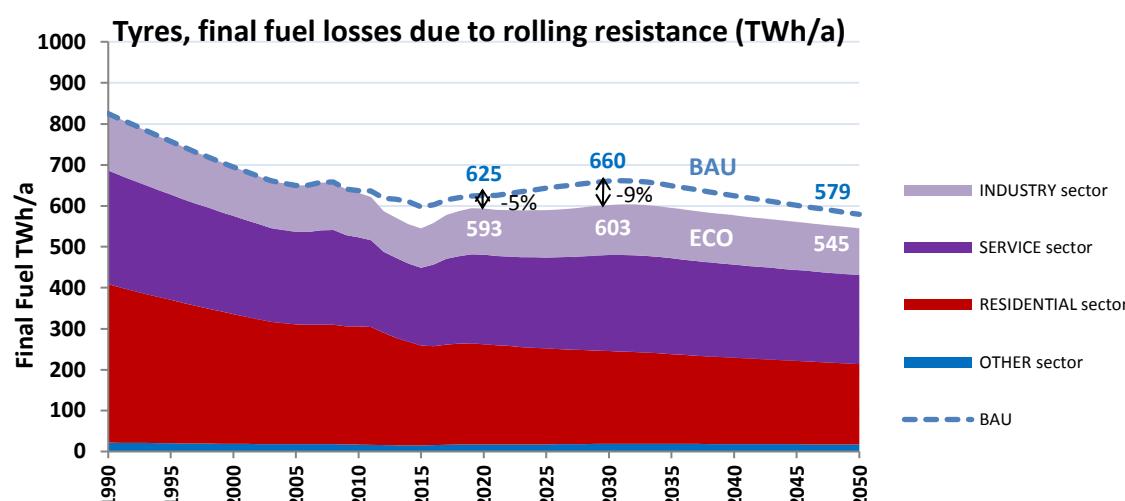
Transport Sector: see separate reporting below; not included in other sector totals

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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. Feb. 2021, Final Energy except Electricity (in mtoe for Industry for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	234	164	155							



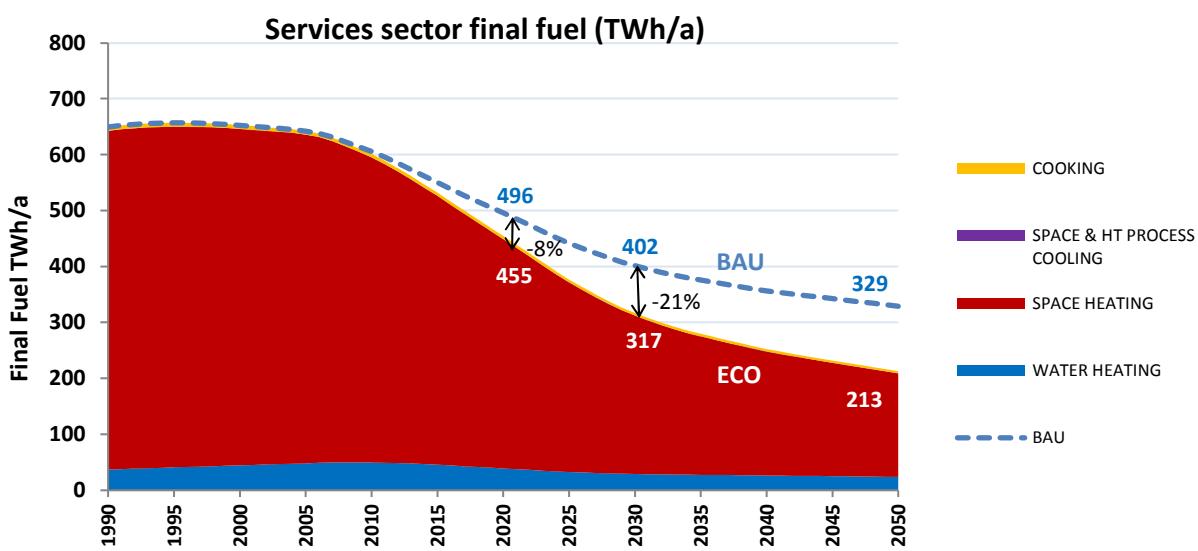
ECO Final Fuel (summary TRANSPORT, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	109	96	112	116	123	123	120	117	114
TYRES for SERVICE-sector-related 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. Feb. 2021, Final Energy except Electricity (in mtoe for Road Transport for EU27 (2020))	202	261	255							



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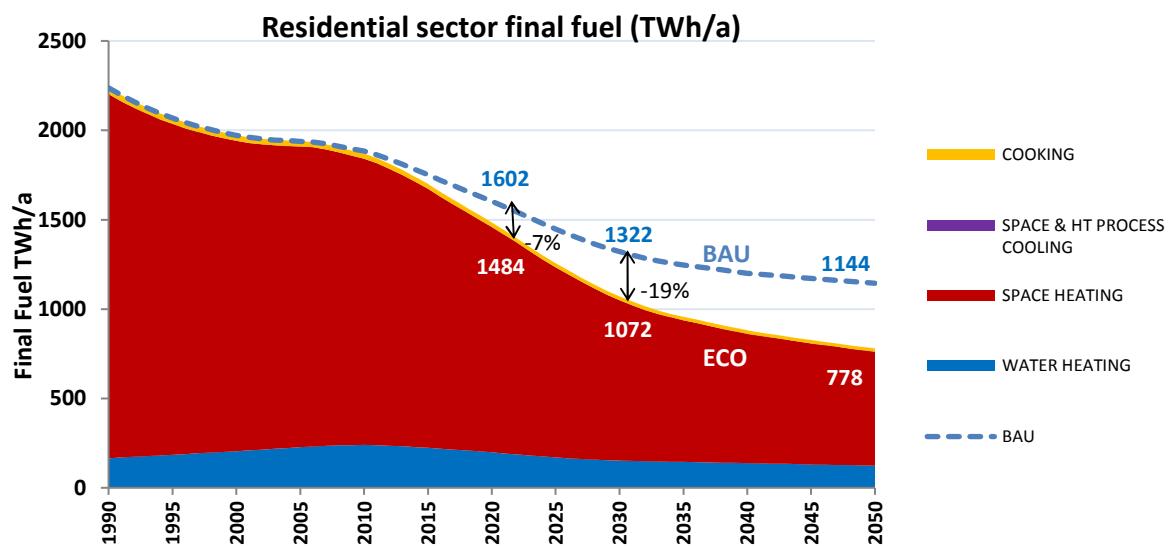
ECO Fuel (summary TERTIARY/SERVICES, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	37	50	45	39	33	29	28	26	25	24
SPACE HEATING	605	545	481	410	339	283	247	221	202	185
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	0	0	0
ELECTRONICS	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. Feb. 2021, Final Energy except Electricity (in mtoe for Services for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	66	76	66							

-8% -21%



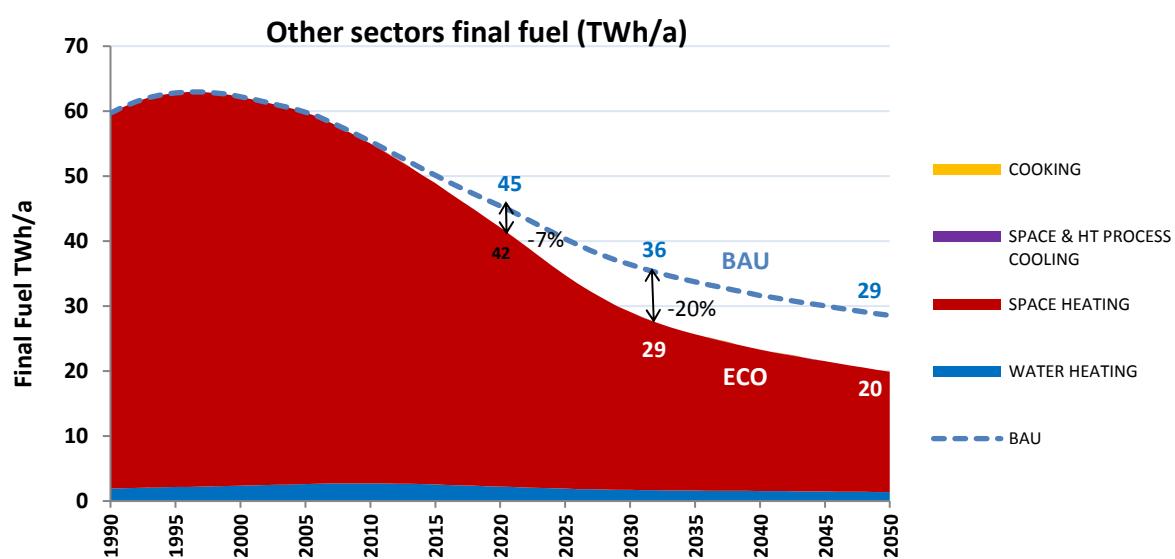
ECO Fuel (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	166	240	225	198	170	153	145	138	131	124
SPACE HEATING	2036	1602	1447	1261	1064	898	792	723	677	637
SPACE & HT PROCESS COOLING	0	0	0	0	0	0	0	0	0	0
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	0	0	0	0	0	0	0	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. Feb. 2021, Final Energy except Electricity (in mtoe for Households for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	193	216	186							

-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. Feb. 2021, Final Energy except Electricity (in mtoe for Other sectors for EU27 (2020)), incl. solid fuel, oil, gas, renewables, wastes, derived heat	29	23	21							



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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

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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%
	Tertiary / Services	88%	88%	88%	88%	88%	89%	89%	89%	89%
	Industry	7%	7%	7%	7%	7%	6%	6%	6%	6%
	Other	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%
	Tertiary / Services	17%	17%	18%	18%	18%	18%	18%	18%	18%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	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%
	Tertiary / Services transport	34%	34%	35%	37%	38%	39%	39%	39%	40%
	Industry transport	17%	17%	18%	19%	20%	20%	21%	21%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.										
	Residential	57%	57%	58%	55%	53%	51%	50%	49%	49%
	Tertiary / Services	16%	18%	18%	17%	16%	15%	15%	14%	14%
	Industry	4%	4%	4%	4%	4%	4%	4%	3%	3%
	Other	2%	2%	2%	2%	1%	1%	1%	1%	1%
	Transport	21%	19%	18%	22%	25%	29%	31%	32%	33%

FUELECO

Comparison per fuel type with Eurostat Energy Balance ed. Feb. 2021 (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							
ESTAT total (mtoe)	27.2	11.1	8.5							
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							
ESTAT total (mtoe)	12.0	1.5	1.1							
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							
ESTAT total (mtoe)	39.2	12.7	9.5							
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							
ESTAT total (mtoe)	44.4	13.2	12.9							
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							
ESTAT total (mtoe)	1.8	1.3	1.0							
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							
ESTAT total (mtoe)	85.3	27.1	23.4							
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	19	1	0							
ESTAT total (mtoe)	1.6	0.1	0.0							
Total all sectors										
EIA total (TWh/a)	388	120	116	94	68	42	29	26	22	19
ESTAT total (TWh/a)	1011	317	272							
ESTAT total (mtoe)	86.9	27.2	23.4							
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							
ESTAT total (mtoe)	58.3	41.0	32.0							
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							
ESTAT total (mtoe)	24.0	17.7	14.7							
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							
ESTAT total (mtoe)	82.3	58.7	46.6							
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							
ESTAT total (mtoe)	54.3	30.7	24.7							
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							
ESTAT total (mtoe)	20.5	14.7	13.8							
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							
ESTAT total (mtoe)	157.1	104.1	85.1							
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)										
ESTAT total (TWh/a)	2525	3047	2952							
ESTAT total (mtoe)	217.1	262.0	253.8							
Total all sectors										
EIA total (TWh/a)	1099	734	567	414	283	176	126	115	111	108
ESTAT total (TWh/a)	4352	4258	3942							
ESTAT total (mtoe)	374.2	366.1	338.9							

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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							
ESTAT total (mtoe)	53.4	92.2	76.6							
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							
ESTAT total (mtoe)	23.5	40.3	37.0							
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							
ESTAT total (mtoe)	76.9	132.5	113.6							
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							
ESTAT total (mtoe)	87.1	77.0	72.2							
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							
ESTAT total (mtoe)	5.0	4.3	3.5							
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							
ESTAT total (mtoe)	168.9	213.9	189.2							
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)	22	44	38							
ESTAT total (TWh/a)	1.9	3.8	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							
ESTAT total (mtoe)	170.8	217.6	192.5							
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							
ESTAT total (mtoe)	22.8	44.0	41.2							
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							
ESTAT total (mtoe)	0.3	2.5	2.3							
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							
ESTAT total (mtoe)	23.1	46.5	43.5							
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							
ESTAT total (mtoe)	12.8	18.9	19.7							
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							
ESTAT total (mtoe)	0.7	1.4	1.5							
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							
ESTAT total (mtoe)	36.7	66.8	64.7							
Other in Eurostat (FC_OTH_NSP_E, FC_TRA_E)										
EIA total (TWh/a)	11	1	1							
ESTAT total (TWh/a)	0.9	0.1	0.1							
Total all sectors										
EIA total (TWh/a)	438	272	294	309	307	292	284	284	291	302
ESTAT total (TWh/a)	438	778	753							
ESTAT total (mtoe)	37.7	66.9	64.8							

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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	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	0	0	0	0	0	0	0	0	0
EIWSH Electric Instant. Shower (secondary)	1.00	0	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	0
ESWH Electric Storage > 30 L (primary)	1.00	0	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	2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	1	2	2	1	1	1	1	1
GSHW Gas Storage, Condensing	0.010	0	0	0	0	0	0	0	0	0	0	1
GSHW Gas Storage, Non-condensing	0.008	0	0	1	2	2	2	2	1	1	1	1
Dedicated WH Heat Pump	1.00	0	0	0	0	0	0	0	0	0	0	0
Dedicated WH Solar (3.5 m ²)	0.80	0	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 m ²)	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 m ²)	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	
CHA-E-S (≤ 400 kW)	1	0	0	0	0	0	0	0	0	0	0	
CHA-E-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	0.1	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	

FUELSAVE

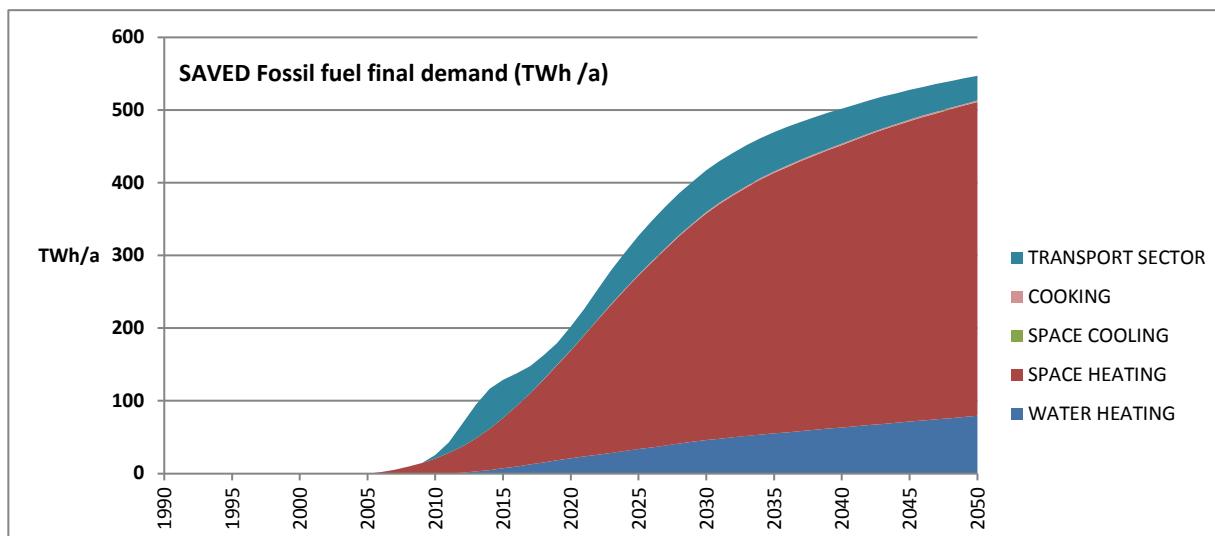
db	SAVED Fossil Fuel (Final Energy in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LH open fireplace	0	0.0	0.0	0.0	0.8	2.7	4.3	5.5	6.5	7.1	7.1
	LH closed fireplace/inset	0	0.0	0.0	0.0	1.1	3.7	5.9	7.7	9.2	9.9	9.6
	LH wood stove	0	0.0	0.0	0.0	0.7	2.2	3.5	4.5	5.4	5.8	5.6
	LH coal stove	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									
	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	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 Circulator pumps <2.5 kW	1	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									
	TOTAL VENTILATION (VU own fuel)		-	-	-	-	-	-	-	-	-	-
1	<i>Impact vs. BAU of VU on SH fuel (already accounted under Space Heating)</i>		-	-	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									
	TOTAL INDUSTRY COMPONENTS		0	0	0	0	0	0	0	0	0	0
	TOTAL ENERGY SECTOR (not final energy)		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

FUELSAVE

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)

FUELSAVE

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

FUELSAVE

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

FUELSAVE

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%	69%	69%	69%
Tertiary / Services			25%	25%	25%	25%	24%	24%	24%	24%
Industry			4%	4%	5%	5%	5%	5%	5%	5%
Other			1%	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%
Tertiary / Services					13%	13%	13%	12%	12%	12%
Industry					0%	0%	0%	0%	0%	0%
Other					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%

FNRGBAU

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	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	7	7	6	7	7	8	8	8	8	9
EIWHS Electric Instant. Shower (secondary)	1.00	8	12	13	12	12	13	13	14	14	14	15
ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	8	8	8	8	8	9	9	9	9	10
ESWH Electric Storage > 30 L (primary)	1.00	53	75	78	76	74	77	81	86	90	90	95
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	13	10	9	8	8	8	7	7	7
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	8	7	6	6	6	6	5	5	5
GSWH Gas Storage, Condensing	0.010	0	0	0	1	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	18	13	9	6	5	4	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	8
WH dedicated Water Heater		121	155	155	146	139	141	146	153	161	168	
CHB Gas Combi Instant. WH	0.04	56	135	140	140	135	137	140	140	140	140	139
CHB Gas + Cyl. WH	0.04	36	57	57	55	53	54	55	55	55	55	54
CHB Jet Burner Gas + Cyl. WH	0.04	9	8	6	5	4	3	2	2	2	2	3
CHB Jet Burner Oil + Cyl. WH	0.04	68	58	47	37	27	20	17	17	17	17	17
CHB Electric (Joule) + Cyl. WH	1.00	1	1	2	2	2	2	2	2	1	1	1
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	1	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	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	1
CHC Central Heating combi, water heating		170	262	256	244	228	222	225	227	228	229	
TOTAL WATER HEATING		291	418	411	391	367	363	371	380	389	398	
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	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	20
LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60	60
LH wood stove	0	38	37	37	37	37	38	38	37	36	36	36
LH coal stove	0	23	13	11	10	9	8	6	5	4	3	3
LH cooker	0	7	11	12	14	15	15	15	15	15	15	14
LH SHR stove	0	16	21	22	24	27	29	32	33	34	34	34
LH pellet stove	0	0	8	11	14	16	17	17	17	17	17	17
LH Solid fuel sum		117	148	161	173	184	190	192	191	188	184	184
LH Electric portable	1	23	22	21	21	20	18	17	17	16	15	15
LH Electric fixed > 250W	1	124	111	102	88	75	66	62	59	56	54	54
LH Electric fixed ≤ 250W	1	8	7	7	6	5	4	4	4	4	4	4
LH Electric storage	1	7	7	6	6	5	5	4	4	4	4	4
LH Electric underfloor	1	21	21	20	20	19	19	18	17	16	16	16
LH Electric visibly glowing > 1.2 kW	1	2	2	2	2	2	2	1	1	1	1	1
LH Electric visibly glowing ≤ 1.2 kW	1	0	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	7
LH Electric sum		193	179	168	152	134	122	115	110	105	100	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	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	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	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	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	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	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	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	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	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	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	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	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	0.3
LH Local Space Heaters total		330	339	340	334	325	317	312	305	296	288	288
RAC fixed < 6 kW, cooling	1	2	17	15	11	11	12	12	14	15	17	17
RAC fixed 6-12 kW, cooling	1	1	9	9	7	7	7	7	7	8	9	9
RAC portable < 12 kW, cooling	1	0	1	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	27
RAC fixed < 6 kW, reversible, heating	1	1	20	23	23	27	34	40	48	55	62	62
RAC fixed 6-12 kW, reversible, heating	1	0	10	13	14	16	19	21	24	27	29	29
RAC portable < 12 kW, reversible, heating	1	0	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	91
RAC Room Air Conditioner		4	57	61	56	62	72	82	94	107	117	117
1 CIRC Integrated circulators	1	13	19	19	20	21	21	21	20	19	18	18
1 CIRC Large standalone circulators	1	8	12	11	10	9	8	7	6	6	6	6
1 CIRC Small standalone circulators	1	6	9	8	7	7	6	5	5	5	4	4
1 CIRC Circulator pumps <2.5 kW	1	27	39	38	37	36	35	33	31	30	28	28
TOTAL SPACE HEATING		3124	2676	2484	2270	2058	1884	1777	1707	1666	1627	1627
TOTAL SPACE COOLING		73	160	171	174	177	177	177	178	180	183	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	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	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	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	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	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	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	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	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	0.5
RVU, Total residential, VU own electricity		3	7	8	8	10	13	16	19	22	25	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	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	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	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	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	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	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	7.3
NRVU, Total non-residential, VU own electricity		24	36	37	37	38	40	43	46	49	51	51
VU Ventilation Units, res + non-res., VU own electricity		26	43	44	45	48	53	59	65	70	76	76
TOTAL VENTILATION (VU own electricity)		26	43	44	45	48	53	59	65	70	76	76
<i>¹ Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)</i>		-	-	-	-	-	-	-	-	-	-	-

db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, final energy incl. control gear</i>												
LFL (T12,T8h,T8t,T5,other)	1	77	122	146	165	163	140	110	86	67	53	53
HID (HPM, HPS, MH)	1	29	62	65	66	56	38	20	11	6	3	3
CFLni (all shapes)	1	2	8	9	9	8	6	3	2	1	1	1
CFLi (retrofit for GLS, HL)	1	1	11	15	15	13	11	7	4	3	2	2
GLS (DLS & NDLS)	1	74	62	45	33	19	11	7	4	2	1	1
HL (DLS & NDLS, LV & MV)	1	6	36	48	56	40	20	11	6	3	2	2
LED replacing LFL (retrofit & luminaire)	1	0	0	1	8	24	49	74	97	120	143	143
LED replacing HID (retrofit & luminaire)	1	0	0	0	6	19	33	45	54	64	74	74
LED replacing CFLni (retrofit & luminaire)	1	0	0	0	0	1	2	4	5	5	6	6
LED replacing DLS (retrofit & luminaire)	1	0	0	0	1	2	4	4	5	6	6	6
LED replacing NDLS (retrofit & luminaire)	1	0	0	0	3	9	14	19	22	25	28	28
<i>Standby</i>	1	9	15	13	11	9	7	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	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	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	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	5.3
DP TV standby, total all types		3	2	3	5	7	8	8	7	6	5	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	1.2
Total Game consoles, all modes		0	5	8	9							
<i>ES&DS only, without effects on infrastructure</i>												
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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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	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
<i>Products regulated only for (networked) standby</i>												
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>												
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
<i>db EPS Active mode (electricity losses)</i>												
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	0.9	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
<i>db EPS No-load mode</i>												
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

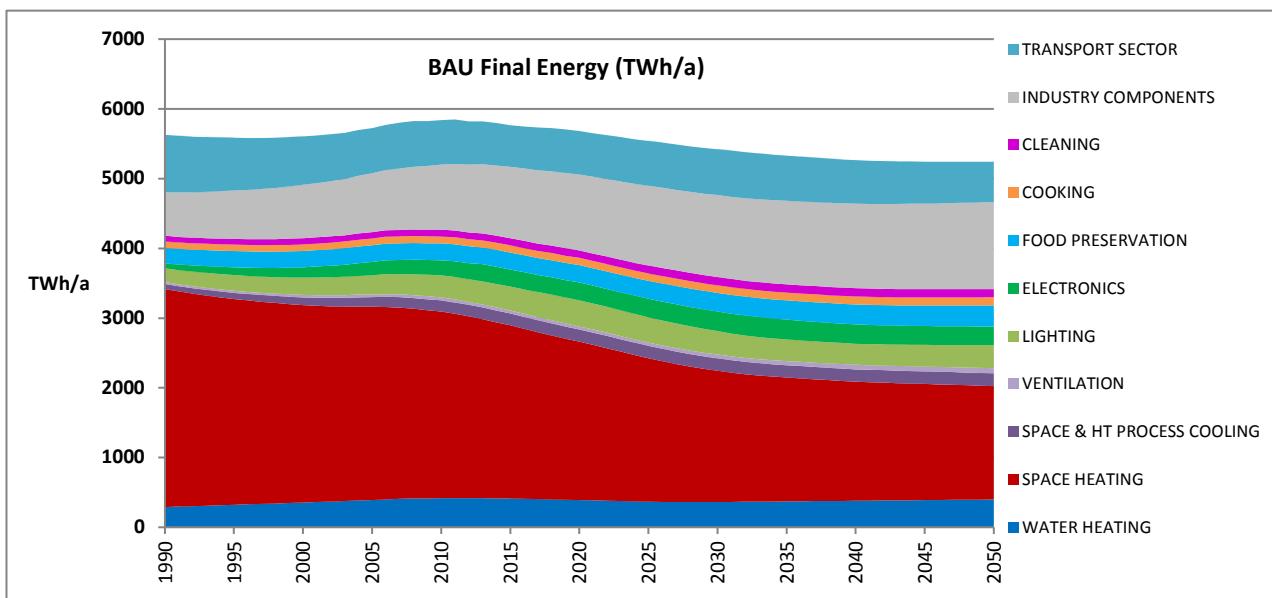
db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	112	113	115	116	117	117	117	117	116	116
	CF open vertical chilled multi deck (RVC2)	1	14	13	12	11	11	11	11	11	11	11
	CF open horizontal frozen island (RHF4)	1	1	1	1	1	1	1	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		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		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		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		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		10	19	22	25	29	31	34	36	38	40
	LD condensing heat pump	1	0	0	0	0	1	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	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
	VC dom	1	8	14	19	20	29	30	31	31	30	29
	VC nondom	1	3	4	5	5	6	6	7	7	7	7
	Total VC Vacuum Cleaner		11	18	23	25	34	36	38	38	38	36
	TOTAL CLEANING		79	97	104	105	115	118	119	119	119	117

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db	BAU Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
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							
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	6	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)		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	
	Total WP Water Pumps		1	79	106	115	124	134	144	154	164	174	184
	CP Fixed Speed 5-1280 l/s	1	21	44	37	32	32	33	33	34	35	36	
	CP Variable speed 5-1280 l/s	1	0	8	14	18	20	21	21	22	22	23	
	CP Pistons 2-64 l/s	1	1	1	1	1	1	1	1	1	1	1	
	Total CP Standard Air Compressors		22	53	53	52	53	55	56	58	59	60	
	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	6.6	6.6	6.6	6.7	
	TOTAL INDUSTRY COMPONENTS		622	936	1022	1090	1141	1175	1196	1213	1229	1249	
	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		5629	5840	5765	5685	5541	5424	5331	5265	5245	5246	
	BAU Final Energy, Total, in PJ		20263	21025	20754	20467	19949	19528	19192	18954	18884	18884	
	BAU Final Energy, Total, in mtce		484	502	496	489	476	466	458	453	451	451	

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BAU Final Energy (summary ALL SECTORS)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING		291	418	411	391	367	363	371	380	389	398
SPACE HEATING		3124	2676	2484	2270	2058	1884	1777	1707	1666	1627
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		79	97	104	105	115	118	119	119	119	117
INDUSTRY COMPONENTS		622	936	1022	1090	1141	1175	1196	1213	1229	1249
ENERGY SECTOR (not final energy)											
TRANSPORT SECTOR		826	637	597	625	643	660	649	625	601	579
BAU Final Energy, Total, in TWh		5629	5840	5765	5685	5541	5424	5331	5265	5245	5246
BAU Final Energy, Total, in PJ		20263	21025	20754	20467	19949	19528	19192	18954	18884	18884
BAU Final Energy, Total, in mtoe		484	502	496	489	476	466	458	453	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	12	11	11	11	11	12	12
SPACE HEATING		174	154	141	128	114	103	96	91	87	83
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	0	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS		440	645	697	741	771	788	799	806	813	822
BAU Final Energy, Industry, in TWh		692	937	990	1035	1061	1074	1081	1088	1099	1114
BAU Final Energy, Industry, in PJ		2490	3372	3564	3727	3821	3865	3891	3917	3956	4010
BAU Final Energy, Industry, in mtoe		59	81	85	89	91	92	93	94	94	96

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	61	84	83	79	75	74	76	79	81	84
SPACE HEATING	686	664	614	561	509	470	444	425	412	399
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	5	7	8	8	9	9	10	10	10	11
INDUSTRY COMPONENTS	151	250	279	301	319	332	340	346	353	360
BAU Final Energy, Services, in TWh	1211	1501	1514	1519	1506	1486	1466	1458	1467	1485
BAU Final Energy, Services, in PJ	4361	5402	5450	5468	5421	5348	5278	5249	5282	5346
BAU Final Energy, Services, in mtOE	104	129	130	131	129	128	126	125	126	128
BAU Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	219	317	312	296	278	275	280	286	292	298
SPACE HEATING	2204	1802	1679	1536	1394	1274	1203	1160	1137	1116
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	74	89	95	96	105	108	109	108	107	105
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Final Energy, Residential, in TWh	2796	2647	2546	2387	2214	2088	2017	1975	1956	1943
BAU Final Energy, Residential, in PJ	10065	9529	9164	8595	7969	7517	7262	7108	7042	6995
BAU Final Energy, Residential, in mtOE	240	228	219	205	190	180	173	170	168	167
(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	4	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	30	42	45	48	51	54	58	61	64	67
BAU Final Energy, Other sectors, in TWh	104	119	119	118	117	117	118	120	122	125
BAU Final Energy, Other sectors, in PJ	373	429	427	426	422	421	425	431	439	449
BAU Final Energy, Other sectors, in mtOE	9	10	10	10	10	10	10	10	10	11

BAU Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	291	418	411	391	367	363	371	380	389	398
Residential		219	317	312	296	278	275	280	286	292	298
Tertiary / Services		61	84	83	79	75	74	76	79	81	84
Industry		9	12	12	12	11	11	11	11	12	12
Other		3	4	4	4	3	3	3	4	4	4
SPACE HEATING.	All sectors, TWh	3124	2676	2484	2270	2058	1884	1777	1707	1666	1627
Residential		2204	1802	1679	1536	1394	1274	1203	1160	1137	1116
Tertiary / Services		686	664	614	561	509	470	444	425	412	399
Industry		174	154	141	128	114	103	96	91	87	83
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	3	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	79	97	104	105	115	118	119	119	119	117
	Residential	74	89	95	96	105	108	109	108	107	105
	Tertiary / Services	5	7	8	8	9	9	10	10	10	11
	Industry	0	0	1	1	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	622	936	1022	1090	1141	1175	1196	1213	1229	1249
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	151	250	279	301	319	332	340	346	353	360
	Industry	440	645	697	741	771	788	799	806	813	822
	Other	30	42	45	48	51	54	58	61	64	67
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	5629	5840	5765	5685	5541	5424	5331	5265	5245	5246
	Residential	2796	2647	2546	2387	2214	2088	2017	1975	1956	1943
	Tertiary / Services	1211	1501	1514	1519	1506	1486	1466	1458	1467	1485
	Industry	692	937	990	1035	1061	1074	1081	1088	1099	1114
	Other	104	119	119	118	117	117	118	120	122	125
	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%	75%	75%	75%
Tertiary / Services	21%	20%	20%	20%	20%	20%	21%	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%	9%	10%
	Tertiary / Services	64%	62%	63%	64%	64%	63%	63%	62%	62%
	Industry	26%	21%	22%	22%	23%	23%	22%	22%	22%
	Other	8%	6%	6%	6%	6%	6%	6%	6%	6%
VENTILATION										
	Residential	10%	16%	17%	19%	21%	24%	27%	29%	31%
	Tertiary / Services	77%	72%	71%	70%	68%	65%	63%	61%	59%
	Industry	12%	11%	11%	11%	10%	10%	9%	9%	9%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%
LIGHTING.										
	Residential	35%	29%	27%	24%	19%	15%	13%	12%	11%
	Tertiary / Services	51%	57%	59%	61%	65%	68%	69%	70%	71%
	Industry	13%	13%	14%	14%	15%	16%	17%	17%	17%
	Other	1%	1%	1%	1%	1%	1%	1%	1%	1%
ELECTRONICS.										
	Residential	61%	59%	61%	58%	54%	53%	52%	51%	51%
	Tertiary / Services	37%	36%	35%	38%	41%	42%	43%	43%	43%
	Industry	2%	4%	4%	4%	5%	5%	5%	5%	5%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.										
	Residential	46%	44%	43%	43%	42%	40%	39%	38%	36%
	Tertiary / Services	44%	39%	38%	36%	36%	36%	36%	36%	36%
	Industry	9%	15%	17%	19%	20%	22%	23%	24%	25%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%
COOKING.										
	Residential	85%	87%	87%	88%	88%	88%	89%	89%	89%
	Tertiary / Services	15%	13%	13%	12%	12%	12%	11%	11%	11%
	Industry	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.										
	Residential	93%	92%	92%	91%	92%	91%	91%	91%	90%
	Tertiary / Services	6%	7%	7%	8%	8%	8%	8%	8%	9%
	Industry	0%	1%	1%	1%	1%	1%	1%	1%	1%
	Other	0%	0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.										
	Residential	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services	24%	27%	27%	28%	28%	28%	28%	29%	29%
	Industry	71%	69%	68%	68%	68%	67%	67%	66%	66%
	Other	5%	4%	4%	4%	4%	5%	5%	5%	5%
TYRES.										
	Residential transport	47%	46%	46%	42%	41%	39%	38%	37%	37%
	Tertiary / Services transport	34%	34%	34%	36%	37%	38%	39%	39%	40%
	Industry transport	17%	17%	17%	19%	19%	20%	20%	20%	21%
	Other transport	3%	3%	3%	3%	3%	3%	3%	3%	3%
ALL PRODUCTS.										
	Residential	50%	45%	44%	42%	40%	38%	38%	38%	37%
	Tertiary / Services	22%	26%	26%	27%	27%	28%	28%	28%	28%
	Industry	12%	16%	17%	18%	19%	20%	20%	21%	21%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%
	Transport	15%	11%	10%	11%	12%	12%	12%	12%	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	0	1	1	1	1	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	6	7	7	6	5	5	6	6	7	7	7
EIWSH Electric Instant. Shower (secondary)	1.00	8	12	12	11	10	10	10	11	11	12	12
ESWH Electric Storage ≤ 30 L (secondary)	1.00	7	8	8	8	8	8	8	9	9	10	10
ESWH Electric Storage > 30 L (primary)	1.00	53	75	77	73	68	69	73	77	82	87	87
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5	5
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	7	8	8	6	5	4	4	4	4	4	4
GSWH Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	3	2	2
Dedicated WH Heat Pump	1.00	0	0	1	1	2	3	4	5	7	8	8
Dedicated WH Solar (3.5 m ²)	0.80	1	7	9	9	8	7	7	7	7	7	7
WH dedicated Water Heater		121	155	150	133	119	118	123	130	137	144	
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 m ²)	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		291	418	402	363	322	304	304	307	310	312	
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 m ²)	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	
1 CIRC Large standalone circulators	1	8	12	10	7	6	5	5	5	5	5	
1 CIRC Small standalone circulators	1	6	9	7	4	3	3	3	3	3	3	
1 CIRC Circulator pumps <2.5 kW	1	27	39	33	24	21	21	21	20	20	20	
TOTAL SPACE HEATING		3124	2648	2400	2096	1786	1541	1399	1313	1258	1208	
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		

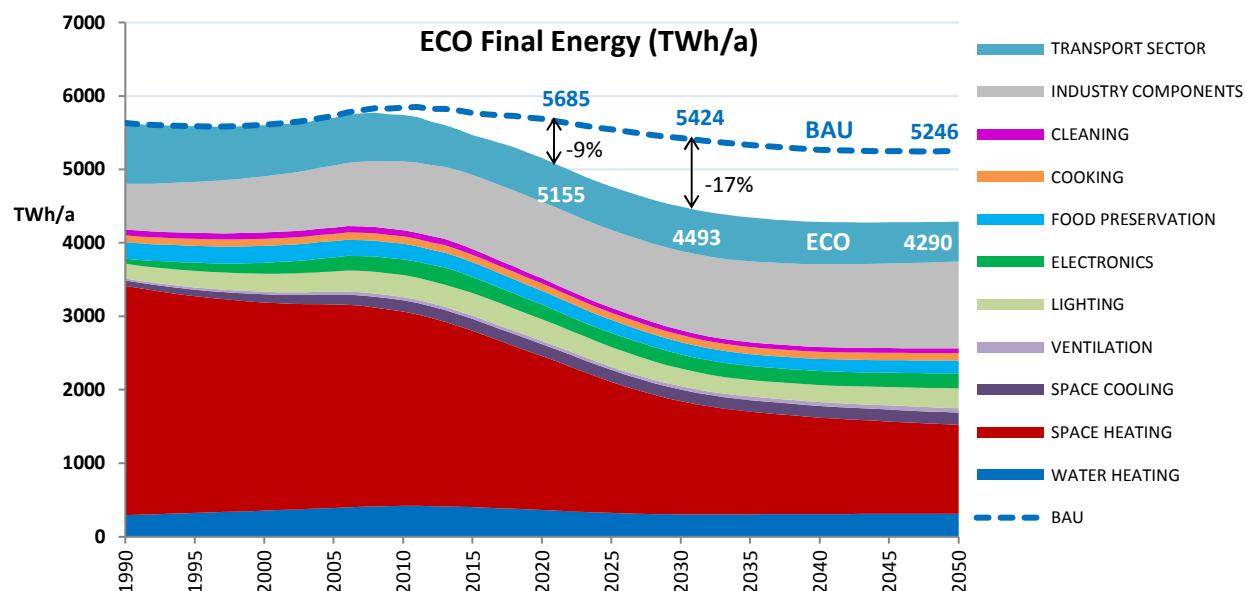
db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LS, final energy incl. control gear											
	LFL (T12,T8h,T8t,T5,other)	1	77	120	141	151	122	68	31	15	9	5
	HID (HPM, HPS, MH)	1	29	61	53	45	33	17	7	2	1	0
	CFLni (all shapes)	1	2	8	8	7	5	2	1	0	0	0
	CFLi (retrofit for 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
	<i>Standby</i>	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						
	<i>ES&DS only, without effects on infrastructure</i>											
	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
<i>of which for modes under CR 1275/2008</i>			<i>14</i>	<i>6</i>	<i>5</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>3</i>	<i>2</i>	<i>2</i>
<i>Products regulated only for (networked) standby</i>												
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>												
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	<i>EPS Active mode (electricity losses)</i>											
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
db	<i>EPS No-load mode</i>											
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
	EPS, overall total (active + no-load)			0.2	11.9	13.8	11.6	10.0	10.0	10.1	10.2	10.3
	EPS, double counted subtracted			0.2	6.2	6.8	5.7	4.7	4.7	4.8	4.8	4.9
	TOTAL ELECTRONICS			72	214	219	200	190	195	192	193	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		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		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		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	0	0	0	0
	Total WM-WD household Washing		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	0.6	0.6	0.6	0.7	0.7
	Total DW household Dishwasher		10	15	16	18	20	21	23	24	25	26
	LD condensing heat pump	1	0	1	2	3	4	4	5	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	0	0
	LD vented gas	0	0	0	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
	VC dom	1	8	14	15	8	10	9	8	7	6	5
	VC nondom	1	3	4	4	4	3	4	4	4	4	4
	Total VC Vacuum Cleaner		11	18	19	12	14	13	12	11	10	9
	TOTAL CLEANING		79	85	80	68	67	66	65	65	65	65

db	ECO Final Energy (in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
	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
	Total 3-ph 0.75-375 kW with VSD		52	128	173	257	337	388	416	443	471	495
	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
	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
	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
	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
	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
	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
	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
	Total WP Water Pumps	1	79	106	114	121	130	140	149	159	169	178
CP Fixed Speed 5-1280 l/s		1	21	44	37	32	31	32	33	34	34	35
CP Variable speed 5-1280 l/s		1	0	8	14	18	20	20	21	21	22	22
CP Pistons 2-64 l/s		1	1	1	1	1	1	1	1	1	1	1
	Total CP Standard Air Compressors		22	53	52	51	52	53	55	56	58	59
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		622	935	1008	1044	1062	1079	1101	1126	1152	1181
	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		5629	5739	5468	5155	4766	4493	4344	4284	4279	4290
	ECO Final Energy, Total, in PJ		20263	20662	19686	18557	17159	16173	15639	15423	15406	15445
	ECO Final Energy, Total, in mtoe		484	493	470	443	410	386	374	368	368	369

ECO Final Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	291	418	402	363	322	304	304	307	310	312
SPACE HEATING	3124	2648	2400	2096	1786	1541	1399	1313	1258	1208
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
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	79	85	80	68	67	66	65	65	65	65
INDUSTRY COMPONENTS	622	935	1008	1044	1062	1079	1101	1126	1152	1181
ENERGY SECTOR (not final energy)										
TRANSPORT SECTOR	826	632	545	593	590	603	595	576	560	545
ECO Final Energy, Total, in TWh	5629	5739	5468	5155	4766	4493	4344	4284	4279	4290
ECO Final Energy, Total, in PJ	20263	20662	19686	18557	17159	16173	15639	15423	15406	15445
ECO Final Energy, Total, in mtoe	484	493	470	443	410	386	374	368	368	369
For comparison: Eurostat Energy Balance Feb. 2021, Final Energy Consumption (in mtoe for EU27 (2020))	907	973	910					-9%	-17%	



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

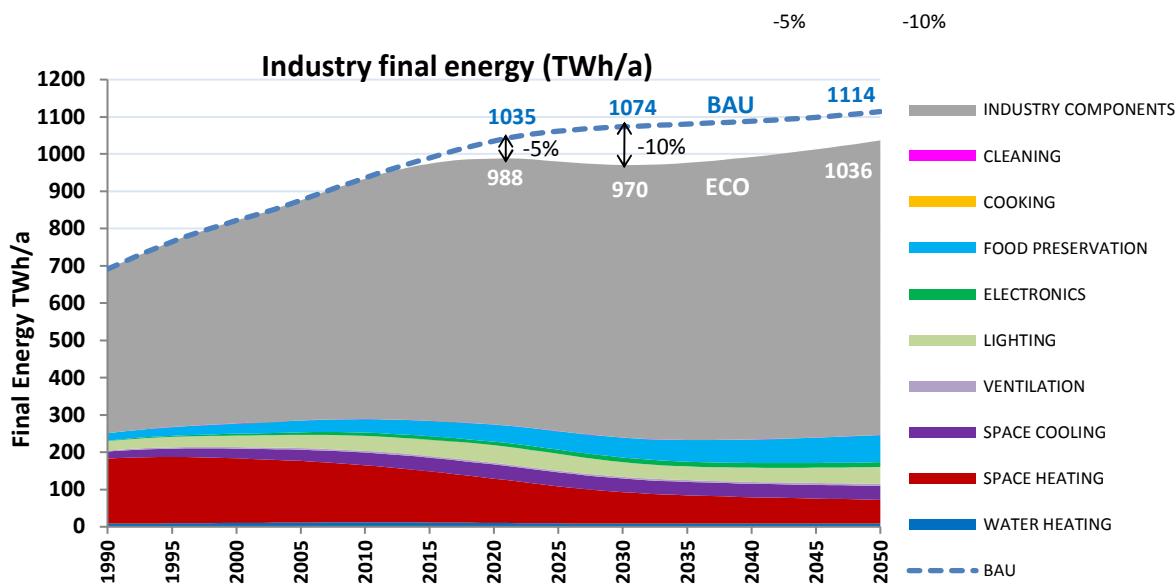
Ventilation: reported data regard only electricity consumed by Ventilation Units; heat saving effects are included in Space Heating

Lighting: includes energy consumption by control gears and estimate for standby

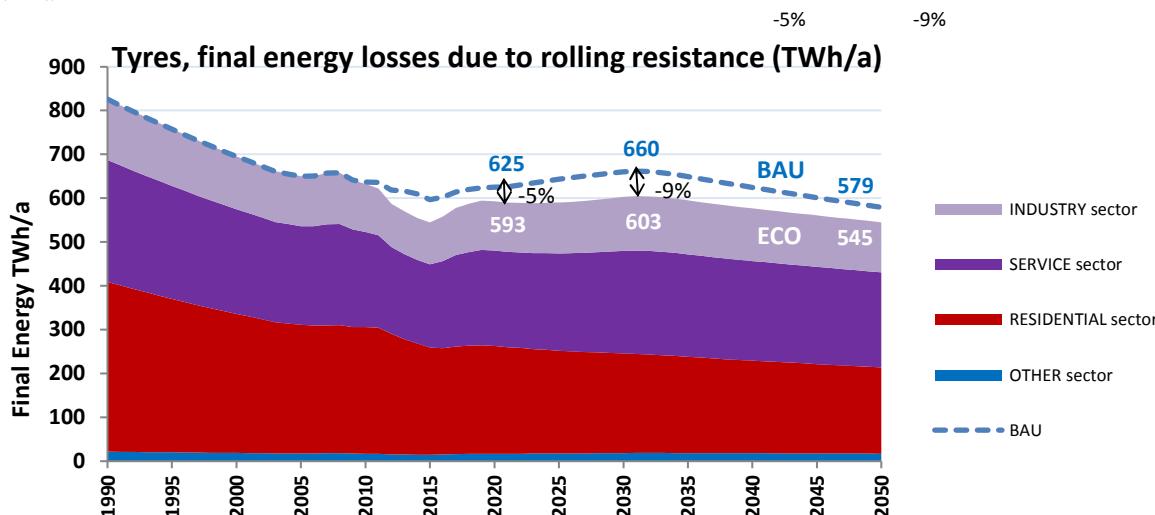
Energy Sector: see separate reporting above; not included in other sector totals

Transport Sector: see separate reporting below; not included in other sector totals

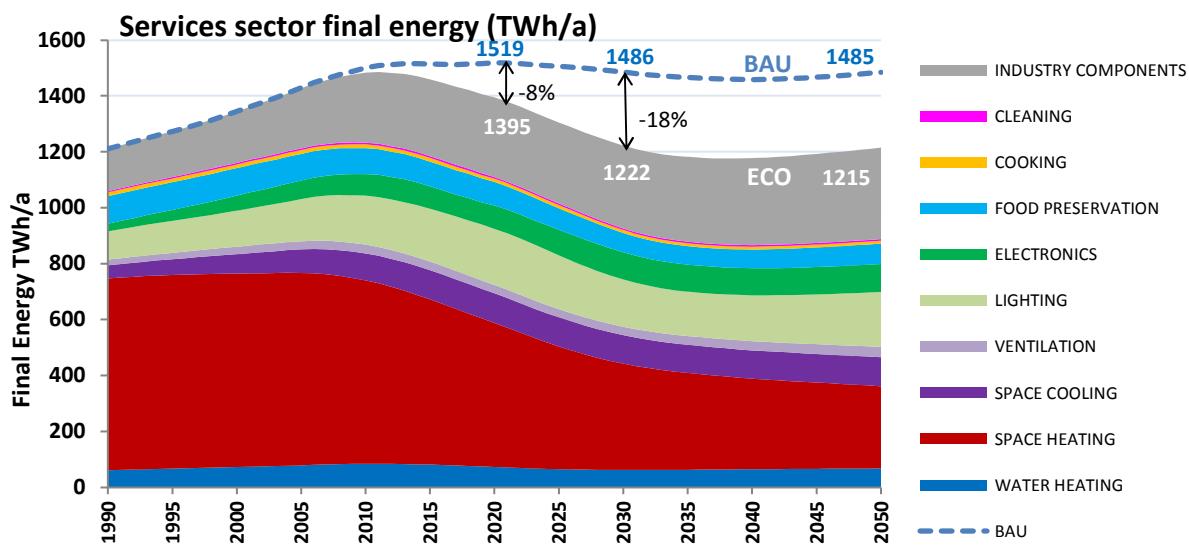
ECO Final Energy (summary INDUSTRY)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	9	12	12	11	10	9	9	9	9	9
SPACE HEATING	174	153	137	119	99	84	76	71	67	64
SPACE COOLING	19	34	37	38	38	36	36	36	37	37
VENTILATION	3	5	5	5	4	5	5	5	5	5
LIGHTING	25	40	44	47	45	39	37	38	41	45
ELECTRONICS	1	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	0	1	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	440	644	689	713	723	731	743	757	773	790
ECO Final Energy, Industry, in TWh	692	934	974	988	980	970	976	992	1012	1036
ECO Final Energy, Industry, in PJ	2490	3361	3507	3556	3527	3493	3515	3570	3645	3731
ECO Final Energy, Industry, in mtOE	59	80	84	85	84	83	84	85	87	89
For comparison: Eurostat Energy Balance Feb. 2021, Final Energy Consumption Industry (in mtOE for EU27 (2020))	310	244	233							



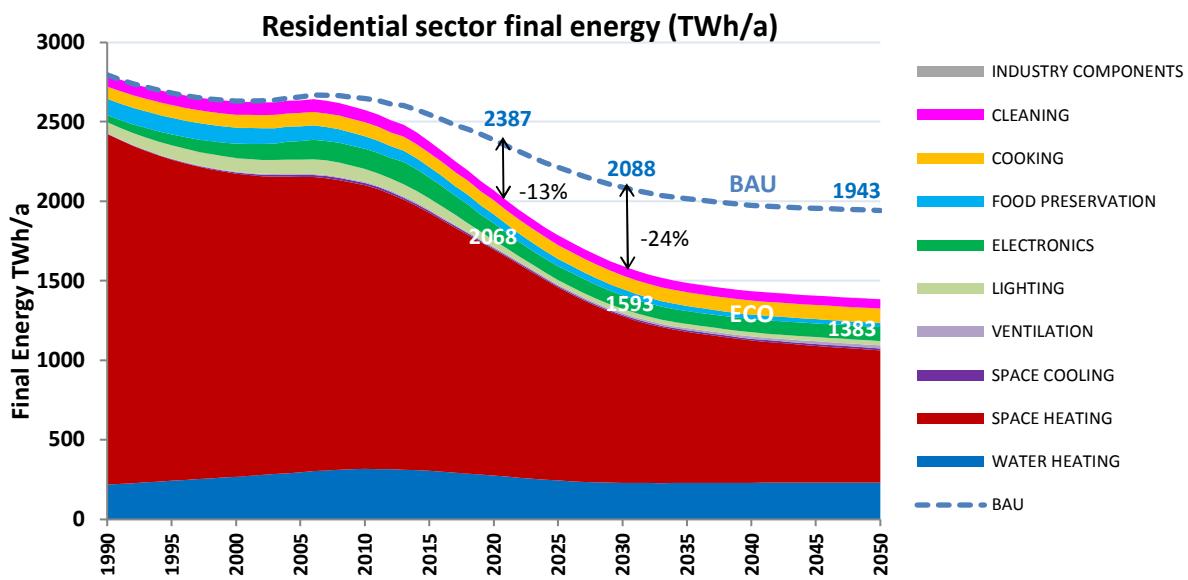
ECO Final Energy (summary TRANSPORT)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
(EIA values are energy losses due to the rolling resistance of C1-, C2- and C3-type tyres)										
TYRES for INDUSTRY-sector-related transport	139	109	96	112	116	123	123	120	117	114
TYRES for SERVICE-sector-related 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 Feb. 2021, Final Energy Consumption Road Transport (in mtOE for EU27 (2020))	202	261	256							



ECO Final Energy (summary SERVICES)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	61	84	81	73	65	62	63	65	66	68
SPACE HEATING	686	656	592	515	438	380	346	324	308	293
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	5	6	6	6	6	6	6	6	6	6
INDUSTRY COMPONENTS	151	250	274	284	290	296	303	310	318	326
ECO Final Energy, Services, in TWh	1211	1482	1459	1395	1305	1222	1182	1177	1192	1215
ECO Final Energy, Services, in PJ	4361	5336	5251	5022	4697	4400	4254	4237	4293	4373
ECO Final Energy, Services, in mtOE	104	127	125	120	112	105	102	101	103	104
For comparison: Eurostat Energy Balance Feb. 2021, Final Energy Consumption Services (in mtOE for EU27 (2020))	98	140	129							



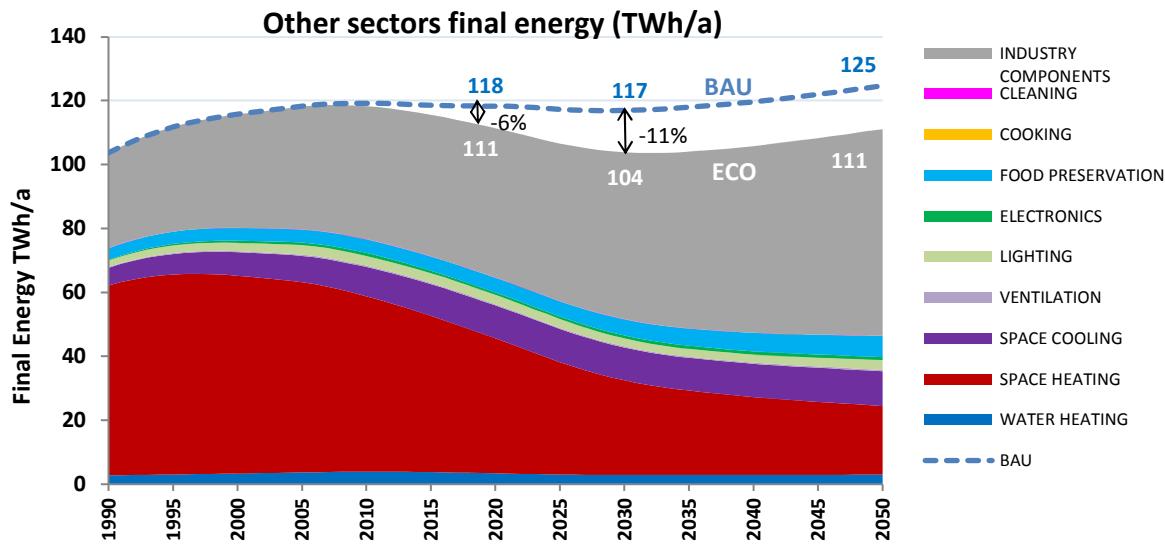
ECO Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	219	317	305	276	244	230	229	230	231	232
SPACE HEATING	2204	1783	1622	1420	1214	1047	951	894	860	830
SPACE COOLING	2	14	12	9	9	9	10	11	12	13
VENTILATION	3	7	8	8	8	10	12	15	17	19
LIGHTING	69	82	72	43	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	74	78	73	62	61	60	59	58	58	58
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Final Energy, Residential, in TWh	2796	2573	2376	2068	1786	1593	1487	1433	1406	1383
ECO Final Energy, Residential, in PJ	10065	9263	8552	7444	6430	5736	5354	5160	5061	4979
ECO Final Energy, Residential, in mtoe	240	221	204	178	154	137	128	123	121	119
For comparison: Eurostat Energy Balance Feb. 2021, Final Energy Consumption Households (in mtoe for EU27 (2020))	237	279	245							
						-13%	-24%			



(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	21
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	30	42	44	47	49	52	55	58	62	65
ECO Final Energy, Other sectors, in TWh	104	118	116	111	107	104	104	106	108	111
ECO Final Energy, Other sectors, in PJ	373	426	416	401	384	374	374	381	390	400
ECO Final Energy, Other sectors, in mtoe	9	10	10	10	9	9	9	9	9	10
For comparison: Eurostat Energy Balance Feb. 2021, Final Energy Consumption Other sectors (in mtoe for EU27 (2020))	33	27	26							

-6% -11%



ECO Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	291	418	402	363	322	304	304	307	310	312
	Residential	219	317	305	276	244	230	229	230	231	232
	Tertiary / Services	61	84	81	73	65	62	63	65	66	68
	Industry	9	12	12	11	10	9	9	9	9	9
	Other	3	4	4	3	3	3	3	3	3	3
SPACE HEATING.	All sectors, TWh	3124	2648	2400	2096	1786	1541	1399	1313	1258	1208
	Residential	2204	1783	1622	1420	1214	1047	951	894	860	830
	Tertiary / Services	686	656	592	515	438	380	346	324	308	293
	Industry	174	153	137	119	99	84	76	71	67	64
	Other	60	55	49	42	35	30	26	24	23	21
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	2	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	79	85	80	68	67	66	65	65	65	65
	Residential	74	78	73	62	61	60	59	58	58	58
	Tertiary / Services	5	6	6	6	6	6	6	6	6	6
	Industry	0	0	1	0	0	0	0	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	622	935	1008	1044	1062	1079	1101	1126	1152	1181
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	151	250	274	284	290	296	303	310	318	326
	Industry	440	644	689	713	723	731	743	757	773	790
	Other	30	42	44	47	49	52	55	58	62	65
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	5629	5739	5468	5155	4766	4493	4344	4284	4279	4290
	Residential	2796	2573	2376	2068	1786	1593	1487	1433	1406	1383
	Tertiary / Services	1211	1482	1459	1395	1305	1222	1182	1177	1192	1215
	Industry	692	934	974	988	980	970	976	992	1012	1036
	Other	104	118	116	111	107	104	104	106	108	111
	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%	75%	75%	75%	74%
	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	93%	92%	91%	91%	91%	91%	90%	90%	90%	90%
	Tertiary / Services	6%	8%	8%	8%	8%	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	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services	24%	27%	27%	27%	27%	27%	28%	28%	28%	28%
	Industry	71%	69%	68%	68%	68%	68%	67%	67%	67%	67%
	Other	5%	4%	4%	4%	5%	5%	5%	5%	5%	5%
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%	43%	40%	37%	35%	34%	33%	33%	32%
	Tertiary / Services	22%	26%	27%	27%	27%	27%	27%	27%	28%	28%
	Industry	12%	16%	18%	19%	21%	22%	22%	23%	24%	24%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	3%	3%
	Transport	15%	11%	10%	12%	12%	13%	14%	13%	13%	13%

FNRGSAVE

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	0.1	0.1	0.1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0.0	0.0	0.2	0.6	1.0	1.3	1.5	1.6	1.7	1.8
EIWHS Electric Instant. Shower (secondary)	1.00	0.0	0.0	0.6	1.6	2.4	2.8	2.9	3.0	3.1	3.2
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	3.3	5.8	7.8	8.0	8.1	8.3	8.3
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 m ²)	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	5	13	20	23	23	24	24	24	24
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 m ²)	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	28	45	60	67	73	79	85	
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 m ²)	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	

FNRS SAVE

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	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	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	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	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	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	1.0
LH pellet stove	0	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.6	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	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	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	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	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	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	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	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	0.1	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	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	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	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	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	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	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	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	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	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	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	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	
1 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	
1 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	
1 CIRC Circulator pumps <2.5 kW	1	0	0	5	13	15	14	12	11	9	8	
TOTAL SPACE HEATING		0	28	84	174	272	343	378	394	408	419	
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	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	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	

FNRS SAVE

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, final energy incl. control gear (BAU-ECO)</i>												
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	
<i>Standby</i>	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							
<i>ES&DS only, without effects on infrastructure</i>												
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	

FNRS SAVE

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									
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
<i>Products regulated only for (networked) standby</i>												
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>												
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
<i>db EPS Active mode (electricity losses)</i>												
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
<i>db EPS No-load mode</i>												
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

FNRS SAVE

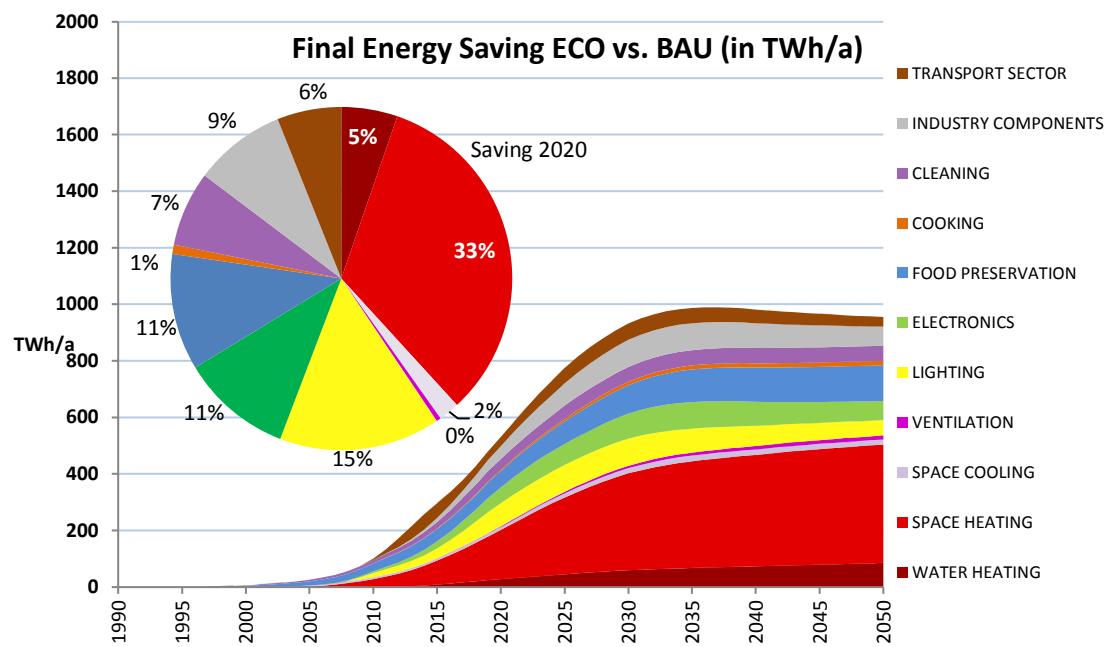
db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	0	28	43	55	66	75	82	86	88	89
	CF open vertical chilled multi deck (RVC2)	1	0.0	0.0	0.0	0.0	1.2	3.7	5.5	5.9	5.9	6.0
	CF open horizontal frozen island (RHF4)	1	0.0	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	0.0	-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	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
	VC dom	1	0	0	4	11	18	21	23	24	24	24
	VC nondom	1	0	0	0	2	2	3	3	3	3	3
	Total VC Vacuum Cleaner		0	0	4	13	20	23	26	27	27	27
	TOTAL CLEANING		-	12	24	38	48	52	54	54	54	52

FNRS SAVE

db	SAVED Final Energy (BAU-ECO, in TWh)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	0.2	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)		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
	Total WP Water Pumps	1	0	0	1	3	4	4	4	5	5	5
	CP Fixed Speed 5-1280 l/s	1	0.0	0.0	0.1	0.6	0.9	1.0	0.9	0.8	0.8	0.7
	CP Variable speed 5-1280 l/s	1	0.0	0.0	0.0	0.2	0.4	0.5	0.4	0.3	0.2	0.1
	CP Pistons 2-64 l/s	1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CP Standard Air Compressors		0	0	0	1	1	2	1	1	1	1
	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	46	79	96	95	87	77	68
	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	297	531	775	932	987	981	966	955
	SAVED Final Energy, Total, in PJ		0	363	1068	1910	2789	3355	3553	3531	3478	3439
	SAVED Final Energy, Total, in mtoe		0	9	26	46	67	80	85	84	83	82

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SAVED Final Energy (BAU-ECO, ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	9	28	45	60	67	73	79	85
SPACE HEATING	0	28	84	174	272	343	378	394	408	419
SPACE COOLING	0	7	8	10	15	19	20	19	19	18
VENTILATION	0	0	1	2	5	8	11	12	13	15
<i>Impact vs. BAU of VU on SH final energy (already accounted under Space Heating)</i>	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	24	38	48	52	54	54	54	52
INDUSTRY COMPONENTS	0	0	14	46	79	96	95	87	77	68
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	297	531	775	932	987	981	966	955
SAVED Final Energy, Total, in PJ	0	363	1068	1910	2789	3355	3553	3531	3478	3439
SAVED Final Energy, Total, in mtoe	0	9	26	46	67	80	85	84	83	82
Saving in % versus BAU (from 1990=0)	0.0%	1.7%	5.1%	9.3%	14.0%	17.2%	18.5%	18.6%	18.4%	18.2%
Saving In % versus BAU (from 2010=0)	-1.8%	0.0%	3.4%	7.6%	12.2%	15.3%	16.6%	16.7%	16.5%	16.3%



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	3
SPACE HEATING	0	1	3	9	15	19	20	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	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	0	0	8	28	48	58	56	49	40	33
SAVED Final Energy, Industry, in TWh	0	3	16	47	82	103	104	96	86	77
SAVED Final Energy, Industry, in PJ	0	11	57	171	295	371	376	347	311	278
SAVED Final Energy, Industry, in mtoe	0	0	1	4	7	9	9	8	7	7

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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	10	12	13	14	15	16
SPACE HEATING	0	8	22	46	71	90	98	101	104	105
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	1	3	3	4	4	4	4	4
INDUSTRY COMPONENTS	0	0	5	17	29	36	37	36	35	33
SAVED Final Energy, Services, in TWh	0	18	55	124	201	263	284	281	275	270
SAVED Final Energy, Services, in PJ	0	66	199	447	724	948	1024	1013	989	972
SAVED Final Energy, Services, in mtoe	0	2	5	11	17	23	24	24	24	23
SAVED Final Energy (summary RESIDENTIAL)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	7	21	34	45	51	56	61	66
SPACE HEATING	0	19	57	116	180	227	252	265	277	286
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	22	35	44	48	50	50	49	47
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Final Energy, Residential, in TWh	0	74	170	320	428	495	530	541	550	560
SAVED Final Energy, Residential, in PJ	0	266	612	1151	1539	1781	1908	1948	1981	2016
SAVED Final Energy, Residential, in mtoe	0	6	15	27	37	43	46	47	47	48
(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	1	1	2	2	2	2	2	2
SAVED Final Energy, Other sectors, in TWh	0	1	3	7	11	13	14	14	14	14
SAVED Final Energy, Other sectors, in PJ	0	4	11	25	39	47	50	50	49	49
SAVED Final Energy, Other sectors, in mtoe	0	0	0	1	1	1	1	1	1	1

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SAVED Final Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	9	28	45	60	67	73	79	85
Residential		0	0	7	21	34	45	51	56	61	66
Tertiary / Services		0	0	2	6	10	12	13	14	15	16
Industry		0	0	0	1	1	2	2	2	2	3
Other		0	0	0	0	0	1	1	1	1	1
SPACE HEATING.	All sectors, TWh	0	28	84	174	272	343	378	394	408	419
Residential		0	19	57	116	180	227	252	265	277	286
Tertiary / Services		0	8	22	46	71	90	98	101	104	105
Industry		0	1	3	9	15	19	20	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	24	38	48	52	54	54	54	52
Residential		0	12	22	35	44	48	50	50	49	47
Tertiary / Services		0	1	1	3	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
INDUSTRY COMP.	All sectors, TWh	0	0	14	46	79	96	95	87	77	68
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		0	0	5	17	29	36	37	36	35	33
Industry		0	0	8	28	48	58	56	49	40	33
Other		0	0	1	1	2	2	2	2	2	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 excl. Energy, TWh	0	101	297	531	775	932	987	981	966	955
Residential		0	74	170	320	428	495	530	541	550	560
Tertiary / Services		0	18	55	124	201	263	284	281	275	270
Industry		0	3	16	47	82	103	104	96	86	77
Other		0	1	3	7	11	13	14	14	14	14
Transport		0	5	52	32	54	58	54	48	41	34

FNRS SAVE

SAVED Final Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			74%	74%	75%	76%	76%	77%	77%	77%
	Tertiary / Services			22%	22%	21%	21%	20%	19%	19%	19%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential			68%	68%	67%	66%	66%	67%	67%	68%
	Tertiary / Services			27%	26%	26%	26%	26%	26%	25%	25%
	Industry			4%	4%	5%	5%	6%	5%	5%	5%
	Other			1%	2%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential			62%	60%	42%	28%	21%	19%	20%	22%
	Tertiary / Services			32%	34%	44%	51%	55%	56%	56%	55%
	Industry			5%	5%	11%	16%	18%	19%	19%	18%
	Other			1%	1%	3%	5%	5%	6%	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%
	Tertiary / Services			26%	34%	32%	45%	59%	65%	68%	69%
	Industry			7%	9%	8%	11%	15%	17%	18%	19%
	Other			1%	2%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential			53%	73%	74%	75%	74%	72%	71%	72%
	Tertiary			47%	26%	25%	24%	25%	26%	27%	26%
	Industry			0%	1%	1%	1%	2%	2%	2%	2%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential			92%	92%	86%	76%	68%	66%	65%	65%
	Tertiary / Services			6%	6%	10%	19%	26%	28%	29%	29%
	Industry			1%	1%	3%	4%	5%	5%	5%	5%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential			87%	85%	84%	84%	83%	83%	83%	83%
	Tertiary / Services			13%	15%	16%	16%	17%	17%	17%	17%
	Industry			0%	0%	0%	0%	0%	0%	0%	0%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential			96%	94%	92%	92%	92%	92%	91%	91%
	Tertiary / Services			4%	5%	7%	7%	7%	7%	8%	9%
	Industry			0%	0%	1%	1%	1%	1%	1%	1%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential			0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services			23%	39%	37%	37%	37%	39%	41%	45%
	Industry			65%	57%	60%	61%	60%	58%	56%	52%
	Other			12%	4%	3%	2%	2%	2%	3%	3%
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%	53%	54%	55%	57%
	Tertiary / Services			18%	19%	23%	26%	28%	29%	29%	28%
	Industry			3%	5%	9%	11%	11%	11%	10%	9%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
	Transport			5%	18%	6%	7%	6%	5%	5%	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	1	1	1	1	1	1	1	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	15	18	18	17	13	14	15	16	18	19	19
EIWHS Electric Instant. Shower (secondary)	1.00	20	30	32	31	26	26	28	29	30	32	32
ESWH Electric Storage ≤ 30 L (secondary)	1.00	17	21	21	20	17	17	18	19	20	21	21
ESWH Electric Storage > 30 L (primary)	1.00	133	188	194	190	155	161	170	180	190	199	199
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	13	10	9	8	8	8	7	7	7
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	8	9	8	7	6	6	6	6	5	5	5
GSWH Gas Storage, Condensing	0.010	0	0	0	1	1	1	1	1	1	1	2
GSWH Gas Storage, Non-condensing	0.008	24	22	18	13	9	7	5	4	4	3	3
Dedicated WH Heat Pump	1.00	0	1	3	5	8	12	16	20	24	28	28
Dedicated WH Solar (3.5 m ²)	0.80	2	14	18	19	17	15	15	15	15	15	15
WH dedicated Water Heater		234	317	325	315	261	269	282	299	315	332	
CHB Gas Combi Instant. WH	0.04	58	139	145	145	139	140	143	143	143	142	142
CHB Gas + Cyl. WH	0.04	37	59	59	57	54	55	56	56	56	55	55
CHB Jet Burner Gas + Cyl. WH	0.04	9	8	7	5	4	3	3	3	3	3	3
CHB Jet Burner Oil + Cyl. WH	0.04	70	60	49	38	28	20	18	18	18	18	18
CHB Electric (Joule) + Cyl. WH	1.00	3	4	4	4	4	4	4	3	3	3	3
CHB Hybrid Gas/Electric WH	0.10	0	0	0	0	0	0	1	1	2	2	2
CHB Electric HP + Cyl. WH	1.00	1	5	7	10	10	11	13	15	18	20	20
CHB Gas HP + Cyl. WH	0.02	0	0	0	0	0	0	1	1	1	1	2
CHB Gas mCHP + Cyl. WH	0.02	0	0	0	0	0	0	0	0	0	1	1
CHB Solar Combi (16 m ²)	0.04	1	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		411	593	596	576	502	504	521	540	560	578	
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 m ²)	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	20
LH closed fireplace/inset	0	18	41	48	55	60	63	64	63	62	60	60
LH wood stove	0	38	37	37	37	37	38	38	37	36	36	36
LH coal stove	0	23	13	11	10	9	8	6	5	4	3	3
LH cooker	0	7	11	12	14	15	15	15	15	15	15	14
LH SHR stove	0	16	21	22	24	27	29	32	33	34	34	34
LH pellet stove	0	0	8	11	14	16	17	17	17	17	17	17
LH Solid fuel sum		117	148	161	173	184	190	192	191	188	188	184
LH Electric portable	1	58	54	53	51	41	39	36	35	33	32	32
LH Electric fixed > 250W	1	310	277	254	220	157	138	130	124	118	113	113
LH Electric fixed ≤ 250W	1	21	19	17	15	11	9	9	8	8	8	8
LH Electric storage	1	18	17	16	14	11	10	9	9	9	9	8
LH Electric underfloor	1	53	52	51	50	41	39	38	36	34	33	33
LH Electric visibly glowing > 1.2 kW	1	5	5	4	4	3	3	3	3	3	3	3
LH Electric visibly glowing ≤ 1.2 kW	1	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	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	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	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	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	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	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	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	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	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	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	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	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	
¹ CIRC Large standalone circulators	1	21	29	27	24	19	16	14	13	13	12	
¹ CIRC Small standalone circulators	1	16	22	20	18	14	12	11	10	10	9	
¹ CIRC Circulator pumps <2.5 kW	1	69	98	95	92	76	73	69	66	63	60	
TOTAL SPACE HEATING		3520	3154	2963	2730	2385	2204	2098	2031	1996	1961	
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)	-	-	-	-	-	-	-	-	-	-	-	

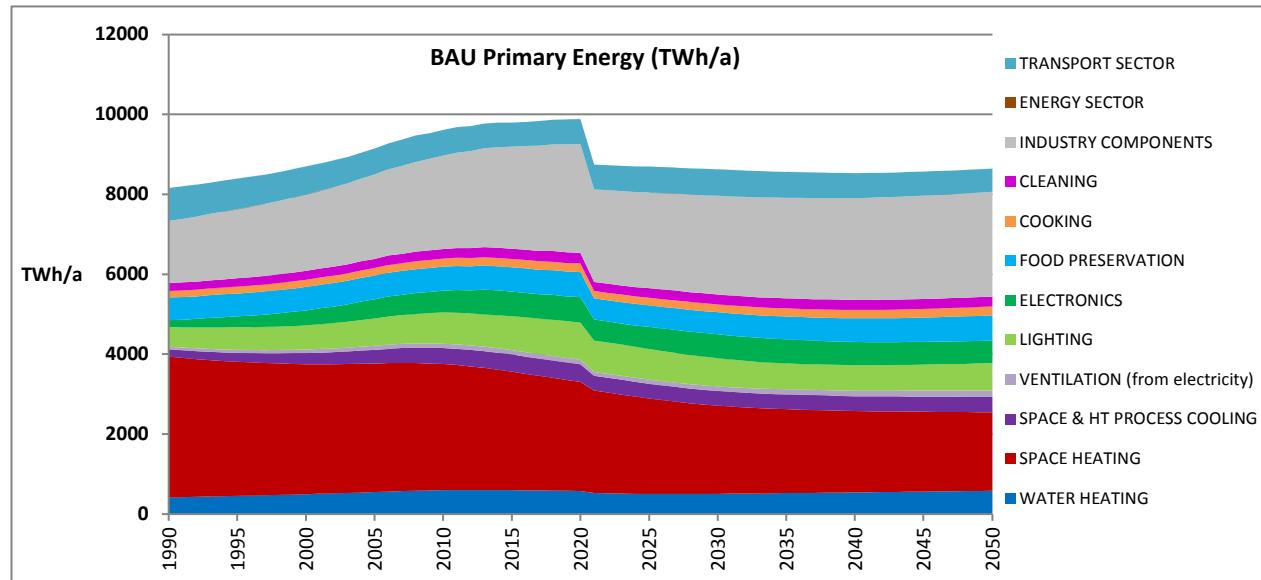
db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, primary energy incl. control gear</i>												
LFL (T12,T8h,T8t,T5,other)	1	193	304	365	412	343	294	230	180	141	111	
HID (HPM, HPS, MH)	1	71	155	162	165	118	79	42	23	13	7	
CFLni (all shapes)	1	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	
<i>Standby</i>	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	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	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	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	2.4	
Total Game consoles, all modes		0	12	19	23	18	18	18	18	18	18	
<i>ES&DS only, without effects on infrastructure</i>												
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
<i>Products regulated only for (networked) standby</i>												
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>												
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
<i>db EPS Active mode (electricity losses)</i>												
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	2.0	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
<i>db EPS No-load mode</i>												
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	1.9	1.8	1.7	1.6	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	7	7	8	9	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	7	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	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	29	29
	VC dom	1	21	34	47	49	60	64	66	66	64	61
	VC nondom	1	6	10	12	13	12	13	14	14	15	15
	Total VC Vacuum Cleaner		27	45	59	63	72	77	79	80	79	76
	TOTAL CLEANING		197	243	259	264	242	248	250	251	249	246

db	BAU Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
	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
	Total 3-ph 0.75-375 kW with VSD		131	320	401	494	499	588	689	805	924	1030
	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
	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
	Total Small 3-ph 0.12-0.75 kW		26	37	40	42	36	36	37	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
	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
	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
	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
	Total 8-pole 0.75-375 kW (no VSD)		3	5	5	6	5	5	6	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
	Total WP Water Pumps		197	264	287	311	281	302	323	344	365	386
CP Fixed Speed 5-1280 l/s		1	53	109	93	81	67	68	70	72	74	76
CP Variable speed 5-1280 l/s		1	0	20	36	46	42	44	45	46	47	47
CP Pistons 2-64 l/s		1	3	3	3	3	3	3	3	3	3	3
	Total CP Standard Air Compressors		56	132	131	130	112	115	118	121	124	126
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		1554	2340	2554	2725	2396	2467	2512	2547	2582	2623
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									
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	8162	9608	9789	9882	8691	8624	8561	8530	8567	8642
BAU Primary Energy, Total, in PJ	29382	34588	35240	35574	31289	31046	30819	30709	30843	31112
BAU Primary Energy, Total, in mtoe	702	826	842	850	747	742	736	733	737	743
BAU Primary Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	411	593	596	576	502	504	521	540	560	578
SPACE HEATING	3520	3154	2963	2730	2385	2204	2098	2031	1996	1961
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
<i>Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)</i>	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	197	243	259	264	242	248	250	251	249	246
INDUSTRY COMPONENTS	1554	2340	2554	2725	2396	2467	2512	2547	2582	2623
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	8162	9608	9789	9882	8691	8624	8561	8530	8567	8642
BAU Primary Energy, Total, in PJ	29382	34588	35240	35574	31289	31046	30819	30709	30843	31112
BAU Primary Energy, Total, in mtoe	702	826	842	850	747	742	736	733	737	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

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BAU Primary Energy (summary INDUSTRY, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	12	18	18	17	15	15	16	16	17	17
SPACE HEATING	194	180	166	151	131	119	111	106	102	98
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	1	1	2	1	2	2	2	2	2
INDUSTRY COMPONENTS	1101	1611	1744	1852	1619	1656	1677	1692	1707	1727
BAU Primary Energy, Industry, in TWh	1477	2122	2277	2409	2112	2149	2171	2193	2220	2255
BAU Primary Energy, Industry, in PJ	5319	7641	8196	8671	7603	7735	7817	7893	7990	8117
BAU Primary Energy, Industry, in mtoe	127	182	196	207	182	185	187	189	191	194
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	97	136	138	134	114	116	120	126	131	137
SPACE HEATING	808	833	788	731	632	590	564	545	532	519
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	12	18	19	21	19	19	20	21	22	22
INDUSTRY COMPONENTS	379	624	698	753	670	697	714	727	740	755
BAU Primary Energy, Services, in TWh	2054	2842	2958	3054	2676	2678	2665	2670	2704	2756
BAU Primary Energy, Services, in PJ	7393	10232	10650	10994	9634	9641	9596	9613	9735	9923
BAU Primary Energy, Services, in mtoe	177	244	254	263	230	230	229	230	233	237
BAU Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	298	433	435	419	368	369	380	393	406	419
SPACE HEATING	2456	2082	1955	1798	1579	1455	1386	1346	1329	1312
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	184	224	238	241	222	226	228	228	225	222
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Primary Energy, Residential, in TWh	3635	3791	3736	3566	3058	2931	2864	2826	2819	2822
BAU Primary Energy, Residential, in PJ	13085	13649	13449	12838	11009	10553	10312	10175	10149	10157
BAU Primary Energy, Residential, in mtoe	313	326	321	307	263	252	246	243	242	243
BAU Primary Energy (summary OTHER, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4	6	6	5	5	5	5	5	5	6
SPACE HEATING	62	59	54	49	43	39	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	74	104	112	120	108	114	121	127	134	141
BAU Primary Energy, Other sectors, in TWh	170	215	221	228	202	206	211	216	223	230
BAU Primary Energy, Other sectors, in PJ	611	774	797	820	727	740	758	779	803	829
BAU Primary Energy, Other sectors, in mtoe	15	18	19	20	17	18	18	19	19	20

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BAU Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	411	593	596	576	502	504	521	540	560	578
Residential		298	433	435	419	368	369	380	393	406	419
Tertiary / Services		97	136	138	134	114	116	120	126	131	137
Industry		12	18	18	17	15	15	16	16	17	17
Other		4	6	6	5	5	5	5	5	5	6
SPACE HEATING.	All sectors, TWh	3520	3154	2963	2730	2385	2204	2098	2031	1996	1961
Residential		2456	2082	1955	1798	1579	1455	1386	1346	1329	1312
Tertiary / Services		808	833	788	731	632	590	564	545	532	519
Industry		194	180	166	151	131	119	111	106	102	98
Other		62	59	54	49	43	39	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	197	243	259	264	242	248	250	251	249	246
Residential		184	224	238	241	222	226	228	228	225	222
Tertiary / Services		12	18	19	21	19	19	20	21	22	22
Industry		1	1	1	2	1	2	2	2	2	2
Other		0	0	0	0	0	0	0	0	0	0
INDUSTRY COMP.	All sectors, TWh	1554	2340	2554	2725	2396	2467	2512	2547	2582	2623
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		379	624	698	753	670	697	714	727	740	755
Industry		1101	1611	1744	1852	1619	1656	1677	1692	1707	1727
Other		74	104	112	120	108	114	121	127	134	141
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	8162	9608	9789	9882	8691	8624	8561	8530	8567	8642
Residential		3635	3791	3736	3566	3058	2931	2864	2826	2819	2822
Tertiary / Services		2054	2842	2958	3054	2676	2678	2665	2670	2704	2756
Industry		1477	2122	2277	2409	2112	2149	2171	2193	2220	2255
Other		170	215	221	228	202	206	211	216	223	230
Transport		826	637	597	625	643	660	649	625	601	579

NRGBAU

BAU Primary Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	72%	73%	73%	73%	73%	73%	73%	73%	73%	72%
	Tertiary / Services	24%	23%	23%	23%	23%	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%	26%	27%	27%	26%	27%	27%	27%	27%	26%
	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	93%	92%	92%	91%	92%	91%	91%	91%	90%	90%
	Tertiary / Services	6%	7%	7%	8%	8%	8%	8%	8%	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	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services	24%	27%	27%	28%	28%	28%	28%	29%	29%	29%
	Industry	71%	69%	68%	68%	68%	67%	67%	66%	66%	66%
	Other	5%	4%	4%	4%	4%	5%	5%	5%	5%	5%
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%	39%	38%	36%	35%	34%	33%	33%	33%	33%
	Tertiary / Services	25%	30%	30%	31%	31%	31%	31%	31%	32%	32%
	Industry	18%	22%	23%	24%	24%	25%	25%	26%	26%	26%
	Other	2%	2%	2%	2%	2%	2%	2%	3%	3%	3%
	Transport	10%	7%	6%	6%	7%	8%	8%	7%	7%	7%

NRGECO

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	1
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	15	18	17	15	11	11	12	13	14	15	15
EIWHS Electric Instant. Shower (secondary)	1.00	20	30	30	27	21	21	22	23	24	25	25
ESWH Electric Storage ≤ 30 L (secondary)	1.00	17	21	20	19	16	17	18	19	20	21	21
ESWH Electric Storage > 30 L (primary)	1.00	133	188	193	182	142	144	153	163	172	182	182
GIWH Gas Instant. < 13 L/min (secondary)	0.003	15	15	12	8	6	6	6	5	5	5	5
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	8	9	8	6	5	4	4	4	4	4	4
GSWH Gas Storage, Condensing	0.010	0	0	0	0	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	0.008	24	22	17	11	6	4	4	3	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	12
WH dedicated Water Heater		234	317	318	291	228	228	240	255	271	286	
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		411	593	584	536	444	429	440	456	471	486	
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	2	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	
1 CIRC Large standalone circulators	1	21	29	24	17	12	11	10	10	10	10	
1 CIRC Small standalone circulators	1	16	22	16	10	7	6	6	6	6	6	
1 CIRC Circulator pumps <2.5 kW	1	69	98	83	61	44	44	43	43	43	43	
TOTAL SPACE HEATING		3520	3115	2856	2517	2077	1828	1699	1630	1593	1557	
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	0	1	1	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
<i>LS, primary energy incl. control gear</i>												
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	
<i>Standby</i>	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	
<i>ES&DS only, without effects on infrastructure</i>												
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
<i>of which for modes under CR 1275/2008</i>			36	16	13	9	6	6	6	5	5	5
<i>Products regulated only for (networked) standby</i>												
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>												
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

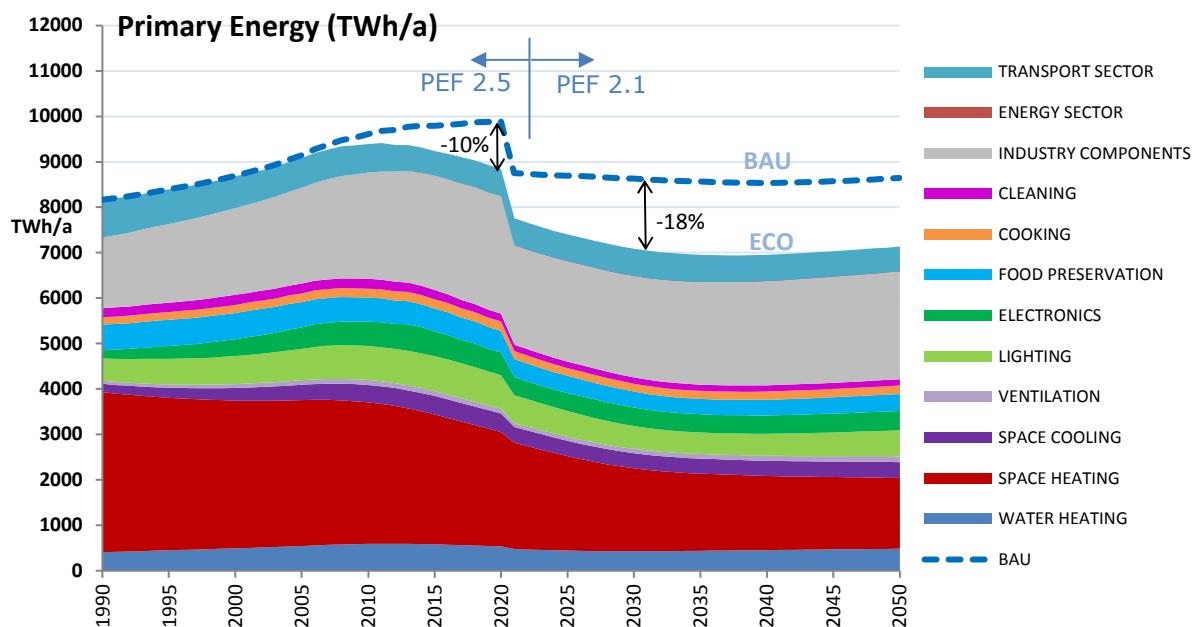
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db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	1	281	213	178	154	107	89	73	65	61	56
	CF open vertical chilled multi deck (RVC2)	1	35	32	30	28	20	14	10	10	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		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		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		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		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		26	38	41	45	42	45	48	50	52	54
	LD condensing heat pump	1	0	3	6	7	8	9	10	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
	VC dom	1	21	34	38	21	22	20	18	15	13	11
	VC nondom	1	6	10	11	9	7	8	8	8	8	8
	Total VC Vacuum Cleaner		27	45	48	30	29	27	25	23	21	19
	TOTAL CLEANING		197	212	200	170	141	138	137	136	136	136

db	ECO Primary Energy (in TWh primary NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
Total WP Water Pumps			197	264	284	303	273	293	313	334	354	375
CP Fixed Speed 5-1280 l/s		1	53	109	92	79	65	66	68	70	72	74
CP Variable speed 5-1280 l/s		1	0	20	35	45	42	43	44	45	46	47
CP Pistons 2-64 l/s		1	3	3	3	3	3	3	3	3	3	3
Total CP Standard Air Compressors			56	132	131	128	109	112	115	118	122	125
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			1554	2339	2519	2610	2230	2265	2313	2364	2420	2479
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	

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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	8162	9393	9237	8845	7402	7091	6954	6954	7033	7134	
ECO Primary Energy, Total, in PJ	29381.5	33816.6	33253.3	31840.3	26645.6	25525.8	25033.3	25033.3	25319.1	25681.4	
ECO Primary Energy, Total, in mtoe	702	808	794	760	636	610	598	598	605	613	
ECO Primary Energy (summary ALL SECTORS)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	411	593	584	536	444	429	440	456	471	486	
SPACE HEATING	3520	3115	2856	2517	2077	1828	1699	1630	1593	1557	
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	
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	197	212	200	170	141	138	137	136	136	136	
INDUSTRY COMPONENTS	1554	2339	2519	2610	2230	2265	2313	2364	2420	2479	
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	8162	9393	9237	8845	7402	7091	6954	6954	7033	7134	
ECO Primary Energy, Total, in PJ	29381.5	33816.6	33253.3	31840.3	26645.6	25525.8	25033.3	25033.3	25319.1	25681.4	
ECO Primary Energy, Total, in mtoe	702	808	794	760	636	610	598	598	605	613	
For comparison: Eurostat Energy Balance ed. Feb. 2021 for EU27 (2020), Primary Energy Consumption (code PEC2020-2030) (in mtoe)	1367	1458	1354								
Share EIA products / Eurostat total	51%	55%	59%								
							-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 FNREG-, 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)

NRGECO

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	18	17	16	13	13	13	14	14	14
SPACE HEATING	194	178	161	140	114	98	89	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	1	1	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	1101	1611	1723	1783	1518	1534	1561	1590	1623	1658
ECO Primary Energy, Industry, in TWh	1477	2116	2241	2302	1956	1953	1975	2014	2062	2117
ECO Primary Energy, Industry, in PJ	5319	7617	8069	8288	7040	7029	7110	7249	7423	7620
ECO Primary Energy, Industry, in mtoe	127	182	193	198	168	168	170	173	177	182
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, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	97	136	135	124	101	98	102	107	112	116
SPACE HEATING	808	822	758	672	547	486	455	436	425	413
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	12	16	16	14	12	12	12	12	13	13
INDUSTRY COMPONENTS	379	624	685	711	609	621	636	651	668	685
ECO Primary Energy, Services, in TWh	2054	2804	2848	2805	2325	2218	2174	2194	2249	2317
ECO Primary Energy, Services, in PJ	7393	10095	10254	10098	8371	7984	7828	7900	8097	8342
ECO Primary Energy, Services, in mtoe	177	241	245	241	200	191	187	189	193	199
ECO Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	298	433	426	391	326	314	321	331	341	351
SPACE HEATING	2456	2056	1884	1659	1379	1212	1126	1082	1061	1041
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	184	194	183	154	129	125	124	123	122	122
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Primary Energy, Residential, in TWh	3635	3628	3391	2943	2368	2167	2071	2042	2044	2048
ECO Primary Energy, Residential, in PJ	13085	13062	12207	10596	8525	7800	7454	7351	7357	7374
ECO Primary Energy, Residential, in mtoe	313	312	292	253	204	186	178	176	176	176

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ECO Primary Energy (summary OTHER)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4	6	6	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	74	104	111	117	103	110	116	123	129	136
ECO Primary Energy, Other sectors, in TWh	170	213	216	215	186	186	190	196	204	211
ECO Primary Energy, Other sectors, in PJ	611	767	776	774	668	670	685	707	733	761
ECO Primary Energy, Other sectors, in mt ² e	15	18	19	18	16	16	16	17	18	18

NRGECO

ECO Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	411	593	584	536	444	429	440	456	471	486
Residential		298	433	426	391	326	314	321	331	341	351
Tertiary / Services		97	136	135	124	101	98	102	107	112	116
Industry		12	18	17	16	13	13	13	14	14	14
Other		4	6	6	5	4	4	4	4	4	5
SPACE HEATING.	All sectors, TWh	3520	3115	2856	2517	2077	1828	1699	1630	1593	1557
Residential		2456	2056	1884	1659	1379	1212	1126	1082	1061	1041
Tertiary / Services		808	822	758	672	547	486	455	436	425	413
Industry		194	178	161	140	114	98	89	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	197	212	200	170	141	138	137	136	136	136
Residential		184	194	183	154	129	125	124	123	122	122
Tertiary / Services		12	16	16	14	12	12	12	12	13	13
Industry		1	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	1554	2339	2519	2610	2230	2265	2313	2364	2420	2479
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		379	624	685	711	609	621	636	651	668	685
Industry		1101	1611	1723	1783	1518	1534	1561	1590	1623	1658
Other		74	104	111	117	103	110	116	123	129	136
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	8162	9393	9241	8859	7424	7126	7005	7022	7119	7238
(excl. Energy sector)	Residential	3635	3628	3391	2943	2368	2167	2071	2042	2044	2048
	Tertiary / Services	2054	2804	2848	2805	2325	2218	2174	2194	2249	2317
	Industry	1477	2116	2241	2302	1956	1953	1975	2014	2062	2117
	Other	170	213	216	215	186	186	190	196	204	211
	Transport	826	632	545	593	590	603	595	576	560	545

NRGECO

ECO Primary Energy (summary FUNCTIONS, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
Residential		72%	73%	73%	73%	73%	73%	73%	73%	72%	72%
Tertiary / Services		24%	23%	23%	23%	23%	23%	23%	23%	24%	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%	26%	27%	27%	26%	27%	27%	27%	27%	26%
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		93%	92%	91%	91%	91%	91%	90%	90%	90%	90%
Tertiary / Services		6%	8%	8%	8%	8%	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		0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Tertiary / Services		24%	27%	27%	27%	27%	27%	28%	28%	28%	28%
Industry		71%	69%	68%	68%	68%	68%	67%	67%	67%	67%
Other		5%	4%	4%	4%	5%	5%	5%	5%	5%	5%
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%	33%	32%	30%	30%	29%	29%	28%
Tertiary / Services		25%	30%	31%	32%	31%	31%	31%	31%	32%	32%
Industry		18%	23%	24%	26%	26%	27%	28%	29%	29%	29%
Other		2%	2%	2%	2%	2%	3%	3%	3%	3%	3%
Transport		10%	7%	6%	7%	8%	8%	8%	8%	8%	8%

NRGSAVE

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	0
EIWH Electric Instant. ≥ 12 kW (primary)	1.00	0	0	1	2	2	3	3	3	4	4	4
EIWHS Electric Instant. Shower (secondary)	1.00	0	0	1	4	5	6	6	6	6	7	7
ESWH Electric Storage ≤ 30 L (secondary)	1.00	0	0	0	1	1	1	0	0	0	0	0
ESWH Electric Storage > 30 L (primary)	1.00	0	0	1	8	12	16	17	17	17	18	18
GIWH Gas Instant. < 13 L/min (secondary)	0.003	0	0	1	2	3	3	3	2	2	2	2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.008	0	0	0	1	2	2	1	1	1	1	1
GSWH Gas Storage, Condensing	0.010	0	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	1
Dedicated WH Heat Pump	1.00	0	0	1	2	3	5	7	9	10	12	12
Dedicated WH Solar (3.5 m2)	0.80	0	0	1	2	2	3	3	2	2	2	2
WH dedicated Water Heater		0	0	8	24	33	41	42	43	45	46	
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	0
CHB Jet Burner Oil + Cyl. WH	0.04	0	0	0	1	2	3	3	3	3	3	3
CHB Electric (Joule) + Cyl. WH	1.00	0	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	12	39	58	75	81	84	88	92	
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	

NRGSAVE

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	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	9.9	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	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	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	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	1.0
LH pellet stove	0	0.0	0.0	0.0	0.1	0.4	0.7	0.7	0.6	0.6	0.6	0.7
LH Solid fuel sum		0	0	0	3	11	17	22	25	27	26	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	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	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	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	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	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	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	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	0.3
LH Electric sum		0	0	4	17	24	28	28	26	25	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	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	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	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	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	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	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	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	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	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	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	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	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	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	
¹ CIRC Large standalone circulators	1	0	0	3	8	7	5	4	3	3	2	
¹ CIRC Small standalone circulators	1	0	0	3	8	7	6	5	5	4	4	
¹ CIRC Circulator pumps <2.5 kW	1	0	0	12	31	32	29	26	23	20	17	
TOTAL SPACE HEATING		0	39	107	213	308	376	399	401	403	404	
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	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	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	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	0.1	0.7	1.3	2.1	2.7	3.2	3.6	4.1	
NR-AHU-S 2500-5500 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-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		

NRGSAVE

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>LS, primary energy incl. control gear (BAU-ECO)</i>												
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	
<i>Standby</i>	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	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	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	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	1.6	
Total Game consoles, all modes		0	0	3	10	9	9	9	9	9	9	
<i>ES&DS only, without effects on infrastructure</i>												
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							
ES total cloud		0	0	0	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	7	7	7	7	

NRGSAVE

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									
	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
	<i>Products regulated only for (networked) standby</i>											
	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
	<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
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	<i>EPS Active mode (electricity losses)</i>											
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	0.0	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	<i>EPS No-load mode</i>											
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

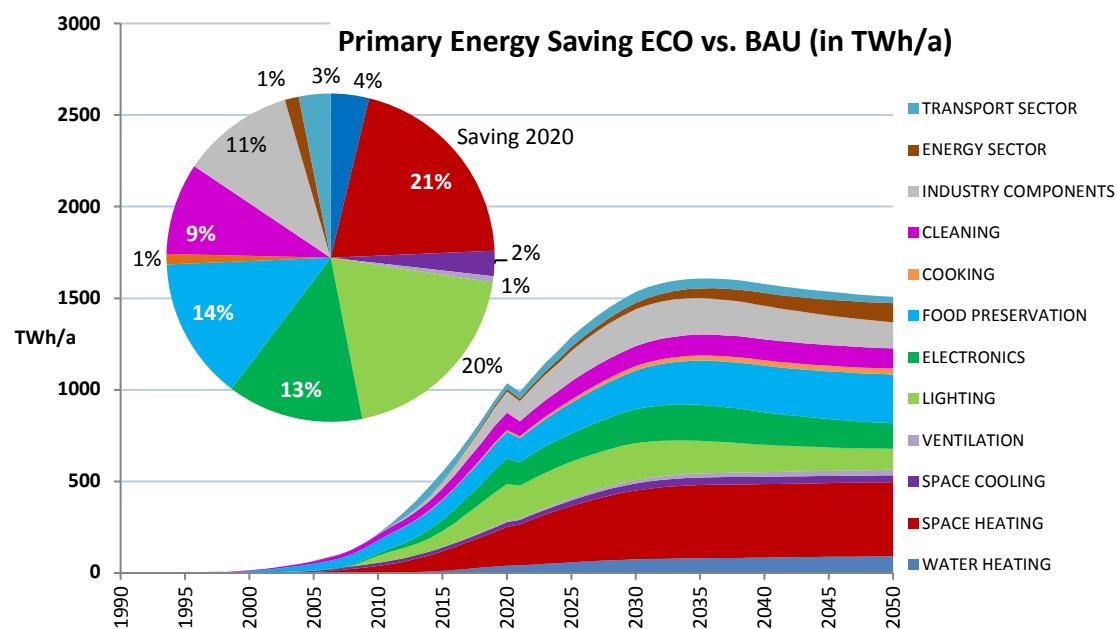
NRGSAVE

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	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	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	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	0.0	-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	0.0	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	
	VC dom	1	0	0	9	28	38	44	48	50	51	49	
	VC nondom	1	0	0	1	5	5	5	6	6	7	7	
	Total VC Vacuum Cleaner		0	0	10	33	43	49	54	57	58	57	
	TOTAL CLEANING		-	31	59	94	101	109	114	114	113	110	

db	SAVED Primary Energy (BAU-ECO, in TWh NCV)	elec	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
Total WP Water Pumps			1	0	0	3	7	8	9	9	10	11
CP Fixed Speed 5-1280 l/s		1	0.0	0.0	0.4	1.4	2.0	2.1	1.9	1.8	1.6	1.4
CP Variable speed 5-1280 l/s		1	0.0	0.0	0.1	0.5	0.8	1.0	0.9	0.7	0.5	0.3
CP Pistons 2-64 l/s		1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CP Standard Air Compressors			0	0	0	2	3	3	3	3	2	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	35	115	166	201	200	183	162	143
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	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	1	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

NRGSAVE

SAVED Primary Energy, Total, in TWh	0	214	552	1037	1290	1533	1607	1577	1534	1508
SAVED Primary Energy, Total, in PJ	0	772	1987	3734	4643	5520	5786	5676	5524	5431
SAVED Primary Energy, Total, in mtoe	0	18	47	89	111	132	138	136	132	130
SAVED Primary Energy (BAU-ECO, All Sectors)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	12	39	58	75	81	84	88	92
SPACE HEATING	0	39	107	213	308	376	399	401	403	404
SPACE COOLING	0	17	21	26	31	39	42	40	39	37
VENTILATION	0	0	1	6	11	18	22	25	28	31
<i>Impact vs. BAU of VU on SH primary energy (already accounted under Space Heating)</i>	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	59	94	101	109	114	114	113	110
INDUSTRY COMPONENTS	0	1	35	115	166	201	200	183	162	143
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	552	1037	1290	1533	1607	1577	1534	1508
SAVED Primary Energy, Total, in PJ	0	772	1987	3734	4643	5520	5786	5676	5524	5431
SAVED Primary Energy, Total, in mtoe	0	18	47	89	111	132	138	136	132	130
Saving in % versus BAU (from 1990=0)		0.0%	2.2%	5.6%	10.5%	14.8%	17.8%	18.8%	18.5%	17.9%
Saving In % versus BAU (from 2010=0)		-2.6%	0.0%	3.4%	8.3%	12.4%	15.3%	16.3%	16.0%	15.4%
										17.5%



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 FNKG-, 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

NRGSAVE

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	3	3	3
SPACE HEATING	0	2	5	11	17	21	22	21	20	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	1	1	1	1
INDUSTRY COMPONENTS	0	1	20	69	101	121	117	102	85	68
SAVED Primary Energy, Industry, in TWh	0	6	35	106	156	196	196	179	158	138
SAVED Primary Energy, Industry, in PJ	0	23	127	383	563	706	707	645	567	497
SAVED Primary Energy, Industry, in mtoe	0	1	3	9	13	17	17	15	14	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	10	14	17	18	19	20	21
SPACE HEATING	0	11	29	60	85	104	110	108	108	107
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	3	7	7	8	8	9	9	9
INDUSTRY COMPONENTS	0	0	14	42	61	75	78	76	73	70
SAVED Primary Energy, Services, in TWh	0	38	110	249	351	460	491	476	455	439
SAVED Primary Energy, Services, in PJ	0	137	396	896	1264	1657	1768	1714	1638	1581
SAVED Primary Energy, Services, in mtoe	0	3	9	21	30	40	42	41	39	38
SAVED Primary Energy (summary RESIDENTIAL, TWh)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	9	28	42	54	59	62	65	68
SPACE HEATING	0	26	71	139	200	244	260	264	268	271
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	56	87	93	101	105	105	103	100
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED Primary Energy, Residential, in TWh	0	163	345	623	690	765	794	785	775	773
SAVED Primary Energy, Residential, in PJ	0	587	1241	2242	2484	2753	2858	2824	2792	2783
SAVED Primary Energy, Residential, in mtoe	0	14	30	54	59	66	68	67	67	66
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	7	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	5	5	5	5	5
SAVED Primary Energy, Other sectors, in TWh	0	2	6	13	17	20	20	20	19	19
SAVED Primary Energy, Other sectors, in PJ	0	7	21	45	60	71	74	72	70	69
SAVED Primary Energy, Other sectors, in mtoe	0	0	0	1	1	2	2	2	2	2

NRGSAVE

SAVED Primary Energy (summary FUNCTIONS, TWh)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	0	0	12	39	58	75	81	84	88	92
Residential		0	0	9	28	42	54	59	62	65	68
Tertiary / Services		0	0	3	10	14	17	18	19	20	21
Industry		0	0	0	1	2	2	2	3	3	3
Other		0	0	0	0	1	1	1	1	1	1
SPACE HEATING.	All sectors, TWh	0	39	107	213	308	376	399	401	403	404
Residential		0	26	71	139	200	244	260	264	268	271
Tertiary / Services		0	11	29	60	85	104	110	108	108	107
Industry		0	2	5	11	17	21	22	21	20	20
Other		0	1	2	4	6	7	8	7	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	1	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	59	94	101	109	114	114	113	110
Residential		0	30	56	87	93	101	105	105	103	100
Tertiary / Services		0	1	3	7	7	8	8	9	9	9
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	1	35	115	166	201	200	183	162	143
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		0	0	14	42	61	75	78	76	73	70
Industry		0	1	20	69	101	121	117	102	85	68
Other		0	0	1	3	4	5	5	5	5	5
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	548	1023	1267	1498	1556	1508	1448	1404
(excl. Energy	Residential	0	163	345	623	690	765	794	785	775	773
sector)	Tertiary / Services	0	38	110	249	351	460	491	476	455	439
	Industry	0	6	35	106	156	196	196	179	158	138
	Other	0	2	6	13	17	20	20	20	19	19
	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%	72%	73%	73%	73%	74%	74%
	Tertiary / Services			24%	24%	24%	23%	23%	23%	23%	22%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential			66%	67%	65%	65%	65%	66%	66%	67%
	Tertiary / Services			28%	28%	28%	28%	27%	27%	27%	26%
	Industry			4%	4%	5%	5%	5%	5%	5%	5%
	Other			1%	1%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential			62%	60%	42%	28%	21%	19%	20%	22%
	Tertiary / Services			32%	34%	44%	51%	55%	56%	56%	55%
	Industry			5%	5%	11%	16%	18%	19%	19%	16%
	Other			1%	1%	3%	5%	5%	6%	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%
	Tertiary / Services			26%	34%	32%	45%	59%	65%	68%	69%
	Industry			7%	9%	8%	11%	15%	17%	18%	19%
	Other			1%	2%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential			53%	73%	74%	75%	74%	72%	71%	72%
	Tertiary / Services			47%	26%	25%	24%	25%	26%	27%	26%
	Industry			0%	1%	1%	1%	2%	2%	2%	2%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential			92%	92%	86%	76%	68%	66%	65%	65%
	Tertiary / Services			6%	6%	10%	19%	26%	28%	29%	29%
	Industry			1%	1%	3%	4%	5%	5%	5%	5%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential			87%	85%	84%	84%	83%	83%	83%	83%
	Tertiary / Services			13%	15%	16%	16%	17%	17%	17%	17%
	Industry			0%	0%	0%	0%	0%	0%	0%	0%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential			96%	94%	92%	92%	92%	92%	91%	91%
	Tertiary / Services			4%	5%	7%	7%	7%	7%	8%	9%
	Industry			0%	0%	1%	1%	1%	1%	1%	1%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential			0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services			23%	39%	37%	37%	37%	39%	41%	45%
	Industry			65%	57%	60%	61%	60%	58%	56%	52%
	Other			12%	4%	3%	2%	2%	3%	3%	3%
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%	63%	61%	54%	51%	51%	52%	54%
	Tertiary / Services			18%	20%	24%	28%	31%	32%	32%	31%
	Industry			3%	6%	10%	12%	13%	13%	12%	10%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
	Transport			2%	10%	3%	4%	4%	3%	3%	2%

EMISSRATES

Emission rates

GWP (Global Warming Potential)

All greenhouse gas emissions in GWP-100, CO₂ equivalent

			(values taken from the user choice on sheet General_1)									
			1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
electricity												
GWPel	electricity	kg CO ₂ /kWh	0.500	0.410	0.395	0.380	0.360	0.340	0.320	0.300	0.280	0.260
heating fuels												
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 _x BAU	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 _x ECO	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), NO_x, CO, OGC and PM emissions

CR 2015/1189 sets emissions limits for NO_x (nitrogen oxides), CO (carbon monoxide), OGC (organic gaseous carbon) and PM (particulate matter). For NO_x insufficient data were available in IA for a quantification of emissions in EIA and hence no NO_x 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 emission 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/m ³ in 2010	CO-emission rates in g/GJ, average of stock									
		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

ECO	mg/m ³ in 2020	CO-emission rates in g/GJ, average of stock									
		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/m ³ in 2010	OGC-emission rates in g/GJ, average of stock									
		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

EMISSRATES

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
SFB Coal	20		18	11	11	10	10	10	10	10	10
SFB Pellets	20		54	45	44	38	31	26	20	17	17
SFB Wood chips	20		11	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**

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**

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**

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

EMISSRATES

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

ECO	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

ECO	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, comfort 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 mg/kWh in 2021
limits from WD limits from WD

ECO	limits from WD	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

EMISSRATES

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)

EMISSBAU

db	BAU Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>see also other emissions at bottom of Table</i>											
EIWH Electric Instant. < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant. ≥ 12 kW (primary)	3	3	3	3	2	2	2	2	2	2	2
EIWS Electric Instant. Shower (secondary)	4	5	5	5	4	4	4	4	4	4	4
ESWH Electric Storage ≤ 30 L (secondary)	3	3	3	3	3	3	3	3	3	3	3
ESWH Electric Storage > 30 L (primary)	27	31	31	29	27	26	26	26	25	25	25
GIWH Gas Instant. < 13 L/min (secondary)	3	3	2	2	2	2	2	2	1	1	1
GIWH Gas Instant. ≥ 13 L/min (primary)	1	2	2	1	1	1	1	1	1	1	1
GSH Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0	0
GSH Gas Storage, Non-condensing	5	4	4	3	2	1	1	1	1	1	1
Dedicated WH Heat Pump	0	0	0	1	1	2	2	3	3	3	3
Dedicated WH Solar (3.5 m ²)	0	2	3	3	3	3	2	2	2	2	2
WH dedicated Water Heater	47	54	53	49	46	44	44	44	43	43	43
CHB Gas Combi Instant. WH	11	27	28	28	27	28	28	28	28	28	28
CHB Gas + Cyl. WH	7	12	12	11	11	11	11	11	11	11	11
CHB Jet Burner Gas + Cyl. WH	2	2	1	1	1	1	0	0	0	0	1
CHB Jet Burner Oil + Cyl. WH	19	16	13	10	7	5	5	5	5	5	5
CHB Electric (Joule) + Cyl. WH	1	1	1	1	1	1	1	1	0	0	0
CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	0	0	0	0	0
CHB Electric HP + Cyl. WH	0	1	1	1	2	2	2	2	2	2	2
CHB Gas HP + Cyl. WH	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
CHB Solar Combi (16 m ²)	0	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	40	58	56	53	49	47	47	47	48	48	48
TOTAL WATER HEATING	87	112	109	102	94	92	91	91	91	91	90
CHB Gas non-condensing	154	173	139	105	75	64	56	47	40	34	
CHB Gas condensing	2	55	82	107	125	130	131	129	127	124	
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	179	135	95	61	33	19	15	13	11	
CHB Oil Jet burner condensing	0	3	6	9	12	16	17	17	18	18	
CHB Electric Joule-effect	6	6	6	6	6	5	4	3	3	2	
CHB Hybrid (gas-electric)	0	0	0	0	0	0	0	1	1	1	
CHB Electric Heat Pump	1	5	6	8	9	10	10	11	11	11	
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 m ²)	1	1	1	1	1	1	1	1	1	1	
CHB Central Heating boiler < 400 kW, space heating	459	432	383	338	295	262	242	227	217	207	
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	3.7	4.1	4.2	4.0	3.8	3.6	3.4	3.1	2.9	
CHAE-L (> 400 kW)	2.6	5.2	5.5	5.5	5.2	4.5	4.0	3.5	3.1	2.8	
CHWE-S (< 400 kW)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	
CHWE-M (> 400 kW; ≤ 1500 kW)	0.6	1.1	1.2	1.2	1.1	1.0	0.8	0.7	0.7	0.6	
CHWE-L (> 1500 kW)	0.4	0.7	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.4	
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	13.1	14.0	14.4	14.2	13.7	13.1	12.4	11.7	11.0	
HT PCH-AE-L	9.6	12.5	13.3	13.7	13.4	12.9	12.3	11.6	11.0	10.3	
HT PCH-WE-S	2.0	2.8	2.9	3.1	3.0	2.9	2.8	2.6	2.5	2.3	
HT PCH-WE-M	4.1	5.4	5.8	6.0	5.9	5.7	5.4	5.2	4.9	4.6	
HT PCH-WE-L	0.8	1.1	1.2	1.2	1.2	1.2	1.1	1.1	1.0	0.9	
AC rooftop	1.4	2.8	2.6	2.2	1.6	0.9	0.4	0.2	0.1	0.1	
AC splits	1.9	4.6	4.4	3.9	3.5	3.0	2.5	2.1	1.7	1.4	
AC VRF	0.0	1.2	1.6	2.1	2.4	2.8	3.1	3.1	3.1	2.9	
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	55	58	59	57	53	50	47	44	41	
AC rooftop (rev)	1.9	4.7	4.6	3.9	2.9	1.7	0.8	0.2	0.0	0.0	
AC splits (rev)	3.4	8.7	8.7	8.2	7.4	6.3	5.3	4.4	3.7	3.0	
AC VRF (rev)	0.0	2.9	4.0	5.4	6.3	7.3	7.7	7.6	7.1	6.5	
ACF (rev)	0	0	0	0	0	0	0	0	0	0	
AHF	43	31	27	23	20	18	16	14	12	11	
AHE	0.5	1.0	0.8	0.5	0.4	0.4	0.4	0.3	0.3	0.2	
SubTotal AHC central Air Heating	49	49	45	41	37	34	30	27	23	21	
Total AHC central Air Heating & Cooling	84	103	103	100	94	87	80	73	67	61	

EMISSBAU

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	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	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	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	1.3
LH cooker	0.1	0.2	0.3	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	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	0.7
LH Solid fuel sum	11	8	8	8	8	7	7	6	6	6	6
LH Electric portable	12	9	8	8	7	6	6	5	4	4	4
LH Electric fixed > 250W	62	45	40	33	27	22	20	18	16	14	
LH Electric fixed ≤ 250W	4	3	3	2	2	1	1	1	1	1	1
LH Electric storage	4	3	2	2	2	2	1	1	1	1	1
LH Electric underfloor	11	9	8	8	7	6	6	5	5	4	
LH Electric visibly glowing > 1.2 kW	1	1	1	1	1	1	0	0	0	0	0
LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0	0
LH Electric Towel Heaters	3	4	4	4	3	3	2	2	2	2	2
LH Electric sum	96	73	66	58	48	41	37	33	29	26	
LH Gas luminous (commercial)	0.2	0.2	0.2	0.2	0.2	0.1	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	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	0.1
LH Gas balanced flue	1.7	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.2	0.2	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	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	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	0.0
LH Liquid closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	84	76	67	57	50	45	40	36	32	
RAC fixed < 6 kW, cooling	0.9	6.8	5.8	4.2	3.9	4.0	4.0	4.1	4.2	4.4	
RAC fixed 6-12 kW, cooling	0.5	3.6	3.5	2.7	2.5	2.4	2.3	2.2	2.2	2.2	
RAC portable < 12 kW, cooling	0.1	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	
RAC < 12 kW total, cooling mode	1	11	10	7							
RAC fixed < 6 kW, reversible, heating	0.4	8.3	9.2	8.7	9.9	11.5	12.9	14.4	15.5	16.0	
RAC fixed 6-12 kW, reversible, heating	0.2	4.2	5.2	5.2	5.8	6.4	6.8	7.3	7.5	7.5	
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	1	13	14	14	16	18	20	22	23	24	
RAC Room Air Conditioner	2	23	24	21	22	25	26	28	30	30	
¹ CIRC Integrated circulators	6.5	7.7	7.6	7.6	7.4	7.2	6.7	6.0	5.4	4.7	
¹ CIRC Large standalone circulators	4.1	4.8	4.3	3.7	3.2	2.6	2.2	1.9	1.7	1.5	
¹ CIRC Small standalone circulators	3.1	3.5	3.1	2.7	2.4	2.0	1.7	1.5	1.3	1.1	
¹ CIRC Circulator pumps <2.5 kW	14	16	15	14	13	12	11	9	8	7	
TOTAL SPACE HEATING	771	622	564	497	433	382	349	328	311	295	
TOTAL SPACE COOLING	37	65	67	66	64	60	57	53	51	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	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	0.0
R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.1	0.1	0.2	0.5	0.7	0.9	1.1	1.2	
R-UVU 100-250 m3/h	0.2	0.3	0.3	0.3	0.3	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	0.3	0.4	0.4	
R-UVU 250-1000 m3/h	1.1	2.1	2.2	2.2	2.2	2.1	2.1	2.0	1.9	1.8	
R-BVU 250-1000 m3/h	0.0	0.2	0.3	0.3	0.6	1.1	1.5	1.9	2.3	2.6	
R-UVU > 1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	
R-BVU 1000-2500 m3/h	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
RVU, Total residential, from VU own electricity	1	3	3	3	4	4	5	6	6	6	
NR-UVU 250-1000 m3/h	0.5	0.8	0.8	0.8	0.7	0.7	0.7	0.6	0.6	0.5	
NR-BVU 250-1000 m3/h	0.0	0.3	0.5	0.5	0.6	0.7	0.8	0.8	0.9	0.9	
NR-UVU > 1000 m3/h	0.3	0.5	0.4	0.3	0.3	0.3	0.3	0.2	0.2	0.2	
NR-BVU 1000-2500 m3/h	0.0	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7	
NR-AHU-S 2500-5500 m3/h	0.1	1.0	1.4	1.7	1.9	2.0	2.2	2.3	2.4	2.4	
NR-AHU-M 5500-14500 m3/h	8.6	9.4	8.6	8.0	7.5	7.4	7.3	7.2	7.0	6.7	
NR-AHU-L > 14500 m3/h	2.4	2.7	2.4	2.2	2.1	2.1	2.1	2.0	2.0	1.9	
NRVU, Total non-residential, from VU own electricity	12	15	14	13							
VU Ventilation Units, res + non-res. from VU own elec.	13	18	17	17	17	18	19	19	20	20	
TOTAL VENTILATION (from VU own electricity)	13	18	17	17	17	18	19	19	20	20	
¹ Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)	-	-	-	-	-	-	-	-	-	-	

EMISSBAU

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	49.9	57.7	62.7	58.7	47.6	35.1	25.7	18.8	13.7	
HID (HPM, HPS, MH)	14.3	25.5	25.7	25.1	20.2	12.8	6.5	3.3	1.7	0.9	
CFLni (all shapes)	1.0	3.4	3.6	3.5	3.0	2.0	1.0	0.5	0.3	0.1	
CFLi (retrofit for GLS, HL)	0.4	4.5	5.8	5.8	4.7	3.6	2.2	1.3	0.8	0.5	
GLS (DLS & NDLS)	36.8	25.2	17.9	12.5	7.0	3.9	2.1	1.2	0.6	0.3	
HL (DLS & NDLS, LV & MV)	3.1	14.9	18.8	21.5	14.5	7.0	3.4	1.7	0.9	0.5	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.3	3.1	8.8	16.6	23.6	29.1	33.5	37.3	
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	2.4	6.7	11.2	14.3	16.3	17.9	19.3	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.4	0.8	1.2	1.4	1.5	1.6	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.3	0.8	1.2	1.4	1.6	1.6	1.7	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	1.1	3.1	4.8	6.0	6.6	7.0	7.2	
<i>Standby</i>	4.7	6.0	5.1	4.1	3.2	2.5	2.4	2.2	2.1	1.9	
TOTAL LIGHTING (incl. standby)	99	129	135	142	131	114	99	91	87	85	
DP TV on-mode, total all types	11.7	25.2	27.9	28.2	24.4	26.0	24.3	21.3	19.3	18.4	
DP TV standby, standard (NoNA)	1.5	0.8	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	0.4	0.2	0.1	0.0	0.0	0.0	0.0	
DP TV standby, HiNA ('Smart')	0.0	0.0	0.6	1.6	2.3	2.7	2.6	2.2	1.8	1.4	
DP TV standby, total all types	2	1	1	2	3	3	3	2	2	1	
DP TV total on-mode + standby	13	26	29	30	27	29	27	24	21	20	
DP Monitor on-mode	0.4	5.1	3.0	2.0	1.9	1.6	1.2	1.0	0.9	0.8	
DP Monitor standby	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DP Monitor total	0	5	3	2	2	2	1	1	1	1	
DP Signage on-mode	0.0	0.4	3.1	6.8	7.8	7.1	6.2	5.6	5.0	4.5	
DP Signage standby	0.0	0.1	0.5	1.0	1.2	1.1	0.9	0.8	0.7	0.7	
DP Signage total	0	0	4	8	9	8	7	6	6	5	
DP Electronic Displays, total on-mode	12	31	34	37	34	35	32	28	25	24	
DP Electronic Displays, total standby	2	1	2	3	4	4	4	3	3	2	
DP Electronic Displays, total	14	32	36	40	38	39	35	31	28	26	
SSTB	0.0	1.1	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CSTB (low-power modes)	0.0	2.1	4.7	4.5	4.0	3.5	3.2	3.0	2.8	2.6	
CSTB (other modes)	0.0	1.1	2.5	2.4	2.1	1.9	1.7	1.6	1.5	1.4	
CSTB (all covered modes)	0.0	3.2	7.2	6.9	6.1	5.4	4.9	4.6	4.3	4.0	
Total STB set top boxes (Complex & Simple)	0	4	8	7	6	5	5	5	4	4	
Game consoles > 20 W Active modes (SRI)	0.0	1.0	1.8	2.1	1.9	1.8	1.7	1.6	1.5	1.4	
Game consoles > 20 W Non-Active (CR)	0.0	0.5	0.8	0.9	0.8	0.7	0.7	0.7	0.6	0.6	
Game consoles < 20 W Non-Active (CR)	0.0	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	
Game consoles < 20 W Active (no reg.)	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
Total Game consoles, active modes	0.0	1.1	1.8	2.2	2.0	1.8	1.7	1.6	1.5	1.4	
Total Game consoles, non-active modes	0.0	0.9	1.2	1.3	1.2	1.1	1.0	1.0	0.9	0.8	
Total Game consoles > 20 W, all modes	0.0	1.5	2.5	3.0	2.7	2.5	2.4	2.2	2.1	1.9	
Total Game consoles < 20 W, all modes	0.0	0.4	0.5	0.4	0.4	0.4	0.4	0.3	0.3	0.3	
Total Game consoles, all modes	0	2	3	3	3	3	3	3	2	2	
<i>ES&DS only, without effects on infrastructure</i>											
ES tower 1-socket traditional	0.0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 1-socket traditional	0.1	1.2	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.5	
ES rack 2-socket traditional	0.3	5.3	2.7	1.6	1.8	2.0	2.0	1.9	1.7	1.6	
ES rack 2-socket cloud	0.0	3.0	4.5	4.8	5.3	5.9	6.0	5.6	5.3	4.9	
ES rack 4-socket traditional	0.0	0.6	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.2	
ES rack 4-socket cloud	0.0	0.3	0.6	0.7	0.8	0.9	0.9	0.9	0.8	0.8	
ES rack 2-socket resilient trad.	0.0	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 2-socket resilient cloud	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
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	0.0	0.0	0.0	0.0	0.0	0.0	
ES blade 1-socket traditional	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ES blade 2-socket traditional	0.3	2.4	1.2	0.7	0.8	0.9	0.9	0.9	0.8	0.8	
ES blade 2-socket cloud	0.0	1.4	2.0	2.3	2.6	2.9	2.9	2.8	2.6	2.4	
ES blade 4-socket traditional	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
ES blade 4-socket cloud	0.0	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.3	0.3	
ES total traditional	1	11	6	4	4	4	4	4	4	4	
ES total cloud	0	5	7	8	9	10	10	10	9	9	
ES Enterprise Servers total	1	16	13	12	13	15	15	14	13	12	
DS Online 2	0.2	2.3	3.0	4.0	4.8	5.4	5.4	5.0	4.7	4.4	
DS Online 3	0.0	0.3	0.4	0.6	0.7	0.8	0.8	0.7	0.7	0.6	
DS Online 4	0.1	1.3	1.7	2.2	2.6	3.0	2.9	2.8	2.6	2.4	
DS Data Storage products total	0	4	5	7	8	9	9	9	8	7	
ES + DS total (excl. infrastructure)	1	20	19	19	21	24	24	22	21	19	

EMISSBAU

db	BAU Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	7.8	8.5	5.5	3.4	3.5	3.7	3.4	3.1	2.7	2.4	
PC Integrated Desktop	0.2	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	
PC Notebook	0.0	3.0	3.3	2.6	2.6	2.6	2.5	2.4	2.2	2.0	
PC Tablet/slate	0.0	0.1	0.9	0.9	0.5	0.5	0.5	0.4	0.4	0.4	
PC Thin client	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PC Workstation	0.3	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	
Total PC, electricity	8	13	11	8	8	8	7	7	6	5	
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	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	
EP / Laser Printer mono	3.9	0.9	0.7	0.5	0.4	0.3	0.2	0.2	0.1	0.1	
EP / Laser Printer colour	0.0	0.5	0.7	0.9	1.0	1.0	1.0	0.9	0.9	0.9	
EP / Laser Copier mono	4.4	0.5	0.3	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	0.9	1.1	1.1	1.0	0.9	0.8	0.7	0.6	0.6	
EP / Laser MFD colour	0.0	1.0	1.3	1.3	1.2	1.1	0.9	0.8	0.7	0.7	
Total IE Imaging Equipment, from electricity	9	4	5	4	4	4	3	3	3	2	
of which for modes under CR 1275/2008	7	3	4	3	3	3	2	2	2	2	
(see Resources for contributions from paper, toner)											
<i>Products regulated only for (networked) standby</i>											
SB Radios (sb & off modes)	1.0	2.4	2.1	1.7	1.4	1.2	1.0	0.9	0.7	0.6	
SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
SB Audio speakers (wired) (sb & off modes)	0.9	1.1	0.8	0.4	0.1	0.0	0.0	0.0	0.0	0.0	
SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.3	1.2	1.8	1.8	1.7	1.6	1.5	1.4	
SB Small appliances (sb & off modes)	0.6	2.8	2.8	2.8	2.7	2.6	2.5	2.4	2.2	2.1	
SB Media boxes /sticks (sb mode)	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.4	0.3	0.3	
SB Media players and recorders (sb mode)	0.0	1.4	1.6	0.4	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	1.3	1.3	1.2	1.0	0.8	0.7	0.6	0.5	0.4	
SB Office phones (nsb mode)	0.3	0.9	0.7	0.6	0.4	0.3	0.3	0.2	0.2	0.2	
SB Home NAS (nsb mode)	0.0	0.4	0.6	0.8	0.9	1.0	1.0	1.0	0.9	0.8	
SB Home Network Equipment (nsb mode)	0.0	1.1	1.3	1.3	1.3	1.3	1.3	1.3	1.2	1.1	
SB Office Network Equipment (nsb mode)	0.0	0.1	0.4	0.9	1.3	1.7	1.9	1.9	1.7	1.6	
SB Coffee makers (off mode)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.3	
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
1 SB Washing Machines (sb & off, until 2021)	0.0	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5	
1 SB Dishwashers (sb & off, until 2021)	0.0	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	
1 SB Laundry Dryers (sb & off modes)	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1	
1 SB Electric Ovens (sb mode)	0.0	1.3	1.7	1.9	1.9	1.9	1.9	1.8	1.7	1.6	
1 SB Electric Hobs (sb mode)	0.0	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	
1 SB Complex Set-Top Boxes (low-power modes)	0.0	2.1	4.7	4.5	4.0	3.5	3.2	3.0	2.8	2.6	
1 SB Game consoles (non-active modes)	0.0	0.9	1.2	1.3	1.2	1.1	1.0	1.0	0.9	0.8	
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	0.4	0.4	0.3	0.3	0.3	0.2	0.2	0.2	
1 SB IE Laser Printers (nsb mode)	3.0	1.1	1.1	1.1	1.0	1.0	0.9	0.8	0.8	0.7	
1 SB IE Laser Copiers (nsb mode)	3.3	0.4	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	1.4	1.8	1.8	1.6	1.5	1.3	1.2	1.0	0.9	
Total (networked) SB (incl. double)	11	21	26	25	23	22	21	19	18	17	
Total (networked) SB (excl. double)	4	12	13	12	12	12	11	11	10	9	
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	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.3	0.2	
0.6 EPS 10–12 W	0.0	2.8	4.3	4.5	4.1	3.7	3.4	3.0	2.7	2.5	
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	0.3	0.4	0.3	0.3	0.2	0.2	0.2	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	0.0	0.1	0.1	0.1	0.1	0.1	
1.0 EPS 65–120 W	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
0.5 EPS 65–120 W, multiple-V	0.0	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.0	
0.0 EPS 12–15 W	0.0	0.1	0.2	0.3	0.3	0.3	0.2	0.2	0.2	0.2	
EPS, total for active mode	0.0	4.3	5.8	5.8	5.3	4.8	4.4	3.9	3.5	3.2	
db EPS No-load mode											
0.0 EPS ≤ 6W, low-V	0.0	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
0.0 EPS 6–10 W	0.0	0.4	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0.2	
0.0 EPS 10–12 W	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	0.6	0.6	0.6	0.5	0.4	0.4	0.3	0.3	0.2	
EPS, overall total (active + no-load)	0.1	4.9	6.4	6.3	5.8	5.3	4.7	4.2	3.8	3.5	
EPS, double counted subtracted	0.1	2.6	3.2	3.2	2.9	2.6	2.4	2.1	1.9	1.7	
TOTAL ELECTRONICS	36	90	96	97	95	96	91	83	76	70	

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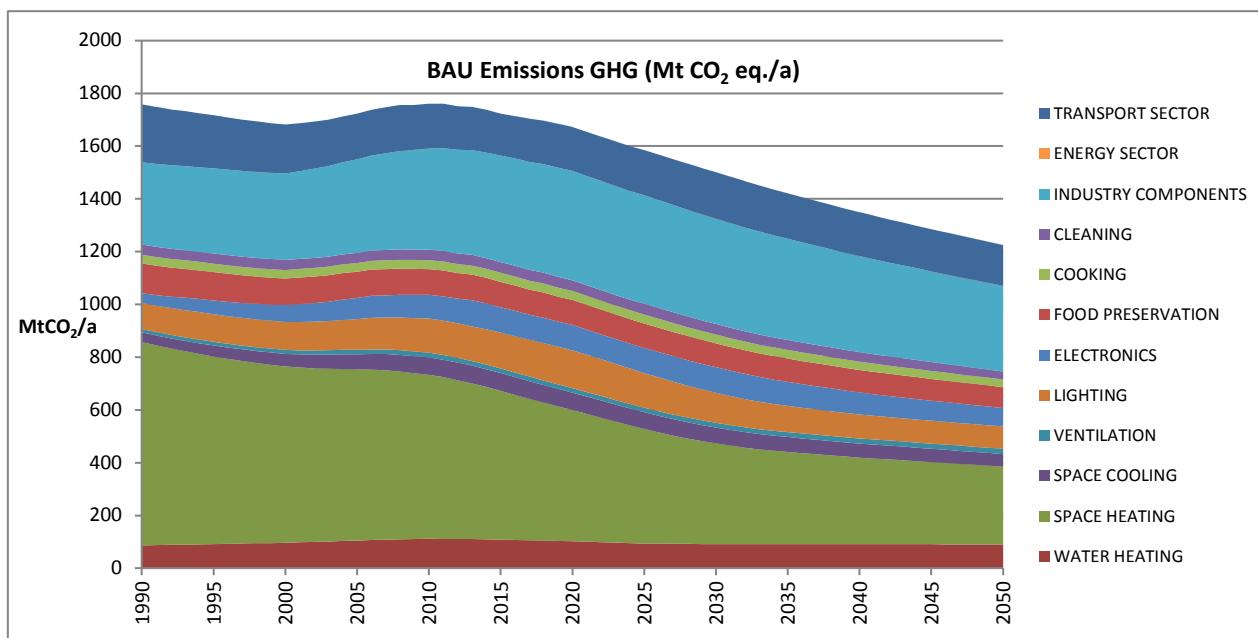
db	BAU Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	56	47	45	44	42	40	37	35	33	30
	CF open vertical chilled multi deck (RVC2)	6.9	5.2	4.7	4.2	3.8	3.6	3.4	3.2	3.0	2.8
	CF open horizontal frozen island (RHF4)	0.6	0.5	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.2
	CF other supermarket display (non-BCs)	12.1	9.4	9.0	8.5	8.1	7.9	7.7	7.4	7.0	6.7
	CF Plug in one door beverage cooler	7.7	6.4	5.9	5.3	4.9	4.7	4.5	4.3	4.0	3.8
	CF Plug in horizontal ice cream freezer	1.7	1.5	1.3	1.2	1.1	1.1	1.0	1.0	0.9	0.9
	CF Spiral vending machine	1.8	1.1	0.7	0.5	0.5	0.5	0.5	0.5	0.4	0.4
	Total CF Commercial Refrigeration	31	24	22	20	19	18	17	16	16	15
	PF Storage cabinet Chilled Vertical (CV)	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.8	0.8
	PF Storage cabinet Frozen Vertical (FV)	0.9	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	0.9
	PF Storage cabinet Chilled Horizontal (CH)	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6
	PF Storage cabinet Frozen Horizontal (FH)	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinets All types	2.6	3.0	3.1	3.1	3.1	3.0	3.0	2.9	2.9	2.8
	PF Process Chiller AC MT S ≤ 300 kW	1.4	2.6	2.9	3.2	3.4	3.6	3.7	3.8	3.8	3.8
	PF Process Chiller AC MT L > 300 kW	1.4	2.5	2.8	3.1	3.3	3.5	3.6	3.6	3.7	3.7
	PF Process Chiller AC LT S ≤ 200 kW	1.4	2.6	2.9	3.3	3.5	3.6	3.7	3.8	3.8	3.8
	PF Process Chiller AC LT L > 200 kW	1.5	2.7	3.0	3.4	3.6	3.7	3.8	3.9	4.0	4.0
	PF Process Chiller WC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	1.0	1.0	1.0	1.1	1.1	1.1
	PF Process Chiller WC MT L > 300 kW	0.6	1.1	1.2	1.3	1.4	1.5	1.5	1.6	1.6	1.6
	PF Process Chiller WC LT S ≤ 200 kW	0.5	0.9	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.4
	PF Process Chiller WC LT L > 200 kW	0.7	1.2	1.3	1.5	1.6	1.6	1.7	1.7	1.7	1.7
	PF Process Chiller All MT&LT	8	14	16	18	19	20	20	21	21	21
	PF Condensing Unit MT S 0.2-1 kW	2.8	1.9	1.8	1.8	1.8	1.8	1.9	1.9	1.9	1.9
	PF Condensing Unit MT M 1-5 kW	7.1	4.8	4.5	4.5	4.6	4.7	4.7	4.8	4.8	4.8
	PF Condensing Unit MT L 5-20 kW	8.7	5.9	5.5	5.5	5.7	5.8	5.8	5.9	5.9	5.9
	PF Condensing Unit MT XL 20-50 kW	8.6	5.8	5.5	5.5	5.6	5.7	5.8	5.9	5.9	5.9
	PF Condensing Unit LT S 0.1-0.4 kW	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	1.3	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
	PF Condensing Unit LT L 2-8 kW	2.2	1.5	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5
	PF Condensing Unit LT XL 8-20 kW	6.7	4.5	4.2	4.3	4.4	4.5	4.5	4.6	4.6	4.6
0.6	PF Condensing Unit, All MT&LT	38	25	24	24	25	25	25	26	26	26
	PF Professional Refrigeration, Total	26	27	29	31	32	33	34	34	34	34
	TOTAL FOOD PRESERVATION	113	98	96	95	93	91	88	86	82	79
	CA Electric Hobs (active modes)	9.4	11.9	12.7	13.4	13.7	13.7	13.6	13.3	13.0	12.6
	CA Electric Hobs (low-power modes)	0.0	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
	CA Electric Hobs (sum all modes)	9	12	13	14	14	14	14	14	14	13
	CA Electric Ovens (active modes)	10.7	8.8	8.0	7.3	6.8	6.5	6.3	6.0	5.6	5.3
	CA Electric Ovens (low-power modes)	0.0	1.3	1.7	1.9	1.9	1.9	1.9	1.8	1.7	1.6
	CA Electric Ovens (sum all modes)	11	10	10	9	9	8	8	8	7	7
	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	4.6	4.7	4.8	4.8	4.7	4.7	4.6	4.5	4.4
	CA Elec. Hobs&Ovens low-power modes	0.0	1.8	2.3	2.6	2.6	2.6	2.6	2.5	2.4	2.2
	CA other products or modes	33	32	32	32	31	31	30	29	28	27
	TOTAL COOKING	33	34	34	34	34	33	32	31	30	29
	WM Washing Machines, active modes	21.4	14.0	13.0	11.7	10.2	9.0	7.8	6.7	5.8	4.9
	WM Washing Machines, low-power modes	0.0	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.5	0.5
	WM Washing Machines, all modes	21.4	14.7	13.7	12.4	10.9	9.6	8.4	7.3	6.3	5.4
	WD Washer-Dryers, active modes	3.6	3.5	3.3	3.0	2.7	2.4	2.1	1.9	1.7	1.6
	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	3.5	3.3	3.1	2.8	2.4	2.2	1.9	1.8	1.6
	WM-WD Washing, sum active modes	24.9	17.5	16.3	14.7	13.0	11.4	10.0	8.6	7.5	6.5
	WM-WD Washing, sum low-power modes	0.0	0.7	0.7	0.7	0.7	0.6	0.6	0.5	0.5	0.5
	Total WM-WD Household Washing	25	18	17	15	14	12	11	9	8	7
	DW Dishwashers, active modes	5.1	7.6	8.5	9.4	10.0	10.3	10.5	10.5	10.3	10.1
	DW Dishwashers, low-power modes	0.0	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	Total DW Household Dishwasher	5	8	9	10	10	11	11	11	11	10
	LD condensing heat pump	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.3	0.4	0.4
	LD condensing electric heat element	0.6	3.6	3.6	3.4	3.4	3.2	3.0	2.6	2.3	2.0
	LD vented electric	3.2	2.9	2.4	1.9	1.7	1.5	1.4	1.4	1.3	1.2
	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	6.4	5.9	5.3	5.0	4.8	4.5	4.1	3.8	3.5
	LD Laundry Dryers, low-power modes	0.0	0.1	0.1	0.1	0.2	0.2	0.1	0.1	0.1	0.1
	Total LD Household Laundry Dryer	4	7	6	5	5	5	4	4	4	4
	VC dom	4.1	5.7	7.4	7.5	10.3	10.3	10.0	9.4	8.5	7.5
	VC nondom	1.3	1.7	1.9	2.0	2.1	2.1	2.1	2.0	2.0	1.9
	Total VC Vacuum Cleaner	5	7	9	10	12	12	11	11	11	9
	TOTAL CLEANING	39	40	41	40	41	40	38	36	33	30

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db	BAU Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	8.2	19.0	21.6	23.4	24.5	24.5	23.4	22.0	20.5	19.0
0.5	FAN Axial>300Pa	14.1	34.7	38.7	39.7	39.3	38.1	36.1	33.8	31.6	29.3
0.5	FAN Centr.FC	3.5	6.2	7.3	7.9	8.1	8.1	7.8	7.3	6.8	6.3
0.5	FAN Centr.BC-free	9.1	15.9	18.4	19.6	20.4	21.1	21.0	20.3	19.3	18.3
0.5	FAN Centr.BC	9.5	17.9	20.9	22.3	23.3	24.2	24.6	24.7	25.1	25.3
0.5	FAN Cross-flow	0.6	0.9	1.0	1.1	1.2	1.3	1.3	1.3	1.3	1.3
	Total FAN, industrial (excl. box & roof fans)	22	47	54	57	58	59	57	55	52	50
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	49	51	52	52	49	45	41	37	32	28
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	73	79	81	80	76	69	62	54	46	38
0.45	Medium (L) 3-ph 75-375 kW no VSD	149	156	158	155	145	130	111	91	74	62
0.45	Total 3ph 0.75-375 kW no VSD	270	286	290	288	270	244	214	182	152	128
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	3	6	7	9	10	11	11	12	14	15
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	6	12	14	17	19	21	23	25	28	30
0.45	Medium (L) 3-ph 75-375 kW with VSD	17	34	42	50	57	64	70	77	82	83
0.45	Total 3-ph 0.75-375 kW with VSD	26	52	63	75	85	95	105	115	123	128
0.45	Total 3-ph 0.75-375 kW w/wo VSD	297	338	354	363	355	339	319	297	276	255
0.45	Small 1 ph 0.12-0.75 kW no VSD	4	4	4	4	4	4	3	3	3	3
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	4	4	4	4	4	3	3	3	3
0.45	Small 3 ph 0.12-0.75 kW no VSD	5	6	6	6	5	5	5	4	4	4
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	1	1	1	1	1	1	1	1
0.45	Total Small 3-ph 0.12-0.75 kW	5	6	6	6	6	6	5	5	5	5
0.45	Large 3-ph LV 375-1000 kW no VSD	76	76	71	65	58	52	48	45	42	38
0.45	Large 3-ph LV 375-1000kW with VSD	4	17	25	33	38	41	41	41	40	39
0.45	Total Large 3-ph LV 375-1000 kW	80	93	96	98	96	93	90	86	81	77
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	2	2	2	2	2	2	2	2	2	2
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	5	5	5	5	5	5	4	4	4
0.45	Explosion motors (L) 3-ph 75-375 kW	7	9	9	10	10	10	9	9	9	8
0.45	Total Expl. 0.75-375 kW (no VSD)	13	15	16	17	17	16	16	15	15	14
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	1	1	1	1	1	1	1	1	1
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	3	3	3	3	3	3	3	3	3
0.45	Brake motors (L) 3-ph 75-375 kW	4	4	5	5	5	5	5	5	4	4
0.45	Total Brake 0.75-375 kW (no VSD)	7	9	9	10	10	9	9	9	8	8
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	1	1	1	0	0	0	0
0.45	Total 8-pole 0.75-375 kW (no VSD)	1									
0.45	1-phase motors >0.75 kW (no VSD)	20	23	24	25	24	23	22	21	20	19
MT Elec.	Motors LV 0.12-1000 kW	235	269	281	288	283	271	256	241	225	210
	including also double counted amounts	426	489	511	523	514	493	466	438	409	381
	Total WP Water Pumps	39	43	45	47	48	49	49	49	49	48
CP Fixed Speed	5-1280 l/s	10.7	17.9	14.6	12.3	11.4	11.1	10.7	10.3	9.9	9.4
CP Variable speed	5-1280 l/s	0.0	3.3	5.6	7.0	7.3	7.1	6.8	6.5	6.2	5.9
CP Pistons	2-64 l/s	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
	Total CP Standard Air Compressors	11	22	21	20	19	19	18	17	16	16
WE arc-on-mode,	from electricity	3.1	2.5	2.4	2.3	2.2	2.1	2.0	1.9	1.7	1.6
WE idle mode,	from electricity	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total WE Welding Equipment	3	3	3	2						
TOTAL INDUSTRY COMPONENTS		311	384	404	414	411	399	383	364	344	325
TRAFO Distribution		5.2	7.2	7.8	8.3	8.7	9.0	9.3	9.4	9.4	9.4
TRAFO Industry oil		3.9	5.6	6.0	6.5	6.7	6.9	6.9	7.0	7.0	6.9
TRAFO Industry dry		1.2	1.7	1.9	2.0	2.1	2.2	2.2	2.2	2.2	2.2
TRAFO Power		15.0	19.1	20.7	22.1	23.1	23.8	24.3	24.5	24.5	24.3
TRAFO DER oil		0.0	0.2	0.3	0.5	0.8	1.2	1.9	2.7	3.5	4.3
TRAFO DER dry		0.0	0.7	1.3	2.1	3.3	5.2	7.9	11.2	14.8	18.4
TRAFO Small		0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4
	Total TRAFO Utility Transformers	26	35	39	42	45	49	53	57	62	66
	TOTAL ENERGY SECTOR	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

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db	BAU Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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 CO₂)	1758	1761	1723	1672	1584	1501	1421	1349	1285	1225
	BAU Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	87	112	109	102	94	92	91	91	91	90
	SPACE HEATING	771	622	564	497	433	382	349	328	311	295
	SPACE COOLING	37	65	67	66	64	60	57	53	51	48
	VENTILATION	13	18	17	17	17	18	19	19	20	20
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	129	135	142	131	114	99	91	87	85
	ELECTRONICS	36	90	96	97	95	96	91	83	76	70
	FOOD PRESERVATION	113	98	96	95	93	91	88	86	82	79
	COOKING	33	34	34	34	34	33	32	31	30	29
	CLEANING	39	40	41	40	41	40	38	36	33	30
	INDUSTRY COMPONENTS	311	384	404	414	411	399	383	364	344	325
	ENERGY SECTOR	0									
	TRANSPORT SECTOR	220	169	159	166	171	176	173	166	160	154
	TOTAL in Mt CO₂	1758	1761	1723	1672	1584	1501	1421	1349	1285	1225



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									
BAU GHG emission, Energy Sector, MtCO2eq	0	0	0	0	0	0	0	0	0	0

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BAU GHG emission (INDUSTRY, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3	3	3	3	3	3	3	3	3	3
SPACE HEATING	42	35	31	27	24	21	19	18	16	15
SPACE & HT PROCESS COOLING	9	14	15	15	14	14	13	12	11	10
VENTILATION	2	2	2	2	2	2	2	2	2	2
LIGHTING	13	17	18	20	20	18	16	15	15	14
ELECTRONICS	1	4	4	4	4	5	5	4	4	4
FOOD PRESERVATION	10	15	16	18	19	20	20	21	21	21
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	220	264	275	282	277	268	256	242	228	214
BAU GHG emission, Industry, MtCO2eq	299	354	365	371	364	350	333	316	299	283
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	25	24	23	21	20	20	20	20	20
SPACE HEATING	179	165	151	135	119	107	98	92	87	82
SPACE & HT PROCESS COOLING	23	40	42	42	40	38	36	34	32	29
VENTILATION	10	13	12	12	12	12	12	12	12	11
LIGHTING	51	73	79	86	85	77	69	64	62	61
ELECTRONICS	14	33	34	37	39	40	39	36	33	30
FOOD PRESERVATION	49	39	36	34	33	32	31	31	30	28
COOKING	4	4	4	4	4	4	4	3	3	3
CLEANING	2	3	3	3	3	3	3	3	3	3
INDUSTRY COMPONENTS	76	102	110	114	115	113	109	104	99	94
BAU GHG emission, Services, MtCO2eq	429	497	496	490	471	446	421	398	379	362
BAU GHG emission (RESIDENTIAL, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	63	83	81	76	70	68	68	68	67	67
SPACE HEATING	536	410	371	326	282	246	225	212	203	193
SPACE & HT PROCESS COOLING	1	7	7	5	5	5	5	4	5	5
VENTILATION	1	3	3	3	4	4	5	6	6	6
LIGHTING	35	38	36	34	25	17	13	11	9	8
ELECTRONICS	22	53	58	56	51	51	48	43	39	36
FOOD PRESERVATION	52	43	42	41	39	37	34	32	30	28
COOKING	29	30	30	30	30	30	29	28	27	26
CLEANING	37	37	38	37	38	37	35	33	30	27
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU GHG emission, Residential, MtCO2eq	775	703	666	608	543	494	461	436	416	396
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	11	9	8	7	7	6	6	5
SPACE & HT PROCESS COOLING	3	4	4	4	4	4	4	3	3	3
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	1	1	1	2	1	1	1	1	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	2	2	2	2	2	2	2	2	2	2
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	15	17	18	18	18	19	18	18	18	17
BAU GHG emission, Other sectors, MtCO2eq	35	38	37	37	36	34	33	32	31	30

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BAU GHG emissions (per FUNCTION, MTCO2eq)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.	All sectors, TWh	87	112	109	102	94	92	91	91	91	90
Residential		63	83	81	76	70	68	68	68	67	67
Tertiary / Services		20	25	24	23	21	20	20	20	20	20
Industry		3	3	3	3	3	3	3	3	3	3
Other		1	1	1	1	1	1	1	1	1	1
SPACE HEATING.	All sectors, TWh	771	622	564	497	433	382	349	328	311	295
Residential		536	410	371	326	282	246	225	212	203	193
Tertiary / Services		179	165	151	135	119	107	98	92	87	82
Industry		42	35	31	27	24	21	19	18	16	15
Other		14	12	11	9	8	7	7	6	6	5
SPACE COOLING.	All sectors, TWh	37	65	67	66	64	60	57	53	51	48
& HT PROCESS	Residential	1	7	7	5	5	5	5	4	5	5
	Tertiary / Services	23	40	42	42	40	38	36	34	32	29
	Industry	9	14	15	15	14	14	13	12	11	10
	Other	3	4	4	4	4	4	4	3	3	3
VENTILATION.	All sectors, TWh	13	18	17	17	17	18	19	19	20	20
Residential		1	3	3	3	4	4	5	6	6	6
Tertiary / Services		10	13	12	12	12	12	12	12	12	11
Industry		2	2	2	2	2	2	2	2	2	2
Other		0	0	0	0	0	0	0	0	0	0
LIGHTING.	All sectors, TWh	99	129	135	142	131	114	99	91	87	85
Residential		35	38	36	34	25	17	13	11	9	8
Tertiary / Services		51	73	79	86	85	77	69	64	62	61
Industry		13	17	18	20	20	18	16	15	15	14
Other		1	1	1	2	1	1	1	1	1	1
ELECTRONICS.	All sectors, TWh	36	90	96	97	95	96	91	83	76	70
Residential		22	53	58	56	51	51	48	43	39	36
Tertiary / Services		14	33	34	37	39	40	39	36	33	30
Industry		1	4	4	4	4	5	5	4	4	4
Other		0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE.	All sectors, TWh	113	98	96	95	93	91	88	86	82	79
Residential		52	43	42	41	39	37	34	32	30	28
Tertiary / Services		49	39	36	34	33	32	31	31	30	28
Industry		10	15	16	18	19	20	20	21	21	21
Other		2	2	2	2	2	2	2	2	2	2
COOKING.	All sectors, TWh	33	34	34	34	34	33	32	31	30	29
Residential		29	30	30	30	30	30	29	28	27	26
Tertiary / Services		4	4	4	4	4	4	4	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	39	40	41	40	41	40	38	36	33	30
Residential		37	37	38	37	38	37	35	33	30	27
Tertiary / Services		2	3	3	3	3	3	3	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
INDUSTRY COMP.	All sectors, TWh	311	384	404	414	411	399	383	364	344	325
Residential		0	0	0	0	0	0	0	0	0	0
Tertiary / Services		76	102	110	114	115	113	109	104	99	94
Industry		220	264	275	282	277	268	256	242	228	214
Other		15	17	18	18	18	19	18	18	18	17
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	1758	1761	1723	1672	1584	1501	1421	1349	1285	1225
Residential		775	703	666	608	543	494	461	436	416	396
Tertiary / Services		429	497	496	490	471	446	421	398	379	362
Industry		299	354	365	371	364	350	333	316	299	283
Other		35	38	37	37	36	34	33	32	31	30
Transport		220	169	159	166	171	176	173	166	160	154

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BAU GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	74%	74%	74%	74%	74%	74%	74%	74%	74%
	Tertiary / Services	23%	22%	22%	22%	22%	22%	22%	22%	22%	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	69%	66%	66%	66%	65%	65%	64%	65%	65%	65%
	Tertiary / Services	23%	27%	27%	27%	27%	28%	28%	28%	28%	28%
	Industry	5%	6%	6%	6%	6%	6%	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 (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%	89%	89%	89%	89%	89%	89%	90%
	Tertiary / Services	14%	12%	12%	11%	11%	11%	11%	11%	11%	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	93%	92%	92%	91%	92%	91%	91%	91%	90%	90%
	Tertiary / Services	6%	7%	7%	8%	8%	8%	8%	8%	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	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services	24%	27%	27%	28%	28%	28%	28%	29%	29%	29%
	Industry	71%	69%	68%	68%	68%	67%	67%	66%	66%	66%
	Other	5%	4%	4%	4%	4%	5%	5%	5%	5%	5%
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%	40%	39%	36%	34%	33%	32%	32%	32%	32%
	Tertiary / Services	24%	28%	29%	29%	30%	30%	30%	30%	30%	30%
	Industry	17%	20%	21%	22%	23%	23%	23%	23%	23%	23%
	Other	2%	2%	2%	2%	2%	2%	2%	2%	2%	2%
	Transport	12%	10%	9%	10%	11%	12%	12%	12%	12%	13%

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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 SO₂ 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 Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.14 (EU28 minus UK).											
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.											

EMISSBAU

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	71.0					
Tyres C1, OEM for cars	71.2	71.1	71.0	71.0	71.0	71.0					
Tyres C2, replacement for vans	72.5	72.4	72.3	72.3	72.3	72.3					
Tyres C2, OEM for vans	72.5	72.4	72.3	72.3	72.3	72.3					
Tyres C3, replacement for trucks/busses	72.0	71.9	71.8	71.8	71.8	71.8					
Tyres C3, OEM for trucks/busses	72.0	71.9	71.8	71.8	71.8	71.8					

EMISSECO

db	ECO Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>see also other emissions at bottom of Table</i>											
EIWH Electric Instant, < 12 kW (secondary)	0	0	0	0	0	0	0	0	0	0	0
EIWH Electric Instant, ≥ 12 kW (primary)	3	3	3	2	2	2	2	2	2	2	2
EIWHS Electric Instant. Shower (secondary)	4	5	5	4	4	3	3	3	3	3	3
ESWH Electric Storage ≤ 30 L (secondary)	3	3	3	3	3	3	3	3	3	3	3
ESWH Electric Storage > 30 L (primary)	27	31	30	28	24	23	23	23	23	23	22
GIWH Gas Instant, < 13 L/min (secondary)	3	3	2	2	1	1	1	1	1	1	1
GIWH Gas Instant, ≥ 13 L/min (primary)	1	2	1	1	1	1	1	1	1	1	1
GSHW Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0	0
GSHW Gas Storage, Non-condensing	5	4	3	2	1	1	1	1	1	1	0
Dedicated WH Heat Pump	0	0	0	1	1	1	1	1	2	2	2
Dedicated WH Solar (3.5 m ²)	0	2	3	3	3	2	2	2	2	2	2
WH dedicated Water Heater	47	54	52	46	40	38	37	37	37	36	
CHB Gas Combi Instant. WH	11	27	28	27	24	23	21	20	18	16	
CHB Gas + Cyl. WH	7	12	11	10	9	8	8	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	10	7	5	4	4	4	4	
CHB Electric (Joule) + Cyl. WH	1	1	1	1	1	1	1	0	0	0	
CHB Hybrid Gas/Electric WH	0	0	0	0	0	0	1	1	1	1	2
CHB Electric HP + Cyl. WH	0	1	1	2	2	3	4	5	6	6	
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 m ²)	0	0	0	0	0	0	0	0	0	0	
CHC Central Heating combi, water heating	40	58	55	50	44	40	39	38	37	36	
TOTAL WATER HEATING	87	112	107	95	83	78	76	76	74	73	
CHB Gas non-condensing	154	171	131	81	38	18	7	4	2	1	
CHB Gas condensing	2	53	78	106	124	127	122	108	95	82	
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	178	132	90	53	22	7	3	2	2	
CHB Oil Jet burner condensing	0	3	6	10	14	18	21	22	22	22	
CHB Electric Joule-effect	6	5	5	6	5	4	4	3	2	2	
CHB Hybrid (gas-electric)	0	0	0	0	0	1	2	3	3	4	
CHB Electric Heat Pump	1	5	6	8	10	13	16	20	22	24	
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 m ²)	1	1	1	1	1	1	1	1	1	1	
CHB Central Heating boiler < 400 kW, space heating	459	427	368	308	251	208	183	166	154	141	
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	3.7	4.1	4.2	3.9	3.6	3.3	3.1	2.9	2.7	
CHAE-L (> 400 kW)	2.6	5.2	5.5	5.5	4.9	4.3	3.7	3.2	2.9	2.6	
CHWE-S (≤ 400 kW)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.3	0.3	0.3	
CHWE-M (> 400 kW; ≤ 1500 kW)	0.6	1.1	1.2	1.2	1.1	1.0	0.8	0.7	0.7	0.6	
CHWE-L (> 1500 kW)	0.4	0.7	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.4	
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	13.1	13.9	14.1	13.4	12.5	11.9	11.4	10.9	10.4	
HT PCH-AE-L	9.6	12.5	13.3	13.3	12.4	11.4	10.5	10.0	9.5	9.1	
HT PCH-WE-S	2.0	2.8	2.9	3.0	2.9	2.8	2.6	2.5	2.4	2.3	
HT PCH-WE-M	4.1	5.4	5.8	5.9	5.8	5.5	5.3	5.1	4.9	4.6	
HT PCH-WE-L	0.8	1.1	1.2	1.2	1.2	1.1	1.1	1.0	1.0	0.9	
AC rooftop	1.4	2.8	2.6	2.2	1.6	0.9	0.4	0.2	0.1	0.1	
AC splits	1.9	4.6	4.3	3.8	3.2	2.6	2.2	1.9	1.6	1.3	
AC VRF	0.0	1.2	1.6	2.1	2.3	2.6	2.7	2.8	2.8	2.7	
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	55	58	58	54	49	46	43	40	38	
AC rooftop (rev)	1.9	4.7	4.5	3.7	2.5	1.4	0.6	0.2	0.0	0.0	
AC splits (rev)	3.4	8.7	8.7	7.8	6.7	5.4	4.5	3.8	3.2	2.7	
AC VRF (rev)	0.0	2.9	4.0	5.2	5.9	6.5	6.8	6.6	6.3	5.8	
ACF (rev)	0	0	0	0	0	0	0	0	0	0	
AHF	43	31	27	22	18	14	12	11	9	8	
AHE	0.5	1.0	0.8	0.5	0.4	0.4	0.3	0.3	0.2	0.2	
SubTotal AHC central Air Heating	49	49	45	39	33	28	24	22	19	17	
Total AHC central Air Heating & Cooling	84	103	102	97	87	77	70	64	60	55	

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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	0.3
LH closed fireplace/inset	0.4	0.9	1.0	1.2	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	0.7	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	1.1
LH cooker	0.1	0.2	0.3	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	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	0.6
LH Solid fuel sum	11	8	8	8	7	7	6	6	5	5	5
LH Electric portable	12	9	8	7	6	5	5	4	4	4	3
LH Electric fixed > 250W	62	45	40	32	25	20	17	15	14	12	
LH Electric fixed ≤ 250W	4	3	3	2	2	1	1	1	1	1	1
LH Electric storage	4	3	2	2	2	1	1	1	1	1	1
LH Electric underfloor	11	9	8	7	7	6	5	5	4	4	4
LH Electric visibly glowing > 1.2 kW	1	1	1	1	1	0	0	0	0	0	0
LH Electric visibly glowing ≤ 1.2 kW	0	0	0	0	0	0	0	0	0	0	0
LH Electric Towel Heaters	3	4	4	4	3	3	2	2	2	2	2
LH Electric sum	96	73	66	55	44	37	33	29	26	23	
LH Gas luminous (commercial)	0.2	0.2	0.2	0.2	0.2	0.1	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	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	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	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	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	0.0
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	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	0.0
LH Liquid closed front	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	84	76	64	53	45	40	35	32	28	
RAC fixed < 6 kW, cooling	1	5	4	3	3	3	3	3	3	3	3
RAC fixed 6-12 kW, cooling	0	3	2	2	2	2	2	2	2	2	2
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0	0
RAC < 12 kW total, cooling mode	1	8	7	5	4	5	5	5	5	5	
RAC fixed < 6 kW, reversible, heating	0	7	7	6	7	9	11	12	13	14	
RAC fixed 6-12 kW, reversible, heating	0	3	3	3	4	4	5	6	6	6	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	1	10	10	9	11	13	16	18	19	20	
RAC Room Air Conditioner	2	18	17	14	15	18	20	23	24	25	
1 CIRC Integrated circulators	6.5	7.7	6.8	5.2	4.3	4.3	4.1	3.9	3.6	3.4	
1 CIRC Large standalone circulators	4.1	4.8	3.8	2.6	2.1	1.8	1.6	1.4	1.3	1.2	
1 CIRC Small standalone circulators	3.1	3.5	2.6	1.5	1.1	1.0	0.9	0.8	0.8	0.7	
1 CIRC Circulator pumps <2.5 kW	14	16	13	9	8	7	7	6	6	5	
TOTAL SPACE HEATING	771	615	544	458	375	311	275	252	235	217	
TOTAL SPACE COOLING	37	63	64	62	58	54	50	48	45	43	
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	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	0.0
R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.0	0.1	0.1	0.2	0.4	0.6	0.8	0.9	1.0	
R-UVU 100-250 m3/h	0.2	0.3	0.3	0.3	0.3	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	0.1	0.2	0.2	0.3	0.3	
R-UVU 250-1000 m3/h	1.1	2.1	2.1	2.0	1.7	1.6	1.4	1.3	1.3	1.2	
R-BVU 250-1000 m3/h	0.0	0.2	0.3	0.3	0.6	1.0	1.3	1.6	1.9	2.1	
R-UVU > 1000 m3/h	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
R-BVU 1000-2500 m3/h	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
RVU, Total residential, from VU own electricity	1	3	3	3	3	3	4	4	5	5	
NR-UVU 250-1000 m3/h	0.5	0.8	0.8	0.7	0.6	0.5	0.5	0.4	0.4	0.3	
NR-BVU 250-1000 m3/h	0.0	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.7	0.7	
NR-UVU > 1000 m3/h	0.3	0.5	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.1	
NR-BVU 1000-2500 m3/h	0.0	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	
NR-AHU-S 2500-5500 m3/h	0.1	1.0	1.4	1.6	1.6	1.7	1.8	1.8	1.9	1.9	
NR-AHU-M 5500-14500 m3/h	8.6	9.4	8.6	7.7	6.9	6.6	6.3	6.2	6.0	5.7	
NR-AHU-L > 14500 m3/h	2.4	2.7	2.4	2.1	1.9	1.8	1.7	1.7	1.6	1.6	
NRVU, Total non-residential, from VU own electricity	12	15	14	13	12	12	12	11	11	11	
VU Ventilation Units, res + non-res. from VU own elec.	13	18	17	16	15	15	16	16	16	16	
TOTAL VENTILATION (from VU own electricity)	13	18	17	16	15	15	16	16	16	16	
<i>Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)</i>	-	-	-1	-4	-7	-9	-10	-10	-10	-10	

EMISSECO

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	49.4	55.7	57.2	43.8	23.2	9.9	4.5	2.4	1.4	
HID (HPM, HPS, MH)	14.3	25.0	20.8	17.1	12.0	5.9	2.1	0.7	0.2	0.1	
CFLni (all shapes)	1.0	3.3	3.3	2.6	1.7	0.8	0.3	0.1	0.0	0.0	
CFLi (retrofit for GLS, HL)	0.4	5.6	7.1	5.4	1.8	0.5	0.0	0.0	0.0	0.0	
GLS (DLS & NDLS)	36.8	17.3	4.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HL (DLS & NDLS, LV & MV)	3.1	16.5	19.8	7.9	0.5	0.0	0.0	0.0	0.0	0.0	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.7	4.5	14.2	25.0	31.9	35.1	37.1	38.8	
LED replacing HID (retrofit & luminaire)	0.0	0.0	3.5	7.0	10.3	13.0	14.8	16.2	17.3	18.3	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.1	0.4	0.9	1.1	1.2	1.3	1.4	1.4	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.4	1.2	1.8	1.8	1.8	1.8	1.8	1.7	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.6	4.1	6.8	7.4	7.5	7.5	7.4	7.2	
<i>Standby</i>	4.7	6.0	5.1	4.1	3.2	2.5	2.4	2.2	2.1	1.9	
TOTAL LIGHTING (incl. standby)	99	123	121	112	97	81	72	69	70	71	
DP TV on-mode, total all types	11.7	25.2	26.0	21.5	12.7	10.9	9.0	9.1	9.9	10.6	
DP TV standby, standard (NoNA)	1.5	0.8	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	0.4	0.2	0.1	0.0	0.0	0.0	0.0	
DP TV standby, HiNA ('Smart')	0.0	0.0	0.6	1.6	2.3	2.7	2.6	2.2	1.8	1.4	
DP TV standby, total all types	2	1	1	2	3	3	3	2	2	1	
DP TV total on-mode + standby	13	26	27	23	15	14	12	11	12	12	
DP Monitor on-mode	0.4	5.1	2.7	1.0	0.9	0.6	0.4	0.4	0.4	0.4	
DP Monitor standby	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
DP Monitor total	0	5	3	1	1	1	0	0	0	0	
DP Signage on-mode	0.0	0.4	3.1	6.8	7.6	6.0	4.3	3.9	4.0	4.3	
DP Signage standby	0.0	0.1	0.5	1.0	1.1	0.9	0.6	0.6	0.6	0.6	
DP Signage total	0	0	4	8	9	7	5	4	5	5	
DP Electronic Displays, total on-mode	12	31	32	29	21	17	14	13	14	15	
DP Electronic Displays, total standby	2	1	2	3	4	4	3	3	2	2	
DP Electronic Displays, total	14	32	33	32	25	21	17	16	17	17	
SSTB	0.0	0.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CSTB (low-power modes)	0.0	2.1	4.2	3.3	2.9	2.6	2.5	2.3	2.1	2.0	
CSTB (other modes)	0.0	1.1	2.3	1.8	1.5	1.4	1.3	1.2	1.2	1.1	
CSTB (all covered modes)	0.0	3.2	6.4	5.0	4.4	4.1	3.8	3.5	3.3	3.1	
Total STB set top boxes (Complex & Simple)	0	4	7	5	4	4	4	4	3	3	
Game consoles > 20 W Active modes (SRI)	0.0	1.0	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.9	
Game consoles > 20 W Non-Active (CR)	0.0	0.5	0.6	0.4	0.2	0.2	0.2	0.2	0.2	0.2	
Game consoles < 20 W Non-Active (CR)	0.0	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
Game consoles < 20 W Active (no reg.)	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
Total Game consoles, active modes	0.0	1.1	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.9	
Total Game consoles, non-active modes	0.0	0.9	1.0	0.6	0.3	0.3	0.3	0.3	0.3	0.2	
Total Game consoles > 20 W, all modes	0.0	1.5	2.1	1.7	1.5	1.4	1.3	1.2	1.2	1.1	
Total Game consoles < 20 W, all modes	0.0	0.4	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
Total Game consoles, all modes	0	2	2	2	2	2	1	1	1	1	
<i>ES&DS only, without effects on infrastructure</i>											
ES tower 1-socket traditional	0.0	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 1-socket traditional	0.1	1.2	0.8	0.7	0.6	0.7	0.6	0.6	0.5	0.5	
ES rack 2-socket traditional	0.3	5.3	2.7	1.5	1.6	1.8	1.9	1.7	1.6	1.5	
ES rack 2-socket cloud	0.0	3.0	4.5	4.5	5.0	5.6	5.7	5.4	5.0	4.7	
ES rack 4-socket traditional	0.0	0.6	0.3	0.2	0.2	0.3	0.3	0.2	0.2	0.2	
ES rack 4-socket cloud	0.0	0.3	0.6	0.7	0.8	0.9	0.9	0.8	0.8	0.7	
ES rack 2-socket resilient trad.	0.0	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 2-socket resilient cloud	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
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	0.0	0.0	0.0	0.0	0.0	0.0	
ES blade 1-socket traditional	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
ES blade 2-socket traditional	0.3	2.4	1.2	0.7	0.8	0.9	0.9	0.8	0.8	0.7	
ES blade 2-socket cloud	0.0	1.4	2.0	2.2	2.5	2.8	2.8	2.6	2.5	2.3	
ES blade 4-socket traditional	0.0	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
ES blade 4-socket cloud	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
ES total traditional	1	11	6	4	4	4	4	4	4	3	
ES total cloud	0	5	7	8	9	10	10	9	9	8	
ES Enterprise Servers total	1	16	13	12	12	14	14	13	12	11	
DS Online 2	0.2	2.3	3.0	4.0	4.7	5.3	5.2	4.9	4.6	4.3	
DS Online 3	0.0	0.3	0.4	0.6	0.7	0.7	0.7	0.7	0.6	0.6	
DS Online 4	0.1	1.3	1.7	2.2	2.6	2.9	2.9	2.7	2.5	2.3	
DS Data Storage products total	0	4	5	7	8	9	9	8	8	7	
ES + DS total (excl. infrastructure)	1	20	19	18	20	23	23	22	20	19	

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db	ECO Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	7.8	8.5	5.5	3.4	3.5	3.7	3.4	3.1	2.7	2.4	
PC Integrated Desktop	0.2	0.4	0.2	0.2	0.2	0.2	0.3	0.2	0.2	0.2	
PC Notebook	0.0	3.0	3.3	2.6	2.6	2.6	2.5	2.4	2.2	2.0	
PC Tablet/slate	0.0	0.1	0.9	0.9	0.5	0.5	0.5	0.4	0.4	0.4	
PC Thin client	0.0	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
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	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
PC Workstation	0.3	0.6	0.6	0.6	0.6	0.6	0.7	0.6	0.6	0.5	
Total PC, electricity	8	13	11	8	8	8	7	7	6	5	
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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
EP / Laser Printer mono	3.9	0.7	0.5	0.3	0.2	0.1	0.1	0.1	0.0	0.0	
EP / Laser Printer colour	0.0	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
EP / Laser Copier mono	4.4	0.3	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	0.6	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	
EP / Laser MFD colour	0.0	0.8	0.8	0.5	0.3	0.3	0.3	0.2	0.2	0.2	
Total IE Imaging Equipment, from electricity	9	3	3	2	1	1	1	1	1	1	
<i>of which for modes under CR 1275/2008 (see Resources for contributions from paper, toner)</i>	7	3	2	1	1	1	1	1	1	1	
<i>Products regulated only for (networked) standby</i>											
SB Radios (sb & off modes)	1.0	2.4	1.8	1.1	0.9	0.8	0.7	0.6	0.5	0.4	
SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
SB Audio speakers (wired) (sb & off modes)	0.9	0.9	0.1	0.1	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	0.6	0.7	0.7	0.6	0.6	0.6	0.5	
SB Small appliances (sb & off modes)	0.6	2.8	2.0	1.3	1.3	1.2	1.2	1.1	1.0	1.0	
SB Media boxes /sticks (sb mode)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	
SB Media players and recorders (sb mode)	0.0	1.1	0.4	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	1.3	1.3	1.0	0.7	0.6	0.6	0.5	0.5	0.4	
SB Office phones (nsb mode)	0.3	0.9	0.7	0.5	0.3	0.3	0.3	0.2	0.2	0.2	
SB Home NAS (nsb mode)	0.0	0.4	0.6	0.2	0.3	0.3	0.3	0.3	0.3	0.3	
SB Home Network Equipment (nsb mode)	0.0	1.1	1.3	1.2	1.2	1.2	1.2	1.1	1.1	1.0	
SB Office Network Equipment (nsb mode)	0.0	0.1	0.4	0.5	0.7	0.9	1.0	1.0	0.9	0.9	
SB Coffee makers (off mode)	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
1 SB Washing Machines (sb & off, until 2021)	0.0	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1	
1 SB Dishwashers (sb & off, until 2021)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
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	1.3	1.3	1.0	0.7	0.3	0.3	0.3	0.3	0.2	
1 SB Electric Hobs (sb mode)	0.0	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2	
1 SB Complex Set-Top Boxes (low-power modes)	0.0	2.1	4.2	3.3	2.9	2.6	2.5	2.3	2.1	2.0	
1 SB Game consoles (non-active modes)	0.0	0.9	1.0	0.6	0.3	0.3	0.3	0.3	0.3	0.2	
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	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
1 SB IE Laser Printers (nsb mode)	3.0	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.3	0.3	
1 SB IE Laser Copiers (nsb mode)	3.3	0.3	0.2	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	1.0	0.6	0.5	0.4	0.4	0.3	0.3	0.3	
Total (networked) SB (incl. double)	11	20	19	14	12	11	10	10	9	8	
Total (networked) SB (excl. double)	4	12	9	7	6	6	6	6	5	5	
<i>db EPS Active mode (for electricity losses)</i>											
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	0.4	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	
0.6 EPS 10–12 W	0.0	2.8	3.7	3.2	2.6	2.5	2.4	2.2	2.1	2.0	
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	0.3	0.3	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	0.0	0.1	0.1	0.1	0.1	0.1	
1.0 EPS 65–120 W	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	
0.5 EPS 65–120 W, multiple-V	0.0	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.0	0.0	
0.0 EPS 12–15 W	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	
EPS, total for active mode	0.0	4.3	5.0	4.2	3.5	3.3	3.1	2.9	2.8	2.6	
<i>db EPS No-load mode</i>											
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	0.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
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	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
EPS, overall total (active + no-load)	0.1	4.9	5.4	4.4	3.6	3.4	3.2	3.1	2.9	2.7	
EPS, double counted subtracted	0.1	2.5	2.7	2.2	1.7	1.6	1.5	1.4	1.4	1.3	
TOTAL ELECTRONICS	36	88	87	76	68	66	61	58	55	53	

EMISSECO

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	35	28	23	18	14	11	9	8	7
	CF open vertical chilled multi deck (RVC2)	6.9	5.2	4.7	4.2	3.4	2.3	1.6	1.4	1.3	1.2
	CF open horizontal frozen island (RHF4)	0.6	0.5	0.4	0.4	0.3	0.2	0.2	0.2	0.1	0.1
	CF other supermarket display (non-BCs)	12.1	9.4	9.0	8.4	7.6	6.3	5.3	4.9	4.7	4.4
	CF Plug in one door beverage cooler	7.7	6.4	5.9	5.2	3.9	2.7	2.2	2.1	2.0	1.9
	CF Plug in horizontal ice cream freezer	1.7	1.5	1.3	1.2	1.0	0.8	0.7	0.7	0.6	0.6
	CF Spiral vending machine	1.8	1.1	0.7	0.5	0.5	0.4	0.4	0.4	0.4	0.3
	Total CF Commercial Refrigeration	31	24	22	20	17	13	10	10	9	9
	PF Storage cabinet Chilled Vertical (CV)	0.8	0.9	0.9	0.8	0.6	0.5	0.5	0.5	0.5	0.5
	PF Storage cabinet Frozen Vertical (FV)	0.9	1.0	1.1	0.9	0.7	0.6	0.6	0.6	0.6	0.6
	PF Storage cabinet Chilled Horizontal (CH)	0.6	0.7	0.7	0.6	0.5	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinet Frozen Horizontal (FH)	0.4	0.4	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinets All types	2.6	3.0	3.1	2.7	2.0	1.8	1.8	1.7	1.7	1.6
	PF Process Chiller AC MT S ≤ 300 kW	1.4	2.6	2.9	3.2	3.3	3.3	3.4	3.5	3.5	3.5
	PF Process Chiller AC MT L > 300 kW	1.4	2.5	2.8	3.1	3.2	3.2	3.3	3.4	3.4	3.4
	PF Process Chiller AC LT S ≤ 200 kW	1.4	2.6	2.9	3.2	3.3	3.4	3.5	3.5	3.6	3.6
	PF Process Chiller AC LT L > 200 kW	1.5	2.7	3.0	3.3	3.4	3.5	3.6	3.6	3.7	3.7
	PF Process Chiller WC MT S ≤ 300 kW	0.4	0.7	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0
	PF Process Chiller WC MT L > 300 kW	0.6	1.1	1.2	1.3	1.4	1.4	1.4	1.4	1.5	1.5
	PF Process Chiller WC LT S ≤ 200 kW	0.5	0.9	1.0	1.1	1.2	1.2	1.2	1.3	1.3	1.3
	PF Process Chiller WC LT L > 200 kW	0.7	1.2	1.3	1.4	1.5	1.5	1.6	1.6	1.6	1.6
	PF Process Chiller All MT&LT	8	14	16	17	18	18	19	19	19	19
	PF Condensing Unit MT S 0.2-1 kW	2.8	1.9	1.8	1.7	1.6	1.7	1.7	1.7	1.7	1.7
	PF Condensing Unit MT M 1-5 kW	7.1	4.8	4.5	4.3	4.3	4.4	4.4	4.5	4.5	4.5
	PF Condensing Unit MT L 5-20 kW	8.7	5.9	5.5	5.3	5.2	5.3	5.4	5.4	5.4	5.4
	PF Condensing Unit MT XL 20-50 kW	8.6	5.8	5.5	5.3	5.2	5.3	5.4	5.4	5.4	5.4
	PF Condensing Unit LT S 0.1-0.4 kW	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	1.3	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	PF Condensing Unit LT L 2-8 kW	2.2	1.5	1.4	1.2	1.2	1.2	1.2	1.2	1.2	1.3
	PF Condensing Unit LT XL 8-20 kW	6.7	4.5	4.2	4.0	4.0	4.0	4.1	4.1	4.1	4.2
0.6	PF Condensing Unit, All MT&LT	38	25	24	23	22	23	23	23	24	24
	PF Professional Refrigeration, Total	26	27	29	29	29	29	30	30	31	30
	TOTAL FOOD PRESERVATION	113	86	79	73	64	56	51	49	48	46
	CA Electric Hobs (active modes)	9.4	11.9	12.7	13.4	13.6	13.7	13.5	13.3	12.9	12.5
	CA Electric Hobs (low-power modes)	0.0	0.5	0.5	0.4	0.3	0.3	0.2	0.2	0.2	0.2
	CA Electric Hobs (sum all modes)	9	12	13	14	14	14	14	14	13	13
	CA Electric Ovens (active modes)	10.7	8.8	8.0	7.2	6.4	6.0	5.7	5.3	5.0	4.7
	CA Electric Ovens (low-power modes)	0.0	1.3	1.3	1.0	0.7	0.3	0.3	0.3	0.2	0.2
	CA Electric Ovens (sum all modes)	11	10	9	8	7	6	6	6	5	5
	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	4.6	4.7	4.5	4.1	3.7	3.4	3.3	3.2	3.1
	CA Elec. Hobs&Ovens low-power modes	0.0	1.7	1.8	1.4	0.9	0.6	0.5	0.5	0.5	0.5
	CA other products or modes	33	32	32	31	30	29	28	27	26	24
	TOTAL COOKING	33	34	34	33	31	29	28	27	26	25
	WM Washing Machines, active modes	21.4	11.0	8.9	7.3	6.2	5.6	5.1	4.8	4.5	4.1
	WM Washing Machines, low-power modes	0.0	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	WM Washing Machines, all modes	21.4	11.5	9.2	7.6	6.5	5.8	5.3	4.9	4.6	4.3
	WD Washer-Dryers, active modes	3.6	3.1	2.7	2.5	2.2	2.1	1.9	1.8	1.7	1.6
	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	3.1	2.7	2.5	2.2	2.1	1.9	1.8	1.7	1.6
	WM-WD Washing, sum active modes	24.9	14.1	11.6	9.8	8.5	7.7	7.0	6.6	6.1	5.7
	WM-WD Washing, sum low-power modes	0.0	0.5	0.3	0.3	0.2	0.2	0.2	0.1	0.1	0.1
	Total WM-WD household Washing	25	15	12	10	9	8	7	7	6	6
	DW Dishwashers, active modes	5.1	6.0	6.3	6.7	7.0	7.1	7.1	7.0	6.8	6.5
	DW Dishwashers, low-power modes	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	Total DW household Dishwasher	5	6	7							
	LD condensing heat pump	0.0	0.0	0.4	0.9	1.2	1.3	1.4	1.4	1.3	1.2
	LD condensing electric heat element	0.6	3.6	3.2	2.3	1.6	1.3	1.0	0.9	0.8	0.7
	LD vented electric	3.2	2.8	2.0	1.1	0.6	0.3	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	3.9	6.4	5.5	4.2	3.3	2.8	2.5	2.2	2.0	1.9
	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	6	6	4	3	3	3	2	2	2
	VC dom	4.1	5.7	6.0	3.2	3.7	3.2	2.7	2.2	1.8	1.4
	VC nondom	1.3	1.7	1.7	1.3	1.3	1.2	1.2	1.1	1.1	1.0
	Total VC Vacuum Cleaner	5	7	8	5	5	4	4	3	3	2
	TOTAL CLEANING	39	35	32	26	24	22	21	19	18	17

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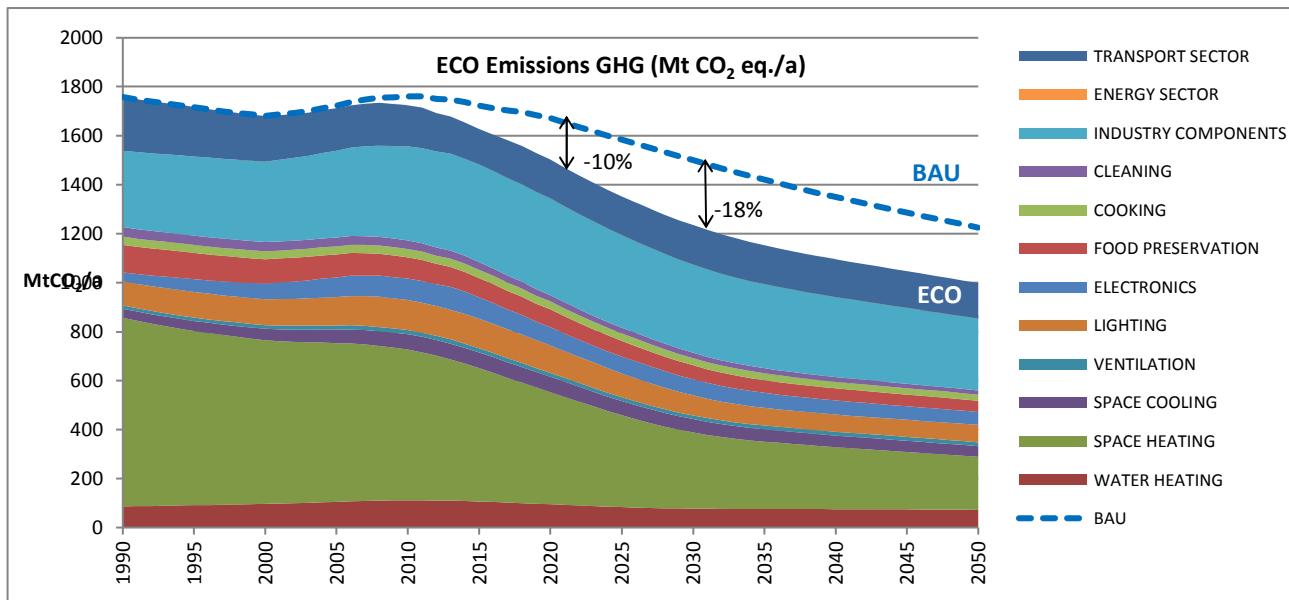
db	ECO Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	8.2	19.0	20.8	21.0	20.4	19.7	18.6	17.4	16.2	15.1
0.5	FAN Axial>300Pa	14.1	34.7	37.9	37.2	34.8	32.6	30.4	28.5	26.6	24.7
0.5	FAN Centr.FC	3.5	6.2	7.0	6.8	6.3	5.8	5.5	5.1	4.8	4.5
0.5	FAN Centr.BC-free	9.1	15.9	17.7	17.8	17.6	17.8	17.7	17.1	16.3	15.4
0.5	FAN Centr.BC	9.5	17.9	20.0	20.0	19.8	20.1	20.4	20.5	20.8	20.9
0.5	FAN Cross-flow	0.6	0.9	0.8	0.6	0.5	0.4	0.4	0.4	0.5	0.5
	Total FAN, industrial	22	47	52	52	50	48	46	45	43	41
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	49	51	50	43	36	33	31	29	27	24
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	73	79	78	67	54	49	45	41	38	34
0.45	Medium (L) 3-ph 75-375 kW no VSD	149	156	152	135	113	92	81	72	64	58
0.45	Total 3ph 0.75-375 kW no VSD	270	285	280	246	203	174	157	142	128	117
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	3	6	8	12	15	15	15	15	15	15
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	6	12	16	24	31	32	32	32	32	31
0.45	Medium (L) 3-ph 75-375 kW with VSD	17	34	45	62	75	85	86	86	85	83
0.45	Total 3-ph 0.75-375 kW with VSD	26	52	68	98	121	132	133	133	132	129
0.45	Total 3-ph 0.75-375 kW w/wo VSD	297	338	348	343	325	306	290	275	260	245
0.45	Small 1 ph 0.12-0.75 kW no VSD	4	4	4	4	4	3	3	3	3	2
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	4	4	4	4	3	3	3	3	3
0.45	Small 3 ph 0.12-0.75 kW no VSD	5	6	6	6	5	5	4	4	4	4
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	1	1	1	1	1	1	1	1
0.45	Total Small 3-ph 0.12-0.75 kW	5	6	6	6	5	5	5	5	5	4
0.45	Large 3-ph LV 375-1000 kW no VSD	76	76	71	65	58	52	48	45	41	38
0.45	Large 3-ph LV 375-1000kW with VSD	4	17	25	33	38	41	41	40	39	38
0.45	Total Large 3-ph LV 375-1000 kW	80	93	96	98	96	93	89	85	80	76
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	2	2	2	2	2	2	2	2	2	1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	5	5	5	5	5	5	4	4	4
0.45	Explosion motors (L) 3-ph 75-375 kW	7	9	9	10	10	10	9	9	9	8
0.45	Total Expl. 0.75-375 kW (no VSD)	13	15	16	17	17	16	16	15	14	14
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	1	1	1	1	1	1	1	1	1	1
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	3	3	3	3	3	3	3	3	3
0.45	Brake motors (L) 3-ph 75-375 kW	4	4	5	5	5	5	5	4	4	4
0.45	Total Brake 0.75-375 kW (no VSD)	7	9	9	10	10	9	9	8	8	8
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	1	1	0	0	0	0	0
0.45	Total 8-pole 0.75-375 kW (no VSD)	1									
0.45	1-phase motors >0.75 kW (no VSD)	20	23	24	25	24	23	21	21	20	19
	Total MT Elec. Motors LV 0.12-1000 kW including also double counted amounts	235	269	278	277	265	251	239	227	215	203
		426	488	505	504	482	456	434	412	391	369
	Total WP Water Pumps	39	43	45	46	47	47	48	48	47	46
	CP Fixed Speed 5-1280 l/s	10.7	17.9	14.6	12.1	11.1	10.7	10.4	10.1	9.7	9.2
	CP Variable speed 5-1280 l/s	0.0	3.3	5.6	6.9	7.1	7.0	6.7	6.4	6.2	5.8
	CP Pistons 2-64 l/s	0.5	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.4
	Total CP Standard Air Compressors	11	22	21	19	19	18	18	17	16	15
	WE arc-on-mode, from electricity	3.1	2.5	2.4	2.3	2.0	1.8	1.7	1.6	1.5	1.4
	WE idle mode, from electricity	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total WE Welding Equipment	3	3	3	2	2	2	2	2	2	1
	TOTAL INDUSTRY COMPONENTS	311	384	398	397	382	367	352	338	323	307
	TRAFO Distribution	5.2	7.2	7.6	7.6	7.5	7.4	7.2	6.9	6.6	6.2
	TRAFO Industry oil	3.9	5.6	5.8	5.6	5.2	4.8	4.3	4.0	4.0	4.0
	TRAFO Industry dry	1.2	1.7	1.8	1.9	1.8	1.8	1.7	1.6	1.6	1.6
	TRAFO Power	15.0	19.1	20.7	22.1	23.1	23.8	24.3	24.5	24.5	24.3
	TRAFO DER oil	0.0	0.2	0.3	0.4	0.6	0.8	1.2	1.6	2.1	2.6
	TRAFO DER dry	0.0	0.7	1.2	1.8	2.7	4.1	6.0	8.5	11.2	13.9
	TRAFO Small	0.8	0.7	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.4
	Total TRAFO Utility Transformers	26	35	38	40	42	43	45	48	50	53
	TOTAL ENERGY SECTOR (only improvement over BAU)	0	0	-1	-2	-4	-6	-8	-10	-11	-13
	(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

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db	ECO Emissions GHG (in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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 CO₂)	1758	1724	1626	1502	1351	1235	1153	1096	1047	999
	ECO Emissions GHG (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	87	112	107	95	83	78	76	76	74	73
	SPACE HEATING	771	615	544	458	375	311	275	252	235	217
	SPACE COOLING	37	63	64	62	58	54	50	48	45	43
	VENTILATION	13	18	17	16	15	15	16	16	16	16
1	VENTILATION (from heat saving vs. BAU; already included in EMIS for space heating)	0	0	-1	-4	-7	-9	-10	-10	-10	-10
	LIGHTING	99	123	121	112	97	81	72	69	70	71
	ELECTRONICS	36	88	87	76	68	66	61	58	55	53
	FOOD PRESERVATION	113	86	79	73	64	56	51	49	48	46
	COOKING	33	34	34	33	31	29	28	27	26	25
	CLEANING	39	35	32	26	24	22	21	19	18	17
	INDUSTRY COMPONENTS	311	384	398	397	382	367	352	338	323	307
	ENERGY SECTOR	0	0	-1	-2	-4	-6	-8	-10	-11	-13
	TRANSPORT SECTOR	220	168	145	158	157	160	158	153	149	145
	TOTAL in Mt CO₂	1758	1724	1626	1502	1351	1235	1153	1096	1047	999

For comparison: Total EU27 (2020) GHG emissions, excluding LULUCF, excluding international aviation, in MtCO₂eq *. 4858 4188 3829

* Source: Annual European Union greenhouse gas inventory 1990–2018 and inventory report 2020 , Submission to the UNFCCC Secretariat, 27 May 2020, European Environment Agency, Table ES.6 (EU27+UK, subtracting UK), and <https://www.eea.europa.eu/data-and-maps/data/data-viewers/greenhouse-gases-viewer>



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	-1	-2	-4	-6	-8	-10	-11	-13
ECO GHG emission, Energy Sector, MtCO ₂ eq	0	0	-1	-2	-4	-6	-8	-10	-11	-13

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ECO GHG emission (INDUSTRY, MtCO ₂ eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	3	3	3	3	2	2	2	2	2	2
SPACE HEATING	42	35	30	25	21	17	15	14	12	11
SPACE & HT PROCESS COOLING	9	14	15	14	14	12	12	11	10	10
VENTILATION	2	2	2	2	2	2	2	1	1	1
LIGHTING	13	16	17	18	16	13	12	11	11	12
ELECTRONICS	1	4	4	4	4	4	4	4	4	3
FOOD PRESERVATION	10	15	16	17	18	18	18	19	19	19
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	220	264	272	271	260	248	238	227	216	205
ECO GHG emission, Industry, MtCO ₂ eq	299	353	359	354	337	318	303	289	277	264
ECO GHG emission (TRANSPORT, MtCO ₂ eq)	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, MtCO ₂ eq	220	168	145	158	157	160	158	153	149	145
ECO GHG emission (TERTIARY/SERVICES, MtCO ₂ eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	20	25	24	21	18	17	17	17	17	16
SPACE HEATING	179	163	145	124	103	87	78	71	66	61
SPACE & HT PROCESS COOLING	23	39	41	40	38	35	32	30	29	27
VENTILATION	10	13	12	11	11	10	10	10	10	9
LIGHTING	51	72	74	76	69	58	51	50	50	51
ELECTRONICS	14	32	31	32	33	33	31	29	27	26
FOOD PRESERVATION	49	38	35	32	28	23	21	20	20	19
COOKING	4	4	4	4	3	3	3	3	2	2
CLEANING	2	3	3	2	2	2	2	2	2	2
INDUSTRY COMPONENTS	76	102	108	108	104	101	97	93	89	85
ECO GHG emission, Services, MtCO ₂ eq	429	490	478	450	409	369	341	324	311	299
ECO GHG emission (RESIDENTIAL, MtCO ₂ eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	63	83	79	71	62	57	56	56	55	54
SPACE HEATING	536	405	358	300	244	201	177	163	152	141
SPACE & HT PROCESS COOLING	1	6	5	3	3	3	3	3	3	3
VENTILATION	1	3	3	3	3	3	4	4	5	5
LIGHTING	35	34	29	16	11	9	8	8	7	7
ELECTRONICS	22	52	51	40	31	29	26	25	24	23
FOOD PRESERVATION	52	32	26	21	17	13	10	9	7	6
COOKING	29	30	30	29	27	26	25	24	24	23
CLEANING	37	32	29	23	22	20	19	18	16	15
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO GHG emission, Residential, MtCO ₂ eq	775	675	609	507	420	363	329	309	293	277
ECO GHG emission (OTHER sectors, MtCO ₂ eq)	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	7	6	5	5	4	4
SPACE & HT PROCESS COOLING	3	4	4	4	4	3	3	3	3	3
VENTILATION	0	0	0	0	0	0	0	0	0	0
LIGHTING	1	1	1	1	1	1	1	1	1	1
ELECTRONICS	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVATION	2	2	2	2	2	2	2	2	2	2
COOKING	0	0	0	0	0	0	0	0	0	0
CLEANING	0	0	0	0	0	0	0	0	0	0
INDUSTRY COMPONENTS	15	17	17	18	18	18	18	18	17	17
ECO GHG emission, Other sectors, MtCO ₂ eq	35	37	36	35	33	31	30	29	28	27

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ECO GHG emissions (per FUNCTION, MTCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh	87	112	107	95	83	78	76	76	74	73
Residential	63	83	79	71	62	57	56	56	55	54
Tertiary / Services	20	25	24	21	18	17	17	17	17	16
Industry	3	3	3	3	2	2	2	2	2	2
Other	1	1	1	1	1	1	1	1	1	1
SPACE HEATING. All sectors, TWh	771	615	544	458	375	311	275	252	235	217
Residential	536	405	358	300	244	201	177	163	152	141
Tertiary / Services	179	163	145	124	103	87	78	71	66	61
Industry	42	35	30	25	21	17	15	14	12	11
Other	14	12	10	9	7	6	5	5	4	4
SPACE COOLING. All sectors, TWh	37	63	64	62	58	54	50	48	45	43
& HT PROCESS	Residential	1	6	5	3	3	3	3	3	3
	Tertiary / Services	23	39	41	40	38	35	32	30	29
	Industry	9	14	15	14	14	12	12	11	10
	Other	3	4	4	4	4	3	3	3	3
VENTILATION. All sectors, TWh	13	18	17	16	15	15	16	16	16	16
Residential	1	3	3	3	3	3	4	4	5	5
Tertiary / Services	10	13	12	11	11	10	10	10	10	9
Industry	2	2	2	2	2	2	2	1	1	1
Other	0	0	0	0	0	0	0	0	0	0
LIGHTING. All sectors, TWh	99	123	121	112	97	81	72	69	70	71
Residential	35	34	29	16	11	9	8	8	7	7
Tertiary / Services	51	72	74	76	69	58	51	50	50	51
Industry	13	16	17	18	16	13	12	11	11	12
Other	1	1	1	1	1	1	1	1	1	1
ELECTRONICS. All sectors, TWh	36	88	87	76	68	66	61	58	55	53
Residential	22	52	51	40	31	29	26	25	24	23
Tertiary / Services	14	32	31	32	33	33	31	29	27	26
Industry	1	4	4	4	4	4	4	4	4	3
Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE. All sectors, TWh	113	86	79	73	64	56	51	49	48	46
Residential	52	32	26	21	17	13	10	9	7	6
Tertiary / Services	49	38	35	32	28	23	21	20	20	19
Industry	10	15	16	17	18	18	18	19	19	19
Other	2	2	2	2	2	2	2	2	2	2
COOKING. All sectors, TWh	33	34	34	33	31	29	28	27	26	25
Residential	29	30	30	29	27	26	25	24	24	23
Tertiary / Services	4	4	4	4	3	3	3	3	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	39	35	32	26	24	22	21	19	18	17
Residential	37	32	29	23	22	20	19	18	16	15
Tertiary / Services	2	3	3	2	2	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
INDUSTRY COMP. All sectors, TWh	311	384	398	397	382	367	352	338	323	307
Residential	0	0	0	0	0	0	0	0	0	0
Tertiary / Services	76	102	108	108	104	101	97	93	89	85
Industry	220	264	272	271	260	248	238	227	216	205
Other	15	17	17	18	18	18	18	18	17	17
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	1758	1724	1626	1502	1351	1235	1153	1096	1047	999
Residential	775	675	609	507	420	363	329	309	293	277
Tertiary / Services	429	490	478	450	409	369	341	324	311	299
Industry	299	353	359	354	337	318	303	289	277	264
Other	35	37	36	35	33	31	30	29	28	27
Transport	220	168	145	158	157	160	158	153	149	145

EMISSECO

ECO GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential	73%	74%	74%	74%	74%	74%	74%	74%	74%	74%
	Tertiary / Services	23%	22%	22%	22%	22%	22%	22%	22%	22%	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	69%	66%	66%	66%	65%	65%	64%	65%	65%	65%
	Tertiary / Services	23%	27%	27%	27%	27%	28%	28%	28%	28%	28%
	Industry	5%	6%	6%	6%	6%	6%	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%	88%	89%	89%	90%	90%	90%	90%	91%
	Tertiary / Services	14%	12%	12%	11%	11%	10%	10%	10%	10%	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	93%	92%	91%	91%	91%	91%	90%	90%	90%	90%
	Tertiary / Services	6%	8%	8%	8%	8%	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	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services	24%	27%	27%	27%	27%	27%	28%	28%	28%	28%
	Industry	71%	69%	68%	68%	68%	68%	67%	67%	67%	67%
	Other	5%	4%	4%	4%	5%	5%	5%	5%	5%	5%
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%	39%	37%	34%	31%	29%	29%	28%	28%	28%
	Tertiary / Services	24%	28%	29%	30%	30%	30%	30%	30%	30%	30%
	Industry	17%	20%	22%	24%	25%	26%	26%	26%	26%	26%
	Other	2%	2%	2%	2%	2%	3%	3%	3%	3%	3%
	Transport	12%	10%	9%	10%	12%	13%	14%	14%	14%	15%

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 NO_x 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	14805	7630	6410							
Share EIA Nox / ref. EU total	3.0%	5.8%	5.7%							

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).

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	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).

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 kton	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 Air Pollution (LRTAP), EEA Report No 05/2020, Table 3.7 (EU28 minus UK; adjusted data used).

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.

EMISSECO

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					

EMISSSAVE

db	Avoided Emissions GHG (BAU-ECO, in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>see also other emissions at bottom of Table</i>											
EIWH Electric Instant. < 12 kW (secondary)	0	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	0
EIWS Electric Instant. Shower (secondary)	0	0	0	1	1	1	1	1	1	1	1
ESWH Electric Storage ≤ 30 L (secondary)	0	0	0	0	0	0	0	0	0	0	0
ESWH Electric Storage > 30 L (primary)	0	0	0	1	2	3	3	2	2	2	2
GIWH Gas Instant. < 13 L/min (secondary)	0	0	0	0	1	1	0	0	0	0	0
GIWH Gas Instant. ≥ 13 L/min (primary)	0	0	0	0	0	0	0	0	0	0	0
GSHW Gas Storage, Condensing	0	0	0	0	0	0	0	0	0	0	0
GSHW Gas Storage, Non-condensing	0	0	0	0	0	0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	1	1	1	1	1	1	1
Dedicated WH Solar (3.5 m ²)	0	0	0	0	0	0	0	0	0	0	0
WH dedicated Water Heater	0	0	1	4	6	7	7	7	6	6	6
CHB Gas Combi Instant. WH	0	0	1	2	3	5	7	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	-1	-2	-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 m ²)	0	0	0	0	0	0	0	0	0	0	
CHC Central Heating combi, water heating	0	0	1	3	5	7	8	9	10	11	
TOTAL WATER HEATING	0	0	2	7	11	14	15	16	17	17	
CHB Gas non-condensing	0	2	8	24	37	46	48	43	38	33	
CHB Gas condensing	0	1	4	1	1	3	9	21	32	42	
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	6	9	11	11	12	11	10	
CHB Oil Jet burner condensing	0	0	0	-1	-2	-3	-4	-4	-4	-3	
CHB Electric Joule-effect	0	0	0	0	1	1	1	0	0	0	
CHB Hybrid (gas-electric)	0	0	0	0	0	-1	-1	-2	-2	-3	
CHB Electric Heat Pump	0	0	0	1	-1	-3	-6	-9	-11	-12	
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 m ²)	0	0	0	0	0	0	0	0	0	0	
CHB Central Heating boiler < 400 kW, space heating	0	5	15	30	44	54	59	61	64	66	
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	0.03	0.11	0.19	0.24	0.26	0.23	0.18	
CHAE-L (> 400 kW)	0.00	0.00	0.00	0.08	0.23	0.29	0.30	0.30	0.26	0.18	
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	0.01	0.01	0.01	0.01	0.01	
CHWE-L (> 1500 kW)	0.00	0.00	0.00	0.00	0.01	0.01	0.01	0.01	0.01	0.01	
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	0.02	0.37	0.86	1.19	1.21	1.03	0.84	0.65	
HT PCH-AE-L	0.00	0.00	0.02	0.41	1.01	1.53	1.72	1.65	1.46	1.25	
HT PCH-WE-S	0.00	0.00	0.00	0.04	0.09	0.12	0.11	0.08	0.04	0.02	
HT PCH-WE-M	0.00	0.00	0.00	0.07	0.15	0.18	0.13	0.06	0.02	0.00	
HT PCH-WE-L	0.00	0.00	0.00	0.02	0.04	0.06	0.07	0.06	0.05	0.04	
AC rooftop	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.00	0.00	
AC splits	0.00	0.00	0.01	0.14	0.26	0.33	0.28	0.22	0.16	0.12	
AC VRF	0.00	0.00	0.00	0.05	0.14	0.25	0.31	0.31	0.28	0.23	
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	1.2	3.0	4.2	4.5	4.0	3.4	2.7	
AC rooftop (rev)	0.00	0.00	0.03	0.23	0.37	0.35	0.18	0.05	0.00	0.00	
AC splits (rev)	0.00	0.00	0.05	0.38	0.69	0.85	0.77	0.61	0.47	0.36	
AC VRF (rev)	0.00	0.00	0.02	0.15	0.41	0.74	0.95	0.95	0.84	0.70	
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	1.27	2.59	3.50	3.60	3.23	2.82	2.44	
AHE	0.00	0.00	0.00	0.01	0.04	0.05	0.05	0.04	0.03	0.03	
SubTotal AHC central Air Heating	0.0	0.0	0.3	2.0	4.1	5.5	5.6	4.9	4.2	3.5	
Total AHC central Air Heating & Cooling	0.0	0.0	0.3	3.3	7.1	9.7	10.0	8.9	7.6	6.2	

EMISSSAVE

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	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	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	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	0.21
LH cooker	0.00	0.00	0.00	0.01	0.02	0.03	0.04	0.03	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	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	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	0.8
LH Electric portable	0.00	0.00	0.18	0.82	1.12	1.01	0.89	0.80	0.73	0.65	
LH Electric fixed > 250W	0.00	0.00	0.29	1.33	2.27	2.66	2.49	2.18	1.95	1.76	
LH Electric fixed ≤ 250W	0.00	0.00	0.02	0.09	0.15	0.17	0.16	0.14	0.13	0.11	
LH Electric storage	0.00	0.00	0.05	0.20	0.30	0.34	0.30	0.27	0.24	0.24	0.21
LH Electric underfloor	0.00	0.00	0.02	0.10	0.18	0.24	0.25	0.24	0.23	0.23	0.21
LH Electric visibly glowing > 1.2 kW	0.00	0.00	0.01	0.04	0.07	0.07	0.06	0.05	0.05	0.04	
LH Electric visibly glowing ≤ 1.2 kW	0.00	0.00	0.00	0.01	0.02	0.01	0.01	0.01	0.01	0.01	0.01
LH Electric Towel Heaters	0.00	0.00	0.00	0.00	0.02	0.03	0.03	0.04	0.04	0.04	0.04
LH Electric sum	0.0	0.0	0.6	2.6	4.1	4.5	4.2	3.7	3.4	3.0	
LH Gas luminous (commercial)	0.00	0.00	0.00	0.01	0.02	0.02	0.02	0.02	0.01	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	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	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	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	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	0.00
LH Gaseous fuel sum	0.0	0.0	0.0	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	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	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	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	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	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	0.0
LH Local Space Heaters total	0.0	0.0	0.6	2.8	4.6	5.3	5.1	4.7	4.3	3.9	
RAC fixed < 6 kW, cooling	0.0	1.6	1.8	1.5	1.4	1.3	1.1	1.1	1.2	1.3	
RAC fixed 6-12 kW, cooling	0.0	1.0	1.3	1.1	1.0	0.8	0.7	0.6	0.6	0.6	
RAC portable < 12 kW, cooling	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
RAC < 12 kW total, cooling mode	0.0	2.7	3.2	2.7	2.4	2.1	1.9	1.8	1.8	1.9	
RAC fixed < 6 kW, reversible, heating	0.0	1.6	2.3	2.5	2.6	2.6	2.4	2.2	2.2	2.2	
RAC fixed 6-12 kW, reversible, heating	0.0	1.1	1.7	1.9	2.0	1.9	1.8	1.6	1.5	1.4	
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	2.7	4.0	4.3	4.6	4.5	4.1	3.8	3.7	3.6	
RAC Room Air Conditioner	0.0	5.4	7.2	7.0	7.0	6.7	6.0	5.6	5.5	5.5	
1 CIRC Integrated circulators	0.0	0.0	0.8	2.4	3.1	2.9	2.6	2.1	1.7	1.3	
1 CIRC Large standalone circulators	0.0	0.0	0.5	1.2	1.1	0.9	0.6	0.5	0.4	0.3	
1 CIRC Small standalone circulators	0.0	0.0	0.6	1.2	1.2	1.0	0.8	0.7	0.5	0.4	
1 CIRC Circulator pumps <2.5 kW	0.0	0.0	1.9	4.8	5.4	4.7	4.0	3.3	2.6	2.1	
TOTAL SPACE HEATING	0	7	20	40	58	71	75	76	77	78	
TOTAL SPACE COOLING	0	3	3	4	5	6	6	6	5	5	
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	0.1	0.1	0.1	0.2	0.2	
R-UVU 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-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	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.6	0.6	0.6	
R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.4	0.5	
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	0.1	0.3	0.6	1.0	1.2	1.3	1.4	1.5	
NR-UVU 250-1000 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	0.2	
NR-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	
NR-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	
NR-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	
NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5	
NR-AHU-M 5500-14500 m3/h	0.0	0.0	0.1	0.3	0.6	0.8	1.0	1.0	1.0	1.0	
NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	
NRVU, Total non-residential, from VU own electricity	0.0	0.0	0.1	0.7	1.3	1.9	2.2	2.3	2.3	2.4	
VU Ventilation Units, res + non-res. from VU own elec.	0.0	0.0	0.2	0.9	1.9	2.9	3.4	3.6	3.7	3.9	
TOTAL VENTILATION (from VU own electricity)	0	0	0	1	2	3	3	4	4	4	
<i>Impact vs. BAU of VU on SH emissions (already accounted under Space Heating)</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>4</i>	<i>7</i>	<i>9</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>	

EMISSSAVE

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	0.5	2.0	5.4	14.9	24.4	25.2	21.2	16.4	12.4	
HID (HPM, HPS, MH)	0.0	0.5	4.9	8.0	8.2	6.9	4.3	2.6	1.5	0.8	
CFLni (all shapes)	0.0	0.1	0.4	0.9	1.4	1.2	0.7	0.4	0.2	0.1	
CFLi (retrofit for GLS, HL)	0.0	-1.1	-1.2	0.5	2.9	3.1	2.2	1.3	0.8	0.5	
GLS (DLS & NDLS)	0.0	7.9	13.3	12.5	7.0	3.9	2.1	1.2	0.6	0.3	
HL (DLS & NDLS, LV & MV)	0.0	-1.6	-1.0	13.6	14.1	7.0	3.4	1.7	0.9	0.5	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.3	-1.4	-5.4	-8.4	-8.2	-6.0	-3.6	-1.5	
LED replacing HID (retrofit & luminaire)	0.0	0.0	-3.4	-4.6	-3.6	-1.8	-0.5	0.1	0.6	1.0	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	-0.1	-0.3	-0.5	-0.3	-0.1	0.0	0.1	0.1	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	-0.4	-0.9	-1.0	-0.6	-0.4	-0.2	-0.1	0.0	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-0.5	-2.9	-3.7	-2.7	-1.6	-0.8	-0.3	0.0	
<i>Standby</i>	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	6	14	31	34	33	27	21	17	14	
DP TV on-mode, total all types	0.0	0.0	1.9	6.7	11.6	15.1	15.3	12.1	9.4	7.8	
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	7	12	15	15	12	9	8	
DP Monitor on-mode	0.0	0.0	0.3	1.0	1.0	1.0	0.8	0.6	0.5	0.4	
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	1	1	0	
DP Signage on-mode	0.0	0.0	0.0	0.0	0.2	1.2	1.9	1.7	0.9	0.2	
DP Signage standby	0.0	0.0	0.0	0.0	0.0	0.2	0.3	0.3	0.1	0.0	
DP Signage total	0	0	0	0	0	1	2	2	1	0	
DP Electronic Displays, total on-mode	0	0	2	8	13	17	18	14	11	8	
DP Electronic Displays, total standby	0	0	0	0	0	0	0	0	0	0	
DP Electronic Displays, total	0	0	2	8	13	17	18	15	11	9	
SSTB	0.0	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CSTB (low-power modes)	0.0	0.0	0.5	1.3	1.1	0.8	0.7	0.7	0.6	0.6	
CSTB (other modes)	0.0	0.0	0.3	0.7	0.6	0.5	0.4	0.4	0.3	0.3	
CSTB (all covered modes)	0.0	0.0	0.8	1.9	1.7	1.3	1.1	1.0	0.9	0.9	
Total STB set top boxes (Complex & Simple)	0	0	1	2	2	1	1	1	1	1	
Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.3	0.8	0.6	0.6	0.6	0.5	0.5	0.5	
Game consoles > 20 W Non-Active (CR)	0.0	0.0	0.2	0.6	0.6	0.5	0.5	0.5	0.4	0.4	
Game consoles < 20 W Non-Active (CR)	0.0	0.0	0.0	0.2	0.3	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	0.3	0.8	0.6	0.6	0.6	0.5	0.5	0.5	
Total Game consoles, non-active modes	0.0	0.0	0.2	0.8	0.8	0.8	0.7	0.7	0.6	0.6	
Total Game consoles > 20 W, all modes	0.0	0.0	0.5	1.3	1.2	1.1	1.1	1.0	0.9	0.9	
Total Game consoles < 20 W, all modes	0.0	0.0	0.0	0.2	0.3	0.3	0.2	0.2	0.2	0.2	
Total Game consoles, all modes	0.0	0.0	0.5	1.5	1.5	1.4	1.3	1.2	1.1	1.1	
<i>ES&DS only, without effects on infrastructure</i>											
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	0.3	0.3	0.3	0.3	0.3	0.3	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	0.1	0.1	0.1	0.1	0.1	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	0.1	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	0.2	0.3	0.2	0.2	0.2	0.2	0.2	
ES total cloud	0	0	0	0.4	0.5	0.5	0.5	0.5	0.4	0.4	
ES Enterprise Servers total	0	0	0	0.7	0.8	0.8	0.7	0.7	0.7	0.6	
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	0.1	0.1	0.1	0.1	0.1	0.1	
DS Data Storage products total	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	
ES + DS total (excl. infrastructure)	0	0	0	0.7	1.0	1.0	1.0	0.9	0.9	0.8	

EMISSSAVE

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									
	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	0.3	0.2	0.2	0.2	0.2	0.2	0.1
	EP / Laser Printer mono	0.0	0.2	0.3	0.3	0.2	0.2	0.1	0.1	0.1	0.0
	EP / Laser Printer colour	0.0	0.0	0.2	0.5	0.6	0.6	0.6	0.5	0.5	0.5
	EP / Laser Copier mono	0.0	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	0.2	0.6	0.7	0.7	0.6	0.6	0.5	0.4	0.4
	EP / Laser MFD colour	0.0	0.2	0.5	0.8	0.8	0.7	0.7	0.6	0.5	0.5
	Total IE Imaging Equipment, from electricity	0.0	1.1	2.0	2.7	2.6	2.4	2.1	1.9	1.7	1.5
	of which for modes under CR 1275/2008	0.0	0.8	1.5	2.1	2.0	1.8	1.6	1.5	1.3	1.2
	(see Resources for contributions from paper, toner)										
	<i>Products regulated only for (networked) standby</i>										
	SB Radios (sb & off modes)	0.0	0.0	0.3	0.6	0.5	0.4	0.4	0.3	0.2	0.2
	SB Electric toothbrushes (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	SB Audio speakers (wired) (sb & off modes)	0.0	0.2	0.6	0.3	0.1	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	1.0	1.0	0.9	0.8
	SB Small appliances (sb & off modes)	0.0	0.0	0.9	1.5	1.5	1.4	1.3	1.3	1.2	1.1
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.4	0.4	0.4	0.3	0.3	0.3	0.3
	SB Media players and recorders (sb mode)	0.0	0.3	1.2	0.3	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	0.3	0.2	0.2	0.1	0.1	0.0
	SB Office phones (nsb mode)	0.0	0.0	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0
	SB Home NAS (nsb mode)	0.0	0.0	0.0	0.5	0.6	0.7	0.7	0.7	0.6	0.5
	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	0.4	0.6	0.8	0.9	0.9	0.8	0.8
	SB Coffee makers (off mode)	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.2	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
1	SB Laundry Dryers (sb & off modes)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	SB Electric Ovens (sb mode)	0.0	0.0	0.4	0.8	1.3	1.6	1.6	1.5	1.4	1.3
1	SB Electric Hobs (sb mode)	0.0	0.0	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.5	1.3	1.1	0.8	0.7	0.7	0.6	0.6
1	SB Game consoles (non-active modes)	0.0	0.0	0.2	0.8	0.8	0.8	0.7	0.7	0.6	0.6
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 Laser Printers (nsb mode)	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1
1	SB IE Laser Printers (nsb mode)	0.0	0.2	0.4	0.6	0.6	0.6	0.5	0.5	0.4	0.4
1	SB IE Laser Copiers (nsb mode)	0.0	0.1	0.2	0.1	0.0	0.0	0.0	0.0	0.0	0.0
1	SB IE Laser MFDs (nsb mode)	0.0	0.3	0.8	1.2	1.1	1.0	0.9	0.8	0.7	0.6
	Total (networked) SB (incl. double)	0	2	7	11	11	11	10	10	9	8
	Total (networked) SB (excl. double)	0	1	4	5	6	5	5	5	4	4
db	<i>EPS Active mode (for electricity losses)</i>										
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	0.1	0.1	0.1	0.1	0.0
0.6	EPS 10–12 W	0.0	0.0	0.6	1.3	1.5	1.2	1.0	0.8	0.6	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	0.0	0.1	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	0.0	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	0.1	0.1	0.1	0.1	0.1	0.0	0.0
	EPS, total for active mode	0.0	0.0	0.8	1.6	1.8	1.5	1.2	1.0	0.7	0.6
db	<i>EPS No-load mode</i>										
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	0.2	0.3	0.2	0.2	0.2	0.1	0.1
0.0	EPS 10–12 W	0.0	0.0	0.0	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	0.0	0.2	0.3	0.4	0.3	0.3	0.2	0.2	0.1
	EPS, overall total (active + no-load)	0.0	0.1	1.0	1.9	2.2	1.8	1.5	1.2	0.9	0.8
	EPS, double counted subtracted	0.0	0.0	0.5	1.0	1.2	1.0	0.8	0.7	0.5	0.4
	TOTAL ELECTRONICS	0	2	10	21	27	30	30	25	21	17

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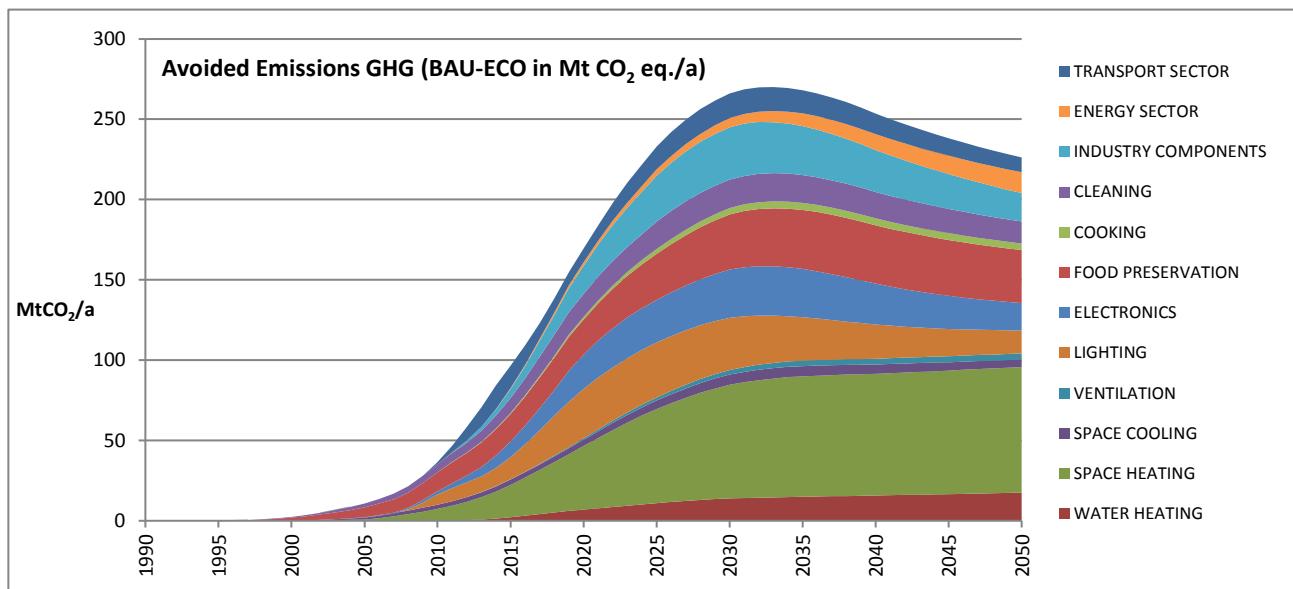
db	Avoided Emissions GHG (BAU-ECO, in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	0	12	17	21	24	25	26	26	25	23
	CF open vertical chilled multi deck (RVC2)	0	0	0.0	0.0	0.4	1.3	1.8	1.8	1.7	1.6
	CF open horizontal frozen island (RHF4)	0	0	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	0.5	1.6	2.4	2.5	2.4	2.2
	CF Plug in one door beverage cooler	0	0	0.0	0.1	1.0	2.0	2.2	2.2	2.1	2.0
	CF Plug in horizontal ice cream freezer	0	0	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3
	CF Spiral vending machine	0	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	Total CF Commercial Refrigeration	0	0	0	0	2	5	7	7	7	6
	PF Storage cabinet Chilled Vertical (CV)	0	0	0	0.1	0.3	0.4	0.4	0.4	0.3	0.3
	PF Storage cabinet Frozen Vertical (FV)	0	0	0	0.2	0.4	0.4	0.4	0.4	0.4	0.4
	PF Storage cabinet Chilled Horizontal (CH)	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.2
	PF Storage cabinet Frozen Horizontal (FH)	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Storage cabinets All types	0	0	0	0.4	1.1	1.2	1.2	1.2	1.2	1.1
	PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.3	0.3
	PF Process Chiller AC MT L > 300 kW	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	PF Process Chiller AC LT S ≤ 200 kW	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	PF Process Chiller AC LT L > 200 kW	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.3
	PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC MT L > 300 kW	0	0	0	0.0	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	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	0	0	0	0.4	0.9	1.4	1.5	1.5	1.5	1.5
	PF Condensing Unit MT S 0.2-1 kW	0	0	0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	0	0	0	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	PF Condensing Unit MT L 5-20 kW	0	0	0	0.3	0.5	0.5	0.5	0.5	0.5	0.5
	PF Condensing Unit MT XL 20-50 kW	0	0	0	0.2	0.4	0.4	0.5	0.5	0.5	0.5
	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	0.1	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	0.2	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit LT XL 8-20 kW	0	0	0	0.2	0.4	0.4	0.4	0.4	0.4	0.4
0.6	PF Condensing Unit, All MT&LT	0	0	0	1.2	2.1	2.2	2.2	2.2	2.2	2.2
	PF Professional Refrigeration, Total	0	0	0	1.3	2.8	3.5	3.6	3.6	3.6	3.6
	TOTAL FOOD PRESERVATION	0	12	17	22	29	34	37	36	35	33
	CA Electric Hobs (active modes)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
	CA Electric Hobs (low-power modes)	0.0	0.0	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5
	CA Electric Hobs (sum all modes)	0.0	0.0	0.2	0.3	0.5	0.5	0.5	0.5	0.5	0.5
	CA Electric Ovens (active modes)	0.0	0.0	0.0	0.2	0.3	0.5	0.6	0.6	0.6	0.6
	CA Electric Ovens (low-power modes)	0.0	0.0	0.4	0.8	1.3	1.6	1.6	1.5	1.4	1.3
	CA Electric Ovens (sum all modes)	0.0	0.0	0.4	1.0	1.6	2.1	2.2	2.1	2.0	1.9
	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	0.2	0.6	1.1	1.3	1.3	1.3	1.3
	CA Elec. Hobs&Ovens low-power modes	0.0	0.1	0.5	1.2	1.7	2.0	2.1	2.0	1.9	1.8
	CA other products or modes	0.0	0.0	0.0	0.5	1.2	1.9	2.3	2.4	2.3	2.3
	TOTAL COOKING	0	0	1	2	3	4	4	4	4	4
	WM Washing Machines, active modes	0.0	3.0	4.1	4.3	4.0	3.4	2.7	2.0	1.3	0.7
	WM Washing Machines, low-power modes	0.0	0.2	0.4	0.4	0.4	0.5	0.4	0.4	0.4	0.4
	WM Washing Machines, all modes	0.0	3.2	4.5	4.8	4.4	3.8	3.1	2.4	1.7	1.1
	WD Washer-Dryers, active modes	0.0	0.3	0.5	0.6	0.5	0.4	0.2	0.1	0.1	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	0.5	0.6	0.5	0.4	0.2	0.1	0.1	0.0
	WM-WD Washing, sum active modes	0.0	3.3	4.6	4.9	4.5	3.7	2.9	2.1	1.4	0.8
	WM-WD Washing, sum low-power modes	0.0	0.2	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4
	Total WM-WD household Washing	0	4	5	5	5	4	3	2	2	1
	DW Dishwashers, active modes	0.0	1.5	2.2	2.7	3.0	3.2	3.4	3.5	3.6	3.6
	DW Dishwashers, low-power modes	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Total DW household Dishwasher	0	2	2	3	3	3	4	4	4	4
	LD condensing heat pump	0.0	0.0	-0.3	-0.8	-1.1	-1.1	-1.1	-1.1	-0.9	-0.8
	LD condensing electric heat element	0.0	0.0	0.3	1.1	1.8	1.9	1.9	1.8	1.5	1.3
	LD vented electric	0.0	0.0	0.4	0.8	1.1	1.2	1.3	1.3	1.3	1.2
	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	0.4	1.1	1.7	1.9	2.0	2.0	1.8	1.6
	LD Laundry Dryers, low-power modes	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total LD household Laundry Dryer	0	0	0	1	2	2	2	2	2	2
	VC dom	0.0	0.0	1.4	4.3	6.5	7.1	7.3	7.2	6.8	6.1
	VC nondom	0.0	0.0	0.2	0.7	0.9	0.9	0.9	0.9	0.9	0.9
	Total VC Vacuum Cleaner	0	0	2	5	7	8	8	8	8	7
	TOTAL CLEANING	-	5	9	14	17	18	17	16	15	14

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db	Avoided Emissions GHG (BAU-ECO, in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.8	2.4	4.0	4.8	4.9	4.6	4.3	4.0
0.5	FAN Axial>300Pa	0.0	0.0	0.8	2.5	4.5	5.5	5.7	5.3	5.0	4.6
0.5	FAN Centr.FC	0.0	0.0	0.3	1.1	1.8	2.3	2.3	2.1	2.0	1.9
0.5	FAN Centr.BC-free	0.0	0.0	0.7	1.8	2.8	3.3	3.3	3.2	3.1	2.9
0.5	FAN Centr.BC	0.0	0.0	0.9	2.2	3.5	4.1	4.2	4.2	4.3	4.3
0.5	FAN Cross-flow	0.0	0.0	0.2	0.5	0.7	0.8	0.8	0.8	0.9	0.9
	Total FAN, industrial	0	0	2	5	9	10	11	10	10	9
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.1	2.1	8.5	12.9	11.9	9.9	7.8	5.5	3.2
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.1	3.0	13.3	21.3	20.4	17.0	13.1	8.8	4.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.1	5.5	20.2	32.3	38.0	30.3	19.5	9.8	3.6
0.45	Total 3ph 0.75-375 kW no VSD	0	0	11	42	67	70	57	40	24	11
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.3	-3.3	-5.6	-4.8	-3.8	-2.7	-1.6	-0.3
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-1.5	-7.3	-11.8	-10.8	-8.7	-6.4	-3.9	-1.2
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-3.1	-11.8	-18.3	-20.9	-15.5	-8.8	-3.0	0.5
0.45	Total 3-ph 0.75-375 kW with VSD	0	0	-5	-22	-36	-37	-28	-18	-9	-1
0.45	Total 3-ph 0.75-375 kW w/wo VSD	0	0	6	20	31	34	29	22	16	10
0.45	Small 1 ph 0.12-0.75 kW no VSD	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	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	0.1	0.3	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	0.3	0.4	0.3	0.3	0.2	0.2
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
0.45	Total Small 3-ph 0.12-0.75 kW	0	0	0	0.0	0.3	0.4	0.4	0.3	0.3	0.3
0.45	Large 3-ph LV 375-1000 kW no VSD	0	0	0	0.0	0.1	0.2	0.2	0.2	0.2	0.1
0.45	Large 3-ph LV 375-1000kW with VSD	0	0	0	0.0	0.3	0.5	0.7	0.8	0.7	0.6
0.45	Total Large 3-ph LV 375-1000 kW	0	0	0	0.0	0.4	0.7	0.9	1.1	0.9	0.8
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	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	0.0	0.0	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	0.1	0.1	0.1	0.1	0.1
0.45	Total Expl. 0.75-375 kW (no VSD)	0	0	0	0.0	0.1	0.2	0.3	0.3	0.2	0.2
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0.0	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	0.0	0.0	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	0.1	0.1	0.1	0.1
0.45	Total Brake 0.75-375 kW (no VSD)	0	0	0	0.0	0.1	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
0.45	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						
0.45	1-phase motors >0.75 kW (no VSD)	0	0	0	0.0	0.3	0.7	0.9	0.8	0.6	0.5
	MT Elec. Motors LV 0.12-1000 kW	0	0	3	11	18	20	18	14	10	7
	including also double counted amounts	-	0	6	20	32	36	32	25	18	12
	Total WP Water Pumps	0	0	1							
	CP Fixed Speed 5-1280 l/s	0.00	0.00	0.06	0.21	0.34	0.34	0.29	0.25	0.21	0.17
	CP Variable speed 5-1280 l/s	0.00	0.00	0.01	0.07	0.14	0.17	0.13	0.10	0.06	0.03
	CP Pistons 2-64 l/s	0.00	0.00	0.00	0.01	0.02	0.02	0.01	0.01	0.01	0.01
	Total CP Standard Air Compressors	0.0	0.0	0.1	0.3	0.5	0.5	0.4	0.4	0.3	0.2
	WE arc-on-mode, from electricity	0	0	0	0.00	0.14	0.25	0.24	0.23	0.22	0.21
	WE idle mode, from electricity	0	0	0	0.00	0.03	0.05	0.05	0.04	0.04	0.04
	Total WE Welding Equipment	0	0	0	0.0	0.2	0.3	0.3	0.3	0.2	0.2
	TOTAL INDUSTRY COMPONENTS	0	0	6	17	28	33	30	26	22	18
	TRAFO Distribution	0.0	0.0	0.2	0.7	1.2	1.6	2.1	2.5	2.8	3.2
	TRAFO Industry oil	0.0	0.0	0.3	0.9	1.5	2.1	2.6	3.0	3.0	2.9
	TRAFO Industry dry	0.0	0.0	0.0	0.2	0.3	0.4	0.5	0.6	0.6	0.6
	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	0.2	0.4	0.7	1.1	1.4	1.7
	TRAFO DER dry	0.0	0.0	0.1	0.3	0.6	1.1	1.9	2.8	3.6	4.5
	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	1	2	4	6	8	10	11	13
	TOTAL ENERGY SECTOR	0	0	1	2	4	6	8	10	11	13
	(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

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db	Avoided Emissions GHG (BAU-ECO, in MtCO ₂ eq./a)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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 CO₂)	0	37	96	170	233	266	268	253	238	226
	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	7	11	14	15	16	17	17
	SPACE HEATING	0	7	20	40	58	71	75	76	77	78
	SPACE COOLING	0	3	3	4	5	6	6	6	5	5
	VENTILATION	0	0	0	1	2	3	3	4	4	4
1	<i>VENTILATION (from heat saving vs. BAU; already included in EMIS for space heating)</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>4</i>	<i>7</i>	<i>9</i>	<i>10</i>	<i>10</i>	<i>10</i>	<i>10</i>
	LIGHTING	0	6	14	31	34	33	27	21	17	14
	ELECTRONICS	0	2	10	21	27	30	30	25	21	17
	FOOD PRESERVATION	0	12	17	22	29	34	37	36	35	33
	COOKING	0	0	1	2	3	4	4	4	4	4
	CLEANING	0	5	9	14	17	18	17	16	15	14
	INDUSTRY COMPONENTS	0	0	6	17	28	33	30	26	22	18
	ENERGY SECTOR	0	0	1	2	4	6	8	10	11	13
	TRANSPORT SECTOR	0	1	14	9	14	15	14	13	11	9
	TOTAL in Mt CO₂	0	37	96	170	233	266	268	253	238	226
	Saving in % versus BAU (from 1990=0)	0.0%	2.1%	5.6%	10.1%	14.7%	17.7%	18.8%	18.8%	18.5%	18.5%
	Saving In % versus BAU (from 2010=0)	-2.1%	0.0%	3.5%	8.0%	12.4%	15.3%	16.3%	16.1%	15.7%	15.5%



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, MtCO ₂ eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TOTAL ENERGY SECTOR	0	0	1	2	4	6	8	10	11	13
SAVED GHG emission, Energy Sector, MtCO ₂ eq	0	0	1	2	4	6	8	10	11	13

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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	1
SPACE HEATING	0	0	1	2	3	4	4	4	4	4
SPACE & HT PROCESS 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	2	4	5	5	4	3	3
ELECTRONICS	0	0	0	0	0	0	1	0	0	0
FOOD PRESERVATION	0	0	0	1	1	2	2	2	2	2
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	3	11	17	20	18	15	11	8
SAVED GHG emission, Industry, MtCO2eq	0	1	6	17	27	32	31	27	22	19
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, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	2	3	3	3	3	3	3
SPACE HEATING	0	2	5	11	16	20	21	21	21	21
SPACE & HT PROCESS COOLING	0	1	1	2	3	3	4	3	3	2
VENTILATION	0	0	0	1	1	2	2	2	2	2
LIGHTING	0	2	5	10	16	19	18	14	12	10
ELECTRONICS	0	1	3	5	6	7	8	7	5	4
FOOD PRESERVATION	0	1	1	2	5	9	10	10	10	10
COOKING	0	0	0	0	0	1	1	1	1	1
CLEANING	0	0	0	1	1	1	1	1	1	1
INDUSTRY COMPONENTS	0	0	2	6	10	12	12	11	10	9
SAVED GHG emission, Services, MtCO2eq	0	6	18	40	62	78	79	74	68	63
SAVED GHG emission (RESIDENTIAL, MtCO2eq)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	2	5	8	10	11	12	13	13
SPACE HEATING	0	5	14	26	38	45	48	49	51	52
SPACE & HT PROCESS COOLING	0	2	2	2	1	1	1	1	1	1
VENTILATION	0	0	0	0	1	1	1	1	1	1
LIGHTING	0	4	8	18	15	8	5	3	2	1
ELECTRONICS	0	1	7	16	20	22	22	18	15	13
FOOD PRESERVATION	0	11	16	19	22	23	24	24	23	21
COOKING	0	0	1	1	2	3	4	4	4	3
CLEANING	0	5	9	13	16	16	16	15	14	12
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
SAVED GHG emission, Residential, MtCO2eq	0	27	57	100	123	131	132	127	123	119
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	1	1	1
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	1	1	1	1	1	1	1
SAVED GHG emission, Other sectors, MtCO2eq	0	0	1	2	3	3	3	3	3	3

EMISSSAVE

SAVED GHG emissions (per FUNCTION, MTCO2eq)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING. All sectors, TWh		0	0	2	7	11	14	15	16	17	17
Residential		0	0	2	5	8	10	11	12	13	13
Tertiary / Services		0	0	1	2	3	3	3	3	3	3
Industry		0	0	0	0	0	0	0	0	0	1
Other		0	0	0	0	0	0	0	0	0	0
SPACE HEATING. All sectors, TWh		0	7	20	40	58	71	75	76	77	78
Residential		0	5	14	26	38	45	48	49	51	52
Tertiary / Services		0	2	5	11	16	20	21	21	21	21
Industry		0	0	1	2	3	4	4	4	4	4
Other		0	0	0	1	1	1	2	1	1	1
SPACE COOLING. All sectors, TWh		0	3	3	4	5	6	6	6	5	5
& HT PROCESS	Residential	0	2	2	2	1	1	1	1	1	1
	Tertiary / Services	0	1	1	2	3	3	4	3	3	2
	Industry	0	0	0	0	1	1	1	1	1	1
	Other	0	0	0	0	0	0	0	0	0	0
VENTILATION.	All sectors, TWh	0	0	0	1	2	3	3	4	4	4
	Residential	0	0	0	0	1	1	1	1	1	1
	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
LIGHTING.	All sectors, TWh	0	6	14	31	34	33	27	21	17	14
	Residential	0	4	8	18	15	8	5	3	2	1
	Tertiary / Services	0	2	5	10	16	19	18	14	12	10
	Industry	0	0	1	2	4	5	5	4	3	3
	Other	0	0	0	0	0	0	0	0	0	0
ELECTRONICS.	All sectors, TWh	0	2	10	21	27	30	30	25	21	17
	Residential	0	1	7	16	20	22	22	18	15	13
	Tertiary / Services	0	1	3	5	6	7	8	7	5	4
	Industry	0	0	0	0	0	0	1	0	0	0
	Other	0	0	0	0	0	0	0	0	0	0
FOOD PRESERVE. All sectors, TWh		0	12	17	22	29	34	37	36	35	33
	Residential	0	11	16	19	22	23	24	24	23	21
	Tertiary / Services	0	1	1	2	5	9	10	10	10	10
	Industry	0	0	0	1	1	2	2	2	2	2
	Other	0	0	0	0	0	0	0	0	0	0
COOKING.	All sectors, TWh	0	0	1	2	3	4	4	4	4	4
	Residential	0	0	1	1	2	3	4	4	4	3
	Tertiary / Services	0	0	0	0	0	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
CLEANING.	All sectors, TWh	0	5	9	14	17	18	17	16	15	14
	Residential	0	5	9	13	16	16	16	15	14	12
	Tertiary / Services	0	0	0	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
INDUSTRY COMP. All sectors, TWh		0	0	6	17	28	33	30	26	22	18
	Residential	0	0	0	0	0	0	0	0	0	0
	Tertiary / Services	0	0	2	6	10	12	12	11	10	9
	Industry	0	0	3	11	17	20	18	15	11	8
	Other	0	0	0	1	1	1	1	1	1	1
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	37	96	170	233	266	268	253	238	226
	Residential	0	27	57	100	123	131	132	127	123	119
	Tertiary / Services	0	6	18	40	62	78	79	74	68	63
	Industry	0	1	6	17	27	32	31	27	22	19
	Other	0	0	1	2	3	3	3	3	3	3
	Transport	0	1	14	9	14	15	14	13	11	9

EMISSSAVE

SAVED GHG emissions (per FUNCTION, %)		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING.											
	Residential			72%	73%	73%	74%	75%	75%	76%	76%
	Tertiary / Services			24%	23%	23%	22%	21%	21%	20%	20%
	Industry			3%	3%	3%	3%	3%	3%	3%	3%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
SPACE HEATING.											
	Residential			67%	67%	65%	65%	64%	65%	65%	67%
	Tertiary / Services			28%	27%	28%	28%	28%	27%	27%	27%
	Industry			4%	4%	5%	6%	6%	5%	5%	5%
	Other			1%	1%	2%	2%	2%	2%	2%	2%
SPACE COOLING.											
& HT PROCESS	Residential			62%	60%	42%	28%	21%	19%	20%	22%
	Tertiary / Services			32%	34%	44%	51%	55%	56%	56%	55%
	Industry			5%	5%	11%	16%	18%	19%	19%	18%
	Other			1%	1%	3%	5%	5%	6%	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%
	Tertiary / Services			26%	34%	32%	45%	59%	65%	68%	69%
	Industry			7%	9%	8%	11%	15%	17%	18%	19%
	Other			1%	2%	1%	1%	1%	1%	1%	1%
ELECTRONICS.											
	Residential			53%	73%	74%	75%	74%	72%	71%	72%
	Tertiary / Services			47%	26%	25%	24%	25%	26%	27%	26%
	Industry			0%	1%	1%	1%	2%	2%	2%	2%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
FOOD PRESERVE.											
	Residential			92%	92%	86%	76%	68%	66%	65%	65%
	Tertiary / Services			6%	6%	10%	19%	26%	28%	29%	29%
	Industry			1%	1%	3%	4%	5%	5%	5%	5%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
COOKING.											
	Residential			85%	84%	84%	83%	83%	83%	83%	83%
	Tertiary / Services			15%	16%	16%	17%	17%	17%	17%	17%
	Industry			0%	0%	0%	0%	0%	0%	0%	0%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
CLEANING.											
	Residential			96%	94%	92%	92%	92%	92%	91%	91%
	Tertiary / Services			4%	5%	7%	7%	7%	7%	8%	9%
	Industry			0%	0%	1%	1%	1%	1%	1%	1%
	Other			0%	0%	0%	0%	0%	0%	0%	0%
INDUSTRY COMP.											
	Residential			0%	0%	0%	0%	0%	0%	0%	0%
	Tertiary / Services			23%	39%	37%	37%	37%	39%	41%	45%
	Industry			65%	57%	60%	61%	60%	58%	56%	52%
	Other			12%	4%	3%	2%	2%	2%	3%	3%
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			75%	59%	59%	53%	49%	49%	50%	51%
	Tertiary / Services			18%	19%	24%	27%	29%	30%	29%	28%
	Industry			3%	6%	10%	12%	12%	12%	11%	9%
	Other			1%	1%	1%	1%	1%	1%	1%	1%
	Transport			3%	14%	5%	6%	6%	5%	5%	4%

EMISSSAVE

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 NO_x	0	4	34	119	165	182	177	172	169	166
Direct NO_x 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

EMISSSAVE

db	Avoided noise emissions by tyres (in dB(A))	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	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					

PRICE

UNIT PRICE (in 2015-euros)	var	ref year	BC	BC	mid	mid	BAT	BAT	BC-mid	mid-BAT	PriceDec
			price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF	%
EIWH Electric Instant. < 12 kW (secondary)		2015	151		constant price						
EIWH Electric Instant. ≥ 12 kW (primary)		2015	151		constant price						
EIWHS Electric Instant. Shower (secondary)		2015	151		constant price						
ESWH Electric Storage ≤ 30 L (secondary)		2015	151		constant price						
ESWH Electric Storage > 30 L (primary)		2015	392		constant price						
GIWH Gas Instant. < 13 L/min (secondary)		2015	316		constant price						
GIWH Gas Instant. ≥ 13 L/min (primary)		2015	565		constant price						
GSWH Gas Storage, Condensing		2015	848		constant price						
GSWH Gas Storage, Non-condensing		2015	848		constant price						
Dedicated WH Heat Pump		2015	703		constant price						
Dedicated WH Solar (3.5 m ²)		2015	1791		constant price						
CHB Gas Combi Instant. WH		2015	405		constant price						
CHB Gas + Cyl. WH		2015	649		constant price						
CHB Jet Burner Gas + Cyl. WH		2015	2050		constant price						
CHB Jet Burner Oil + Cyl. WH		2015	2050		constant price						
CHB Electric (Joule) + Cyl. WH		2015	409		constant price						
CHB Hybrid Gas/Electric WH		2015	1572		constant price						
CHB Electric HP + Cyl. WH		2015	1871		constant price						
CHB Gas HP + Cyl. WH		2015	2605		constant price						
CHB Gas mCHP + Cyl. WH		2015	5326		constant price						
CHB Solar Combi (16 m ²)		2015	2248		constant price						
CHB Gas non-condensing		2015	1795		constant price						
CHB Gas condensing		2015	2255		constant price from 2016 onwards, for prices 2004-2016, see PRICEBAU						
CHB Gas Jet burner non-condensing		2015	10055		constant price						
CHB Gas Jet burner condensing		2015	11012		constant price						
CHB Oil Jet burner non-condensing		2015	10055		constant price						
CHB Oil Jet burner condensing		2015	11012		constant price						
CHB Electric Joule-effect		2015	2102		constant price						
CHB Hybrid (gas-electric)		2015	8080		constant price						
CHB Electric Heat Pump		2015	9614		constant price						
CHB Gas Heat Pump		2015	13388		constant price						
CHB micro CHP		2015	27367		constant price						
CHB Solar combi (16 m ²)		2015	11552		constant price						
			€	%	€	%	€	%	€ct/%	€ct/%	
SFB Wood Manual [18 kW]	%	2010	4860	51%	8430	63%	10063	75%	29384	13439	0.7%
SFB Wood Direct Draft [20 kW]	%	2010	7019	73%	7570	74%	8425	75%	47854	74345	0.8%
SFB Coal [25 kW]	%	2010	5940	67%	5940	70%	5940	72%	0	0	0.7%
SFB Pellets [25 kW]	%	2010	8639	73%	9397	76%	10060	78%	30295	26551	0.8%
SFB Wood chips [160 kW]	%	2010	36177	73%	40940	75%	42207	77%	238166	63310	0.9%
Air Cooling:			€	%	€	%	€	%	€ct/%	€ct/%	
CHAE-S (≤ 400 kW)	%	2010	18685	136%	19501	161%	20352	186%	3262	3405	1.0%
CHAE-L (> 400 kW)	%	2010	45476	140%	49216	180%	53264	219%	9469	10248	1.0%
CHWE-S (≤ 400 kW)	%	2010	15097	186%	15680	216%	16285	245%	1976	2052	1.0%
CHWE-M (> 400 kW; ≤ 1500 kW)	%	2010	66552	217%	74646	288%	83725	358%	11481	12877	1.0%
CHWE-L (> 1500 kW)	%	2010	119156	217%	133648	288%	149902	358%	20556	23056	1.0%
CHF	%	2010	16305	103%	18830	139%	21747	175%	7015	8101	1.0%
HT PCH-AE-S	%	2010	20422	470%	22281	598%	24310	725%	1459	1592	1.0%
HT PCH-AE-L	%	2010	51689	510%	58050	655%	65193	800%	4387	4927	1.0%
HT PCH-WE-S	%	2010	17298	730%	18660	878%	20128	1025%	923	996	1.0%
HT PCH-WE-M	%	2010	81307	850%	92617	1050%	105500	1250%	5655	6442	1.0%
HT PCH-WE-L	%	2010	173373	850%	200731	1075%	232406	1300%	12159	14078	1.0%
AC rooftop	%	2010	20736	120%	21034	153%	21336	185%	917	930	1.0%
AC splits	%	2010	3547	156%	3959	214%	4420	272%	711	794	1.0%
AC VRF	%	2010	33230	165%	33988	191%	34764	217%	2917	2984	1.0%
ACF	%	2010	16305	103%	18830	139%	21747	175%	7015	8101	1.0%
Air Heating:			€	%	€	%	€	%	€ct/%	€ct/%	
AC rooftop (rev)	%	2010	20543	99%	20812	128%	21085	158%	908	920	1.0%
AC splits (rev)	%	2010	3294	117%	3570	160%	3870	202%	651	705	1.0%
AC VRF (rev)	%	2010	32230	130%	32712	147%	33201	164%	2818	2861	1.0%
ACF (rev)	%	2010	18093	129%	19836	152%	21747	175%	7581	8311	1.0%
AHF	%	2010	5590	63%	6524	74%	7614	84%	9068	10583	1.0%
AHE	%	2010	540	30%	540	34%	540	38%	0	0	1.0%

PRICE

UNIT PRICE (in 2015-euros)	var	ref	BC		mid		BAT		BC-mid		mid-BAT		PriceDec
			year	price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF	%	
LH open fireplace [8 kW]	%	2010	2862	30%	4074	45%	5982	60%	7998	12600		0.7%	
LH closed fireplace/inset [8 kW]	%	2010	2934	69%	3280	75%	3680	80%	6454	7477		0.7%	
LH wood stove [8 kW]	%	2010	2719	69%	3064	75%	3464	80%	6454	7477		0.8%	
LH coal stove [8 kW]	%	2010	1992	69%	2223	75%	2489	80%	4303	4985		0.7%	
LH cooker [10 kW]	%	2010	3075	64%	3684	72%	4438	80%	7778	9646		0.8%	
LH SHR stove [8 kW]	%	2010	8591	80%	8797	83%	9016	85%	8234	8765		0.4%	
LH pellet stove [8 kW]	%	2010	3638	85%	3753	88%	3873	90%	4733	4909		0.9%	
LH Electric portable	%	2015	29	74%	31	87%	32	100%	12	13		1.0%	
LH Electric fixed > 250W	%	2015	261	74%	269	88%	278	100%	60	72		0.8%	
LH Electric fixed ≤ 250W	%	2015	146	69%	150	82%	155	95%	36	37		0.8%	
LH Electric storage	%	2015	618	74%	739	87%	889	100%	944	1160		0.9%	
LH Electric underfloor	%	2015	282	74%	300	79%	320	95%	383	126		0.6%	
LH Electric visibly glowing > 1.2 kW	%	2015	66	70%	66	86%	66	90%	0	0		0.0%	
LH Electric visibly glowing ≤ 1.2 kW	%	2015	44	62%	44	78%	44	82%	0	0		0.0%	
LH Electric Towel Heaters	%	2015	250	68%	250	79%	250	83%	0	0		0.0%	
LH Gas luminous (commercial)	%	2015	1227	81%	1453	90%	1743	99%	2584	3324		0.8%	
LH Gaseous Tube (commercial < 120 kW)	%	2015	1359	71%	1702	83%	2176	95%	2852	3947		0.8%	
LH Gas open front	%	2015	1156	42%	1329	61%	1539	80%	902	1093		0.7%	
LH Gas closed front	%	2015	2216	64%	2342	72%	2477	80%	1603	1734		0.7%	
LH Gas balanced flue	%	2015	1551	68%	1639	76%	1734	84%	1122	1214		0.7%	
LH Gas flueless	%	2015	337	100%	337	100%	337	100%	0	0		0.0%	
LH Liquid tube (commercial < 120 kW)	%	2015	1359	68%	1702	80%	2176	92%	2852	3947		0.8%	
LH Liquid open front	%	2015	832	42%	957	61%	1108	80%	650	787		0.7%	
LH Liquid closed front	%	2015	2216	64%	2342	72%	2477	80%	1603	1734		0.7%	
LH Liquid balanced flue	%	2015	1477	68%	1561	76%	1651	84%	1068	1155		0.7%	
LH Liquid flueless	%	2015	280	100%	280	100%	280	100%	0	0		0.0%	
RAC fixed < 6 kW, cooling	SEER	2010	1202	2.16	1362	3.22	2164	8.50	152	152		2.0%	
RAC fixed 6-12 kW, cooling	SEER	2010	1636	1.86	2016	2.84	3759	7.30	391	391		2.0%	
RAC portable < 12 kW, cooling	SEER	2010	258	1.16	300	1.39	437	2.14	185	185		2.0%	
RAC fixed < 6 kW, reversible, heating			1202	2.16	1362	3.22	2164	8.50	152	152		2.0%	
RAC fixed 6-12 kW, reversible, heating			1636	1.86	2016	2.84	3759	7.30	391	391		2.0%	
RAC portable < 12 kW, reversible, heating			258	1.16	300	1.39	437	2.14	185	185		2.0%	
CIRC Integrated circulators	EEI	2015	295	0.48	326	0.26	333	0.21	-137	-137		1.0%	
CIRC Large standalone circulators	EEI	2015	661	0.40	1559	0.22	1617	0.20	-4847	-4847		1.0%	
CIRC Small standalone circulators	EEI	2015	295	0.57	392	0.22	397	0.20	-280	-280		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 the 2020 review study analyses.									0.6%	
R-BVU 100-250 m3/h		2012	Prices do not only depend on electric efficiency, but also on e.g. motor controls, flow controls, sensors and ventilation performance.									0.7%	
R-UVU 250-1000 m3/h		2012	Review study applied the indicated annual price decrease from 2012.									0.4%	
R-BVU 250-1000 m3/h		2012										0.4%	
NR-UVU 250-1000 m3/h		2012	The share of installation in overall acquisition varies with the years. Installation costs are therefore specified separately.									0.6%	
NR-BVU 250-1000 m3/h		2012	Installation costs in EIA are the sum of installation materials and labour.									0.7%	
NR-UVU > 1000 m3/h		2012	Installation costs differ for replacement and new-built/renovation.									0.4%	
NR-BVU 1000-2500 m3/h		2012										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 the MELISA model, computed as total EU acquisition costs divided by total EU sales units.										
CFLni (all shapes)													
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)													

PRICE

UNIT PRICE (in 2015-euros)	var	ref	BC		mid		BAT		BC-mid		mid-BAT		PriceDec %		
			year	price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF				
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	54	19	56	17	64	4	0.65	0.65	1%				
CSTB	kWh	2010	162	88	199	31	207	18	0.65	0.65	1%				
Game consoles > 20 W		2015	395											1.7%	
Game consoles < 20 W		2015	278											0.0%	
ES tower 1-socket traditional			1200.015												
ES rack 1-socket traditional			1000.013												
ES rack 2-socket traditional			3000.038												
ES rack 2-socket cloud			4000												
ES rack 4-socket traditional			28000.35												
ES rack 4-socket cloud			33000.42												
ES rack 2-socket resilient trad.			35000.44												
ES rack 2-socket resilient cloud			36000.45												
ES rack 4-socket resilient trad.			37000.47												
ES rack 4-socket resilient cloud			38000.48												
ES blade 1-socket traditional			350.0044												
ES blade 2-socket traditional			3000.038												
ES blade 2-socket cloud			4000												
ES blade 4-socket traditional			6000												
ES blade 4-socket cloud			7000												
DS Online 2			20000.25												
DS Online 3			50000												
DS Online 4			160000												
PC Desktop		2015	739												
PC Integrated Desktop		2015	790												
PC Notebook		2015	1019												
PC Tablet/slate		2015	676												
PC Thin client		2015	601												
PC Integrated Thin Client		2015	470												
PC Small-scale Server		2015	1500												
PC Workstation		2015	2661												
Inkjet Printer			from EIA 2018 2010 and before			from review study 2018 and after									
Inkjet MFD			100			152									
EP / Laser Printer mono			150			64									
EP / Laser Printer colour			216			456									
EP / Laser Copier mono			540			513									
EP / Laser Copier colour			1620			1620									
EP / Laser MFD mono			2700			2700									
EP / Laser MFD colour			757			757									
paper			4800			4800									
ink and toner			see rates			see resources									
<i>Products regulated only for (networked) standby</i>															
SB Radios			25												
SB Electric toothbrushes			31												
SB Audio speakers (wired)			136												
SB Audio speakers (wireless)			119												
SB Small appliances			42												
SB Media boxes /sticks			50												
SB Media players and recorders			78												
SB Projectors			392												
SB Home phones			55												
SB Office phones			55												
SB Home NAS			261												
SB Home Network Equipment			118												
SB Office Network Equipment			118												
SB Coffee makers			42												
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>														not used for SB, see main accounting for the product group	

PRICE

UNIT PRICE (in 2015-euros)	var	ref year	BC		mid		BAT		BC-mid		mid-BAT		PriceDec %
			price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF			
EPS ≤ 6W, low-V	%	2010	3.85	66.3%	5.22	73.6%	5.72	74.1%	0.19	0.99	0.5%	0.5%	
EPS 6–10 W	%	2010	7.95	72.1%	8.36	81.9%	9.05	84.3%	0.04	0.29	0.5%	0.5%	
EPS 10–12 W	%	2010	11.87	73.6%	12.51	83.0%	13.10	85.9%	0.07	0.20	0.5%	0.5%	
EPS 15–20 W	%	2010	8.31	76.9%	9.49	85.0%	9.92	85.9%	0.14	0.48	0.5%	0.5%	
EPS 20–30 W	%	2010	13.94	81.0%	16.03	86.9%	17.02	88.5%	0.35	0.62	0.5%	0.5%	
EPS 30–65 W, multiple-V	%	2010	18.52	83.0%	18.52	83.1%	25.86	85.8%	0.00	2.72	0.5%	0.5%	
EPS 30–65 W	%	2010	26.51	85.5%	27.69	88.0%	31.99	90.2%	0.47	1.95	0.5%	0.5%	
EPS 65–120 W	%	2010	29.33	85.0%	30.54	88.0%	34.86	90.2%	0.40	1.96	0.5%	0.5%	
EPS 65–120 W, multiple-V	%	2010	39.65	86.0%	39.65	86.1%	47.36	87.3%	0.00	6.42	0.5%	0.5%	
EPS 12–15 W	%	2010	13.72	75.4%	14.15	84.1%	14.15	84.2%	0.05	0.00	0.5%	0.5%	
			€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a			
RF for BAU, and for ECO until 2015 *	kWh	2010	455	430	526	242	763	76	0.38	1.43	1%	1%	
RF for ECO from 2016 onwards *	kWh	2010	571	213	702	119	991	81	1.39	7.62	1%	1%	
			€	BC EEI	€	MID EEI	€	BAT EEI	€/EEI	€/EEI			
CF open vertical chilled multi deck (RVC2)	EEI	2010	4158	116	5268	80	6378	45	31	31	1.0%	1.0%	
CF open horizontal frozen island (RHF4)	EEI	2010	4752	114	5083	85	5415	56	11	11	1.0%	1.0%	
CF other supermarket display (non-BCs)	EEI	2010	2573	97	2836	78	3098	60	14	14	1.0%	1.0%	
CF Plug in one door beverage cooler	EEI	2010	896	141	1009	101	1122	60	3	3	1.0%	1.0%	
CF Plug in horizontal ice cream freezer	EEI	2010	864	78	885	62	905	47	1	1	1.0%	1.0%	
CF Spiral vending machine	EEI	2010	3780	60	4040	54	4300	48	42	42	1.0%	1.0%	
PF Storage cabinet Chilled Vertical (CV)	EEI	2010	1577	96	1734	73	1892	57	6.7	9.9	1%	1%	
PF Storage cabinet Frozen Vertical (FV)	EEI	2010	1862	91	2048	75	2234	53	11.4	8.5	1%	1%	
PF Storage cabinet Chilled Horizontal (CH)	EEI	2010	756	109	832	72	907	65	2.1	11.2	1%	1%	
PF Storage cabinet Frozen Horizontal (FH)	EEI	2010	1296	106	1425	86	1555	61	6.5	5.1	1%	1%	
PF Storage cabinets All types	EEI	2010	1441	98	1586	74	1730	58	6.0	8.9	1%		
PF Process Chiller AC MT S ≤ 300 kW	SEPR	2010	30238	2.70	31145	2.76	34773	2.93	15119	21344	1%	1%	
PF Process Chiller AC MT L > 300 kW	SEPR	2010	97192	3.00	98164	3.03	106911	3.24	32397	41654	1%	1%	
PF Process Chiller AC LT S ≤ 200 kW	SEPR	2010	33477	1.59	34482	1.60	38499	1.71	100431.97	36521	1%	1%	
PF Process Chiller AC LT L > 200 kW	SEPR	2010	101512	1.70	102527	1.71	111663	1.83	101512	76134	1%	1%	
PF Process Chiller WC MT S ≤ 300 kW	SEPR	2010	45356	3.60	46717	3.69	52160	3.91	15119	24740	1%	1%	
PF Process Chiller WC MT L > 300 kW	SEPR	2010	145788	3.90	147246	3.91	160367	4.20	145788	45245	1%	1%	
PF Process Chiller WC LT S ≤ 200 kW	SEPR	2010	50216	2.00	51722	2.02	57748	2.16	75324	43042	1%	1%	
PF Process Chiller WC LT L > 200 kW	SEPR	2010	152268	2.25	153790	2.27	167495	2.43	76134	85651	1%	1%	
PF Process Chiller All MT&LT	SEPR	2010	55472	2.41	56559	2.44	62349.3	2.61	38908	35070	1%		
PF Condensing Unit MT S 0.2-1 kW	COP	2010	540	1.42	551	1.43	621	1.57	1080	501	1%	1%	
PF Condensing Unit MT M 1-5 kW	COP	2010	1944	1.64	1983	1.66	2216	1.76	1944	2333	1%	1%	
PF Condensing Unit MT L 5-20 kW	SEPR	2010	3996	2.64	4076	2.73	4715	2.88	888	4262	1%	1%	
PF Condensing Unit MT XL 20-50 kW	SEPR	2010	9179	2.71	9363	2.81	10832	2.94	1836	11298	1%	1%	
PF Condensing Unit LT S 0.1-0.4 kW	COP	2010	648	0.80	648	0.85	745	0.87	0	4860	1%	1%	
PF Condensing Unit LT M 0.4-2 kW	COP	2010	864	0.95	864	1.04	985	1.07	0	4032	1%	1%	
PF Condensing Unit LT L 2-8 kW	SEPR	2010	4644	1.46	4644	1.68	5479	1.72	0	20896	1%	1%	
PF Condensing Unit LT XL 8-20 kW	SEPR	2010	8099	1.61	8099	1.73	9557	1.78	0	29158	1%	1%	
PF Condensing Unit, All MT&LT	comb	2010	1982	2.05	2013	2.14	2310	2.24	357	2769	1%		
			€	eff	€	eff	€	eff	€/eff	€/eff			
CA Electric Hobs, Wh/ltr	Wh	2010	157	205	462	190	927	174	20.4	29.0	1%	1%	
CA Electric Ovens, kWh/a	kWh	2010	564	107	661	88.15	725	69	5.15	3.35	1%	1%	
CA Gas Hobs, % efficiency NCV	%	2010	275	58%	349	64%	469	73%	1353	1256	1%	1%	
CA Gas Ovens, kWh prim, NCV	kWh	2010	286	231	406	190	567	145	2.95	3.55	1%	1%	
CA Range Hoods, kWh elec	kWh	2010	229	130	279	120	316	110	5.04	3.66	1%	1%	
			€	kWh/a	€	kWh/a	€	kWh/a	€/kWh/a	€/kWh/a			
WM Washing Machines	kWh	2010	484	207	584	130	680	87	1.30	2.24	1%	1%	
WD Washer-Dryers	kWh	2015	889	1600	889	915	902	830	0.00	0.15	1%	1%	
DW Household Dishwasher	kWh	2010	584	269	704	224.5	824	180	2.69	2.69	1%	1%	
LD condensing heat pump	kWh	2016	565	241	762	124	851	101	1.68	3.83	1%	1%	
LD condensing electric heat element	kWh	2016	375	350	434	286	506	255	0.93	2.26	1%	1%	
LD vented electric	kWh	2016	327	310	361	284	375	251	1.29	0.44	1%	1%	
LD vented gas	kWh	2016	527	445	527	411	527	374	0.00	0.00	0%	0%	
			€	W	€	W	€	W	€/W	€/W			
VC dom. Vacuum Cleaner	W	2010	238	1739	265	1000	300	650	0.037	0.102	1%	1%	
VC nondom Vacuum Cleaner	W	2010	648	1293	713	1000	799	650	0.221	0.247	1%	1%	
			€	%	€	%	€	%	€ct/%	€ct/%			
FAN Axial<300Pa [247 W flow out]	%	2010	270	31%	349	35%	428	40%	1730	1730	0.9%	0.9%	
FAN Axial>300Pa [489 W fluid-dyn out]	%	2010	351	37%	386	42%	422	47%	712	712	0.9%	0.9%	
FAN Centr.FC [141 W flow out]	%	2010	432	32%	549	37%	666	42%	2359	2359	0.9%	0.9%	
FAN Centr.BC-free [2120 W flow out]	%	2010	832	56%	1012	63%	1193	70%	2654	2654	0.9%	0.9%	
FAN Centr.BC [2052 W flow out]	%	2010	1782	54%	2377	60%	2971	67%	8951	8951	0.9%	0.9%	
FAN Cross-flow [31 W flow out]	%	2010	351	7%	446	9%	540	10%	6944	6944	0.9%	0.9%	

PRICE

UNIT PRICE (in 2015-euros)	var	ref year	BC		mid		BAT		BC-mid		mid-BAT		PriceDec %
			price €	EF	price €	EF	price €	EF	slope €/EF	slope €/EF			
Medium (S) 3-ph 0.75-7.5 kW no VSD	%	2010	BC € 130	Eff 71.8%	IE2 € 184	Eff 81.4%	IE4 € 267	Eff 87.2%	562	1434	1%		
Medium (M) 3-ph 7.5-75 kW no VSD	%	2010	514	86.5%	734	89.8%	955	93.5%	6676	5954	1%		
Medium (L) 3-ph 75-375 kW no VSD	%	2010	4725	92.7%	6749	94.5%	8099	96.3%	112491	74994	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	36	62.4%	54	66.0%	90	77.3%	500	319	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	73	62.4%	97	66.0%	146	77.3%	675	430	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	20032	93.5%	28618	95.1%	37203	96.8%	536582	505018	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	194	71.8%	275	81.4%	400	87.2%	844	2151	1%		
Explosion motors (M) 3-ph 7.5-75 kW	%	2010	771	86.5%	1102	89.8%	1432	93.5%	10014	8931	1%		
Explosion motors (L) 3-ph 75-375 kW	%	2010	7087	92.7%	10124	94.5%	12149	96.3%	168737	112491	1%		
Brake motors (S) 3-ph 0.75-7.5 kW	%	2010	194	71.8%	275	81.4%	400	87.2%	844	2151	1%		
Brake motors (M) 3-ph 7.5-75 kW	%	2010	771	86.5%	1102	89.8%	1432	93.5%	10014	8931	1%		
Brake motors (L) 3-ph 75-375 kW	%	2010	7087	92.7%	10124	94.5%	12149	96.3%	168737	112491	1%		
8-pole motors (S) 3-ph 0.75-7.5 kW	%	2010	207	63.8%	294	73.4%	427	79.2%	900	2294	1%		
8-pole motors (M) 3-ph 7.5-75 kW	%	2010	822	83.5%	1175	86.8%	1527	90.5%	10681	9527	1%		
8-pole motors (L) 3-ph 75-375 kW	%	2010	7559	90.7%	10799	92.5%	12959	94.3%	179986	119990	1%		
1-phase motors >0.75 kW (no VSD)	%	2010	143	71.8%	202	81.4%	293	87.2%	619	1577	1%		
WP Water pumps (load) [%]	%	2010	1545	66.5%	1549	68.6%	1595	69.7%	154	4221	0.7%		
CP Fixed Speed 5-1280 l/s	%	2010	8365	63.2%	9613	66.9%	9867	75.1%	33901	3088	0%		
CP Variable speed 5-1280 l/s	%	2010	18636	64.6%	20568	68.1%	23917	74.3%	54526	53951	0%		
CP Pistons 2-64 l/s	%	2010	1788	46.8%	3332	52.1%	6078	62.0%	28994	27588	0%		
WE Welding Equipment			1035	76%	not used for WE: direct input of unit prices for each year								
TRAFO Distribution, kWh/a	kWh	2010	€ 8345	kWh/a 7859	€ 9326	kWh/a 6457	€ 10308	kWh/a 5056	€/kWh/a 0.70	€/kWh/a 0.70	0%		
TRAFO Industry oil	kWh	2010	14395	27168	18210	21400	22025	15631	0.66	0.66	0%		
TRAFO Industry dry	kWh	2010	36070	39727	42417	34178	48764	28629	1.14	1.14	0%		
TRAFO Power	kWh	2010	980066	724886	980066	724886	980066	724886	0.00	0.00	0%		
TRAFO DER oil	kWh	2010	24042	59094	32216	47304	40391	35515	0.69	0.69	0%		
TRAFO DER dry	kWh	2010	37141	62415	42899	54762	48656	47109	0.75	0.75	0%		
TRAFO Small	kWh	2010	1519	2523	1519	2523	1519	2523	0.00	0.00	0%		
Tyres C1, replacement for cars			not used for tyres:										
Tyres C1, OEM for cars			direct input of unit prices for each year										
Tyres C2, replacement for vans			(because prices also depend on wet grip)										
Tyres C2, OEM for vans													
Tyres C3, replacement for trucks/busses													
Tyres C3, OEM for trucks/busses													

VSD price information for calculation of prices for motor+VSD

	BC: IEOV-level	MID: IE1V-level		BAT: IE3V-level		€/W	€/W	Dec
		€	loss [W]	€	loss [W]			
VSD - Very Small 0.12 - 0.75 kW 1-phase	W 2010	292	148	324	118	389	59	-1.10
VSD - Very Small 0.12 - 0.75 kW 3-phase	W 2010	292	148	324	118	389	59	-1.10
VSD - Small 0.75 - 7.5 kW 3-phase	W 2010	408	204	454	163	544	82	-1.11
VSD - Medium 7.5 - 75kW 3-phase	W 2010	1647	980	1830	784	2197	392	-0.93
VSD - Large 75 - 375kW 3-phase	W 2010	7756	6978	8618	5582	10341	2791	-0.62
VSD - Very Large 375 - 1,000kW 3-phase	W 2010	60055	34714	66728	27771	80073	13886	-0.96

* 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.

PRICE2

UNIT PRICE SPLIT (in euro 2015)	unit	kit	install	ErP	maint €/a	share VAT20%	avg VAT tariff	split-up materials price by party			
								VAT	retail	whole	industry
EIWH Electric Instant. < 12 kW (secondary)	0.50	0.50			15	65%	13%	0.12	0.15	0.15	0.58
EIWH Electric Instant. ≥ 12 kW (primary)	0.50	0.50			15	65%	13%	0.12	0.15	0.15	0.58
EIWHS Electric Instant. Shower (secondary)	0.50	0.50			15	65%	13%	0.12	0.15	0.15	0.58
ESWH Electric Storage ≤ 30 L (secondary)	0.50	0.50			36	65%	13%	0.12	0.15	0.15	0.58
ESWH Electric Storage > 30 L (primary)	0.50	0.50			36	65%	13%	0.12	0.15	0.15	0.58
GIWH Gas Instant. < 13 L/min (secondary)	0.50	0.50			58	65%	13%	0.12	0.15	0.15	0.58
GIWH Gas Instant. ≥ 13 L/min (primary)	0.50	0.50			58	65%	13%	0.12	0.15	0.15	0.58
GSWH Gas Storage, Condensing	0.50	0.50			64	65%	13%	0.12	0.15	0.15	0.58
GSWH Gas Storage, Non-condensing	0.50	0.50			64	65%	13%	0.12	0.15	0.15	0.58
Dedicated WH Heat Pump	0.50	0.50			85	65%	13%	0.12	0.15	0.15	0.58
Dedicated WH Solar (3.5 m2)	0.50	0.50			119	65%	13%	0.12	0.15	0.15	0.58
CHB Gas Combi Instant. WH	0.53	0.47			29	82%	16%	0.14	0.15	0.15	0.56
CHB Gas + Cyl. WH	0.48	0.52			29	82%	16%	0.14	0.15	0.15	0.56
CHB Jet Burner Gas + Cyl. WH	0.46	0.55			39	82%	16%	0.14	0.15	0.15	0.56
CHB Jet Burner Oil + Cyl. WH	0.46	0.55			39	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			28	82%	16%	0.14	0.15	0.15	0.56
CHB Electric HP + Cyl. WH	0.40	0.60			14	82%	16%	0.14	0.15	0.15	0.56
CHB Gas HP + Cyl. WH	0.49	0.51			32	82%	16%	0.14	0.15	0.15	0.56
CHB Gas mCHP + Cyl. WH	0.44	0.56			47	82%	16%	0.14	0.15	0.15	0.56
CHB Solar Combi (16 m2)	0.50	0.50			13	82%	16%	0.14	0.15	0.15	0.56
CHB Gas non-condensing	0.56	0.44			149	70%	14%	0.12	0.15	0.15	0.58
CHB Gas condensing	0.50	0.50			153	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Jet burner non-condensing	0.48	0.52			224	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Jet burner condensing	0.43	0.57			190	70%	14%	0.12	0.15	0.15	0.58
CHB Oil Jet burner non-condensing	0.48	0.52			224	70%	14%	0.12	0.15	0.15	0.58
CHB Oil Jet burner condensing	0.43	0.57			190	70%	14%	0.12	0.15	0.15	0.58
CHB Electric Joule-effect	0.57	0.43			45	70%	14%	0.12	0.15	0.15	0.58
CHB Hybrid (gas-electric)	0.44	0.56			148	70%	14%	0.12	0.15	0.15	0.58
CHB Electric Heat Pump	0.40	0.60			72	70%	14%	0.12	0.15	0.15	0.58
CHB Gas Heat Pump	0.49	0.51			167	70%	14%	0.12	0.15	0.15	0.58
CHB micro CHP	0.44	0.56			246	70%	14%	0.12	0.15	0.15	0.58
CHB Solar combi (16 m2)	0.50	0.50			68	70%	14%	0.12	0.15	0.15	0.58
SFB Wood Manual [18 kW]	0.67	excl.	0.33	excl.	52	90%	18%	0.15	0.03	0.03	0.79
SFB Wood Direct Draft [20 kW]	0.77		0.23		52	90%	18%	0.15	0.03	0.03	0.79
SFB Coal [25 kW]	0.73		0.27		46	90%	18%	0.15	0.03	0.03	0.79
SFB Pellets [25 kW]	0.75		0.25		46	70%	14%	0.12	0.03	0.03	0.81
SFB Wood chips [160 kW]	0.90		0.10		59	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		815	5%	1%	0.01	0.10	0.10	0.79
CHAE-L (> 400 kW)	0.60	0.14	0.27		2013	0%	0%	0.00	0.10	0.10	0.80
CHWE-S (< 400 kW)	0.43	0.10	0.19	0.28	680	5%	1%	0.01	0.10	0.10	0.79
CHWE-M (> 400 kW; ≤ 1500 kW)	0.31	0.10	0.19	0.40	3171	0%	0%	0.00	0.10	0.10	0.80
CHWE-L (> 1500 kW)	0.28	0.06	0.13	0.53	4756	0%	0%	0.00	0.10	0.10	0.80
CHF	0.60	0.14	0.27		3110	5%	1%	0.01	0.10	0.10	0.79
HT PCH-AE-S	0.60	0.14	0.27		1087	0%	0%	0.00	0.10	0.10	0.80
HT PCH-AE-L	0.60	0.14	0.27		3355	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-S	0.60	0.14	0.27		907	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-M	0.71	0.10	0.19		5284	0%	0%	0.00	0.10	0.10	0.80
HT PCH-WE-L	0.81	0.06	0.13		5945	0%	0%	0.00	0.10	0.10	0.80
AC rooftop	0.56	0.02	0.42		929	0%	0%	0.00	0.10	0.10	0.80
AC splits	0.66	0.04	0.30		230	5%	1%	0.01	0.10	0.10	0.79
AC VRF	0.54	0.09	0.38		1555	1%	0%	0.00	0.10	0.10	0.80
ACF	0.60	0.14	0.27		1087	3%	1%	0.01	0.10	0.10	0.79
Heating:	unit	kit	install	cooler	maint/a						
AC rooftop (rev)	0.56	0.02	0.42		929	0%	0%	0.00	0.10	0.10	0.80
AC splits (rev)	0.66	0.04	0.30		230	5%	1%	0.01	0.10	0.10	0.79
AC VRF (rev)	0.54	0.09	0.38		1555	1%	0%	0.00	0.10	0.10	0.80
ACF (rev)	0.59	0.14	0.27		1087	3%	1%	0.01	0.10	0.10	0.79
AHF	0.60	0.00	0.40		68	2%	0%	0.00	0.10	0.10	0.80
AHE	0.86	0.00	0.14		22	2%	0%	0.00	0.10	0.10	0.80

PRICE2

UNIT PRICE SPLIT (in euro 2015)	unit split up (price=100%)	kit	install	ErP	maint €/a	share VAT20%	avg VAT tariff	split-up materials price by party			
								VAT	retail	whole	industry
LH open fireplace [8 kW]	0.74	excl.	0.26	excl.	18.1	90%	18%	0.17	0.11	0.09	0.63
LH closed fireplace/inset [8 kW]	0.74		0.26		20.2	90%	18%	0.17	0.11	0.09	0.63
LH wood stove [8 kW]	0.80		0.20		17.4	90%	18%	0.17	0.11	0.09	0.63
LH coal stove [8 kW]	0.73		0.27		17.4	90%	18%	0.17	0.11	0.09	0.63
LH cooker [10 kW]	0.82		0.18		61.3	90%	18%	0.17	0.11	0.09	0.63
LH SHR stove [8 kW]	0.37		0.63		16.4	90%	18%	0.17	0.11	0.09	0.63
LH pellet stove [8 kW]	0.85		0.15		35.6	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		40.9	0%	0%	0.00	0.10	0.10	0.80
LH Gaseous Tube (commercial < 120 kW)	0.85		0.15		38.1	0%	0%	0.00	0.10	0.10	0.80
LH Gas open front	0.81		0.19		65.3	90%	18%	0.15	0.11	0.09	0.65
LH Gas closed front	0.89		0.11		65.3	90%	18%	0.15	0.11	0.09	0.65
LH Gas balanced flue	0.85		0.15		65.3	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		38.1	0%	0%	0.00	0.10	0.10	0.80
LH Liquid open front	0.74		0.26		65.3	90%	18%	0.15	0.11	0.09	0.65
LH Liquid closed front	0.89		0.11		65.3	90%	18%	0.15	0.11	0.09	0.65
LH Liquid balanced flue	0.84		0.16		65.3	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		22.0	71%	14%	0.12	0.18	0.25	0.45
RAC fixed 6-12 kW, cooling	0.60		0.40		22.0	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		22.0	71%	14%	0.12	0.18	0.25	0.45
RAC fixed 6-12 kW, reversible, heating	0.60		0.40		22.0	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		0.9	70%	14%	0.12	0.06	0.21	0.61
CIRC Large standalone circulators	0.92		0.08		6.9	47%	9%	0.09	0.00	0.22	0.69
CIRC Small standalone circulators	0.68		0.32		2.7	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					22	100%	20%	0.17	0.17	0.16	0.50
R-UVU 100-250 m3/h		See sheets PRICEBAU and PRICEECO			10	100%	20%	0.17	0.17	0.16	0.50
R-BVU 100-250 m3/h					52	100%	20%	0.17	0.17	0.16	0.50
R-UVU 250-1000 m3/h					41	100%	20%	0.17	0.17	0.16	0.50
R-BVU 250-1000 m3/h					94	100%	20%	0.17	0.17	0.16	0.50
R-UVU > 1000 m3/h					72	100%	20%	0.17	0.10	0.10	0.63
R-BVU 1000-2500 m3/h					135	100%	20%	0.17	0.10	0.10	0.63
NR-UVU 250-1000 m3/h					34	0%	0%	0.00	0.10	0.10	0.80
NR-BVU 250-1000 m3/h					78	0%	0%	0.00	0.10	0.10	0.80
NR-UVU > 1000 m3/h					60	0%	0%	0.00	0.10	0.10	0.80
NR-BVU 1000-2500 m3/h					113	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-S 2500-5500 m3/h					191	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-M 5500-14500 m3/h					652	0%	0%	0.00	0.10	0.10	0.80
NR-AHU-L > 14500 m3/h					2739	0%	0%	0.00	0.10	0.10	0.80
LFL (T12,T8h,T8t,T5,other)	0.59		0.41		0.39	6%	1.3%	0.01	0.10	0.10	0.79
HID (HPM, HPS, MH)	0.74		0.26		6.17	0%	0.0%	0.00	0.10	0.10	0.80
CFLni (all shapes)	0.52		0.48		1.76	30%	6.0%	0.06	0.23	0.28	0.43
CFLi (retrofit for GLS, HL)	0.87		0.13		0.37	60%	12.0%	0.11	0.23	0.26	0.41
GLS (DLS & NDLS)	0.70		0.30		0.17	80%	16.0%	0.14	0.23	0.24	0.39
HL (DLS & NDLS, LV & MV)	0.87		0.13		0.29	71%	14.3%	0.13	0.23	0.25	0.40
LED replacing LFL (retrofit & luminaire)	0.93		0.07		0.38	6%	1.2%	0.01	0.10	0.10	0.79
LED replacing HID (retrofit & luminaire)	0.97		0.03		6.17	0%	0.0%	0.00	0.10	0.10	0.80
LED replacing CFLni (retrofit & luminaire)	0.76		0.24		2.32	18%	3.6%	0.04	0.09	0.10	0.77
LED replacing DLS (retrofit & luminaire)	0.95		0.05		0.27	68%	13.5%	0.12	0.08	0.10	0.70
LED replacing NDLS (retrofit & luminaire)	0.97		0.03		0.16	80%	16.0%	0.14	0.08	0.10	0.68

PRICE2

UNIT PRICE SPLIT (in euro 2015)	unit split up (price=100%)	kit	install	ErP	maint €/a	share VAT20%	avg VAT tariff	split-up materials price by party			
								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		0.89		90%	18%	0.15	0.40	0.05	0.40
DP Monitor	1.00	0.00		0.89		49%	10%	0.09	0.26	0.15	0.50
DP Signage	1.00	0.00		0.89		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	50			10%	2%	0.02	0.18	0.15	0.65
EP / Laser Printer colour	1.00	0.00	170			10%	2%	0.02	0.18	0.15	0.65
EP / Laser Copier mono	1.00	0.00	50			10%	2%	0.02	0.18	0.15	0.65
EP / Laser Copier colour	1.00	0.00	170			10%	2%	0.02	0.18	0.15	0.65
EP / Laser MFD mono	1.00	0.00	170			10%	2%	0.02	0.18	0.15	0.65
EP / Laser MFD colour	1.00	0.00	400			5%	1%	0.01	0.19	0.15	0.65
paper						see resources					
ink and toner						see resources					
<i>Products regulated only for (networked) standby</i>											
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
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											

not used for SB, see main accounting for the product group

PRICE2

UNIT PRICE SPLIT (in euro 2015)	unit split up	kit	install (price=100%)	ErP	maint €/a	share VAT20%	avg VAT tariff	split-up materials price by party			
								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	259		0%	0%	0.00	0.00	0.30	0.70	
CF open horizontal frozen island (RHF4)	0.91	0.09	281		0%	0%	0.00	0.00	0.30	0.70	
CF other supermarket display (non-BCs)	0.87	0.13	216		0%	0%	0.00	0.00	0.30	0.70	
CF Plug in one door beverage cooler	1.00	0.00	30		0%	0%	0.00	0.00	0.30	0.70	
CF Plug in horizontal ice cream freezer	1.00	0.00	23		0%	0%	0.00	0.00	0.30	0.70	
CF Spiral vending machine	1.00	0.00	51		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	3.6		97%	19%	0.16	0.40	0.03	0.41	
WD Washer-Dryers	1.00	0.00	3.6		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 dom. Vacuum Cleaner	1.00	0.00	0		100%	20%	0.17	0.40	0.03	0.40	
VC nondom Vacuum Cleaner	1.00	0.00	0		0%	0%	0.00	0.15	0.20	0.65	
FAN Axial<300Pa [247 W flow out]	0.90	0.10	6		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	20		0%	0%	0.00	0.10	0.23	0.67	
FAN Centr.BC [2052 W flow out]	0.91	0.09	36		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	

PRICE2

UNIT PRICE SPLIT (in euro 2015)	unit split up (price=100%)	kit	install	ErP	maint €/a	share VAT20%	avg VAT tariff	split-up materials price by party			
								VAT	retail	whole	industry
Medium (S) 3-ph 0.75-7.5 kW no VSD	0.79	0.21		0	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		69	381	0%	0%	0.00	0.10	0.23	0.67
Medium (L) 3-ph 75-375 kW no VSD	0.96	0.04				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		89		0%	0%	0.00	0.10	0.23	0.67
Medium (L) 3-ph 75-375 kW with VSD	0.80	0.20		499		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		1270		0%	0%	0.00	0.10	0.23	0.67
Large 3-ph LV 375-1000kW with VSD	0.76	0.24		1388		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		69		0%	0%	0.00	0.10	0.23	0.67
Explosion motors (L) 3-ph 75-375 kW	0.96	0.04		381		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		69		0%	0%	0.00	0.10	0.23	0.67
Brake motors (L) 3-ph 75-375 kW	0.96	0.04		381		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		69		0%	0%	0.00	0.10	0.23	0.67
8-pole motors (L) 3-ph 75-375 kW	0.98	0.03		381		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
WP Water pumps (load) [%]	0.69	0.31		89		0%	0%	0.00	0.10	0.23	0.67
CP Fixed Speed 5-1280 l/s	0.96	0.04		1273		0%	0%	0.00	0.00	0.00	1.00
CP Variable speed 5-1280 l/s	0.96	0.04		1893		0%	0%	0.00	0.00	0.00	1.00
CP Pistons 2-64 l/s	0.94	0.06		229		0%	0%	0.00	0.00	0.00	1.00
WE Welding Equipment	0.65	0.35		35		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
<hr/>											
<u>VSD price information for calculation of prices for motor+VSD</u>											
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		19		0%	0%	0.00	0.10	0.23	0.67
VSD - Large 75 - 375kW 3-phase	0.67	0.33		118		0%	0%	0.00	0.10	0.23	0.67
VSD - Very Large 375 - 1,000kW 3-phase	0.68	0.32		118		0%	0%	0.00	0.10	0.23	0.67

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UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	151	151	151	151	151	151	151	151	151	151
EIWH Electric Instant. ≥ 12 kW (primary)	151	151	151	151	151	151	151	151	151	151
EIWHS Electric Instant. Shower (secondary)	151	151	151	151	151	151	151	151	151	151
ESWH Electric Storage ≤ 30 L (secondary)	151	151	151	151	151	151	151	151	151	151
ESWH Electric Storage > 30 L (primary)	392	392	392	392	392	392	392	392	392	392
GIWH Gas Instant. < 13 L/min (secondary)	316	316	316	316	316	316	316	316	316	316
GIWH Gas Instant. ≥ 13 L/min (primary)	565	565	565	565	565	565	565	565	565	565
GSWH Gas Storage, Condensing	848	848	848	848	848	848	848	848	848	848
GSWH Gas Storage, Non-condensing	848	848	848	848	848	848	848	848	848	848
Dedicated WH Heat Pump	703	703	703	703	703	703	703	703	703	703
Dedicated WH Solar (3.5 m2)	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791
CHB Gas Combi Instant. WH	405	405	405	405	405	405	405	405	405	405
CHB Gas + Cyl. WH	649	649	649	649	649	649	649	649	649	649
CHB Jet Burner Gas + Cyl. WH	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
CHB Jet Burner Oil + Cyl. WH	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
CHB Electric (Joule) + Cyl. WH	409	409	409	409	409	409	409	409	409	409
CHB Hybrid Gas/Electric WH	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572
CHB Electric HP + Cyl. WH	1871	1871	1871	1871	1871	1871	1871	1871	1871	1871
CHB Gas HP + Cyl. WH	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605
CHB Gas mCHP + Cyl. WH	5326	5326	5326	5326	5326	5326	5326	5326	5326	5326
CHB Solar Combi (16 m2)	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248
CHB Gas non-condensing	1795	1795	1795	1795	1795	1795	1795	1795	1795	1795
CHB Gas condensing	3983	3119	2399	2255	2255	2255	2255	2255	2255	2255
CHB Gas Jet burner non-condensing	10055	10055	10055	10055	10055	10055	10055	10055	10055	10055
CHB Gas Jet burner condensing	11012	11012	11012	11012	11012	11012	11012	11012	11012	11012
CHB Oil Jet burner non-condensing	10055	10055	10055	10055	10055	10055	10055	10055	10055	10055
CHB Oil Jet burner condensing	11012	11012	11012	11012	11012	11012	11012	11012	11012	11012
CHB Electric Joule-effect	2102	2102	2102	2102	2102	2102	2102	2102	2102	2102
CHB Hybrid (gas-electric)	8080	8080	8080	8080	8080	8080	8080	8080	8080	8080
CHB Electric Heat Pump	9614	9614	9614	9614	9614	9614	9614	9614	9614	9614
CHB Gas Heat Pump	13388	13388	13388	13388	13388	13388	13388	13388	13388	13388
CHB micro CHP	27367	27367	27367	27367	27367	27367	27367	27367	27367	27367
CHB Solar combi (16 m2)	11552	11552	11552	11552	11552	11552	11552	11552	11552	11552
SFB Wood Manual [18 kW]	4860	4860	5067	5264	5452	5631	5801	5963	6116	6262
SFB Wood Direct Draft [20 kW]	7019	7019	7178	7490	7832	8023	7721	7431	7152	7019
SFB Coal [25 kW]	5940	5940	5940	5940	5940	5940	5940	5940	5940	5940
SFB Pellets [25 kW]	8639	8639	8644	8641	8639	8639	8639	8639	8639	8639
SFB Wood chips [160 kW]	36177	36177	36269	36301	36177	36177	36177	36177	36177	36177
Cooling:										
CHAE-S (≤ 400 kW)	18685	18692	18685	18685	18685	18685	18685	18685	18685	18685
CHAE-L (> 400 kW)	45476	45495	45476	45476	45476	45476	45476	45476	45476	45476
CHWE-S (≤ 400 kW)	15097	15097	15097	15097	15097	15097	15097	15097	15097	15097
CHWE-M (> 400 kW; ≤ 1500 kW)	66552	66598	66552	66552	66552	66552	66552	66552	66552	66552
CHWE-L (> 1500 kW)	119156	119238	119156	119156	119156	119156	119156	119156	119156	119156
CHF	16305	16305	16305	16305	16305	16305	16305	16305	16305	16305
HT PCH-AE-S	20422	20422	20422	20422	20422	20422	20422	20422	20422	20422
HT PCH-AE-L	51689	51689	51689	51689	51689	51689	51689	51689	51689	51689
HT PCH-WE-S	17298	17298	17298	17298	17298	17298	17298	17298	17298	17298
HT PCH-WE-M	81307	81307	81307	81307	81307	81307	81307	81307	81307	81307
HT PCH-WE-L	173373	173373	173373	173373	173373	173373	173373	173373	173373	173373
AC rooftop	20736	20736	20736	20736	20736	20736	20736	20736	20736	20736
AC splits	3547	3547	3547	3547	3547	3547	3547	3547	3547	3547
AC VRF	33230	33230	33230	33230	33230	33230	33230	33230	33230	33230
ACF	16305	16305	16305	16305	16305	16305	16305	16305	16305	16305
Heating:										
AC rooftop (rev)	20543	20543	20543	20543	20543	20543	20543	20543	20543	20543
AC splits (rev)	3294	3294	3294	3294	3294	3294	3294	3294	3294	3294
AC VRF (rev)	32230	32230	32230	32230	32230	32230	32230	32230	32230	32230
ACF (rev)	18093	18093	18093	18093	18093	18093	18093	18093	18093	18093
AHF	5590	5590	5590	5590	5590	5590	5590	5590	5590	5590
AHE	540	540	540	540	540	540	540	540	540	540
LH open fireplace [8 kW]	2862	2862	2862	2862	2862	2862	2862	2862	2862	2862
LH closed fireplace/inset [8 kW]	2934	2934	2934	2934	2934	2934	2934	2934	2934	2934
LH wood stove [8 kW]	2719	2719	2719	2719	2719	2719	2719	2719	2719	2719
LH coal stove [8 kW]	1992	1992	1992	1992	1992	1992	1992	1992	1992	1992
LH cooker [10 kW]	3075	3075	3075	3075	3075	3075	3075	3075	3075	3075
LH SHR stove [8 kW]	8591	8591	8591	8591	8591	8591	8591	8591	8591	8591
LH pellet stove [8 kW]	3638	3638	3638	3638	3638	3638	3638	3638	3638	3638

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UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	29	29	29	29	29	29	29	29	29	29
LH Electric fixed > 250W	261	263	264	261	261	261	261	261	261	261
LH Electric fixed ≤ 250W	146	147	147	146	146	146	146	146	146	146
LH Electric storage	618	618	633	619	618	618	618	618	618	618
LH Electric underfloor	282	282	288	285	282	282	282	282	282	282
LH Electric visibly glowing > 1.2 kW	66	66	66	66	66	66	66	66	66	66
LH Electric visibly glowing ≤ 1.2 kW	44	44	44	44	44	44	44	44	44	44
LH Electric Towel Heaters	250	250	250	250	250	250	250	250	250	250
 LH Gas luminous (commercial)	1227	1277	1325	1316	1307	1300	1248	1227	1227	1227
LH Gaseous Tube (commercial < 120 kW)	1359	1407	1451	1431	1411	1390	1359	1359	1359	1359
LH Gas open front	1156	1156	1162	1156	1156	1156	1156	1156	1156	1156
LH Gas closed front	2216	2216	2237	2216	2216	2216	2216	2216	2216	2216
LH Gas balanced flue	1551	1551	1558	1551	1551	1551	1551	1551	1551	1551
LH Gas flueless	337	337	337	337	337	337	337	337	337	337
 LH Liquid tube (commercial < 120 kW)	1359	1426	1469	1447	1425	1403	1359	1359	1359	1359
LH Liquid open front	832	832	837	832	832	832	832	832	832	832
LH Liquid closed front	2216	2216	2237	2216	2216	2216	2216	2216	2216	2216
LH Liquid balanced flue	1477	1477	1484	1477	1477	1477	1477	1477	1477	1477
LH Liquid flueless	280	280	280	280	280	280	280	280	280	280
 RAC fixed < 6 kW, cooling	1202	1362	1297	1232	1202	1202	1202	1202	1202	1202
RAC fixed 6-12 kW, cooling	1636	2016	1976	1926	1867	1802	1733	1636	1636	1636
RAC portable < 12 kW, cooling	258	300	281	262	258	258	258	258	258	258
 RAC fixed < 6 kW, reversible, heating	1202	1362	1297	1232	1202	1202	1202	1202	1202	1202
RAC fixed 6-12 kW, reversible, heating	1636	2016	1976	1926	1867	1802	1733	1636	1636	1636
RAC portable < 12 kW, reversible, heating	258	300	281	262	258	258	258	258	258	258
 CIRC Integrated circulators	295	304	307	295	295	295	295	295	295	295
CIRC Large standalone circulators	661	883	967	997	1018	1031	1038	1038	1034	1018
CIRC Small standalone circulators	295	320	327	317	307	297	295	295	295	295
 R-UVU ≤ 100 m3/h for Extract Spaces	212	212	233	233	233	233	233	233	233	233
o/w purchase price (excl. installation)	142	142	161	161	161	161	161	161	161	161
o/w installation material costs	0	0	0	0	0	0	0	0	0	0
o/w installation labour costs	70	70	72	72	72	72	72	72	72	72
 R-UVU ≤ 100 m3/h for Habitable Spaces	212	212	233	233	233	233	233	233	233	233
o/w purchase price (excl. installation)	142	142	161	161	161	161	161	161	161	161
o/w installation material costs	0	0	0	0	0	0	0	0	0	0
o/w installation labour costs	70	70	72	72	72	72	72	72	72	72
 R-BVU ≤ 100 m3/h for Habitable Spaces	748	724	746	746	763	762	754	712	697	696
o/w purchase price (excl. installation)	484	484	508	508	508	508	508	508	508	508
o/w installation material costs	126	109	106	106	119	118	112	82	71	70
o/w installation labour costs	138	131	132	132	137	137	134	122	118	118
 R-UVU 100-250 m3/h	696	932	902	865	827	879	883	883	962	994
o/w purchase price (excl. installation)	240	360	410	410	410	410	410	410	410	410
o/w installation material costs	246	304	237	208	174	195	193	190	226	240
o/w installation labour costs	210	268	255	246	242	274	279	283	325	343
 R-BVU 100-250 m3/h	3491	3363	3321	3346	3754	3846	3848	3287	3093	3110
o/w purchase price (excl. installation)	1361	1481	1536	1536	1536	1536	1536	1536	1536	1536
o/w installation material costs	755	592	555	545	646	654	642	470	409	412
o/w installation labour costs	1375	1290	1230	1265	1572	1655	1670	1280	1148	1162
 R-UVU 250-1000 m3/h	978	1153	1065	1008	952	1030	1036	1036	1154	1202
o/w purchase price (excl. installation)	298	298	331	331	331	331	331	331	331	331
o/w installation material costs	369	456	355	313	262	292	290	285	339	360
o/w installation labour costs	311	400	379	364	359	406	415	419	484	511
 R-BVU 250-1000 m3/h	5146	4765	4659	4696	5312	5451	5453	4604	4312	4337
o/w purchase price (excl. installation)	1950	1950	1993	1993	1993	1993	1993	1993	1993	1993
o/w installation material costs	1133	888	832	818	969	982	963	706	614	618
o/w installation labour costs	2063	1927	1833	1885	2350	2476	2497	1905	1704	1726
 R-UVU > 1000 m3/h	5584	2928	2537	2302	1949	1933	1829	1756	1681	1594
o/w purchase price (excl. installation)	636	636	682	682	682	682	682	682	682	682
o/w installation material costs	1856	793	619	515	371	360	320	292	264	230
o/w installation labour costs	3092	1499	1236	1105	897	892	827	782	736	682
 R-BVU 1000-2500 m3/h	5400	26255	23340	21639	19232	18758	18018	17336	16473	16166
o/w purchase price (excl. installation)	5400	5400	5473	5473	5473	5473	5473	5473	5473	5473
o/w installation material costs	0	7939	6644	5865	4807	4567	4251	3959	3589	3458
o/w installation labour costs	0	12917	11223	10301	8952	8718	8294	7904	7411	7235

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UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-UVU 250-1000 m3/h	1331	773	708	664	592	591	568	552	535	516
o/w purchase price (excl. installation)	248	248	276	276	276	276	276	276	276	276
o/w installation material costs	556	237	186	154	111	108	96	88	79	69
o/w installation labour costs	527	287	247	234	205	207	196	188	180	171
NR-BVU 250-1000 m3/h	1625	4282	3900	3687	3358	3313	3207	3109	2985	2941
o/w purchase price (excl. installation)	1625	1625	1661	1661	1661	1661	1661	1661	1661	1661
o/w installation material costs	0	811	679	599	491	467	434	404	367	353
o/w installation labour costs	0	1846	1560	1426	1206	1185	1111	1043	958	927
NR-UVU > 1000 m3/h	4653	2440	2115	1919	1624	1611	1524	1463	1401	1328
o/w purchase price (excl. installation)	530	530	568	568	568	568	568	568	568	568
o/w installation material costs	1547	661	516	430	309	300	267	244	220	192
o/w installation labour costs	2576	1249	1030	921	747	743	689	652	613	568
NR-BVU 1000-2500 m3/h	4500	21880	19450	18032	16026	15631	15015	14447	13728	13472
o/w purchase price (excl. installation)	4500	4500	4561	4561	4561	4561	4561	4561	4561	4561
o/w installation material costs	0	6616	5536	4887	4005	3806	3542	3299	2991	2882
o/w installation labour costs	0	10764	9353	8584	7460	7265	6912	6587	6176	6029
NR-AHU-S 2500-5500 m3/h	86178	89896	82638	70577	57732	52961	48318	47055	44353	41116
o/w purchase price (excl. installation)	7252	7903	8567	8567	8567	8567	8567	8567	8567	8567
o/w installation material costs	29881	31087	28000	23127	18045	16073	14276	13789	12744	11491
o/w installation labour costs	49045	50906	46070	38883	31120	28321	25475	24699	23042	21058
NR-AHU-M 5500-14500 m3/h	55939	90294	92751	87642	74653	74667	72461	73030	70534	68117
o/w purchase price (excl. installation)	9450	10956	11875	11875	11875	11875	11875	11875	11875	11875
o/w installation material costs	16218	28961	29587	27455	22372	22227	21387	21609	20659	19738
o/w installation labour costs	30271	50378	51289	48312	40406	40565	39199	39546	38001	36505
NR-AHU-L > 14500 m3/h	158029	264650	271409	255313	214434	214459	207519	209309	201458	193854
o/w purchase price (excl. installation)	17640	20886	22804	22804	22804	22804	22804	22804	22804	22804
o/w installation material costs	50674	90489	92444	85782	69903	69448	66823	67518	64548	61671
o/w installation labour costs	89715	153275	156161	146727	121727	122208	117891	118987	114106	109379

LS, prices for light source and control gear, excl. additional luminaire cost:

LFL (T12,T8h,T8t,T5,other)	14	14	14	14	14	14	14	14	14	14
HID (HPM, HPS, MH)	32	35	36	36	36	36	36	36	36	36
CFLni (all shapes)	9	9	9	9	9	9	8	7	7	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	4	4	4	4	4
LED replacing LFL (retrofit & luminaire)	177	106	59	34	27	27	27	27	28	28
LED replacing HID (retrofit & luminaire)	583	404	251	137	110	111	112	113	113	113
LED replacing CFLni (retrofit & luminaire)		28	16	11	10	9	10	10	10	10
LED replacing DLS (retrofit & luminaire)	22	21	7	5	4	4	4	4	4	4
LED replacing NDLS (retrofit & luminaire)	37	25	8	5	4	4	4	4	4	4
DP TV all types	800	450	450	450	450	450	450	450	450	450
DP Monitor	200	170	170	170	170	170	170	170	170	170
DP Signage	1600	900	900	900	900	900	900	900	900	900
SSTB	54	54	54	54	54	54	54	54	54	54
CSTB	162	162	162	162	162	162	162	162	162	162
Game consoles > 20 W	395	395	395	395	395	395	395	395	395	395
Game consoles < 20 W	278	278	278	278	278	278	278	278	278	278
ES tower 1-socket traditional	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
ES rack 1-socket traditional	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
ES rack 2-socket traditional	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
ES rack 2-socket cloud	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
ES rack 4-socket traditional	28000	28000	28000	28000	28000	28000	28000	28000	28000	28000
ES rack 4-socket cloud	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
ES rack 2-socket resilient trad.	35000	35000	35000	35000	35000	35000	35000	35000	35000	35000
ES rack 2-socket resilient cloud	36000	36000	36000	36000	36000	36000	36000	36000	36000	36000
ES rack 4-socket resilient trad.	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000
ES rack 4-socket resilient cloud	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
ES blade 1-socket traditional	350	350	350	350	350	350	350	350	350	350
ES blade 2-socket traditional	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
ES blade 2-socket cloud	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
ES blade 4-socket traditional	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
ES blade 4-socket cloud	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
DS Online 2	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DS Online 3	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
DS Online 4	160000	160000	160000	160000	160000	160000	160000	160000	160000	160000

PRICEBAU

UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	739	739	739	739	739	739	739	739	739	739
PC Integrated Desktop	790	790	790	790	790	790	790	790	790	790
PC Notebook	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
PC Tablet/slate	676	676	676	676	676	676	676	676	676	676
PC Thin client	601	601	601	601	601	601	601	601	601	601
PC Integrated Thin Client	470	470	470	470	470	470	470	470	470	470
PC Small-scale Server	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
PC Workstation	2661	2661	2661	2661	2661	2661	2661	2661	2661	2661
Inkjet Printer	100	100	133	152	152	152	152	152	152	152
Inkjet MFD	150	150	96	64	64	64	64	64	64	64
EP / Laser Printer mono	216	216	366	456	456	456	456	456	456	456
EP / Laser Printer colour	540	540	523	513	513	513	513	513	513	513
EP / Laser Copier mono	1620	1620	1620	1620	1620	1620	1620	1620	1620	1620
EP / Laser Copier colour	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
EP / Laser MFD mono	757	757	757	757	757	757	757	757	757	757
EP / Laser MFD colour	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
<i>Products regulated only for (networked) standby</i>										
SB Radios	25	25	25	25	25	25	25	25	25	25
SB Electric toothbrushes	31	31	31	31	31	31	31	31	31	31
SB Audio speakers (wired)	136	136	136	136	136	136	136	136	136	136
SB Audio speakers (wireless)	119	119	119	119	119	119	119	119	119	119
SB Small appliances	42	42	42	42	42	42	42	42	42	42
SB Media boxes /sticks	50	50	50	50	50	50	50	50	50	50
SB Media players and recorders	78	78	78	78	78	78	78	78	78	78
SB Projectors	392	392	392	392	392	392	392	392	392	392
SB Home phones	55									
SB Office phones	55	55	55	55	55	55	55	55	55	55
SB Home NAS	261	261	261	261	261	261	261	261	261	261
SB Home Network Equipment	118	118	118	118	118	118	118	118	118	118
SB Office Network Equipment	118	118	118	118	118	118	118	118	118	118
SB Coffee makers	42	42	42	42	42	42	42	42	42	42
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
not used for SB, see main accounting for the product group										
EPS ≤ 6W, low-V	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.8
EPS 6–10 W	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0	8.0
EPS 10–12 W	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9	11.9
EPS 15–20 W	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3	8.3
EPS 20–30 W	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9	13.9
EPS 30–65 W, multiple-V	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5	18.5
EPS 30–65 W	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5	26.5
EPS 65–120 W	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3	29.3
EPS 65–120 W, multiple-V	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7	39.7
EPS 12–15 W	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7	13.7
RF Household refrigerator and freezer	455	455	455	455	455	455	455	455	455	455
CF open vertical chilled multi deck (RCV2)	4158	4158	4158	4158	4158	4158	4158	4158	4158	4158
CF open horizontal frozen island (RHF4)	4752	4752	4752	4752	4752	4752	4752	4752	4752	4752
CF other supermarket display (non-BCs)	2573	2573	2573	2573	2573	2573	2573	2573	2573	2573
CF Plug in one door beverage cooler	896	896	896	896	896	896	896	896	896	896
CF Plug in horizontal ice cream freezer	864	864	864	864	864	864	864	864	864	864
CF Spiral vending machine	3780	3780	3780	3780	3780	3780	3780	3780	3780	3780
PF Storage cabinet Chilled Vertical (CV)	1577	1577	1577	1577	1577	1577	1577	1577	1577	1577
PF Storage cabinet Frozen Vertical (FV)	1862	1862	1862	1862	1862	1862	1862	1862	1862	1862
PF Storage cabinet Chilled Horizontal (CH)	756	756	756	756	756	756	756	756	756	756
PF Storage cabinet Frozen Horizontal (FH)	1296	1296	1296	1296	1296	1296	1296	1296	1296	1296
PF Storage cabinets All types	1441									
PF Process Chiller AC MT S ≤ 300 kW	30238	30238	30238	30238	30238	30238	30238	30238	30238	30238
PF Process Chiller AC MT L > 300 kW	97192	97192	97192	97192	97192	97192	97192	97192	97192	97192
PF Process Chiller AC LT S ≤ 200 kW	33477	33477	33477	33477	33477	33477	33477	33477	33477	33477
PF Process Chiller AC LT L > 200 kW	101512	101512	101512	101512	101512	101512	101512	101512	101512	101512
PF Process Chiller WC MT S ≤ 300 kW	45356	45356	45356	45356	45356	45356	45356	45356	45356	45356
PF Process Chiller WC MT L > 300 kW	145788	145788	145788	145788	145788	145788	145788	145788	145788	145788
PF Process Chiller WC LT S ≤ 200 kW	50216	50216	50216	50216	50216	50216	50216	50216	50216	50216
PF Process Chiller WC LT L > 200 kW	152268	152268	152268	152268	152268	152268	152268	152268	152268	152268
PF Process Chiller All MT&LT	55472									

PRICEBAU

UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Condensing Unit MT S 0.2-1 kW	540	540	540	540	540	540	540	540	540	540
PF Condensing Unit MT M 1-5 kW	1944	1944	1944	1944	1944	1944	1944	1944	1944	1944
PF Condensing Unit MT L 5-20 kW	3996	3996	3996	3996	3996	3996	3996	3996	3996	3996
PF Condensing Unit MT XL 20-50 kW	9179	9179	9179	9179	9179	9179	9179	9179	9179	9179
PF Condensing Unit LT S 0.1-0.4 kW	648	648	648	648	648	648	648	648	648	648
PF Condensing Unit LT M 0.4-2 kW	864	864	864	864	864	864	864	864	864	864
PF Condensing Unit LT L 2-8 kW	4644	4644	4644	4644	4644	4644	4644	4644	4644	4644
PF Condensing Unit LT XL 8-20 kW	8099	8099	8099	8099	8099	8099	8099	8099	8099	8099
PF Condensing Unit, All MT&LT	1982									
CA Electric Hobs	380	546	538	537	535	532	527	522	516	510
CA Electric Ovens	564	616	622	594	567	564	564	564	564	564
CA Gas Hobs	300	308	295	283	275	275	275	275	275	275
CA Gas Ovens	286	371	375	367	360	354	347	340	334	326
CA Range Hoods	229	229	229	229	229	229	229	229	229	229
WM Washing Machines	484	487	487	484	484	484	484	484	484	484
WD Washer-Dryers	889	889	889	889	889	889	889	889	889	889
DW Household Dishwasher	584	584	584	584	584	584	584	584	584	584
LD condensing heat pump	903	903	801	706	671	639	608	578	565	565
LD condensing electric heat element	375	375	410	449	427	406	387	375	375	375
LD vented electric	327	327	333	354	337	327	327	327	327	327
LD vented gas	527	527	527	527	527	527	527	527	527	527
VC dom. Vacuum Cleaner	255	238	238	238	238	238	238	238	238	238
VC nondom Vacuum Cleaner	730	648	648	648	648	648	648	648	648	648
FAN Axial<300Pa [247 W flow out]	270	270	270	270	270	270	270	270	270	270
FAN Axial>300Pa [489 W fluid-dyn out]	351	351	351	351	351	351	351	351	351	351
FAN Centr.FC [141 W flow out]	432	432	432	432	432	432	432	432	432	432
FAN Centr.BC-free [2120 W flow out]	832	832	832	832	832	832	832	832	832	832
FAN Centr.BC [2052 W flow out]	1782	1782	1782	1782	1782	1782	1782	1782	1782	1782
FAN Cross-flow [31 W flow out]	351	351	351	351	351	351	351	351	351	351
Medium (S) 3-ph 0.75-7.5 kW no VSD	130	153	148	145	141	138	134	130	130	130
Medium (M) 3-ph 7.5-75 kW no VSD	514	608	593	581	569	556	543	531	518	514
Medium (L) 3-ph 75-375 kW no VSD	4725	5587	5451	5339	5225	5110	4993	4876	4759	4725
Medium (S) 3-ph 0.75-7.5 kW with VSD	538	620	604	583	562	546	542	539	538	538
Medium (M) 3-ph 7.5-75 kW with VSD	2161	2495	2430	2347	2267	2203	2191	2178	2165	2161
Medium (L) 3-ph 75-375 kW with VSD	12481	14470	14099	13654	13220	12866	12749	12632	12515	12481
Small 1 ph 0.12-0.75 kW no VSD	36	50	51	51	51	50	49	49	48	48
Small 1 ph 0.12-0.75 kW with VSD	328	363	354	343	342	342	341	340	340	339
Small 3 ph 0.12-0.75 kW no VSD	73	92	92	91	89	87	86	84	82	81
Small 3 ph 0.12-0.75 kW with VSD	365	405	395	383	381	379	377	376	374	372
Large 3-ph LV 375-1000 kW no VSD	20032	24626	24947	25183	25302	25314	24556	23813	23084	22371
Large 3-ph LV 375-1000kW with VSD	80087	88258	86341	85239	85357	85370	84611	83868	83139	82426
Explosion motors (S) 3-ph 0.75-7.5 kW	194	229	223	217	212	206	201	196	194	194
Explosion motors (M) 3-ph 7.5-75 kW	771	912	889	871	853	834	815	796	777	771
Explosion motors (L) 3-ph 75-375 kW	7087	8380	8176	8008	7838	7665	7490	7314	7138	7087
Brake motors (S) 3-ph 0.75-7.5 kW	194	229	223	217	212	206	201	196	194	194
Brake motors (M) 3-ph 7.5-75 kW	771	912	889	871	853	834	815	796	777	771
Brake motors (L) 3-ph 75-375 kW	7087	8380	8176	8008	7838	7665	7490	7314	7138	7087
8-pole motors (S) 3-ph 0.75-7.5 kW	207	244	238	232	226	220	214	209	207	207
8-pole motors (M) 3-ph 7.5-75 kW	822	973	949	929	910	890	870	849	829	822
8-pole motors (L) 3-ph 75-375 kW	7559	8939	8721	8542	8360	8176	7989	7802	7614	7559
1-phase motors >0.75 kW (no VSD)	143	168	163	159	155	151	147	143	143	143
WP Water pumps (load) [%]	1545	1545	1545	1545	1545	1545	1545	1545	1545	1545
CP Fixed Speed 5-1280 l/s	8365	8365	8483	8648	8774	8874	8969	9063	9158	9254
CP Variable speed 5-1280 l/s	18636	18781	18636	18828	19067	19233	19389	19546	19703	19861
CP Pistons 2-64 l/s	1788	1863	1989	2090	2172	2238	2302	2366	2430	2494
WE Welding Equipment	1035	1035	1035	1035	1035	1035	1035	1035	1035	1035

PRICEBAU

UNIT PRICE BAU (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution, kWh/a	8345	8345	8345	8345	8345	8345	8345	8345	8345	8345
TRAFO Industry oil	14395	14395	14395	14395	14395	14395	14395	14395	14395	14395
TRAFO Industry dry	36070	36070	36070	36070	36070	36070	36070	36070	36070	36070
TRAFO Power	980066	980066	980066	980066	980066	980066	980066	980066	980066	980066
TRAFO DER oil	24042	24042	24042	24042	24042	24042	24042	24042	24042	24042
TRAFO DER dry	37141	37141	37141	37141	37141	37141	37141	37141	37141	37141
TRAFO Small	1519	1519	1519	1519	1519	1519	1519	1519	1519	1519
Tyres C1, replacement for cars	66	73	83	85	87	89	89	89	89	89
Tyres C1, OEM for cars	66	73	83	85	87	89	89	89	89	89
Tyres C2, replacement for vans	89	93	96	97	98	99	99	99	99	99
Tyres C2, OEM for vans	89	93	96	97	98	99	99	99	99	99
Tyres C3, replacement for trucks/busses	304	304	328	374	387	399	399	399	399	399
Tyres C3, OEM for trucks/busses	304	304	328	374	387	399	399	399	399	399

LS, BAU, Basic LED price curves from MELISA in euros/km (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	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	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	5.0

VSD price information for calculation of prices for motor+VSD

VSD - Very Small 0.12 - 0.75 kW 1-phase	292	313	303	292	292	292	292	292	292	292
VSD - Very Small 0.12 - 0.75 kW 3-phase	292	313	303	292	292	292	292	292	292	292
VSD - Small 0.75 - 7.5 kW 3-phase	408	468	455	438	421	408	408	408	408	408
VSD - Medium 7.5 - 75kW 3-phase	1647	1887	1837	1766	1698	1647	1647	1647	1647	1647
VSD - Large 75 - 375kW 3-phase	7756	8883	8648	8316	7995	7756	7756	7756	7756	7756
VSD - Very Large 375 - 1,000kW 3-phase	60055	63632	61394	60055	60055	60055	60055	60055	60055	60055

PRICEECO

UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	151	151	151	151	151	151	151	151	151	151
EIWH Electric Instant. ≥ 12 kW (primary)	151	151	151	151	151	151	151	151	151	151
EIWHS Electric Instant. Shower (secondary)	151	151	151	151	151	151	151	151	151	151
ESWH Electric Storage ≤ 30 L (secondary)	151	151	151	151	151	151	151	151	151	151
ESWH Electric Storage > 30 L (primary)	392	392	392	392	392	392	392	392	392	392
GIWH Gas Instant. < 13 L/min (secondary)	316	316	316	316	316	316	316	316	316	316
GIWH Gas Instant. ≥ 13 L/min (primary)	565	565	565	565	565	565	565	565	565	565
GSHW Gas Storage, Condensing	848	848	848	848	848	848	848	848	848	848
GSHW Gas Storage, Non-condensing	848	848	848	848	848	848	848	848	848	848
Dedicated WH Heat Pump	703	703	703	703	703	703	703	703	703	703
Dedicated WH Solar (3.5 m ²)	1791	1791	1791	1791	1791	1791	1791	1791	1791	1791
CHB Gas Combi Instant. WH	405	405	405	405	405	405	405	405	405	405
CHB Gas + Cyl. WH	649	649	649	649	649	649	649	649	649	649
CHB Jet Burner Gas + Cyl. WH	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
CHB Jet Burner Oil + Cyl. WH	2050	2050	2050	2050	2050	2050	2050	2050	2050	2050
CHB Electric (Joule) + Cyl. WH	409	409	409	409	409	409	409	409	409	409
CHB Hybrid Gas/Electric WH	1572	1572	1572	1572	1572	1572	1572	1572	1572	1572
CHB Electric HP + Cyl. WH	1871	1871	1871	1871	1871	1871	1871	1871	1871	1871
CHB Gas HP + Cyl. WH	2605	2605	2605	2605	2605	2605	2605	2605	2605	2605
CHB Gas mCHP + Cyl. WH	5326	5326	5326	5326	5326	5326	5326	5326	5326	5326
CHB Solar Combi (16 m ²)	2248	2248	2248	2248	2248	2248	2248	2248	2248	2248
CHB Gas non-condensing	1795	1795	1795	1795	1795	1795	1795	1795	1795	1795
CHB Gas condensing	3983	3119	2399	2255	2255	2255	2255	2255	2255	2255
CHB Gas Jet burner non-condensing	10055	10055	10055	10055	10055	10055	10055	10055	10055	10055
CHB Gas Jet burner condensing	11012	11012	11012	11012	11012	11012	11012	11012	11012	11012
CHB Oil Jet burner non-condensing	10055	10055	10055	10055	10055	10055	10055	10055	10055	10055
CHB Oil Jet burner condensing	11012	11012	11012	11012	11012	11012	11012	11012	11012	11012
CHB Electric Joule-effect	2102	2102	2102	2102	2102	2102	2102	2102	2102	2102
CHB Hybrid (gas-electric)	8080	8080	8080	8080	8080	8080	8080	8080	8080	8080
CHB Electric Heat Pump	9614	9614	9614	9614	9614	9614	9614	9614	9614	9614
CHB Gas Heat Pump	13388	13388	13388	13388	13388	13388	13388	13388	13388	13388
CHB micro CHP	27367	27367	27367	27367	27367	27367	27367	27367	27367	27367
CHB Solar combi (16 m ²)	11552	11552	11552	11552	11552	11552	11552	11552	11552	11552
SFB Wood Manual [18 kW]	4860	4860	6806	9378	9437	9128	8830	8541	8262	7992
SFB Wood Direct Draft [20 kW]	7019	7019	7199	7597	9299	8950	8613	8290	7978	7678
SFB Coal [25 kW]	5940	5940	5940	5940	5940	5940	5940	5940	5940	5940
SFB Pellets [25 kW]	8639	8639	8644	8641	8994	8664	8639	8639	8639	8639
SFB Wood chips [160 kW]	36177	36177	37917	38607	36923	36177	36177	36177	36177	36177
Cooling:										
CHAE-S (≤ 400 kW)	18685	18692	18685	18685	18685	18685	18685	18685	18685	18685
CHAE-L (> 400 kW)	45476	45495	45476	45476	45476	45476	45476	45476	45476	45476
CHWE-S (≤ 400 kW)	15097	15097	15097	15097	15097	15097	15097	15097	15097	15097
CHWE-M (> 400 kW; ≤ 1500 kW)	66552	66598	66552	66552	66552	66552	66552	66552	66552	66552
CHWE-L (> 1500 kW)	119156	119238	119156	119156	119156	119156	119156	119156	119156	119156
CHF	16305	16305	16515	18856	18313	17590	16826	16305	16305	16305
HT PCH-AE-S	20422	20422	20422	20422	20422	20422	20422	20422	20422	20422
HT PCH-AE-L	51689	51689	51689	51689	51689	51689	51689	51689	51689	51689
HT PCH-WE-S	17298	17298	17298	17298	17298	17298	17298	17298	17298	17298
HT PCH-WE-M	81307	81307	81307	81307	81307	81307	81307	81307	81307	81307
HT PCH-WE-L	173373	173373	173373	173373	173373	173373	173373	173373	173373	173373
AC rooftop	20736	20736	20736	20736	20736	20736	20736	20736	20736	20736
AC splits	3547	3547	3547	3547	3547	3547	3547	3547	3547	3547
AC VRF	33230	33230	33230	33230	33230	33230	33230	33230	33230	33230
ACF	16305	16305	16515	18856	18468	17922	17142	16398	16305	16305
Heating:										
AC rooftop (rev)	20543	20543	20543	20543	20543	20543	20543	20543	20543	20543
AC splits (rev)	3294	3294	3294	3294	3294	3294	3294	3294	3294	3294
AC VRF (rev)	32230	32230	32230	32230	32230	32230	32230	32230	32230	32230
ACF (rev)	18093	18093	18093	18093	18093	18093	18093	18093	18093	18093
AHF	5590	5590	5590	6127	6174	6067	5801	5590	5590	5590
AHE	540	540	540	540	540	540	540	540	540	540
LH open fireplace [8 kW]	2862	2862	2862	3529	3892	3752	3617	3487	3361	3240
LH closed fireplace/inset [8 kW]	2934	2934	2934	3487	3695	3561	3431	3307	3187	3071
LH wood stove [8 kW]	2719	2719	2719	3267	3471	3335	3205	3079	2959	2843
LH coal stove [8 kW]	1992	1992	1992	2361	2500	2411	2325	2242	2162	2085
LH cooker [10 kW]	3075	3075	3075	3377	3498	3357	3222	3092	3075	3075
LH SHR stove [8 kW]	8591	8591	8591	8640	8611	8591	8591	8591	8591	8591
LH pellet stove [8 kW]	3638	3638	3638	3640	3638	3638	3638	3638	3638	3638

PRICEECO

UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH Electric portable	29	29	30	30	29	29	29	29	29	29
LH Electric fixed > 250W	261	263	267	261	261	261	261	261	261	261
LH Electric fixed ≤ 250W	146	147	149	146	146	146	146	146	146	146
LH Electric storage	618	618	725	810	781	753	721	691	662	634
LH Electric underfloor	282	282	292	292	284	282	282	282	282	282
LH Electric visibly glowing > 1.2 kW	66	66	66	66	66	66	66	66	66	66
LH Electric visibly glowing ≤ 1.2 kW	44	44	44	44	44	44	44	44	44	44
LH Electric Towel Heaters	250	250	250	250	250	250	250	250	250	250
LH Gas luminous (commercial)	1227	1277	1419	1604	1541	1480	1422	1366	1312	1260
LH Gaseous Tube (commercial < 120 kW)	1359	1407	1582	1816	1744	1676	1610	1547	1486	1427
LH Gas open front	1156	1156	1169	1156	1156	1156	1156	1156	1156	1156
LH Gas closed front	2216	2216	2305	2360	2279	2216	2216	2216	2216	2216
LH Gas balanced flue	1551	1551	1609	1652	1595	1551	1551	1551	1551	1551
LH Gas flueless	337	337	337	337	337	337	337	337	337	337
LH Liquid tube (commercial < 120 kW)	1359	1426	1596	1823	1751	1682	1616	1553	1492	1433
LH Liquid open front	832	832	841	832	832	832	832	832	832	832
LH Liquid closed front	2216	2216	2305	2360	2279	2216	2216	2216	2216	2216
LH Liquid balanced flue	1477	1477	1532	1572	1519	1477	1477	1477	1477	1477
LH Liquid flueless	280	280	280	280	280	280	280	280	280	280
RAC fixed < 6 kW, cooling	1202	1604	1616	1508	1406	1310	1220	1202	1202	1202
RAC fixed 6-12 kW, cooling	1636	2698	2874	2672	2482	2305	2138	1983	1838	1703
RAC portable < 12 kW, cooling	258	348	344	319	295	272	258	258	258	258
RAC fixed < 6 kW, reversible, heating	1202	1604	1616	1508	1406	1310	1220	1202	1202	1202
RAC fixed 6-12 kW, reversible, heating	1636	2698	2874	2672	2482	2305	2138	1983	1838	1703
RAC portable < 12 kW, reversible, heating	258	348	344	319	295	272	258	258	258	258
CIRC Integrated circulators	295	304	326	315	301	295	295	295	295	295
CIRC Large standalone circulators	661	883	1559	1516	1451	1393	1325	1261	1200	1142
CIRC Small standalone circulators	295	320	392	376	359	342	325	310	295	295
R-UVU ≤ 100 m3/h for Extract Spaces	212	212	260	301	291	282	273	265	257	249
o/w purchase price (excl. installation)	142	142	185	221	211	202	193	185	177	169
o/w installation material costs	0	0	0	0	0	0	0	0	0	0
o/w installation labour costs	70	70	75	80	80	80	80	80	80	80
R-UVU ≤ 100 m3/h for Habitable Spaces	212	212	260	301	293	285	277	270	262	255
o/w purchase price (excl. installation)	142	142	185	221	213	205	197	190	182	175
o/w installation material costs	0	0	0	0	0	0	0	0	0	0
o/w installation labour costs	70	70	75	80	80	80	80	80	80	80
R-BVU ≤ 100 m3/h for Habitable Spaces	748	724	770	807	802	778	761	717	701	700
o/w purchase price (excl. installation)	484	484	529	562	539	516	508	508	508	508
o/w installation material costs	126	109	106	106	119	118	112	82	71	70
o/w installation labour costs	138	131	135	139	145	144	142	128	123	122
R-UVU 100-250 m3/h	696	932	971	1040	991	1031	1024	1013	1081	1103
o/w purchase price (excl. installation)	240	360	477	583	572	560	549	538	527	516
o/w installation material costs	246	304	237	208	174	195	193	190	226	240
o/w installation labour costs	210	268	256	248	245	276	282	285	328	347
R-BVU 100-250 m3/h	3491	3363	3372	3477	3838	3884	3855	3292	3099	3115
o/w purchase price (excl. installation)	1361	1481	1585	1661	1613	1566	1536	1536	1536	1536
o/w installation material costs	755	592	555	545	646	654	642	470	409	412
o/w installation labour costs	1375	1290	1232	1271	1579	1663	1677	1286	1153	1168
R-JVU 250-1000 m3/h	978	1153	1109	1121	1061	1136	1149	1154	1276	1329
o/w purchase price (excl. installation)	298	298	375	444	441	437	443	449	453	457
o/w installation material costs	369	456	355	313	262	292	290	285	339	360
o/w installation labour costs	311	400	379	364	359	406	415	420	485	512
R-BVU 250-1000 m3/h	5146	4765	4681	4751	5312	5451	5454	4605	4313	4338
o/w purchase price (excl. installation)	1950	1950	2015	2048	1993	1993	1993	1993	1993	1993
o/w installation material costs	1133	888	832	818	969	982	963	706	614	618
o/w installation labour costs	2063	1927	1833	1885	2350	2476	2498	1906	1705	1727
R-UVU > 1000 m3/h	5584	2928	2597	2458	2098	2076	1975	1905	1833	1748
o/w purchase price (excl. installation)	636	636	741	837	831	824	828	831	833	835
o/w installation material costs	1856	793	619	515	371	360	320	292	264	230
o/w installation labour costs	3092	1499	1236	1105	897	892	827	782	736	682
R-BVU 1000-2500 m3/h	5400	26255	23383	21749	19242	18758	18018	17337	16474	16167
o/w purchase price (excl. installation)	5400	5400	5516	5584	5484	5473	5473	5473	5473	5473
o/w installation material costs	0	7939	6644	5865	4807	4567	4251	3959	3589	3458
o/w installation labour costs	0	12917	11223	10301	8952	8718	8295	7905	7411	7236

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UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
NR-UVU 250-1000 m3/h	1331	773	745	758	683	680	661	650	637	621
o/w purchase price (excl. installation)	248	248	312	370	367	365	369	374	378	381
o/w installation material costs	556	237	186	154	111	108	96	88	79	69
o/w installation labour costs	527	287	247	234	205	207	196	188	180	171
NR-BVU 250-1000 m3/h	1625	4282	3918	3733	3359	3313	3207	3109	2986	2942
o/w purchase price (excl. installation)	1625	1625	1679	1707	1661	1661	1661	1661	1661	1661
o/w installation material costs	0	811	679	599	491	467	434	404	367	353
o/w installation labour costs	0	1846	1560	1426	1206	1185	1112	1044	958	927
NR-UVU > 1000 m3/h	4653	2440	2164	2048	1748	1730	1646	1588	1527	1456
o/w purchase price (excl. installation)	530	530	618	697	692	687	690	692	694	696
o/w installation material costs	1547	661	516	430	309	300	267	244	220	192
o/w installation labour costs	2576	1249	1030	921	747	743	689	652	613	568
NR-BVU 1000-2500 m3/h	4500	21880	19486	18125	16035	15632	15015	14447	13728	13473
o/w purchase price (excl. installation)	4500	4500	4597	4653	4570	4561	4561	4561	4561	4561
o/w installation material costs	0	6616	5536	4887	4005	3806	3542	3299	2991	2882
o/w installation labour costs	0	10764	9353	8584	7460	7265	6912	6587	6176	6030
NR-AHU-S 2500-5500 m3/h	86178	89896	83520	72880	59847	54891	50077	48646	45777	42377
o/w purchase price (excl. installation)	7252	7903	9450	10871	10683	10497	10326	10158	9992	9828
o/w installation material costs	29881	31087	28000	23127	18045	16073	14276	13789	12744	11491
o/w installation labour costs	49045	50906	46070	38883	31120	28321	25475	24699	23042	21058
NR-AHU-M 5500-14500 m3/h	55939	90294	93972	90830	77585	77346	74911	75254	72536	69900
o/w purchase price (excl. installation)	9450	10956	13096	15063	14807	14554	14325	14099	13877	13658
o/w installation material costs	16218	28961	29587	27455	22372	22227	21387	21609	20659	19738
o/w installation labour costs	30271	50378	51289	48312	40406	40565	39199	39546	38001	36505
NR-AHU-L > 14500 m3/h	158029	264650	273979	262025	220628	220144	212728	214051	205741	197684
o/w purchase price (excl. installation)	17640	20886	25374	29516	28998	28489	28013	27546	27086	26634
o/w installation material costs	50674	90489	92444	85782	69903	69448	66823	67518	64548	61671
o/w installation labour costs	89715	153275	156161	146727	121727	122208	117891	118987	114106	109379
<i>LS, prices for light source and control gear, excl. additional luminaire cost:</i>										
LFL (T12,T8h,T8t,T5,other)	14	14	14	14	14	14	14	13	13	14
HID (HPM, HPS, MH)	32	35	36	36	36	36	36	36	36	36
CFLni (all shapes)	9	9	9	9	9	8	7	6	6	5
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)	152	86	47	35	31	30	31	31	31	31
LED replacing HID (retrofit & luminaire)	501	288	186	138	126	128	129	129	129	129
LED replacing CFLni (retrofit & luminaire)			22	13	11	10	11	11	11	11
LED replacing DLS (retrofit & luminaire)			31	13	6	7	6	6	6	6
LED replacing NDLS (retrofit & luminaire)			39	15	6	6	5	6	6	6
DP TV all types	800	450	450	450	450	450	450	450	450	450
DP Monitor	200	170	170	170	170	170	170	170	170	170
DP Signage	1600	900	900	900	900	900	900	900	900	900
SSTB	54	54	54	54	54	54	54	54	54	54
CSTB	162	162	162	162	162	162	162	162	162	162
Game consoles > 20 W	395	395	395	395	395	395	395	395	395	395
Game consoles < 20 W	278	278	278	278	278	278	278	278	278	278
ES tower 1-socket traditional	1200	1200	1200	1200	1200	1200	1200	1200	1200	1200
ES rack 1-socket traditional	1000	1000	1000	1000	1000	1000	1000	1000	1000	1000
ES rack 2-socket traditional	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
ES rack 2-socket cloud	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
ES rack 4-socket traditional	28000	28000	28000	28000	28000	28000	28000	28000	28000	28000
ES rack 4-socket cloud	33000	33000	33000	33000	33000	33000	33000	33000	33000	33000
ES rack 2-socket resilient trad.	35000	35000	35000	35000	35000	35000	35000	35000	35000	35000
ES rack 2-socket resilient cloud	36000	36000	36000	36000	36000	36000	36000	36000	36000	36000
ES rack 4-socket resilient trad.	37000	37000	37000	37000	37000	37000	37000	37000	37000	37000
ES rack 4-socket resilient cloud	38000	38000	38000	38000	38000	38000	38000	38000	38000	38000
ES blade 1-socket traditional	350	350	350	350	350	350	350	350	350	350
ES blade 2-socket traditional	3000	3000	3000	3000	3000	3000	3000	3000	3000	3000
ES blade 2-socket cloud	4000	4000	4000	4000	4000	4000	4000	4000	4000	4000
ES blade 4-socket traditional	6000	6000	6000	6000	6000	6000	6000	6000	6000	6000
ES blade 4-socket cloud	7000	7000	7000	7000	7000	7000	7000	7000	7000	7000
DS Online 2	20000	20000	20000	20000	20000	20000	20000	20000	20000	20000
DS Online 3	50000	50000	50000	50000	50000	50000	50000	50000	50000	50000
DS Online 4	160000	160000	160000	160000	160000	160000	160000	160000	160000	160000

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UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	739	739	739	739	739	739	739	739	739	739
PC Integrated Desktop	790	790	790	790	790	790	790	790	790	790
PC Notebook	1019	1019	1019	1019	1019	1019	1019	1019	1019	1019
PC Tablet/slate	676	676	676	676	676	676	676	676	676	676
PC Thin client	601	601	601	601	601	601	601	601	601	601
PC Integrated Thin Client	470	470	470	470	470	470	470	470	470	470
PC Small-scale Server	1500	1500	1500	1500	1500	1500	1500	1500	1500	1500
PC Workstation	2661	2661	2661	2661	2661	2661	2661	2661	2661	2661
Inkjet Printer	100	100	133	152	152	152	152	152	152	152
Inkjet MFD	150	150	96	64	64	64	64	64	64	64
EP / Laser Printer mono	216	216	366	456	456	456	456	456	456	456
EP / Laser Printer colour	540	540	523	513	513	513	513	513	513	513
EP / Laser Copier mono	1620	1620	1620	1620	1620	1620	1620	1620	1620	1620
EP / Laser Copier colour	2700	2700	2700	2700	2700	2700	2700	2700	2700	2700
EP / Laser MFD mono	757	757	757	757	757	757	757	757	757	757
EP / Laser MFD colour	4800	4800	4800	4800	4800	4800	4800	4800	4800	4800
<i>Products regulated only for (networked) standby</i>										
SB Radios	25	25	25	25	25	25	25	25	25	25
SB Electric toothbrushes	31	31	31	31	31	31	31	31	31	31
SB Audio speakers (wired)	136	136	136	136	136	136	136	136	136	136
SB Audio speakers (wireless)	119	119	119	119	119	119	119	119	119	119
SB Small appliances	42	42	42	42	42	42	42	42	42	42
SB Media boxes /sticks	50	50	50	50	50	50	50	50	50	50
SB Media players and recorders	78	78	78	78	78	78	78	78	78	78
SB Projectors	392	392	392	392	392	392	392	392	392	392
SB Home phones	55									
SB Office phones	55	55	55	55	55	55	55	55	55	55
SB Home NAS	261	261	261	261	261	261	261	261	261	261
SB Home Network Equipment	118	118	118	118	118	118	118	118	118	118
SB Office Network Equipment	118	118	118	118	118	118	118	118	118	118
SB Coffee makers	42	42	42	42	42	42	42	42	42	42
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
not used for SB, see main accounting for the product group										
<u>EPS Active mode (for electricity losses)</u>										
EPS ≤ 6W, low-V	3.85	3.95	4.47	4.97	4.90	4.82	4.70	4.59	4.48	4.37
EPS 6–10 W	7.95	7.98	7.97	7.95	7.95	7.95	7.95	7.95	7.95	7.95
EPS 10–12 W	11.87	11.91	11.89	11.90	11.87	11.87	11.87	11.87	11.87	11.87
EPS 15–20 W	8.31	8.38	8.56	9.02	8.81	8.63	8.42	8.31	8.31	8.31
EPS 20–30 W	13.94	14.16	15.09	15.47	15.10	14.74	14.37	14.02	13.94	13.94
EPS 30–65 W, multiple-V	18.52	18.52	18.52	18.52	18.52	18.52	18.52	18.52	18.52	18.52
EPS 30–65 W	26.51	26.73	27.39	27.30	26.65	26.51	26.51	26.51	26.51	26.51
EPS 65–120 W	29.33	29.48	29.60	30.02	29.33	29.33	29.33	29.33	29.33	29.33
EPS 65–120 W, multiple-V	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65	39.65
EPS 12–15 W	13.72	13.74	13.72	13.72	13.72	13.72	13.72	13.72	13.72	13.72
RF Household refrigerator and freezer	455	522	556	571	642	608	656	666	674	680
CF open vertical chilled multi deck (RCV2)	4158	4158	4158	4158	4874	5227	4987	4757	4538	4329
CF open horizontal frozen island (RHF4)	4752	4752	4752	4752	4752	4752	4752	4752	4752	4752
CF other supermarket display (non-BCs)	2573	2573	2573	2573	2573	2573	2573	2573	2573	2573
CF Plug in one door beverage cooler	896	896	896	896	934	920	896	896	896	896
CF Plug in horizontal ice cream freezer	864	864	864	864	864	864	864	864	864	864
CF Spiral vending machine	3780	3780	3780	3780	3780	3780	3780	3780	3780	3780
PF Storage cabinet Chilled Vertical (CV)	1577	1577	1577	1713	1630	1577	1577	1577	1577	1577
PF Storage cabinet Frozen Vertical (FV)	1862	1862	1862	2023	1924	1862	1862	1862	1862	1862
PF Storage cabinet Chilled Horizontal (CH)	756	756	756	821	781	756	756	756	756	756
PF Storage cabinet Frozen Horizontal (FH)	1296	1296	1296	1408	1339	1296	1296	1296	1296	1296
PF Storage cabinets All types	1441	1441	1441	1566	1490	1441	1441	1441	1441	1441
PF Process Chiller AC MT S ≤ 300 kW	30238	30238	30238	31480	30238	30238	30238	30238	30238	30238
PF Process Chiller AC MT L > 300 kW	97192	97192	97192	97192	97192	97192	97192	97192	97192	97192
PF Process Chiller AC LT S ≤ 200 kW	33477	33477	33477	34853	33477	33477	33477	33477	33477	33477
PF Process Chiller AC LT L > 200 kW	101512	101512	101512	101512	101512	101512	101512	101512	101512	101512
PF Process Chiller WC MT S ≤ 300 kW	45356	45356	45356	47220	45356	45356	45356	45356	45356	45356
PF Process Chiller WC MT L > 300 kW	145788	145788	145788	145788	145788	145788	145788	145788	145788	145788
PF Process Chiller WC LT S ≤ 200 kW	50216	50216	50216	52279	50216	50216	50216	50216	50216	50216
PF Process Chiller WC LT L > 200 kW	152268	152268	152268	152268	152268	152268	152268	152268	152268	152268
PF Process Chiller All MT&LT	55472	55472	55472	56437	55472	55472	55472	55472	55472	55472

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UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PF Condensing Unit MT S 0.2-1 kW	540	540	540	562	540	540	540	540	540	540
PF Condensing Unit MT M 1-5 kW	1944	1944	1944	2006	1944	1944	1944	1944	1944	1944
PF Condensing Unit MT L 5-20 kW	3996	3996	3996	4268	4061	3996	3996	3996	3996	3996
PF Condensing Unit MT XL 20-50 kW	9179	9179	9179	9806	9330	9179	9179	9179	9179	9179
PF Condensing Unit LT S 0.1-0.4 kW	648	648	648	675	648	648	648	648	648	648
PF Condensing Unit LT M 0.4-2 kW	864	864	864	892	864	864	864	864	864	864
PF Condensing Unit LT L 2-8 kW	4644	4644	4644	4961	4720	4644	4644	4644	4644	4644
PF Condensing Unit LT XL 8-20 kW	8099	8099	8099	8652	8232	8099	8099	8099	8099	8099
PF Condensing Unit, All MT&LT	1982	1982	1982	2094	1996	1982	1982	1982	1982	1982
CA Electric Hobs	380	546	538	560	556	552	547	541	534	526
CA Electric Ovens	564	616	630	624	595	568	564	564	564	564
CA Gas Hobs	300	308	295	299	286	275	275	275	275	275
CA Gas Ovens	286	371	397	506	493	481	468	455	443	430
CA Range Hoods	229	229	229	285	316	303	291	279	267	257
WM Washing Machines	484	587	598	591	569	542	515	490	484	484
WD Washer-Dryers	889	889	889	889	889	889	889	889	889	889
DW Household Dishwasher	584	776	776	760	740	721	701	682	663	644
LD condensing heat pump	903	903	801	809	775	740	704	670	638	607
LD condensing electric heat element	375	375	421	486	462	440	419	398	379	375
LD vented electric	327	327	342	360	343	327	327	327	327	327
LD vented gas	527	527	527	527	527	527	527	527	527	527
VC dom. Vacuum Cleaner	255	238	245	244	238	238	238	238	238	238
VC nondom Vacuum Cleaner	730	648	663	666	648	648	648	648	648	648
FAN Axial<300Pa [247 W flow out]	270	270	336	375	358	343	328	313	300	286
FAN Axial>300Pa [489 W fluid-dyn out]	351	351	351	365	351	351	351	351	351	351
FAN Centr.FC [141 W flow out]	432	432	557	680	649	619	591	564	538	514
FAN Centr.BC-free [2120 W flow out]	832	832	1016	1017	972	929	888	849	832	832
FAN Centr.BC [2052 W flow out]	1782	1782	2489	2534	2422	2315	2213	2115	2021	1932
FAN Cross-flow [31 W flow out]	351	351	1007	1189	1136	1085	1036	990	945	903
Medium (S) 3-ph 0.75-7.5 kW no VSD	130	155	170	189	195	189	181	174	167	161
Medium (M) 3-ph 7.5-75 kW no VSD	514	616	689	722	724	697	668	639	612	586
Medium (L) 3-ph 75-375 kW no VSD	4725	5666	6338	6513	6852	6569	6253	5953	5668	5396
Medium (S) 3-ph 0.75-7.5 kW with VSD	538	622	626	631	630	605	590	583	576	569
Medium (M) 3-ph 7.5-75 kW with VSD	2161	2503	2526	2505	2478	2377	2315	2287	2260	2234
Medium (L) 3-ph 75-375 kW with VSD	12481	14549	14986	14909	15111	14477	14009	13709	13424	13152
Small 1 ph 0.12-0.75 kW no VSD	36	50	51	51	65	63	61	59	57	55
Small 1 ph 0.12-0.75 kW with VSD	328	363	354	343	356	354	352	350	348	347
Small 3 ph 0.12-0.75 kW no VSD	73	92	92	95	109	105	101	98	94	91
Small 3 ph 0.12-0.75 kW with VSD	365	405	395	397	418	400	393	389	386	383
Large 3-ph LV 375-1000 kW no VSD	20032	24626	24947	25421	28607	27417	26275	25180	24130	23122
Large 3-ph LV 375-1000kW with VSD	80087	88258	86341	86433	91830	87572	86330	85235	84185	83177
Explosion motors (S) 3-ph 0.75-7.5 kW	194	229	223	225	264	256	247	238	230	221
Explosion motors (M) 3-ph 7.5-75 kW	771	912	889	909	1016	978	940	902	866	831
Explosion motors (L) 3-ph 75-375 kW	7087	8380	8176	8355	9189	8818	8446	8088	7744	7411
Brake motors (S) 3-ph 0.75-7.5 kW	194	229	223	230	292	283	272	261	251	240
Brake motors (M) 3-ph 7.5-75 kW	771	912	889	935	1083	1043	1000	958	917	877
Brake motors (L) 3-ph 75-375 kW	7087	8380	8176	8596	9658	9268	8862	8469	8094	7728
8-pole motors (S) 3-ph 0.75-7.5 kW	207	244	238	248	341	332	323	314	305	295
8-pole motors (M) 3-ph 7.5-75 kW	822	973	949	1002	1164	1118	1074	1031	990	949
8-pole motors (L) 3-ph 75-375 kW	7559	8939	8721	9303	10581	10159	9754	9364	8990	8614
1-phase motors >0.75 kW (no VSD)	143	168	163	159	174	171	168	164	161	157
WP Water pumps (load) [%]	1545	1546	1545	1545	1545	1545	1545	1545	1545	1545
CP Fixed Speed 5-1280 l/s	8365	8365	8884	9371	9466	9494	9519	9545	9571	9577
CP Variable speed 5-1280 l/s	18636	18781	18777	19727	19939	19929	19919	19909	19900	19890
CP Pistons 2-64 l/s	1788	1863	2274	2650	2711	2709	2708	2707	2705	2704
WE Welding Equipment	1035	1035	1035	1035	1056	1056	1035	1035	1035	1035

PRICEECO

UNIT PRICE ECO (in euro 2015, incl VAT & Install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
TRAFO Distribution, kWh/a	8345	8345	10308	10308	10308	10308	10308	10308	10308	10308
TRAFO Industry oil	14395	14395	22025	22025	22025	22025	22025	22025	22025	22025
TRAFO Industry dry	36070	36070	48764	48764	48764	48764	48764	48764	48764	48764
TRAFO Power	980066	980066	980066	980066	980066	980066	980066	980066	980066	980066
TRAFO DER oil	24042	24042	40391	40391	40391	40391	40391	40391	40391	40391
TRAFO DER dry	37141	37141	48656	48656	48656	48656	48656	48656	48656	48656
TRAFO Small	1519	1519	1519	1519	1519	1519	1519	1519	1519	1519
Tyres C1, replacement for cars	66	76	96	104	106	107	107	107	107	107
Tyres C1, OEM for cars	66	73	83	101	106	107	107	107	107	107
Tyres C2, replacement for vans	89	93	100	112	117	119	119	119	119	119
Tyres C2, OEM for vans	89	93	96	101	115	119	119	119	119	119
Tyres C3, replacement for trucks/busses	304	304	477	496	514	517	517	517	517	517
Tyres C3, OEM for trucks/busses	304	304	328	389	514	517	517	517	517	517

LS, ECO, Basic LED price curves from MELISA in 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	292	313	303	292	292	292	292	292	292	292
VSD - Very Small 0.12 - 0.75 kW 3-phase	292	313	303	302	309	295	292	292	292	292
VSD - Small 0.75 - 7.5 kW 3-phase	408	468	455	442	435	416	408	408	408	408
VSD - Medium 7.5 - 75kW 3-phase	1647	1887	1837	1783	1754	1680	1647	1647	1647	1647
VSD - Large 75 - 375kW 3-phase	7756	8883	8648	8396	8259	7908	7756	7756	7756	7756
VSD - Very Large 375 - 1,000kW 3-phase	60055	63632	61394	61012	63224	60155	60055	60055	60055	60055

ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	0.0	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)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EIWSH Electric Instant. Shower (secondary)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ESWH Electric Storage ≤ 30 L (secondary)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
ESWH Electric Storage > 30 L (primary)	1.3	1.5	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	
GIWH Gas Instant. < 13 L/min (secondary)	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
GSHW Gas Storage, Condensing	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GSHW Gas Storage, Non-condensing	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dedicated WH Heat Pump	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	
Dedicated WH Solar (3.5 m ²)	0.3	1.0	1.0	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.0
WH dedicated Water Heater	3	4	3	3	4	4	4	4	5	5	
CHB Gas Combi Instant. WH	0.7	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
CHB Gas + Cyl. WH	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
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	0.1
CHB Jet Burner Oil + Cyl. WH	1.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4	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	0.0
CHB Hybrid Gas/Electric WH	0.0	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	0.9	1.1	1.2	1.4	1.6	
CHB Gas HP + Cyl. WH	0.0	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	0.1	0.2	0.2
CHB Solar Combi (16 m ²)	0.0	0.1	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	3	4	4	4	4	5	
TOTAL WATER HEATING	6	7	7	7	7	8	8	8	9	10	
CHB Gas non-condensing	5.2	2.8	2.6	2.6	2.4	2.2	2.0	1.8	1.6	1.4	
CHB Gas condensing	0.4	8.5	7.1	7.5	8.0	8.4	8.8	9.1	9.3	9.4	
CHB Gas Jet burner non-condensing	1.3	0.4	0.2	0.2	0.2	0.1	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	0.3	0.4	
CHB Oil Jet burner non-condensing	9.1	2.8	1.2	1.1	1.0	0.9	0.9	0.8	0.8	0.7	
CHB Oil Jet burner condensing	0.0	1.0	1.4	1.4	1.6	1.8	1.9	2.1	2.2	2.3	
CHB Electric Joule-effect	0.1	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	0.4	0.7	1.2	
CHB Electric Heat Pump	0.2	2.7	3.1	3.8	4.4	5.1	6.0	6.9	8.0	9.3	
CHB Gas Heat Pump	0.0	0.0	0.0	0.1	0.1	0.1	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 m ²)	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5
CHB Central Heating boiler < 400 kW, space heating	17	19	16	18	19	20	21	23	25	27	
SFB Wood Manual	1.1	0.6	0.4	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
SFB Wood Direct Draft	0.0	1.5	1.6	1.7	1.5	1.9	2.2	2.6	3.1	3.7	
SFB Coal	0.3	1.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	
SFB Pellets	0.0	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.9	1.0	
SFB Wood chips	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	
Total Solid Fuel Boiler	1	4	3	3	3	3	4	4	5	5	
CHAE-S (< 400 kW)	0.3	1.5	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	
CHAE-L (> 400 kW)	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CHWE-S (< 400 kW)	0.0	0.1	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	0.1	0.1
CHWE-L (> 1500 kW)	0.0	0.1	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	0.0
HT PCH-AE-S	0.2	0.3	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	0.2	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	0.1
HT PCH-WE-M	0.1	0.2	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	0.0	0.0	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	0.1
AC splits	0.3	1.0	1.1	1.1	1.0	1.0	0.9	0.9	0.9	0.9	0.8
AC VRF	0.0	2.7	3.5	5.1	6.4	7.8	9.1	10.2	11.2	11.9	
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SubTotal AHC Cooling	1	7	8	10	11	13	14	16	17	18	
AC rooftop (rev)	0.1	0.4	0.4	0.3	0.2	0.0	0.0	0.0	0.0	0.0	0.0
AC splits (rev)	0.2	0.7	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.5
AC VRF (rev)	0.0	2.3	2.8	4.4	5.3	6.1	6.7	7.2	7.5	7.6	
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
AHF	0.7	0.4	0.4	0.4	0.4	0.3	0.3	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	0.0
SubTotal AHC Heating (rev double)	1	4	4	6	7	7	8	8	8	8	
Total AHC Heating & Cooling	2	8	9	10	12	13	15	16	17	18	

ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	1.5	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
LH closed fireplace/inset	0.9	2.4	2.7	2.9	3.0	3.0	3.0	3.0	3.0	3.0	3.0
LH wood stove	0.9	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
LH coal stove	0.3	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1
LH cooker	0.8	1.5	1.8	2.1	2.1	2.2	2.2	2.2	2.2	2.2	2.2
LH SHR stove	1.8	2.5	3.1	3.7	4.1	4.5	4.6	4.6	4.6	4.6	4.6
LH pellet stove	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4
LH Solid fuel sum	6	11	12	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	0.2
LH Electric fixed > 250W	1.6	1.8	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
LH Electric fixed ≤ 250W	0.2	0.3	0.2	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	0.2
LH Electric underfloor	0.3	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	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	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	0.5
LH Electric sum	2.7	3.3	2.8	2.7							
LH Gas luminous (commercial)	0.0	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	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	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	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	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	0.0
LH Gaseous fuel sum	0.3	0.2	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.1	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	0.0									
LH Local Space Heaters total	9	14	15	16	17						
<i>Acquisition partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	0.3	2.9	2.2	2.4	2.6	2.9	3.2	3.5	4.1	4.7	
RAC fixed 6-12 kW, cooling	0.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.2	1.4	
RAC portable < 12 kW, cooling	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
RAC < 12 kW total, cooling mode	0.4	4.1	3.3	3.5	3.8	4.1	4.4	4.8	5.4	6.2	
RAC fixed < 6 kW, reversible, heating	0.0	1.1	1.0	1.4	1.8	2.3	2.8	3.5	4.1	4.7	
RAC fixed 6-12 kW, reversible, heating	0.0	0.4	0.5	0.6	0.7	0.9	1.0	1.1	1.2	1.4	
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	0.0
RAC < 12 kW total, heating mode	0.0	1.5	1.5	2.0	2.6	3.2	3.9	4.7	5.3	6.1	
RAC Room Air Conditioner	0	6	5	6	6	7	8	9	11	12	
1 CIRC Integrated circulators	1.4	2.3	2.5	2.6	2.8	3.0	3.0	3.0	3.0	3.0	3.0
1 CIRC Large standalone circulators	0.4	0.8	0.8	0.8	0.7						
1 CIRC Small standalone circulators	1.0	1.5	1.5	1.4	1.3	1.1	1.1	1.1	1.1	1.1	1.1
1 CIRC Circulator pumps <2.5 kW	2.8	4.6	4.8	4.8	4.9	4.8	4.8	4.8	4.8	4.8	4.8
TOTAL SPACE HEATING (incl. rev AC)	28	43	40	45	48	51	54	57	61	65	
TOTAL SPACE COOLING	2	11	12	14	15	17	19	20	22	24	
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	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	0.0
R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.1	0.3	1.4	1.5	1.6	2.3	2.7	3.0	
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	0.4
R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.8	0.9	0.9	1.2	1.3	1.4	
R-UVU 250-1000 m3/h	0.2	0.5	0.5	0.6	0.5	0.5	0.6	0.6	0.6	0.6	0.7
R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.3	1.5	1.6	1.7	2.1	2.4	2.6	
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	0.0
R-BVU 1000-2500 m3/h	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2
RVU, Total residential	0	1	1	2	5	5	5	7	8	8	
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	0.1
NR-BVU 250-1000 m3/h	0.0	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	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	0.1
NR-BVU 1000-2500 m3/h	0.0	0.7	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2	
NR-AHU-S 2500-5500 m3/h	0.2	4.1	5.0	5.0	4.3	4.8	5.0	5.1	5.3	5.5	
NR-AHU-M 5500-14500 m3/h	2.5	7.0	7.8	7.6	6.6	7.1	7.3	7.4	7.5	7.7	
NR-AHU-L > 14500 m3/h	0.6	1.8	2.0	1.9	1.6	1.8	1.8	1.8	1.9	1.9	
NRVU, Total non-residential	4	14	16	16	14	15	16	16	16	17	
VU Ventilation Units, res + non-res.	4	15	17	18	19	20	21	23	24	25	
TOTAL VENTILATION	4	15	17	18	19	20	21	23	24	25	

ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	3.3	4.9	4.4	3.4	2.3	1.7	1.4	1.1	0.8	0.6	
HID (HPM, HPS, MH)	0.4	1.3	1.1	0.8	0.6	0.3	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	1.7	1.1	1.3	0.8	0.6	0.3	0.2	0.1	0.1	0.1
GLS (DLS & NDLS)	1.7	1.4	1.2	0.8	0.5	0.3	0.2	0.1	0.1	0.0	
HL (DLS & NDLS, LV & MV)	0.3	2.1	2.6	2.7	1.7	0.9	0.5	0.3	0.1	0.1	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.5	2.0	3.0	4.2	4.6	5.3	6.4	7.5	
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.2	1.0	1.2	1.5	1.8	2.1	2.5	2.8	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.3	0.5	0.5	0.6	0.7	0.7	
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	2.2	1.9	1.4	1.1	0.9	0.8	0.8	
SUBTOTAL non-LED	6.0	12.0	11.0	9.6	6.3	4.0	2.6	1.8	1.2	0.9	
SUBTOTAL LED	0.0	0.1	1.2	5.8	6.8	7.8	8.2	9.1	10.5	12.0	
TOTAL LIGHTING	6.0	12.1	12.2	15.3	13.1	11.8	10.8	10.9	11.7	12.9	
DP TV, standard (NoNA)	16.9	21.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV, LoNA	0.0	3.3	7.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV, HiNA ('Smart')	0.0	3.3	7.8	14.8	22.8	26.3	26.6	26.6	26.6	26.6	26.6
DP TV all types	17	28	16	20	23	26	27	27	27	27	27
DP Monitor	1.7	3.6	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
DP Signage	0.0	0.3	1.4	3.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4
DP Electronic Displays, total	19	32	19	25	27	31	31	31	31	31	31
SSTB	0.0	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	4.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Total STB set top boxes (Complex & Simple)	0.0	5.7	5.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Game consoles > 20 W	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Game consoles < 20 W	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles	0.2	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
ES tower 1-socket traditional	0.0	0.2	0.2	0.2	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	0.5	0.6	0.6	0.6	0.6	0.6	0.6
ES rack 2-socket traditional	0.2	2.9	1.3	1.6	1.9	2.3	2.3	2.3	2.3	2.3	2.3
ES rack 2-socket cloud	0.0	2.7	4.1	5.0	6.1	7.4	7.4	7.4	7.4	7.4	7.4
ES rack 4-socket traditional	0.1	1.5	0.6	0.8	0.9	1.2	1.2	1.2	1.2	1.2	1.2
ES rack 4-socket cloud	0.0	1.3	1.8	2.2	2.6	3.2	3.2	3.2	3.2	3.2	3.2
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	0.5
ES rack 2-socket resilient cloud	0.0	0.4	0.6	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1
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	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	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	0.1
ES blade 2-socket traditional	0.1	0.9	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
ES blade 2-socket cloud	0.0	0.9	1.3	1.6	1.9	2.3	2.3	2.3	2.3	2.3	2.3
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	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	0.2
ES total traditional	0.5	6.7	3.4	4.0	4.7	5.6	5.6	5.6	5.6	5.6	5.6
ES total cloud	0.0	5.4	7.9	9.6	11.7	14.3	14.3	14.3	14.3	14.3	14.3
ES Enterprise Servers total	0.5	12.1	11.3	13.7	16.4	19.8	19.8	19.8	19.8	19.8	19.8
DS Online 2	0.2	5.4	5.0	5.5	6.1	6.7	6.7	6.7	6.7	6.7	6.7
DS Online 3	0.4	8.4	6.0	6.6	7.3	8.1	8.1	8.1	8.1	8.1	8.1
DS Online 4	0.3	5.5	5.0	5.5	6.1	6.7	6.7	6.7	6.7	6.7	6.7
DS Data Storage products total	0.9	19.4	16.1	17.7	19.5	21.5	21.5	21.5	21.5	21.5	21.5
ES + DS total	1.4	31.5	27.4	31.3	35.9	41.4	41.4	41.4	41.4	41.4	41.4
PC Desktop	11.5	17.8	9.4	10.5	14.5	15.5	16.1	16.2	16.3	16.3	
PC Integrated Desktop	0.5	0.8	0.4	0.5	0.6	0.8	0.9	0.9	0.9	0.9	
PC Notebook	0.0	49.2	43.4	43.3	57.1	72.0	82.7	86.6	87.9	88.3	
PC Tablet/slate	0.0	2.4	27.6	26.6	28.9	31.3	32.8	33.3	33.4	33.5	
PC Thin client	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
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	1.7	2.1	2.4	2.9	3.5	3.8	4.0	4.0	4.0	
Total PC, electricity	13.0	73.0	84.0	84.4	105.2	124.2	137.4	142.1	143.7	144.2	
Inkjet Printer	0.5	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Inkjet MFD	0.6	1.6	1.2	0.8	0.7	0.7	0.7	0.6	0.6	0.6	0.6
EP / Laser Printer mono	0.6	0.6	0.7	0.7	0.6	0.4	0.4	0.3	0.2	0.1	
EP / Laser Printer colour	0.0	0.6	0.7	0.9	0.9	1.0	1.0	1.0	1.1	1.1	
EP / Laser Copier mono	3.2	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser Copier colour	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser MFD mono	0.0	1.0	1.4	1.3	1.3	1.2	1.1	1.1	1.0	1.0	
EP / Laser MFD colour	0.0	6.6	8.9	8.5	8.0	7.6	7.3	6.9	6.6	6.2	
Total IE Imaging Equipment	5.0	13.1	14.2	12.2	11.7	11.1	10.6	10.0	9.5	9.0	

ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
SB Radios	1.6	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.5	0.4
SB Electric toothbrushes	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6
SB Audio speakers (wired)	4.1	2.1	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Audio speakers (wireless)	0.0	0.0	1.5	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4
SB Small appliances	4.7	7.6	7.8	8.0	8.1	8.2	8.3	8.4	8.5	8.5	8.5
SB Media boxes /sticks	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SB Media players and recorders	0.0	2.3	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Projectors	0.0	0.7	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
SB Home phones	0.2	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8
SB Office phones	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SB Home NAS	0.0	1.3	2.1	2.9	3.6	4.3	5.0	5.4	5.7	5.7	5.7
SB Home Network Equipment	0.0	2.8	3.1	3.3	3.5	3.7	4.0	4.0	4.0	4.0	4.0
SB Office Network Equipment	0.0	0.3	0.9	1.6	2.3	3.1	3.5	3.5	3.5	3.5	3.5
SB Coffee makers	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
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	21	23	25	26	28	29	30	30	30	30
Total (networked) SB (excl. double)	12	21	23	25	26	28	29	30	30	30	30
0.0 EPS ≤ 6W, low-V	0.0	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0
0.3 EPS 6–10 W	0.1	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.0	2.0	2.1
0.6 EPS 10–12 W	0.0	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
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	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	0.1
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	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	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	0.0
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	0.1
0.0 EPS 12–15 W	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPS, total	0.1	4.2	4.1	4.2	4.3	4.3	4.4	4.4	4.5	4.6	
EPS, double counted subtracted	0.1	2.3	2.3	2.4	2.4	2.4	2.5	2.5	2.5	2.6	
TOTAL ELECTRONICS	50	182	180	190	218	247	261	266	268	268	
Total RF household Refrigerators & Freezers	6.5	7.3	7.4	7.6	7.7	7.8	8.0	8.1	8.2	8.3	
CF open vertical chilled multi deck (RVC2)	0.3	0.3	0.3	0.3	0.3	0.3	0.3	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	0.0
CF other supermarket display (non-BCs)	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2
CF Plug in one door beverage cooler	0.5	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
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	0.3	0.3
CF Spiral vending machine	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total CF Commercial Refrigeration	2.1	2.4	2.4	2.5	2.6	2.7	2.7	2.8	2.9	3.0	
PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	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	0.1	0.1	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	0.1
PF Storage cabinet Frozen Horizontal (FH)	0.0	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	0.5	0.6	0.6	0.6	0.6	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	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	0.1
PF Process Chiller AC LT S ≤ 200 kW	0.0	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	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	0.1
PF Process Chiller WC MT L > 300 kW	0.0	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	0.0	0.0	0.1
PF Process Chiller WC LT L > 200 kW	0.0	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	0.5	0.6	0.6	0.7	

ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install]	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.1	0.1	0.1	0.1	0.1	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	0.3	0.4	0.4	0.4	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	0.4	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	0.3	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	0.0	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	0.1	0.2
0.6	PF Condensing Unit, All MT&LT	1.4	1.1	1.2	1.3	1.3	1.5	1.6	1.7	1.8	2.0
	PF Professional Refrigeration, Total	1.1	1.3	1.3	1.4	1.6	1.7	1.8	1.9	2.0	2.1
	TOTAL FOOD PRESERVATION	10	11	11	12	12	12	12	13	13	13
	CA Electric Hobs	2.3	5.3	5.7	6.2	6.5	6.8	7.1	7.4	7.6	7.9
	CA Electric Ovens	5.0	6.0	6.3	6.9	6.7	6.7	6.8	6.9	7.0	7.0
	CA Gas Hobs	1.9	1.7	1.5	1.4	1.3	1.2	1.2	1.1	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.5
	CA Range Hoods	1.2	1.5	1.6	1.7	1.7	1.8	1.9	2.0	2.1	2.2
	TOTAL COOKING	11	15	16	17	17	17	18	18	18	19
	WM Washing Machines	3.6	5.3	5.4	5.8	5.5	5.5	5.5	5.5	5.5	5.5
	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	3.9	5.8	5.8	6.3	6.0	6.0	6.0	6.0	6.0	6.0
	Total DW household Dishwasher	1.5	3.4	4.0	4.6	5.1	5.7	6.2	6.8	7.3	7.9
	LD condensing heat pump	0.0	0.1	0.1	0.1	0.2	0.3	0.4	0.4	0.5	0.6
	LD condensing electric heat element	0.3	0.7	1.0	1.3	1.3	1.2	1.0	0.9	0.9	0.8
	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	1.6	1.9	1.9	1.9	1.9	1.8	1.9	1.9
	VC dom	3.5	10.5	14.8	18.1	19.7	19.5	19.8	19.7	19.6	19.5
	VC nondom	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1
	Total VC Vacuum Cleaner	4.1	11.2	15.5	18.9	20.6	20.4	20.7	20.7	20.6	20.6
	TOTAL CLEANING	10	22	27	32	34	34	35	35	36	36
0.5	FAN Axial<300Pa (all FAN types >125W)	0.4	1.3	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
0.5	FAN Axial>300Pa	0.5	1.8	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0
0.5	FAN Centr.FC	0.3	0.8	0.9	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	0.6	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	0.4	1.1	1.2	1.4	1.6	1.6	1.8	1.9	2.1	2.2
0.5	FAN Cross-flow	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
	Total FAN, industrial (excl. box & roof fans)	0.9	2.8	3.1	3.5	3.6	3.6	3.7	3.8	3.9	4.0
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.6	1.0	1.0	1.0	0.9	0.9	0.8	0.8	0.7	0.7
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.3	0.5	0.5	0.5	0.4	0.4	0.4	0.4	0.3	0.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
0.45	Total 3ph 0.75-375 kW no VSD	1.1	1.8	1.8	1.8	1.7	1.6	1.4	1.3	1.2	1.1
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.3	0.8	0.9	1.1	1.2	1.4	1.6	1.9	2.2	2.6
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.2	0.6	0.7	0.8	0.9	1.0	1.2	1.4	1.6	1.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.4	0.5	0.5	0.6	0.7	0.8	1.0	1.0	1.0
0.45	Total 3-ph 0.75-375 kW with VSD	0.6	1.7	2.1	2.4	2.7	3.1	3.6	4.2	4.8	5.4
0.45	Total 3-ph 0.75-375 kW w/wo VSD	1.7	3.5	3.9	4.2	4.4	4.7	5.1	5.5	6.0	6.5
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.4	0.7	0.7	0.8	0.7	0.7	0.7	0.7	0.7	0.7
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.0
0.45	Total Small 1-ph 0.12-0.75 kW	0.4	1.3	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8
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	0.3	0.4	0.4	0.5	0.5
0.45	Total Small 3-ph 0.12-0.75 kW	0.2	0.6	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.9
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 375-1000 kW with VSD	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	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	0.6	0.6	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								
0.45	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	0.0	0.0	0.0	0.0	0.0	0.0	0.1
0.45	Total Brake 0.75-375 kW (no VSD)	0.1	0.2								

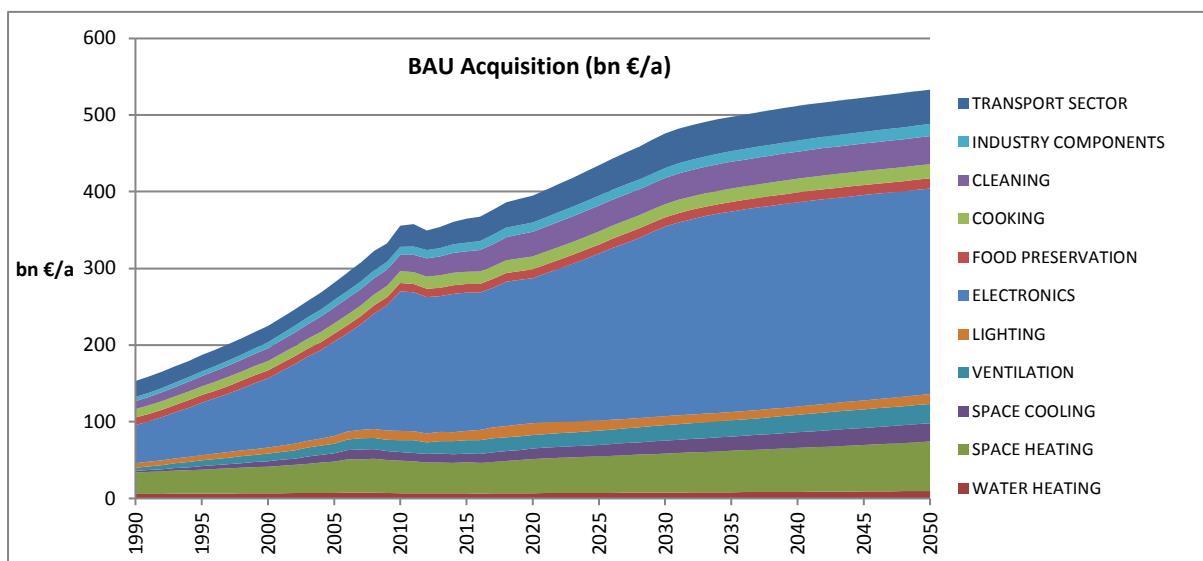
ACQBAU

db	BAU Acquisition (in bn euros 2015, incl VAT & install)	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)	0.8	1.5	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6
MT Elec. Motors LV 0.12-1000 kW including double counted amounts		2.0 4	4.2 8	4.6 8	4.9 9	5.0 9	5.2 10	5.5 10	5.8 11	6.1 11	6.5 12
Total WP Water Pumps		1.7	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9
CP Fixed Speed 5-1280 l/s	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4
CP Variable speed 5-1280 l/s	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CP Pistons 2-64 l/s	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CP Standard Air Compressors	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.8	0.9	0.9	0.9
Total WE Welding Equipment	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
TOTAL INDUSTRY COMPONENTS	5.5	10.4	11.4	12.2	12.8	13.2	13.8	14.5	15.2	15.9	
TRAFO Distribution	0.4	0.7	0.8	0.8	0.9	0.9	1.0	1.1	1.1	1.1	1.2
TRAFO Industry oil	0.2	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6
TRAFO Industry dry	0.1	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
TRAFO Power	1.8	2.9	3.1	3.4	3.6	3.9	4.2	4.5	4.7	5.0	
TRAFO DER oil	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	
TRAFO DER dry	0.0	0.1	0.2	0.3	0.6	1.0	1.4	1.9	2.3	2.8	
TRAFO Small	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total TRAFO Utility Transformers	2.6	4.3	4.8	5.3	5.9	6.8	7.7	8.6	9.5	10.5	
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	0
Tyres C1, replacement for cars	12	16	18	20	23	26	26	26	26	26	26
Tyres C1, OEM for cars	3	5	6	6	7	8	8	8	8	8	8
Tyres C1, total	15	21	23	26	29	33	33	33	33	33	33
Tyres C2, replacement for vans	2	2	2	3	3	3	3	3	3	3	3
Tyres C2, OEM for vans	0	0	1	1	1	1	1	1	1	1	1
Tyres C2, total	2	3	3	3	3	4	4	4	4	4	4
Tyres C3, replacement for trucks/busses	3	3	4	5	5	6	6	6	6	6	6
Tyres C3, OEM for trucks/busses	1	1	1	1	2	2	2	2	2	2	2
Tyres C3, total	4	4	5	6	7	8	8	8	8	8	8
Tyres, total C1+C2+C3	21	27	31	35	40	45	45	45	45	45	45
TRANSPORT SECTOR	21	27	31	35	40	45	45	45	45	45	45
GENERAL TOTAL (in bn euros)	153	355	364	395	434	476	498	512	523	533	

db	BAU Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	6	7	7	7	7	8	8	8	9	10
	SPACE HEATING	28	43	40	45	48	51	54	57	61	65
	SPACE COOLING	2	11	12	14	15	17	19	20	22	24
	VENTILATION	4	15	17	18	19	20	21	23	24	25
	LIGHTING	6	12	12	15	13	12	11	11	12	13
	ELECTRONICS	50	182	180	190	218	247	261	266	268	268
	FOOD PRESERVATION	10	11	11	12	12	12	12	13	13	13
	COOKING	11	15	16	17	17	17	18	18	18	19
	CLEANING	10	22	27	32	34	34	35	35	36	36
	INDUSTRY COMPONENTS	5	10	11	12	13	13	14	14	15	16
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	21	27	31	35	40	45	45	45	45	45
	TOTAL in bn euros	153	355	364	395	434	476	498	512	523	533
	(in bn euros 2015, 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									
Total in bn euros, incl. energy Sector	153	355	364	395	434	476	498	512	523	533

Acquisition costs for VSDs only (without motor)

VSD - Very Small 0.12 - 0.75 kW 1-phase	0.1	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	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	0.8	0.9	1.0	1.2	1.4	1.7	2.0
VSD - Medium 7.5 - 75kW 3-phase	0.1	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.2	1.4
VSD - Large 75 - 375kW 3-phase	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.6	0.6
VSD - Very Large 375 - 1,000kW 3-phase	0.0	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
Total Acquisition for VSDs only (BAU)	0.5	2.1	2.6	2.9	3.2	3.5	4.0	4.5	5.1	5.7

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	4	5	5	5	5	6	6	6	7	7
SPACE HEATING	21	31	29	31	33	35	37	39	41	44
SPACE & HT PROCESS COOLING	0	3	2	3	3	3	3	4	4	5
VENTILATION	0	1	1	2	5	5	5	7	8	8
LIGHTING	1	3	4	5	4	2	1	1	1	1
ELECTRONICS	37	109	112	115	134	151	162	166	167	167
FOOD PRESERVATION	6	7	7	7	7	7	7	8	8	8
COOKING	10	14	14	15	15	15	16	16	16	17
CLEANING	9	20	26	30	32	33	33	34	34	35
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Acquisition, Residential, in bn euros	90	193	200	214	238	258	272	280	286	292

ACQECO

db	ECO Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	0.0	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)	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
EIWHS Electric Instant. Shower (secondary)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
ESWH Electric Storage ≤ 30 L (secondary)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
ESWH Electric Storage > 30 L (primary)	1.3	1.5	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	
GIWH Gas Instant. < 13 L/min (secondary)	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
GIWH Gas Instant. ≥ 13 L/min (primary)	0.1	0.1	0.1	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	0.0
GSWH Gas Storage, Non-condensing	0.2	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Dedicated WH Heat Pump	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	0.4	0.5	
Dedicated WH Solar (3.5 m ²)	0.3	1.0	1.0	0.8	0.9	0.9	0.9	1.0	1.0	1.0	
WH dedicated Water Heater	3	4	3	3	4	4	4	4	5	5	
CHB Gas Combi Instant. WH	0.7	1.2	1.3	1.3	1.2	1.1	1.1	1.0	0.9	0.7	
CHB Gas + Cyl. WH	0.4	0.6	0.5	0.6	0.5	0.5	0.4	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	1.5	0.6	0.4	0.4	0.4	0.4	0.4	0.4	0.4	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	0.2	0.3	0.4	0.6	
CHB Electric HP + Cyl. WH	0.0	0.5	0.6	1.0	1.8	2.6	3.3	4.1	4.9	5.7	
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 m ²)	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	4	5	6	7	8	8	
TOTAL WATER HEATING	6	7	7	7	8	9	10	11	12	13	
CHB Gas non-condensing	5.2	2.8	2.1	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.0
CHB Gas condensing	0.4	8.5	7.7	9.5	9.1	8.8	8.1	7.4	6.6	5.7	
CHB Gas Jet burner non-condensing	1.3	0.4	0.1	0.0	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	0.4	0.5	0.5	
CHB Oil Jet burner non-condensing	9.1	2.8	0.9	0.3	0.3	0.2	0.2	0.1	0.1	0.1	
CHB Oil Jet burner condensing	0.0	1.0	1.7	2.3	2.4	2.6	2.7	2.8	2.9	3.0	
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	0.1	0.5	0.9	1.4	1.9	2.5	3.2	
CHB Electric Heat Pump	0.2	2.7	2.8	5.3	9.2	13.2	17.1	21.0	25.2	29.3	
CHB Gas Heat Pump	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.8	1.0	1.2	
CHB micro CHP	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.1	1.2	1.4	
CHB Solar combi (16 m ²)	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	
CHB Central Heating boiler < 400 kW, space heating	17	19	17	20	24	28	32	36	41	45	
SFB Wood Manual	1.1	0.6	0.6	0.4	0.3	0.2	0.2	0.2	0.1	0.1	
SFB Wood Direct Draft	0.0	1.5	1.6	1.7	1.8	2.1	2.5	2.9	3.4	4.0	
SFB Coal	0.3	1.2	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.2	
SFB Pellets	0.0	0.4	0.6	0.6	0.6	0.6	0.7	0.8	0.9	1.0	
SFB Wood chips	0.0	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.4	0.4	
Total Solid Fuel Boiler	1	4	3	3	3	4	4	4	5	6	
CHAE-S (< 400 kW)	0.3	1.5	1.6	1.8	2.0	2.2	2.3	2.5	2.7	2.9	
CHAE-L (> 400 kW)	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
CHWE-S (≤ 400 kW)	0.0	0.1	0.1	0.1	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	0.1	
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	0.3	0.4	0.4	0.4	0.4	
HT PCH-AE-L	0.1	0.2	0.2	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	0.2	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	0.0	0.0	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	1.0	1.1	1.1	1.0	1.0	0.9	0.9	0.9	0.8	
AC VRF	0.0	2.7	3.5	5.1	6.4	7.8	9.1	10.2	11.2	11.9	
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	7	8	10	11	13	14	16	17	18	
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	0.6	0.6	0.6	0.6	0.5	
AC VRF (rev)	0.0	2.3	2.8	4.4	5.3	6.1	6.7	7.2	7.5	7.6	
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AHF	0.7	0.4	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	4	6	7	7	8	8	8	8	
Total AHC Heating & Cooling	2	8	9	10	12	13	15	16	17	18	

ACQECO

db	ECO Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	1.5	2.1	2.1	2.6	2.8	2.7	2.6	2.5	2.4	2.4	2.3
LH closed fireplace/inset	0.9	2.4	2.7	3.5	3.7	3.7	3.5	3.4	3.3	3.3	3.2
LH wood stove	0.9	1.1	1.2	1.5	1.6	1.6	1.5	1.5	1.4	1.4	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	0.1
LH cooker	0.8	1.5	1.8	2.3	2.4	2.4	2.3	2.2	2.2	2.2	2.2
LH SHR stove	1.8	2.5	3.1	3.7	4.1	4.5	4.6	4.6	4.6	4.6	4.6
LH pellet stove	0.0	0.8	1.0	1.2	1.3	1.4	1.4	1.4	1.4	1.4	1.4
LH Solid fuel sum	6	11	12	15	16	16	16	16	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	0.2
LH Electric fixed > 250W	1.6	1.8	1.4	1.3	1.3	1.3	1.3	1.3	1.3	1.3	1.3
LH Electric fixed ≤ 250W	0.2	0.3	0.2	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	0.2
LH Electric underfloor	0.3	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	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	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	0.5
LH Electric sum	2.7	3.3	2.9	2.8	2.8	2.7	2.7	2.7	2.7	2.7	2.7
LH Gas luminous (commercial)	0.0	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	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	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	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	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	0.0
LH Gaseous fuel sum	0.3	0.2	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.1	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	0.0									
LH Local Space Heaters total	9	14	15	18	19	19	19	19	18	18	18
<i>Acquisition partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	0.3	3.4	2.7	2.9	3.1	3.1	3.2	3.5	4.1	4.7	
RAC fixed 6-12 kW, cooling	0.1	1.4	1.5	1.4	1.4	1.4	1.4	1.4	1.4	1.4	
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	0.1
RAC < 12 kW total, cooling mode	0.4	5.0	4.4	4.5	4.6	4.7	4.7	5.0	5.6	6.3	
RAC fixed < 6 kW, reversible, heating	0.0	1.3	1.3	1.8	2.2	2.5	2.9	3.5	4.1	4.7	
RAC fixed 6-12 kW, reversible, heating	0.0	0.5	0.7	0.9	1.0	1.1	1.2	1.4	1.4	1.4	
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	1.8	2.0	2.6	3.2	3.6	4.1	4.9	5.5	6.1	
RAC Room Air Conditioner	0	7	6	7	8	8	9	10	11	12	
1 CIRC Integrated circulators	1.4	2.3	2.7	2.8	2.9	3.0	3.0	3.0	3.0	3.0	3.0
1 CIRC Large standalone circulators	0.4	0.8	1.3	1.2	1.1	0.9	0.9	0.8	0.8	0.8	0.7
1 CIRC Small standalone circulators	1.0	1.5	1.8	1.7	1.5	1.3	1.3	1.2	1.1	1.1	1.1
1 CIRC Circulator pumps <2.5 kW	2.8	4.6	5.8	5.7	5.5	5.2	5.1	5.0	4.9	4.9	
TOTAL SPACE HEATING (incl. rev AC)	28	43	41	49	56	62	67	72	78	83	
TOTAL SPACE COOLING	2	12	13	14	16	17	19	21	22	24	
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	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	0.0
R-BVU ≤ 100 m3/h for Habitable Spaces	0.0	0.1	0.1	0.3	1.4	1.5	1.7	2.3	2.8	3.0	
R-UVU 100-250 m3/h	0.1	0.3	0.3	0.4	0.4	0.4	0.4	0.5	0.4	0.5	
R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.8	0.9	0.9	1.2	1.3	1.5	
R-UVU 250-1000 m3/h	0.2	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7	
R-BVU 250-1000 m3/h	0.0	0.2	0.2	0.3	1.5	1.6	1.7	2.1	2.4	2.6	
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	0.1	0.1	
RVU, Total residential	0	1	1	2	5	5	6	7	8	8	
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	0.3	0.4	0.4	0.5	0.5	0.5	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	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2	
NR-AHU-S 2500-5500 m3/h	0.2	4.1	5.1	5.1	4.5	5.0	5.2	5.3	5.4	5.7	
NR-AHU-M 5500-14500 m3/h	2.5	7.0	7.9	7.9	6.8	7.4	7.5	7.6	7.7	7.9	
NR-AHU-L > 14500 m3/h	0.6	1.8	2.0	2.0	1.7	1.8	1.9	1.9	1.9	1.9	
NRVU, Total non-residential	4	14	16	16	14	16	16	16	17	17	
VU Ventilation Units, res + non-res.	4	15	18	18	19	21	22	23	25	26	
TOTAL VENTILATION	4	15	18	18	19	21	22	23	25	26	

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db	ECO Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	3.3	4.9	3.6	3.0	0.9	0.5	0.3	0.2	0.1	0.1	0.1
HID (HPM, HPS, MH)	0.4	1.3	0.9	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0
CFLni (all shapes)	0.2	0.7	0.5	0.4	0.2	0.1	0.0	0.0	0.0	0.0	0.0
CFLi (retrofit for GLS, HL)	0.1	2.3	0.8	0.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0
GLS (DLS & NDLS)	1.7	0.7	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
HL (DLS & NDLS, LV & MV)	0.3	2.4	2.8	0.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LED replacing LFL (retrofit & luminaire)	0.0	0.0	1.0	2.2	6.2	6.5	6.0	6.5	7.7	8.9	
LED replacing HID (retrofit & luminaire)	0.0	0.0	1.6	1.1	1.6	1.9	2.2	2.5	2.9	3.3	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.2	0.4	0.5	0.6	0.6	0.7	0.8	0.8	
LED replacing DLS (retrofit & luminaire)	0.0	0.1	1.0	0.7	0.6	0.1	0.1	0.2	0.2	0.2	
LED replacing NDLS (retrofit & luminaire)	0.0	0.1	3.2	4.9	2.2	1.3	0.7	0.7	0.8	0.9	
SUBTOTAL non-LED	6.0	12.3	8.6	4.9	1.5	0.7	0.3	0.2	0.1	0.1	
SUBTOTAL LED	0.0	0.2	7.0	9.3	11.1	10.4	9.7	10.5	12.3	14.1	
TOTAL LIGHTING	6.0	12.5	15.5	14.2	12.6	11.1	10.0	10.7	12.4	14.1	
DP TV, standard (NoNA)	16.9	21.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV, LoNA	0.0	3.3	7.9	4.9	0.0	0.0	0.0	0.0	0.0	0.0	0.0
DP TV, HiNA ('Smart')	0.0	3.3	7.8	14.8	22.8	26.3	26.6	26.6	26.6	26.6	26.6
DP TV all types	17	28	16	20	23	26	27	27	27	27	27
DP Monitor	1.7	3.6	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1	2.1
DP Signage	0.0	0.3	1.4	3.2	2.4	2.4	2.4	2.4	2.4	2.4	2.4
DP Electronic Displays, total	19	32	19	25	27	31	31	31	31	31	31
SSTB	0.0	1.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CSTB	0.0	4.5	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Total STB set top boxes (Complex & Simple)	0.0	5.7	5.8	5.6	5.6	5.6	5.6	5.6	5.6	5.6	5.6
Game consoles > 20 W	0.0	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1	3.1
Game consoles < 20 W	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles	0.2	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9	3.9
ES tower 1-socket traditional	0.0	0.2	0.2	0.2	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	0.5	0.6	0.6	0.6	0.6	0.6	0.6
ES rack 2-socket traditional	0.2	2.9	1.3	1.6	1.9	2.3	2.3	2.3	2.3	2.3	2.3
ES rack 2-socket cloud	0.0	2.7	4.1	5.0	6.1	7.4	7.4	7.4	7.4	7.4	7.4
ES rack 4-socket traditional	0.1	1.5	0.6	0.8	0.9	1.2	1.2	1.2	1.2	1.2	1.2
ES rack 4-socket cloud	0.0	1.3	1.8	2.2	2.6	3.2	3.2	3.2	3.2	3.2	3.2
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	0.5
ES rack 2-socket resilient cloud	0.0	0.4	0.6	0.8	0.9	1.1	1.1	1.1	1.1	1.1	1.1
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	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	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	0.1
ES blade 2-socket traditional	0.1	0.9	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
ES blade 2-socket cloud	0.0	0.9	1.3	1.6	1.9	2.3	2.3	2.3	2.3	2.3	2.3
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	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	0.2
ES total traditional	0.5	6.7	3.4	4.0	4.7	5.6	5.6	5.6	5.6	5.6	5.6
ES total cloud	0.0	5.4	7.9	9.6	11.7	14.3	14.3	14.3	14.3	14.3	14.3
ES Enterprise Servers total	0.5	12.1	11.3	13.7	16.4	19.8	19.8	19.8	19.8	19.8	19.8
DS Online 2	0.2	5.4	5.0	5.5	6.1	6.7	6.7	6.7	6.7	6.7	6.7
DS Online 3	0.4	8.4	6.0	6.6	7.3	8.1	8.1	8.1	8.1	8.1	8.1
DS Online 4	0.3	5.5	5.0	5.5	6.1	6.7	6.7	6.7	6.7	6.7	6.7
DS Data Storage products total	0.9	19.4	16.1	17.7	19.5	21.5	21.5	21.5	21.5	21.5	21.5
ES + DS total	1.4	31.5	27.4	31.3	35.9	41.4	41.4	41.4	41.4	41.4	41.4
PC Desktop	11.5	17.8	9.4	10.5	14.5	15.5	16.1	16.2	16.3	16.3	
PC Integrated Desktop	0.5	0.8	0.4	0.5	0.6	0.8	0.9	0.9	0.9	0.9	
PC Notebook	0.0	49.2	43.4	43.3	57.1	72.0	82.7	86.6	87.9	88.3	
PC Tablet/slate	0.0	2.4	27.6	26.6	28.9	31.3	32.8	33.3	33.4	33.5	
PC Thin client	0.0	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
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	1.7	2.1	2.4	2.9	3.5	3.8	4.0	4.0	4.0	
Total PC, electricity	13.0	73.0	84.0	84.4	105.2	124.2	137.4	142.1	143.7	144.2	
Inkjet Printer	0.5	0.8	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Inkjet MFD	0.6	1.6	1.2	0.8	0.7	0.7	0.7	0.6	0.6	0.6	
EP / Laser Printer mono	0.6	0.6	0.7	0.7	0.6	0.4	0.4	0.3	0.2	0.1	
EP / Laser Printer colour	0.0	0.6	0.7	0.9	0.9	1.0	1.0	1.0	1.1	1.1	
EP / Laser Copier mono	3.2	1.3	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser Copier colour	0.0	0.4	0.8	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser MFD mono	0.0	1.0	1.4	1.3	1.3	1.2	1.1	1.1	1.0	1.0	
EP / Laser MFD colour	0.0	6.6	8.9	8.5	8.0	7.6	7.3	6.9	6.6	6.2	
Total IE Imaging Equipment	5.0	13.1	14.2	12.2	11.7	11.1	10.6	10.0	9.5	9.0	

ACQECO

db	ECO Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
SB Radios	1.6	1.3	1.0	0.9	0.8	0.7	0.7	0.6	0.5	0.4	0.4
SB Electric toothbrushes	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6	0.6
SB Audio speakers (wired)	4.1	2.1	1.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Audio speakers (wireless)	0.0	0.0	1.5	3.9	4.4	4.4	4.4	4.4	4.4	4.4	4.4
SB Small appliances	4.7	7.6	7.8	8.0	8.1	8.2	8.3	8.4	8.5	8.5	8.5
SB Media boxes /sticks	0.0	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SB Media players and recorders	0.0	2.3	2.0	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SB Projectors	0.0	0.7	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0	0.0
SB Home phones	0.2	1.0	1.0	0.9	0.9	0.9	0.8	0.8	0.8	0.8	0.8
SB Office phones	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
SB Home NAS	0.0	1.3	2.1	2.9	3.6	4.3	5.0	5.4	5.7	5.7	5.7
SB Home Network Equipment	0.0	2.8	3.1	3.3	3.5	3.7	4.0	4.0	4.0	4.0	4.0
SB Office Network Equipment	0.0	0.3	0.9	1.6	2.3	3.1	3.5	3.5	3.5	3.5	3.5
SB Coffee makers	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.1	1.1
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
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	21	23	25	26	28	29	30	30	30	30
Total (networked) SB (excl. double)	12	21	23	25	26	28	29	30	30	30	30
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	0.0
0.3 EPS 6–10 W	0.1	1.5	1.6	1.7	1.8	1.9	1.9	2.0	2.0	2.0	2.1
0.6 EPS 10–12 W	0.0	1.2	1.5	1.6	1.6	1.6	1.6	1.6	1.6	1.6	1.6
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	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	0.1
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	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	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	0.0
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	0.1
0.0 EPS 12–15 W	0.0	0.1	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
EPS, total	0.1	4.2	4.2	4.3	4.3	4.4	4.4	4.4	4.4	4.5	4.6
EPS, double counted subtracted	0.1	2.3	2.4	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.6
TOTAL ELECTRONICS	50	182	180	190	218	247	261	266	268	268	268
Total RF household Refrigerators & Freezers	6.5	8.3	9.1	9.6	10.9	10.5	11.5	11.8	12.1	12.4	
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	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	0.0
CF other supermarket display (non-BCs)	0.7	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.1	1.2
CF Plug in one door beverage cooler	0.5	0.7	0.6	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8
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	0.3	0.3
CF Spiral vending machine	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
Total CF Commercial Refrigeration	2.1	2.4	2.4	2.5	2.7	2.8	2.8	2.9	2.9	3.0	
PF Storage cabinet Chilled Vertical (CV)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
PF Storage cabinet Frozen Vertical (FV)	0.1	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	0.1
PF Storage cabinet Frozen Horizontal (FH)	0.0	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	0.6	0.6	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	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	0.1
PF Process Chiller AC LT S ≤ 200 kW	0.0	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	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	0.1
PF Process Chiller WC MT L > 300 kW	0.0	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	0.0	0.0	0.1
PF Process Chiller WC LT L > 200 kW	0.0	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	0.5	0.6	0.6	0.6	0.7

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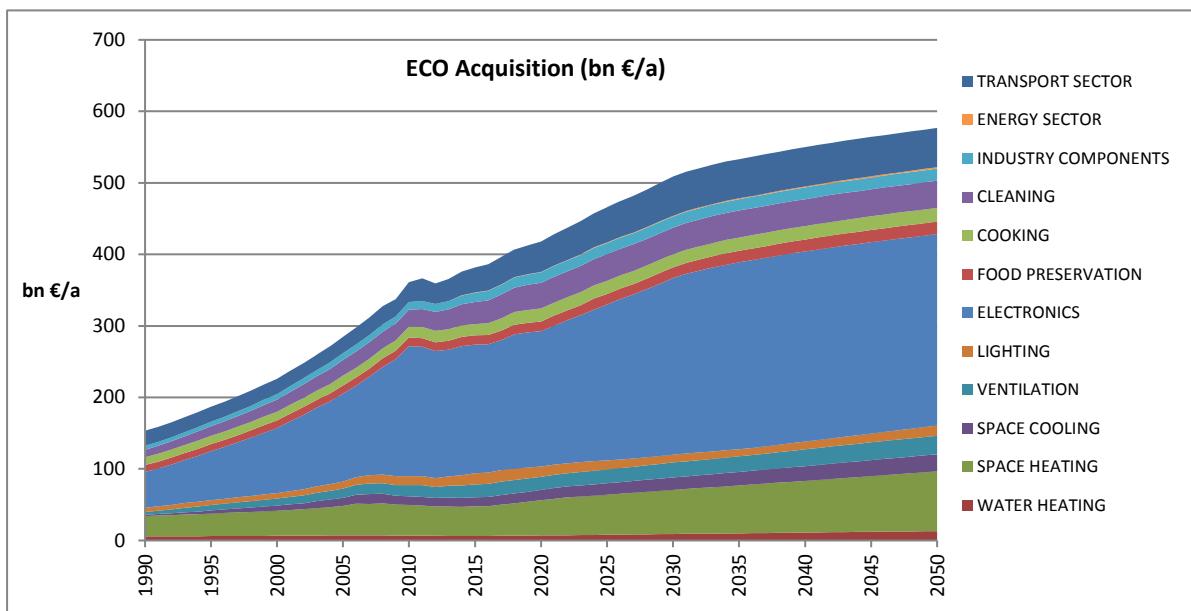
db	ECO Acquisition (in bn euros 2015, incl VAT & install)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
	PF Condensing Unit MT M 1-5 kW	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.5
	PF Condensing Unit MT L 5-20 kW	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	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	0.3	0.4
	PF Condensing Unit LTS 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	0.0	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	0.1	0.2
0.6	PF Condensing Unit, All MT&LT	1.4	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0
	PF Professional Refrigeration, Total	1.1	1.3	1.3	1.5	1.6	1.7	1.8	1.9	2.0	2.1
	TOTAL FOOD PRESERVATION	10	12	13	14	15	15	16	17	17	18
	CA Electric Hobs	2.3	5.3	5.7	6.4	6.8	7.1	7.4	7.6	7.9	8.1
	CA Electric Ovens	5.0	6.0	6.4	7.2	7.0	6.7	6.8	6.9	7.0	7.0
	CA Gas Hobs	1.9	1.7	1.5	1.5	1.4	1.2	1.2	1.1	1.1	1.0
	CA Gas Ovens	0.7	0.7	0.7	0.9	0.9	0.8	0.8	0.8	0.7	0.7
	CA Range Hoods	1.2	1.5	1.6	2.1	2.4	2.4	2.4	2.4	2.5	2.5
	TOTAL COOKING	11	15	16	18	18	18	19	19	19	19
	WM Washing Machines	3.6	6.4	6.6	7.0	6.5	6.2	5.9	5.6	5.5	5.5
	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	3.9	6.9	7.0	7.5	7.0	6.7	6.4	6.1	6.0	6.0
	Total DW household Dishwasher	1.5	4.5	5.3	6.0	6.5	7.0	7.5	7.9	8.3	8.7
	LD condensing heat pump	0.0	0.3	1.5	2.1	2.3	2.8	2.6	2.5	2.4	2.3
	LD condensing electric heat element	0.3	0.7	0.6	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	1.3	2.3	3.0	3.1	3.2	3.0	2.9	2.8	2.6
	VC dom	3.5	10.5	15.2	18.6	19.7	19.5	19.8	19.7	19.6	19.5
	VC nondom	0.7	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.1
	Total VC Vacuum Cleaner	4.1	11.2	16.0	19.5	20.6	20.4	20.7	20.7	20.6	20.6
	TOTAL CLEANING	10	24	31	36	37	37	38	38	38	38
0.5	FAN Axial<300Pa (all FAN types >125W)	0.4	1.3	1.8	2.3	2.2	2.1	2.0	1.9	1.8	1.7
0.5	FAN Axial>300Pa	0.5	1.8	1.9	2.1	2.0	2.0	2.0	2.0	2.0	2.0
0.5	FAN Centr.FC	0.3	0.8	1.2	1.7	1.6	1.5	1.4	1.4	1.3	1.3
0.5	FAN Centr.BC-free	0.2	0.5	0.6	0.7	0.8	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.BC	0.4	1.1	1.7	2.0	2.1	2.1	2.2	2.3	2.4	2.4
0.5	FAN Cross-flow	0.1	0.2	0.5	0.7	0.8	0.7	0.8	0.8	0.8	0.9
	Total FAN, industrial (excl. box & roof fans)	0.9	2.8	3.9	4.7	4.7	4.6	4.6	4.5	4.5	4.5
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.6	1.0	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.8
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.3	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
0.45	Total 3ph 0.75-375 kW no VSD	1.1	1.8	1.8	1.7	1.7	1.6	1.5	1.5	1.4	1.3
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.3	0.8	1.2	2.1	2.2	2.3	2.4	2.5	2.6	2.8
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.2	0.6	1.1	1.4	1.5	1.6	1.6	1.7	1.8	1.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.4	0.7	0.9	0.9	1.0	1.0	1.0	1.0	1.1
0.45	Total 3-ph 0.75-375 kW with VSD	0.6	1.7	3.0	4.4	4.7	4.8	5.0	5.2	5.5	5.7
0.45	Total 3-ph 0.75-375 kW w/wo VSD	1.7	3.6	4.8	6.1	6.4	6.5	6.7	6.9	7.0	
0.45	Small 1 ph 0.12-0.75 kW no VSD	0.4	0.7	0.7	0.8	1.0	0.9	0.9	0.9	0.9	0.8
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.6	0.7	0.7	0.8	0.9	0.9	1.0	1.0	1.1
0.45	Total Small 1-ph 0.12-0.75 kW	0.4	1.3	1.4	1.5	1.8	1.8	1.8	1.8	1.9	1.9
0.45	Small 3 ph 0.12-0.75 kW no VSD	0.2	0.4	0.4	0.4	0.5	0.5	0.4	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	0.6	0.7	0.8	0.8	0.8	0.9	0.9	0.9
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 375-1000 kW with VSD	0.0	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	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	
0.45	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								
0.45	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

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db	ECO Acquisition (in bn euros 2015, incl VAT & install)	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
	Total 8-pole 0.75-375 kW (no VSD)	0.0									
0.45	1-phase motors >0.75 kW (no VSD)	0.8	1.5	1.5	1.6	1.8	1.8	1.8	1.8	1.8	1.8
	MT Elec. Motors LV 0.12-1000 kW including double counted amounts	2.0 4	4.2 8	5.1 9	5.9 11	6.5 12	6.6 12	6.6 12	6.8 12	6.9 13	7.0 13
	Total WP Water Pumps	1.7	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	3.9
	CP Fixed Speed 5-1280 l/s	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.5
	CP Variable speed 5-1280 l/s	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
	CP Pistons 2-64 l/s	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	Total CP Standard Air Compressors	0.5	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9
	Total WE Welding Equipment	0.4	0.5								
	TOTAL INDUSTRY COMPONENTS	5.5	10.4	12.8	14.6	15.5	15.6	15.9	16.2	16.6	16.9
	TRAFO Distribution	0.4	0.7	0.9	1.0	1.1	1.2	1.3	1.3	1.4	1.5
	TRAFO Industry oil	0.2	0.4	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0
	TRAFO Industry dry	0.1	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4
	TRAFO Power	1.8	2.9	3.1	3.4	3.6	3.9	4.2	4.5	4.7	5.0
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	0.8
	TRAFO DER dry	0.0	0.1	0.3	0.5	0.8	1.2	1.8	2.4	3.0	3.6
	TRAFO Small	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
	Total TRAFO Utility Transformers	2.6	4.3	5.3	5.9	6.7	7.7	8.9	10.0	11.2	12.4
	TOTAL ENERGY SECTOR (only improvement over BAU)	0.0	0.0	0.6	0.6	0.8	1.0	1.2	1.4	1.7	1.9
	Tyres C1, replacement for cars	12	17	20	24	28	31	31	31	31	31
	Tyres C1, OEM for cars	3	5	6	7	8	9	9	9	9	9
	Tyres C1, total	15	21	26	31	36	40	40	40	40	40
	Tyres C2, replacement for vans	2	2	2	3	3	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	3	4	5	5	5	5	5
	Tyres C3, replacement for trucks/busses	3	3	5	6	7	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	6	8	9	10	10	10	10	10
	Tyres, total C1+C2+C3	21	28	35	42	49	55	55	55	55	55
	TRANSPORT SECTOR	21	28	35	42	49	55	55	55	55	55
	GENERAL TOTAL (in bn euros)	153	361	382	418	466	509	533	550	564	577
	db ECO Acquisition (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	6	7	7	7	8	9	10	11	12	13
	SPACE HEATING	28	43	41	49	56	62	67	72	78	83
	SPACE COOLING	2	12	13	14	16	17	19	21	22	24
	VENTILATION	4	15	18	18	19	21	22	23	25	26
	LIGHTING	6	12	16	14	13	11	10	11	12	14
	ELECTRONICS	50	182	180	190	218	247	261	266	268	268
	FOOD PRESERVATION	10	12	13	14	15	15	16	17	17	18
	COOKING	11	15	16	18	18	18	19	19	19	19
	CLEANING	10	24	31	36	37	37	38	38	38	38
	INDUSTRY COMPONENTS	5	10	13	15	15	16	16	16	17	17
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	21	28	35	42	49	55	55	55	55	55
	TOTAL in bn euros	153	361	381	418	465	508	532	548	562	575
	(in bn euros 2015, 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	1	2	2
Total in bn euros, incl. energy Sector	153	361	382	418	466	509	533	550	564	577

Acquisition costs for VSDs only (without motor)

VSD - Very Small 0.12 - 0.75 kW 1-phase	0.1	0.5	0.6	0.6	0.7	0.7	0.7	0.8	0.8	0.8	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	0.3	0.4	0.4
VSD - Small 0.75 - 7.5 kW 3-phase	0.2	0.6	0.9	1.5	1.5	1.6	1.6	1.8	1.9	2.0	
VSD - Medium 7.5 - 75kW 3-phase	0.1	0.4	0.8	1.0	1.1	1.1	1.1	1.2	1.3	1.4	
VSD - Large 75 - 375kW 3-phase	0.1	0.2	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
VSD - Very Large 375 - 1,000kW 3-phase	0.0	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Total Acquisition for VSDs only (ECO)	0.5	2.1	3.1	4.1	4.4	4.5	4.7	5.1	5.4	5.7	

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	4	5	5	5	6	7	8	9	10	10
SPACE HEATING	21	31	30	35	39	43	47	50	54	58
SPACE & HT PROCESS COOLING	0	4	3	3	3	3	4	4	4	5
VENTILATION	0	1	1	2	5	5	6	7	8	8
LIGHTING	1	4	6	4	2	1	1	1	0	1
ELECTRONICS	37	109	112	116	134	151	162	166	167	167
FOOD PRESERVATION	6	8	8	9	10	10	11	11	11	12
COOKING	10	14	14	16	16	16	17	17	17	17
CLEANING	9	23	29	34	36	36	36	36	36	36
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
ECO Acquisition, Residential, in bn euros	90	198	209	225	252	273	289	300	308	315

ACQADD

db	ADDED Acquisition (ECO-BAU, in bn euros 2015, 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	0.0
CHB Gas Combi Instant. WH	0.0	0.0	0.0	-0.1	-0.2	-0.3	-0.4	-0.4	-0.5	-0.6	-0.6
CHB Gas + Cyl. WH	0.0	0.0	-0.1	-0.1	-0.1	-0.2	-0.2	-0.2	-0.2	-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	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	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	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	0.4
CHB Electric HP + Cyl. WH	0.0	0.0	0.0	0.3	1.0	1.6	2.3	2.9	3.5	4.1	4.1
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	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	0.1	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	0.0
CHC Central Heating combi, water heating	0.0	0.0	0.0	0.3	0.9	1.5	2.1	2.6	3.2	3.7	
TOTAL WATER HEATING	0.0	0.0	0.0	0.3	0.9	1.5	2.1	2.6	3.2	3.7	
CHB Gas non-condensing	0.0	0.0	-0.5	-1.9	-2.0	-2.0	-1.9	-1.7	-1.6	-1.4	
CHB Gas condensing	0.0	0.0	0.7	2.0	1.1	0.3	-0.7	-1.7	-2.7	-3.6	
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	0.0	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	-0.7	-0.7	-0.7	-0.6	-0.6	
CHB Oil Jet burner condensing	0.0	0.0	0.3	0.9	0.8	0.8	0.8	0.8	0.7	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	0.4	0.8	1.1	1.4	1.8	2.0	
CHB Electric Heat Pump	0.0	0.0	-0.2	1.5	4.8	8.0	11.1	14.1	17.1	20.0	
CHB Gas Heat Pump	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.5	0.5	0.6	
CHB micro CHP	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.5	0.4	
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	13	16	18	
SFB Wood Manual	0.00	0.00	0.15	0.20	0.11	0.09	0.07	0.05	0.04	0.03	
SFB Wood Direct Draft	0.00	0.00	0.00	0.02	0.29	0.22	0.26	0.30	0.36	0.34	
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	0.02	0.00	0.00	0.00	0.00	0.00	
SFB Wood chips	0.00	0.00	0.01	0.01	0.00	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	0.48	0.74	0.64	0.54	0.45	0.36	0.27	
LH closed fireplace/inset	0.00	0.00	0.00	0.55	0.77	0.64	0.51	0.38	0.26	0.14	
LH wood stove	0.00	0.00	0.00	0.26	0.36	0.30	0.23	0.17	0.12	0.06	
LH coal stove	0.00	0.00	0.00	0.03	0.04	0.02	0.01	0.01	0.01	0.00	
LH cooker	0.00	0.00	0.00	0.20	0.29	0.20	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	2.2	1.8	1.4	1.0	0.7	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	0.04	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	0.0	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	1.6	2.3	1.8	1.4	1.0	0.8	0.5	

ACQADD

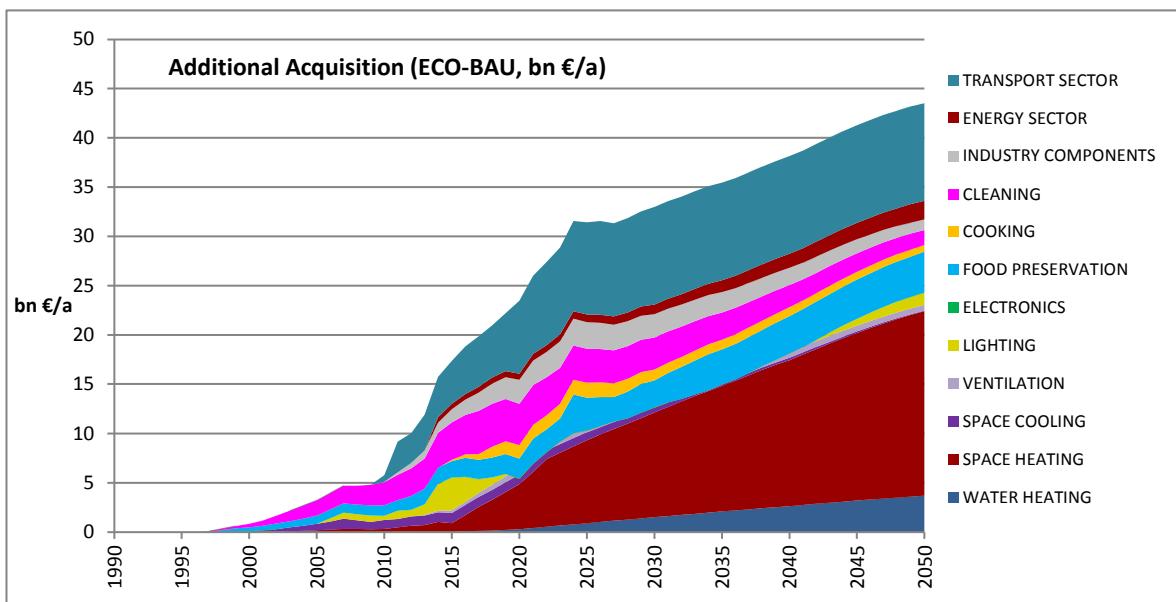
db	ADDED Acquisition (ECO-BAU, in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Acquisition partitioned over cooling and heating</i>											
	RAC fixed < 6 kW, cooling	0.0	0.5	0.5	0.5	0.4	0.3	0.0	0.0	0.0	0.0
	RAC fixed 6-12 kW, cooling	0.0	0.4	0.5	0.4	0.4	0.3	0.3	0.2	0.2	0.1
	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	0.9	1.0	1.0	0.8	0.6	0.3	0.2	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	0.2	0.2	0.2	0.2	0.2	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	0.3	0.5	0.6	0.6	0.5	0.3	0.2	0.2	0.1
	RAC Room Air Conditioner	0.0	1.2	1.5	1.5	1.4	1.0	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
1	CIRC Large standalone circulators	0.0	0.0	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1
1	CIRC Small standalone circulators	0.0	0.0	0.3	0.3	0.2	0.2	0.1	0.1	0.0	0.0
1	CIRC Circulator pumps <2.5 kW	0.0	0.0	0.9	0.9	0.6	0.4	0.3	0.2	0.1	0.1
TOTAL SPACE HEATING (incl. rev AC)											
	TOTAL SPACE COOLING	0.0	0.9	1.0	1.0	0.8	0.6	0.3	0.2	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	0.0	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	0.1	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	0.1	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	0.2	0.2	0.2	0.2
	NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.0
	NRVU, Total non-residential	0.0	0.0	0.2	0.5	0.5	0.5	0.5	0.5	0.4	0.4
	TOTAL VENTILATION	0.0	0.0	0.2	0.7	0.7	0.7	0.6	0.6	0.6	0.6
	LFL (T12,T8h,T8t,T5,other)	0.0	0.0	-0.9	-0.4	-1.4	-1.2	-1.1	-0.9	-0.7	-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	-0.2	-0.2	-0.1	-0.1	0.0	0.0
	CFLi (retrofit for GLS, HL)	0.0	0.6	-0.4	-0.9	-0.8	-0.6	-0.3	-0.2	-0.1	-0.1
	GLS (DLS & NDLS)	0.0	-0.7	-1.1	-0.8	-0.5	-0.3	-0.2	-0.1	-0.1	0.0
	HL (DLS & NDLS, LV & MV)	0.0	0.3	0.2	-2.1	-1.7	-0.9	-0.5	-0.3	-0.1	-0.1
	LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.4	0.2	3.2	2.3	1.5	1.2	1.4	1.4
	LED replacing HID (retrofit & luminaire)	0.0	0.0	1.4	0.1	0.5	0.4	0.4	0.4	0.4	0.4
	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	0.1	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	2.9	2.7	0.4	-0.1	-0.4	-0.2	0.0	0.1
	SUBTOTAL non-LED	0.0	0.2	-2.5	-4.6	-4.8	-3.3	-2.3	-1.6	-1.1	-0.8
	SUBTOTAL LED	0.0	0.2	5.8	3.5	4.3	2.6	1.5	1.4	1.8	2.1
	TOTAL LIGHTING	0.0	0.4	3.3	-1.1	-0.6	-0.7	-0.8	-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	1.7	2.0	3.2	2.6	3.5	3.8	3.9	4.1
	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<	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<	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	1.7	2.0	3.3	2.7	3.6	3.8	4.0	4.1

ACQADD

db	ADDED Acquisition (ECO-BAU, in bn euros 2015)	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	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	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	0.0
CA Gas Ovens	0.0	0.0	0.0	0.2	0.2	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	0.4	0.4	0.4	0.3
TOTAL COOKING	0.0	0.0	0.1	1.3	1.5	1.1	1.0	0.9	0.8	0.7	
WM Washing Machines	0.0	1.1	1.2	1.3	1.0	0.7	0.4	0.1	0.0	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	0.0
Total WM-WD household Washing	0.0	1.1	1.2	1.3	1.0	0.7	0.4	0.1	0.0	0.0	
Total DW household Dishwasher	0.0	1.1	1.3	1.4	1.4	1.3	1.2	1.1	1.0	0.8	
LD condensing heat pump	0.0	0.2	1.4	1.9	2.1	2.5	2.3	2.1	1.9	1.7	
LD condensing electric heat element	0.0	0.0	-0.4	-0.6	-0.7	-0.7	-0.6	-0.6	-0.5	-0.5	
LD vented electric	0.0	-0.1	-0.2	-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	1.0	1.1	1.3	1.2	1.0	0.9	0.7	
VC dom	0.0	0.0	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
VC nondom	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	0.5	0.5	0.0	0.0	0.0	0.0	0.0	0.0	
TOTAL CLEANING	0.0	2.3	3.8	4.2	3.5	3.3	2.8	2.2	1.9	1.5	
0.5 FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.4	0.6	0.5	0.4	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	0.5	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	0.5	0.5	0.5	0.5	0.5	0.5	
Total FAN, industrial (excl. box & roof fans)	0.0	0.0	0.8	1.3	1.1	1.0	0.9	0.7	0.6	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	0.1	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	0.0
0.45 Medium (L) 3-ph 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	0.0
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	1.0	1.0	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	0.6	0.5	0.4	0.3	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	
Total 3-ph 0.75-375 kW with VSD	0.0	0.0	0.9	2.0	2.0	1.7	1.4	1.0	0.7	0.3	
Total 3-ph 0.75-375 kW w/wo VSD	0.0	0.0	0.9	1.9	2.0	1.8	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	0.1	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	0.0	0.0
Total Small 1-ph 0.12-0.75 kW	0.0	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	
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	0.1	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	0.0
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	0.0
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	0.0
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	0.0
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	0.0
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	0.0
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	0.0
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	0.0
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	0.0
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	
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	0.0
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	0.0
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	0.0
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	0.2
MT Elec. Motors LV 0.12-1000 kW	0.0	0.0	0.5	1.1	1.5	1.3	1.1	1.0	0.8	0.5	
including double counted amounts	-	0.0	0.9	2.0	2.7	2.4	2.1	1.8	1.4	0.9	
Total WP Water Pumps	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CP Fixed Speed 5-1280 l/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CP Variable speed 5-1280 l/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
CP Pistons 2-64 l/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CP Standard Air Compressors	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	

ACQADD

db ADDED Acquisition (ECO-BAU, in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	1.3	2.4	2.7	2.4	2.1	1.8	1.4	1.0
TRAFO Distribution	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
TRAFO Industry oil	0.0	0.0	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3
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	0.4	0.6	0.7	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	0.6	0.8	1.0	1.2	1.4	1.7	1.9
TOTAL ENERGY SECTOR	0.0	0.0	0.6	0.6	0.8	1.0	1.2	1.4	1.7	1.9
Tyres C1, replacement for cars	0.0	0.7	2.6	4.3	4.9	5.2	5.2	5.2	5.2	5.2
Tyres C1, OEM for cars	0.0	0.0	0.0	1.1	1.5	1.6	1.6	1.6	1.6	1.6
Tyres C1, total	0.0	0.7	2.6	5.4	6.4	6.8	6.8	6.8	6.8	6.8
Tyres C2, replacement for vans	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.6	0.6	0.6
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	1.7	1.5	1.8	1.8	1.8	1.8	1.8	1.8
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	1.7	1.6	2.3	2.3	2.3	2.3	2.3	2.3
Tyres, total C1+C2+C3	0.0	0.7	4.4	7.4	9.3	9.9	9.9	9.9	9.9	9.9
TRANSPORT SECTOR	0.0	0.7	4.4	7.4	9.3	9.9	9.9	9.9	9.9	9.9
Total Added Acquisition (in bn euros)	0	6	17	23	31	33	35	38	41	44
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	0.9	1.5	2.1	2.6	3.2	3.7
SPACE HEATING	0.0	0.3	0.9	4.6	8.4	10.6	12.7	14.8	17.0	18.7
SPACE COOLING	0.0	0.9	1.0	1.0	0.8	0.6	0.3	0.2	0.2	0.1
VENTILATION	0.0	0.0	0.2	0.7	0.7	0.7	0.6	0.6	0.6	0.6
LIGHTING	0.0	0.4	3.3	-1.1	-0.6	-0.7	-0.8	-0.2	0.7	1.3
ELECTRONICS	0.0									
FOOD PRESERVATION	0.0	1.1	1.7	2.0	3.3	2.7	3.6	3.8	4.0	4.1
COOKING	0.0	0.0	0.1	1.3	1.5	1.1	1.0	0.9	0.8	0.7
CLEANING	0.0	2.3	3.8	4.2	3.5	3.3	2.8	2.2	1.9	1.5
INDUSTRY COMPONENTS	0.0	0.0	1.3	2.4	2.7	2.4	2.1	1.8	1.4	1.0
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0.0	0.7	4.4	7.4	9.3	9.9	9.9	9.9	9.9	9.9
Added Acquisition TOTAL in bn euros	0	6	17	23	31	32	34	37	40	42
(in bn euros 2015, incl VAT & install)										
Increase in % versus BAU (from 1990=0)	0.0%	1.6%	4.6%	5.8%	7.1%	6.7%	6.9%	7.2%	7.6%	7.8%
Increase in % versus BAU (from 2010=0)	-3.8%	0.0%	3.0%	4.3%	5.7%	5.5%	5.7%	6.1%	6.5%	6.7%
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	0.6	0.8	1.0	1.2	1.4	1.7	1.9
Total in bn euros, incl. energy Sector	0	6	17	23	31	33	35	38	41	44



ACQADD

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	0.6	0.6	0.5	0.4	0.3	0.2	0.0
VSD - Medium 7.5 - 75kW 3-phase	0.0	0.0	0.3	0.4	0.4	0.3	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	1.2	1.2	1.0	0.7	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	0.2	0.8	1.3	1.8	2.2	2.7	3.1
SPACE HEATING	0.0	0.2	0.6	3.6	6.6	8.1	9.6	11.1	12.7	13.9
SPACE & HT PROCESS COOLING	0.0	0.6	0.7	0.6	0.5	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	0.1	0.2	0.1	0.1
LIGHTING	0.0	0.3	2.1	-0.5	-1.7	-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	1.0	1.6	1.8	3.0	2.5	3.3	3.5	3.7	3.8
COOKING	0.0	0.0	0.1	1.2	1.3	1.0	0.9	0.8	0.7	0.6
CLEANING	0.0	2.2	3.6	4.0	3.3	3.1	2.6	2.1	1.8	1.5
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	4.4	8.7	11.1	14.0	15.4	17.9	19.7	21.6	23.1

RATES

REAL Energy & consumables rates	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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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 2015, inflation corrected)

electricity

Rel1	electricity RES	€/kwh elec	0.207	0.183	0.210	0.201	0.212	0.222	0.234	0.246	0.258	0.271
Rel2	electricity IND	€/kwh elec	0.131	0.111	0.116	0.118	0.124	0.131	0.137	0.144	0.152	0.159
Rel3	electricity TER	€/kwh elec	0.180	0.158	0.177	0.172	0.181	0.190	0.200	0.210	0.221	0.232
Rel4	electricity OTH	€/kwh elec	0.180	0.158	0.177	0.172	0.181	0.190	0.200	0.210	0.221	0.232

natural gas (heating fuel)

Rgas1	natural gas RES	€/kWh NCV	0.059	0.070	0.077	0.069	0.074	0.080	0.086	0.092	0.100	0.107
Rgas2	natural gas IND	€/kWh NCV	0.028	0.039	0.039	0.033	0.035	0.038	0.041	0.044	0.048	0.051
Rgas3	natural gas TER	€/kWh NCV	0.046	0.057	0.061	0.054	0.058	0.062	0.067	0.072	0.078	0.084
Rgas4	natural gas OTH	€/kWh NCV	0.046	0.057	0.061	0.054	0.058	0.062	0.067	0.072	0.078	0.084

gas oil (heating fuel)

Roil1	gas oil heating RES	€/kWh NCV	0.042	0.079	0.069	0.077	0.083	0.090	0.097	0.104	0.112	0.121
Roil2	gas oil heating IND	€/kWh NCV	0.036	0.065	0.057	0.064	0.069	0.075	0.081	0.087	0.093	0.101
Roil3	gas oil heating TER	€/kWh NCV	0.036	0.065	0.057	0.064	0.069	0.075	0.081	0.087	0.093	0.101
Roil4	gas oil heating OTH	€/kWh NCV	0.036	0.065	0.057	0.064	0.069	0.075	0.081	0.087	0.093	0.101

fossil fuel (heating fuel) (mix of gas and oil)

Rfossil1	oil-gas mix RES	€/kWh NCV	0.056	0.072	0.076	0.070	0.076	0.082	0.088	0.095	0.102	0.110
Rfossil2	oil-gas mix IND	€/kWh NCV	0.029	0.044	0.043	0.039	0.042	0.046	0.049	0.053	0.057	0.061
Rfossil3	oil-gas mix TER	€/kWh NCV	0.044	0.059	0.061	0.056	0.060	0.065	0.070	0.075	0.081	0.087
Rfossil4	oil-gas mix OTH	€/kWh NCV	0.044	0.059	0.061	0.056	0.060	0.065	0.070	0.075	0.081	0.087

LPG (heating fuel)

RLPG1	LPG/propane RES	€/kWh NCV	0.060	0.099	0.085	0.084	0.090	0.097	0.105	0.113	0.121	0.131
RLPG2	LPG/propane IND	€/kWh NCV	0.052	0.083	0.071	0.070	0.075	0.081	0.087	0.094	0.101	0.109
RLPG3	LPG/propane TER	€/kWh NCV	0.052	0.083	0.071	0.070	0.075	0.081	0.087	0.094	0.101	0.109
RLPG4	LPG/propane OTH	€/kWh NCV	0.052	0.083	0.071	0.070	0.075	0.081	0.087	0.094	0.101	0.109

firewood, logs (heating fuel)

Rwood1	firewood logs RES	€/kWh NCV	0.029	0.033	0.049	0.051	0.057	0.063	0.069	0.076	0.084	0.093
Rwood2	firewood logs IND	€/kWh NCV	0.024	0.027	0.041	0.043	0.047	0.052	0.058	0.064	0.070	0.078
Rwood3	firewood logs TER	€/kWh NCV	0.024	0.027	0.041	0.043	0.047	0.052	0.058	0.064	0.070	0.078
Rwood4	firewood logs OTH	€/kWh NCV	0.024	0.027	0.041	0.043	0.047	0.052	0.058	0.064	0.070	0.078

Wood pellets (heating fuel)

Rpellets1	pellets RES	€/kWh NCV	0.044	0.050	0.053	0.056	0.061	0.068	0.075	0.083	0.091	0.101
Rpellets2	pellets IND	€/kWh NCV	0.037	0.042	0.045	0.046	0.051	0.057	0.062	0.069	0.076	0.084
Rpellets3	pellets TER	€/kWh NCV	0.037	0.042	0.045	0.046	0.051	0.057	0.062	0.069	0.076	0.084
Rpellets4	pellets OTH	€/kWh NCV	0.037	0.042	0.045	0.046	0.051	0.057	0.062	0.069	0.076	0.084

Coal (heating fuel)

Rcoal1	coal RES	€/kWh NCV	0.017	0.031	0.018	0.029	0.035	0.043	0.052	0.064	0.078	0.094
Rcoal2	coal IND	€/kWh NCV	0.014	0.026	0.015	0.024	0.029	0.036	0.044	0.053	0.065	0.079
Rcoal3	coal TER	€/kWh NCV	0.014	0.026	0.015	0.024	0.029	0.036	0.044	0.053	0.065	0.079
Rcoal4	coal OTH	€/kWh NCV	0.014	0.026	0.015	0.024	0.029	0.036	0.044	0.053	0.065	0.079

Wood chips (heating fuel)

Rwoodchip1	wood chips RES	€/kWh NCV	0.021	0.030	0.034	0.036	0.040	0.044	0.049	0.054	0.060	0.066
Rwoodchip2	wood chips IND	€/kWh NCV	0.018	0.025	0.028	0.030	0.033	0.037	0.041	0.045	0.050	0.055
Rwoodchip3	wood chips TER	€/kWh NCV	0.018	0.025	0.028							

NRGCOSTBAU

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	0
EIWH Electric Instant. ≥ 12 kW (primary)	1	1	1	1	1	1	2	2	2	2	2
EIWS Electric Instant. Shower (secondary)	2	2	2	2	2	3	3	3	4	4	4
ESWH Electric Storage ≤ 30 L (secondary)	1	1	2	2	2	2	2	2	2	2	3
ESWH Electric Storage > 30 L (primary)	10	13	15	14	15	16	18	20	22	24	24
GIWH Gas Instant. < 13 L/min (secondary)	1	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	1
GSWH Gas Storage, Condensing	0	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	0
Dedicated WH Heat Pump	0	0	0	0	1	1	2	2	3	3	3
Dedicated WH Solar (3.5 m ²)	0	1	1	1	1	1	1	2	2	2	2
WH dedicated Water Heater	17	22	25	23	24	26	29	32	36	40	
CHB Gas Combi Instant. WH	3	9	11	10	10	11	12	13	14	15	
CHB Gas + Cyl. WH	2	4	4	4	4	4	5	5	5	6	
CHB Jet Burner Gas + Cyl. WH	1	1	0	0	0	0	0	0	0	0	
CHB Jet Burner Oil + Cyl. WH	3	5	3	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	0	0	
CHB Electric HP + Cyl. WH	0	0	1	1	1	1	1	2	2	3	
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 m ²)	0	0	0	0	0	0	0	0	0	0	
CHC Central Heating combi, water heating	9	19	20	18	18	19	20	22	24	26	
TOTAL WATER HEATING	26	41	45	41	42	45	49	55	60	66	
CHB Gas non-condensing	43	58	51	34	26	24	23	21	19	17	
CHB Gas condensing	0	18	30	35	44	49	54	57	61	64	
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	0	1	1	1	1	
CHB Oil Jet burner non-condensing	44	50	34	27	18	11	6	6	5	5	
CHB Oil Jet burner condensing	0	1	1	3	4	5	6	7	7	8	
CHB Electric Joule-effect	3	2	3	3	3	3	3	3	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	8	10	11	
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 m ²)	0	0	0	0	0	1	1	1	1	1	
CHB Central Heating boiler < 400 kW, space heating	96	136	126	108	103	101	101	103	107	111	
SFB Wood Manual	9.6	2.9	3.3	2.6	1.9	1.2	0.8	0.6	0.6	0.5	
SFB Wood Direct Draft	0.1	0.7	2.1	3.0	4.0	4.2	4.7	5.5	7.0	9.0	
SFB Coal	6.2	3.2	1.8	2.4	2.1	1.6	1.3	1.5	1.6	1.7	
SFB Pellets	0.0	0.4	0.8	1.2	1.6	1.9	2.1	2.4	2.7	3.1	
SFB Wood chips	0.0	0.4	0.5	0.6	0.6	0.6	0.7	0.9	1.0	1.2	
Total Solid Fuel Boiler	16	8	9	10	10	10	10	11	13	15	
CHAE-S (< 400 kW)	0.6	1.4	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.6	
CHAE-L (> 400 kW)	0.9	1.8	2.2	2.3	2.4	2.3	2.3	2.2	2.2	2.2	
CHWE-S (< 400 kW)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	
CHWE-L (> 1500 kW)	0.1	0.3	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	3.3	4.6	5.6	5.9	6.5	7.0	7.4	7.9	8.4	8.9	
HT PCH-AE-L	3.2	4.4	5.3	5.6	6.1	6.5	6.9	7.4	7.8	8.3	
HT PCH-WE-S	0.7	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9	
HT PCH-WE-M	1.3	1.9	2.3	2.5	2.7	2.9	3.1	3.3	3.5	3.7	
HT PCH-WE-L	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7	0.8	
AC rooftop	0.5	1.0	1.1	1.0	0.8	0.5	0.3	0.1	0.1	0.1	
AC splits	0.7	1.7	1.9	1.7	1.7	1.6	1.5	1.4	1.3	1.3	
AC VRF	0.0	0.4	0.7	1.0	1.2	1.6	1.9	2.2	2.4	2.6	
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
SubTotal AHC Cooling	12	20	24	25	26	28	29	30	32	33	
AC rooftop (rev)	0.7	1.7	1.9	1.7	1.4	0.9	0.4	0.1	0.0	0.0	
AC splits (rev)	1.2	3.3	3.8	3.7	3.6	3.4	3.2	3.0	2.8	2.7	
AC VRF (rev)	0.0	1.1	1.8	2.4	3.1	4.0	4.8	5.2	5.6	5.7	
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	
AHF	8.0	7.9	6.9	5.5	5.2	4.9	4.7	4.4	4.2	4.0	
AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	
SubTotal AHC Heating	10	14	15	13	14	14	13	13	13	13	
Total AHC Heating & Cooling	22	34	38	38	40	41	42	43	45	46	

NRGCOSTBAU

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0.4	0.6	0.9	1.0	1.1	1.2	1.4	1.5	1.6	1.8	
LH closed fireplace/inset	0.5	1.3	2.3	2.8	3.3	3.9	4.3	4.7	5.1	5.5	
LH wood stove	1.1	1.2	1.8	1.9	2.1	2.3	2.6	2.8	3.0	3.3	
LH coal stove	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
LH cooker	0.2	0.3	0.6	0.7	0.8	0.9	1.0	1.1	1.2	1.3	
LH SHR stove	0.5	0.7	1.1	1.2	1.5	1.8	2.2	2.5	2.8	3.1	
LH pellet stove	0.0	0.4	0.6	0.7	0.9	1.1	1.3	1.4	1.5	1.6	
LH Solid fuel sum	3	5	7	9	10	12	13	14	16	17	
LH Electric portable	4.6	3.7	4.1	3.9	3.9	3.8	3.8	3.8	3.9	3.9	
LH Electric fixed > 250W	24.3	19.1	19.9	16.7	14.9	13.7	13.6	13.6	13.7	13.7	
LH Electric fixed ≤ 250W	1.7	1.3	1.3	1.1	1.0	0.9	0.9	0.9	0.9	0.9	
LH Electric storage	1.4	1.1	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	
LH Electric underfloor	4.1	3.6	4.0	3.8	3.8	3.9	3.9	4.0	4.0	4.0	
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	1.7	2.0	1.9	1.8	1.8	1.7	1.7	1.8	1.8	
LH Electric sum	38	31	33	29	27	26	25	25	26	26	
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	0.0	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	0.1	
LH Gas balanced flue	0.5	0.3	0.3	0.2	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	1.0	0.7	0.7	0.5	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	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	42	37	41	38	37	38	39	40	42	43	
RAC fixed < 6 kW, cooling	0.4	2.9	2.9	2.1	2.2	2.5	2.8	3.2	3.7	4.4	
RAC fixed 6-12 kW, cooling	0.2	1.5	1.7	1.3	1.3	1.4	1.5	1.7	1.9	2.1	
RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
RAC < 12 kW total, cooling mode	0.6	4.6	4.8	3.6	3.7	4.1	4.5	5.1	5.8	6.8	
RAC fixed < 6 kW, reversible, heating	0.2	3.5	4.6	4.3	5.5	7.1	8.9	11.1	13.5	15.8	
RAC fixed 6-12 kW, reversible, heating	0.1	1.7	2.5	2.5	3.1	3.8	4.5	5.4	6.3	7.1	
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	5.2	7.1	6.8	8.6	10.9	13.4	16.5	19.9	22.9	
RAC Room Air Conditioner	1	10	12	10	12	15	18	22	26	30	
1 CIRC Integrated circulators	2.5	3.3	3.8	3.8	4.1	4.4	4.6	4.7	4.7	4.7	
1 CIRC Large standalone circulators	1.6	2.0	2.1	1.8	1.7	1.6	1.5	1.4	1.4	1.4	
1 CIRC Small standalone circulators	1.2	1.5	1.6	1.4	1.3	1.2	1.2	1.1	1.1	1.1	
1 CIRC Circulator pumps <2.5 kW	5.3	6.7	7.4	6.9	7.1	7.2	7.2	7.2	7.2	7.2	
TOTAL SPACE HEATING	164	200	198	176	173	172	176	184	194	205	
TOTAL SPACE COOLING	12	24	28	28	30	32	33	35	38	40	
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	1.0	1.3	
R-UVU 100-250 m3/h	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
R-BVU 100-250 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	
R-UVU 250-1000 m3/h	0.4	0.9	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8	
R-BVU 250-1000 m3/h	0.0	0.1	0.1	0.2	0.4	0.7	1.1	1.6	2.1	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, from VU own electricity	0.5	1.3	1.6	1.7	2.2	2.9	3.7	4.6	5.6	6.8	
NR-UVU 250-1000 m3/h	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	
NR-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.6	0.7	0.8	
NR-UVU > 1000 m3/h	0.1	0.2	0.2	0.1	0.1	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	0.3	0.4	0.5	0.6	
NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.6	0.7	0.9	1.1	1.3	1.5	1.8	2.1	
NR-AHU-M 5500-14500 m3/h	3.0	3.5	3.7	3.5	3.6	4.0	4.4	4.8	5.3	5.8	
NR-AHU-L > 14500 m3/h	0.8	1.0	1.0	1.0	1.0	1.1	1.2	1.4	1.5	1.6	
NRVU, Total non-residential, from VU own electricity	4.1	5.5	6.2	6.1	6.6	7.4	8.3	9.3	10.3	11.4	
VU Ventilation Units, res + non-res., from VU own elec.	4.7	6.8	7.8	7.8	8.7	10.3	12.0	13.9	15.9	18.2	
TOTAL VENTILATION (from VU own electricity)	5	7	8	8	9	10	12	14	16	18	
<i>¹ Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)</i>	-	-	-	-	-	-	-	-	-	-	

NRGCOSTBAU

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.2	18.1	24.1	26.7	27.8	25.0	20.6	16.9	14.0	11.5	
HID (HPM, HPS, MH)	5.1	9.6	11.2	11.1	10.0	7.0	4.0	2.3	1.3	0.8	
CFLni (all shapes)	0.4	1.4	1.7	1.7	1.6	1.2	0.7	0.4	0.2	0.1	
CFLi (retrofit for GLS, HL)	0.1	1.8	2.8	2.8	2.5	2.1	1.5	1.0	0.7	0.4	
GLS (DLS & NDLS)	14.7	10.8	9.0	6.4	3.9	2.4	1.5	0.9	0.6	0.3	
HL (DLS & NDLS, LV & MV)	1.2	6.2	9.2	10.6	7.9	4.2	2.3	1.3	0.8	0.5	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.1	1.3	4.2	8.7	13.9	19.2	24.8	31.3	
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	1.1	3.3	6.1	8.7	11.2	13.8	16.9	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.2	0.5	0.8	1.0	1.2	1.4	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.4	0.7	1.0	1.2	1.4	1.6	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.6	1.7	2.9	4.1	5.1	6.1	7.1	
<i>Standby</i>	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7	
TOTAL LIGHTING (incl. standby)	36	50	61	64	65	62	60	62	66	74	
DP TV on-mode, total all types	4.8	11.1	14.6	14.7	14.1	16.7	17.5	17.2	17.6	18.9	
DP TV standby, standard (NoNA)	0.6	0.4	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	1.9	1.8	1.6	1.4	
DP TV standby, total all types	1	0	1	1	1	2	2	2	2	1	
DP TV total on-mode + standby	5	11	15	16	16	19	19	19	19	20	
DP Monitor on-mode	0.1	2.1	1.4	1.0	1.0	0.9	0.8	0.7	0.7	0.8	
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								
DP Signage on-mode	0.0	0.1	1.3	3.0	3.8	3.9	3.8	3.8	3.8	3.9	
DP Signage standby	0.0	0.0	0.2	0.4	0.6	0.6	0.6	0.6	0.6	0.6	
DP Signage total	0	0	2	3	4	4	4	4	4	5	
DP Electronic Displays, total on-mode	5	13	17	19	19	22	22	22	22	24	
DP Electronic Displays, total standby	1	0	1	2							
DP Electronic Displays, total	6	14	18	20	21	24	25	24	24	26	
SSTB	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CSTB (low-power modes)	0.0	0.9	2.5	2.4	2.3	2.2	2.3	2.4	2.5	2.7	
CSTB (other modes)	0.0	0.5	1.3	1.3	1.2	1.2	1.2	1.3	1.4	1.4	
CSTB (all covered modes)	0.0	1.4	3.8	3.6	3.5	3.5	3.5	3.7	3.9	4.1	
Total STB set top boxes (Complex & Simple)	0	2	4	4	4	3	4	4	4	4	
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.9	1.1	1.1	1.2	1.2	1.3	1.4	1.4	
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	
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	1.0	1.2	1.1	1.2	1.3	1.3	1.4	1.5	
Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	
Total Game consoles > 20 W, all modes	0.0	0.7	1.4	1.6	1.6	1.7	1.7	1.8	1.9	2.0	
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	2								
<i>ES&DS only, without effects on infrastructure</i>											
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	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	
ES rack 2-socket traditional	0.1	2.0	1.2	0.7	0.8	1.1	1.2	1.3	1.3	1.4	
ES rack 2-socket cloud	0.0	1.1	1.9	2.1	2.6	3.2	3.6	3.8	4.0	4.2	
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	0.7	
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	0.6	0.6	0.6	0.6	
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.5	1.8	1.9	1.9	2.0	
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	0.3	
ES total traditional	0	4	3	2	2	3	3	3	3	3	
ES total cloud	0	2	3	4	4	6	6	7	7	7	
ES Enterprise Servers total	0	6	6	5	6	8	9	9	10	10	
DS Online 2	0.1	0.9	1.3	1.7	2.3	2.9	3.2	3.4	3.6	3.7	
DS Online 3	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.5	
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.6	1.8	1.9	2.0	2.1	
DS Data Storage products total	0	1	2	3	4	5	5	6	6	6	
ES + DS total (excl. infrastructure)	0	7	8	8	10	13	14	15	16	17	

NRGCOSTBAU

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PC Desktop	3.1	3.6	2.7	1.7	1.9	2.3	2.3	2.4	2.4	2.3
	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	1.3	1.6	1.3	1.5	1.6	1.7	1.9	1.9	2.0
	PC Tablet/slate	0.0	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4
	PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	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	0.3	0.4	0.4	0.4	0.4
	Total PC, electricity	3.3	5.4	5.3	3.8	4.2	4.7	5.0	5.3	5.3	5.3
	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	0.7	0.7	0.8
	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	0.5
	EP / Laser MFD colour	0.0	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Total IE Imaging Equipment	3.5	1.7	2.2	2.1	2.0	2.1	2.1	2.1	2.1	2.1
	<i>of which for modes under CR 1275/2008</i>	2.7	1.3	1.7	1.6	1.5	1.6	1.6	1.6	1.6	1.6
	<i>Products regulated only for (networked) standby</i>										
	SB Radios (sb & off modes)	0.4	1.1	1.1	0.9	0.8	0.8	0.7	0.7	0.6	0.6
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	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	0.6	1.1	1.1	1.2	1.3	1.3	1.4
	SB Small appliances (sb & off modes)	0.3	1.3	1.5	1.5	1.6	1.7	1.8	1.9	2.0	2.2
	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	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.8
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.4	0.6	0.9	1.2	1.3	1.3	1.4
	SB Coffee makers (off mode)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
	<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
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	0.6	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
1	SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.5	2.4	2.3	2.2	2.3	2.4	2.5	2.7
1	SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
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	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
1	SB IE Laser Copiers (nsb mode)	1.2	0.2	0.2	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	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	Total (networked) SB (incl. double)	4	9	13	13	13	14	15	15	16	17
	Total (networked) SB (excl. double)	1	5	7	6	7	7	8	8	9	9
db	<i>EPS Active mode (for electricity losses)</i>										
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	2.2	2.3	2.3	2.4	2.4	2.4	2.5	2.5
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	0.1	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	0.1	0.1	0.1	0.1
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	0.2	0.2	0.2
	EPS, total for active mode	0.0	1.9	3.0	2.9	3.0	3.0	3.1	3.1	3.2	
db	<i>EPS No-load mode</i>										
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	0.2	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	0.2	0.2						
	EPS, overall total (active + no-load)	0.0	2.1	3.3	3.2	3.3	3.3	3.3	3.4	3.4	3.5
	EPS, double counted subtracted	0.0	1.1	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7
	TOTAL ELECTRONICS	14	37	47	48	51	58	61	62	64	67

NRGCOSTBAU

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	23	21	24	23	24	26	27	28	30	31
	CF open vertical chilled multi deck (RVC2)	2.5	2.0	2.1	1.9	1.9	2.0	2.1	2.2	2.3	2.5
	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)	4.4	3.6	4.0	3.8	4.1	4.4	4.8	5.2	5.6	6.0
	CF Plug in one door beverage cooler	2.8	2.5	2.6	2.4	2.5	2.6	2.8	3.0	3.2	3.4
	CF Plug in horizontal ice cream freezer	0.6	0.6	0.6	0.5	0.6	0.6	0.6	0.7	0.7	0.8
	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	10	9	9	10	11	12	12	13
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6
	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	1.2	1.4	1.4	1.6	1.7	1.9	2.1	2.3	2.5
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.9	1.1	1.2	1.4	1.7	1.9	2.2	2.4
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.9	1.0	1.2	1.4	1.6	1.8	2.1	2.4
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.9	1.1	1.2	1.4	1.7	1.9	2.2	2.5
	PF Process Chiller AC LT L > 200 kW	0.4	0.8	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.5
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
	PF Process Chiller All MT&LT	2	4	5	6	7	8	9	10	12	13
	PF Condensing Unit MT S 0.2-1 kW	1.0	0.7	0.8	0.8	0.9	1.0	1.1	1.3	1.5	1.6
	PF Condensing Unit MT M 1-5 kW	2.5	1.8	1.9	2.0	2.2	2.5	2.9	3.3	3.7	4.2
	PF Condensing Unit MT L 5-20 kW	3.0	2.2	2.4	2.4	2.8	3.1	3.5	4.0	4.5	5.1
	PF Condensing Unit MT XL 20-50 kW	3.0	2.2	2.4	2.4	2.7	3.1	3.5	4.0	4.5	5.1
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8
	PF Condensing Unit LT L 2-8 kW	0.8	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.3
	PF Condensing Unit LT XL 8-20 kW	2.4	1.7	1.8	1.9	2.1	2.4	2.7	3.1	3.5	4.0
0.6	PF Condensing Unit, All MT&LT	13	10	10	11	12	14	15	17	20	22
	PF Professional Refrigeration, Total	8	9	10	11	13	15	17	19	22	25
	TOTAL FOOD PRESERVATION	42	39	44	43	47	51	55	59	64	69
	CA Electric Hobs (active modes)	3.9	5.3	6.7	7.1	8.0	9.0	9.9	10.9	12.0	13.1
	CA Electric Hobs (low-power modes)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
	CA Electric Hobs (sum all modes)	4	6	7	7	8	9	10	12	13	14
	CA Electric Ovens (active modes)	4.3	3.8	4.1	3.8	3.9	4.2	4.5	4.8	5.0	5.3
	CA Electric Ovens (low-power modes)	0.0	0.6	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
	CA Electric Ovens (sum all modes)	4	4	5	5	5	5	6	7	7	7
	CA Gas Hobs	1.7	1.7	1.8	1.6	1.6	1.6	1.7	1.7	1.7	1.8
	CA Gas Ovens	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6
	CA Range Hoods	1.8	2.0	2.4	2.5	2.7	3.0	3.3	3.7	4.0	4.4
	CA Elec. Hobs&Ovens low-power modes	0.0	0.8	1.2	1.3	1.5	1.7	1.8	2.0	2.1	2.3
	CA other products or modes	12	13	16	15	17	18	20	22	23	25
	TOTAL COOKING	12	14	17	17	18	20	22	24	25	28
	WM Washing Machines, active modes	8.8	6.2	6.9	6.2	6.0	5.9	5.7	5.5	5.3	5.1
	WM Washing Machines, low-power modes	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
	WM Washing Machines	8.8	6.5	7.2	6.5	6.4	6.3	6.1	5.9	5.8	5.6
	WD Washer-Dryers, active modes	1.5	1.5	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.7
	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	1.5	1.5	1.7	1.6	1.6	1.6	1.6	1.6	1.6	1.7
	WM-WD Washing, sum active modes	10	8	9	8	8	7	7	7	7	7
	WM-WD Washing, sum low-power modes	0	0	0	0	0	0	0	0	0	1
	Total WM-WD household Washing	10	8	9	8	8	8	8	8	7	7
	Total DW household Dishwasher	2	3	5	5	6	7	8	9	10	11
	LD condensing heat pump	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4
	LD condensing electric heat element	0.3	1.6	1.9	1.8	2.0	2.1	2.2	2.1	2.1	2.1
	LD vented electric	1.3	1.3	1.3	1.0	1.0	1.0	1.0	1.1	1.2	1.2
	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	1.6	2.8	3.1	2.8	2.9	3.1	3.3	3.4	3.5	3.6
	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	1.6	2.9	3.2	2.8	3.0	3.2	3.4	3.5	3.6	3.7
	VC dom	2	3	4	4	6	7	7	8	8	8
	VC nondom	0	1	1	1	1	1	1	1	1	2
	Total VC Vacuum Cleaner	2	3	5	5	7	8	9	9	9	9
	TOTAL CLEANING	16	18	21	21	24	26	27	29	30	31

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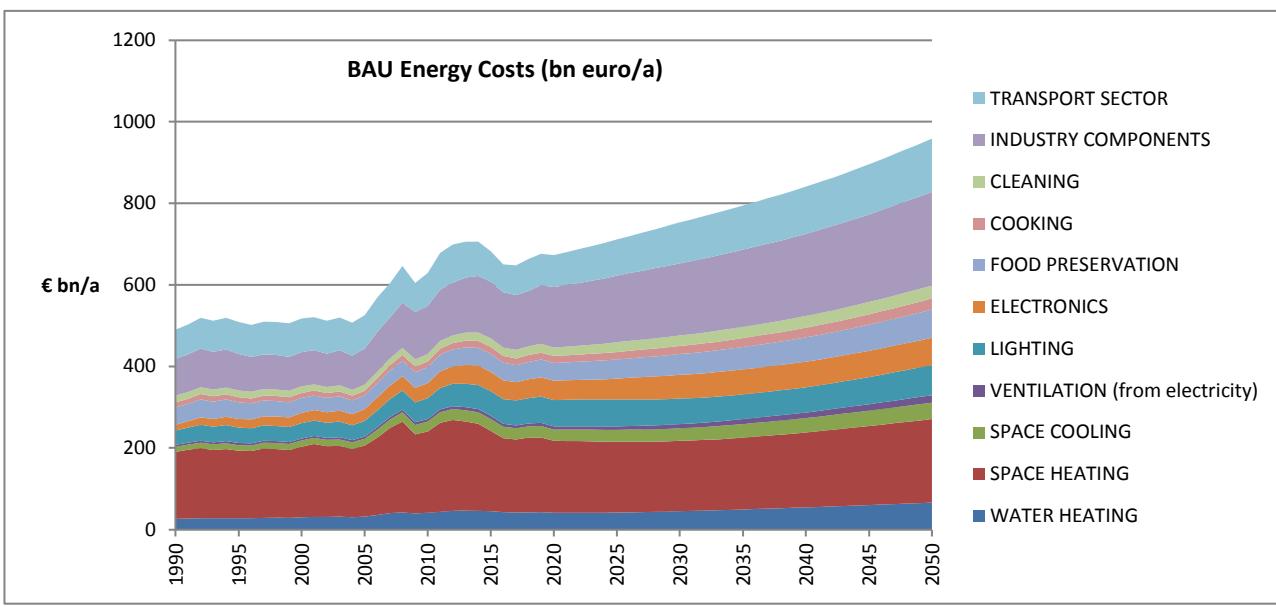
db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	3	7	9	10	11	13	14	14	15	16
0.5	FAN Axial>300Pa	5	12	16	17	18	20	21	22	23	24
0.5	FAN Centr.FC	1	2	3	3	4	4	4	5	5	5
0.5	FAN Centr.BC-free	3	6	8	8	9	11	12	13	14	15
0.5	FAN Centr.BC	3	6	9	9	11	13	14	16	18	21
0.5	FAN Cross-flow	0	0	0	0	1	1	1	1	1	1
	Total FAN, industrial (excl. box & roof fans)	8	17	22	24	27	30	33	35	38	41
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	14	15	17	18	19	19	19	19	19	19
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21	23	26	27	29	29	29	29	28	26
0.45	Medium (L) 3-ph 75-375 kW no VSD	42	46	51	53	55	55	52	48	44	41
0.45	Total 3ph 0.75-375 kW no VSD	76	84	95	98	102	103	101	96	90	86
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	2	2	3	4	4	5	7	8	10
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	2	3	5	6	7	9	11	13	16	20
0.45	Medium (L) 3-ph 75-375 kW with VSD	5	10	14	17	22	27	33	41	49	56
0.45	Total 3-ph 0.75-375 kW with VSD	7	16	21	26	32	40	49	61	73	86
0.45	Total 3-ph 0.75-375 kW w/wo VSD	84	100	115	124	134	143	150	157	164	171
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	1	1	1	1	1	2	2	2	2
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	2	2	2	2	2	2
0.45	Small 3 ph 0.12-0.75 kW no VSD	1	2	2	2	2	2	2	2	2	3
0.45	Small 3 ph 0.12-0.75 kW with VSD	0	0	0	0	0	0	0	0	0	1
0.45	Total Small 3-ph 0.12-0.75 kW	1	2	2	2	2	3	3	3	3	3
0.45	Large 3-ph LV 375-1000 kW no VSD	21	22	23	22	22	22	23	24	25	26
0.45	Large 3-ph LV 375-1000kW with VSD	1	5	8	11	15	17	19	21	24	26
0.45	Total Large 3-ph LV 375-1000 kW	23	27	31	33	36	39	42	45	48	52
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	1	1	1	1	1	1	1	1	1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	1	2	2	2	2	2	2	3	3
0.45	Explosion motors (L) 3-ph 75-375 kW	2	3	3	3	4	4	4	5	5	6
0.45	Total Expl. 0.75-375 kW (no VSD)	4	5	5	6	6	7	7	8	9	9
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	1	1	1	1	1	1
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	1	1	1	1	1	1	2	2	2
0.45	Brake motors (L) 3-ph 75-375 kW	1	1	2	2	2	2	2	2	3	3
0.45	Total Brake 0.75-375 kW (no VSD)	2	3	3	3	4	4	4	5	5	5
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									
0.45	1-phase motors >0.75 kW (no VSD)	6	7	8	8	9	10	11	11	12	13
	MT Elec. Motors LV 0.12-1000 kW	66	79	92	98	107	114	121	127	133	141
	including double counted amounts	121	145	166	178	194	207	219	231	243	256
	Total WP Water Pumps	13	15	17	19	21	24	27	30	33	37
	CP Fixed Speed 5-1280 l/s	3	5	4	4	4	4	5	5	5	6
	CP Variable speed 5-1280 l/s	0	1	2	2	3	3	3	3	3	4
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	3	6	6	6	7	7	8	9	9	10
	Total WE Welding Equipment	0.9	0.7	0.7	0.8	0.8	0.8	0.9	0.9	1.0	1.1
	TOTAL INDUSTRY COMPONENTS	90	118	138	148	163	176	189	202	215	230
1	TRAFO Distribution	1	2	2	3	3	3	4	5	5	6
1	TRAFO Industry oil	1	2	2	2	2	3	3	3	4	4
1	TRAFO Industry dry	0	0	1	1	1	1	1	1	1	1
1	TRAFO Power	4	5	6	7	8	9	10	12	13	15
1	TRAFO DER oil	0	0	0	0	0	0	1	1	2	3
1	TRAFO DER dry	0	0	0	1	1	2	3	5	8	11
1	TRAFO Small	0	0	0	0	0	0	0	0	0	0
	Total TRAFO Utility Transformers	7	10	11	13	16	19	23	28	34	40
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)	0									
	<i>(costs for fuel consumption due to rolling resistance)</i>										
	Tyres C1, replacement for cars	37	40	36	35	39	42	44	46	49	51
	Tyres C1, OEM for cars	11	12	11	11	12	13	13	14	15	15
	Tyres C1, total	48	51	47	46	50	54	57	60	63	66
	Tyres C2, replacement for vans	8	11	10	11	13	15	16	17	17	18
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	9	13	12	13	15	18	19	20	21	22

NRGCOSTBAU

db	BAU Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C3, replacement for trucks/busses	12	14	13	16	19	23	26	29	31	34
	Tyres C3, OEM for trucks/busses	3	3	3	4	4	5	6	6	7	8
	Tyres C3, total	14	17	16	20	24	29	32	35	38	42
	Tyres, total C1+C2+C3	71	81	74	79	89	100	109	115	123	130
	TOTAL TRANSPORT SECTOR	71	81	74	79	89	100	109	115	123	130
	GENERAL TOTAL in bn euros	490	629	682	673	711	753	795	841	896	958
db	BAU Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	26	41	45	41	42	45	49	55	60	66
	SPACE HEATING	164	200	198	176	173	172	176	184	194	205
	SPACE COOLING	12	24	28	28	30	32	33	35	38	40
	VENTILATION	5	7	8	8	9	10	12	14	16	18
	LIGHTING	36	50	61	64	65	62	60	62	66	74
	ELECTRONICS	14	37	47	48	51	58	61	62	64	67
	FOOD PRESERVATION	42	39	44	43	47	51	55	59	64	69
	COOKING	12	14	17	17	18	20	22	24	25	28
	CLEANING	16	18	21	21	24	26	27	29	30	31
	INDUSTRY COMPONENTS	90	118	138	148	163	176	189	202	215	230
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	71	81	74	79	89	100	109	115	123	130
	TOTAL in bn euros, excl. energy sector	490	629	682	673	711	753	795	841	896	958

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									
Total in bn euros, incl. energy Sector	490	629	682	673	711	753	795	841	896	958



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	20	31	35	31	32	34	38	42	46	50
SPACE HEATING	116	139	138	123	121	120	124	129	138	146
SPACE & HT PROCESS COOLING	0	3	3	3	3	3	3	4	4	5
VENTILATION (from electricity)	1	1	2	2	2	3	4	5	6	7
LIGHTING	14	16	18	18	15	12	11	10	10	11
ELECTRONICS	9	24	31	30	30	33	35	35	36	37
FOOD PRESERVATION	21	19	22	21	23	24	25	26	28	29
COOKING	11	13	15	15	17	18	20	22	23	25
CLEANING	15	16	20	19	22	24	25	27	28	29
INDUSTRY COMPONENTS	0									
BAU Energy Cost, Residential, in bn euros	208	263	284	262	265	272	284	299	318	339

NRGCOSTECO

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	2	2
EIWHS Electric Instant. Shower (secondary)	2	2	2	2	2	2	2	3	3	3
ESWH Electric Storage ≤ 30 L (secondary)	1	1	2	1	2	2	2	2	2	3
ESWH Electric Storage > 30 L (primary)	10	13	15	14	14	14	16	18	20	22
GIWH Gas Instant. < 13 L/min (secondary)	1	1	1	1	0	0	0	0	0	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	0	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	0	1	1	1	2	2
Dedicated WH Solar (3.5 m ²)	0	1	1	1	1	1	1	1	1	1
WH dedicated Water Heater	17	22	25	22	21	22	25	28	31	34
CHB Gas Combi Instant. WH	3	9	11	9	9	9	9	9	9	9
CHB Gas + Cyl. WH	2	4	4	3	3	3	3	3	3	3
CHB Jet Burner Gas + Cyl. WH	1	1	0	0	0	0	0	0	0	0
CHB Jet Burner Oil + Cyl. WH	3	5	3	3	2	2	1	1	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	7
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 m ²)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	9	19	20	17	16	16	17	19	21	22
TOTAL WATER HEATING	26	41	44	38	37	39	42	47	51	57
CHB Gas non-condensing	43	57	48	27	14	7	3	2	1	1
CHB Gas condensing	0	18	29	35	44	48	50	48	45	42
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	44	50	33	25	16	7	3	1	1	1
CHB Oil Jet burner condensing	0	1	1	3	4	6	7	8	9	10
CHB Electric Joule-effect	3	2	3	3	3	3	3	2	2	2
CHB Hybrid (gas-electric)	0	0	0	0	0	1	1	2	2	3
CHB Electric Heat Pump	0	2	3	4	6	8	11	15	19	23
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	0	0
CHB Solar combi (16 m ²)	0	0	0	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating	96	135	121	98	88	81	79	80	82	84
SFB Wood Manual	9.6	2.9	3.3	2.4	1.7	1.0	0.6	0.4	0.4	0.4
SFB Wood Direct Draft	0.1	0.7	2.1	3.0	3.9	4.1	4.5	5.3	6.7	8.6
SFB Coal	6.2	3.2	1.8	2.4	2.1	1.5	1.2	1.3	1.4	1.5
SFB Pellets	0.0	0.4	0.8	1.2	1.5	1.8	2.0	2.2	2.6	3.0
SFB Wood chips	0.0	0.4	0.5	0.6	0.6	0.6	0.7	0.8	0.9	1.0
Total Solid Fuel Boiler	16	8	8	10	10	9	9	10	12	14
CHAE-S (< 400 kW)	0.6	1.4	1.8	1.9	2.0	2.0	2.1	2.2	2.3	2.5
CHAE-L (> 400 kW)	0.9	1.8	2.2	2.2	2.3	2.2	2.1	2.1	2.1	2.1
CHWE-S (< 400 kW)	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5
CHWE-L (> 1500 kW)	0.1	0.3	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	3.3	4.6	5.6	5.8	6.1	6.3	6.7	7.2	7.8	8.4
HT PCH-AE-L	3.2	4.4	5.3	5.5	5.7	5.8	6.0	6.3	6.8	7.3
HT PCH-WE-S	0.7	1.0	1.2	1.2	1.3	1.4	1.5	1.6	1.7	1.9
HT PCH-WE-M	1.3	1.9	2.3	2.4	2.6	2.8	3.0	3.2	3.5	3.7
HT PCH-WE-L	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.6	0.7	0.7
AC rooftop	0.5	1.0	1.1	0.9	0.8	0.5	0.2	0.1	0.1	0.1
AC splits	0.7	1.7	1.9	1.7	1.6	1.4	1.3	1.3	1.2	1.1
AC VRF	0.0	0.4	0.7	0.9	1.1	1.4	1.7	1.9	2.2	2.4
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
SubTotal AHC Cooling	12	20	24	24	25	25	26	28	29	31
AC rooftop (rev)	0.7	1.7	1.9	1.6	1.2	0.7	0.3	0.1	0.0	0.0
AC splits (rev)	1.2	3.3	3.8	3.5	3.3	3.0	2.8	2.6	2.5	2.3
AC VRF (rev)	0.0	1.1	1.8	2.3	2.9	3.6	4.2	4.6	4.9	5.1
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
AHF	8.0	7.9	6.8	5.2	4.5	3.9	3.6	3.4	3.3	3.1
AHE	0.2	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Heating	10	14	15	13	12	11	11	11	11	11
Total AHC Heating & Cooling	22	34	38	37	37	37	37	39	40	42

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0.4	0.6	0.9	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1
LH closed fireplace/inset	0.5	1.3	2.3	2.7	3.1	3.5	3.8	4.1	4.3	4.6	
LH wood stove	1.1	1.2	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.7	
LH coal stove	0.4	0.4	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
LH cooker	0.2	0.3	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.2	
LH SHR stove	0.5	0.7	1.1	1.2	1.5	1.8	2.1	2.4	2.7	3.0	
LH pellet stove	0.0	0.4	0.6	0.7	0.9	1.1	1.2	1.3	1.5	1.6	
LH Solid fuel sum	3	5	7	8	10	11	12	13	13	15	
LH Electric portable	4.6	3.7	4.0	3.5	3.3	3.2	3.2	3.2	3.2	3.2	3.2
LH Electric fixed > 250W	24.3	19.1	19.8	16.0	13.6	12.1	11.9	11.9	12.0	12.0	12.0
LH Electric fixed ≤ 250W	1.7	1.3	1.3	1.1	0.9	0.8	0.8	0.8	0.8	0.8	0.8
LH Electric storage	1.4	1.1	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	0.8
LH Electric underfloor	4.1	3.6	4.0	3.7	3.7	3.8	3.8	3.8	3.8	3.8	3.8
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	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	0.1
LH Electric Towel Heaters	1.4	1.7	2.0	1.9	1.8	1.7	1.7	1.7	1.7	1.7	1.7
LH Electric sum	38	31	33	28	25	23	22	23	23	23	
LH Gas luminous (commercial)	0.1	0.1	0.1	0.0	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	0.1
LH Gas open front	0.1	0.1	0.1	0.1	0.1	0.1	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	0.1	0.1	0.0	0.1
LH Gas balanced flue	0.5	0.3	0.3	0.2	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	0.0
LH Gaseous fuel sum	1.0	0.7	0.7	0.5	0.4	0.3	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	42	37	41	36	35	34	34	35	36	38	
RAC fixed < 6 kW, cooling	0.4	2.2	2.0	1.3	1.4	1.7	2.0	2.3	2.7	3.1	
RAC fixed 6-12 kW, cooling	0.2	1.1	1.1	0.8	0.8	0.9	1.1	1.2	1.4	1.6	
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	3.4	3.2	2.3	2.4	2.8	3.2	3.7	4.3	4.9	
RAC fixed < 6 kW, reversible, heating	0.2	2.9	3.4	3.1	4.0	5.5	7.3	9.4	11.6	13.7	
RAC fixed 6-12 kW, reversible, heating	0.1	1.3	1.7	1.6	2.0	2.6	3.4	4.2	5.0	5.8	
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	0.2	4.1	5.1	4.7	6.0	8.2	10.6	13.6	16.7	19.4	
RAC Room Air Conditioner	1	8	8	7	8	11	14	17	21	24	
1 CIRC Integrated circulators	2.5	3.3	3.4	2.6	2.4	2.6	2.8	3.0	3.2	3.3	
1 CIRC Large standalone circulators	1.6	2.0	1.8	1.2	1.1	1.1	1.0	1.1	1.1	1.2	
1 CIRC Small standalone circulators	1.2	1.5	1.3	0.8	0.6	0.6	0.6	0.6	0.6	0.7	
1 CIRC Circulator pumps <2.5 kW	5.3	6.7	6.5	4.6	4.1	4.3	4.5	4.7	4.9	5.2	
TOTAL SPACE HEATING	164	197	190	162	151	143	144	150	158	166	
TOTAL SPACE COOLING	12	23	27	26	27	28	30	31	34	36	
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	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	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	0.8	1.1	
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	0.0	0.0	0.1	0.1	0.2	0.2	0.3	
R-UVU 250-1000 m3/h	0.4	0.9	1.1	1.1	1.0	1.0	1.0	1.1	1.2	1.2	
R-BVU 250-1000 m3/h	0.0	0.1	0.1	0.2	0.3	0.6	1.0	1.3	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	0.0	0.1	0.1	0.1	0.1	0.1	
RVU, Total residential, from VU own electricity	0.5	1.3	1.6	1.5	1.8	2.3	2.9	3.6	4.3	5.2	
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	0.4	0.5	0.5	0.5	0.6	
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	0.3	0.3	0.3	0.4	0.4	
NR-AHU-S 2500-5500 m3/h	0.0	0.4	0.6	0.7	0.8	0.9	1.1	1.2	1.4	1.6	
NR-AHU-M 5500-14500 m3/h	3.0	3.5	3.7	3.3	3.3	3.5	3.8	4.1	4.5	4.9	
NR-AHU-L > 14500 m3/h	0.8	1.0	1.0	0.9	0.9	1.0	1.0	1.1	1.2	1.3	
NRVU, Total non-residential, from VU own electricity	4.1	5.5	6.1	5.8	5.9	6.4	7.0	7.7	8.5	9.4	
VU Ventilation Units, res + non-res., from VU own elec.	4.7	6.8	7.7	7.3	7.7	8.6	9.8	11.3	12.9	14.6	
TOTAL VENTILATION (from VU own electricity)	5	7	8	7	8	9	10	11	13	15	
<i>¹ Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)</i>	-	-	-0	-1	-3	-4	-5	-6	-7	-7	

NRGCOSTECO

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.2	18.0	23.3	24.4	20.7	12.2	5.8	3.0	1.8	1.2	
HID (HPM, HPS, MH)	5.1	9.4	9.1	7.6	5.9	3.2	1.3	0.5	0.2	0.1	
CFLni (all shapes)	0.4	1.3	1.5	1.2	0.9	0.5	0.2	0.1	0.0	0.0	
CFLi (retrofit for GLS, HL)	0.1	2.3	3.4	2.6	1.0	0.3	0.0	0.0	0.0	0.0	
GLS (DLS & NDLS)	14.7	7.4	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HL (DLS & NDLS, LV & MV)	1.2	6.9	9.7	3.9	0.2	0.0	0.0	0.0	0.0	0.0	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.3	1.9	6.7	13.1	18.7	23.1	27.5	32.5	
LED replacing HID (retrofit & luminaire)	0.0	0.0	1.5	3.1	5.1	7.1	9.1	11.1	13.4	16.0	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.5	0.7	0.8	0.9	1.1	1.3	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.2	0.6	1.0	1.1	1.2	1.3	1.5	1.7	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.3	2.0	3.8	4.6	5.2	5.8	6.4	7.2	
<i>Standby</i>	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7	
TOTAL LIGHTING (incl. standby)	36	48	54	49	47	44	44	47	53	62	
DP TV on-mode, total all types	4.8	11.1	13.6	11.2	7.4	7.0	6.5	7.4	9.0	10.9	
DP TV standby, standard (NoNA)	0.6	0.4	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	1.9	1.8	1.6	1.4	
DP TV standby, total all types	1	0	1	1	1	2	2	2	2	1	
DP TV total on-mode + standby	5	11	14	12	9	9	8	9	11	12	
DP Monitor on-mode	0.1	2.1	1.3	0.5	0.5	0.3	0.3	0.3	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	3.0	3.7	3.2	2.6	2.6	3.1	3.7	
DP Signage standby	0.0	0.0	0.2	0.4	0.6	0.5	0.4	0.4	0.5	0.6	
DP Signage total	0	0	2	3	4	4	3	3	4	4	
DP Electronic Displays, total on-mode	5	13	16	15	12	11	9	10	12	15	
DP Electronic Displays, total standby	1	0	1	2	2	2	2	2	2	2	
DP Electronic Displays, total	6	14	17	16	14	13	12	12	14	17	
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	2.2	1.7	1.7	1.7	1.8	1.9	2.0	2.0	
CSTB (other modes)	0.0	0.5	1.2	0.9	0.9	0.9	1.0	1.0	1.1	1.1	
CSTB (all covered modes)	0.0	1.4	3.4	2.6	2.6	2.6	2.7	2.9	3.0	3.2	
Total STB set top boxes (Complex & Simple)	0	2	4	3							
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.8	0.7	0.7	0.8	0.8	0.9	0.9	1.0	
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	
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	0.8	0.7	0.8	0.8	0.8	0.9	0.9	1.0	
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	1.1	0.9	0.9	0.9	1.0	1.0	1.1	1.1	
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									
<i>ES&DS only, without effects on infrastructure</i>											
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	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	
ES rack 2-socket traditional	0.1	2.0	1.2	0.6	0.8	1.0	1.1	1.2	1.2	1.3	
ES rack 2-socket cloud	0.0	1.1	1.9	2.0	2.4	3.0	3.4	3.6	3.8	4.0	
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	0.6	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	0.6	0.6	0.6	
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.5	1.7	1.8	1.9	2.0	
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	3	2	2	2	2	3	3	3	
ES total cloud	0	2	3	3	4	5	6	6	7	7	
ES Enterprise Servers total	0	6	6	5	6	7	8	9	9	10	
DS Online 2	0.1	0.9	1.3	1.7	2.3	2.8	3.1	3.3	3.5	3.6	
DS Online 3	0.0	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.5	
DS Online 4	0.0	0.5	0.7	0.9	1.2	1.6	1.7	1.8	1.9	2.0	
DS Data Storage products total	0	1	2	3	4	5	5	6	6	6	
ES + DS total (excl. infrastructure)	0	7	8	8	10	12	14	14	15	16	

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PC Desktop	3.1	3.6	2.7	1.7	1.9	2.3	2.3	2.4	2.4	2.3	2.3
PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2
PC Notebook	0.0	1.3	1.6	1.3	1.5	1.6	1.7	1.9	1.9	1.9	2.0
PC Tablet/slate	0.0	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.3	0.4	0.4
PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
PC Integrated Thin Client	0.0	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	0.0
PC Workstation	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
Total PC, electricity	3.3	5.4	5.3	3.8	4.2	4.7	5.0	5.3	5.3	5.3	5.3
Inkjet Printer	0.2	0.1	0.0	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	0.1
EP / Laser Printer mono	1.4	0.3	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0
EP / Laser Printer colour	0.0	0.2	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	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	0.0
EP / Laser MFD mono	0.0	0.2	0.2	0.2	0.1	0.1	0.1	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	0.2	0.2
Total IE Imaging Equipment	3.5	1.3	1.2	0.8	0.7						
of which for modes under CR 1275/2008	2.7	1.0	0.9	0.6	0.5	0.5	0.5	0.5	0.6	0.6	0.6
<i>Products regulated only for (networked) standby</i>											
SB Radios (sb & off modes)	0.4	1.1	0.9	0.6	0.5	0.5	0.5	0.5	0.4	0.4	0.4
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	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	0.0
SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
SB Small appliances (sb & off modes)	0.3	1.2	1.0	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.0
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	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	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	0.0
SB Home phones (nsb mode)	0.1	0.6	0.7	0.6	0.4	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	0.1	0.2	0.2	0.2	0.2	0.2
SB Home NAS (nsb mode)	0.0	0.2	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
SB Home Network Equipment (nsb mode)	0.0	0.5	0.7	0.6	0.7	0.8	0.9	0.9	1.0	1.0	1.0
SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.2	0.3	0.5	0.6	0.7	0.7	0.7	0.7
SB Coffee makers (off mode)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
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	0.1
1 SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	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	0.0
1 SB Electric Ovens (sb mode)	0.0	0.5	0.7	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2
1 SB Electric Hobs (sb mode)	0.0	0.2	0.3	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	2.2	1.7	1.7	1.7	1.8	1.9	2.0	2.0	2.0
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	0.2
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	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	0.1
1 SB IE Laser Printers (nsb mode)	1.1	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
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	0.0
1 SB IE Laser MFDs (nsb mode)	0.0	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total (networked) SB (incl. double)	4	9	10	7	7	7	7	8	8	8	8
Total (networked) SB (excl. double)	1	5	5	4	4	4	4	5	5	5	5
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	0.0
0.3 EPS 6–10 W	0.0	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
0.6 EPS 10–12 W	0.0	1.2	1.9	1.6	1.5	1.6	1.7	1.8	1.9	2.0	2.0
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	0.0
1.0 EPS 20–30 W	0.0	0.1	0.2	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	0.0	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	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	0.0
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
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	0.1
EPS, total for active mode	0.0	1.8	2.6	2.1	2.0	2.1	2.2	2.3	2.5	2.6	2.6
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
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	0.1
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
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
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
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
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
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
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
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	0.0
EPS, total for no-load mode	0.0	0.3	0.2	0.1							
EPS, overall total (active + no-load)	0.0	2.1	2.8	2.3	2.0	2.1	2.3	2.4	2.6	2.7	
EPS, double counted subtracted	0.0	1.1	1.4	1.1	1.0	1.0	1.1	1.1	1.2	1.3	
TOTAL ELECTRONICS	14	37	42	37	36	39	40	43	46	50	

NRGCOSTECO

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Total RF household Refrigerators & Freezers	23	15	15	12	11	9	8	8	7	7
	CF open vertical chilled multi deck (RVC2)	2.5	2.0	2.1	1.9	1.7	1.3	1.0	1.0	1.0	1.1
	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)	4.4	3.6	4.0	3.8	3.8	3.5	3.3	3.4	3.7	4.0
	CF Plug in one door beverage cooler	2.8	2.5	2.6	2.4	2.0	1.5	1.4	1.5	1.6	1.7
	CF Plug in horizontal ice cream freezer	0.6	0.6	0.6	0.5	0.5	0.4	0.4	0.5	0.5	0.5
	CF Spiral vending machine	0.6	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3
	Total CF Commercial Refrigeration	11	9	10	9	8	7	6	7	7	8
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.5	0.5
	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	1.2	1.4	1.2	1.0	1.0	1.1	1.2	1.3	1.5
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.9	1.0	1.2	1.3	1.5	1.7	2.0	2.2
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.9	1.0	1.1	1.3	1.5	1.7	1.9	2.2
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.9	1.0	1.2	1.4	1.5	1.8	2.0	2.3
	PF Process Chiller AC LT L > 200 kW	0.4	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.4
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.9
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0
	PF Process Chiller All MT&LT	2	4	5	6	6	7	8	10	11	12
	PF Condensing Unit MT S 0.2-1 kW	1.0	0.7	0.8	0.7	0.8	0.9	1.0	1.2	1.3	1.5
	PF Condensing Unit MT M 1-5 kW	2.5	1.8	1.9	1.9	2.1	2.4	2.7	3.0	3.4	3.9
	PF Condensing Unit MT L 5-20 kW	3.0	2.2	2.4	2.3	2.5	2.9	3.2	3.7	4.2	4.7
	PF Condensing Unit MT XL 20-50 kW	3.0	2.2	2.4	2.3	2.5	2.9	3.2	3.7	4.2	4.7
	PF Condensing Unit LTS 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	0.4	0.3	0.4	0.4	0.5	0.5	0.6	0.7
	PF Condensing Unit LT L 2-8 kW	0.8	0.5	0.6	0.5	0.6	0.7	0.7	0.8	1.0	1.1
	PF Condensing Unit LT XL 8-20 kW	2.4	1.7	1.8	1.8	1.9	2.2	2.5	2.8	3.2	3.6
0.6	PF Condensing Unit, All MT&LT	13	10	10	10	11	12	14	16	18	20
	PF Professional Refrigeration, Total	8	9	10	11	12	13	15	17	19	22
	TOTAL FOOD PRESERVATION	42	34	35	32	31	30	30	31	34	37
	CA Electric Hobs (active modes)	3.9	5.3	6.7	7.1	8.0	8.9	9.9	10.9	11.9	13.1
	CA Electric Hobs (low-power modes)	0.0	0.2	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CA Electric Hobs (sum all modes)	4	6	7	7	8	9	10	11	12	13
	CA Electric Ovens (active modes)	4.3	3.8	4.1	3.7	3.7	3.8	4.0	4.2	4.5	4.7
	CA Electric Ovens (low-power modes)	0.0	0.5	0.7	0.5	0.4	0.2	0.2	0.2	0.2	0.2
	CA Electric Ovens (sum all modes)	4	4	5	4	4	4	4	4	5	5
	CA Gas Hobs	2	2	2	2	2	2	2	2	2	2
	CA Gas Ovens	1	1	1	0	0	0	0	0	0	0
	CA Range Hoods	2	2	2	2	2	2	2	3	3	3
	CA Elec. Hobs&Ovens low-power modes	0.0	0.8	0.9	0.7	0.5	0.4	0.4	0.4	0.4	0.5
	CA other products or modes	12	13	16	15	16	17	18	20	21	23
	TOTAL COOKING	12	14	17	16	17	18	19	20	22	24
	WM Washing Machines, active modes	8.8	4.9	4.7	3.9	3.7	3.7	3.7	3.9	4.1	4.3
	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	8.8	5.1	4.8	4.0	3.8	3.8	3.9	4.0	4.2	4.4
	WD Washer-Dryers, active modes	1.5	1.4	1.4	1.3	1.3	1.3	1.4	1.5	1.5	1.6
	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	1.5	1.4	1.4	1.3	1.3	1.3	1.4	1.5	1.6	1.6
	WM-WD Washing, sum active modes	10	6	6	5	5	5	5	5	6	6
	WM-WD Washing, sum low-power modes	0	0	0	0	0	0	0	0	0	0
	Total WM-WD household Washing	10	7	6	5	5	5	5	6	6	6
	Total DW household Dishwasher	2	3	3	4	4	5	5	6	6	7
	LD condensing heat pump	0.0	0.2	0.5	0.7	0.8	1.0	1.1	1.2	1.2	1.2
	LD condensing electric heat element	0.3	1.6	1.7	1.2	1.0	0.8	0.8	0.7	0.7	0.8
	LD vented electric	1.3	1.3	1.0	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	1.6	2.8	2.9	2.2	1.9	1.8	1.8	1.8	1.9	2.0
	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	1.6	2.9	3.0	2.2	2.0	1.9	1.8	1.8	1.9	2.0
	VC dom	2	3	3	2	2	2	2	2	2	1
	VC nondom	0	1	1	1	1	1	1	1	1	1
	Total VC Vacuum Cleaner	2	3	4	2	3	3	3	2	2	2
	TOTAL CLEANING	16	15	17	13	14	14	15	16	16	17

NRGCOSTECO

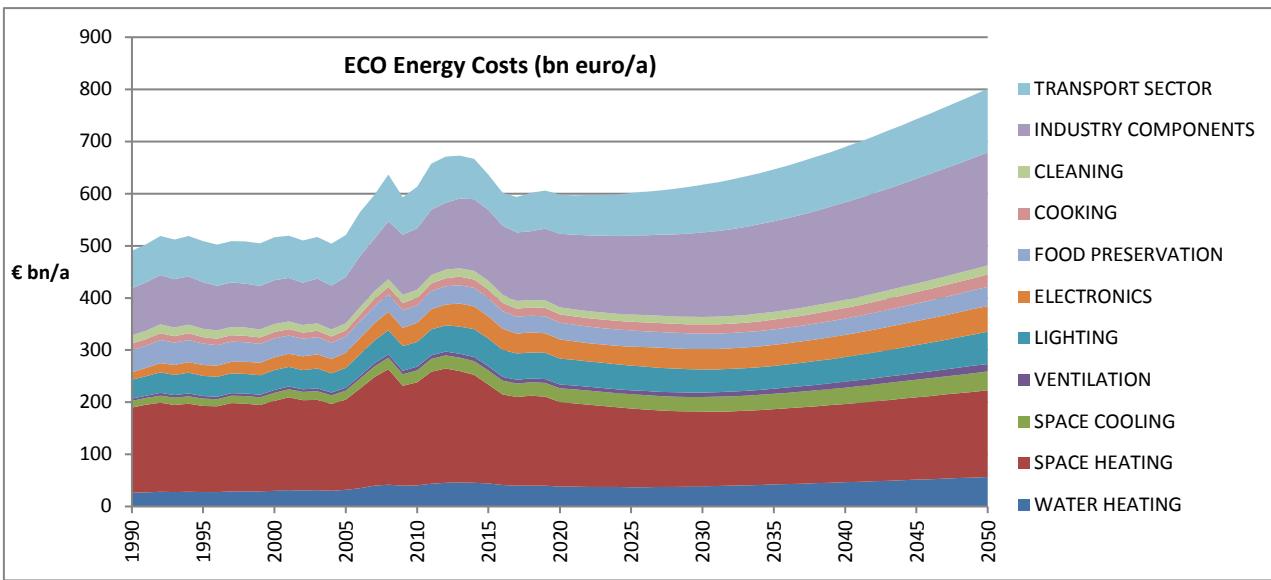
db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.5	FAN Axial<300Pa (all FAN types >125W)	3	7	9	9	10	10	11	11	12	12
0.5	FAN Axial>300Pa	5	12	16	16	16	17	18	18	19	20
0.5	FAN Centr.FC	1	2	3	3	3	3	3	3	4	4
0.5	FAN Centr.BC-free	3	6	7	7	8	9	10	11	12	13
0.5	FAN Centr.BC	3	6	8	8	9	10	12	13	15	17
0.5	FAN Cross-flow	0	0	0	0	0	0	0	0	0	0
	Total FAN, industrial (excl. box & roof fans)	8	17	21	22	23	25	27	29	31	33
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	14	15	16	15	14	14	15	15	16	16
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21	23	25	23	21	21	21	22	22	23
0.45	Medium (L) 3-ph 75-375 kW no VSD	42	46	50	46	43	39	38	38	38	39
0.45	Total 3ph 0.75-375 kW no VSD	76	84	91	84	77	73	74	75	76	78
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1	2	3	4	6	6	7	8	9	10
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	2	3	5	8	12	13	15	17	19	21
0.45	Medium (L) 3-ph 75-375 kW with VSD	5	10	15	21	28	36	40	45	51	56
0.45	Total 3-ph 0.75-375 kW with VSD	7	16	22	33	46	55	63	70	78	86
0.45	Total 3-ph 0.75-375 kW w/wo VSD	84	100	113	117	123	129	136	145	154	165
0.45	Small 1 ph 0.12-0.75 kW no VSD	1	1	1	1	1	1	1	2	2	2
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	2	2	2	2	2	2
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	3	3	3
0.45	Large 3-ph LV 375-1000 kW no VSD	21	22	23	22	22	22	23	24	25	26
0.45	Large 3-ph LV 375-1000kW with VSD	1	5	8	11	14	17	19	21	23	26
0.45	Total Large 3-ph LV 375-1000 kW	23	27	31	33	36	39	42	45	48	51
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0	1	1	1	1	1	1	1	1	1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1	1	2	2	2	2	2	2	2	3
0.45	Explosion motors (L) 3-ph 75-375 kW	2	3	3	3	4	4	4	5	5	5
0.45	Total Expl. 0.75-375 kW (no VSD)	4	5	5	6	6	7	7	8	8	9
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	1	1	1	1	1
0.45	Brake motors (M) 3-ph 7.5-75 kW	1	1	1	1	1	1	1	2	2	2
0.45	Brake motors (L) 3-ph 75-375 kW	1	1	2	2	2	2	2	2	3	3
0.45	Total Brake 0.75-375 kW (no VSD)	2	3	3	3	4	4	4	4	5	5
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									
0.45	1-phase motors >0.75 kW (no VSD)	6	7	8	8	9	10	10	11	12	12
	MT Elec. Motors LV 0.12-1000 kW including double counted amounts	66	79	91	94	100	106	112	120	128	136
		121	144	165	172	182	192	204	217	232	248
	Total WP Water Pumps	13	15	17	18	21	23	26	29	32	36
	CP Fixed Speed 5-1280 l/s	3	5	4	4	4	4	5	5	5	6
	CP Variable speed 5-1280 l/s	0	1	2	2	2	3	3	3	3	4
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	3	6	6	6	7	7	8	8	9	10
	Total WE Welding Equipment	0.9	0.7	0.7	0.8	0.7	0.7	0.8	0.8	0.9	0.9
	TOTAL INDUSTRY COMPONENTS	90	118	136	141	151	162	174	187	201	217
1	TRAFO Distribution	1	2	2	2	3	3	3	3	4	4
1	TRAFO Industry oil	1	2	2	2	2	2	2	2	2	2
1	TRAFO Industry dry	0	0	1	1	1	1	1	1	1	1
1	TRAFO Power	4	5	6	7	8	9	10	12	13	15
1	TRAFO DER oil	0	0	0	0	0	0	0	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	10	11	12	14	17	19	23	27	32
	TOTAL ENERGY SECTOR (only improvement over BAU)	0	0	0	-1	-1	-2	-3	-5	-6	-8
	<i>(costs for fuel consumption due to rolling resistance)</i>										
	Tyres C1, replacement for cars	37	39	31	32	34	37	39	41	44	47
	Tyres C1, OEM for cars	11	12	11	11	11	11	12	13	14	15
	Tyres C1, total	48	51	42	43	45	48	51	54	58	62
	Tyres C2, replacement for vans	8	10	9	10	12	13	15	15	16	17
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	9	13	11	13	14	16	18	19	20	21

NRGCOSTECO

db	ECO Energy costs (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C3, replacement for trucks/busses	12	14	12	16	18	22	25	27	29	32
	Tyres C3, OEM for trucks/busses	3	3	3	4	4	5	6	6	7	7
	Tyres C3, total	14	17	15	19	22	27	30	33	36	39
	Tyres, total C1+C2+C3	71	80	68	75	81	91	99	106	114	122
	TOTAL TRANSPORT SECTOR	71	80	68	75	81	91	99	106	114	122
	GENERAL TOTAL in bn euros	490	614	637	597	599	615	643	685	736	793
	ECO Energy Costs (summary)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	26	41	44	38	37	39	42	47	51	57
	SPACE HEATING	164	197	190	162	151	143	144	150	158	166
	SPACE COOLING	12	23	27	26	27	28	30	31	34	36
	VENTILATION	5	7	8	7	8	9	10	11	13	15
1	<i>VENTILATION (from heat saving vs. BAU; already included in COST for space heating)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>-1</i>	<i>-3</i>	<i>-4</i>	<i>-5</i>	<i>-6</i>	<i>-7</i>	<i>-7</i>
	LIGHTING	36	48	54	49	47	44	44	47	53	62
	ELECTRONICS	14	37	42	37	36	39	40	43	46	50
	FOOD PRESERVATION	42	34	35	32	31	30	30	31	34	37
	COOKING	12	14	17	16	17	18	19	20	22	24
	CLEANING	16	15	17	13	14	14	15	16	16	17
	INDUSTRY COMPONENTS	90	118	136	141	151	162	174	187	201	217
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	71	80	68	75	81	91	99	106	114	122
	TOTAL in bn euros, excl. energy sector	490	614	637	598	601	617	646	689	743	801

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	-5	-6	-8
Total in bn euros, incl. energy Sector	490	614	637	598	599	615	643	685	736	793



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	20	31	34	29	28	29	32	35	39	43
SPACE HEATING	116	137	132	113	105	100	101	105	112	118
SPACE & HT PROCESS COOLING	0	3	2	2	2	2	2	3	3	4
VENTILATION (from electricity)	1	1	2	2	2	2	3	4	4	5
LIGHTING	14	14	14	9	7	7	7	8	8	9
ELECTRONICS	9	23	27	21	18	19	19	20	22	24
FOOD PRESERVATION	21	14	14	11	10	9	8	7	7	7
COOKING	11	13	15	14	15	16	17	19	20	22
CLEANING	15	14	15	12	13	13	14	14	15	16
INDUSTRY COMPONENTS	0									
ECO Energy Cost, Residential, in bn euros	208	251	255	214	201	198	203	215	231	247

NRGCOSTSAVE

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	0.0
EIWH Electric Instant. ≥ 12 kW (primary)	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5
EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.1	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.8
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	0.0
ESWH Electric Storage > 30 L (primary)	0.0	0.0	0.1	0.6	1.2	1.6	1.8	1.9	2.0	2.1	
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	0.2	0.2
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	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	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	0.1
Dedicated WH Heat Pump	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	
Dedicated WH Solar (3.5 m ²)	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
WH dedicated Water Heater	0.0	0.0	0.6	1.7	2.9	3.9	4.2	4.6	5.1	5.5	
CHB Gas Combi Instant. WH	0.0	0.0	0.2	0.6	1.2	1.9	2.8	3.7	4.8	6.0	
CHB Gas + Cyl. WH	0.0	0.0	0.1	0.4	0.7	1.1	1.4	1.8	2.2	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	0.0
CHB Jet Burner Oil + Cyl. WH	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.3	
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	0.0
CHB Hybrid Gas/Electric WH	0.0	0.0	0.0	0.0	0.0	-0.1	-0.2	-0.4	-0.5	-0.7	
CHB Electric HP + Cyl. WH	0.0	0.0	0.0	-0.1	-0.2	-0.7	-1.3	-2.2	-3.1	-4.0	
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 m ²)	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	1.0	1.7	2.5	2.9	3.2	3.6	4.1	
TOTAL WATER HEATING	0	0	1	3	5	6	7	8	9	10	
CHB Gas non-condensing	0.0	0.7	3.0	7.7	12.9	17.6	19.9	19.0	18.1	16.8	
CHB Gas condensing	0.0	0.5	1.5	0.2	0.3	1.1	3.9	9.4	15.3	21.6	
CHB Gas Jet burner non-condensing	0.0	0.0	0.1	0.1	0.2	0.3	0.3	0.3	0.3	0.3	
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	0.0	0.2	0.6	1.5	2.6	3.4	4.0	4.4	4.4	4.2	
CHB Oil Jet burner condensing	0.0	0.0	0.0	-0.2	-0.6	-0.9	-1.3	-1.6	-1.6	-1.5	
CHB Electric Joule-effect	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.2	
CHB Hybrid (gas-electric)	0.0	0.0	0.0	0.0	-0.1	-0.4	-0.7	-1.2	-1.6	-2.0	
CHB Electric Heat Pump	0.0	0.0	0.2	0.3	-0.3	-1.8	-4.3	-7.1	-9.8	-12.2	
CHB Gas Heat Pump	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.2	-0.3	
CHB micro CHP	0.0	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.1	-0.1	-0.1	0.0
CHB Solar combi (16 m ²)	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2	
CHB Central Heating boiler < 400 kW, space heating	0	2	5	10	15	20	22	23	25	27	
SFB Wood Manual	0.0	0.0	0.0	0.1	0.2	0.3	0.2	0.2	0.2	0.1	
SFB Wood Direct Draft	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.3	0.4	
SFB Coal	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	
SFB Pellets	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	
SFB Wood chips	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	
Total Solid Fuel Boiler	0.0	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.9	1.0	
CHAE-S (< 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	
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	0.7	0.6	0.5	
HT PCH-AE-L	0.0	0.0	0.0	0.2	0.5	0.8	1.0	1.0	1.0	1.0	
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	2.6	2.6	2.5	2.2	
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	0.3	0.5	0.5	0.4	0.4	0.3	
AC VRF (rev)	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.7	0.7	0.6	
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AHF	0.0	0.0	0.0	0.3	0.7	1.0	1.1	1.0	1.0	0.9	
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	2.2	2.0	1.9	
Total AHC Heating & Cooling	0.0	0.0	0.1	1.2	2.8	4.2	4.8	4.8	4.5	4.1	

NRGCOSTSAVE

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	0.2	0.3	0.4	0.5	0.6	0.7	
LH closed fireplace/inset	0.0	0.0	0.0	0.1	0.2	0.4	0.5	0.7	0.8	0.9	
LH wood stove	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	
LH coal stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1
LH cooker	0.0	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	0.1	0.1	0.1	0.1
LH pellet stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
LH Solid fuel sum	0.0	0.0	0.0	0.2	0.6	1.0	1.5	1.9	2.2	2.4	
LH Electric portable	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6
LH Electric fixed > 250W	0.0	0.0	0.1	0.7	1.3	1.6	1.7	1.7	1.7	1.7	
LH Electric fixed ≤ 250W	0.0	0.0	0.0	0.0	0.1	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	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	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	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	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	0.0
LH Electric sum	0.0	0.0	0.3	1.3	2.3	2.8	2.9	2.9	2.9	3.0	
LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	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	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	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	2.9	3.9	4.4	4.8	5.2	5.4	
RAC fixed < 6 kW, cooling	0.0	0.7	0.9	0.8	0.8	0.8	0.8	0.9	1.0	1.3	
RAC fixed 6-12 kW, cooling	0.0	0.4	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.6	
RAC portable < 12 kW, cooling	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	
RAC < 12 kW total, cooling mode	0.0	1.1	1.6	1.3	1.3	1.3	1.3	1.3	1.5	1.9	
RAC fixed < 6 kW, reversible, heating	0.0	0.7	1.1	1.2	1.5	1.6	1.6	1.7	1.9	2.2	
RAC fixed 6-12 kW, reversible, heating	0.0	0.4	0.8	0.9	1.1	1.1	1.2	1.2	1.3	1.4	
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	2.0	2.1	2.5	2.8	2.8	2.9	3.2	3.5	
RAC Room Air Conditioner	0	2	4	3	4	4	4	4	5	5	
1 CIRC Integrated circulators	0.0	0.0	0.4	1.2	1.7	1.8	1.8	1.6	1.5	1.3	
1 CIRC Large standalone circulators	0.0	0.0	0.3	0.6	0.6	0.5	0.4	0.4	0.3	0.3	
1 CIRC Small standalone circulators	0.0	0.0	0.3	0.6	0.7	0.6	0.5	0.5	0.5	0.4	
1 CIRC Circulator pumps <2.5 kW	0.0	0.0	0.9	2.4	3.0	2.9	2.7	2.5	2.3	2.0	
TOTAL SPACE HEATING	0	3	8	14	22	29	32	34	36	39	
TOTAL SPACE COOLING	0	1	2	2	3	3	4	4	4	4	
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	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	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	0.6	0.6	
R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.5	
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	0.9	1.1	1.3	1.6	
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	0.1	0.2	0.2	0.3	0.4	
NR-AHU-S 2500-5500 m3/h	0.0	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.6	0.7	
NR-AHU-M 5500-14500 m3/h	0.0	0.0	0.0	0.1	0.3	0.5	0.6	0.7	0.8	0.9	
NR-AHU-L > 14500 m3/h	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.3	
NRVU, Total non-residential, from VU own electricity	0.0	0.0	0.1	0.3	0.6	1.0	1.3	1.5	1.8	2.0	
VU Ventilation Units, res + non-res., from VU own elec.	0.0	0.0	0.1	0.4	1.0	1.6	2.2	2.6	3.1	3.6	
TOTAL VENTILATION (from VU own electricity)	0	0	0	0	1	2	2	3	3	4	
1 Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)	0	0	0	1	3	4	5	6	7	7	

NRGCOSTSAVE

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	0.9	2.3	7.0	12.8	14.8	14.0	12.2	10.4	
HID (HPM, HPS, MH)	0.0	0.2	2.1	3.6	4.0	3.8	2.6	1.8	1.1	0.7	
CFLni (all shapes)	0.0	0.0	0.2	0.4	0.7	0.7	0.4	0.3	0.2	0.1	
CFLi (retrofit for GLS, HL)	0.0	-0.4	-0.6	0.2	1.6	1.9	1.5	1.0	0.7	0.4	
GLS (DLS & NDLS)	0.0	3.4	6.7	6.3	3.9	2.4	1.5	0.9	0.6	0.3	
HL (DLS & NDLS, LV & MV)	0.0	-0.7	-0.5	6.7	7.7	4.2	2.3	1.3	0.8	0.5	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.1	-0.6	-2.5	-4.4	-4.8	-4.0	-2.6	-1.3	
LED replacing HID (retrofit & luminaire)	0.0	0.0	-1.5	-2.0	-1.8	-1.0	-0.3	0.1	0.5	0.9	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	-0.1	-0.2	-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	-0.2	-0.1	0.0	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-0.2	-1.5	-2.1	-1.7	-1.1	-0.6	-0.3	0.0	
<i>Standby</i>	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	7	15	18	18	17	15	13	12	
DP TV on-mode, total all types	0.0	0.0	1.0	3.5	6.7	9.7	11.0	9.8	8.6	8.0	
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	11	10	9	8	
DP Monitor on-mode	0.0	0.0	0.2	0.5	0.5	0.6	0.5	0.4	0.4	0.4	
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	0	1	1	1	0	0	0	
DP Signage on-mode	0.0	0.0	0.0	0.0	0.1	0.6	1.2	1.1	0.7	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	13	11	10	9	
DP Electronic Displays, total standby	0	0	0	0	0	0	0	0	0	0	
DP Electronic Displays, total	0	0	1	4	7	11	13	12	10	9	
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	0.3	0.7	0.6	0.5	0.5	0.5	0.6	0.6	
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	0.9	0.9	
Total STB set top boxes (Complex & Simple)	0	0	0	1							
Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	
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	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	
Total Game consoles, non-active modes	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.6	0.6	0.6	
Total Game consoles > 20 W, all modes	0.0	0.0	0.3	0.7	0.7	0.7	0.8	0.8	0.9	0.9	
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							
<i>ES&DS only, without effects on infrastructure</i>											
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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 2-socket cloud	0	0	0	0.1	0.1	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	0.2	0.2	
ES total cloud	0	0	0	0.2	0.3	0.3	0.3	0.3	0.3	0.4	
ES Enterprise Servers total	0	0	0	0.3	0.4	0.4	0.4	0.5	0.5	0.5	
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	0.1	0.1	
DS Data Storage products total	0	0	0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	
ES + DS total (excl. infrastructure)	0	0	0	0.3	0.5	0.5	0.6	0.6	0.7	0.7	
Total PC Personal computers	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	

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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	0.1	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	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
	EP / Laser MFD colour	0.0	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4
	Total IE Imaging Equipment	0.0	0.4	0.9	1.3	1.3	1.3	1.4	1.4	1.4	1.4
	of which for modes under CR 1275/2008	0.0	0.3	0.7	1.0	1.0	1.0	1.0	1.1	1.1	1.1
	<i>Products regulated only for (networked) standby</i>										
	SB Radios (sb & off modes)	0.0	0.0	0.2	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	0.6	0.7	0.7	0.8	0.8	0.9
	SB Small appliances (sb & off modes)	0.0	0.0	0.4	0.8	0.8	0.9	1.0	1.0	1.1	1.1
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	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	0.1	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	0.5
	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	0.6	0.6	0.6
	SB Coffee makers (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
1	SB Washing Machines (sb & off, until 2021)	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.4
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	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	1.2	1.3	1.3
1	SB Electric Hobs (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.3	0.7	0.6	0.5	0.5	0.6	0.6	0.6
1	SB Game consoles (non-active modes)	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.6	0.6	0.6
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	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4
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	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	Total (networked) SB (incl. double)	0	1	4	6	6	7	7	8	8	8
	Total (networked) SB (excl. double)	0	0	2	3	3	3	4	4	4	4
db	<i>EPS Active mode (for electricity losses)</i>										
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	0.6	0.8	0.8	0.7	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	0.0	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	1.0	1.0	0.9	0.8	0.7	0.6
db	<i>EPS No-load mode</i>										
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	0.1	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	
	EPS, overall total (active + no-load)	0.0	0.0	0.5	1.0	1.2	1.2	1.1	0.9	0.8	0.8
	EPS, double counted subtracted	0.0	0.0	0.3	0.5	0.7	0.6	0.6	0.5	0.5	0.4
	TOTAL ELECTRONICS	0	1	5	11	15	19	21	20	18	17
	Total RF household Refrigerators & Freezers	0	5	9	11	14	16	19	21	22	24
	CF open vertical chilled multi deck (RVC2)	0.0	0.0	0.0	0.0	0.2	0.7	1.1	1.2	1.3	1.4
	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	0.9	1.5	1.7	1.9	2.0
	CF Plug in one door beverage cooler	0.0	0.0	0.0	0.0	0.5	1.1	1.4	1.5	1.6	1.7
	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	0.3
	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	3.0	4.3	4.9	5.2	5.6

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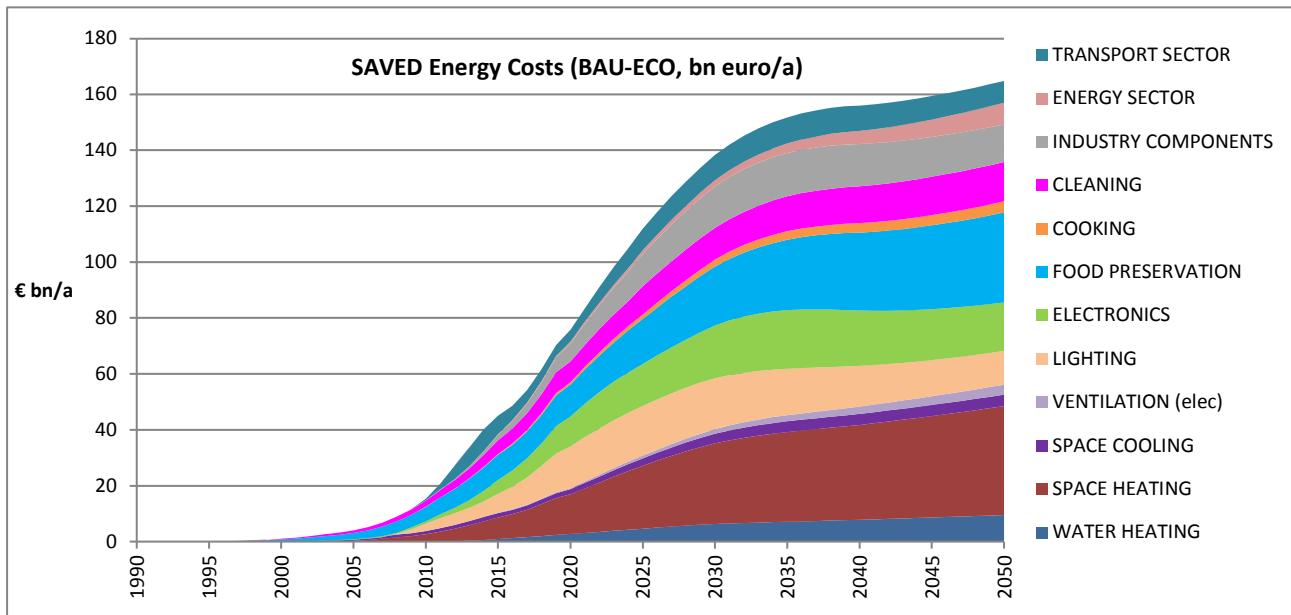
db	SAVED Energy costs (BAU-ECO, in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	PF Storage cabinet Frozen Vertical (FV)	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.4
	PF Storage cabinet Chilled Horizontal (CH)	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	0.9	1.0
	PF Process Chiller AC MT S ≤ 300 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC MT L > 300 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC LT S ≤ 200 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC LT L > 200 kW	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	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	0.1
	PF Process Chiller WC MT L > 300 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	0.1	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	0.0	0.0	0.0	0.1	0.3	0.5	0.7	0.8	0.9	1.0
	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	0.2
	PF Condensing Unit MT M 1-5 kW	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	PF Condensing Unit MT L 5-20 kW	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit MT XL 20-50 kW	0.0	0.0	0.0	0.1	0.2	0.2	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	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	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	0.4
0.6	PF Condensing Unit, All MT&LT	0.0	0.0	0.0	0.5	1.0	1.2	1.3	1.5	1.7	1.9
	PF Professional Refrigeration, Total	0.0	0.0	0.0	0.5	1.3	1.7	2.0	2.2	2.5	2.8
	TOTAL FOOD PRESERVATION	0	5	9	11	16	21	25	28	30	32
	CA Electric Hobs (active modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	CA Electric Hobs (low-power modes)	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5
	CA Electric Hobs (sum all modes)	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	CA Electric Ovens (active modes)	0.0	0.0	0.0	0.1	0.2	0.3	0.5	0.5	0.5	0.6
	CA Electric Ovens (low-power modes)	0.0	0.0	0.2	0.4	0.7	1.0	1.1	1.2	1.3	1.3
	CA Electric Ovens (sum all modes)	0.0	0.0	0.2	0.5	0.9	1.3	1.6	1.7	1.8	1.9
	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	1.0	1.2	1.3
	CA Elec. Hobs&Ovens low-power modes	0.0	0.0	0.3	0.6	1.0	1.3	1.5	1.6	1.7	1.8
	CA other products or modes	0.0	0.0	0.0	0.2	0.7	1.1	1.6	1.8	1.9	2.1
	TOTAL COOKING	0.0	0.0	0.3	0.8	1.6	2.5	3.0	3.4	3.7	4.0
	WM Washing Machines, active modes	0.0	1.3	2.2	2.3	2.3	2.2	2.0	1.6	1.2	0.8
	WM Washing Machines, low-power modes	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	WM Washing Machines	0.0	1.4	2.4	2.5	2.6	2.5	2.3	1.9	1.6	1.1
	WD Washer-Dryers, active modes	0.0	0.2	0.3	0.3	0.3	0.2	0.2	0.1	0.1	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	1.5	2.4	2.6	2.6	2.4	2.1	1.7	1.3	0.8
	WM-WD Washing, sum low-power modes	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
	Total WM-WD household Washing	0.0	1.6	2.7	2.8	2.9	2.7	2.4	2.0	1.6	1.2
	Total DW household Dishwasher	0.0	0.7	1.2	1.4	1.8	2.2	2.6	3.0	3.4	3.9
	LD condensing heat pump	0.0	-0.2	-0.4	-0.6	-0.7	-0.8	-0.9	-0.8	-0.8	-0.8
	LD condensing electric heat element	0.0	0.0	0.2	0.6	1.0	1.3	1.4	1.4	1.4	1.3
	LD vented electric	0.0	0.0	0.2	0.4	0.6	0.8	1.0	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	0.0	0.0	0.2	0.6	1.0	1.3	1.5	1.6	1.6	1.6
	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	0.0	0.2	0.6	1.0	1.3	1.5	1.7	1.7	1.7
	VC dom	0.0	0.0	0.8	2.3	3.8	4.6	5.4	5.9	6.2	6.4
	VC nondom	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.8
	Total VC Vacuum Cleaner	0.0	0.0	0.8	2.6	4.2	5.1	5.9	6.5	6.9	7.2
	TOTAL CLEANING	-	2	5	7	10	11	12	13	14	14
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.3	1.0	1.9	2.5	2.8	3.0	3.1	3.3
0.5	FAN Axial>300Pa	0.0	0.0	0.3	1.0	2.1	2.9	3.3	3.5	3.6	3.8
0.5	FAN Centr.FC	0.0	0.0	0.1	0.5	0.9	1.2	1.3	1.4	1.5	1.5
0.5	FAN Centr.BC-free	0.0	0.0	0.3	0.7	1.3	1.7	1.9	2.1	2.2	2.4
0.5	FAN Centr.BC	0.0	0.0	0.4	0.9	1.6	2.1	2.4	2.7	3.1	3.6
0.5	FAN Cross-flow	0.0	0.0	0.1	0.2	0.3	0.4	0.5	0.5	0.6	0.7
	Total FAN, industrial (excl. box & roof fans)	0.0	0.0	0.7	2.2	4.1	5.4	6.1	6.6	7.1	7.6

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db	SAVED Energy costs (BAU-ECO, in bn euros)	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	0.7	2.9	4.9	5.0	4.7	4.1	3.3	2.1
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	1.0	4.5	8.1	8.6	8.0	6.9	5.2	2.9
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.0	1.8	6.9	12.2	16.0	14.2	10.3	5.8	2.4
0.45 Total 3ph 0.75-375 kW no VSD	0.0	0.1	3.4	14.3	25.2	29.6	26.9	21.3	14.3	7.4	
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.1	-1.1	-2.1	-2.0	-1.8	-1.4	-0.9	-0.2
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-0.5	-2.5	-4.5	-4.6	-4.1	-3.4	-2.3	-0.8
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-1.0	-4.0	-6.9	-8.8	-7.3	-4.6	-1.8	0.3
0.45 Total 3-ph 0.75-375 kW with VSD	0.0	0.0	-1.6	-7.6	-13.5	-15.4	-13.2	-9.4	-5.1	-0.7	
0.45 Total 3-ph 0.75-375 kW w/wo VSD	0.0	0.0	1.8	6.7	11.7	14.2	13.7	11.8	9.3	6.7	
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	0.2	0.2	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	0.2	0.2	0.2	
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	0.4	0.4	0.4
0.45 Total Large 3-ph LV 375-1000 kW	0	0	0	0.0	0.1	0.3	0.4	0.6	0.5	0.5	
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	0.3	0.4	0.4	0.4	0.4	
MT Elec. Motors LV 0.12-1000 kW	0.0	0.0	1.0	3.7	6.7	8.4	8.3	7.3	5.9	4.5	
including double counted amounts		-	0	2	7	12	15	13	11	8	
Total WP Water Pumps	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.9	1.0	1.1	
CP Fixed Speed 5-1280 l/s	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
CP Variable speed 5-1280 l/s	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0
CP Pistons 2-64 l/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total CP Standard Air Compressors	0.0	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.1	
Total WE Welding Equipment	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	
TOTAL INDUSTRY COMPONENTS	0	0	2	6	12	15	16	15	14	13	
1 TRAFO Distribution	0.0	0.0	0.1	0.2	0.4	0.6	0.9	1.2	1.5	1.9	
1 TRAFO Industry oil	0.0	0.0	0.1	0.3	0.5	0.8	1.1	1.4	1.6	1.8	
1 TRAFO Industry dry	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.3	0.3	0.4	
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	0.2	0.3	0.5	0.8	1.1	
1 TRAFO DER dry	0.0	0.0	0.0	0.1	0.2	0.4	0.8	1.3	2.0	2.8	
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	0.2	0.7	1.3	2.2	3.4	4.7	6.2	7.9	
TOTAL ENERGY SECTOR	0.0	0.0	0.2	0.7	1.3	2.2	3.4	4.7	6.2	7.9	
<i>(costs for fuel consumption due to rolling resistance)</i>											
Tyres C1, replacement for cars	0.0	0.4	4.8	3.1	4.5	5.0	5.2	4.9	4.3	3.5	
Tyres C1, OEM for cars	0.0	0.0	0.0	0.1	0.8	1.0	1.0	1.0	0.9	0.8	
Tyres C1, total	0.0	0.4	4.8	3.2	5.3	6.1	6.2	5.9	5.2	4.4	
Tyres C2, replacement for vans	0.0	0.1	0.8	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	0.8	0.4	1.1	1.3	1.3	1.3	1.1	1.0	
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	0.7	1.2	1.6	1.9	2.0	2.2	2.4	
Tyres, total C1+C2+C3	0.0	0.6	6.7	4.2	7.6	9.0	9.3	9.1	8.5	7.8	
TOTAL TRANSPORT SECTOR	0.0	0.6	6.7	4.2	7.6	9.0	9.3	9.1	8.5	7.8	
SAVED GENERAL TOTAL in bn euros	0	15	45	76	112	138	152	156	159	165	

NRGCOSTSAVE

SAVED Energy costs (BAU-ECO, in bn euros, Summar	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	3	5	6	7	8	9	10
SPACE HEATING	0	3	8	14	22	29	32	34	36	39
SPACE COOLING	0	1	2	2	3	3	4	4	4	4
VENTILATION (elec)	0	0	0	0	1	2	2	3	3	4
1 VENTILATION [from heat saving vs. BAU; already included in COST for space heating]	0	0	0	1	3	4	5	6	7	7
LIGHTING	0	3	7	15	18	18	17	15	13	12
ELECTRONICS	0	1	5	11	15	19	21	20	18	17
FOOD PRESERVATION	0	5	9	11	16	21	25	28	30	32
COOKING	0	0	0	1	2	2	3	3	4	4
CLEANING	-	2	5	7	10	11	12	13	14	14
INDUSTRY COMPONENTS	0	0	2	6	12	15	16	15	14	13
ENERGY SECTOR (see separate below)										
TRANSPORT SECTOR	0	1	7	4	8	9	9	9	9	8
TOTAL in bn euros	0	15	45	75	111	136	148	151	153	157
% saving versus BAU (from 1990=0%)	0%	2%	7%	11%	16%	18%	19%	18%	17%	16%
% saving versus BAU (from 2010=0%)	-3%	0%	4%	9%	13%	16%	17%	16%	15%	15%
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	5	6	8
Total in bn euros, incl. energy Sector	0	15	45	76	112	138	152	156	159	165



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	0.7	2.1	3.5	4.8	5.5	6.0	6.6	7.4
SPACE HEATING	0.0	1.9	5.6	10.0	15.7	20.0	22.4	24.0	26.0	28.2
SPACE & HT PROCESS COOLING	0.0	0.8	1.0	0.9	0.9	0.9	0.9	0.9	1.1	1.3
VENTILATION (from electricity)	0.0	0.0	0.0	0.1	0.4	0.6	0.9	1.1	1.3	1.6
LIGHTING	0.0	2.1	4.7	8.9	8.1	5.4	3.6	2.4	1.8	1.5
ELECTRONICS	0.0	0.5	3.8	8.3	11.7	14.5	15.7	14.7	13.7	13.4
FOOD PRESERVATION	0.0	4.8	8.4	10.1	12.8	15.3	17.7	19.4	20.8	22.3
COOKING	0.0	0.0	0.3	0.7	1.4	2.1	2.6	2.9	3.1	3.4
CLEANING	0.0	2.2	4.7	7.0	9.4	10.7	11.7	12.3	12.7	12.9
INDUSTRY COMPONENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Energy Cost Saving, Residential, in bn euros	0	12	29	48	64	74	81	84	87	92

MAINTBAU

db	Maintenance BAU incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	0.0	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	0.2	0.2
EIWHS Electric Instant. Shower (secondary)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
ESWH Electric Storage ≤ 30 L (secondary)	0.7	0.9	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.3
ESWH Electric Storage > 30 L (primary)	1.6	2.1	2.1	2.1	2.0	2.1	2.2	2.4	2.5	2.6	2.6
GIWH Gas Instant. < 13 L/min (secondary)	1.0	1.0	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.2	0.2	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	0.0
GSWH Gas Storage, Non-condensing	0.2	0.2	0.1	0.1	0.1	0.1	0.0	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	0.5	0.6	0.8	0.8
Dedicated WH Solar (3.5 m ²)	0.1	0.8	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.2	1.2
WH dedicated Water Heater	4.2	5.8	5.8	5.8	5.7	5.9	6.2	6.6	6.9	7.3	
CHB Gas Combi Instant. WH	0.6	1.4	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.8
CHB Gas + Cyl. WH	0.3	0.4	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	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	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	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	0.0
CHB Electric HP + Cyl. WH	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	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	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	0.0
CHB Solar Combi (16 m ²)	0.0	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	1.6	2.6	2.6	2.6	2.6	2.6	2.7	2.7	2.7	2.8	
TOTAL WATER HEATING	5.8	8.3	8.5	8.4	8.3	8.5	8.8	9.3	9.7	10.1	
CHB Gas non-condensing	5.3	7.8	6.7	5.4	4.2	3.8	3.5	3.2	2.9	2.6	
CHB Gas condensing	0.1	3.3	5.1	7.0	8.6	9.5	10.1	10.4	10.8	11.1	
CHB Gas Jet burner non-condensing	0.7	0.6	0.5	0.3	0.2	0.1	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	4.6	4.0	3.2	2.4	1.7	1.0	0.6	0.5	0.5	0.4	
CHB Oil Jet burner condensing	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.7	0.8	0.8	
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	0.0	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	0.5	0.6	0.7	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 m ²)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CHB Central Heating boiler < 400 kW, space heating	11	16	17								
SFB Wood Manual [18 kW]	0.3	0.2	0.1	0.1	0.1	0.0	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	0.2	0.3	0.4	
SFB Coal [25 kW]	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.0	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								
CHAE-S (< 400 kW)	0.2	0.9	1.1	1.3	1.4	1.6	1.7	1.9	2.1	2.2	
CHAE-L (> 400 kW)	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
CHWE-S (< 400 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	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	0.2	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	0.2	0.3	0.3	0.3	0.3	0.3	
HT PCH-AE-L	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	
HT PCH-WE-S	0.0	0.0	0.0	0.0	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	0.2	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	0.4	0.4	0.3	0.1	0.1	0.1	0.1	
AC splits	0.2	0.9	1.0	1.0	1.0	1.0	1.0	1.0	0.9	0.9	
AC VRF	0.0	1.0	1.6	2.4	3.1	4.1	5.1	6.0	6.8	7.5	
ACF	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
SubTotal AHC Cooling	1	4	5	6	7	8	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)	0.1	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	
AC VRF (rev)	0.0	0.8	1.4	2.0	2.7	3.5	4.2	4.7	5.1	5.3	
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	2	3	4	4	5	5	6	6	
Total AHC Heating & Cooling	1	4	5	7	8	9	10	11	12	13	

MAINTBAU

db	Maintenance BAU incl. VAT (bn euro 2015)	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	0.4	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	LH cooker [10 kW]	0.2	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7
	LH SHR stove [8 kW]	0.1	0.1	0.1	0.1	0.1	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	0.7	1.3	1.5	1.7	1.9	2.0	2.1	2.1	2.1	2.2
	LH Electric sum	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	0.2	0.2	0.2	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									
	LH Local Space Heaters total	1.0	1.5	1.6	1.8	2.0	2.1	2.2	2.2	2.2	2.2
	<i>Maintenance partitioned over cooling and heating</i>										
	RAC fixed < 6 kW, cooling	0.1	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.8	0.9
	RAC fixed 6-12 kW, cooling	0.0	0.1	0.2	0.1	0.1	0.1	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	0.6	0.6	0.7	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	0.6	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	0.6	0.8	0.9	1.1
	RAC Room Air Conditioner	0.1	1.0	1.0	0.9	1.0	1.2	1.4	1.6	1.9	2.2
1	CIRC Integrated circulators	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	CIRC Large standalone circulators	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
1	CIRC Small standalone circulators	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
1	CIRC Circulator pumps <2.5 kW	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2
	TOTAL SPACE HEATING	12.8	19.9	20.8	21.6	22.3	23.1	24.0	24.8	25.7	26.5
	TOTAL SPACE COOLING	1.0	4.9	6.0	7.1	8.1	9.2	10.3	11.4	12.5	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	1.0	1.3
	R-UVU 100-250 m3/h	0.0	0.0	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	0.0	0.1	0.1	0.3	0.4	0.5	0.6	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	0.8	1.2	1.6	2.0	2.4	2.9
	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	0.2	0.3	0.3	0.3	0.4
	NR-AHU-M 5500-14500 m3/h	0.5	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2
	NR-AHU-L > 14500 m3/h	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4
	NRVU, Total non-residential	0.7	1.3	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.5
	VU Ventilation Units, res + non-res.	0.8	1.7	1.9	2.2	2.7	3.2	3.7	4.2	4.8	5.3
	TOTAL VENTILATION	0.8	1.7	1.9	2.2	2.7	3.2	3.7	4.2	4.8	5.3
	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

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db	Maintenance BAU incl. VAT (bn euro 2015)	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	0.5	0.5	0.5
	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	0.02	0.02	0.02	0.02	0.02	0.02
	DP Electronic Displays, total	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	Total STB set top boxes	0									
	Total GC Game consoles	0									
	Total ES&DS Servers and Data Storage	0									
	Total PC Personal computers	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	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
	EP / Laser Printer colour	0.0	0.7	1.1	1.5	1.8	1.9	2.0	2.1	2.1	2.1
	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	1.6	1.8	1.8	1.7	1.6	1.5	1.4	1.4
	EP / Laser MFD colour	0.0	2.7	3.9	4.3	4.1	3.9	3.7	3.5	3.4	3.2
	Total IE Imaging Equipment	1.0	5.5	7.5	8.3	8.0	7.8	7.5	7.3	7.0	6.7
	Total (networked) SB (excl. double)	0									
	Total EPS External power Supplies	0									
	TOTAL ELECTRONICS	1.2	5.9	7.9	8.8	8.5	8.3	8.1	7.9	7.6	7.4
	RF Household refrigerator and freezer	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	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9
	CF Plug in one door beverage cooler	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF Plug in horizontal ice cream freezer	0.0	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	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
	PF Professional Refrigeration, Total	0									
	TOTAL FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
	TOTAL COOKING	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								
	DW Household Dishwasher	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	0.1
	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
	Total VC Vacuum Cleaner	0									
	TOTAL CLEANING	0	1								
0.5	FAN Axial<300Pa [247 W flow out]	0.1	0.4	0.4	0.5	0.6	0.6	0.6	0.6	0.6	1
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	0.2	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	1
0.5	FAN Centr.FC [141 W flow out]	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0
0.5	FAN Centr.BC-free [2120 W flow out]	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0
0.5	FAN Centr.BC [2052 W flow out]	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	1
0.5	FAN Cross-flow [31 W flow out]	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0
	Total FAN, industrial (excl. box & roof fans)	0.3	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.4
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
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.5	0
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.3	0.3	0.4	0.4	0.4	0.3	0.3	0.3	0.2	0
0.45	Total 3ph 0.75-375 kW no VSD	0.7	0.9	1.0	1.0	1.0	1.0	0.9	0.8	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
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.6	1
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.1	0.2	0.2	0.3	0.3	0.4	0.5	0.5	0.5	1
0.45	Total 3-ph 0.75-375 kW with VSD	0.1	0.3	0.4	0.5	0.6	0.7	0.9	1.0	1.2	1.3
0.45	Total 3-ph 0.75-375 kW w/wo VSD	0.8	1.2	1.4	1.5	1.6	1.7	1.8	1.8	1.9	2.0
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
0.45	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
0.45	Total Small 1-ph 0.12-0.75 kW	0.0									

MAINTBAU

db	Maintenance BAU incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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									
0.45	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	0.1	0.1	0.2
0.45	Total Large 3-ph LV 375-1000 kW	0.1	0.2	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	0.0	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								
0.45	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	0.1	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									
0.45	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									
0.45	1-phase motors >0.75 kW (no VSD)	0.0									
MT Elec. Motors LV 0.12-1000 kW		0.6	0.9	1.0	1.0	1.1	1.2	1.2	1.3	1.3	1.3
WP Water pumps (load) [%]		1.0	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2.4
CP Fixed Speed 5-1280 l/s		0.3	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
CP Variable speed 5-1280 l/s		0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4
CP Pistons 2-64 l/s		0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CP Standard Air Compressors		0.4	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.2
Total WE Welding Equipment		0.1									
TOTAL INDUSTRY COMPONENTS		2.4	4.0	4.4	4.7	5.1	5.4	5.6	5.8	6.1	6.3
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									
TRANSPORT SECTOR		0									
GENERAL TOTAL (in bn euro 2015)		27	50	56	60	63	66	70	74	78	82
SUMMARY											
Maintenance BAU incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	6	8	8	8	8	8	9	9	10	10	
SPACE HEATING	13	20	21	22	22	23	24	25	26	26	
SPACE COOLING	1	5	6	7	8	9	10	11	13	14	
VENTILATION	1	2	2	2	3	3	4	4	5	5	
LIGHTING	2	4	4	5	6	6	7	8	9	10	
ELECTRONICS	1	6	8	9	8	8	8	8	8	7	
FOOD PRESERVATION	1	1	1	1	1	1	1	1	1	2	
COOKING	0	0	0	0	0	0	0	0	0	0	
CLEANING	0	1									
INDUSTRY COMPONENTS	2	4	4	5	5	5	6	6	6	6	
ENERGY SECTOR (see separate below)											
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	
TOTAL in bn euro 2015	27	50	56	60	63	66	70	74	78	82	

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									
Total in bn euros, incl. energy Sector	27	50	56	60	63	66	70	74	78	82

MAINTBAU

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 e)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4.3	6.2	6.2	6.2	6.1	6.3	6.5	6.8	7.1	7.4
SPACE HEATING	9.5	13.7	14.0	14.2	14.3	14.4	14.7	15.0	15.5	15.9
SPACE & HT PROCESS COOLING	0.1	0.7	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.1
VENTILATION (from electricity)	0.1	0.4	0.5	0.6	0.8	1.2	1.6	2.0	2.4	2.9
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	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.1
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	0.4	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
INDUSTRY COMPONENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
BAU Maint Cost, Residential, in bn euros	14.7	22.6	23.3	23.6	23.9	24.7	25.8	26.8	28.1	29.4

MAINTECO

db	Maintenance ECO incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	0.0	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	0.2	0.2
EIWHS Electric Instant. Shower (secondary)	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
ESWH Electric Storage ≤ 30 L (secondary)	0.7	0.9	0.9	0.9	1.0	1.0	1.1	1.2	1.2	1.2	1.3
ESWH Electric Storage > 30 L (primary)	1.6	2.1	2.1	2.1	2.0	2.1	2.2	2.4	2.5	2.6	
GIWH Gas Instant. < 13 L/min (secondary)	1.0	1.0	0.9	0.7	0.7	0.6	0.6	0.6	0.6	0.6	0.6
GIWH Gas Instant. ≥ 13 L/min (primary)	0.2	0.2	0.2	0.2	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	0.0
GSWH Gas Storage, Non-condensing	0.2	0.2	0.1	0.1	0.1	0.1	0.0	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	0.5	0.6	0.6	0.8
Dedicated WH Solar (3.5 m ²)	0.1	0.8	1.0	1.1	1.1	1.1	1.0	1.1	1.1	1.1	1.2
WH dedicated Water Heater	4.2	5.8	5.8	5.8	5.7	5.9	6.2	6.6	6.9	7.3	
CHB Gas Combi Instant. WH	0.6	1.4	1.6	1.6	1.6	1.6	1.5	1.4	1.3	1.2	
CHB Gas + Cyl. WH	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.3	0.3	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	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	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	0.0
CHB Hybrid Gas/Electric WH	0.0	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	0.0	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	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	0.0
CHB Solar Combi (16 m ²)	0.0	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	1.6	2.6	2.6	2.6	2.5						
TOTAL WATER HEATING	5.8	8.3	8.4	8.4	8.2	8.4	8.7	9.1	9.5	9.8	
CHB Gas non-condensing	5.3	7.8	6.6	4.5	2.5	1.3	0.5	0.3	0.2	0.1	
CHB Gas condensing	0.1	3.3	5.2	7.8	9.9	11.0	11.2	10.4	9.6	8.7	
CHB Gas Jet burner non-condensing	0.7	0.6	0.5	0.3	0.2	0.1	0.0	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	0.1	0.2	0.2	0.2	0.2
CHB Oil Jet burner non-condensing	4.6	4.0	3.2	2.3	1.5	0.7	0.3	0.1	0.1	0.1	0.1
CHB Oil Jet burner condensing	0.0	0.1	0.2	0.4	0.6	0.8	0.9	1.0	1.1	1.1	
CHB Electric Joule-effect	0.0	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	0.0	0.1	0.1	0.2	0.4	0.5	0.7	
CHB Electric Heat Pump	0.0	0.2	0.3	0.4	0.6	1.0	1.4	1.9	2.5	3.0	
CHB Gas Heat Pump	0.0	0.0	0.0	0.0	0.0	0.1	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	0.2	0.2	0.2
CHB Solar combi (16 m ²)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
CHB Central Heating boiler < 400 kW, space heating	11	16	16	16	16	15	15	15	15	15	14
SFB Wood Manual [18 kW]	0.3	0.2	0.1	0.1	0.1	0.0	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	0.2	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	0.0	0.0	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	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	0.0
Total Solid Fuel Boiler	0.7	0.4	0.5								
CHAE-S (< 400 kW)	0.2	0.9	1.1	1.3	1.4	1.6	1.7	1.9	2.1	2.2	
CHAE-L (> 400 kW)	0.0	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
CHWE-S (< 400 kW)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	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	0.2	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	0.1
CHF	0.0	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	0.2	0.3	0.3	0.3	0.3	0.3	0.3
HT PCH-AE-L	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
HT PCH-WE-S	0.0	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	0.2	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	0.0
AC rooftop	0.1	0.4	0.5	0.4	0.4	0.3	0.1	0.1	0.1	0.1	0.1
AC splits	0.2	0.9	1.0	1.0	1.0	1.0	1.0	0.9	0.9	0.9	0.9
AC VRF	0.0	1.0	1.6	2.4	3.1	4.1	5.1	6.0	6.8	7.5	
ACF	0.0	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	5	6	7	8	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	0.0
AC splits (rev)	0.1	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.6	0.6	0.6
AC VRF (rev)	0.0	0.8	1.4	2.0	2.7	3.5	4.2	4.7	5.1	5.3	
ACF (rev)	0.0	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	0.1
AHE	0.0	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	2	3	4	4	5	5	6	6	
Total AHC Heating & Cooling	1	4	5	7	8	9	10	11	12	13	

MAINTECO

db	Maintenance ECO incl. VAT (bn euro 2015)	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	0.3
LH closed fireplace/inset [8 kW]	0.1	0.3	0.3	0.4	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	0.2
LH coal stove [8 kW]	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH cooker [10 kW]	0.2	0.4	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.7	0.7
LH SHR stove [8 kW]	0.1	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	0.2
LH Solid fuel sum	0.7	1.3	1.5	1.7	1.9	2.0	2.1	2.1	2.1	2.1	2.2
LH Electric sum	0.0	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	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	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	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	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	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	0.0
LH Gaseous fuel sum	0.2	0.2	0.2	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid fuel sum	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Local Space Heaters total	1	1	2	2							
<i>Maintenance partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	0.1	0.6	0.6	0.5	0.5	0.6	0.6	0.7	0.8	0.9	
RAC fixed 6-12 kW, cooling	0.0	0.1	0.2	0.1	0.1	0.1	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	0.6	0.6	0.7	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	0.6	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	0.6	0.8	0.9	1.1	
RAC Room Air Conditioner	0.1	1.0	1.0	0.9	1.0	1.2	1.4	1.6	1.9	2.2	
1 CIRC Integrated circulators	0.0	0.1									
1 CIRC Large standalone circulators	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
1 CIRC Small standalone circulators	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
1 CIRC Circulator pumps <2.5 kW	0.2	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	
TOTAL SPACE HEATING	12.8	19.9	20.8	21.6	22.1	22.7	23.2	23.4	23.9	24.2	
TOTAL SPACE COOLING	1.0	4.9	6.0	7.1	8.1	9.2	10.3	11.4	12.5	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	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	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	1.0	1.3	
R-UVU 100-250 m3/h	0.0	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	0.0	0.1	0.1	0.3	0.4	0.5	0.6	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	0.8	1.2	1.6	2.0	2.4	2.9	
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	0.2	0.3	0.3	0.3	0.4	
NR-AHU-M 5500-14500 m3/h	0.5	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	
NR-AHU-L > 14500 m3/h	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	
NRVU, Total non-residential	0.7	1.3	1.5	1.7	1.8	2.0	2.1	2.2	2.4	2.5	
VU Ventilation Units, res + non-res.	0.8	1.7	1.9	2.2	2.7	3.2	3.7	4.2	4.8	5.3	
TOTAL VENTILATION	0.8	1.7	1.9	2.2	2.7	3.2	3.7	4.2	4.8	5.3	
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	

MAINTECO

db	Maintenance ECO incl. VAT (bn euro 2015)	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	0.5	0.5	0.5
	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	0.02	0.02	0.02	0.02	0.02	0.02
	DP Electronic Displays, total	0.2	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.6	0.6
	Total STB set top boxes	0									
	Total GC Game consoles	0									
	Total ES&DS Servers and Data Storage	0									
	Total PC	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	0.5	0.4	0.3	0.3	0.2	0.2	0.1	0.1
	EP / Laser Printer colour	0.0	0.7	1.1	1.5	1.8	1.9	2.0	2.1	2.1	2.1
	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	1.6	1.8	1.8	1.7	1.6	1.5	1.4	1.4
	EP / Laser MFD colour	0.0	2.7	3.9	4.3	4.1	3.9	3.7	3.5	3.4	3.2
	Total IE Imaging Equipment	1.0	5.5	7.5	8.3	8.0	7.8	7.5	7.3	7.0	6.7
	Total (networked) SB (incl. double)	0	0	0	0	0	0	0	0	0	0
	Total (networked) SB (excl. double)	0									
	Total EPS External power Supplies	0									
	TOTAL ELECTRONICS	1.2	5.9	7.9	8.8	8.5	8.3	8.1	7.9	7.6	7.4
	RF Household refrigerator and freezer	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	0.6	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9
	CF Plug in one door beverage cooler	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	CF Plug in horizontal ice cream freezer	0.0	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	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
	PF Professional Refrigeration, Total	0									
	TOTAL FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
	TOTAL COOKING	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								
	DW Household Dishwasher	0									
	LD condensing heat pump	0.0	0.0	0.0	0.1	0.1	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 dom. Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	VC nondom Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0
	Total VC Vacuum Cleaner	0									
	TOTAL CLEANING	0	1								
0.5	FAN Axial<300Pa [247 W flow out]	0.1	0.4	0.4	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	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7
0.5	FAN Centr.FC [141 W flow out]	0.1	0.2	0.3	0.3	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	0.2	0.2	0.3
0.5	FAN Centr.BC [2052 W flow out]	0.1	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.6
0.5	FAN Cross-flow [31 W flow out]	0.0	0.0	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	0.8	1.0	1.1	1.2	1.2	1.3	1.3	1.3	1.4
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	0.4	0.6	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.4
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.3	0.3	0.3	0.3	0.3	0.2	0.2	0.2	0.2	0.2
0.45	Total 3ph 0.75-375 kW no VSD	0.7	0.9	0.9	0.9	0.8	0.7	0.7	0.7	0.6	0.6
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	0.4	0.5	0.6	0.6	0.7	0.7	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	0.5	0.6	0.6
0.45	Total 3-ph 0.75-375 kW with VSD	0.1	0.3	0.5	0.7	0.9	1.1	1.1	1.2	1.3	1.4
0.45	Total 3-ph 0.75-375 kW w/wo VSD	0.8	1.2	1.4	1.6	1.7	1.8	1.8	1.9	1.9	2.0
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									

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db	Maintenance ECO incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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
	Total Small 3-ph 0.12-0.75 kW	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	0.1	0.1	0.2
	Total Large 3-ph LV 375-1000 kW	0.1	0.2	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	0.0	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
	Total Expl. 0.75-375 kW (no VSD)	0.0	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	0.0	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
	Total Brake 0.75-375 kW (no VSD)	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
	Total 8-pole 0.75-375 kW (no VSD)	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	1.1	1.2	1.2	1.3	1.3	1.4
	WP Water pumps (load) [%]	1.0	1.4	1.5	1.6	1.7	1.8	2.0	2.1	2.2	2
CP Fixed Speed 5-1280 l/s	0.3	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7
CP Variable speed 5-1280 l/s	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
CP Pistons 2-64 l/s	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Total CP Standard Air Compressors	0.4	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.1	1.1	1.2
Total WE Welding Equipment	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
TOTAL INDUSTRY COMPONENTS	2.4	4.0	4.4	4.8	5.1	5.4	5.6	5.9	6.1	6.3	
TOTAL ENERGY SECTOR	0	0	0	0	0	0	0	0	0	0	0
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	0
GENERAL TOTAL (in bn euro 2015)	27	50	56	60	62	66	69	72	76	79	
SUMMARY											
Maintenance ECO incl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	6	8	8	8	8	8	9	9	9	10	
SPACE HEATING	13	20	21	22	22	23	23	23	24	24	
SPACE COOLING	1	5	6	7	8	9	10	11	13	14	
VENTILATION	1	2	2	2	3	3	4	4	5	5	
LIGHTING	2	4	4	5	6	6	7	8	9	10	
ELECTRONICS	1	6	8	9	8	8	8	8	8	7	
FOOD PRESERVATION	1	1	1	1	1	1	1	1	1	2	
COOKING	0	0	0	0	0	0	0	0	0	0	
CLEANING	0	1									
INDUSTRY COMPONENTS	2	4	4	5	5	5	6	6	6	6	
ENERGY SECTOR (see separate below)	0	0	0	0	0	0	0	0	0	0	
TRANSPORT SECTOR	0	0	0	0	0	0	0	0	0	0	
TOTAL in bn euro 2015	27	50	56	60	62	66	69	72	76	79	

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									
Total in bn euros, incl. energy Sector	27	50	56	60	62	66	69	72	76	79

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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 eu)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	4.3	6.2	6.2	6.2	6.1	6.2	6.4	6.7	6.9	7.2
SPACE HEATING	9.5	13.7	14.0	14.2	14.2	14.1	14.1	14.0	14.1	14.3
SPACE & HT PROCESS COOLING	0.1	0.7	0.8	0.7	0.7	0.8	0.9	0.9	1.0	1.1
VENTILATION (from electricity)	0.1	0.4	0.5	0.6	0.8	1.2	1.6	2.0	2.4	2.9
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	1.0	1.1	1.1	1.1	1.2	1.2	1.2	1.1
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	0.4	0.7	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
INDUSTRY COMPONENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO Maint Cost, Residential, in bn euros	14.7	22.6	23.3	23.5	23.8	24.3	25.0	25.7	26.6	27.5

RESOURCES

CONSUMABLE RESOURCES prices incl. VAT in 2015 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
<i>IJ share of images in total</i>			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%
<i>duplexing is addressed in VA and impact assessment</i>												
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									
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		0.013									
EU IE Paper cost, BAU	bn€		4.8	6.7	5.5	4.1	3.0	2.6	2.4	2.2	2.1	1.9
EU IE Paper cost, ECO	bn€		4.8	6.5	4.9	3.5	2.6	2.2	2.0	1.9	1.8	1.7
EU IE Paper cost, SAVE	bn€		0.0	0.2	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3
Paper Primary Energy content (40 MJ/kg)	kWh/kg		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									
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												
<i>Masses per image are intended to be net quantities of ink/toner used for printing an image</i>												
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
<i>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</i>												
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
<i>IJ share of ink/toner</i>			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		17									
Ink cartridge / container price, ECO	€/unit		17									
Toner cartridge / container price, BAU	€/unit		110									
Toner cartridge / container price, ECO	€/unit		110									
EU IE Ink/Toner cost, BAU	bn€		11.2	18.3	14.3	10.5	7.9	6.8	6.3	5.8	5.5	5.2
EU IE Ink/Toner cost, ECO	bn€		11.2	18.3	14.3	10.5	7.9	6.8	6.3	5.8	5.5	5.2
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		0.110	0.111	0.111	0.110						
Toner cost per EP image	€/image		0.013	0.015	0.015	0.016						
Overall cost per image	€/image		0.019	0.022	0.021	0.022						
<i>Data below for primary energy content and GHG emissions are for the ink and toner itself. Cartridge or container 'housing' not included.</i>												
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									
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€		16	25	20	15	11	9	9	8	8	7
ECO	bn€		16	25	19	14	10	9	8	8	7	7
SAVE (BAU-ECO)	bn€		0.0	0.2	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3

RESOURCES

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 (€ 0.15/cycle)	bn€	3.8	4.6	4.7	4.7	4.8	4.9	4.8	4.8	4.8	4.8
WD detergent (€ 0.15/cycle)	bn€	0.2	0.2	0.2	0.2	0.2	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 m ³ /a per unit	m ³ /a	22	14	13	13	13	13	13	13	13	13
WM Water stock total M m ³ /a	M m ³ /a	2196	2133	2189	2187	2227	2257	2249	2236	2236	2236
WM Water costs	bn€	6.6	8.0	8.9	9.8	11.6	13.6	15.8	18.2	21.1	24.4
WD Water stock average ltr./cycle	ltr/cyc	130	122	122	122	122	122	122	122	122	122
WD Water stock average m ³ /a per unit	m ³ /a	29	27	27	27	27	27	27	27	27	27
WD Water stock total M m ³ /a	M m ³ /a	127	168	178	185	190	192	193	194	195	196
WD Water costs	bn€	0.4	0.6	0.7	0.8	1.0	1.2	1.4	1.6	1.8	2.1
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 m ³ /a per unit	m ³ /a	22	9	7	6	6	5	5	5	5	5
WM Water stock total M m ³ /a	M m ³ /a	2196	1397	1211	1051	956	912	909	904	904	904
WM Water costs	bn€	6.6	5.2	4.9	4.7	5.0	5.5	6.4	7.3	8.5	9.9
WD Water stock average ltr./cycle	ltr/cyc	130	106	91	73	51	47	46	46	46	46
WD Water stock average m ³ /a per unit	m ³ /a	29	23	20	16	11	10	10	10	10	10
WD Water stock total M m ³ /a	M m ³ /a	127	146	132	110	79	73	73	74	74	74
WD Water costs	bn€	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.6	0.7	0.8
WM-WD water consumption											
BAU	M m ³ /a	2323	2301	2367	2373	2416	2449	2442	2430	2431	2432
ECO	M m ³ /a	2323	1543	1343	1161	1035	986	982	977	978	978
SAVE (BAU-ECO)	M m ³ /a	0	758	1024	1212	1381	1464	1460	1453	1454	1454
WM-WD detergent & water costs											
BAU	bn€	11	13	15	16	18	20	22	25	28	32
ECO	bn€	11	11	10	10	10	11	12	13	14	16
SAVE (BAU-ECO)	bn€	0.0	2.8	4.2	5.4	7.2	8.8	10.2	11.8	13.7	15.9
DW Household Dishwasher (water is addressed in legislation; detergent costs are added to complete the economics)											
DW detergent (€ 0.09/cycle)	bn€	0.6	1.4	1.7	2.1	2.4	2.7	3.0	3.3	3.6	3.9
BAU water consumption											
Water stock average ltr./cycle	ltr/cyc	30	24	24	24	24	24	24	24	24	24
Water stock average m ³ /a per unit	m ³ /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 m ³ /a	M m ³ /a	201	359	431	510	588	665	740	815	890	965
Water costs	bn€	0.6	1.3	1.8	2.3	3.1	4.0	5.2	6.6	8.4	10.5
ECO water consumption											
Water stock average ltr./cycle	ltr/cyc	30	15	12	10	9	9	9	9	9	9
Water stock average m ³ /a per unit	m ³ /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 m ³ /a	M m ³ /a	201	217	210	214	224	244	272	299	327	354
Water costs	bn€	0.6	0.8	0.9	1.0	1.2	1.5	1.9	2.4	3.1	3.9
DW water consumption											
BAU	M m ³ /a	201	359	431	510	588	665	740	815	890	965
ECO	M m ³ /a	201	217	210	214	224	244	272	299	327	354
SAVE (BAU-ECO)	M m ³ /a	0	141	220	295	364	421	469	516	564	611
DW consumable costs (detergent & water)											
BAU	bn€	1.2	2.8	3.5	4.3	5.4	6.7	8.2	9.9	12.0	14.4
ECO	bn€	1.2	2.3	2.6	3.0	3.5	4.2	4.9	5.7	6.7	7.8
SAVE (BAU-ECO)	bn€	0.0	0.5	0.9	1.3	1.9	2.5	3.3	4.2	5.3	6.7
VC Vacuum Cleaners (not regulated, no difference BAU-ECO; bag costs added to complete the economics)											
VC dom. Vacuum Cleaner	bn€	0.9	1.3	1.3	1.4	1.5	1.4	1.3	1.1	1.0	0.9
VC nondom Vacuum Cleaner	bn€	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6
Total VC Vacuum Cleaner	bn€	1.3	1.7	1.8	1.9	2.0	1.9	1.8	1.7	1.6	1.5
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
Shielding Gas cost per kg Argon	€/kg	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17	2.17
EU Cost Shielding Gas, BAU	Meuros	1213	1380	1416	1417	1431	1446	1459	1470	1481	1491
EU Cost Shielding Gas, ECO	Meuros	1213	1380	1416	1417	1359	1301	1313	1323	1333	1342
EU Cost Shielding Gas, SAVE	Meuros	0	0	0	0	72	145	146	147	148	149
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

RESOURCES

CONSUMABLE RESOURCES, continued	unit	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42	0.42
EU Cost Wire/Electrode, BAU	Meuros	581	661	678	679	686	693	699	704	710	715
EU Cost Wire/Electrode, ECO	Meuros	581	661	678	679	668	658	664	669	674	679
EU Cost Wire/Electrode, SAVE	Meuros	0	0	0	0	17	35	35	35	35	36
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 emiss., BAU	MtCO2eq	2.1	2.4	2.4	2.4	2.5	2.5	2.5	2.5	2.5	2.5
EU Wire/Electr. GHG emiss., 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 emiss., 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€	1.8	2.0	2.1	2.1	2.1	2.1	2.2	2.2	2.2	2.2
ECO	bn€	1.8	2.0	2.1	2.1	2.0	2.0	2.0	2.0	2.0	2.0
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

Consumable cost data are included in RUN and EXPENSE data

They are not considered for Business revenues and Jobs

SUMMARY USER EXPENSES for CONSUMABLE RESOURCES (incl. VAT, bn euros 2015)

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS (paper, ink, toner)	16	25	20	15	11	9	9	8	8	7
CLEANING (water, detergents, VC bags)	13	18	20	22	25	29	32	36	42	48
INDUSTRY COMP. (welding gas, wire, electrodes)	2									
TOTAL in bn euro 2015	31	45	42	39	38	40	43	47	51	57
ECO										
ELECTRONICS (paper, ink, toner)	16	25	19	14	10	9	8	8	7	7
CLEANING (water, detergents, VC bags)	13	15	15	15	16	17	19	20	23	25
INDUSTRY COMP. (welding gas, wire, electrodes)	2									
TOTAL in bn euro 2015	31	41	36	31	28	28	29	30	32	34
SAVE										
ELECTRONICS (paper, ink, toner)	0.0	0.2	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3
CLEANING (water, detergents, VC bags)	0.0	3.4	5.1	6.8	9.1	11.4	13.5	16.0	19.0	22.5
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 2015	0.0	3.6	5.7	7.4	9.6	12.0	14.0	16.5	19.5	23.0

Consumable primary energy data are NOT included in NRG data

SUMMARY INDIRECT PRIMARY ENERGY for CONSUMABLE RESOURCES (TWh/a)

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
ELECTRONICS (paper, ink, toner)	21	29	24	18	13	11	10	9	8	7
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								
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

Consumable GHG emission data are NOT included in EMISS data

SUMMARY GHG EMISSIONS for CONSUMABLE RESOURCES (MtCO2eq/a)

	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
SAVE										
ELECTRONICS (paper, ink, toner)	0.0	0.0	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

RESOURCES

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€	4.2	5.9	4.9	3.6	2.7	2.3	2.1	2.0	1.8	1.7
BAU, Residential	bn€	0.5	0.8	0.6	0.5	0.3	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€	4.2	5.7	4.3	3.1	2.3	2.0	1.8	1.7	1.6	1.5
ECO, Residential	bn€	0.5	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€	8.7	13.9	11.2	8.3	6.2	5.4	5.0	4.6	4.3	4.1
BAU, Residential	bn€	2.5	4.5	3.1	2.2	1.7	1.4	1.3	1.2	1.1	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€	8.7	13.9	11.2	8.3	6.2	5.4	5.0	4.6	4.3	4.1
ECO, Residential	bn€	2.5	4.5	3.1	2.2	1.7	1.4	1.3	1.2	1.1	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	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
BAU and ECO, Residential	bn€	3.8	4.7	4.8	4.8	4.9	5.0	4.9	4.9	4.9	4.9
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	0.4	0.4	0.5	0.6	0.7	0.8
BAU, Residential	bn€	6.8	8.4	9.4	10.3	12.2	14.4	16.6	19.1	22.2	25.7
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	0.2	0.2	0.2	0.2	0.3	0.3
ECO, Residential	bn€	6.8	5.6	5.3	5.1	5.2	5.8	6.7	7.7	8.9	10.4
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	0.1	0.2	0.2	0.2	0.2	0.3	0.3
BAU and ECO, Residential	bn€	0.6	1.3	1.6	1.9	2.2	2.5	2.8	3.1	3.3	3.6
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	0.3	0.4	0.5	0.6	0.7
BAU, Residential	bn€	0.6	1.2	1.6	2.1	2.9	3.7	4.8	6.2	7.8	9.8
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	0.1	0.1	0.1	0.1
ECO, Residential	bn€	0.6	0.8	0.8	0.9	1.1	1.4	1.8	2.4	3.0	3.8
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	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
BAU and ECO, Tertiary	bn€	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6
BAU and ECO, Residential	bn€	0.9	1.3	1.3	1.4	1.5	1.4	1.3	1.1	1.0	0.9
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
Welding Equipment, Shielding Gas Cost											
BAU, Industry	bn€	1.2	1.4	1.4	1.4	1.4	1.4	1.5	1.5	1.5	1.5
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€	1.2	1.4	1.4	1.4	1.4	1.3	1.3	1.3	1.3	1.3
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	0.7	0.7
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

RUNBAU

db BAU Running costs (in bn euros 2015)	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	2	1	1	2	2	2	2	3
EIWHS Electric Instant. Shower (secondary)	2	2	3	3	3	3	3	4	4	4
ESWH Electric Storage ≤ 30 L (secondary)	2	2	3	2	3	3	3	3	4	4
ESWH Electric Storage > 30 L (primary)	12	15	17	17	17	18	20	22	24	27
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 m ²)	0	2	2	2	3	3	3	3	3	3
WH dedicated Water Heater	21	28	31	29	30	32	35	39	43	47
CHB Gas Combi Instant. WH	4	11	12	11	12	13	14	15	16	16
CHB Gas + Cyl. WH	2	4	5	4	4	5	5	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	4	5	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	2	2	2	3
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 m ²)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	11	22	22	20	20	21	23	25	27	29
TOTAL WATER HEATING	32	49	54	50	50	53	58	64	70	76
CHB Gas non-condensing	49	66	58	40	31	28	26	24	22	20
CHB Gas condensing	1	22	35	42	53	59	64	67	71	75
CHB Gas Jet burner non-condensing	5	4	3	2	2	1	1	1	0	0
CHB Gas Jet burner condensing	0	0	0	0	0	1	1	1	1	1
CHB Oil Jet burner non-condensing	48	54	37	29	20	11	7	6	6	5
CHB Oil Jet burner condensing	0	1	2	3	4	6	7	7	8	9
CHB Electric Joule-effect	3	2	3	3	3	3	3	3	2	2
CHB Hybrid (gas-electric)	0	0	0	0	0	0	0	0	1	1
CHB Electric Heat Pump	0	2	4	4	6	7	8	9	10	12
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	1
CHB Solar combi (16 m ²)	0	0	1	0	1	1	1	1	1	1
CHB Central Heating boiler < 400 kW, space heating	106	152	142	124	119	116	117	119	123	128
SFB Wood Manual	10	3	3	3	2	1	1	1	1	1
SFB Wood Direct Draft	0	1	2	3	4	4	5	6	7	9
SFB Coal	7	3	2	3	2	2	1	2	2	2
SFB Pellets	0	0	1	1	2	2	2	2	3	3
SFB Wood chips	0	0	0	1	1	1	1	1	1	1
Total Solid Fuel Boiler	17	8	9	10	11	10	10	11	13	16
CHAE-S (≤ 400 kW)	0.8	2.3	2.9	3.2	3.4	3.7	4.0	4.3	4.6	4.8
CHAE-L (> 400 kW)	0.9	2.0	2.4	2.5	2.6	2.6	2.6	2.6	2.6	2.6
CHWE-S (≤ 400 kW)	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
CHWE-L (> 1500 kW)	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
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	3.4	4.8	5.8	6.2	6.7	7.2	7.7	8.2	8.7	9.2
HT PCH-AE-L	3.3	4.6	5.5	5.8	6.4	6.8	7.2	7.7	8.1	8.6
HT PCH-WE-S	0.7	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
HT PCH-WE-M	1.4	2.1	2.5	2.7	2.9	3.1	3.3	3.6	3.8	4.0
HT PCH-WE-L	0.3	0.4	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.8
AC rooftop	0.6	1.4	1.6	1.4	1.1	0.7	0.4	0.2	0.1	0.1
AC splits	0.9	2.6	2.9	2.8	2.7	2.6	2.5	2.4	2.2	2.1
AC VRF	0.0	1.4	2.3	3.3	4.4	5.7	7.0	8.2	9.2	10.1
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	13	24	29	31	34	36	38	41	43	46
AC rooftop (rev)	0.7	2.0	2.2	1.9	1.6	1.1	0.5	0.2	0.0	0.0
AC splits (rev)	1.4	3.9	4.5	4.4	4.4	4.1	3.9	3.7	3.5	3.3
AC VRF (rev)	0.0	1.9	3.1	4.4	5.8	7.5	9.0	9.9	10.6	11.0
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
AHF	8.1	8.0	6.9	5.6	5.3	5.0	4.7	4.5	4.3	4.1
AHE	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Air Heating	10	16	17	17	17	18	18	19	19	19
Total AHC Air Heating & Cooling	23	38	44	45	47	50	52	54	56	59

RUNBAU

db	BAU Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0.6	0.9	1.2	1.3	1.4	1.6	1.7	1.8	2.0	2.1	
LH closed fireplace/inset	0.6	1.6	2.6	3.1	3.8	4.3	4.8	5.3	5.6	6.0	
LH wood stove	1.2	1.4	1.9	2.1	2.3	2.5	2.8	3.0	3.2	3.5	
LH coal stove	0.5	0.4	0.2	0.3	0.4	0.4	0.4	0.3	0.3	0.3	
LH cooker	0.4	0.7	1.0	1.2	1.4	1.6	1.7	1.8	1.9	2.0	
LH SHR stove	0.5	0.8	1.2	1.4	1.6	2.0	2.3	2.7	3.0	3.3	
LH pellet stove	0.0	0.4	0.7	0.9	1.1	1.3	1.5	1.6	1.7	1.8	
LH Solid fuel sum	4	6	9	10	12	14	15	17	18	19	
LH Electric portable	4.6	3.7	4.1	3.9	3.9	3.8	3.8	3.8	3.9	3.9	
LH Electric fixed > 250W	24.3	19.1	19.9	16.7	14.9	13.7	13.6	13.6	13.7	13.7	
LH Electric fixed ≤ 250W	1.7	1.3	1.3	1.1	1.0	0.9	0.9	0.9	0.9	0.9	
LH Electric storage	1.4	1.1	1.2	1.1	1.0	1.0	1.0	1.0	1.0	1.0	
LH Electric underfloor	4.1	3.6	4.0	3.8	3.8	3.9	3.9	4.0	4.0	4.0	
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	1.7	2.0	1.9	1.8	1.8	1.7	1.7	1.8	1.8	
LH Electric sum	38	31	33	29	27	26	25	25	26	26	
LH Gas luminous (commercial)	0.1	0.1	0.1	0.1	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	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
LH Gas balanced flue	0.7	0.4	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	0.1	0.1	0.1	0.1	
LH Gaseous fuel sum	1.2	0.9	0.8	0.6	0.5	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	0.0	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	0.1	0.1	0.0	0.0	0.0	0.0	0.0	
LH Local Space Heaters total	43	38	43	40	39	40	41	42	44	45	
RAC fixed < 6 kW, cooling	0.4	3.5	3.5	2.6	2.7	3.0	3.4	3.8	4.5	5.2	
RAC fixed 6-12 kW, cooling	0.2	1.6	1.8	1.4	1.5	1.6	1.7	1.8	2.1	2.3	
RAC portable < 12 kW, cooling	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
RAC < 12 kW total, cooling mode	0.6	5.4	5.6	4.2	4.4	4.8	5.3	5.9	6.8	7.9	
RAC fixed < 6 kW, reversible, heating	0.2	3.7	4.8	4.6	5.8	7.5	9.4	11.7	14.3	16.7	
RAC fixed 6-12 kW, reversible, heating	0.1	1.7	2.5	2.6	3.2	3.9	4.7	5.6	6.5	7.3	
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	0.2	5.5	7.3	7.1	8.9	11.4	14.1	17.3	20.8	24.0	
RAC Room Air Conditioner	1	11	13	11	13	16	19	23	28	32	
1 CIRC Integrated circulators	2.6	3.3	3.9	3.9	4.2	4.5	4.7	4.8	4.7	4.8	
1 CIRC Large standalone circulators	1.6	2.0	2.1	1.8	1.8	1.6	1.5	1.5	1.5	1.5	
1 CIRC Small standalone circulators	1.3	1.6	1.7	1.5	1.4	1.3	1.3	1.2	1.2	1.2	
1 CIRC Circulator pumps <2.5 kW	5.5	6.9	7.7	7.2	7.4	7.5	7.5	7.5	7.5	7.5	
TOTAL SPACE HEATING	176	220	219	198	195	195	200	208	220	232	
TOTAL SPACE COOLING	13	29	34	35	38	41	44	47	50	54	
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	2.0	2.5	
R-UVU 100-250 m3/h	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.4	
R-BVU 100-250 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.6	0.8	
R-UVU 250-1000 m3/h	0.5	1.2	1.4	1.5	1.6	1.8	1.9	2.0	2.1	2.2	
R-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.5	1.0	1.5	2.1	2.7	3.5	
R-UVU > 1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
R-BVU 1000-2500 m3/h	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	
RVU, Total residential	0.7	1.7	2.1	2.3	3.0	4.1	5.3	6.6	8.0	9.6	
NR-UVU 250-1000 m3/h	0.2	0.4	0.4	0.4	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	0.9	1.0	
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	0.4	0.4	0.5	0.6	0.7	
NR-AHU-S 2500-5500 m3/h	0.0	0.5	0.7	0.9	1.1	1.3	1.6	1.9	2.1	2.4	
NR-AHU-M 5500-14500 m3/h	3.5	4.2	4.5	4.3	4.6	5.0	5.4	5.9	6.4	6.9	
NR-AHU-L > 14500 m3/h	1.0	1.2	1.3	1.3	1.4	1.5	1.6	1.7	1.9	2.0	
NRVU, Total non-residential	4.8	6.8	7.7	7.7	8.4	9.3	10.4	11.5	12.7	13.9	
VU Ventilation Units, res + non-res.	5.5	8.5	9.7	10.0	11.4	13.4	15.7	18.1	20.7	23.5	
TOTAL VENTILATION (VU own electricity & maint.)	6	8	10	10	11	13	16	18	21	24	
<i>¹ Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)</i>	-	-	-	-	-	-	-	-	-	-	

RUNBAU

db	BAU Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.6	18.8	24.9	27.5	28.6	25.7	21.1	17.4	14.3	11.8	
HID (HPM, HPS, MH)	5.3	10.1	11.8	11.7	10.4	7.3	4.1	2.3	1.3	0.8	
CFLni (all shapes)	0.6	2.2	2.6	2.6	2.4	1.7	0.9	0.5	0.3	0.2	
CFLi (retrofit for GLS, HL)	0.2	2.6	3.8	3.9	3.4	2.9	2.0	1.3	0.9	0.6	
GLS (DLS & NDLS)	15.2	11.3	9.4	6.6	4.1	2.5	1.5	0.9	0.6	0.4	
HL (DLS & NDLS, LV & MV)	1.3	6.7	9.8	11.2	8.5	4.5	2.5	1.4	0.8	0.5	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.1	1.4	4.4	9.2	14.6	20.2	26.1	32.9	
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.1	1.2	3.5	6.6	9.5	12.1	15.0	18.2	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.1	0.5	1.3	2.0	2.6	3.1	3.6	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.0	0.2	0.6	1.1	1.5	1.8	2.2	2.5	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.1	0.8	2.5	4.3	6.2	7.8	9.3	10.9	
<i>Standby (nrgcost only)</i>	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7	
TOTAL LIGHTING (incl. standby)	36	52	63	67	69	67	66	68	74	82	
DP TV total all types	5.6	11.8	15.5	16.2	16.0	19.0	19.9	19.5	19.7	20.9	
DP Monitor	0.2	2.3	1.6	1.1	1.1	1.0	0.9	0.8	0.8	0.8	
DP Signage	0.0	0.2	1.6	3.5	4.4	4.5	4.4	4.4	4.4	4.5	
DP Electronic Displays, total	5.8	14.2	18.6	20.7	21.5	24.5	25.1	24.7	24.9	26.2	
SSTB	0.0	0.5	0.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
CSTB (all covered modes)	0.0	1.4	3.8	3.6	3.5	3.5	3.5	3.7	3.9	4.1	
Total STB set top boxes (Complex & Simple)	0.0	1.9	4.0	3.6	3.5	3.5	3.5	3.7	3.9	4.1	
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.9	1.1	1.1	1.2	1.2	1.3	1.4	1.4	
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6	
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	
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	1.0	1.2	1.1	1.2	1.3	1.3	1.4	1.5	
Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9	
Total Game consoles > 20 W, all modes	0.0	0.7	1.4	1.6	1.6	1.7	1.7	1.8	1.9	2.0	
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	1.6	1.9	1.8	1.9	2.0	2.1	2.2	2.3	
<i>ES&DS only, without effects on infrastructure</i>											
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	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	
ES rack 2-socket traditional	0.1	2.0	1.2	0.7	0.8	1.1	1.2	1.3	1.3	1.4	
ES rack 2-socket cloud	0.0	1.1	1.9	2.1	2.6	3.2	3.6	3.8	4.0	4.2	
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	0.7	
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	0.6	0.6	0.6	0.6	
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.5	1.8	1.9	1.9	2.0	
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	0.3	
ES total traditional	0	4	3	2	2	2	3	3	3	3	
ES total cloud	0	2	3	4	4	6	6	7	7	7	
ES Enterprise Servers total	0	6	6	5	6	8	9	9	10	10	
DS Online 2	0.1	0.9	1.3	1.7	2.3	2.9	3.2	3.4	3.6	3.7	
DS Online 3	0.0	0.1	0.2	0.2	0.3	0.4	0.5	0.5	0.5	0.5	
DS Online 4	0.0	0.5	0.7	1.0	1.3	1.6	1.8	1.9	2.0	2.1	
DS Data Storage products total	0	1	2	3	4	5	5	6	6	6	
ES + DS total (excl. infrastructure)	0	7	8	8	10	13	14	15	16	17	
PC Desktop	3.1	3.6	2.7	1.7	1.9	2.3	2.3	2.4	2.4	2.3	
PC Integrated Desktop	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	
PC Notebook	0.0	1.3	1.6	1.3	1.5	1.6	1.7	1.9	1.9	2.0	
PC Tablet/slate	0.0	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	
PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
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	0.3	0.4	0.4	0.4	0.4	
Total PC, electricity	3.3	5.4	5.3	3.8	4.2	4.7	5.0	5.3	5.3	5.3	
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	0.5	0.4	0.4	0.3	0.2	0.1	
EP / Laser Printer colour	0.0	0.9	1.4	2.0	2.3	2.5	2.6	2.7	2.8	2.9	
EP / Laser Copier mono	2.0	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	0.4	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser MFD mono	0.0	1.5	2.1	2.3	2.3	2.2	2.1	2.0	1.9	1.9	
EP / Laser MFD colour	0.0	3.1	4.4	4.9	4.7	4.5	4.3	4.1	4.0	3.8	
Consumables, paper, ink, toner	16.0	25.0	19.8	14.6	10.8	9.4	8.7	8.0	7.5	7.2	
Total IE Imaging Equipment	20	32	29	25	21	19	18	17	17	16	

RUNBAU

db	BAU Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
	SB Radios (sb & off modes)	0.4	1.1	1.1	0.9	0.8	0.8	0.7	0.7	0.6	0.6
	SB Electric toothbrushes (off mode)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	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	0.6	1.1	1.1	1.2	1.3	1.3	1.4
	SB Small appliances (sb & off modes)	0.3	1.3	1.5	1.5	1.6	1.7	1.8	1.9	2.0	2.2
	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	0.9	0.2	0.0	0.0	0.0	0.0	0.0	0.0
	SB Projectors (sb & off modes)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	SB Home phones (nsb mode)	0.1	0.6	0.7	0.6	0.6	0.6	0.5	0.5	0.5	0.5
	SB Office phones (nsb mode)	0.1	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
	SB Home NAS (nsb mode)	0.0	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	0.8
	SB Home Network Equipment (nsb mode)	0.0	0.5	0.7	0.7	0.8	0.9	1.0	1.0	1.1	1.2
	SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.4	0.6	0.9	1.2	1.3	1.3	1.4
	SB Coffee makers (off mode)	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
1	SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
1	SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
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	0.6	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
1	SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.5	2.4	2.3	2.2	2.3	2.4	2.5	2.7
1	SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
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	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
1	SB IE Laser Copiers (nsb mode)	1.2	0.2	0.2	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	0.8	0.8	0.8	0.8	0.8	0.8	0.8
	Total (networked) SB (incl. double)	4	9	13	13	13	14	15	15	16	17
	Total (networked) SB (excl. double)	1	5	7	6	7	7	8	8	9	9
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	2.2	2.3	2.4	2.4	2.4	2.4	2.4	2.5
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	0.1	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	0.1	0.1	0.1	0.1
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	0.2	0.2	0.2
	EPS, total	0.0	2.1	3.3	3.2	3.3	3.3	3.3	3.4	3.4	3.5
	EPS, double counted subtracted	0.0	1.1	1.7	1.6	1.7	1.7	1.7	1.7	1.7	1.7
	TOTAL ELECTRONICS	31	68	75	71	71	76	78	78	79	81
	Total RF household Refrigerators & Freezers	23	21	24	23	24	26	27	28	30	31
	CF open vertical chilled multi deck (RVC2)	2.7	2.2	2.3	2.1	2.1	2.2	2.3	2.4	2.6	2.7
	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)	4.9	4.3	4.7	4.6	4.9	5.2	5.6	6.0	6.5	6.9
	CF Plug in one door beverage cooler	2.9	2.7	2.8	2.6	2.7	2.8	3.0	3.2	3.4	3.7
	CF Plug in horizontal ice cream freezer	0.7	0.6	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.9
	CF Spiral vending machine	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4
	Total CF Commercial Refrigeration	12	10	11	10	11	11	12	13	14	15
	PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.7	0.7
	PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8
	PF Storage cabinet Chilled Horizontal (CH)	0.2	0.3	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.6
	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	1.2	1.4	1.4	1.6	1.7	1.9	2.1	2.3	2.5
	PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.9	1.1	1.2	1.4	1.7	1.9	2.2	2.4
	PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.9	1.0	1.2	1.4	1.6	1.8	2.1	2.4
	PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.9	1.1	1.2	1.4	1.7	1.9	2.2	2.5
	PF Process Chiller AC LT L > 200 kW	0.4	0.8	0.9	1.1	1.3	1.5	1.7	2.0	2.2	2.5
	PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.3	0.4	0.5	0.5	0.6	0.7
	PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0
	PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.8	0.9
	PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1
	PF Process Chiller All MT&LT	2	4	5	6	7	8	9	10	12	13

RUNBAU

db	BAU Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.0	0.7	0.8	0.8	0.9	1.0	1.1	1.3	1.5	1.6
	PF Condensing Unit MT M 1-5 kW	2.5	1.8	1.9	2.0	2.2	2.5	2.9	3.3	3.7	4.2
	PF Condensing Unit MT L 5-20 kW	3.0	2.2	2.4	2.4	2.8	3.1	3.5	4.0	4.5	5.1
	PF Condensing Unit MT XL 20-50 kW	3.0	2.2	2.4	2.4	2.7	3.1	3.5	4.0	4.5	5.1
	PF Condensing Unit LT S 0.1-0.4 kW	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
	PF Condensing Unit LT M 0.4-2 kW	0.5	0.3	0.4	0.4	0.4	0.5	0.5	0.6	0.7	0.8
	PF Condensing Unit LT L 2-8 kW	0.8	0.5	0.6	0.6	0.7	0.8	0.9	1.0	1.1	1.3
	PF Condensing Unit LT XL 8-20 kW	2.4	1.7	1.8	1.9	2.1	2.4	2.7	3.1	3.5	4.0
0.6	PF Condensing Unit, All MT&LT	13	10	10	11	12	14	15	17	20	22
	PF Professional Refrigeration, Total	8	9	10	11	13	15	17	19	22	25
	TOTAL FOOD PRESERVATION	43	40	45	45	48	52	56	61	65	70
	CA Electric Hobs (sum all modes)	3.9	5.5	7.1	7.5	8.5	9.5	10.5	11.5	12.6	13.8
	CA Electric Ovens (sum all modes)	4.3	4.4	5.0	4.7	5.0	5.4	5.8	6.2	6.5	6.9
	CA Gas Hobs	1.7	1.7	1.8	1.6	1.6	1.6	1.7	1.7	1.7	1.8
	CA Gas Ovens	0.7	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.6	0.6
	CA Range Hoods	1.8	2.0	2.4	2.5	2.7	3.0	3.3	3.7	4.0	4.4
	TOTAL COOKING	12	14	17	17	18	20	22	24	25	28
	WM Washing Machines	20	20	21	22	23	25	27	30	32	35
	WD Washer-Dryers	2	2	3	3	3	3	3	3	4	4
	Total WM-WD household Washing	22	22	24	24	26	28	31	33	36	40
	<i>including detergent and water costs</i>	11	13	15	16	18	20	22	25	28	32
	Total DW household Dishwasher	3	6	8	9	11	14	16	19	22	25
	<i>including detergent and water costs</i>	1	3	3	4	5	7	8	10	12	14
	LD condensing heat pump	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5
	LD condensing electric heat element	0.3	1.7	2.0	1.9	2.2	2.3	2.3	2.3	2.3	2.3
	LD vented electric	1.4	1.4	1.3	1.1	1.0	1.1	1.1	1.2	1.2	1.3
	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	1.7	3.0	3.3	3.0	3.2	3.4	3.5	3.7	3.8	3.9
	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	4	4	4	4
	VC dom	1.7	2.5	3.9	4.0	6.0	6.7	7.3	7.7	7.9	7.9
	VC nondom	0.5	0.6	0.8	0.9	1.0	1.1	1.2	1.4	1.5	1.6
	Total VC Vacuum Cleaner	3	5	7	7	9	10	10	11	11	11
	<i>including costs of bags & filters</i>	1	2	2	2	2	2	2	2	2	2
	TOTAL CLEANING	30	36	42	44	50	55	61	66	73	80
0.5	FAN Axial<300Pa (all FAN types >125W)	2.9	7.2	9.3	10.3	11.9	13.3	14.1	14.8	15.5	16.3
0.5	FAN Axial>300Pa	4.9	13.0	16.5	17.3	19.0	20.5	21.6	22.7	23.8	25.0
0.5	FAN Centr.FC	1.3	2.5	3.3	3.6	4.1	4.6	4.9	5.1	5.4	5.6
0.5	FAN Centr.BC-free	3.1	5.8	7.7	8.4	9.7	11.1	12.4	13.4	14.3	15.3
0.5	FAN Centr.BC	3.3	6.7	8.9	9.7	11.3	13.0	14.7	16.5	18.8	21.5
0.5	FAN Cross-flow	0.2	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.1	1.2
	Total FAN, industrial (excl. box & roof fans)	8	18	23	25	28	32	34	37	39	42
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.7	15.0	17.0	17.7	18.5	19.0	19.3	19.3	19.1	18.6
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21.1	23.8	26.9	28.0	29.3	29.8	29.8	29.2	28.0	26.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	42.3	46.5	51.7	53.4	55.3	55.0	52.6	48.4	44.0	41.7
	Total 3ph 0.75-375 kW no VSD	77	85	96	99	103	104	102	97	91	87
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.9	1.8	2.4	2.9	3.6	4.4	5.4	6.6	8.0	9.8
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.7	3.7	4.9	6.0	7.5	9.2	11.3	13.9	17.0	20.7
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.8	10.3	13.8	17.2	21.8	27.2	33.5	41.2	49.3	56.5
	Total 3-ph 0.75-375 kW with VSD	8	16	21	26	33	41	50	62	74	87
0.45	Total 3-ph 0.75-375 kW w/wo VSD	85	101	117	125	136	145	152	159	165	173
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.0	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	1.8
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.3
	Total Small 1-ph 0.12-0.75 kW	1	1	1	1	2	2	2	2	2	2
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.5	1.6	1.8	1.9	2.0	2.1	2.2	2.4	2.5	2.6
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.1	0.2	0.2	0.3	0.3	0.4	0.4	0.5	0.5
	Total Small 3-ph 0.12-0.75 kW	1	2	2	2	2	2	3	3	3	3
0.45	Large 3-ph LV 375-1000 kW no VSD	21.6	22.5	23.4	22.3	22.1	22.0	22.8	23.8	24.8	25.8
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.1	8.1	11.3	14.7	17.5	19.6	21.6	23.8	26.2
	Total Large 3-ph LV 375-1000 kW	23	28	31	34	37	40	42	45	49	52
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.4	1.6	1.8	1.9	2.1	2.2	2.4	2.6	2.8
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.7	3.1	3.4	3.8	4.2	4.5	4.8	5.2	5.6
	Total Expl. 0.75-375 kW (no VSD)	4	5	5	6	6	7	8	8	9	9
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.3	0.4	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.7
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.3	1.6	1.7	1.9	2.1	2.3	2.4	2.6	2.8
	Total Brake 0.75-375 kW (no VSD)	2	3	3	3	4	4	4	5	5	5

RUNBAU

db	BAU Running costs (in bn euros)	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	0.1	0.1
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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
	Total 8-pole 0.75-375 kW (no VSD)	0									
0.45	1-phase motors >0.75 kW (no VSD)	6	7	8	8	9	10	11	11	12	13
	MT Elec. Motors LV 0.12-1000 kW	67	80	93	99	108	115	122	128	135	142
	Total WP Water Pumps	14	16	19	20	23	26	29	32	36	40
	CP Fixed Speed 5-1280 l/s	3.2	5.7	5.1	4.5	4.6	5.0	5.3	5.7	6.1	6.6
	CP Variable speed 5-1280 l/s	0.0	1.0	1.8	2.4	2.8	3.0	3.3	3.5	3.7	4.0
	CP Pistons 2-64 l/s	0	0	0	0	0	0	0	0	0	0
	Total CP Standard Air Compressors	3	7	7	7	8	8	9	10	10	11
	Total WE Welding Equipment	3									
	TOTAL INDUSTRY COMPONENTS	95	124	145	155	170	184	197	210	223	239
	TRAFO Distribution	1.4	2.0	2.3	2.6	3.0	3.5	4.0	4.5	5.1	5.8
	TRAFO Industry oil	1.0	1.5	1.8	2.0	2.3	2.6	3.0	3.4	3.8	4.2
	TRAFO Industry dry	0.3	0.5	0.6	0.6	0.7	0.8	0.9	1.1	1.2	1.3
	TRAFO Power	3.9	5.2	6.1	6.9	8.0	9.1	10.4	11.8	13.3	14.9
	TRAFO DER oil	0.0	0.0	0.1	0.2	0.3	0.5	0.8	1.3	1.9	2.7
	TRAFO DER dry	0.0	0.2	0.4	0.7	1.2	2.0	3.4	5.4	8.0	11.3
	TRAFO Small	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
	Total TRAFO Utility Transformers	7	10	11	13	16	19	23	28	34	40
	TOTAL ENERGY SECTOR (energy already included in power generation factor, so reference=0)	0									
	Tyres C1, replacement for cars	37	40	36	35	39	42	44	46	49	51
	Tyres C1, OEM for cars	11	12	11	11	12	13	13	14	15	15
	Tyres C1, total	48	51	47	46	50	54	57	60	63	66
	Tyres C2, replacement for vans	8	11	10	11	13	15	16	17	17	18
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	9	13	12	13	15	18	19	20	21	22
	Tyres C3, replacement for trucks/busses	12	14	13	16	19	23	26	29	31	34
	Tyres C3, OEM for trucks/busses	3	3	3	4	4	5	6	6	7	8
	Tyres C3, total	14	17	16	20	24	29	32	35	38	42
	Tyres, total C1+C2+C3	71	81	74	79	89	100	109	115	123	130
	TRANSPORT SECTOR	71	81	74	79	89	100	109	115	123	130
	GENERAL TOTAL (in bn euros)	547	722	777	769	810	858	906	960	1023	1095
	BAU Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	32	49	54	50	50	53	58	64	70	76
	SPACE HEATING	176	220	219	198	195	195	200	208	220	232
	SPACE COOLING	13	29	34	35	38	41	44	47	50	54
	VENTILATION (elec. & maint.)	6	8	10	10	11	13	16	18	21	24
1	VENTILATION (from heat saving vs. BAU; already included in COST for space heating)	0									
	LIGHTING	36	52	63	67	69	67	66	68	74	82
	ELECTRONICS	31	68	75	71	71	76	78	78	79	81
	FOOD PRESERVATION	43	40	45	45	48	52	56	61	65	70
	COOKING	12	14	17	17	18	20	22	24	25	28
	CLEANING	30	36	42	44	50	55	61	66	73	80
	INDUSTRY COMPONENTS	95	124	145	155	170	184	197	210	223	239
	ENERGY SECTOR	0									
	TRANSPORT SECTOR	71	81	74	79	89	100	109	115	123	130
	TOTAL in bn euros	547	722	777	769	810	858	906	960	1023	1095

RUNECO

db ECO Running costs (in bn euros 2015)	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	2	1	1	1	1	2	2	2
EIWHS Electric Instant. Shower (secondary)	2	2	3	2	2	2	3	3	3	3
ESWH Electric Storage ≤ 30 L (secondary)	2	2	3	2	2	3	3	3	4	4
ESWH Electric Storage > 30 L (primary)	12	15	17	16	16	16	18	20	22	25
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	0	0	0	0	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	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	1	1	1	2	2	3
Dedicated WH Solar (3.5 m ²)	0	2	2	2	2	2	2	2	2	3
WH dedicated Water Heater	21	28	30	27	27	28	31	34	38	42
CHB Gas Combi Instant. WH	4	11	12	11	10	10	11	10	10	10
CHB Gas + Cyl. WH	2	4	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	4	5	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	1	1	1
CHB Electric HP + Cyl. WH	0	0	1	1	1	2	3	4	6	7
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 m ²)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	11	22	22	19	19	19	20	21	23	25
TOTAL WATER HEATING	32	49	53	47	45	47	51	56	61	66
CHB Gas non-condensing	49	65	55	31	16	8	3	2	1	1
CHB Gas condensing	1	21	34	43	54	59	61	58	55	51
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	48	54	36	27	17	8	3	1	1	1
CHB Oil Jet burner condensing	0	1	2	3	5	7	8	9	10	11
CHB Electric Joule-effect	3	2	3	3	3	3	3	2	2	2
CHB Hybrid (gas-electric)	0	0	0	0	0	1	1	2	3	4
CHB Electric Heat Pump	0	2	3	4	6	9	13	17	22	26
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	1	1
CHB Solar combi (16 m ²)	0	0	1	0	0	0	0	0	0	0
CHB Central Heating boiler < 400 kW, space heating	106	151	137	114	104	96	94	94	97	98
SFB Wood Manual	10	3	3	3	2	1	1	0	0	0
SFB Wood Direct Draft	0	1	2	3	4	4	5	6	7	9
SFB Coal	7	3	2	3	2	2	1	1	1	2
SFB Pellets	0	0	1	1	2	2	2	2	3	3
SFB Wood chips	0	0	0	1	1	1	1	1	1	1
Total Solid Fuel Boiler	17	8	9	10	10	9	9	11	12	15
CHAE-S (≤ 400 kW)	0.8	2.3	2.9	3.2	3.4	3.6	3.8	4.1	4.4	4.7
CHAE-L (> 400 kW)	0.9	2.0	2.4	2.5	2.5	2.5	2.4	2.4	2.4	2.4
CHWE-S (≤ 400 kW)	0.1	0.2	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6
CHWE-L (> 1500 kW)	0.1	0.3	0.4	0.4	0.4	0.4	0.4	0.4	0.4	0.4
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	3.4	4.8	5.8	6.0	6.3	6.6	7.0	7.5	8.1	8.7
HT PCH-AE-L	3.3	4.6	5.5	5.7	5.9	6.0	6.2	6.6	7.1	7.6
HT PCH-WE-S	0.7	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
HT PCH-WE-M	1.4	2.1	2.5	2.6	2.9	3.0	3.3	3.5	3.8	4.0
HT PCH-WE-L	0.3	0.4	0.5	0.5	0.6	0.6	0.6	0.7	0.7	0.8
AC rooftop	0.6	1.4	1.6	1.4	1.1	0.7	0.4	0.2	0.1	0.1
AC splits	0.9	2.6	2.9	2.7	2.6	2.5	2.3	2.2	2.1	2.0
AC VRF	0.0	1.4	2.3	3.3	4.3	5.6	6.8	7.9	9.0	9.9
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	13	24	29	31	32	34	36	38	41	44
AC rooftop (rev)	0.7	2.0	2.2	1.8	1.4	0.9	0.4	0.1	0.0	0.0
AC splits (rev)	1.4	3.9	4.5	4.2	4.0	3.7	3.4	3.3	3.1	2.9
AC VRF (rev)	0.0	1.9	3.1	4.4	5.6	7.1	8.4	9.2	10.0	10.4
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
AHF	8.1	8.0	6.9	5.3	4.6	4.0	3.7	3.5	3.3	3.2
AHE	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Air Heating	10	16	17	16	16	16	16	17	17	17
Total AHC Air Heating & Cooling	23	38	44	43	45	45	47	49	52	55

RUNECO

db	ECO Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0.6	0.9	1.2	1.3	1.3	1.3	1.3	1.3	1.3	1.4	1.5
LH closed fireplace/inset	0.6	1.6	2.6	3.1	3.6	4.0	4.3	4.6	4.8	5.2	
LH wood stove	1.2	1.4	1.9	2.0	2.2	2.3	2.4	2.6	2.7	2.9	
LH coal stove	0.5	0.4	0.2	0.3	0.4	0.3	0.3	0.3	0.3	0.3	0.3
LH cooker	0.4	0.7	1.0	1.2	1.3	1.5	1.6	1.7	1.7	1.8	
LH SHR stove	0.5	0.8	1.2	1.4	1.6	1.9	2.3	2.6	2.9	3.3	
LH pellet stove	0.0	0.4	0.7	0.9	1.1	1.3	1.4	1.6	1.7	1.8	
LH Solid fuel sum	4	6	9	10	11	13	14	15	16	17	
LH Electric portable	4.6	3.7	4.0	3.5	3.3	3.2	3.2	3.2	3.2	3.2	3.2
LH Electric fixed > 250W	24.3	19.1	19.8	16.0	13.6	12.1	11.9	11.9	12.0	12.0	
LH Electric fixed ≤ 250W	1.7	1.3	1.3	1.1	0.9	0.8	0.8	0.8	0.8	0.8	
LH Electric storage	1.4	1.1	1.2	1.0	0.9	0.8	0.8	0.8	0.8	0.8	
LH Electric underfloor	4.1	3.6	4.0	3.7	3.7	3.8	3.8	3.8	3.8	3.8	
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	1.7	2.0	1.9	1.8	1.7	1.7	1.7	1.7	1.7	
LH Electric sum	38	31	33	28	25	23	22	23	23	23	
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	0.3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
LH Gas balanced flue	0.7	0.4	0.4	0.2	0.2	0.1	0.1	0.1	0.1	0.1	
LH Gas fluless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LH Gaseous fuel sum	1.2	0.9	0.8	0.6	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	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
LH Liquid fluless	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	43	38	43	38	36	36	37	38	39	40	
RAC fixed < 6 kW, cooling	0.4	2.8	2.6	1.8	1.9	2.2	2.6	3.0	3.5	4.0	
RAC fixed 6-12 kW, cooling	0.2	1.2	1.2	0.9	1.0	1.1	1.2	1.4	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	4.2	4.0	2.9	3.0	3.5	4.0	4.6	5.2	6.0	
RAC fixed < 6 kW, reversible, heating	0.2	3.0	3.6	3.3	4.3	5.9	7.8	10.0	12.4	14.5	
RAC fixed 6-12 kW, reversible, heating	0.1	1.3	1.7	1.6	2.1	2.7	3.5	4.4	5.2	5.9	
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	4.3	5.4	5.0	6.4	8.7	11.3	14.4	17.6	20.5	
RAC Room Air Conditioner	1	9	9	8	9	12	15	19	23	26	
¹ CIRC Integrated circulators	2.6	3.3	3.5	2.7	2.5	2.7	2.9	3.1	3.3	3.4	
¹ CIRC Large standalone circulators	1.6	2.0	1.9	1.3	1.2	1.1	1.1	1.1	1.2	1.2	
¹ CIRC Small standalone circulators	1.3	1.6	1.4	0.9	0.8	0.7	0.7	0.7	0.8	0.8	
¹ CIRC Circulator pumps <2.5 kW	5.5	6.9	6.7	4.8	4.4	4.6	4.7	4.9	5.2	5.4	
TOTAL SPACE HEATING	176	217	211	184	173	166	168	173	182	190	
TOTAL SPACE COOLING	13	28	33	33	35	37	40	43	46	50	
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	0.6	1.0	1.4	1.9	2.3	
R-UVU 100-250 m3/h	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	
R-BVU 100-250 m3/h	0.0	0.0	0.0	0.1	0.1	0.2	0.3	0.4	0.5	0.6	
R-UVU 250-1000 m3/h	0.5	1.2	1.4	1.4	1.4	1.4	1.4	1.5	1.6	1.6	
R-BVU 250-1000 m3/h	0.0	0.1	0.2	0.2	0.5	0.9	1.3	1.8	2.4	3.0	
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	0.1	0.1	0.1	0.1	0.1	0.1	
RVU, Total residential	0.7	1.7	2.0	2.1	2.6	3.5	4.5	5.6	6.8	8.1	
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	0.9	
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	0.2	0.3	0.3	0.4	0.4	0.5	0.6	
NR-AHU-S 2500-5500 m3/h	0.0	0.5	0.7	0.8	1.0	1.1	1.3	1.5	1.8	2.0	
NR-AHU-M 5500-14500 m3/h	3.5	4.2	4.5	4.2	4.3	4.5	4.8	5.2	5.6	6.1	
NR-AHU-L > 14500 m3/h	1.0	1.2	1.3	1.3	1.3	1.3	1.4	1.5	1.6	1.8	
NRVU, Total non-residential	4.8	6.8	7.6	7.5	7.8	8.3	9.1	10.0	10.9	11.9	
VU Ventilation Units, res + non-res.	5.5	8.5	9.6	9.6	10.4	11.8	13.5	15.5	17.6	19.9	
TOTAL VENTILATION (VU own electricity & maint.)	6	8	10	10	10	12	14	16	18	20	
¹ Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)	-	-	-0	-1	-3	-4	-5	-6	-7	-7	

RUNECO

db	ECO Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	13.6	18.6	24.0	25.2	21.4	12.6	6.0	3.1	1.9	1.2	
HID (HPM, HPS, MH)	5.3	10.0	9.6	8.0	6.2	3.4	1.4	0.5	0.2	0.1	
CFLni (all shapes)	0.6	2.2	2.4	2.0	1.3	0.7	0.3	0.1	0.0	0.0	
CFLi (retrofit for GLS, HL)	0.2	3.3	4.7	3.6	1.3	0.4	0.0	0.0	0.0	0.0	
GLS (DLS & NDLS)	15.2	7.7	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HL (DLS & NDLS, LV & MV)	1.3	7.4	10.3	4.2	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	7.0	13.9	19.8	24.5	29.0	34.3	
LED replacing HID (retrofit & luminaire)	0.0	0.0	1.6	3.3	5.5	7.8	10.0	12.2	14.6	17.4	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.1	0.5	1.2	1.8	2.2	2.6	3.0	3.5	
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.2	0.8	1.5	1.7	1.9	2.1	2.3	2.6	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	0.4	2.8	5.5	6.9	7.9	8.8	9.9	11.1	
Standby (nrgcost only)	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7	
TOTAL LIGHTING (incl. standby)	38	51	58	54	53	50	51	55	63	72	
DP TV total all types	5.6	11.8	14.4	12.6	9.2	9.2	8.9	9.7	11.1	12.9	
DP Monitor	0.2	2.3	1.4	0.6	0.5	0.4	0.3	0.3	0.4	0.4	
DP Signage	0.0	0.2	1.6	3.5	4.3	3.7	3.0	3.0	3.6	4.3	
DP Electronic Displays, total	5.8	14.2	17.4	16.7	14.1	13.4	12.2	13.1	15.1	17.6	
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	3.4	2.6	2.6	2.6	2.7	2.9	3.0	3.2	
Total STB set top boxes (Complex & Simple)	0.0	1.7	3.6	2.6	2.6	2.6	2.7	2.9	3.0	3.2	
Game consoles > 20 W Active modes (SRI)	0.0	0.4	0.8	0.7	0.7	0.8	0.8	0.9	0.9	1.0	
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	
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	0.8	0.7	0.8	0.8	0.8	0.9	0.9	1.0	
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	1.1	0.9	0.9	0.9	1.0	1.0	1.1	1.1	
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	0.9	1.3	1.0	1.0	1.0	1.1	1.1	1.2	1.2	
<i>ES&DS only, without effects on infrastructure</i>											
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	0.1
ES rack 1-socket traditional	0.0	0.4	0.4	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
ES rack 2-socket traditional	0.1	2.0	1.2	0.6	0.8	1.0	1.1	1.2	1.2	1.3	
ES rack 2-socket cloud	0.0	1.1	1.9	2.0	2.4	3.0	3.4	3.6	3.8	4.0	
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	0.6	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	0.6	0.6	0.6	
ES blade 2-socket cloud	0.0	0.5	0.8	1.0	1.2	1.5	1.7	1.8	1.9	2.0	
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	3	2	2	2	2	3	3	3	
ES total cloud	0	2	3	3	4	5	6	6	7	7	
ES Enterprise Servers total	0	6	6	5	6	7	8	9	9	10	
DS Online 2	0.1	0.9	1.3	1.7	2.3	2.8	3.1	3.3	3.5	3.6	
DS Online 3	0.0	0.1	0.2	0.2	0.3	0.4	0.4	0.5	0.5	0.5	
DS Online 4	0.0	0.5	0.7	0.9	1.2	1.6	1.7	1.8	1.9	2.0	
DS Data Storage products total	0	1	2	3	4	5	5	6	6	6	
ES + DS total (excl. infrastructure)	0	7	8	8	10	12	14	14	15	16	
PC Desktop	3.1	3.6	2.7	1.7	1.9	2.3	2.3	2.4	2.4	2.3	
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	1.3	1.6	1.3	1.5	1.6	1.7	1.9	1.9	2.0	
PC Tablet/slate	0.0	0.0	0.5	0.4	0.3	0.3	0.3	0.3	0.4	0.4	
PC Thin client	0.0	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	
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	0.3	0.4	0.4	0.4	0.4	
Total PC, electricity	3.3	5.4	5.3	3.8	4.2	4.7	5.0	5.3	5.3	5.3	
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	0.7	0.5	0.4	0.3	0.3	0.2	0.2	0.1	
EP / Laser Printer colour	0.0	0.8	1.3	1.7	2.0	2.2	2.3	2.3	2.4	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	1.4	1.9	2.0	1.9	1.8	1.7	1.7	1.6	1.5	
EP / Laser MFD colour	0.0	3.1	4.2	4.5	4.3	4.1	3.9	3.7	3.5	3.4	
Consumables, paper, ink, toner	16.0	24.8	19.1	14.0	10.4	9.0	8.3	7.7	7.2	6.9	
Total IE Imaging Equipment	20	32	28	23	19	18	17	16	15	14	

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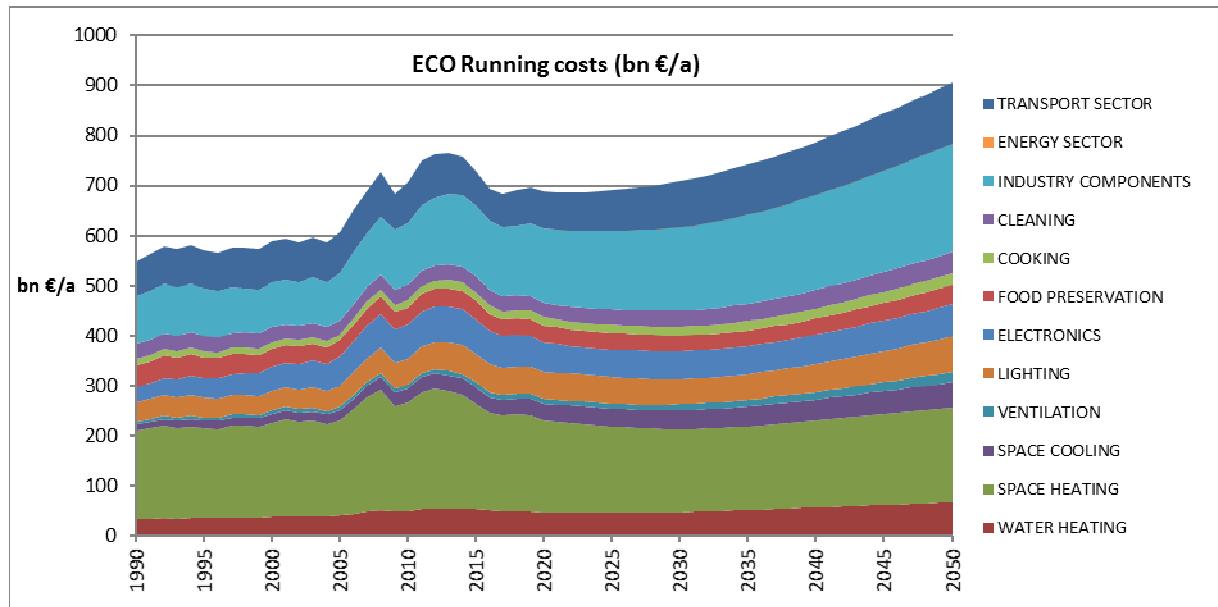
db	ECO Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
SB Radios (sb & off modes)	0.4	1.1	0.9	0.6	0.5	0.5	0.5	0.5	0.5	0.4	0.4
SB Electric toothbrushes (off mode)	0.0	0.1	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	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	0.0
SB Audio speakers (wireless) (nsb & off modes)	0.0	0.0	0.1	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5
SB Small appliances (sb & off modes)	0.3	1.2	1.0	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.0
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	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	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	0.0
SB Home phones (nsb mode)	0.1	0.6	0.7	0.6	0.4	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	0.1	0.2	0.2	0.2	0.2	0.2
SB Home NAS (nsb mode)	0.0	0.2	0.3	0.1	0.2	0.2	0.2	0.3	0.3	0.3	0.3
SB Home Network Equipment (nsb mode)	0.0	0.5	0.7	0.6	0.7	0.8	0.9	0.9	1.0	1.0	1.0
SB Office Network Equipment (nsb mode)	0.0	0.0	0.2	0.2	0.3	0.5	0.6	0.7	0.7	0.7	0.7
SB Coffee makers (off mode)	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
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	0.1
1 SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	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	0.0
1 SB Electric Ovens (sb mode)	0.0	0.5	0.7	0.5	0.4	0.2	0.2	0.2	0.2	0.2	0.2
1 SB Electric Hobs (sb mode)	0.0	0.2	0.3	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	2.2	1.7	1.7	1.7	1.8	1.9	2.0	2.0	2.0
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	0.2
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	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	0.1
1 SB IE Laser Printers (nsb mode)	1.1	0.3	0.3	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
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	0.0
1 SB IE Laser MFDs (nsb mode)	0.0	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Total (networked) SB (incl. double)	4	9	10	7	7	7	7	8	8	8	8
Total (networked) SB (excl. double)	1	5	5	4	4	4	4	5	5	5	5
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
0.3 EPS 6–10 W	0.0	0.3	0.3	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
0.6 EPS 10–12 W	0.0	1.2	1.9	1.7	1.5	1.6	1.7	1.8	1.9	2.0	2.0
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	0.0
1.0 EPS 20–30 W	0.0	0.1	0.2	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	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	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	0.0
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
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	0.1
EPS, total	0.0	2.1	2.8	2.3	2.0	2.1	2.3	2.4	2.6	2.7	2.7
EPS, double counted subtracted	0.0	1.1	1.4	1.1	1.0	1.0	1.1	1.1	1.2	1.2	1.3
TOTAL ELECTRONICS	31	67	70	60	55	57	57	58	61	64	
Total RF household Refrigerators & Freezers	23	15	15	12	11	9	8	8	7	7	
CF open vertical chilled multi deck (RVC2)	2.7	2.2	2.3	2.1	1.9	1.5	1.2	1.2	1.2	1.3	
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)	4.9	4.3	4.7	4.6	4.6	4.3	4.2	4.3	4.6	4.9	
CF Plug in one door beverage cooler	2.9	2.7	2.8	2.6	2.2	1.7	1.6	1.7	1.8	1.9	
CF Plug in horizontal ice cream freezer	0.7	0.6	0.7	0.6	0.6	0.5	0.5	0.5	0.6	0.6	
CF Spiral vending machine	0.7	0.5	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	
Total CF Commercial Refrigeration	12.1	10.4	11.1	10.3	9.7	8.5	7.9	8.1	8.6	9.2	
PF Storage cabinet Chilled Vertical (CV)	0.3	0.3	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	
PF Storage cabinet Frozen Vertical (FV)	0.3	0.4	0.5	0.4	0.3	0.3	0.4	0.4	0.5	0.5	
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	1.2	1.4	1.2	1.0	1.0	1.1	1.2	1.3	1.5	
PF Process Chiller AC MT S ≤ 300 kW	0.4	0.7	0.9	1.0	1.2	1.3	1.5	1.7	2.0	2.2	
PF Process Chiller AC MT L > 300 kW	0.4	0.7	0.9	1.0	1.1	1.3	1.5	1.7	1.9	2.2	
PF Process Chiller AC LT S ≤ 200 kW	0.4	0.7	0.9	1.0	1.2	1.4	1.5	1.8	2.0	2.3	
PF Process Chiller AC LT L > 200 kW	0.4	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.1	2.4	
PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.3	0.4	0.4	0.5	0.6	0.6	
PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.9	
PF Process Chiller WC LT S ≤ 200 kW	0.1	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	
PF Process Chiller WC LT L > 200 kW	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	
PF Process Chiller All MT&LT	2	4	5	6	6	7	8	10	11	12	

RUNECO

db	ECO Running costs (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.0	0.7	0.8	0.7	0.8	0.9	1.0	1.2	1.3	1.5
	PF Condensing Unit MT M 1-5 kW	2.5	1.8	1.9	1.9	2.1	2.4	2.7	3.0	3.4	3.9
	PF Condensing Unit MT L 5-20 kW	3.0	2.2	2.4	2.3	2.5	2.9	3.2	3.7	4.2	4.7
	PF Condensing Unit MT XL 20-50 kW	3.0	2.2	2.4	2.3	2.5	2.9	3.2	3.7	4.2	4.7
	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	0.4	0.3	0.4	0.4	0.5	0.5	0.6	0.7
	PF Condensing Unit LT L 2-8 kW	0.8	0.5	0.6	0.5	0.6	0.7	0.7	0.8	1.0	1.1
	PF Condensing Unit LT XL 8-20 kW	2.4	1.7	1.8	1.8	1.9	2.2	2.5	2.8	3.2	3.6
0.6	PF Condensing Unit, All MT&LT	13	10	10	10	11	12	14	16	18	20
	PF Professional Refrigeration, Total	8	9	10	11	12	13	15	17	19	22
	TOTAL FOOD PRESERVATION	43	35	36	33	32	31	31	33	35	38
	CA Electric Hobs (sum all modes)	3.9	5.5	7.0	7.3	8.2	9.1	10.1	11.1	12.1	13.3
	CA Electric Ovens (sum all modes)	4.3	4.4	4.8	4.2	4.0	4.0	4.2	4.5	4.7	5.0
	CA Gas Hobs	1.7	1.7	1.8	1.5	1.6	1.6	1.6	1.7	1.7	1.7
	CA Gas Ovens	0.7	0.6	0.6	0.5	0.4	0.4	0.4	0.4	0.4	0.4
	CA Range Hoods	1.8	2.0	2.4	2.3	2.4	2.3	2.4	2.6	2.9	3.1
	TOTAL COOKING	12	14	17	16	17	18	19	20	22	24
	WM Washing Machines	20	15	15	14	14	15	16	17	18	20
	WD Washer-Dryers	2	2	2	2	2	2	2	2	3	3
	Total WM-WD household Washing	22	18	17	16	16	17	18	19	21	22
	<i>including detergent and water costs</i>	11	11	10	10	10	11	12	13	14	16
	Total DW household Dishwasher	3	5	6	7	8	9	10	12	13	15
	<i>including detergent and water costs</i>	1	2	3	3	4	4	5	6	7	8
	LD condensing heat pump	0.0	0.2	0.5	0.8	1.0	1.2	1.3	1.4	1.5	1.5
	LD condensing electric heat element	0.3	1.7	1.8	1.3	1.0	0.9	0.8	0.8	0.8	0.8
	LD vented electric	1.4	1.3	1.1	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	1.7	3.0	3.1	2.4	2.2	2.1	2.1	2.1	2.2	2.2
	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	2						
	VC dom	1.7	2.5	3.2	1.7	2.2	2.1	2.0	1.8	1.6	1.5
	VC nondom	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.8	0.8	0.9
	Total VC Vacuum Cleaner	3	5	6	4	5	5	4	4	4	4
	<i>including costs of bags & filters</i>	1	2	2	2	2	2	2	2	2	2
	TOTAL CLEANING	30	31	32	29	31	33	35	37	40	43
0.5	FAN Axial<300Pa (all FAN types >125W)	2.9	7.2	9.0	9.3	10.1	10.8	11.3	11.9	12.4	13.0
0.5	FAN Axial>300Pa	4.9	13.0	16.2	16.3	16.9	17.6	18.3	19.2	20.2	21.1
0.5	FAN Centr.FC	1.3	2.5	3.2	3.2	3.3	3.4	3.6	3.7	3.9	4.1
0.5	FAN Centr.BC-free	3.1	5.8	7.4	7.6	8.4	9.4	10.5	11.3	12.1	12.9
0.5	FAN Centr.BC	3.3	6.7	8.5	8.8	9.6	10.9	12.3	13.8	15.7	17.9
0.5	FAN Cross-flow	0.2	0.4	0.4	0.3	0.3	0.3	0.3	0.4	0.4	0.5
	Total FAN, industrial (excl. box & roof fans)	7.9	17.7	22.4	22.7	24.3	26.2	28.1	30.1	32.4	34.8
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	13.7	15.0	16.3	14.8	13.7	14.0	14.6	15.2	15.8	16.4
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21.1	23.8	25.9	23.4	21.1	21.0	21.6	22.2	22.7	23.3
0.45	Medium (L) 3-ph 75-375 kW no VSD	42.3	46.5	49.9	46.4	43.0	38.9	38.3	38.1	38.2	39.3
	Total 3ph 0.75-375 kW no VSD	77	85	92	85	78	74	75	75	77	79
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.9	1.8	2.5	4.0	5.7	6.4	7.2	8.0	9.0	10.0
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.7	3.7	5.4	8.6	12.2	14.0	15.6	17.4	19.5	21.6
0.45	Medium (L) 3-ph 75-375 kW with VSD	4.8	10.4	14.8	21.3	28.8	36.1	40.9	45.8	51.1	56.1
	Total 3-ph 0.75-375 kW with VSD	8	16	23	34	47	57	64	71	80	88
	Total 3-ph 0.75-375 kW w/wo VSD	85	101	115	119	124	130	138	147	156	167
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.0	1.2	1.3	1.4	1.4	1.4	1.4	1.5	1.6	1.7
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
	Total Small 1-ph 0.12-0.75 kW	1	1	1	1	2	2	2	2	2	2
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.5	1.6	1.8	1.9	1.9	2.0	2.1	2.2	2.3	2.4
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.4	0.4	0.5
	Total Small 3-ph 0.12-0.75 kW	1	2	2	2	2	2	2	3	3	3
0.45	Large 3-ph LV 375-1000 kW no VSD	21.6	22.5	23.4	22.3	22.0	22.0	22.7	23.6	24.6	25.7
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.1	8.1	11.3	14.6	17.3	19.3	21.2	23.4	25.8
	Total Large 3-ph LV 375-1000 kW	23	28	31	34	37	39	42	45	48	51
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.5	0.6	0.7	0.7	0.7	0.8	0.8	0.9	1.0
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.1	1.4	1.6	1.8	1.9	2.1	2.2	2.4	2.5	2.7
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.7	3.1	3.4	3.8	4.1	4.4	4.8	5.1	5.5
	Total Expl. 0.75-375 kW (no VSD)	4	5	5	6	6	7	7	8	9	9
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.7
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.1	1.2	1.3	1.4	1.5	1.6	1.7	1.8
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.3	1.6	1.7	1.9	2.1	2.2	2.4	2.6	2.8
	Total Brake 0.75-375 kW (no VSD)	2	3	3	3	4	4	4	5	5	5

RUNECO

db	ECO Running costs (in bn euros)	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	0.1
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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
0.45	Total 8-pole 0.75-375 kW (no VSD)	0									
0.45	1-phase motors >0.75 kW (no VSD)	6	7	8	8	9	10	10	11	12	12
	MT Elec. Motors LV 0.12-1000 kW	67	80	92	96	101	107	113	121	129	138
	Total WP Water Pumps	14	16	19	20	22	25	28	31	35	38
	CP Fixed Speed 5-1280 l/s	3.2	5.7	5.1	4.4	4.5	4.8	5.2	5.6	6.0	6.5
	CP Variable speed 5-1280 l/s	0.0	1.0	1.8	2.4	2.8	3.0	3.2	3.4	3.7	3.9
	CP Pistons 2-64 l/s	0.3	0.3	0.3	0.3	0.3	0.3	0.4	0.4	0.4	0.4
	Total CP Standard Air Compressors	3	7	7	7	8	8	9	9	10	11
	Total WE Welding Equipment	3									
	TOTAL INDUSTRY COMPONENTS	95	124	143	148	158	169	181	195	209	225
	TRAFO Distribution	1.4	2.0	2.2	2.4	2.6	2.8	3.1	3.3	3.6	3.8
	TRAFO Industry oil	1.0	1.5	1.7	1.7	1.8	1.8	1.8	1.9	2.2	2.4
	TRAFO Industry dry	0.3	0.5	0.5	0.6	0.6	0.7	0.7	0.8	0.9	1.0
	TRAFO Power	3.9	5.2	6.1	6.9	8.0	9.1	10.4	11.8	13.3	14.9
	TRAFO DER oil	0.0	0.0	0.1	0.1	0.2	0.3	0.5	0.8	1.1	1.6
	TRAFO DER dry	0.0	0.2	0.4	0.6	0.9	1.6	2.6	4.1	6.1	8.5
	TRAFO Small	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
	Total TRAFO Utility Transformers	6.9	9.6	11.2	12.4	14.3	16.6	19.4	22.9	27.3	32.5
	TOTAL ENERGY SECTOR (only improvement over BAU)	0	0	0	-1	-1	-2	-3	-5	-6	-8
	Tyres C1, replacement for cars	37	39	31	32	34	37	39	41	44	47
	Tyres C1, OEM for cars	11	12	11	11	11	11	12	13	14	15
	Tyres C1, total	48	51	42	43	45	48	51	54	58	62
	Tyres C2, replacement for vans	8	10	9	10	12	13	15	15	16	17
	Tyres C2, OEM for vans	2	2	2	2	3	3	3	3	4	4
	Tyres C2, total	9	13	11	13	14	16	18	19	20	21
	Tyres C3, replacement for trucks/busses	12	14	12	16	18	22	25	27	29	32
	Tyres C3, OEM for trucks/busses	3	3	3	4	4	5	6	6	7	7
	Tyres C3, total	14	17	15	19	22	27	30	33	36	39
	Tyres, total C1+C2+C3	71	80	68	75	81	91	99	106	114	122
	TRANSPORT SECTOR	71	80	68	75	81	91	99	106	114	122
	GENERAL TOTAL (in bn euros)	549	705	729	688	690	709	741	787	844	907
	ECO Running costs (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	32	49	53	47	45	47	51	56	61	66
	SPACE HEATING	176	217	211	184	173	166	168	173	182	190
	SPACE COOLING	13	28	33	33	35	37	40	43	46	50
	VENTILATION	6	8	10	10	10	12	14	16	18	20
1	<i>VENTILATION (from heat saving vs. BAU; already included in COST for space heating)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>-1</i>	<i>-3</i>	<i>-4</i>	<i>-5</i>	<i>-6</i>	<i>-7</i>	<i>-7</i>
	LIGHTING	38	51	58	54	53	50	51	55	63	72
	ELECTRONICS	31	67	70	60	55	57	57	58	61	64
	FOOD PRESERVATION	43	35	36	33	32	31	31	33	35	38
	COOKING	12	14	17	16	17	18	19	20	22	24
	CLEANING	30	31	32	29	31	33	35	37	40	43
	INDUSTRY COMPONENTS	95	124	143	148	158	169	181	195	209	225
	ENERGY SECTOR	0	0	0	-1	-1	-2	-3	-5	-6	-8
	TRANSPORT SECTOR	71	80	68	75	81	91	99	106	114	122
	TOTAL in bn euros	549	705	729	688	690	709	741	787	844	907



Running costs saving ECO vs. BAU	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0	0	1	3	5	6	7	8	9	10
SPACE HEATING	0	3	8	14	23	29	33	35	38	41
SPACE COOLING	0	1	2	2	3	3	4	4	4	4
VENTILATION (elec. & maint.)	0	0	0	0	1	2	2	3	3	4
VENTILATION (from heat saving vs. BAU; already included in COST for space heating)	-4	-5	-1	3	4	6	7	8	9	10
LIGHTING (incl. SPL, ctrl, sb)	-2	0	5	13	16	17	15	13	11	10
ELECTRONICS	0	1	6	11	15	19	21	20	19	18
FOOD PRESERVATION	0	5	9	11	16	21	25	28	30	32
COOKING	0	0	0	1	2	2	3	3	4	4
CLEANING	0	6	10	14	19	23	26	29	33	37
INDUSTRY COMPONENTS	0	0	2	6	12	15	16	15	14	14
ENERGY SECTOR	0	0	0	1	1	2	3	5	6	8
TRANSPORT SECTOR	0	1	7	4	8	9	9	9	9	8
TOTAL in bn euros	-2	17	49	81	120	149	165	172	179	189
Saving in % versus BAU (from 1990=0)	-0.3%	2.3%	6.3%	10.6%	14.8%	17.4%	18.2%	18.0%	17.5%	17.2%
Saving In % versus BAU (from 2010=0)	-3.3%	0.0%	4.1%	8.4%	12.8%	15.5%	16.4%	16.2%	15.9%	15.7%

EXPENSBAU

db BAU Expenditure (in bn euros 2015)	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	3
EIWHS Electric Instant. Shower (secondary)	2	3	3	3	3	3	3	4	4	4
ESWH Electric Storage ≤ 30 L (secondary)	2	3	3	3	3	3	3	4	4	4
ESWH Electric Storage > 30 L (primary)	13	17	19	18	18	20	22	24	26	29
GIWH Gas Instant. < 13 L/min (secondary)	2	2	2	2	1	1	1	1	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	1	1	1	1	0	0	0	0
Dedicated WH Heat Pump	0	0	0	1	1	2	2	3	4	5
Dedicated WH Solar (3.5 m ²)	1	3	3	3	3	3	3	4	4	4
WH dedicated Water Heater	24	31	35	33	33	36	39	43	47	52
CHB Gas Combi Instant. WH	5	12	14	13	13	14	15	16	17	18
CHB Gas + Cyl. WH	3	5	5	5	5	5	6	6	7	7
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	4	3	2	2	2	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	1	2	2	3	3	4	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 m ²)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	14	25	25	24	24	25	27	29	31	34
TOTAL WATER HEATING	38	56	60	56	57	61	66	72	79	86
CHB Gas non-condensing	54	69	61	42	33	30	28	26	24	22
CHB Gas condensing	1	30	42	49	61	67	73	76	81	84
CHB Gas Jet burner non-condensing	7	5	4	2	2	1	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	57	57	38	30	21	12	8	7	7	6
CHB Oil Jet burner condensing	0	2	3	4	6	7	8	9	10	11
CHB Electric Joule-effect	3	3	3	3	3	3	3	3	3	2
CHB Hybrid (gas-electric)	0	0	0	0	0	0	1	1	1	2
CHB Electric Heat Pump	1	5	7	8	10	12	14	16	19	22
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 m ²)	1	1	1	1	1	1	1	1	1	1
CHB Central Heating boiler < 400 kW, space heating	123	171	159	142	138	136	138	142	148	155
SFB Wood Manual	11	4	4	3	2	1	1	1	1	1
SFB Wood Direct Draft	0	2	4	5	6	6	7	8	10	13
SFB Coal	7	5	2	3	3	2	2	2	2	2
SFB Pellets	0	1	1	2	2	3	3	3	4	4
SFB Wood chips	0	1	1	1	1	1	1	1	1	2
Total Solid Fuel Boiler	18	12	12	13	13	13	14	15	18	21
CHAE-S (≤ 400 kW)	1.1	3.8	4.5	5.0	5.4	5.8	6.3	6.8	7.3	7.7
CHAE-L (> 400 kW)	1.0	2.3	2.7	2.8	2.9	2.9	2.9	2.9	2.9	2.9
CHWE-S (≤ 400 kW)	0.1	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
CHWE-L (> 1500 kW)	0.2	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.5
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	3.6	5.1	6.1	6.5	7.1	7.6	8.0	8.5	9.1	9.6
HT PCH-AE-L	3.4	4.8	5.8	6.1	6.6	7.1	7.5	8.0	8.4	9.0
HT PCH-WE-S	0.7	1.1	1.3	1.4	1.5	1.6	1.7	1.8	1.9	2.0
HT PCH-WE-M	1.6	2.3	2.7	2.9	3.2	3.4	3.6	3.8	4.1	4.3
HT PCH-WE-L	0.3	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.8	0.9
AC rooftop	0.8	2.1	2.2	1.9	1.4	0.8	0.5	0.3	0.2	0.2
AC splits	1.2	3.7	4.0	3.9	3.8	3.6	3.4	3.3	3.1	3.0
AC VRF	0.0	4.1	5.8	8.4	10.8	13.5	16.1	18.4	20.4	22.1
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	37	41	45	49	53	56	60	64
AC rooftop (rev)	0.8	2.4	2.6	2.3	1.8	1.1	0.5	0.2	0.0	0.0
AC splits (rev)	1.5	4.6	5.2	5.1	5.0	4.8	4.5	4.3	4.0	3.8
AC VRF (rev)	0.0	4.2	6.0	8.8	11.1	13.6	15.7	17.1	18.2	18.7
ACF (rev)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
AHF	8.8	8.4	7.4	6.0	5.6	5.3	5.1	4.8	4.6	4.3
AHE	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Air Heating	11	20	21	22	24	25	26	27	27	27
Total AHC Air Heating & Cooling	25	46	52	55	59	63	66	70	73	77

EXPENSBAU

db BAU Expenditure (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	2.0	3.0	3.3	3.4	3.5	3.6	3.7	3.9	4.0	4.2
LH closed fireplace/inset	1.5	4.0	5.3	6.1	6.7	7.4	7.8	8.3	8.7	9.1
LH wood stove	2.1	2.4	3.1	3.3	3.6	3.8	4.1	4.3	4.5	4.8
LH coal stove	0.8	0.7	0.5	0.5	0.5	0.5	0.4	0.4	0.4	0.4
LH cooker	1.1	2.2	2.8	3.3	3.5	3.8	3.9	4.0	4.1	4.2
LH SHR stove	2.4	3.3	4.3	5.0	5.7	6.5	7.0	7.3	7.6	8.0
LH pellet stove	0.0	1.3	1.7	2.1	2.4	2.7	2.9	3.0	3.1	3.3
LH Solid fuel sum	10	17	21	24	26	28	30	31	32	34
LH Electric portable	4.7	3.9	4.3	4.1	4.1	4.0	4.0	4.0	4.1	4.1
LH Electric fixed > 250W	25.9	21.0	21.3	18.0	16.2	15.0	14.9	14.9	15.0	15.1
LH Electric fixed ≤ 250W	1.9	1.5	1.5	1.3	1.2	1.1	1.1	1.1	1.1	1.1
LH Electric storage	1.6	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.2	1.2
LH Electric underfloor	4.4	3.9	4.4	4.1	4.2	4.3	4.3	4.3	4.3	4.3
LH Electric visibly glowing > 1.2 kW	0.4	0.3	0.4	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	1.6	2.2	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2
LH Electric sum	41	34	36	32	30	28	28	28	28	28
LH Gas luminous (commercial)	0.1	0.1	0.1	0.1	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	0.9	0.5	0.4	0.3	0.2	0.2	0.1	0.1	0.1	0.1
LH Gas fluless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Gaseous fuel sum	1.6	1.1	1.0	0.7	0.6	0.5	0.5	0.5	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
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 fluless	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	52	52	58	56	56	57	58	60	61	63
RAC fixed < 6 kW, cooling	0.7	6.4	5.7	5.0	5.3	5.9	6.5	7.4	8.5	9.9
RAC fixed 6-12 kW, cooling	0.3	2.7	2.9	2.5	2.5	2.7	2.8	3.0	3.3	3.7
RAC portable < 12 kW, cooling	0.0	0.4	0.4	0.3	0.3	0.3	0.4	0.4	0.4	0.4
RAC < 12 kW total, cooling mode	1.0	9.5	8.9	7.7	8.2	8.9	9.7	10.7	12.2	14.1
RAC fixed < 6 kW, reversible, heating	0.2	4.8	5.8	6.0	7.6	9.8	12.3	15.3	18.3	21.4
RAC fixed 6-12 kW, reversible, heating	0.1	2.2	3.0	3.2	3.9	4.8	5.7	6.7	7.7	8.7
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	7.0	8.9	9.2	11.5	14.6	17.9	22.0	26.1	30.1
RAC Room Air Conditioner	1	16	18	17	20	24	28	33	38	44
¹ CIRC Integrated circulators	4.0	5.6	6.4	6.5	7.0	7.5	7.7	7.7	7.7	7.7
¹ CIRC Large standalone circulators	2.0	2.8	2.9	2.6	2.5	2.3	2.2	2.2	2.1	2.1
¹ CIRC Small standalone circulators	2.3	3.2	3.2	2.9	2.7	2.5	2.4	2.4	2.4	2.4
¹ CIRC Circulator pumps <2.5 kW	8	12								
TOTAL SPACE HEATING	205	262	259	242	243	246	255	266	281	296
TOTAL SPACE COOLING	15	40	46	49	53	58	62	67	72	78
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	0.1
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	1.7	2.2	2.7	3.8	4.7	5.5
R-UVU 100-250 m3/h	0.2	0.5	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8
R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.9	1.1	1.3	1.6	2.0	2.2
R-UVU 250-1000 m3/h	0.7	1.7	1.9	2.1	2.2	2.3	2.5	2.7	2.7	2.9
R-BVU 250-1000 m3/h	0.0	0.3	0.4	0.5	2.0	2.6	3.2	4.2	5.2	6.1
R-UVU > 1000 m3/h	0.0	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	11	13	16	18
NR-UVU 250-1000 m3/h	0.3	0.5	0.6	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	0.9	1.1	1.2	1.4	1.6
NR-UVU > 1000 m3/h	0.3	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.3	0.3
NR-BVU 1000-2500 m3/h	0.0	0.8	0.8	1.0	1.1	1.2	1.4	1.5	1.7	1.9
NR-AHU-S 2500-5500 m3/h	0.3	4.6	5.8	5.9	5.4	6.1	6.6	7.0	7.4	7.9
NR-AHU-M 5500-14500 m3/h	6.0	11.2	12.3	11.9	11.1	12.1	12.7	13.3	13.9	14.6
NR-AHU-L > 14500 m3/h	1.6	3.0	3.3	3.2	3.0	3.3	3.4	3.6	3.8	4.0
NRVU, Total non-residential	9	21	24	24	22	25	26	28	29	31
VU Ventilation Units, res + non-res.	10	24	27	28	30	34	37	41	45	49
TOTAL VENTILATION (VU own electricity & acq & maint)	10	24	27	28	30	34	37	41	45	49
¹ Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)	-	-	-	-	-	-	-	-	-	-

EXPENSBAU

db BAU Expenditure (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	16.9	23.7	29.3	30.9	30.9	27.4	22.5	18.4	15.1	12.4
HID (HPM, HPS, MH)	5.7	11.4	12.9	12.5	11.0	7.7	4.3	2.4	1.4	0.8
CFLni (all shapes)	0.7	2.9	3.3	3.2	2.9	1.9	1.0	0.5	0.3	0.2
CFLi (retrofit for GLS, HL)	0.3	4.3	4.9	5.2	4.2	3.5	2.3	1.6	1.0	0.7
GLS (DLS & NDLS)	17.0	12.7	10.6	7.5	4.6	2.8	1.7	1.0	0.6	0.4
HL (DLS & NDLS, LV & MV)	1.6	8.8	12.4	13.9	10.1	5.4	2.9	1.7	1.0	0.6
LED replacing LFL (retrofit & luminaire)	0.0	0.0	0.7	3.4	7.3	13.3	19.2	25.5	32.5	40.4
LED replacing HID (retrofit & luminaire)	0.0	0.0	0.2	2.1	4.7	8.1	11.3	14.3	17.5	21.0
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.0	0.3	0.9	1.7	2.5	3.2	3.7	4.3
LED replacing DLS (retrofit & luminaire)	0.0	0.0	0.1	0.6	1.1	1.4	1.7	2.0	2.3	2.7
LED replacing NDLS (retrofit & luminaire)	0.0	0.1	0.4	3.0	4.4	5.7	7.3	8.7	10.1	11.6
Standby (nrgcost only)	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7
TOTAL LIGHTING (incl. standby)	44	66	77	84	84	80	78	81	87	97
DP TV total all types	22.5	39.5	31.3	35.9	38.8	45.2	46.5	46.2	46.4	47.5
DP Monitor	1.8	5.9	3.6	3.1	3.2	3.1	2.9	2.9	2.9	2.9
DP Signage	0.0	0.5	2.9	6.7	6.8	6.9	6.8	6.8	6.8	7.0
DP Electronic Displays, total	24	46	38	46	49	55	56	56	56	57
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	5.9	9.3	9.2	9.2	9.1	9.1	9.3	9.5	9.7
Total STB set top boxes (Complex & Simple)	0	8	10	9	9	9	9	9	9	10
Game consoles > 20 W Active modes (SRI)	0.0	3.5	4.0	4.2	4.2	4.3	4.3	4.4	4.4	4.5
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.6
Game consoles < 20 W Non-Active (CR)	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
Game consoles < 20 W Active (no reg.)	0.1	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total Game consoles, active modes	0.2	4.3	4.8	5.0	5.0	5.1	5.1	5.2	5.3	5.3
Total Game consoles, non-active modes	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
Total Game consoles > 20 W, all modes	0.0	3.8	4.4	4.7	4.7	4.7	4.8	4.9	5.0	5.1
Total Game consoles < 20 W, all modes	0.1	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1
Total Game consoles, all modes	0	5	5	6						
<i>ES&DS only, without effects on infrastructure</i>										
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	0.9	0.9	1.0	1.0	1.0
ES rack 2-socket traditional	0.3	4.8	2.5	2.3	2.8	3.4	3.5	3.6	3.7	3.7
ES rack 2-socket cloud	0.0	3.8	6.0	7.1	8.6	10.5	11.0	11.2	11.4	11.6
ES rack 4-socket traditional	0.1	1.7	0.8	0.9	1.1	1.3	1.3	1.3	1.3	1.3
ES rack 4-socket cloud	0.0	1.4	2.0	2.5	3.0	3.7	3.8	3.8	3.8	3.8
ES rack 2-socket resilient trad.	0.0	0.7	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5
ES rack 2-socket resilient cloud	0.0	0.5	0.7	0.8	1.0	1.2	1.2	1.2	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	1.8	0.9	0.8	1.0	1.2	1.3	1.3	1.4	1.4
ES blade 2-socket cloud	0.0	1.4	2.1	2.6	3.1	3.9	4.1	4.2	4.3	4.4
ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2
ES blade 4-socket cloud	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5	0.5
ES total traditional	1	11	6	6	7	8	8	8	8	9
ES total cloud	0	7	11	13	16	20	21	21	21	22
ES Enterprise Servers total	1	18	17	19	23	28	29	29	30	30
DS Online 2	0.3	6.3	6.3	7.3	8.4	9.6	9.9	10.1	10.3	10.5
DS Online 3	0.4	8.6	6.2	6.9	7.6	8.5	8.5	8.5	8.6	8.6
DS Online 4	0.3	6.0	5.8	6.5	7.4	8.3	8.5	8.6	8.7	8.8
DS Data Storage products total	1	21	18	21	23	26	27	27	28	28
ES + DS total (excl. infrastructure)	2	39	35	40	46	54	56	56	57	58
PC Desktop	14.5	21.4	12.1	12.2	16.5	17.8	18.4	18.6	18.7	18.6
PC Integrated Desktop	0.6	0.9	0.5	0.5	0.7	0.9	1.0	1.1	1.1	1.1
PC Notebook	0.0	50.5	45.0	44.5	58.6	73.6	84.4	88.4	89.8	90.3
PC Tablet/slate	0.0	2.5	28.0	27.0	29.2	31.6	33.1	33.6	33.8	33.8
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	1.9	2.4	2.7	3.2	3.8	4.2	4.4	4.4	4.4
Total PC, electricity	16	78	89	88	109	129	142	147	149	150
Inkjet Printer	0.7	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Inkjet MFD	0.8	1.7	1.4	1.0	0.9	0.9	0.9	0.8	0.8	0.8
EP / Laser Printer mono	2.7	1.6	1.6	1.4	1.1	0.9	0.7	0.5	0.4	0.2
EP / Laser Printer colour	0.0	1.5	2.1	2.8	3.2	3.5	3.7	3.8	3.9	4.0
EP / Laser Copier mono	5.2	1.7	0.6	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	2.5	3.5	3.7	3.5	3.4	3.2	3.1	3.0	2.8
EP / Laser MFD colour	0.0	9.8	13.3	13.4	12.8	12.2	11.6	11.1	10.5	10.0
Consumables, paper, ink, toner	16.0	25.0	19.8	14.6	10.8	9.4	8.7	8.0	7.5	7.2
Total IE Imaging Equipment	25	45	44	37	33	30	29	27	26	25

EXPENSBAU

db BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>										
SB Radios (sb & off modes)	2.0	2.3	2.1	1.8	1.6	1.5	1.4	1.3	1.1	1.0
SB Electric toothbrushes (off mode)	0.2	0.4	0.4	0.4	0.5	0.6	0.6	0.7	0.7	0.8
SB Audio speakers (wired) (sb & off modes)	4.4	2.6	1.9	0.7	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	4.5	5.5	5.6	5.6	5.7	5.8	5.8
SB Small appliances (sb & off modes)	5.0	8.9	9.3	9.5	9.7	9.9	10.1	10.3	10.5	10.7
SB Media boxes /sticks (sb mode)	0.0	0.0	0.4	0.6	0.6	0.6	0.7	0.7	0.7	0.7
SB Media players and recorders (sb mode)	0.0	2.9	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	1.5	1.7	1.6	1.5	1.4	1.4	1.3	1.3	1.2
SB Office phones (nsb mode)	0.4	0.8	0.8	0.7	0.6	0.6	0.6	0.6	0.6	0.6
SB Home NAS (nsb mode)	0.0	1.5	2.4	3.3	4.1	5.0	5.7	6.3	6.5	6.5
SB Home Network Equipment (nsb mode)	0.0	3.2	3.8	4.0	4.3	4.6	5.0	5.0	5.1	5.2
SB Office Network Equipment (nsb mode)	0.0	0.3	1.0	2.0	3.0	4.0	4.7	4.7	4.8	4.9
SB Coffee makers (off mode)	0.9	1.1	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
1 SB Washing Machines (sb & off, until 2021)	0.0	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5	0.5
1 SB Dishwashers (sb & off, until 2021)	0.0	0.1	0.1	0.2	0.2	0.2	0.3	0.3	0.4	0.4
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	0.6	0.9	1.0	1.1	1.2	1.3	1.4	1.5	1.6
1 SB Electric Hobs (sb mode)	0.0	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.7
1 SB Complex Set-Top Boxes (low-power modes)	0.0	0.9	2.5	2.4	2.3	2.2	2.3	2.4	2.5	2.7
1 SB Game consoles (non-active modes)	0.0	0.4	0.6	0.7	0.7	0.7	0.8	0.8	0.8	0.9
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	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6
1 SB IE Laser Copiers (nsb mode)	1.2	0.2	0.2	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	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Total (networked) SB (incl. double)	16	30	37	38	39	41	44	45	46	46
Total (networked) SB (excl. double)	13	26	30	31	33	35	37	38	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	1.8	2.0	2.1	2.2	2.3	2.3	2.4	2.5	2.5
0.6 EPS 10–12 W	0.0	2.5	3.7	3.9	4.0	4.0	4.0	4.0	4.1	4.2
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	0.3	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	1.0	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	6.3	7.4	7.4	7.5	7.7	7.7	7.8	7.9	8.0
EPS, double counted subtracted	0.1	3.4	4.0	4.0	4.1	4.1	4.1	4.2	4.2	4.3
TOTAL ELECTRONICS	81	251	255	261	289	323	339	344	347	349
Total RF household Refrigerators & Freezers	29	28	31	31	32	34	35	36	38	39
CF open vertical chilled multi deck (RVC2)	3.0	2.5	2.6	2.5	2.5	2.6	2.7	2.8	2.9	3.0
CF open horizontal frozen island (RHF4)	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3
CF other supermarket display (non-BCs)	5.6	5.1	5.6	5.5	5.8	6.2	6.7	7.1	7.6	8.1
CF Plug in one door beverage cooler	3.4	3.3	3.5	3.3	3.4	3.6	3.8	4.0	4.2	4.5
CF Plug in horizontal ice cream freezer	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.1	1.1	1.2
CF Spiral vending machine	1.0	0.7	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.7
Total CF Commercial Refrigeration	14	13	13	13	13	14	15	16	17	18
PF Storage cabinet Chilled Vertical (CV)	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.1
PF Storage cabinet Frozen Vertical (FV)	0.4	0.5	0.6	0.6	0.7	0.7	0.8	0.9	1.0	1.0
PF Storage cabinet Chilled Horizontal (CH)	0.3	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
PF Storage cabinet Frozen Horizontal (FH)	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
PF Storage cabinets All types	1.3	1.7	1.9	2.0	2.1	2.3	2.5	2.7	2.9	3.2
PF Process Chiller AC MT S ≤ 300 kW	0.4	0.8	1.0	1.1	1.3	1.5	1.8	2.0	2.3	2.6
PF Process Chiller AC MT L > 300 kW	0.4	0.8	0.9	1.1	1.3	1.5	1.7	1.9	2.2	2.5
PF Process Chiller AC LT S ≤ 200 kW	0.4	0.8	1.0	1.1	1.3	1.5	1.7	2.0	2.3	2.5
PF Process Chiller AC LT L > 200 kW	0.4	0.8	1.0	1.1	1.4	1.6	1.8	2.1	2.3	2.6
PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.6	0.7	0.7
PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.1
PF Process Chiller WC LT S ≤ 200 kW	0.2	0.3	0.4	0.4	0.5	0.6	0.6	0.7	0.8	0.9
PF Process Chiller WC LT L > 200 kW	0.2	0.4	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.2
PF Process Chiller All MT&LT	2	4	5	6	7	8	10	11	12	14

EXPENSBAU

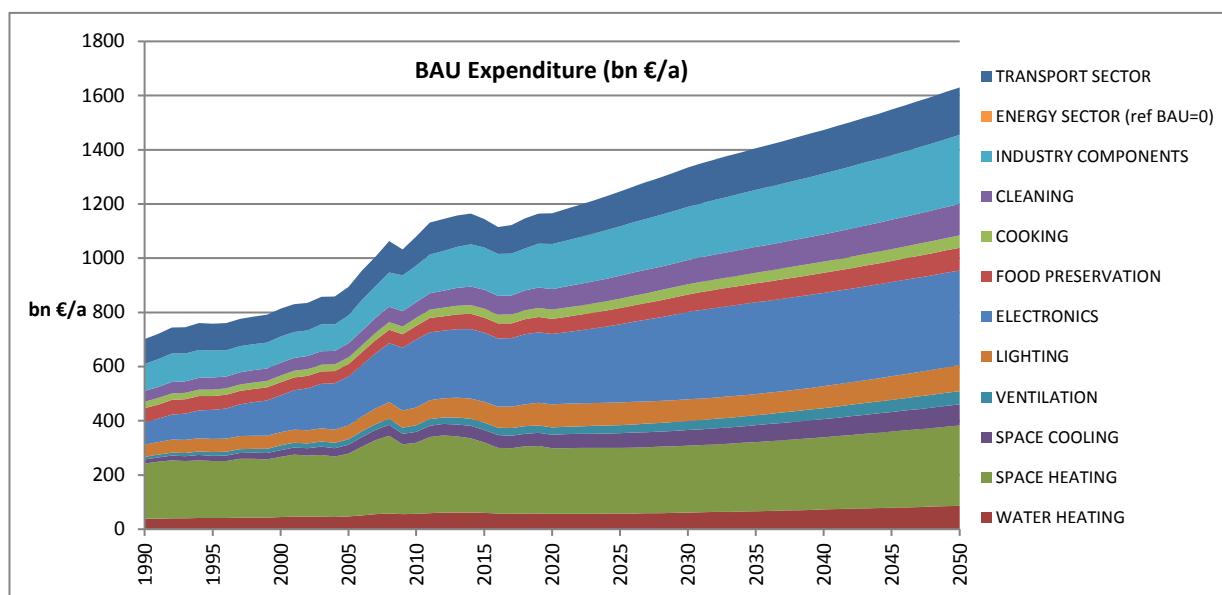
db	BAU Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.1	0.8	0.9	0.9	1.0	1.2	1.3	1.5	1.7	1.9
	PF Condensing Unit MT M 1-5 kW	2.8	2.1	2.2	2.3	2.6	2.9	3.2	3.7	4.1	4.6
	PF Condensing Unit MT L 5-20 kW	3.4	2.5	2.7	2.7	3.1	3.5	3.9	4.4	5.0	5.6
	PF Condensing Unit MT XL 20-50 kW	3.3	2.4	2.6	2.6	3.0	3.4	3.8	4.3	4.8	5.5
	PF Condensing Unit LT S 0.1-0.4 kW	0.2	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	0.5	0.6	0.7	0.8	0.9
	PF Condensing Unit LT L 2-8 kW	0.9	0.6	0.7	0.7	0.8	0.9	1.0	1.1	1.3	1.5
	PF Condensing Unit LT XL 8-20 kW	2.5	1.8	1.9	2.0	2.2	2.5	2.9	3.2	3.6	4.1
0.6	PF Condensing Unit, All MT&LT	15	11	11	12	13	15	17	19	22	24
	PF Professional Refrigeration, Total	9	10	12	13	15	17	19	21	24	27
	TOTAL FOOD PRESERVATION	53	51	56	56	60	64	69	73	79	84
	CA Electric Hobs	6.2	10.8	12.8	13.6	14.9	16.3	17.6	18.9	20.3	21.7
	CA Electric Ovens	9.3	10.4	11.3	11.6	11.6	12.1	12.6	13.0	13.5	14.0
	CA Gas Hobs	3.6	3.4	3.4	3.0	2.9	2.9	2.8	2.8	2.8	2.8
	CA Gas Ovens	1.4	1.3	1.3	1.1	1.1	1.1	1.1	1.1	1.1	1.1
	CA Range Hoods	3.0	3.5	4.0	4.1	4.5	4.8	5.2	5.7	6.1	6.6
	TOTAL COOKING	24	29	33	33	35	37	39	42	44	46
	WM Washing Machines	23	25	27	27	29	31	33	35	38	41
	WD Washer-Dryers	2	3	3	3	3	4	4	4	4	5
	Total WM-WD household Washing	25	28	30	31	32	34	37	39	42	46
	<i>including detergent and water costs</i>	11	13	15	16	18	20	22	25	28	32
	Total DW household Dishwasher	5	10	12	14	17	19	22	26	29	33
	<i>including detergent and water costs</i>	1	3	3	4	5	7	8	10	12	14
	LD condensing heat pump	0.0	0.1	0.1	0.2	0.3	0.4	0.6	0.7	0.9	1.1
	LD condensing electric heat element	0.5	2.4	3.0	3.3	3.4	3.4	3.4	3.3	3.2	3.1
	LD vented electric	1.9	1.8	1.8	1.6	1.5	1.5	1.6	1.6	1.7	1.8
	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	2.5	4.2	4.9	4.9	5.1	5.3	5.4	5.5	5.6	5.8
	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	4	5	5	5	5	6	6	6	6
	VC dom	5.2	13.0	18.7	22.1	25.8	26.2	27.1	27.4	27.5	27.3
	VC nondom	1.1	1.4	1.6	1.7	1.9	2.0	2.2	2.4	2.5	2.7
	Total VC Vacuum Cleaner	8	16	22	26	30	30	31	32	32	32
	<i>including costs of bags & filters</i>	1.3	1.7	1.8	1.9	2.0	1.9	1.8	1.7	1.6	1.5
	TOTAL CLEANING	40	58	69	75	84	89	95	102	109	116
0.5	FAN Axial<300Pa (all FAN types >125W)	3.3	8.4	10.8	12.0	13.6	14.9	15.8	16.5	17.2	18.0
0.5	FAN Axial>300Pa	5.4	14.8	18.4	19.3	21.0	22.5	23.6	24.7	25.8	27.0
0.5	FAN Centr.FC	1.6	3.3	4.2	4.7	5.2	5.7	5.9	6.2	6.4	6.7
0.5	FAN Centr.BC-free	3.3	6.3	8.2	9.0	10.3	11.8	13.0	14.1	15.0	16.0
0.5	FAN Centr.BC	3.7	7.8	10.2	11.1	12.8	14.6	16.4	18.5	20.9	23.7
0.5	FAN Cross-flow	0.3	0.5	0.7	0.7	0.9	1.0	1.1	1.2	1.4	1.5
	Total FAN, industrial (excl. box & roof fans)	9	21	26	28	32	35	38	41	43	46
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	14.3	16.0	18.0	18.6	19.5	19.9	20.1	20.1	19.8	19.2
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21.4	24.3	27.4	28.5	29.8	30.2	30.2	29.6	28.4	26.5
0.45	Medium (L) 3-ph 75-375 kW no VSD	42.5	46.9	52.1	53.7	55.5	55.2	52.8	48.5	44.2	41.9
0.45	Total 3ph 0.75-375 kW no VSD	78	87	97	101	105	105	103	98	92	88
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1.2	2.6	3.3	4.0	4.9	5.8	7.0	8.5	10.3	12.4
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.9	4.2	5.5	6.8	8.4	10.2	12.5	15.2	18.6	22.5
0.45	Medium (L) 3-ph 75-375 kW with VSD	5.0	10.7	14.2	17.7	22.4	27.9	34.3	42.1	50.2	57.5
0.45	Total 3-ph 0.75-375 kW with VSD	8	18	23	29	36	44	54	66	79	92
0.45	Total 3-ph 0.75-375 kW w/wo VSD	86	105	121	129	140	149	157	164	171	180
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.4	1.9	2.1	2.1	2.2	2.2	2.3	2.3	2.4	2.5
0.45	Small 1 ph 0.12-0.75 kW with VSD	0.1	0.7	0.8	0.9	0.9	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	4	4	4
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.7	2.0	2.2	2.3	2.4	2.5	2.6	2.7	2.8	2.9
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.4	0.5	0.5	0.6	0.7	0.7	0.8	0.9	1.0
0.45	Total Small 3-ph 0.12-0.75 kW	2	2	3	3	3	3	3	4	4	4
0.45	Large 3-ph LV 375-1000 kW no VSD	21.7	22.7	23.5	22.5	22.2	22.1	22.9	23.9	24.9	25.9
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.4	8.5	11.7	15.1	18.0	20.1	22.1	24.3	26.8
0.45	Total Large 3-ph LV 375-1000 kW	23	28	32	34	37	40	43	46	49	53
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.6	0.7	0.7	0.8	0.8	0.9	1.0	1.0	1.1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.2	1.4	1.7	1.8	2.0	2.1	2.3	2.5	2.6	2.8
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.7	3.1	3.4	3.8	4.2	4.5	4.9	5.2	5.6
0.45	Total Expl. 0.75-375 kW (no VSD)	4	5	6	6	7	7	8	8	9	10
0.45	Brake 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	0.8
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.8	2.0
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.4	1.6	1.8	2.0	2.1	2.3	2.5	2.7	2.9
0.45	Total Brake 0.75-375 kW (no VSD)	2	3	3	4	4	4	5	5	5	6

EXPENSBAU

db	BAU Expenditure (in bn euros)	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	0.1	0.1	0.1
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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
0.45	Total 8-pole 0.75-375 kW (no VSD)	0									
0.45	1-phase motors >0.75 kW (no VSD)	7	8	9	10	11	11	12	13	14	14
MT Elec. Motors LV 0.12-1000 kW including double counted amounts		69	85	97	104	113	120	127	134	141	149
		125	154	177	189	206	219	231	243	256	270
Total WP Water Pumps		15	18	21	23	26	29	32	36	39	43
CP Fixed Speed 5-1280 l/s		3.6	6.0	5.4	4.9	5.0	5.3	5.7	6.1	6.6	7.0
CP Variable speed 5-1280 l/s		0.0	1.1	2.0	2.7	3.1	3.3	3.5	3.8	4.0	4.3
CP Pistons 2-64 l/s		0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5	0.6	0.6
Total CP Standard Air Compressors		4	8	8	8	8	9	10	10	11	12
Total WE Welding Equipment		3	3	3	3	4	4	4	4	4	4
TOTAL INDUSTRY COMPONENTS		100	134	156	167	183	197	211	224	239	254
TRAFO Distribution		1.8	2.7	3.0	3.4	3.9	4.4	5.0	5.6	6.3	7.0
TRAFO Industry oil		1.3	1.9	2.2	2.4	2.8	3.1	3.5	3.9	4.4	4.9
TRAFO Industry dry		0.4	0.7	0.7	0.8	0.9	1.1	1.2	1.3	1.5	1.6
TRAFO Power		5.7	8.1	9.2	10.3	11.6	13.0	14.6	16.2	18.0	19.9
TRAFO DER oil		0.0	0.1	0.1	0.2	0.4	0.6	1.0	1.6	2.3	3.1
TRAFO DER dry		0.0	0.3	0.6	1.0	1.7	3.0	4.8	7.3	10.3	14.0
TRAFO Small		0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Total TRAFO Utility Transformers		9	14	16	18	22	26	30	36	43	51
TOTAL ENERGY SECTOR (BAU=0 as reference)		0									
<i>(incl. costs for fuel due to rolling resistance)</i>											
Tyres C1, replacement for cars		48	55	53	55	61	67	70	72	74	76
Tyres C1, OEM for cars		15	16	17	17	18	20	21	22	22	23
Tyres C1, total		63	72	70	72	80	87	91	93	96	99
Tyres C2, replacement for vans		9	13	12	13	15	18	19	20	21	21
Tyres C2, OEM for vans		2	3	3	3	3	4	4	4	4	5
Tyres C2, total		11	15	15	16	19	22	23	24	25	26
Tyres C3, replacement for trucks/busses		15	17	16	21	25	30	33	35	37	40
Tyres C3, OEM for trucks/busses		3	4	4	5	6	7	8	8	9	9
Tyres C3, total		18	21	20	26	31	37	40	43	46	50
Tyres, total C1+C2+C3		92	108	105	114	129	145	154	160	167	175
TRANSPORT SECTOR		92	108	105	114	129	145	154	160	167	175
GENERAL TOTAL (in bn euros)		702	1080	1144	1166	1246	1335	1405	1473	1548	1630
BAU Expenditure (summary table)											
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	38	56	60	56	57	61	66	72	79	86	
SPACE HEATING	205	262	259	242	243	246	255	266	281	296	
SPACE COOLING	15	40	46	49	53	58	62	67	72	78	
VENTILATION	10	24	27	28	30	34	37	41	45	49	
¹ <i>VVENTILATION (from heat saving vs. BAU; already included in COST for space heating)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>0</i>	
LIGHTING	44	66	77	84	84	80	78	81	87	97	
ELECTRONICS	81	251	255	261	289	323	339	344	347	349	
FOOD PRESERVATION	53	51	56	56	60	64	69	73	79	84	
COOKING	24	29	33	33	35	37	39	42	44	46	
CLEANING	40	58	69	75	84	89	95	102	109	116	
INDUSTRY COMPONENTS	100	134	156	167	183	197	211	224	239	254	
ENERGY SECTOR (see separate below)											
TRANSPORT SECTOR	92	108	105	114	129	145	154	160	167	175	
TOTAL in bn euros, excl. energy sector	702	1080	1144	1166	1246	1335	1405	1473	1548	1630	

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	702	1080	1144	1166	1246	1335	1405	1473	1548	1630



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	28	43	46	43	44	46	50	55	60	65
SPACE HEATING	147	183	181	169	168	170	175	184	194	206
SPACE & HT PROCESS COOLING	1	7	7	6	6	7	7	8	9	11
VENTILATION (acq, elec, maint)	1	3	3	4	8	9	11	13	16	18
LIGHTING	16	20	22	23	18	14	12	11	11	12
ELECTRONICS	49	139	147	149	167	187	199	203	205	207
FOOD PRESERVATION	27	26	29	29	30	31	33	34	35	37
COOKING	21	26	29	30	32	34	36	38	40	42
CLEANING	38	54	65	71	79	84	90	96	102	109
INDUSTRY COMPONENTS	0	0	0	0	0	0	0	0	0	0
BAU Expense, Residential, in bn euros	329	501	530	523	552	583	613	642	673	706

EXPENSECO

db ECO Expenditure (in bn euros 2015)	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	1	1	1	2	2	2	2
EIWHS Electric Instant. Shower (secondary)	2	3	3	3	2	3	3	3	3	4
ESWH Electric Storage ≤ 30 L (secondary)	2	3	3	3	3	3	3	4	4	4
ESWH Electric Storage > 30 L (primary)	13	17	19	17	17	18	20	22	24	27
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	2	2	1	1	1	0	0	0	0	0
Dedicated WH Heat Pump	0	0	0	0	1	1	2	2	3	3
Dedicated WH Solar (3.5 m ²)	1	3	3	3	3	3	3	3	3	4
WH dedicated Water Heater	24	31	34	31	30	32	35	39	42	46
CHB Gas Combi Instant. WH	5	12	13	12	12	12	12	11	11	11
CHB Gas + Cyl. WH	3	5	5	4	4	4	4	4	4	4
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	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	1	1	1	2
CHB Electric HP + Cyl. WH	0	1	1	2	3	5	6	8	11	13
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 m ²)	0	0	0	0	0	0	0	0	0	0
CHC Central Heating combi, water heating	14	25	25	23	23	24	26	28	31	33
TOTAL WATER HEATING	38	56	59	54	53	56	61	67	73	80
CHB Gas non-condensing	54	68	57	32	16	8	4	2	1	1
CHB Gas condensing	1	30	42	52	63	68	69	65	61	57
CHB Gas Jet burner non-condensing	7	5	4	2	1	1	0	0	0	0
CHB Gas Jet burner condensing	0	0	0	1	1	1	1	1	1	2
CHB Oil Jet burner non-condensing	57	57	37	28	18	8	3	2	1	1
CHB Oil Jet burner condensing	0	2	3	5	7	9	11	12	13	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	15	22	30	38	47	56
CHB Gas Heat Pump	0	0	0	0	0	1	1	1	2	2
CHB micro CHP	0	0	0	0	1	1	1	1	2	2
CHB Solar combi (16 m ²)	1	1	1	1	1	1	1	1	1	1
CHB Central Heating boiler < 400 kW, space heating	123	170	153	134	128	124	126	131	137	143
SFB Wood Manual	11	4	4	3	2	1	1	1	1	1
SFB Wood Direct Draft	0	2	4	5	6	6	7	8	10	13
SFB Coal	7	5	2	3	3	2	2	2	2	2
SFB Pellets	0	1	1	2	2	3	3	3	4	4
SFB Wood chips	0	1	1	1	1	1	1	1	1	1
Total Solid Fuel Boiler	18	12	12	13	13	13	13	15	18	21
CHAE-S (< 400 kW)	1.1	3.8	4.5	5.0	5.4	5.7	6.2	6.6	7.1	7.5
CHAE-L (> 400 kW)	1.0	2.3	2.7	2.8	2.8	2.8	2.7	2.7	2.7	2.8
CHWE-S (< 400 kW)	0.1	0.3	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.7
CHWE-M (> 400 kW; ≤ 1500 kW)	0.2	0.6	0.7	0.7	0.8	0.8	0.7	0.8	0.8	0.8
CHWE-L (> 1500 kW)	0.2	0.4	0.4	0.4	0.5	0.5	0.4	0.5	0.5	0.5
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	3.6	5.1	6.1	6.3	6.7	7.0	7.3	7.9	8.5	9.1
HT PCH-AE-L	3.4	4.8	5.8	5.9	6.2	6.3	6.5	6.9	7.4	7.9
HT PCH-WE-S	0.7	1.1	1.3	1.4	1.5	1.5	1.6	1.8	1.9	2.0
HT PCH-WE-M	1.6	2.3	2.7	2.9	3.1	3.3	3.5	3.8	4.1	4.3
HT PCH-WE-L	0.3	0.4	0.5	0.6	0.6	0.6	0.7	0.7	0.8	0.8
AC rooftop	0.8	2.1	2.2	1.9	1.4	0.8	0.5	0.3	0.2	0.2
AC splits	1.2	3.7	4.0	3.8	3.6	3.4	3.3	3.1	3.0	2.9
AC VRF	0.0	4.1	5.8	8.4	10.7	13.3	15.9	18.2	20.2	21.9
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	37	41	44	47	50	54	58	61
AC rooftop (rev)	0.8	2.4	2.6	2.2	1.6	0.9	0.4	0.1	0.0	0.0
AC splits (rev)	1.5	4.6	5.2	4.9	4.7	4.3	4.0	3.8	3.7	3.5
AC VRF (rev)	0.0	4.2	6.0	8.7	10.9	13.1	15.1	16.5	17.5	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	8.8	8.4	7.3	5.7	5.0	4.4	4.0	3.8	3.6	3.4
AHE	0.2	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2
SubTotal AHC Air Heating	11	20	21	22	22	23	24	24	25	25
Total AHC Air Heating & Cooling	25	46	52	54	56	59	62	65	69	73

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db	ECO Expenditure (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	2.0	3.0	3.3	3.8	4.1	4.0	3.9	3.8	3.8	3.8	3.8
LH closed fireplace/inset	1.5	4.0	5.3	6.6	7.3	7.6	7.8	8.0	8.1	8.3	
LH wood stove	2.1	2.4	3.1	3.5	3.8	3.9	4.0	4.1	4.2	4.3	
LH coal stove	0.8	0.7	0.5	0.6	0.5	0.5	0.4	0.4	0.4	0.4	
LH cooker	1.1	2.2	2.8	3.5	3.8	3.9	3.9	3.9	3.9	3.9	4.0
LH SHR stove	2.4	3.3	4.3	5.0	5.7	6.4	6.9	7.2	7.6	7.9	
LH pellet stove	0.0	1.3	1.7	2.1	2.4	2.6	2.8	3.0	3.1	3.2	
LH Solid fuel sum	10	17	21	25	28	29	30	30	31	32	
LH Electric portable	4.7	3.9	4.3	3.7	3.5	3.4	3.4	3.4	3.4	3.4	3.5
LH Electric fixed > 250W	25.9	21.0	21.2	17.3	14.9	13.4	13.2	13.2	13.3	13.3	
LH Electric fixed ≤ 250W	1.9	1.5	1.5	1.3	1.1	1.0	1.0	1.0	1.0	1.0	
LH Electric storage	1.6	1.3	1.4	1.2	1.1	1.0	1.0	1.0	1.0	1.0	
LH Electric underfloor	4.4	3.9	4.4	4.1	4.1	4.1	4.1	4.1	4.1	4.1	
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	1.6	2.2	2.5	2.3	2.3	2.2	2.2	2.2	2.2	2.2	
LH Electric sum	41	34	36	30	27	25	25	25	25	25	
LH Gas luminous (commercial)	0.1	0.1	0.1	0.1	0.1	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	0.9	0.5	0.4	0.3	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	1.6	1.1	1.0	0.7	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	0.0	0.0	0.0	0.0	0.0	
LH Local Space Heaters total	52	52	58	56	56	55	55	56	57	58	
RAC fixed < 6 kW, cooling	0.7	6.2	5.3	4.8	5.0	5.4	5.8	6.5	7.5	8.7	
RAC fixed 6-12 kW, cooling	0.3	2.6	2.7	2.3	2.4	2.5	2.6	2.7	3.0	3.2	
RAC portable < 12 kW, cooling	0.0	0.4	0.4	0.3	0.3	0.3	0.3	0.3	0.3	0.4	
RAC < 12 kW total, cooling mode	1.0	9.2	8.4	7.4	7.7	8.2	8.7	9.6	10.8	12.2	
RAC fixed < 6 kW, reversible, heating	0.2	4.3	4.9	5.1	6.5	8.4	10.7	13.6	16.4	19.2	
RAC fixed 6-12 kW, reversible, heating	0.1	1.9	2.5	2.5	3.1	3.9	4.7	5.7	6.6	7.4	
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	7.4	7.6	9.6	12.3	15.4	19.3	23.1	26.6	
RAC Room Air Conditioner	1	15	16	15	17	20	24	29	34	39	
1 CIRC Integrated circulators	4.0	5.6	6.1	5.5	5.4	5.7	5.9	6.1	6.3	6.4	
1 CIRC Large standalone circulators	2.0	2.8	3.1	2.5	2.2	2.0	1.9	1.9	1.9	2.0	
1 CIRC Small standalone circulators	2.3	3.2	3.2	2.6	2.3	2.0	2.0	1.9	1.9	1.9	
1 CIRC Circulator pumps <2.5 kW	8	12	13	11	10	10	10	10	10	10	
TOTAL SPACE HEATING	205	260	252	233	229	228	234	246	260	274	
TOTAL SPACE COOLING	15	40	46	48	51	55	59	63	69	74	
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	1.7	2.2	2.7	3.7	4.6	5.3	
R-UVU 100-250 m3/h	0.2	0.5	0.6	0.7	0.6	0.6	0.7	0.7	0.7	0.7	
R-BVU 100-250 m3/h	0.0	0.1	0.1	0.2	0.9	1.1	1.2	1.6	1.9	2.1	
R-UVU 250-1000 m3/h	0.7	1.7	1.9	2.0	2.0	2.0	2.1	2.2	2.2	2.3	
R-BVU 250-1000 m3/h	0.0	0.3	0.4	0.5	1.9	2.5	3.1	4.0	4.8	5.7	
R-UVU > 1000 m3/h	0.0	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	7	9	10	13	15	17	
NR-UVU 250-1000 m3/h	0.3	0.5	0.6	0.5	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	0.8	1.0	1.0	1.2	1.3	1.5	1.6	1.7	
NR-AHU-S 2500-5500 m3/h	0.3	4.6	5.8	6.0	5.5	6.1	6.5	6.8	7.2	7.7	
NR-AHU-M 5500-14500 m3/h	6.0	11.2	12.4	12.1	11.1	11.9	12.4	12.8	13.4	14.0	
NR-AHU-L > 14500 m3/h	1.6	3.0	3.3	3.2	3.0	3.2	3.3	3.4	3.6	3.7	
NRVU, Total non-residential	9	21	24	24	22	24	25	26	28	29	
VU Ventilation Units, res + non-res.	10	24	27	28	30	33	35	39	42	46	
TOTAL VENTILATION (VU own electricity & acq & maint)	10	24	27	28	30	33	35	39	42	46	
<i>1 Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)</i>	-	-	-0	-1	-3	-4	-5	-6	-7	-7	

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db	ECO Expenditure (in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	16.9	23.5	27.6	28.1	22.3	13.0	6.3	3.2	2.0	1.3	
HID (HPM, HPS, MH)	5.7	11.2	10.5	8.6	6.6	3.5	1.4	0.5	0.2	0.1	
CFLni (all shapes)	0.7	2.9	3.0	2.3	1.5	0.7	0.3	0.1	0.0	0.0	
CFLi (retrofit for GLS, HL)	0.3	5.6	5.4	4.0	1.3	0.4	0.0	0.0	0.0	0.0	
GLS (DLS & NDLS)	17.0	8.5	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
HL (DLS & NDLS, LV & MV)	1.6	9.8	13.1	4.9	0.3	0.0	0.0	0.0	0.0	0.0	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	1.2	4.2	13.2	20.4	25.8	31.0	36.8	43.3	
LED replacing HID (retrofit & luminaire)	0.0	0.0	3.2	4.4	7.1	9.7	12.2	14.7	17.5	20.6	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	0.3	0.9	1.6	2.4	2.9	3.3	3.8	4.3	
LED replacing DLS (retrofit & luminaire)	0.0	0.2	1.3	1.5	2.0	1.8	2.0	2.3	2.5	2.8	
LED replacing NDLS (retrofit & luminaire)	0.0	0.1	3.6	7.7	7.8	8.2	8.6	9.6	10.7	11.9	
Standby (nrgcost only)	1.6	2.2	2.2	1.8	1.6	1.4	1.4	1.5	1.6	1.7	
TOTAL LIGHTING (incl. standby)	44	64	74	68	65	61	61	66	75	86	
DP TV total all types	22.5	39.5	30.3	32.4	32.1	35.5	35.5	36.4	37.8	39.5	
DP Monitor	1.8	5.9	3.5	2.6	2.6	2.5	2.4	2.4	2.4	2.5	
DP Signage	0.0	0.5	2.9	6.7	6.7	6.1	5.4	5.5	6.0	6.7	
DP Electronic Displays, total	24	46	37	42	41	44	43	44	46	49	
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	5.9	8.9	8.2	8.2	8.2	8.3	8.5	8.6	8.8	
Total STB set top boxes (Complex & Simple)	0	7	9	8	8	8	8	8	9	9	
Game consoles > 20 W Active modes (SRI)	0.0	3.5	3.9	3.8	3.8	3.9	3.9	4.0	4.0	4.0	
Game consoles > 20 W Non-Active (CR)	0.0	0.2	0.3	0.2	0.1	0.1	0.1	0.1	0.2	0.2	
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	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	
Total Game consoles, active modes	0.2	4.3	4.7	4.6	4.6	4.7	4.7	4.8	4.8	4.8	
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	3.8	4.2	4.0	4.0	4.0	4.0	4.1	4.1	4.2	
Total Game consoles < 20 W, all modes	0.1	1.0	1.0	0.9	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	
<i>ES&DS only, without effects on infrastructure</i>											
ES tower 1-socket traditional	0.0	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	
ES rack 1-socket traditional	0.0	0.9	0.8	0.8	0.8	0.9	0.9	1.0	1.0	1.0	
ES rack 2-socket traditional	0.3	4.8	2.5	2.2	2.7	3.3	3.5	3.5	3.6	3.6	
ES rack 2-socket cloud	0.0	3.8	6.0	6.9	8.5	10.4	10.8	11.0	11.2	11.4	
ES rack 4-socket traditional	0.1	1.7	0.8	0.9	1.1	1.3	1.3	1.3	1.3	1.3	
ES rack 4-socket cloud	0.0	1.4	2.0	2.5	3.0	3.7	3.7	3.7	3.8	3.8	
ES rack 2-socket resilient trad.	0.0	0.7	0.3	0.3	0.4	0.5	0.5	0.5	0.5	0.5	
ES rack 2-socket resilient cloud	0.0	0.5	0.7	0.8	1.0	1.2	1.2	1.2	1.2	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	1.8	0.9	0.8	1.0	1.2	1.3	1.3	1.3	1.4	
ES blade 2-socket cloud	0.0	1.4	2.1	2.5	3.1	3.8	4.0	4.1	4.2	4.3	
ES blade 4-socket traditional	0.0	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	
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	13	16	20	20	21	21	21	
ES Enterprise Servers total	1	18	17	19	22	27	28	29	29	30	
DS Online 2	0.3	6.3	6.3	7.2	8.4	9.6	9.8	10.0	10.2	10.4	
DS Online 3	0.4	8.6	6.2	6.9	7.6	8.5	8.5	8.5	8.6	8.6	
DS Online 4	0.3	6.0	5.8	6.5	7.3	8.3	8.4	8.5	8.6	8.7	
DS Data Storage products total	1	21	18	21	23	26	27	27	27	28	
ES + DS total (excl. infrastructure)	2	39	35	39	46	54	55	56	57	57	
PC Desktop	14.5	21.4	12.1	12.2	16.5	17.8	18.4	18.6	18.7	18.6	
PC Integrated Desktop	0.6	0.9	0.5	0.5	0.7	0.9	1.0	1.1	1.1	1.1	
PC Notebook	0.0	50.5	45.0	44.5	58.6	73.6	84.4	88.4	89.8	90.3	
PC Tablet/slate	0.0	2.5	28.0	27.0	29.2	31.6	33.1	33.6	33.8	33.8	
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	1.9	2.4	2.7	3.2	3.8	4.2	4.4	4.4	4.4	
Total PC, electricity	16	78	89	88	109	129	142	147	149	150	
Inkjet Printer	0.7	0.9	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	
Inkjet MFD	0.8	1.7	1.3	0.8	0.8	0.8	0.7	0.7	0.7	0.6	
EP / Laser Printer mono	2.7	1.5	1.5	1.3	1.0	0.8	0.6	0.5	0.3	0.2	
EP / Laser Printer colour	0.0	1.5	2.0	2.6	2.9	3.1	3.3	3.4	3.5	3.6	
EP / Laser Copier mono	5.2	1.6	0.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser Copier colour	0.0	0.6	1.1	0.2	0.0	0.0	0.0	0.0	0.0	0.0	
EP / Laser MFD mono	0.0	2.4	3.3	3.3	3.2	3.0	2.9	2.7	2.6	2.5	
EP / Laser MFD colour	0.0	9.7	13.1	13.0	12.3	11.7	11.2	10.6	10.1	9.5	
Consumables, paper, ink, toner	16.0	24.8	19.1	14.0	10.4	9.0	8.3	7.7	7.2	6.9	
Total IE Imaging Equipment	25	45	42	35	31	29	27	26	25	23	

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db ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>										
SB Radios (sb & off modes)	2.0	2.3	1.9	1.5	1.3	1.2	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)	4.4	2.5	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	4.2	4.8	4.9	4.9	4.9	4.9	5.0
SB Small appliances (sb & off modes)	5.0	8.9	8.8	8.7	8.8	9.0	9.1	9.3	9.4	9.6
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	2.8	2.2	0.3	0.0	0.0	0.0	0.0	0.0	0.0
SB Projectors (sb & off modes)	0.0	0.8	0.6	0.3	0.1	0.0	0.0	0.0	0.0	0.0
SB Home phones (nsb mode)	0.3	1.5	1.7	1.5	1.3	1.2	1.2	1.2	1.2	1.2
SB Office phones (nsb mode)	0.4	0.8	0.8	0.6	0.6	0.6	0.6	0.6	0.6	0.6
SB Home NAS (nsb mode)	0.0	1.5	2.4	3.0	3.8	4.5	5.2	5.7	6.0	6.0
SB Home Network Equipment (nsb mode)	0.0	3.2	3.8	4.0	4.2	4.5	4.8	4.9	5.0	5.0
SB Office Network Equipment (nsb mode)	0.0	0.3	1.0	1.8	2.7	3.6	4.1	4.2	4.2	4.2
SB Coffee makers (off mode)	0.9	1.1	1.1	1.1	1.1	1.2	1.2	1.2	1.3	1.3
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>										
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	0.2	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	0.7	0.5	0.4	0.2	0.2	0.2	0.2	0.2
1 SB Electric Hobs (sb mode)	0.0	0.2	0.3	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	2.2	1.7	1.7	1.7	1.8	1.9	2.0	2.0
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	0.1	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	0.1	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	0.2	0.2	0.2	0.2	0.3	0.3	0.3
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	0.2	0.2	0.2	0.2	0.2	0.2
Total (networked) SB (incl. double)	16	30	33	32	33	34	36	37	38	38
Total (networked) SB (excl. double)	13	26	28	28	30	32	33	34	35	35
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	1.8	1.9	1.9	2.0	2.1	2.1	2.2	2.3	2.3
0.6 EPS 10–12 W	0.0	2.4	3.4	3.2	3.1	3.2	3.3	3.4	3.5	3.6
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	0.3	0.3	0.3	0.2	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	1.0	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	0.4	0.4	0.4	0.4	0.5	0.5	0.5
EPS, total	0.2	6.3	7.0	6.5	6.3	6.5	6.7	6.8	7.1	7.3
EPS, double counted subtracted	0.1	3.4	3.7	3.5	3.4	3.5	3.5	3.6	3.7	3.9
TOTAL ELECTRONICS	81	250	250	249	273	303	318	324	328	332
Total RF household Refrigerators & Freezers	29	24	24	22	22	20	20	19	20	20
CF open vertical chilled multi deck (RVC2)	3.0	2.5	2.6	2.4	2.3	1.9	1.6	1.6	1.6	1.7
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	5.6	5.5	5.6	5.3	5.2	5.4	5.7	6.0
CF Plug in one door beverage cooler	3.4	3.3	3.5	3.2	2.9	2.5	2.4	2.5	2.6	2.7
CF Plug in horizontal ice cream freezer	0.9	0.9	0.9	0.9	0.8	0.8	0.8	0.9	0.9	1.0
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	13	12	11	11	11	12	12
PF Storage cabinet Chilled Vertical (CV)	0.5	0.6	0.7	0.7	0.6	0.6	0.6	0.7	0.7	0.8
PF Storage cabinet Frozen Vertical (FV)	0.4	0.5	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.7
PF Storage cabinet Chilled Horizontal (CH)	0.3	0.3	0.4	0.3	0.3	0.3	0.3	0.4	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	1.9	1.8	1.6	1.6	1.7	1.9	2.0	2.1
PF Process Chiller AC MT S ≤ 300 kW	0.4	0.8	1.0	1.1	1.3	1.4	1.6	1.9	2.1	2.4
PF Process Chiller AC MT L > 300 kW	0.4	0.8	0.9	1.1	1.2	1.4	1.6	1.8	2.0	2.3
PF Process Chiller AC LT S ≤ 200 kW	0.4	0.8	1.0	1.1	1.3	1.4	1.6	1.9	2.1	2.4
PF Process Chiller AC LT L > 200 kW	0.4	0.8	1.0	1.1	1.3	1.5	1.7	1.9	2.2	2.4
PF Process Chiller WC MT S ≤ 300 kW	0.1	0.2	0.3	0.3	0.4	0.4	0.5	0.5	0.6	0.7
PF Process Chiller WC MT L > 300 kW	0.2	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0
PF Process Chiller WC LT S ≤ 200 kW	0.2	0.3	0.4	0.4	0.5	0.5	0.6	0.7	0.8	0.9
PF Process Chiller WC LT L > 200 kW	0.2	0.4	0.4	0.5	0.6	0.7	0.7	0.9	1.0	1.1
PF Process Chiller All MT&LT	2	4	5	6	7	8	9	10	12	13

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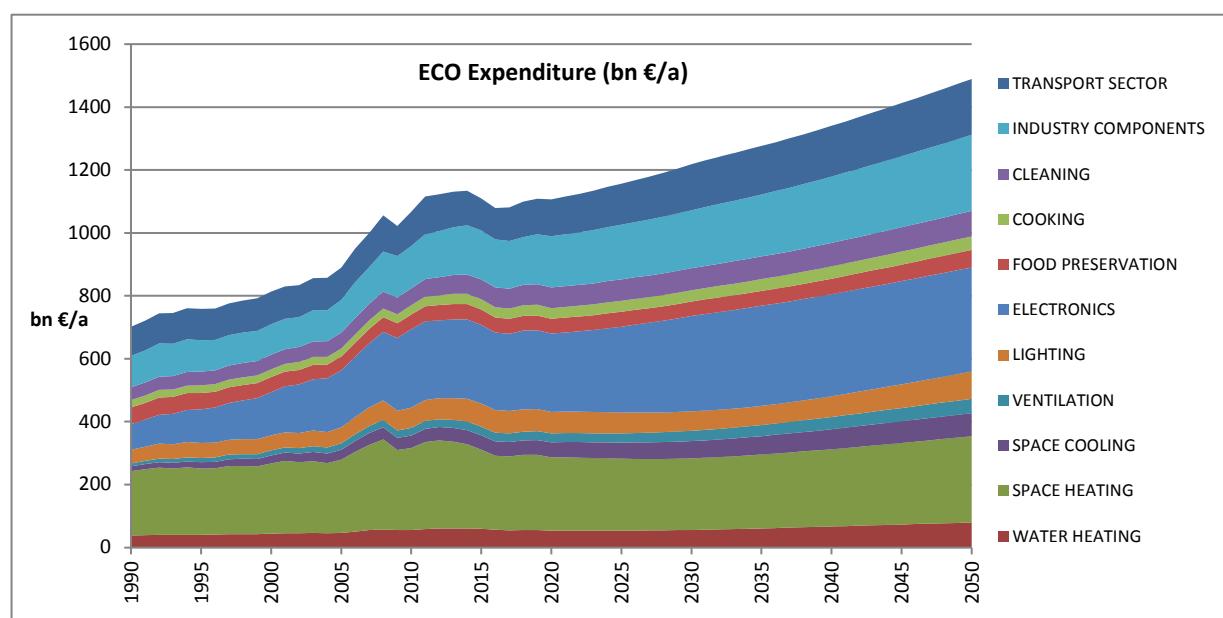
db	ECO Expenditure (in bn euros)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Condensing Unit MT S 0.2-1 kW	1.1	0.8	0.9	0.9	0.9	1.1	1.2	1.3	1.5	1.7
	PF Condensing Unit MT M 1-5 kW	2.8	2.1	2.2	2.2	2.4	2.7	3.1	3.4	3.9	4.4
	PF Condensing Unit MT L 5-20 kW	3.4	2.5	2.7	2.6	2.9	3.2	3.6	4.1	4.6	5.2
	PF Condensing Unit MT XL 20-50 kW	3.3	2.4	2.6	2.6	2.8	3.1	3.5	4.0	4.5	5.1
	PF Condensing Unit LT S 0.1-0.4 kW	0.2	0.1	0.1	0.1	0.1	0.1	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	0.7	0.8
	PF Condensing Unit LT L 2-8 kW	0.9	0.6	0.7	0.7	0.7	0.8	0.9	1.0	1.1	1.3
	PF Condensing Unit LT XL 8-20 kW	2.5	1.8	1.9	1.9	2.0	2.3	2.6	2.9	3.3	3.7
0.6	PF Condensing Unit, All MT&LT	15	11	11	11	12	14	16	18	20	22
	PF Professional Refrigeration, Total	9	10	12	12	13	15	17	19	21	24
	TOTAL FOOD PRESERVATION	53	47	49	47	47	46	47	49	53	56
	CA Electric Hobs	6.2	10.8	12.7	13.7	14.9	16.2	17.4	18.7	20.0	21.4
	CA Electric Ovens	9.3	10.3	11.2	11.4	11.0	10.8	11.0	11.3	11.7	12.0
	CA Gas Hobs	3.6	3.4	3.4	3.0	2.9	2.8	2.8	2.8	2.8	2.7
	CA Gas Ovens	1.4	1.3	1.3	1.4	1.3	1.2	1.2	1.2	1.2	1.1
	CA Range Hoods	3.0	3.5	4.0	4.4	4.8	4.8	4.9	5.1	5.3	5.6
	TOTAL COOKING	24	29	32	34	35	36	37	39	41	43
	WM Washing Machines	23	22	22	21	21	21	22	22	24	25
	WD Washer-Dryers	2	3	3	3	2	3	3	3	3	3
	Total WM-WD household Washing	25	25	24	24	23	24	24	25	27	29
	<i>including detergent and water costs</i>	11	11	10	10	10	11	12	13	14	16
	Total DW household Dishwasher	4.9	9.5	11.3	12.6	14.2	15.9	17.6	19.4	21.3	23.3
	<i>including detergent and water costs</i>	1.2	2.3	2.6	3.0	3.5	4.2	4.9	5.7	6.7	7.8
	LD condensing heat pump	0.3	1.7	2.6	3.2	3.8	3.9	3.9	3.8	3.7	3.7
	LD condensing electric heat element	0.5	2.4	2.4	2.0	1.6	1.3	1.2	1.1	1.1	1.2
	LD vented electric	1.9	1.7	1.3	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	2.5	4.3	5.4	5.4	5.3	5.3	5.1	5.0	4.9	4.9
	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	4	5							
	VC dom	5.2	13.0	18.4	20.3	21.9	21.5	21.7	21.5	21.2	21.0
	VC nondom	1.1	1.4	1.5	1.4	1.5	1.6	1.7	1.7	1.8	1.9
	Total VC Vacuum Cleaner	7.6	16.0	21.7	23.6	25.4	25.0	25.2	25.0	24.7	24.4
	<i>including costs of bags & filters</i>	1.3	1.7	1.8	1.9	2.0	1.9	1.8	1.7	1.6	1.5
	TOTAL CLEANING	40	55	63	65	68	70	72	75	78	81
0.5	FAN Axial<300Pa (all FAN types >125W)	3.3	8.4	10.8	11.6	12.2	12.9	13.3	13.8	14.3	14.8
0.5	FAN Axial>300Pa	5.4	14.8	18.1	18.3	18.9	19.6	20.3	21.2	22.2	23.1
0.5	FAN Centr.FC	1.6	3.3	4.4	4.9	4.9	4.9	5.0	5.1	5.2	5.3
0.5	FAN Centr.BC-free	3.3	6.3	8.1	8.4	9.1	10.2	11.2	12.0	12.8	13.7
0.5	FAN Centr.BC	3.7	7.8	10.3	10.8	11.8	12.9	14.4	16.1	18.1	20.3
0.5	FAN Cross-flow	0.3	0.5	0.9	1.0	1.1	1.1	1.1	1.2	1.3	1.3
	Total FAN, industrial (excl. box & roof fans)	8.8	20.5	26.3	27.5	29.0	30.8	32.7	34.7	36.9	39.3
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	14.3	16.0	17.4	15.8	14.7	15.0	15.5	16.1	16.7	17.3
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	21.4	24.3	26.4	23.8	21.5	21.5	22.0	22.6	23.0	23.7
0.45	Medium (L) 3-ph 75-375 kW no VSD	42.5	46.9	50.2	46.7	43.2	39.1	38.6	38.3	38.4	39.5
0.45	Total 3ph 0.75-375 kW no VSD	78	87	94	86	79	76	76	77	78	80
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	1.2	2.6	3.7	6.1	8.0	8.7	9.6	10.5	11.6	12.8
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	1.9	4.2	6.4	10.1	13.7	15.6	17.2	19.1	21.3	23.4
0.45	Medium (L) 3-ph 75-375 kW with VSD	5.0	10.7	15.5	22.1	29.8	37.1	41.9	46.9	52.1	57.2
0.45	Total 3-ph 0.75-375 kW with VSD	8	18	26	38	51	61	69	77	85	93
0.45	Total 3-ph 0.75-375 kW w/wo VSD	86	105	120	125	131	137	145	153	163	174
0.45	Small 1 ph 0.12-0.75 kW no VSD	1.4	1.9	2.1	2.1	2.3	2.3	2.4	2.4	2.4	2.5
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	4	4	4
0.45	Small 3 ph 0.12-0.75 kW no VSD	1.7	2.0	2.2	2.3	2.4	2.4	2.5	2.6	2.7	2.8
0.45	Small 3 ph 0.12-0.75 kW with VSD	0.0	0.4	0.5	0.5	0.6	0.6	0.7	0.8	0.9	1.0
0.45	Total Small 3-ph 0.12-0.75 kW	2	2	3	3	3	3	3	4	4	4
0.45	Large 3-ph LV 375-1000 kW no VSD	21.7	22.7	23.5	22.5	22.2	22.1	22.8	23.7	24.8	25.8
0.45	Large 3-ph LV 375-1000kW with VSD	1.1	5.4	8.5	11.7	15.0	17.8	19.8	21.7	23.9	26.4
0.45	Total Large 3-ph LV 375-1000 kW	23	28	32	34	37	40	43	45	49	52
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	0.5	0.6	0.7	0.7	0.8	0.8	0.9	0.9	1.0	1.1
0.45	Explosion motors (M) 3-ph 7.5-75 kW	1.2	1.4	1.7	1.8	2.0	2.1	2.3	2.4	2.6	2.8
0.45	Explosion motors (L) 3-ph 75-375 kW	2.1	2.7	3.1	3.5	3.8	4.2	4.5	4.8	5.2	5.6
0.45	Total Expl. 0.75-375 kW (no VSD)	4	5	6	6	7	7	8	8	9	9
0.45	Brake 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	0.8
0.45	Brake motors (M) 3-ph 7.5-75 kW	0.8	1.0	1.2	1.3	1.4	1.5	1.6	1.7	1.8	1.9
0.45	Brake motors (L) 3-ph 75-375 kW	1.1	1.4	1.6	1.8	2.0	2.1	2.3	2.5	2.6	2.8
0.45	Total Brake 0.75-375 kW (no VSD)	2	3	3	4	4	4	5	5	5	6

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db	ECO Expenditure (in bn euros)	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	0.1	0.1	0.1
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	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3
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)	7	8	9	10	11	11	12	13	13	14
	MT Elec. Motors LV 0.12-1000 kW	69	85	97	101	108	113	120	128	136	145
	Total WP Water Pumps	15	18	21	23	25	28	31	35	38	42
	CP Fixed Speed 5-1280 l/s	3.6	6.0	5.4	4.8	4.9	5.2	5.6	6.0	6.5	6.9
	CP Variable speed 5-1280 l/s	0.0	1.1	2.0	2.6	3.0	3.3	3.5	3.7	4.0	4.2
	CP Pistons 2-64 l/s	0.3	0.4	0.4	0.4	0.5	0.5	0.5	0.5	0.6	0.6
	Total CP Standard Air Compressors	4	8	8	8	8	9	10	10	11	12
	Total WE Welding Equipment	3	3	3	3	3	3	3	3	4	4
	TOTAL INDUSTRY COMPONENTS	100	134	155	163	174	185	197	211	226	242
	TRAFO Distribution	1.8	2.7	3.2	3.4	3.7	4.0	4.3	4.7	5.0	5.3
	TRAFO Industry oil	1.3	1.9	2.3	2.4	2.5	2.6	2.7	2.8	3.1	3.4
	TRAFO Industry dry	0.4	0.7	0.8	0.9	0.9	1.0	1.1	1.2	1.2	1.4
	TRAFO Power	5.7	8.1	9.2	10.3	11.6	13.0	14.6	16.2	18.0	19.9
	TRAFO DER oil	0.0	0.1	0.1	0.2	0.3	0.6	0.9	1.3	1.8	2.4
	TRAFO DER dry	0.0	0.3	0.6	1.0	1.7	2.8	4.4	6.5	9.1	12.1
	TRAFO Small	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3
	Total TRAFO Utility Transformers	9.5	13.9	16.5	18.4	21.0	24.3	28.3	32.9	38.5	44.9
	TOTAL ENERGY SECTOR (only improvement over BAU)	0	0	0	0	-1	-1	-2	-3	-5	-6
	(incl. costs for fuel due to rolling resistance)										
	Tyres C1, replacement for cars	48	56	51	56	62	67	70	72	75	78
	Tyres C1, OEM for cars	15	16	17	18	19	21	22	22	23	24
	Tyres C1, total	63	72	68	74	81	88	91	94	98	102
	Tyres C2, replacement for vans	9	13	11	13	15	17	18	19	20	21
	Tyres C2, OEM for vans	2	3	3	3	3	4	4	4	4	5
	Tyres C2, total	11	15	14	16	18	21	22	23	25	26
	Tyres C3, replacement for trucks/busses	15	17	17	22	25	30	33	35	37	40
	Tyres C3, OEM for trucks/busses	3	4	4	5	6	7	8	8	9	10
	Tyres C3, total	18	21	21	27	32	37	41	43	46	50
	Tyres, total C1+C2+C3	92	108	103	117	131	146	154	161	169	177
	TRANSPORT SECTOR	92	108	103	117	131	146	154	161	169	177
	GENERAL TOTAL (in bn euros)	702	1067	1110	1106	1156	1217	1274	1337	1408	1483
db	ECO Expenditure (summary table)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	38	56	59	54	53	56	61	67	73	80
	SPACE HEATING	205	260	252	233	229	228	234	246	260	274
	SPACE COOLING	15	40	46	48	51	55	59	63	69	74
	VENTILATION	10	24	27	28	30	33	35	39	42	46
1	VENTILATION (from heat saving vs. BAU; already included in COST for space heating)	0	0	0	-1	-3	-4	-5	-6	-7	-7
	LIGHTING	44	64	74	68	65	61	61	66	75	86
	ELECTRONICS	81	250	250	249	273	303	318	324	328	332
	FOOD PRESERVATION	53	47	49	47	47	46	47	49	53	56
	COOKING	24	29	32	34	35	36	37	39	41	43
	CLEANING	40	55	63	65	68	70	72	75	78	81
	INDUSTRY COMPONENTS	100	134	155	163	174	185	197	211	226	242
	ENERGY SECTOR (see separate below)										
	TRANSPORT SECTOR	92	108	103	117	131	146	154	161	169	177
	TOTAL in bn euros	702	1067	1110	1106	1157	1219	1276	1340	1413	1489

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	-1	-1	-2	-3	-5	-6
Total in bn euros, incl. energy Sector	702	1067	1110	1106	1157	1217	1274	1337	1408	1483



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	28	43	45	41	41	43	46	51	56	60
SPACE HEATING	147	182	176	162	159	158	162	170	180	190
SPACE & HT PROCESS COOLING	1	7	6	6	6	6	7	7	8	9
VENTILATION (acc, elec, maint)	1	3	3	4	7	9	10	13	15	17
LIGHTING	16	18	20	13	9	8	8	8	9	10
ELECTRONICS	49	138	144	141	155	173	183	188	191	194
FOOD PRESERVATION	27	22	22	20	20	18	18	18	18	18
COOKING	21	26	29	31	32	33	34	36	37	39
CLEANING	38	51	59	62	64	66	68	70	73	76
INDUSTRY COMPONENTS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
ECO Expense, Residential, in bn euros	329	490	505	480	493	513	537	561	587	614

EXPENSSAVE

db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	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	0.0
EIWH Electric Instant. ≥ 12 kW (primary)	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5
EIWHS Electric Instant. Shower (secondary)	0.0	0.0	0.1	0.3	0.5	0.6	0.6	0.7	0.7	0.7	0.8
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	0.0
ESWH Electric Storage > 30 L (primary)	0.0	0.0	0.1	0.6	1.2	1.6	1.8	1.9	2.0	2.1	
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	0.2	0.2
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	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	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	0.1
Dedicated WH Heat Pump	0.0	0.0	0.1	0.2	0.3	0.5	0.7	0.9	1.2	1.4	
Dedicated WH Solar (3.5 m ²)	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3
WH dedicated Water Heater	0.0	0.0	0.6	1.7	2.9	3.9	4.2	4.6	5.1	5.5	
CHB Gas Combi Instant. WH	0.0	0.0	0.2	0.7	1.4	2.3	3.4	4.5	5.8	7.2	
CHB Gas + Cyl. WH	0.0	0.0	0.2	0.5	0.9	1.3	1.7	2.2	2.7	3.2	
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	0.0
CHB Jet Burner Oil + Cyl. WH	0.0	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.3
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	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	-1.2	
CHB Electric HP + Cyl. WH	0.0	0.0	-0.1	-0.4	-1.3	-2.4	-3.7	-5.3	-6.9	-8.5	
CHB Gas HP + Cyl. WH	0.0	0.0	0.0	0.0	-0.1	-0.1	-0.2	-0.3	-0.3	-0.4	
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	-0.1
CHB Solar Combi (16 m ²)	0.0	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	0.8	0.9	1.1	1.0	0.8	0.6	0.6	
TOTAL WATER HEATING	0.0	0.0	0.9	2.5	3.8	4.9	5.2	5.4	5.7	6.2	
CHB Gas non-condensing	0.0	0.7	3.6	10.5	16.6	22.2	24.7	23.6	22.4	20.6	
CHB Gas condensing	0.0	0.5	0.7	-2.6	-2.1	-0.8	3.5	11.1	19.2	27.6	
CHB Gas Jet burner non-condensing	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.5	0.5	0.5	
CHB Gas Jet burner condensing	0.0	0.0	0.0	-0.2	-0.2	-0.2	-0.3	-0.3	-0.3	-0.3	
CHB Oil Jet burner non-condensing	0.0	0.2	0.9	2.4	3.5	4.4	5.0	5.5	5.4	5.2	
CHB Oil Jet burner condensing	0.0	0.0	-0.3	-1.2	-1.6	-2.0	-2.4	-2.7	-2.7	-2.5	
CHB Electric Joule-effect	0.0	0.0	0.1	0.2	0.3	0.4	0.4	0.3	0.3	0.2	
CHB Hybrid (gas-electric)	0.0	0.0	0.0	-0.1	-0.6	-1.2	-2.1	-2.9	-3.8	-4.5	
CHB Electric Heat Pump	0.0	0.0	0.4	-1.3	-5.3	-10.3	-16.2	-22.4	-28.5	-34.2	
CHB Gas Heat Pump	0.0	0.0	0.0	-0.1	-0.3	-0.5	-0.7	-0.8	-1.0	-1.0	
CHB micro CHP	0.0	0.0	-0.1	-0.2	-0.4	-0.5	-0.6	-0.6	-0.5	-0.3	
CHB Solar combi (16 m ²)	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.1	0.1	0.2	
CHB Central Heating boiler < 400 kW, space heating	0	2	5	8	10	12	12	11	11	12	
SFB Wood Manual	0.0	0.0	-0.1	-0.1	0.1	0.2	0.2	0.1	0.1	0.1	
SFB Wood Direct Draft	0.0	0.0	0.0	0.0	-0.2	-0.1	-0.1	-0.1	0.0	0.1	
SFB Coal	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	
SFB Pellets	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	
SFB Wood chips	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	
Total Solid Fuel Boiler	0.0	0.0	-0.1	0.0	0.0	0.3	0.4	0.4	0.5	0.6	
CHAE-S (≤ 400 kW)	0.0	0.0	0.0	0.0	0.1	0.1	0.2	0.2	0.2	0.2	
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	0.7	0.6	0.5	
HT PCH-AE-L	0.0	0.0	0.0	0.2	0.5	0.8	1.0	1.0	1.0	1.0	
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	2.6	2.6	2.5	2.2	
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	0.3	0.5	0.5	0.4	0.4	0.3	
AC VRF (rev)	0.0	0.0	0.0	0.1	0.2	0.4	0.6	0.7	0.7	0.6	
ACF (rev)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
AHF	0.0	0.0	0.0	0.3	0.6	0.9	1.1	1.0	1.0	0.9	
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	2.0	2.3	2.2	2.0	1.9	
Total AHC Air Heating & Cooling	0.0	0.0	0.1	1.1	2.7	4.2	4.8	4.8	4.5	4.1	

EXPENSSAVE

db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace	0.0	0.0	0.0	-0.4	-0.6	-0.4	-0.2	0.0	0.2	0.4	0.4
LH closed fireplace/inset	0.0	0.0	0.0	-0.5	-0.6	-0.3	0.0	0.3	0.6	0.7	
LH wood stove	0.0	0.0	0.0	-0.2	-0.2	-0.1	0.1	0.2	0.4	0.5	
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	-0.2	-0.1	0.0	0.1	0.1	0.1	0.1
LH SHR stove	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
LH pellet stove	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
LH Solid fuel sum	0.0	0.0	0.0	-1.4	-1.6	-0.8	0.1	0.8	1.5	1.9	
LH Electric portable	0.0	0.0	0.1	0.4	0.6	0.6	0.6	0.6	0.6	0.6	0.6
LH Electric fixed > 250W	0.0	0.0	0.1	0.7	1.3	1.6	1.7	1.7	1.7	1.7	
LH Electric fixed ≤ 250W	0.0	0.0	0.0	0.0	0.1	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	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	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	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	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	0.0
LH Electric sum	0.0	0.0	0.2	1.2	2.2	2.8	2.9	2.9	2.9	3.0	
LH Gas luminous (commercial)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	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	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	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	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	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	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	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	0.0
LH Liquid closed front	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid balanced flue	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
LH Liquid flueless	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
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	0.7	2.0	3.0	3.8	4.4	5.0	
RAC fixed < 6 kW, cooling	0.0	0.2	0.4	0.2	0.3	0.5	0.7	0.9	1.0	1.3	
RAC fixed 6-12 kW, cooling	0.0	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.3	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	0.1	
RAC < 12 kW total, cooling mode	0.0	0.2	0.5	0.4	0.5	0.7	1.0	1.1	1.4	1.8	
RAC fixed < 6 kW, reversible, heating	0.0	0.5	0.9	0.9	1.1	1.4	1.6	1.7	1.9	2.2	
RAC fixed 6-12 kW, reversible, heating	0.0	0.3	0.6	0.7	0.8	0.9	0.9	1.0	1.1	1.3	
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	0.8	1.5	1.6	2.0	2.3	2.5	2.7	3.0	3.5	
RAC Room Air Conditioner	0.0	1.0	2.0	1.9	2.5	3.0	3.5	3.8	4.4	5.3	
1 CIRC Integrated circulators	0.0	0.0	0.2	1.0	1.7	1.8	1.8	1.6	1.5	1.3	
1 CIRC Large standalone circulators	0.0	0.0	-0.2	0.1	0.3	0.3	0.2	0.2	0.2	0.2	
1 CIRC Small standalone circulators	0.0	0.0	0.0	0.3	0.5	0.4	0.4	0.5	0.5	0.4	
1 CIRC Circulator pumps <2.5 kW	0.0	0.0	0.0	1.5	2.4	2.5	2.4	2.3	2.2	1.9	
TOTAL SPACE HEATING	0	2	7	10	14	19	20	20	21	22	
TOTAL SPACE COOLING	0	0	1	1	2	3	4	4	4	4	
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	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	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	0.2	
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	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	0.5	0.5	0.6	
R-BVU 250-1000 m3/h	0.0	0.0	0.0	0.0	0.0	0.1	0.2	0.2	0.3	0.5	
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	0.9	1.2	1.4	
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	0.1	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	0.1	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	-0.1	0.0	0.2	0.3	0.5	0.6	0.7	
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	1.1	1.3	1.6	
VU Ventilation Units, res + non-res.	0.0	0.0	-0.2	-0.3	0.3	1.0	1.5	2.0	2.5	3.0	
TOTAL VENTILATION (VU own electricity & acq & maint)	0	0	0	0	0	1	2	2	2	3	
Impact vs. BAU of VU on SH energy cost (already accounted under Space Heating)	0	0	0	1	3	4	5	6	7	7	

EXPENSSAVE

db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	0.0	0.2	1.7	2.7	8.6	14.4	16.3	15.2	13.2	11.2	
HID (HPM, HPS, MH)	0.0	0.2	2.4	3.9	4.5	4.1	2.9	1.9	1.2	0.7	
CFLni (all shapes)	0.0	0.0	0.3	0.9	1.3	1.2	0.7	0.4	0.2	0.2	
CFLi (retrofit for GLS, HL)	0.0	-1.3	-0.5	1.2	2.9	3.1	2.3	1.6	1.0	0.7	
GLS (DLS & NDLS)	0.0	4.3	8.2	7.4	4.6	2.8	1.7	1.0	0.6	0.4	
HL (DLS & NDLS, LV & MV)	0.0	-1.0	-0.7	9.1	9.9	5.4	2.9	1.7	1.0	0.6	
LED replacing LFL (retrofit & luminaire)	0.0	0.0	-0.6	-0.8	-5.9	-7.1	-6.6	-5.5	-4.3	-2.9	
LED replacing HID (retrofit & luminaire)	0.0	0.0	-3.0	-2.3	-2.4	-1.6	-0.9	-0.4	0.0	0.4	
LED replacing CFLni (retrofit & luminaire)	0.0	0.0	-0.3	-0.6	-0.8	-0.6	-0.3	-0.1	0.0	0.0	
LED replacing DLS (retrofit & luminaire)	0.0	-0.2	-1.1	-0.9	-0.9	-0.4	-0.3	-0.2	-0.2	-0.1	
LED replacing NDLS (retrofit & luminaire)	0.0	0.0	-3.2	-4.7	-3.4	-2.5	-1.3	-0.9	-0.6	-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	18	19	17	15	12	11	
DP TV total all types	0.0	0.0	1.0	3.5	6.7	9.7	11.0	9.8	8.6	8.0	
DP Monitor	0.0	0.0	0.2	0.5	0.5	0.6	0.5	0.4	0.4	0.4	
DP Signage	0.0	0.0	0.0	0.0	0.1	0.7	1.3	1.3	0.8	0.2	
DP Electronic Displays, total	0	0	1	4	7	11	13	12	10	9	
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	0.9	0.9	
Total STB set top boxes (Complex & Simple)	0.0	0.2	0.4	1.0	1.0	0.8	0.8	0.8	0.9	0.9	
Game consoles > 20 W Active modes (SRI)	0.0	0.0	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	
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	0.2	0.4	0.4	0.4	0.4	0.4	0.5	0.5	
Total Game consoles, non-active modes	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.6	0.6	0.6	
Total Game consoles > 20 W, all modes	0.0	0.0	0.3	0.7	0.7	0.7	0.8	0.8	0.9	0.9	
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	0.3	0.8	0.9	0.9	1.0	1.0	1.1	1.1	
<i>ES&DS only, without effects on infrastructure</i>											
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	0.0	0.1	0.1	0.1	0.1	0.1	0.1	
ES rack 2-socket cloud	0	0	0	0.1	0.1	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	0.2	0.2
ES total cloud	0	0	0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
ES Enterprise Servers total	0	0	0	0.3	0.4	0.4	0.4	0.4	0.5	0.5	0.5
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	0.1	0.1	
DS Data Storage products total	0	0	0	0.0	0.1	0.1	0.1	0.2	0.2	0.2	
ES + DS total (excl. infrastructure)	0	0	0	0.3	0.5	0.5	0.6	0.6	0.7	0.7	
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	0.1	0.1	
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	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4	
EP / Laser MFD colour	0.0	0.1	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4	
Consumables, paper, ink, toner	0.0	0.2	0.6	0.6	0.4	0.4	0.4	0.3	0.3	0.3	
Total IE Imaging Equipment	0.0	0.6	1.5	1.9	1.8	1.7	1.7	1.7	1.7	1.7	

EXPENSSAVE

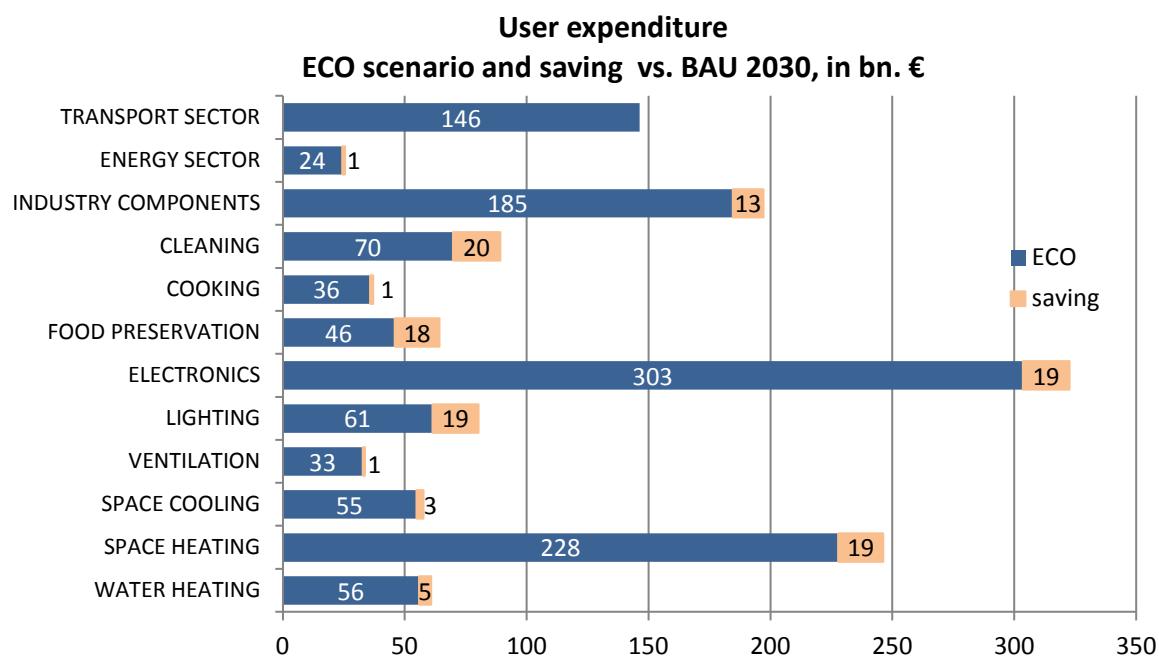
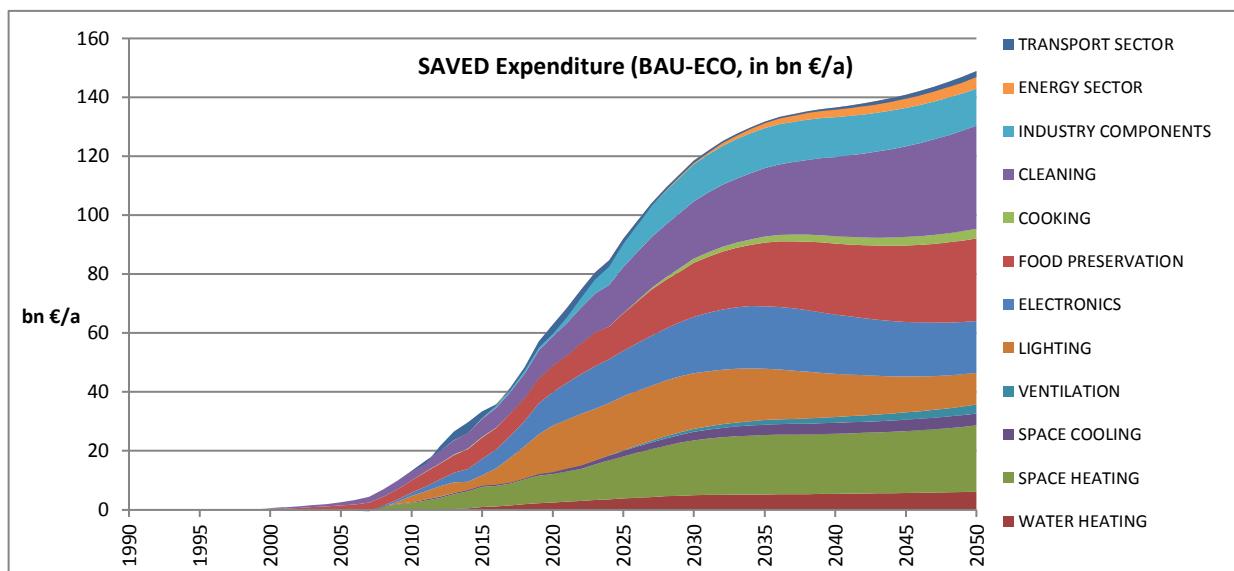
db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
	SB Radios (sb & off modes)	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.2	0.2	0.2
	SB Electric toothbrushes (off mode)	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.1	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	0.6	0.7	0.7	0.8	0.8	0.9
	SB Small appliances (sb & off modes)	0.0	0.0	0.4	0.8	0.8	0.9	1.0	1.0	1.1	1.1
	SB Media boxes /sticks (sb mode)	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3
	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	0.1	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	0.5
	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	0.6	0.6	0.6
	SB Coffee makers (off mode)	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2
<i>Products regulated also for (networked) standby (already accounted elsewhere; here for info only)</i>											
1	SB Washing Machines (sb & off, until 2021)	0.0	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.4	0.4
1	SB Dishwashers (sb & off, until 2021)	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.2	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	1.2	1.3	1.3
1	SB Electric Hobs (sb mode)	0.0	0.0	0.1	0.2	0.3	0.3	0.4	0.4	0.4	0.5
1	SB Complex Set-Top Boxes (low-power modes)	0.0	0.0	0.3	0.7	0.6	0.5	0.5	0.5	0.6	0.6
1	SB Game consoles (non-active modes)	0.0	0.0	0.1	0.4	0.5	0.5	0.5	0.6	0.6	0.6
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	0.2	0.3	0.3	0.3	0.3	0.3	0.4	0.4
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	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.6
	Total (networked) SB (incl. double)	0	1	4	6	6	7	7	8	8	8
	Total (networked) SB (excl. double)	0	0	2	3	3	4	4	4	4	4
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	0.2	0.2
0.6	EPS 10–12 W	0.0	0.0	0.3	0.7	0.9	0.8	0.7	0.7	0.6	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	0.0	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	0.5	0.9	1.2	1.1	1.1	0.9	0.8	0.8
	EPS, double counted subtracted	0.0	0.0	0.2	0.5	0.7	0.6	0.6	0.5	0.5	0.4
	TOTAL ELECTRONICS	0	1	6	11	15	19	21	20	19	18
	Total RF household Refrigerators & Freezers	0	4	7	9	11	14	15	17	18	20
	CF open vertical chilled multi deck (RVC2)	0.0	0.0	0.0	0.0	0.2	0.6	1.0	1.2	1.3	1.4
	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	0.9	1.5	1.7	1.9	2.0
	CF Plug in one door beverage cooler	0.0	0.0	0.0	0.0	0.5	1.1	1.4	1.5	1.6	1.7
	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	0.3
	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	1.0	2.9	4.2	4.8	5.2	5.5
	PF Storage cabinet Chilled Vertical (CV)	0	0	0	0.0	0.2	0.2	0.2	0.2	0.3	0.3
	PF Storage cabinet Frozen Vertical (FV)	0	0	0	0.1	0.2	0.2	0.3	0.3	0.3	0.4
	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	0.1	0.5	0.7	0.8	0.8	0.9	1.0
	PF Process Chiller AC MT S ≤ 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC MT L > 300 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC LTS ≤ 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller AC LT L > 200 kW	0	0	0	0.0	0.1	0.1	0.1	0.1	0.2	0.2
	PF Process Chiller WC MT S ≤ 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
	PF Process Chiller WC MT L > 300 kW	0	0	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	PF Process Chiller WC LTS ≤ 200 kW	0	0	0	0.0	0.0	0.0	0.0	0.1	0.1	0.1
	PF Process Chiller WC LT L > 200 kW	0	0	0	0.0	0.0	0.0	0.1	0.1	0.1	0.1
	PF Process Chiller All MT&LT	0	0	0	0.1	0.3	0.5	0.7	0.8	0.9	1.0

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db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	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	0.2
	PF Condensing Unit MT M 1-5 kW	0	0	0	0.1	0.2	0.2	0.2	0.2	0.3	0.3
	PF Condensing Unit MT L 5-20 kW	0	0	0	0.1	0.2	0.3	0.3	0.3	0.4	0.4
	PF Condensing Unit MT XL 20-50 kW	0	0	0	0.1	0.2	0.2	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
	PF Condensing Unit LT M 0.4-2 kW	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	0	0	0.1	0.1	0.1	0.1	0.2	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	0.4
0.6	PF Condensing Unit, All MT&LT	0	0	0	0.4	1.0	1.2	1.3	1.5	1.7	1.9
	PF Professional Refrigeration, Total	0	0	0	0.4	1.3	1.7	2.0	2.2	2.5	2.8
	TOTAL FOOD PRESERVATION	0	4	7	9	13	18	22	24	26	28
	CA Electric Hobs	0.0	0.0	0.1	-0.1	0.0	0.1	0.1	0.2	0.2	0.3
	CA Electric Ovens	0.0	0.0	0.1	0.2	0.6	1.3	1.6	1.7	1.8	1.9
	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	0.0	0.0
	CA Range Hoods	0.0	0.0	0.0	-0.3	-0.3	0.1	0.4	0.6	0.8	1.1
	TOTAL COOKING	0.0	0.0	0.2	-0.5	0.1	1.3	2.0	2.5	2.9	3.3
	WM Washing Machines	0.0	3.1	5.2	6.4	8.2	10.0	11.3	12.7	14.1	15.7
	WD Washer-Dryers	0.0	0.2	0.5	0.6	0.9	1.0	1.0	1.1	1.2	1.4
	Total WM-WD household Washing	0.0	3.3	5.6	7.0	9.1	10.9	12.3	13.8	15.3	17.1
	<i>including detergent and water savings</i>	0.0	2.8	4.2	5.4	7.2	8.8	10.2	11.8	13.7	15.9
	Total DW household Dishwasher	0.0	0.1	0.8	1.4	2.4	3.4	4.6	6.1	7.8	9.8
	<i>including detergent and water savings</i>	0.0	0.5	0.9	1.3	1.9	2.5	3.3	4.2	5.3	6.7
	LD condensing heat pump		-0.2	-1.6	-2.4	-2.9	-3.4	-3.3	-3.1	-2.9	-2.7
	LD condensing electric heat element	0.0	0.0	0.6	1.3	1.8	2.1	2.1	2.1	2.0	1.9
	LD vented electric	0.0	0.1	0.5	0.8	1.0	1.3	1.5	1.6	1.7	1.8
	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	-0.4	-0.1	0.0	0.3	0.5	0.7	0.9
	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	-0.4	-0.1	0.0	0.4	0.6	0.8	1.0
	VC dom	0.0	0.0	0.3	1.8	3.8	4.6	5.4	5.9	6.2	6.4
	VC nondom	0.0	0.0	0.1	0.3	0.4	0.5	0.5	0.6	0.7	0.8
	Total VC Vacuum Cleaner	0.0	0.0	0.4	2.1	4.2	5.1	5.9	6.5	6.9	7.2
	<i>including costs of bags & filters</i>	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	16	20	23	27	31	35
0.5	FAN Axial<300Pa (all FAN types >125W)	0.0	0.0	0.0	0.4	1.3	2.1	2.5	2.7	2.9	3.2
0.5	FAN Axial>300Pa	0.0	0.0	0.3	1.0	2.1	2.9	3.3	3.5	3.6	3.8
0.5	FAN Centr.FC	0.0	0.0	-0.2	-0.2	0.3	0.7	0.9	1.1	1.2	1.3
0.5	FAN Centr.BC-free	0.0	0.0	0.2	0.6	1.2	1.6	1.9	2.1	2.2	2.4
0.5	FAN Centr.BC	0.0	0.0	-0.1	0.3	1.1	1.6	2.0	2.4	2.8	3.4
0.5	FAN Cross-flow	0.0	0.0	-0.3	-0.3	-0.2	-0.1	0.0	0.0	0.1	0.2
	Total FAN, industrial (excl. box & roof fans)	0.0	0.0	0.0	0.9	2.9	4.4	5.3	5.8	6.5	7.1
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	0.0	0.0	0.6	2.9	4.8	4.9	4.6	4.0	3.1	2.0
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	0.0	0.0	1.0	4.7	8.3	8.8	8.1	7.0	5.3	2.9
0.45	Medium (L) 3-ph 75-375 kW no VSD	0.0	0.0	1.8	7.0	12.3	16.1	14.3	10.3	5.8	2.4
	Total 3ph 0.75-375 kW no VSD	0.0	0.0	3.4	14.5	25.4	29.8	27.0	21.3	14.3	7.2
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	0.0	0.0	-0.4	-2.1	-3.1	-2.9	-2.5	-2.0	-1.3	-0.4
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	0.0	0.0	-0.9	-3.3	-5.3	-5.3	-4.7	-3.9	-2.6	-0.9
0.45	Medium (L) 3-ph 75-375 kW with VSD	0.0	0.0	-1.3	-4.4	-7.3	-9.2	-7.6	-4.8	-1.9	0.3
	Total 3-ph 0.75-375 kW with VSD	0.0	0.0	-2.6	-9.8	-15.8	-17.4	-14.8	-10.7	-5.9	-1.1
0.45	Total 3-ph 0.75-375 kW w/wo VSD	0.0	0.0	0.9	4.7	9.6	12.4	12.2	10.6	8.4	6.2
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	0.0	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
	Total Small 1-ph 0.12-0.75 kW	0	0	0	0.0	-0.2	-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	0.0	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
	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 375-1000 kW with VSD	0	0	0	0.0	0.1	0.2	0.3	0.4	0.4	0.4
	Total Large 3-ph LV 375-1000 kW	0	0	0	0.0	0.1	0.3	0.4	0.5	0.5	0.5
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
	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
	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

EXPENSSAVE

db	SAVED Expenditure (BAU-ECO, in bn euros 2015)	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
0.45	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						
0.45	1-phase motors >0.75 kW (no VSD)	0	0	0	0.0	-0.1	0.1	0.2	0.2	0.2	0.2
	MT Elec. Motors LV 0.12-1000 kW	0	0	0	3	5	7	7	6	5	4
	including double counted amounts	-	0	1	5	9	13	13	12	9	7
	Total WP Water Pumps	0.0	0.0	0.2	0.4	0.6	0.7	0.8	0.9	1.0	1.1
	CP Fixed Speed 5-1280 l/s	0.0	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1
	CP Variable speed 5-1280 l/s	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0
	CP Pistons 2-64 l/s	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	Total CP Standard Air Compressors	0.0	0.0	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	0.1	0.3	0.3	0.3	0.3	0.3
	TOTAL INDUSTRY COMPONENTS	0	0	1	4	9	13	14	13	13	13
	TRAFO Distribution	0.0	0.0	-0.1	0.0	0.2	0.4	0.7	0.9	1.3	1.7
	TRAFO Industry oil	0.0	0.0	-0.1	0.0	0.3	0.5	0.8	1.1	1.3	1.5
	TRAFO Industry dry	0.0	0.0	-0.1	0.0	0.0	0.1	0.1	0.2	0.2	0.3
	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	0.1	0.2	0.3	0.5	0.8
	TRAFO DER dry	0.0	0.0	0.0	0.0	0.0	0.1	0.4	0.7	1.2	1.9
	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	-0.4	0.0	0.5	1.2	2.1	3.3	4.5	6.0
	TOTAL ENERGY SECTOR	0	0	0	0	1	1	2	3	5	6
	<i>(incl. costs for fuel due to rolling resistance)</i>										
	Tyres C1, replacement for cars	0.0	-0.3	2.2	-1.2	-0.4	-0.2	-0.1	-0.3	-1.0	-1.7
	Tyres C1, OEM for cars	0.0	0.0	0.0	-1.0	-0.7	-0.5	-0.6	-0.6	-0.7	-0.7
	Tyres C1, total	0.0	-0.3	2.2	-2.3	-1.1	-0.7	-0.6	-1.0	-1.7	-2.4
	Tyres C2, replacement for vans	0.0	0.1	0.7	0.0	0.5	0.6	0.5	0.5	0.4	0.3
	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	0.7	0.0	0.5	0.6	0.6	0.5	0.4	0.3
	Tyres C3, replacement for trucks/busses	0.0	0.1	-0.6	-0.9	-0.7	-0.4	-0.2	0.0	0.1	0.3
	Tyres C3, OEM for trucks/busses	0.0	0.0	0.0	0.0	-0.4	-0.3	-0.3	-0.3	-0.2	-0.2
	Tyres C3, total	0.0	0.1	-0.6	-0.9	-1.1	-0.7	-0.5	-0.3	-0.1	0.1
	Tyres, total C1+C2+C3	0.0	-0.1	2.3	-3.2	-1.7	-0.9	-0.5	-0.7	-1.4	-2.1
	TRANSPORT SECTOR	0.0	-0.1	2.3	-3.2	-1.7	-0.9	-0.5	-0.7	-1.4	-2.1
	SAVED GENERAL TOTAL (in bn euros)	0	13	33	60	90	118	131	136	140	147
db	SAVED Expenditure (BAU-ECO, in bn €), summary	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	0	0	1	2	4	5	5	5	6	6
	SPACE HEATING	0	2	7	10	14	19	20	20	21	22
	SPACE COOLING	0	0	1	1	2	3	4	4	4	4
	VENTILATION	0	0	0	0	0	1	2	2	2	3
1	<i>VENTILATION (from heat saving vs. BAU; already included in COST for space heating)</i>	<i>0</i>	<i>0</i>	<i>0</i>	<i>1</i>	<i>3</i>	<i>4</i>	<i>5</i>	<i>6</i>	<i>7</i>	<i>7</i>
	LIGHTING	0	2	3	16	18	19	17	15	12	11
	ELECTRONICS	0	1	6	11	15	19	21	20	19	18
	FOOD PRESERVATION	0	4	7	9	13	18	22	24	26	28
	COOKING	0	0	0	0	0	1	2	2	3	3
	CLEANING	0	3	6	10	16	20	23	27	31	35
	INDUSTRY COMPONENTS	0	0	1	4	9	13	14	13	13	13
	ENERGY SECTOR	0	0	0	0	1	1	2	3	5	6
	TRANSPORT SECTOR	0	0	2	-3	-2	-1	-1	-1	-1	-2
	TOTAL in bn euros 2010	0	13	33	60	90	118	131	136	140	147
	Saving in % versus BAU (from 1990=0)	0.0%	1.2%	2.9%	5.1%	7.2%	8.8%	9.3%	9.2%	9.0%	9.0%
	Saving In % versus BAU (from 2010=0)	-1.9%	0.0%	1.8%	4.0%	6.2%	7.8%	8.4%	8.3%	8.2%	8.2%



Data for graph above:

	2030	
	ECO	saving
WATER HEATING	56	5
SPACE HEATING	228	19
SPACE COOLING	55	3
VENTILATION	33	1
LIGHTING	61	19
ELECTRONICS	303	19
FOOD PRESERVATION	46	18
COOKING	36	1
CLEANING	70	20
INDUSTRY COMPONENTS	185	13
ENERGY SECTOR	24	1
TRANSPORT SECTOR	146	-1

REV_IND_BAU

db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	10	15	17	18	18	18	18	18	18	18	18
EIWH Electric Instant. ≥ 12 kW (primary)	29	25	25	26	29	31	34	37	40	43	
EIWSH Electric Instant. Shower (secondary)	42	55	54	53	56	60	63	66	70	73	
ESWH Electric Storage ≤ 30 L (secondary)	65	74	75	78	83	89	94	100	105	110	
ESWH Electric Storage > 30 L (primary)	373	443	407	426	456	485	515	544	573	603	
GIWH Gas Instant. < 13 L/min (secondary)	116	80	66	67	66	65	64	63	62	62	
GIWH Gas Instant. ≥ 13 L/min (primary)	34	32	27	27	27	27	26	26	25	25	
GSWH Gas Storage, Condensing	0	1	2	2	3	3	4	4	5	5	
GSWH Gas Storage, Non-condensing	52	31	23	14	13	11	9	8	6	5	
Dedicated WH Heat Pump	0	9	25	35	54	72	90	109	127	146	
Dedicated WH Solar (3.5 m ²)	83	298	302	246	255	264	273	282	292	301	
WH dedicated Water Heater	804	1063	1021	994	1060	1126	1192	1258	1323	1389	
CHB Gas Combi Instant. WH	219	368	381	409	414	417	418	418	414	407	
CHB Gas + Cyl. WH	112	152	158	170	171	173	173	173	172	169	
CHB Jet Burner Gas + Cyl. WH	49	22	15	15	15	16	16	17	17	17	
CHB Jet Burner Oil + Cyl. WH	376	151	102	99	102	105	108	111	113	116	
CHB Electric (Joule) + Cyl. WH	5	8	8	9	8	7	7	6	6	5	
CHB Hybrid Gas/Electric WH	0	1	1	2	4	7	11	18	30	49	
CHB Electric HP + Cyl. WH	8	112	127	154	178	206	237	273	314	361	
CHB Gas HP + Cyl. WH	0	2	2	3	5	7	10	15	21	30	
CHB Gas mCHP + Cyl. WH	2	3	4	6	9	13	19	27	38	54	
CHB Solar Combi (16 m ²)	12	21	21	22	23	23	24	24	24	25	
CHC Central Heating combi, water heating	783	839	819	890	930	974	1023	1081	1149	1232	
TOTAL WATER HEATING	1587	1902	1840	1884	1990	2100	2215	2338	2472	2622	
CHB Gas non-condensing	1679	903	837	819	755	694	634	576	520	464	
CHB Gas condensing	112	2454	2042	2176	2312	2435	2536	2618	2675	2699	
CHB Gas Jet burner non-condensing	355	114	52	45	42	39	36	34	31	29	
CHB Gas Jet burner condensing	0	38	52	59	65	71	77	82	88	93	
CHB Oil Jet burner non-condensing	2491	768	341	300	279	259	240	223	206	191	
CHB Oil Jet burner condensing	0	256	344	364	403	442	479	516	550	582	
CHB Electric Joule-effect	24	39	38	42	39	36	33	30	27	24	
CHB Hybrid (gas-electric)	2	5	8	14	24	40	66	110	181	299	
CHB Electric Heat Pump	45	625	708	870	1016	1185	1378	1602	1860	2158	
CHB Gas Heat Pump	3	9	13	19	28	41	59	84	121	175	
CHB micro CHP	10	17	23	36	52	75	108	155	223	321	
CHB Solar combi (16 m ²)	63	109	109	119	122	126	130	133	137	140	
CHB Central Heating boiler < 400 kW, space heating	4784	5337	4566	4863	5137	5442	5776	6163	6617	7173	
SFB Wood Manual [18 kW]	571	339	224	131	77	72	67	62	58	53	
SFB Wood Direct Draft [20 kW]	21	926	948	1000	930	1159	1357	1588	1860	2221	
SFB Coal [25 kW]	153	709	157	199	217	196	177	160	145	131	
SFB Pellets [25 kW]	0	238	362	358	358	395	436	482	532	587	
SFB Wood chips [160 kW]	0	147	146	173	201	222	245	270	299	330	
Total Solid Fuel Boiler	746	2359	1838	1861	1783	2044	2282	2563	2893	3322	
CHAE-S (≤ 400 kW)	191	841	926	1027	1136	1243	1352	1458	1560	1656	
CHAE-L (> 400 kW)	44	147	153	158	165	171	178	184	191	197	
CHWE-S (≤ 400 kW)	17	75	83	92	101	111	120	130	139	147	
CHWE-M (> 400 kW; ≤ 1500 kW)	19	69	72	75	78	81	85	88	91	94	
CHWE-L (> 1500 kW)	13	45	47	49	50	52	55	57	59	61	
CHF	0	3	4	5	6	7	8	9	10	10	
HT PCH-AE-S	97	163	175	185	193	201	209	217	225	233	
HT PCH-AE-L	78	130	140	148	155	161	167	174	180	186	
HT PCH-WE-S	21	36	38	40	42	44	46	47	49	51	
HT PCH-WE-M	84	141	151	160	167	174	181	188	195	201	
HT PCH-WE-L	16	26	28	30	31	33	34	35	36	38	
AC rooftop	89	302	306	235	137	36	36	36	36	36	
AC splits	153	579	607	588	568	545	525	504	484	463	
AC VRF	1	1327	1737	2539	3212	3877	4510	5092	5580	5933	
ACF	0	3	4	5	6	7	8	9	10	10	
SubTotal AHC Air Cooling	822	3886	4471	5337	6046	6744	7512	8228	8843	9317	
AC rooftop (rev)	55	186	179	144	81	20	0	0	0	0	
AC splits (rev)	103	371	389	378	365	351	337	324	311	298	
AC VRF (rev)	0	1133	1411	2168	2634	3025	3349	3597	3751	3795	
ACF (rev)	0	7	9	11	13	15	18	20	22	23	
AHF	322	210	197	184	175	164	155	145	135	126	
AHE	1	2	2	2	2	2	2	2	2	2	
SubTotal AHC Air Heating (rev double)	481	1908	2186	2886	3269	3578	3860	4088	4220	4243	
Total AHC Air Heating & Cooling	1145	4098	4670	5524	6224	6912	7671	8376	8983	9447	

REV_IND_BAU

db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	684	982	973	970	963	957	956	956	956	956	956
LH closed fireplace/inset [8 kW]	432	1152	1264	1382	1400	1418	1421	1421	1421	1421	1421
LH wood stove [8 kW]	468	542	591	643	652	660	662	662	662	662	662
LH coal stove [8 kW]	127	104	95	87	65	44	40	40	40	40	40
LH cooker [10 kW]	399	788	937	1088	1115	1143	1149	1149	1149	1149	1149
LH SHR stove [8 kW]	433	596	727	861	962	1064	1085	1085	1085	1085	1085
LH pellet stove [8 kW]	0	443	550	657	704	751	761	761	761	761	761
LH Solid fuel sum	2543	4608	5138	5688	5862	6036	6072	6072	6072	6072	6072
LH Electric portable	110	135	142	142	142	142	142	142	142	142	142
LH Electric fixed > 250W	948	1102	855	795	795	795	795	795	795	795	795
LH Electric fixed ≤ 250W	119	138	107	100	100	100	100	100	100	100	100
LH Electric storage	96	117	106	101	101	101	101	101	101	101	101
LH Electric underfloor	94	114	121	120	119	119	119	119	119	119	119
LH Electric visibly glowing > 1.2 kW	3	4	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	1
LH Electric Towel Heaters	158	264	264	264	264	264	264	264	264	264	264
LH Electric sum	1530	1876	1600	1527	1526	1526	1526	1526	1526	1526	1526
LH Gas luminous (commercial)	3	4	4	4	3	3	3	3	3	3	3
LH Gaseous Tube (commercial < 120 kW)	4	4	5	4	4	3	3	3	3	3	3
LH Gas open front	6	6	6	6	5	4	4	4	4	4	4
LH Gas closed front	67	36	29	25	22	19	19	19	19	19	19
LH Gas balanced flue	104	44	29	24	21	18	18	18	18	18	18
LH Gas flueless	4	1	1	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	188	96	74	62	55	48	47	47	47	47	47
LH Liquid tube (commercial < 120 kW)	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
LH Liquid closed front	7	4	3	2	2	2	2	2	2	2	2
LH Liquid balanced flue	10	4	3	2	2	2	2	2	2	2	2
LH Liquid flueless	39	13	6	0	0	0	0	0	0	0	0
LH Liquid fuel sum	56	22	13	6	5	4	4	4	4	4	4
LH Local Space Heaters total	4317	6601	6825	7283	7448	7614	7650	7650	7650	7650	7650
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	55	531	396	439	486	531	582	651	746	863	
RAC fixed 6-12 kW, cooling	26	310	306	301	313	322	328	329	364	403	
RAC portable < 12 kW, cooling	7	98	88	66	67	69	72	74	77	79	
RAC < 12 kW total, cooling mode	87	939	790	805	866	923	982	1054	1187	1345	
RAC fixed < 6 kW, reversible, heating	5	203	190	263	340	425	524	651	746	863	
RAC fixed 6-12 kW, reversible, heating	2	118	147	180	219	258	295	329	364	403	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	7	321	337	444	559	683	819	980	1110	1266	
RAC Room Air Conditioner	94	1260	1127	1249	1425	1606	1802	2033	2296	2611	
1 CIRC Integrated circulators	517	846	940	983	1060	1122	1122	1122	1122	1122	
1 CIRC Large standalone circulators	262	486	503	499	475	429	432	432	430	423	
1 CIRC Small standalone circulators	417	632	625	588	534	471	468	468	468	468	
1 CIRC Circulator pumps <2.5 kW	1196	1964	2068	2070	2069	2021	2022	2022	2020	2014	
TOTAL SPACE HEATING (incl. rev.AC)	10333	16526	15752	17337	18196	19361	20387	21443	22490	23654	
TOTAL SPACE COOLING	909	4825	5261	6143	6912	7667	8495	9281	10030	10663	
R-UVU ≤ 100 m3/h for Extract Spaces	2	6	7	8	8	8	9	10	9	10	
R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	1	1	1	2	2	
R-BVU ≤ 100 m3/h for Habitable Spaces	2	30	49	111	559	615	677	946	1144	1241	
R-UVU 100-250 m3/h	34	111	117	133	125	123	131	141	132	136	
R-BVU 100-250 m3/h	4	28	33	50	229	248	265	357	424	456	
R-UVU 250-1000 m3/h	62	165	162	181	166	166	177	189	182	190	
R-BVU 250-1000 m3/h	8	50	58	88	407	441	472	630	745	802	
R-UVU > 1000 m3/h	7	7	7	6	6	6	5	5	5	4	
R-BVU 1000-2500 m3/h	0	28	27	31	34	39	42	45	50	53	
RVU, Total residential (incl. instal.mat.)	120	425	461	609	1535	1646	1781	2325	2693	2894	
NR-UVU 250-1000 m3/h	62	64	62	61	54	54	53	50	46	43	
NR-BVU 250-1000 m3/h	0	133	139	164	188	217	238	261	293	313	
NR-UVU > 1000 m3/h	71	70	65	63	54	54	52	49	45	42	
NR-BVU 1000-2500 m3/h	0	269	265	303	331	377	408	440	483	512	
NR-AHU-S 2500-5500 m3/h	77	1429	1787	1786	1594	1791	1893	1941	2026	2140	
NR-AHU-M 5500-14500 m3/h	925	2467	2793	2720	2410	2610	2680	2702	2779	2860	
NR-AHU-L > 14500 m3/h	214	598	675	653	567	614	628	634	649	664	
NRVU, Total non-residential (incl. instal.mat.)	1349	5030	5786	5750	5199	5718	5951	6077	6321	6573	
VU Ventilation Units, res+nres (incl. instal.mat.)	1469	5455	6247	6359	6733	7364	7732	8401	9015	9467	
TOTAL VENTILATION	1469	5455	6247	6359	6733	7364	7732	8401	9015	9467	

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db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	1537	2292	2068	1566	1077	790	658	518	400	306	
HID (HPM, HPS, MH)	250	751	670	464	358	198	98	49	26	14	
CFLni (all shapes)	39	151	133	129	104	52	27	15	7	5	
CFLi (retrofit for GLS, HL)	46	599	391	470	280	208	113	78	49	31	
GLS (DLS & NDLS)	471	387	326	227	133	78	46	27	16	9	
HL (DLS & NDLS, LV & MV)	92	727	907	928	573	296	156	85	48	28	
LED replacing LFL (retrofit & luminaire)	0	3	393	1435	1945	2601	2854	3316	3987	4697	
LED replacing HID (retrofit & luminaire)	0	0	122	747	867	1096	1308	1563	1812	2069	
LED replacing CFLni (retrofit & luminaire)	0	0	24	91	143	182	207	234	256	278	
LED replacing DLS (retrofit & luminaire)	0	0	86	262	295	176	124	102	92	91	
LED replacing NDLS (retrofit & luminaire)	0	33	211	1446	1161	790	609	494	425	400	
SUBTOTAL non-LED	2435	4907	4495	3784	2526	1622	1098	772	544	393	
SUBTOTAL LED	0	37	835	3981	4411	4845	5101	5709	6573	7535	
TOTAL LIGHTING	2435	4944	5330	7765	6937	6467	6199	6482	7117	7927	
DP TV all types	6726	11034	6305	7864	9074	10435	10586	10586	10586	10586	
DP Monitor	830	1823	1026	1032	1032	1032	1032	1032	1032	1032	
DP Signage	0	175	769	1764	1323	1323	1323	1323	1323	1323	
DP Electronic Displays, total	7556	13032	8099	10660	11429	12790	12941	12941	12941	12941	
SSTB	0	656	150	0	0	0	0	0	0	0	
CSTB	0	2470	3047	3074	3074	3074	3074	3074	3074	3074	
Total STB set top boxes (Complex & Simple)	0	3127	3197	3074							
Game consoles > 20 W	16	1213	1213	1213	1213	1213	1213	1213	1213	1213	
Game consoles < 20 W	55	306	306	306	306	306	306	306	306	306	
Total Game consoles	70	1519									
ES tower 1-socket traditional	9	236	247	213	183	157	157	157	157	157	
ES rack 1-socket traditional	18	496	483	509	535	562	562	562	562	562	
ES rack 2-socket traditional	178	2853	1298	1585	1929	2347	2347	2347	2347	2347	
ES rack 2-socket cloud	0	2708	4077	4978	6057	7369	7369	7369	7369	7369	
ES rack 4-socket traditional	93	1495	636	777	945	1150	1150	1150	1150	1150	
ES rack 4-socket cloud	0	1254	1766	2157	2624	3192	3192	3192	3192	3192	
ES rack 2-socket resilient trad.	34	552	255	312	379	461	461	461	461	461	
ES rack 2-socket resilient cloud	0	404	618	755	918	1117	1117	1117	1117	1117	
ES rack 4-socket resilient trad.	2	32	15	18	22	27	27	27	27	27	
ES rack 4-socket resilient cloud	0	23	36	44	53	65	65	65	65	65	
ES blade 1-socket traditional	5	56	53	56	59	62	62	62	62	62	
ES blade 2-socket traditional	136	925	407	497	604	735	735	735	735	735	
ES blade 2-socket cloud	0	878	1278	1560	1898	2309	2309	2309	2309	2309	
ES blade 4-socket traditional	15	103	44	53	65	79	79	79	79	79	
ES blade 4-socket cloud	0	85	120	146	178	216	216	216	216	216	
ES total traditional	490	6748	3437	4019	4721	5580	5580	5580	5580	5580	
ES total cloud	0	5354	7894	9639	11727	14268	14268	14268	14268	14268	
ES Enterprise Servers total	490	12102	11332	13659	16448	19848	19848	19848	19848	19848	
DS Online 2	225	5412	5025	5513	6086	6720	6720	6720	6720	6720	
DS Online 3	394	8433	6035	6621	7311	8072	8072	8072	8072	8072	
DS Online 4	270	5543	5038	5527	6103	6738	6738	6738	6738	6738	
DS Data Storage products total	889	19388	16097	17661	19500	21529	21529	21529	21529	21529	
ES + DS total	1379	31490	27429	31320	35948	41377	41377	41377	41377	41377	
PC Desktop	4624	7182	3799	4250	5863	6251	6476	6552	6577	6585	
PC Integrated Desktop	198	307	163	182	251	306	344	357	362	363	
PC Notebook	0	19845	17499	17455	23033	29048	33358	34921	35450	35626	
PC Tablet/slate	0	957	10962	10569	11489	12453	13025	13218	13283	13304	
PC Thin client	0	445	432	456	461	464	465	466	466	466	
PC Integrated Thin Client	0	35	34	36	36	36	36	36	36	36	
PC Small-scale Server	56	110	139	141	141	142	142	143	143	143	
PC Workstation	551	980	1206	1377	1649	1973	2191	2268	2294	2303	
Total PC, electricity	5428	29860	34232	34465	42923	50673	56038	57962	58611	58826	
Inkjet Printer	227	374	49	54	51	49	46	44	42	39	
Inkjet MFD	279	720	550	349	332	316	300	285	271	256	
EP / Laser Printer mono	418	415	484	458	361	290	228	174	120	67	
EP / Laser Printer colour	0	401	453	557	614	643	667	680	693	706	
EP / Laser Copier mono	2071	872	215	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	292	522	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	679	907	866	824	783	744	707	670	633	
EP / Laser MFD colour	0	4307	5754	5494	5225	4969	4729	4494	4259	4024	
Total IE Imaging Equipment	2994	8059	8934	7777	7406	7049	6713	6384	6054	5725	

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db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
SB Radios	763	619	498	438	400	362	324	286	248	210	
SB Electric toothbrushes	87	141	155	174	195	215	236	256	277	297	
SB Audio speakers (wired)	1993	1026	725	259	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	11	716	1902	2156	2167	2169	2171	2173	2175	
SB Small appliances	2308	3730	3826	3928	3972	4015	4059	4103	4147	4191	
SB Media boxes /sticks	0	0	149	183	183	183	183	183	183	183	
SB Media players and recorders	1	1145	993	131	0	0	0	0	0	0	
SB Projectors	6	468	398	163	70	0	0	0	0	0	
SB Home phones	83	384	399	380	356	343	336	329	322	315	
SB Office phones	137	248	228	214	213	216	212	207	203	198	
SB Home NAS	0	708	1117	1526	1919	2313	2657	2905	3024	3030	
SB Home Network Equipment	0	1329	1509	1610	1699	1788	1931	1931	1931	1931	
SB Office Network Equipment	0	188	554	1041	1526	2011	2265	2265	2265	2265	
SB Coffee makers	310	376	387	398	410	422	434	446	458	470	
Total (networked) SB (excl. double)	5689	10374	11655	12347	13099	14037	14806	15084	15231	15267	
db											
0.0 EPS ≤ 6W, low-V	9	123	88	60	43	23	10	4	2	1	
0.3 EPS 6–10 W	52	731	791	845	885	930	954	978	1002	1028	
0.6 EPS 10–12 W	0	605	723	779	786	791	796	801	806	811	
0.5 EPS 15–20 W	0	3	16	31	34	38	40	42	45	47	
1.0 EPS 20–30 W	2	87	90	83	80	75	69	63	57	51	
0.8 EPS 30–65 W, multiple-V	0	0	0	12	18	25	33	41	48	56	
1.0 EPS 30–65 W	0	0	0	14	34	59	59	59	59	59	
1.0 EPS 65–120 W	1	66	65	49	27	1	0	0	0	0	
0.5 EPS 65–120 W, multiple-V	0	400	145	43	43	43	43	43	43	43	
0.0 EPS 12–15 W	2	66	133	163	164	165	165	165	165	165	
EPS, total for active mode	66	2081	2050	2078	2115	2150	2169	2197	2228	2261	
EPS, double counted subtracted	46	1146	1149	1171	1190	1206	1214	1230	1250	1271	
TOTAL ELECTRONICS	23162	98607	96215	102333	116586	131725	137682	139570	140057	139999	
RF Household refrigerator and freezer	2700	3014	3083	3154	3202	3250	3298	3346	3394	3442	
CF open vertical chilled multi deck (RVC2)	181	208	206	211	214	217	221	224	228	231	
CF open horizontal frozen island (RHF4)	21	25	25	25	25	26	26	27	27	28	
CF other supermarket display (non-BCs)	416	518	548	571	592	613	635	657	680	704	
CF Plug in one door beverage cooler	356	456	455	473	489	506	522	540	557	576	
CF Plug in horizontal ice cream freezer	147	189	188	195	202	209	216	223	230	238	
CF Spiral vending machine	238	187	153	160	166	172	179	186	193	200	
Total CF Commercial Refrigeration	1360	1583	1574	1634	1688	1743	1798	1856	1915	1977	
PF Storage cabinet Chilled Vertical (CV)	134	182	191	199	208	218	228	237	247	256	
PF Storage cabinet Frozen Vertical (FV)	70	95	100	104	109	114	119	124	129	134	
PF Storage cabinet Chilled Horizontal (CH)	27	37	39	41	43	45	47	49	51	53	
PF Storage cabinet Frozen Horizontal (FH)	21	28	30	31	33	34	36	37	38	40	
PF Storage cabinets All types	252	344	360	375	393	411	429	447	465	483	
PF Process Chiller AC MT S ≤ 300 kW	20	41	46	51	56	61	67	72	77	83	
PF Process Chiller AC MT L > 300 kW	19	39	44	48	53	58	63	68	73	78	
PF Process Chiller AC LT S ≤ 200 kW	17	34	37	41	46	50	54	58	63	67	
PF Process Chiller AC LT L > 200 kW	16	32	35	39	43	47	51	55	59	63	
PF Process Chiller WC MT S ≤ 300 kW	9	19	21	23	25	28	30	32	35	37	
PF Process Chiller WC MT L > 300 kW	14	28	31	34	37	41	45	48	52	55	
PF Process Chiller WC LT S ≤ 200 kW	9	18	20	22	24	27	29	31	34	36	
PF Process Chiller WC LT L > 200 kW	11	22	25	28	30	33	36	39	42	45	
PF Process Chiller All MT&LT	115	232	259	286	315	345	375	405	434	464	
PF Condensing Unit MT S 0.2-1 kW	105	87	89	96	104	112	120	130	140	151	
PF Condensing Unit MT M 1-5 kW	226	188	192	208	224	241	260	280	302	325	
PF Condensing Unit MT L 5-20 kW	232	193	198	214	230	248	267	288	310	334	
PF Condensing Unit MT XL 20-50 kW	178	148	151	164	176	190	205	221	238	256	
PF Condensing Unit LT S 0.1-0.4 kW	18	15	15	17	18	19	21	22	24	26	
PF Condensing Unit LT M 0.4-2 kW	32	27	27	30	32	34	37	40	43	46	
PF Condensing Unit LT L 2-8 kW	86	72	74	79	86	92	99	107	115	124	
PF Condensing Unit LT XL 8-20 kW	75	63	64	69	75	80	87	93	101	108	
0.6 PF Condensing Unit, All MT&LT	952	792	811	877	945	1018	1096	1181	1273	1371	
PF Professional Refrigeration, Total	748	893	943	1011	1086	1163	1242	1324	1408	1495	
TOTAL FOOD PRESERVATION	4808	5489	5601	5799	5976	6156	6339	6526	6717	6914	
CA Electric Hobs	932	2136	2295	2484	2621	2744	2860	2969	3072	3167	
CA Electric Ovens	2140	2583	2730	2971	2874	2895	2931	2968	3005	3043	
CA Gas Hobs	831	728	668	609	563	536	509	482	455	428	
CA Gas Ovens	277	289	276	269	261	254	246	238	230	222	
CA Range Hoods	520	645	680	717	753	792	830	868	907	945	
TOTAL COOKING	4700	6380	6649	7050	7071	7219	7375	7525	7668	7805	
WM Washing Machines	1449	2166	2181	2352	2258	2258	2258	2258	2258	2258	
WD Washer-Dryers	133	188	193	198	199	200	201	202	203	204	
Total WM-WD household Washing	1582	2354	2374	2550	2457	2458	2459	2460	2461	2462	
DW Household Dishwasher	631	1413	1649	1891	2120	2348	2577	2805	3034	3262	

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db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LD condensing heat pump	0	23	34	54	81	116	146	174	203	237
	LD condensing electric heat element	98	267	392	512	489	445	401	367	345	324
	LD vented electric	167	134	150	155	153	150	150	150	150	150
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	267	425	577	721	723	711	697	691	699	711
	VC dom. Vacuum Cleaner	1394	4215	5955	7303	7959	7846	7975	7960	7911	7864
	VC nondom Vacuum Cleaner	447	481	507	535	562	590	617	644	671	699
	Total VC Vacuum Cleaner	1841	4696	6462	7837	8521	8436	8592	8604	8582	8562
	TOTAL CLEANING	4321	8888	11063	13000	13822	13953	14326	14560	14776	14998
0.5	FAN Axial<300Pa [247 W flow out]	223	760	876	993	993	993	993	993	993	993
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	308	1107	1172	1238	1238	1238	1238	1238	1238	1238
0.5	FAN Centr.FC [141 W flow out]	191	505	585	665	665	665	665	665	665	665
0.5	FAN Centr.BC-free [2120 W flow out]	109	277	316	355	393	401	408	416	424	431
0.5	FAN Centr.BC [2052 W flow out]	239	660	759	859	956	975	1072	1169	1266	1363
0.5	FAN Cross-flow [31 W flow out]	44	102	117	132	146	149	163	177	192	206
	Total FAN, industrial (excl. box & roof fans)	558	1706	1913	2120	2195	2210	2270	2329	2388	2448
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	315	510	519	513	492	468	440	408	380	347
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	187	295	298	292	276	258	237	212	184	167
0.45	Medium (L) 3-ph 75-375 kW no VSD	146	216	213	201	182	160	134	104	102	104
0.45	Total 3ph 0.75-375 kW no VSD	648	1022	1031	1006	950	886	811	724	666	617
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	124	366	440	510	577	658	768	896	1050	1233
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	92	271	326	378	428	489	571	666	778	867
0.45	Medium (L) 3-ph 75-375 kW with VSD	70	207	249	289	328	375	437	508	520	532
0.45	Total 3-ph 0.75-375 kW with VSD	285	844	1014	1176	1334	1522	1775	2070	2348	2632
0.45	Total 3-ph 0.75-375 kW w/o VSD	933	1865	2045	2182	2284	2408	2586	2794	3014	3249
0.45	Small 1 ph 0.12-0.75 kW no VSD	200	382	402	402	401	399	396	392	389	384
0.45	Small 1 ph 0.12-0.75 kW with VSD	32	262	318	334	355	377	400	425	452	480
0.45	Total Small 1-ph 0.12-0.75 kW	232	644	720	737	755	775	796	818	840	864
0.45	Small 3 ph 0.12-0.75 kW no VSD	110	188	197	199	198	196	194	191	188	185
0.45	Small 3 ph 0.12-0.75 kW with VSD	12	97	120	131	144	158	174	191	210	231
0.45	Total Small 3-ph 0.12-0.75 kW	122	285	317	330	341	354	367	382	398	416
0.45	Large 3-ph LV 375-1000 kW no VSD	67	86	76	74	75	74	72	69	66	63
0.45	Large 3-ph LV 375-1000kW with VSD	24	144	199	220	231	243	253	264	275	287
0.45	Total Large 3-ph LV 375-1000 kW	91	230	275	294	306	317	325	333	341	350
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	20	35	36	37	37	37	37	37	38	39
0.45	Explosion motors (M) 3-ph 7.5-75 kW	18	31	33	34	34	34	34	34	34	35
0.45	Explosion motors (L) 3-ph 75-375 kW	13	23	24	25	25	25	25	25	25	26
0.45	Total Expl. 0.75-375 kW (no VSD)	51	89	94	96	96	96	96	97	99	
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	25	43	46	47	47	47	46	46	47	48
0.45	Brake motors (M) 3-ph 7.5-75 kW	22	39	41	42	42	42	42	42	42	43
0.45	Brake motors (L) 3-ph 75-375 kW	17	29	31	31	31	32	32	32	32	32
0.45	Total Brake 0.75-375 kW (no VSD)	63	111	117	120	120	120	120	120	121	124
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	5	5	5	5	5	5	5	6
0.45	1-phase motors >0.75 kW (no VSD)	456	799	837	856	856	855	853	852	868	890
	MT Elec. Motors LV 0.12-1000 kW	1073	2216	2426	2541	2620	2712	2832	2970	3127	3298
	WP Water pumps	780	1074	1161	1249	1343	1437	1530	1624	1718	1811
	CP Fixed Speed 5-1280 l/s	373	329	314	328	345	361	376	392	408	425
	CP Variable speed 5-1280 l/s	0	140	213	233	244	255	265	275	286	297
	CP Pistons 2-64 l/s	71	81	89	97	105	112	119	126	133	141
	Total CP Standard Air Compressors	444	550	616	659	695	728	760	793	827	862
	Total WE Welding Equipment	209	237	239	241	244	246	248	250	252	254
	TOTAL INDUSTRY COMPONENTS	3064	5782	6355	6811	7097	7333	7640	7966	8311	8673
	TRAFO Distribution, kWh/a	354	564	610	658	706	758	812	866	920	973
	TRAFO Industry oil	184	301	326	351	377	405	434	462	491	520
	TRAFO Industry dry	87	142	153	164	176	189	202	215	228	241
	TRAFO Power	1423	2311	2502	2700	2904	3122	3347	3572	3797	4022
	TRAFO DER oil	0	16	27	45	75	123	182	241	300	358
	TRAFO DER dry	0	101	169	279	461	762	1125	1488	1852	2215
	TRAFO Small	40	40	41	41	41	41	41	41	41	41
	TOTAL ENERGY SECTOR	2089	3477	3826	4239	4740	5400	6143	6885	7628	8370

REV_IND_BAU

db	REVENUE INDUSTRY BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	4976	6869	7567	8612	9746	11007	11007	11007	11007	11007
	Tyres C1, OEM for cars	1498	2053	2415	2593	2935	3314	3314	3314	3314	3314
	Tyres C1, total	6474	8922	9982	11206	12681	14321	14321	14321	14321	14321
	Tyres C2, replacement for vans	863	1125	1123	1264	1417	1587	1587	1587	1587	1587
	Tyres C2, OEM for vans	182	202	252	266	299	335	335	335	335	335
	Tyres C2, total	1045	1326	1374	1530	1716	1922	1922	1922	1922	1922
	Tyres C3, replacement for trucks/busses	1512	1529	1842	2350	2694	3086	3086	3086	3086	3086
	Tyres C3, OEM for trucks/busses	422	360	503	655	751	860	860	860	860	860
	Tyres C3, total	1934	1889	2345	3005	3445	3946	3946	3946	3946	3946
	Tyres, total C1+C2+C3	9454	12138	13701	15741	17842	20188	20188	20188	20188	20188
	TRANSPORT SECTOR	9454	12138	13701	15741	17842	20188	20188	20188	20188	20188
	GENERAL TOTAL (in m euro 2015)	68330	174413	177840	194460	213902	234933	244720	251165	256469	261279
	GENERAL TOTAL (in bn euro 2015)	68	174	178	194	214	235	245	251	256	261
	SUMMARY BAU										
Industry revenue (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	1.6	1.9	1.8	1.9	2.0	2.1	2.2	2.3	2.5	2.6	
SPACE HEATING	10.3	16.5	15.8	17.3	18.2	19.4	20.4	21.4	22.5	23.7	
SPACE COOLING	0.9	4.8	5.3	6.1	6.9	7.7	8.5	9.3	10.0	10.7	
VENTILATION	1.5	5.5	6.2	6.4	6.7	7.4	7.7	8.4	9.0	9.5	
LIGHTING	2.4	4.9	5.3	7.8	6.9	6.5	6.2	6.5	7.1	7.9	
ELECTRONICS	23.2	98.6	96.2	102.3	116.6	131.7	137.7	139.6	140.1	140.0	
FOOD PRESERVATION	4.8	5.5	5.6	5.8	6.0	6.2	6.3	6.5	6.7	6.9	
COOKING	4.7	6.4	6.6	7.1	7.1	7.2	7.4	7.5	7.7	7.8	
CLEANING	4.3	8.9	11.1	13.0	13.8	14.0	14.3	14.6	14.8	15.0	
INDUSTRY COMPONENTS	3.1	5.8	6.4	6.8	7.1	7.3	7.6	8.0	8.3	8.7	
ENERGY SECTOR	2.1	3.5	3.8	4.2	4.7	5.4	6.1	6.9	7.6	8.4	
TRANSPORT SECTOR	9.5	12.1	13.7	15.7	17.8	20.2	20.2	20.2	20.2	20.2	
TOTAL in bn euro 2015	68	174	178	194	214	235	245	251	256	261	
<u>Revenues for VSDs only (without motor, m euros)</u>											
VSD - Very Small 0.12 - 0.75 kW 1-phase	27	219	264	277	294	313	333	354	377	401	
VSD - Very Small 0.12 - 0.75 kW 3-phase	9	72	88	96	106	117	129	143	158	174	
VSD - Small 0.75 - 7.5 kW 3-phase	89	262	315	364	410	467	549	645	757	889	
VSD - Medium 7.5 - 75kW 3-phase	64	188	225	260	294	335	393	461	542	605	
VSD - Large 75 - 375kW 3-phase	36	106	128	147	166	190	223	261	270	277	
VSD - Very Large 375 - 1,000kW 3-phase	16	93	127	138	145	153	161	169	178	187	
Total revenues, VSDs only (BAU)	242	940	1147	1283	1416	1574	1787	2033	2281	2532	

REV_IND_ECO

db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	10	15	17	18	18	18	18	18	18	18	18
EIWH Electric Instant. ≥ 12 kW (primary)	29	25	25	26	29	31	34	37	40	43	
EIWHS Electric Instant. Shower (secondary)	42	55	54	53	56	60	63	66	70	73	
ESWH Electric Storage ≤ 30 L (secondary)	65	74	75	78	83	89	94	100	105	110	
ESWH Electric Storage > 30 L (primary)	373	443	407	426	456	485	515	544	573	603	
GIWH Gas Instant. < 13 L/min (secondary)	116	80	66	67	66	65	64	63	62	62	
GIWH Gas Instant. ≥ 13 L/min (primary)	34	32	27	27	27	27	26	26	25	25	
GSWH Gas Storage, Condensing	0	1	2	2	3	3	4	4	5	5	
GSWH Gas Storage, Non-condensing	52	31	23	14	13	11	9	8	6	5	
Dedicated WH Heat Pump	0	9	25	35	54	72	90	109	127	146	
Dedicated WH Solar (3.5 m2)	83	298	302	246	255	264	273	282	292	301	
WH dedicated Water Heater	804	1063	1021	994	1060	1126	1192	1258	1323	1389	
CHB Gas Combi Instant. WH	219	368	380	392	366	340	313	285	253	220	
CHB Gas + Cyl. WH	112	152	135	148	138	128	118	107	95	83	
CHB Jet Burner Gas + Cyl. WH	49	22	15	15	15	16	16	17	17	17	
CHB Jet Burner Oil + Cyl. WH	376	151	102	99	102	105	108	111	113	116	
CHB Electric (Joule) + Cyl. WH	5	8	8	9	8	7	7	6	6	5	
CHB Hybrid Gas/Electric WH	0	1	3	7	23	40	61	82	111	139	
CHB Electric HP + Cyl. WH	8	112	136	232	403	575	745	916	1098	1280	
CHB Gas HP + Cyl. WH	0	2	4	10	18	26	34	43	53	63	
CHB Gas mCHP + Cyl. WH	2	3	8	16	24	32	40	49	57	65	
CHB Solar Combi (16 m2)	12	21	24	23	24	25	25	26	27	27	
CHC Central Heating combi, water heating	783	839	815	949	1122	1294	1468	1641	1828	2015	
TOTAL WATER HEATING	1587	1902	1836	1943	2182	2420	2659	2899	3152	3405	
CHB Gas non-condensing	1679	903	680	208	127	47	37	27	22	16	
CHB Gas condensing	112	2454	2235	2744	2639	2534	2334	2133	1895	1658	
CHB Gas Jet burner non-condensing	355	114	39	13	11	9	7	5	4	3	
CHB Gas Jet burner condensing	0	38	65	91	96	101	106	111	114	118	
CHB Oil Jet burner non-condensing	2491	768	257	84	69	54	44	34	28	22	
CHB Oil Jet burner condensing	0	256	427	580	613	646	676	706	728	751	
CHB Electric Joule-effect	24	39	38	42	39	36	33	30	27	24	
CHB Hybrid (gas-electric)	2	5	16	38	136	234	354	475	642	809	
CHB Electric Heat Pump	45	625	659	1228	2137	3046	3951	4857	5820	6784	
CHB Gas Heat Pump	3	9	24	54	98	143	192	241	295	350	
CHB micro CHP	10	17	45	87	134	180	225	271	316	361	
CHB Solar combi (16 m2)	63	109	129	123	126	130	133	137	140	143	
CHB Central Heating boiler < 400 kW, space heating	4784	5337	4615	5291	6225	7159	8092	9025	10032	11038	
SFB Wood Manual [18 kW]	571	339	301	233	134	117	102	89	78	68	
SFB Wood Direct Draft [20 kW]	21	926	951	1014	1104	1292	1513	1772	2075	2429	
SFB Coal [25 kW]	153	709	157	199	217	196	177	160	145	131	
SFB Pellets [25 kW]	0	238	362	358	373	396	436	482	532	587	
SFB Wood chips [160 kW]	0	147	153	184	205	222	245	270	299	330	
Total Solid Fuel Boiler	746	2359	1924	1988	2032	2223	2474	2774	3128	3545	
CHAE-S (< 400 kW)	191	841	926	1027	1136	1243	1352	1458	1560	1656	
CHAE-L (> 400 kW)	44	147	153	158	165	171	178	184	191	197	
CHWE-S (< 400 kW)	17	75	83	92	101	111	120	130	139	147	
CHWE-M (> 400 kW; ≤ 1500 kW)	19	69	72	75	78	81	85	88	91	94	
CHWE-L (> 1500 kW)	13	45	47	49	50	52	55	57	59	61	
CHF	0	3	4	6	7	7	8	9	10	10	
HT PCH-AE-S	97	163	175	185	193	201	209	217	225	233	
HT PCH-AE-L	78	130	140	148	155	161	167	174	180	186	
HT PCH-WE-S	21	36	38	40	42	44	46	47	49	51	
HT PCH-WE-M	84	141	151	160	167	174	181	188	195	201	
HT PCH-WE-L	16	26	28	30	31	33	34	35	36	38	
AC rooftop	89	302	306	235	137	36	36	36	36	36	
AC splits	153	579	607	588	568	545	525	504	484	463	
AC VRF	1	1327	1737	2539	3212	3877	4510	5092	5580	5933	
ACF	0	3	4	6	7	8	8	9	10	10	
SubTotal AHC Air Cooling	822	3886	4471	5339	6048	6745	7513	8228	8843	9317	
AC rooftop (rev)	55	186	179	144	81	20	0	0	0	0	
AC splits (rev)	103	371	389	378	365	351	337	324	311	298	
AC VRF (rev)	0	1133	1411	2168	2634	3025	3349	3597	3751	3795	
ACF (rev)	0	7	9	11	13	15	18	20	22	23	
AHF	322	210	197	202	193	178	161	145	135	126	
AHE	1	2	2	2	2	2	2	2	2	2	
SubTotal AHC Air Heating (rev double)	481	1908	2186	2904	3287	3592	3866	4088	4220	4243	
Total AHC Air Heating & Cooling	1145	4098	4670	5542	6242	6926	7676	8376	8983	9447	

REV_IND_ECO

db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	684	982	973	1196	1310	1255	1208	1165	1123	1082	
LH closed fireplace/inset [8 kW]	432	1152	1264	1642	1763	1720	1662	1602	1544	1488	
LH wood stove [8 kW]	468	542	591	773	832	810	780	750	720	692	
LH coal stove [8 kW]	127	104	95	103	82	53	46	45	43	41	
LH cooker [10 kW]	399	788	937	1195	1269	1248	1203	1155	1149	1149	
LH SHR stove [8 kW]	433	596	727	866	965	1064	1085	1085	1085	1085	
LH pellet stove [8 kW]	0	443	550	657	704	751	761	761	761	761	
LH Solid fuel sum	2543	4608	5138	6431	6924	6900	6745	6561	6423	6297	
LH Electric portable	110	135	145	144	142	142	142	142	142	142	
LH Electric fixed > 250W	948	1102	863	795	795	795	795	795	795	795	
LH Electric fixed ≤ 250W	119	138	108	100	100	100	100	100	100	100	
LH Electric storage	96	117	122	133	128	123	118	113	108	104	
LH Electric underfloor	94	114	122	123	120	119	119	119	119	119	
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	158	264	264	264	264	264	264	264	264	264	
LH Electric sum	1530	1876	1629	1564	1553	1548	1543	1538	1533	1529	
LH Gas luminous (commercial)	3	4	4	5	4	3	3	3	3	3	
LH Gaseous Tube (commercial < 120 kW)	4	4	5	5	5	4	4	4	3	3	
LH Gas open front	6	6	6	6	5	4	4	4	4	4	
LH Gas closed front	67	36	30	26	22	19	19	19	19	19	
LH Gas balanced flue	104	44	30	25	21	18	18	18	18	18	
LH Gas flueless	4	1	1	0	0	0	0	0	0	0	
LH Gaseous fuel sum	188	96	76	67	58	49	48	48	48	48	
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	2	2	2	2	2	2	2	
LH Liquid flueless	39	13	6	0	0	0	0	0	0	0	
LH Liquid fuel sum	56	22	13	6	5	4	4	4	4	4	
LH Local Space Heaters total	4317	6601	6856	8069	8540	8501	8340	8151	8008	7877	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	55	626	494	538	568	579	591	651	746	863	
RAC fixed 6-12 kW, cooling	26	414	445	417	416	412	405	398	409	419	
RAC portable < 12 kW, cooling	7	114	108	80	76	73	72	74	77	79	
RAC < 12 kW total, cooling mode	87	1154	1046	1035	1061	1065	1068	1123	1231	1362	
RAC fixed < 6 kW, reversible, heating	5	239	237	323	398	463	532	651	746	863	
RAC fixed 6-12 kW, reversible, heating	2	158	214	250	292	330	365	398	409	419	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	7	397	451	573	689	793	896	1049	1155	1282	
RAC Room Air Conditioner	94	1551	1497	1608	1750	1858	1964	2173	2386	2644	
1 CIRC Integrated circulators	517	846	998	1050	1081	1122	1122	1122	1122	1122	
1 CIRC Large standalone circulators	262	486	811	759	677	579	551	524	499	475	
1 CIRC Small standalone circulators	417	632	750	698	624	542	516	491	468	468	
1 CIRC Circulator pumps <2.5 kW	1196	1964	2558	2507	2382	2244	2189	2137	2089	2065	
TOTAL SPACE HEATING (incl. rev.AC)	10333	16602	16032	18825	20774	22269	23669	25087	26543	27987	
TOTAL SPACE COOLING	909	5040	5518	6373	7109	7810	8581	9351	10075	10679	
R-UVU ≤ 100 m3/h for Extract Spaces	2	6	8	11	11	11	11	11	10	10	
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	30	51	121	587	623	677	946	1144	1241	
R-UVU 100-250 m3/h	34	111	129	170	159	154	162	170	156	158	
R-BVU 100-250 m3/h	4	28	34	53	237	251	265	357	424	456	
R-UVU 250-1000 m3/h	62	165	173	213	197	195	209	225	215	224	
R-BVU 250-1000 m3/h	8	50	59	90	407	441	472	630	745	802	
R-UVU > 1000 m3/h	7	7	7	7	6	6	6	6	5	5	
R-BVU 1000-2500 m3/h	0	28	27	32	34	39	42	45	50	53	
RVU, Total residential (incl. instal.mat.)	120	425	488	697	1639	1721	1846	2393	2753	2952	
NR-UVU 250-1000 m3/h	62	64	67	75	67	66	63	59	56		
NR-BVU 250-1000 m3/h	0	133	140	167	188	217	238	261	293	313	
NR-UVU > 1000 m3/h	71	70	68	71	62	62	60	57	53	49	
NR-BVU 1000-2500 m3/h	0	269	266	306	332	377	408	440	483	512	
NR-AHU-S 2500-5500 m3/h	77	1429	1830	1916	1721	1931	2039	2079	2161	2274	
NR-AHU-M 5500-14500 m3/h	925	2467	2875	2940	2616	2815	2877	2881	2950	3021	
NR-AHU-L > 14500 m3/h	214	598	690	693	605	652	664	667	681	695	
NRVU, Total non-residential (incl. instal.mat.)	1349	5030	5937	6168	5590	6121	6352	6448	6680	6919	
VU Ventilation Units, res+nres (incl. instal.mat.)	1469	5455	6424	6865	7229	7841	8197	8841	9433	9871	
TOTAL VENTILATION	1469	5455	6424	6865	7229	7841	8197	8841	9433	9871	

REV_IND_ECO

db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	1537	2290	1671	1388	429	218	119	78	46	26	
HID (HPM, HPS, MH)	250	751	534	330	204	79	24	8	3	1	
CFLni (all shapes)	39	151	115	83	50	15	4	2	1	0	
CFLi (retrofit for GLS, HL)	46	821	266	144	0	0	0	0	0	0	
GLS (DLS & NDLS)	471	199	17	0	0	0	0	0	0	0	
HL (DLS & NDLS, LV & MV)	92	828	966	210	2	0	0	0	0	0	
LED replacing LFL (retrofit & luminaire)	0	3	702	1537	4111	4189	3874	4172	4973	5750	
LED replacing HID (retrofit & luminaire)	0	0	1216	804	1204	1416	1639	1883	2137	2420	
LED replacing CFLni (retrofit & luminaire)	0	0	138	199	214	241	257	273	305	338	
LED replacing DLS (retrofit & luminaire)	0	102	682	443	355	80	88	97	107	119	
LED replacing NDLS (retrofit & luminaire)	0	58	2130	3103	1396	774	397	416	456	503	
SUBTOTAL non-LED	2435	5042	3570	2156	684	312	147	88	49	27	
SUBTOTAL LED	0	163	4869	6087	7280	6699	6254	6840	7978	9130	
TOTAL LIGHTING	2435	5205	8438	8242	7964	7011	6402	6928	8027	9157	
DP TV all types	6726	11034	6305	7864	9074	10435	10586	10586	10586	10586	
DP Monitor	830	1823	1026	1032	1032	1032	1032	1032	1032	1032	
DP Signage	0	175	769	1764	1323	1323	1323	1323	1323	1323	
DP Electronic Displays, total	7556	13032	8099	10660	11429	12790	12941	12941	12941	12941	
SSTB	0	656	150	0	0	0	0	0	0	0	
CSTB	0	2470	3047	3074	3074	3074	3074	3074	3074	3074	
Total STB set top boxes (Complex & Simple)	0	3127	3197	3074							
Game consoles > 20 W	16	1213	1213	1213	1213	1213	1213	1213	1213	1213	
Game consoles < 20 W	55	306	306	306	306	306	306	306	306	306	
Total Game consoles	70	1519									
ES tower 1-socket traditional	9	236	247	213	183	157	157	157	157	157	
ES rack 1-socket traditional	18	496	483	509	535	562	562	562	562	562	
ES rack 2-socket traditional	178	2853	1298	1585	1929	2347	2347	2347	2347	2347	
ES rack 2-socket cloud	0	2708	4077	4978	6057	7369	7369	7369	7369	7369	
ES rack 4-socket traditional	93	1495	636	777	945	1150	1150	1150	1150	1150	
ES rack 4-socket cloud	0	1254	1766	2157	2624	3192	3192	3192	3192	3192	
ES rack 2-socket resilient trad.	34	552	255	312	379	461	461	461	461	461	
ES rack 2-socket resilient cloud	0	404	618	755	918	1117	1117	1117	1117	1117	
ES rack 4-socket resilient trad.	2	32	15	18	22	27	27	27	27	27	
ES rack 4-socket resilient cloud	0	23	36	44	53	65	65	65	65	65	
ES blade 1-socket traditional	5	56	53	56	59	62	62	62	62	62	
ES blade 2-socket traditional	136	925	407	497	604	735	735	735	735	735	
ES blade 2-socket cloud	0	878	1278	1560	1898	2309	2309	2309	2309	2309	
ES blade 4-socket traditional	15	103	44	53	65	79	79	79	79	79	
ES blade 4-socket cloud	0	85	120	146	178	216	216	216	216	216	
ES total traditional	490	6748	3437	4019	4721	5580	5580	5580	5580	5580	
ES total cloud	0	5354	7894	9639	11727	14268	14268	14268	14268	14268	
ES Enterprise Servers total	490	12102	11332	13659	16448	19848	19848	19848	19848	19848	
DS Online 2	225	5412	5025	5513	6086	6720	6720	6720	6720	6720	
DS Online 3	394	8433	6035	6621	7311	8072	8072	8072	8072	8072	
DS Online 4	270	5543	5038	5527	6103	6738	6738	6738	6738	6738	
DS Data Storage products total	889	19388	16097	17661	19500	21529	21529	21529	21529	21529	
ES + DS total	1379	31490	27429	31320	35948	41377	41377	41377	41377	41377	
PC Desktop	4624	7182	3799	4250	5863	6251	6476	6552	6577	6585	
PC Integrated Desktop	198	307	163	182	251	306	344	357	362	363	
PC Notebook	0	19845	17499	17455	23033	29048	33358	34921	35450	35626	
PC Tablet/slate	0	957	10962	10569	11489	12453	13025	13218	13283	13304	
PC Thin client	0	445	432	456	461	464	465	466	466	466	
PC Integrated Thin Client	0	35	34	36	36	36	36	36	36	36	
PC Small-scale Server	56	110	139	141	141	142	142	143	143	143	
PC Workstation	551	980	1206	1377	1649	1973	2191	2268	2294	2303	
Total PC, electricity	5428	29860	34232	34465	42923	50673	56038	57962	58611	58826	
Inkjet Printer	227	374	49	54	51	49	46	44	42	39	
Inkjet MFD	279	720	550	349	332	316	300	285	271	256	
EP / Laser Printer mono	418	415	484	458	361	290	228	174	120	67	
EP / Laser Printer colour	0	401	453	557	614	643	667	680	693	706	
EP / Laser Copier mono	2071	872	215	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	292	522	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	679	907	866	824	783	744	707	670	633	
EP / Laser MFD colour	0	4307	5754	5494	5225	4969	4729	4494	4259	4024	
Total IE Imaging Equipment	2994	8059	8934	7777	7406	7049	6713	6384	6054	5725	

REV_IND_ECO

db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<i>Products regulated only for (networked) standby</i>											
SB Radios	763	619	498	438	400	362	324	286	248	210	
SB Electric toothbrushes	87	141	155	174	195	215	236	256	277	297	
SB Audio speakers (wired)	1993	1026	725	259	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	11	716	1902	2156	2167	2169	2171	2173	2175	
SB Small appliances	2308	3730	3826	3928	3972	4015	4059	4103	4147	4191	
SB Media boxes /sticks	0	0	149	183	183	183	183	183	183	183	
SB Media players and recorders	1	1145	993	131	0	0	0	0	0	0	
SB Projectors	6	468	398	163	70	0	0	0	0	0	
SB Home phones	83	384	399	380	356	343	336	329	322	315	
SB Office phones	137	248	228	214	213	216	212	207	203	198	
SB Home NAS	0	708	1117	1526	1919	2313	2657	2905	3024	3030	
SB Home Network Equipment	0	1329	1509	1610	1699	1788	1931	1931	1931	1931	
SB Office Network Equipment	0	188	554	1041	1526	2011	2265	2265	2265	2265	
SB Coffee makers	310	376	387	398	410	422	434	446	458	470	
Total (networked) SB (excl. double)	5689	10374	11655	12347	13099	14037	14806	15084	15231	15267	
db											
0.0 EPS ≤ 6W, low-V	9	127	102	77	55	28	12	5	2	1	
0.3 EPS 6–10 W	52	734	792	845	885	930	954	978	1002	1028	
0.6 EPS 10–12 W	0	607	724	782	786	791	796	801	806	811	
0.5 EPS 15–20 W	0	3	17	34	36	40	41	42	45	47	
1.0 EPS 20–30 W	2	88	97	92	86	79	71	63	57	51	
0.8 EPS 30–65 W, multiple-V	0	0	0	12	18	25	33	41	48	56	
1.0 EPS 30–65 W	0	0	0	14	34	59	59	59	59	59	
1.0 EPS 65–120 W	1	67	65	50	27	1	0	0	0	0	
0.5 EPS 65–120 W, multiple-V	0	400	145	43	43	43	43	43	43	43	
0.0 EPS 12–15 W	2	66	133	163	164	165	165	165	165	165	
EPS, total	66	2091	2076	2112	2136	2162	2174	2198	2228	2262	
EPS, double counted subtracted	46	1153	1166	1191	1202	1213	1217	1231	1250	1271	
TOTAL ELECTRONICS	23162	98613	96231	102353	116599	131731	137685	139571	140057	139999	
RF Household refrigerator and freezer	2700	3459	3772	3963	4523	4343	4756	4902	5031	5144	
CF open vertical chilled multi deck (RVC2)	181	208	206	211	251	273	265	257	249	241	
CF open horizontal frozen island (RHF4)	21	25	25	25	25	26	26	27	27	28	
CF other supermarket display (non-BCs)	416	518	548	571	592	613	635	657	680	704	
CF Plug in one door beverage cooler	356	456	455	473	510	519	522	540	557	576	
CF Plug in horizontal ice cream freezer	147	189	188	195	202	209	216	223	230	238	
CF Spiral vending machine	238	187	153	160	166	172	179	186	193	200	
Total CF Commercial Refrigeration	1360	1583	1574	1634	1746	1812	1842	1888	1936	1986	
PF Storage cabinet Chilled Vertical (CV)	134	182	191	216	215	218	228	237	247	256	
PF Storage cabinet Frozen Vertical (FV)	70	95	100	113	113	114	119	124	129	134	
PF Storage cabinet Chilled Horizontal (CH)	27	37	39	44	44	45	47	49	51	53	
PF Storage cabinet Frozen Horizontal (FH)	21	28	30	34	34	34	36	37	38	40	
PF Storage cabinets All types	252	344	360	407	406	411	429	447	465	483	
PF Process Chiller AC MT S ≤ 300 kW	20	41	46	53	56	61	67	72	77	83	
PF Process Chiller AC MT L > 300 kW	19	39	44	48	53	58	63	68	73	78	
PF Process Chiller AC LT S ≤ 200 kW	17	34	37	43	46	50	54	58	63	67	
PF Process Chiller AC LT L > 200 kW	16	32	35	39	43	47	51	55	59	63	
PF Process Chiller WC MT S ≤ 300 kW	9	19	21	24	25	28	30	32	35	37	
PF Process Chiller WC MT L > 300 kW	14	28	31	34	37	41	45	48	52	55	
PF Process Chiller WC LT S ≤ 200 kW	9	18	20	23	24	27	29	31	34	36	
PF Process Chiller WC LT L > 200 kW	11	22	25	28	30	33	36	39	42	45	
PF Process Chiller All MT&LT	115	232	259	291	315	345	375	405	434	464	
PF Condensing Unit MT S 0.2-1 kW	105	87	89	100	104	112	120	130	140	151	
PF Condensing Unit MT M 1-5 kW	226	188	192	215	224	241	260	280	302	325	
PF Condensing Unit MT L 5-20 kW	232	193	198	228	234	248	267	288	310	334	
PF Condensing Unit MT XL 20-50 kW	178	148	151	175	179	190	205	221	238	256	
PF Condensing Unit LT S 0.1-0.4 kW	18	15	15	17	18	19	21	22	24	26	
PF Condensing Unit LT M 0.4-2 kW	32	27	27	31	32	34	37	40	43	46	
PF Condensing Unit LT L 2-8 kW	86	72	74	85	87	92	99	107	115	124	
PF Condensing Unit LT XL 8-20 kW	75	63	64	74	76	80	87	93	101	108	
0.6 PF Condensing Unit, All MT&LT	952	792	811	926	951	1018	1096	1181	1273	1371	
PF Professional Refrigeration, Total	748	893	943	1068	1102	1163	1242	1324	1408	1495	
TOTAL FOOD PRESERVATION	4808	5934	6290	6665	7371	7318	7841	8114	8376	8626	
CA Electric Hobs	932	2136	2295	2588	2725	2849	2965	3074	3176	3270	
CA Electric Ovens	2140	2583	2767	3122	3015	2912	2931	2968	3005	3043	
CA Gas Hobs	831	728	668	643	586	536	509	482	455	428	
CA Gas Ovens	277	289	293	372	358	344	331	318	306	293	
CA Range Hoods	520	645	680	891	1038	1047	1054	1058	1059	1059	
TOTAL COOKING	4700	6380	6703	7617	7723	7688	7789	7899	8000	8093	
WM Washing Machines	1449	2612	2680	2870	2654	2525	2403	2286	2258	2258	
WD Washer-Dryers	133	188	193	198	199	200	201	202	203	204	
Total WM-WD household Washing	1582	2800	2873	3068	2853	2725	2604	2488	2461	2462	
DW Household Dishwasher	631	1876	2191	2460	2686	2897	3093	3274	3442	3596	

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db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LD condensing heat pump	0	102	591	826	932	1104	1051	1000	951	905
	LD condensing electric heat element	98	259	242	267	234	160	152	145	138	136
	LD vented electric	167	117	69	58	36	0	0	0	0	0
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	267	479	903	1151	1202	1264	1203	1145	1089	1041
	VC dom. Vacuum Cleaner	1394	4215	6142	7509	7959	7846	7975	7960	7911	7864
	VC nondom Vacuum Cleaner	447	481	519	550	562	590	617	644	671	699
	Total VC Vacuum Cleaner	1841	4696	6662	8060	8521	8436	8592	8604	8582	8562
	TOTAL CLEANING	4321	9850	12628	14738	15263	15322	15492	15511	15574	15662
0.5	FAN Axial<300Pa [247 W flow out]	223	760	1092	1378	1318	1260	1205	1152	1101	1053
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	308	1107	1172	1288	1238	1238	1238	1238	1238	1238
0.5	FAN Centr.FC [141 W flow out]	191	505	754	1047	999	953	910	868	829	791
0.5	FAN Centr.BC-free [2120 W flow out]	109	277	386	434	460	448	436	425	424	431
0.5	FAN Centr.BC [2052 W flow out]	239	660	1061	1221	1299	1267	1331	1387	1436	1478
0.5	FAN Cross-flow [31 W flow out]	44	102	335	446	472	460	482	500	517	530
	Total FAN, industrial (excl. box & roof fans)	558	1706	2400	2907	2893	2813	2801	2785	2772	2760
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	315	516	559	526	538	520	497	474	451	427
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	187	298	288	259	256	242	227	212	197	190
0.45	Medium (L) 3-ph 75-375 kW no VSD	146	218	191	170	172	157	140	127	122	119
0.45	Total 3ph 0.75-375 kW no VSD	648	1032	1039	956	966	919	864	813	769	736
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	124	371	576	979	1051	1078	1121	1181	1245	1313
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	92	276	517	700	740	757	787	829	874	896
0.45	Medium (L) 3-ph 75-375 kW with VSD	70	211	374	458	498	511	531	552	558	560
0.45	Total 3-ph 0.75-375 kW with VSD	285	857	1467	2137	2289	2346	2438	2562	2677	2770
0.45	Total 3-ph 0.75-375 kW w/o VSD	933	1890	2506	3092	3255	3265	3302	3375	3447	3506
0.45	Small 1 ph 0.12-0.75 kW no VSD	200	382	402	402	515	500	486	472	458	444
0.45	Small 1 ph 0.12-0.75 kW with VSD	32	262	318	334	369	391	414	438	463	490
0.45	Total Small 1-ph 0.12-0.75 kW	232	644	720	737	884	891	900	909	921	934
0.45	Small 3 ph 0.12-0.75 kW no VSD	110	188	197	208	242	236	229	223	216	209
0.45	Small 3 ph 0.12-0.75 kW with VSD	12	97	120	136	158	167	181	198	217	237
0.45	Total Small 3-ph 0.12-0.75 kW	122	285	317	343	400	403	410	421	433	446
0.45	Large 3-ph LV 375-1000 kW no VSD	67	86	76	75	84	80	77	73	69	65
0.45	Large 3-ph LV 375-1000kW with VSD	24	144	199	223	249	249	258	268	278	289
0.45	Total Large 3-ph LV 375-1000 kW	91	230	275	298	333	330	335	341	348	355
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	20	35	36	39	47	46	46	45	45	44
0.45	Explosion motors (M) 3-ph 7.5-75 kW	18	31	33	35	40	40	39	38	38	37
0.45	Explosion motors (L) 3-ph 75-375 kW	13	23	24	26	30	29	29	28	27	27
0.45	Total Expl. 0.75-375 kW (no VSD)	51	89	94	100	116	115	113	112	110	108
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	25	43	46	49	64	64	63	62	61	60
0.45	Brake motors (M) 3-ph 7.5-75 kW	22	39	41	45	54	53	52	51	50	49
0.45	Brake motors (L) 3-ph 75-375 kW	17	29	31	34	39	38	37	37	36	35
0.45	Total Brake 0.75-375 kW (no VSD)	63	111	117	128	156	155	152	150	147	144
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	2	2	2	2	2	2
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)	3	5	5	6	7	7	7	7	7	7
0.45	1-phase motors >0.75 kW (no VSD)	456	799	837	856	958	965	970	975	979	983
	MT Elec. Motors LV 0.12-1000 kW	1073	2229	2679	3058	3361	3372	3405	3459	3515	3566
	WP Water pumps	780	1074	1161	1249	1343	1437	1530	1624	1718	1811
	CP Fixed Speed 5-1280 l/s	373	329	329	356	372	386	399	412	426	439
	CP Variable speed 5-1280 l/s	0	140	214	244	256	264	272	280	289	297
	CP Pistons 2-64 l/s	71	81	102	124	131	135	140	144	148	152
	Total CP Standard Air Compressors	444	550	645	723	759	786	811	837	863	889
	Total WE Welding Equipment	209	237	239	241	249	251	248	250	252	254
	TOTAL INDUSTRY COMPONENTS	3064	5796	7125	8179	8604	8658	8794	8955	9119	9280
	TRAFO Distribution, kWh/a	354	564	753	812	872	937	1003	1070	1136	1202
	TRAFO Industry oil	184	301	498	537	577	619	663	707	751	795
	TRAFO Industry dry	87	142	207	222	238	255	273	291	308	326
	TRAFO Power	1423	2311	2502	2700	2904	3122	3347	3572	3797	4022
	TRAFO DER oil	0	16	46	76	125	207	306	405	503	602
	TRAFO DER dry	0	101	221	366	604	998	1474	1950	2426	2902
	TRAFO Small	40	40	41	41	41	41	41	41	41	41
	TOTAL ENERGY SECTOR	2089	3477	4267	4755	5362	6180	7107	8035	8963	9890

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db	REVENUE INDUSTRY ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	Tyres C1, replacement for cars	4976	7153	8689	10466	11868	13263	13263	13263	13263	13263
	Tyres C1, OEM for cars	1498	2053	2415	3081	3574	3994	3994	3994	3994	3994
	Tyres C1, total	6474	9206	11104	13547	15442	17258	17258	17258	17258	17258
	Tyres C2, replacement for vans	863	1125	1171	1462	1692	1901	1901	1901	1901	1901
	Tyres C2, OEM for vans	182	202	252	277	350	401	401	401	401	401
	Tyres C2, total	1045	1326	1423	1739	2043	2302	2302	2302	2302	2302
	Tyres C3, replacement for trucks/busses	1512	1529	2681	3112	3583	3993	3993	3993	3993	3993
	Tyres C3, OEM for trucks/busses	422	360	503	681	998	1113	1113	1113	1113	1113
	Tyres C3, total	1934	1889	3184	3793	4581	5106	5106	5106	5106	5106
	Tyres, total C1+C2+C3	9454	12422	15711	19078	22066	24666	24666	24666	24666	24666
	TRANSPORT SECTOR	9454	12422	15711	19078	22066	24666	24666	24666	24666	24666
	GENERAL TOTAL (in m euro 2015)	68330	176677	187204	205634	228245	248915	258882	265856	271985	277315
	GENERAL TOTAL (in bn euro 2015)	68	177	187	206	228	249	259	266	272	277
	SUMMARY ECO										
Industry revenue (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	1.6	1.9	1.8	1.9	2.2	2.4	2.7	2.9	3.2	3.4	
SPACE HEATING	10.3	16.6	16.0	18.8	20.8	22.3	23.7	25.1	26.5	28.0	
SPACE COOLING	0.9	5.0	5.5	6.4	7.1	7.8	8.6	9.4	10.1	10.7	
VENTILATION	1.5	5.5	6.4	6.9	7.2	7.8	8.2	8.8	9.4	9.9	
LIGHTING	2.4	5.2	8.4	8.2	8.0	7.0	6.4	6.9	8.0	9.2	
ELECTRONICS	23.2	98.6	96.2	102.4	116.6	131.7	137.7	139.6	140.1	140.0	
FOOD PRESERVATION	4.8	5.9	6.3	6.7	7.4	7.3	7.8	8.1	8.4	8.6	
COOKING	4.7	6.4	6.7	7.6	7.7	7.7	7.8	7.9	8.0	8.1	
CLEANING	4.3	9.9	12.6	14.7	15.3	15.3	15.5	15.5	15.6	15.7	
INDUSTRY COMPONENTS	3.1	5.8	7.1	8.2	8.6	8.7	8.8	9.0	9.1	9.3	
ENERGY SECTOR	2.1	3.5	4.3	4.8	5.4	6.2	7.1	8.0	9.0	9.9	
TRANSPORT SECTOR	9.5	12.4	15.7	19.1	22.1	24.7	24.7	24.7	24.7	24.7	
TOTAL in bn euro 2010	68	177	187	206	228	249	259	266	272	277	
Industry revenue ECO-BAU (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	0.0	-	-	0.0	0.1	0.2	0.3	0.4	0.6	0.7	0.8
SPACE HEATING	-	0.1	0.3	1.5	2.6	2.9	3.3	3.6	4.1	4.3	
SPACE COOLING	-	0.2	0.3	0.2	0.2	0.1	0.1	0.1	0.0	0.0	
VENTILATION	-	-	0.2	0.5	0.5	0.5	0.5	0.4	0.4	0.4	
LIGHTING	-	0.3	3.1	0.5	1.0	0.5	0.2	0.4	0.9	1.2	
ELECTRONICS	-	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	
FOOD PRESERVATION	-	0.4	0.7	0.9	1.4	1.2	1.5	1.6	1.7	1.7	
COOKING	-	-	0.1	0.6	0.7	0.5	0.4	0.4	0.3	0.3	
CLEANING	-	1.0	1.6	1.7	1.4	1.4	1.2	1.0	0.8	0.7	
INDUSTRY COMPONENTS	-	0.0	0.8	1.4	1.5	1.3	1.2	1.0	0.8	0.6	
ENERGY SECTOR	-	-	0.4	0.5	0.6	0.8	1.0	1.1	1.3	1.5	
TRANSPORT SECTOR	-	0.3	2.0	3.3	4.2	4.5	4.5	4.5	4.5	4.5	
TOTAL in bn euro 2015	0	2	9	11	14	14	14	15	16	16	

Revenues for VSDs only (without motor, m euros)

VSD - Very Small 0.12 - 0.75 kW 1-phase	27	219	264	277	294	313	333	354	377	401
VSD - Very Small 0.12 - 0.75 kW 3-phase	9	72	88	99	112	118	129	143	158	174
VSD - Small 0.75 - 7.5 kW 3-phase	89	265	398	651	689	704	737	786	839	895
VSD - Medium 7.5 - 75kW 3-phase	64	190	344	456	479	490	512	547	583	605
VSD - Large 75 - 375kW 3-phase	36	108	181	216	228	234	246	262	270	277
VSD - Very Large 375 - 1,000kW 3-phase	16	93	127	141	153	153	161	169	178	187
Total revenues, VSDs only (ECO)	242	947	1402	1840	1956	2012	2118	2260	2404	2539

REV_RETAIL_BAU

db	REVENUE RETAIL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	3	4	4	5	5	5	5	5	5	5	5
EIWH Electric Instant. ≥ 12 kW (primary)	7	6	6	7	7	8	9	9	10	11	
EIWS Electric Instant. Shower (secondary)	11	14	14	14	14	15	16	17	18	19	
ESWH Electric Storage ≤ 30 L (secondary)	17	19	19	20	21	23	24	26	27	28	
ESWH Electric Storage > 30 L (primary)	96	114	104	109	117	124	132	139	147	155	
GIWH Gas Instant. < 13 L/min (secondary)	30	21	17	17	17	17	17	16	16	16	
GIWH Gas Instant. ≥ 13 L/min (primary)	9	8	7	7	7	7	7	7	7	6	
GSWH Gas Storage, Condensing	0	0	0	1	1	1	1	1	1	1	
GSWH Gas Storage, Non-condensing	13	8	6	4	3	3	2	2	2	1	
Dedicated WH Heat Pump	0	2	6	9	14	18	23	28	33	37	
Dedicated WH Solar (3.5 m2)	21	76	77	63	65	68	70	72	75	77	
WH dedicated Water Heater	206	273	262	255	272	289	306	322	339	356	
CHB Gas Combi Instant. WH	59	99	102	110	111	112	112	112	111	109	
CHB Gas + Cyl. WH	30	41	42	46	46	46	47	46	46	45	
CHB Jet Burner Gas + Cyl. WH	13	6	4	4	4	4	4	4	5	5	
CHB Jet Burner Oil + Cyl. WH	101	41	27	27	27	28	29	30	30	31	
CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	1	1	
CHB Hybrid Gas/Electric WH	0	0	0	1	1	2	3	5	8	13	
CHB Electric HP + Cyl. WH	2	30	34	41	48	55	64	73	84	97	
CHB Gas HP + Cyl. WH	0	0	1	1	1	2	3	4	6	8	
CHB Gas mCHP + Cyl. WH	0	1	1	2	2	4	5	7	10	15	
CHB Solar Combi (16 m2)	3	6	6	6	6	6	6	6	7	7	
CHC Central Heating combi, water heating	210	225	220	239	250	262	275	290	308	331	
TOTAL WATER HEATING	416	498	482	494	521	550	580	613	648	687	
CHB Gas non-condensing	436	235	217	213	196	180	165	150	135	121	
CHB Gas condensing	29	638	531	566	601	633	659	680	695	701	
CHB Gas Jet burner non-condensing	92	30	13	12	11	10	9	9	8	7	
CHB Gas Jet burner condensing	0	10	14	15	17	18	20	21	23	24	
CHB Oil Jet burner non-condensing	647	199	89	78	72	67	62	58	54	50	
CHB Oil Jet burner condensing	0	66	89	95	105	115	125	134	143	151	
CHB Electric Joule-effect	6	10	10	11	10	9	8	8	7	6	
CHB Hybrid (gas-electric)	0	1	2	4	6	10	17	28	47	78	
CHB Electric Heat Pump	12	162	184	226	264	308	358	416	483	561	
CHB Gas Heat Pump	1	2	3	5	7	11	15	22	32	45	
CHB micro CHP	3	4	6	9	13	19	28	40	58	83	
CHB Solar combi (16 m2)	16	28	28	31	32	33	34	35	36	36	
CHB Central Heating boiler < 400 kW, space heating	1243	1387	1187	1264	1335	1414	1501	1602	1720	1864	
SFB Wood Manual [18 kW]	22	13	9	5	3	3	3	2	2	2	
SFB Wood Direct Draft [20 kW]	1	36	37	39	36	45	52	61	72	86	
SFB Coal [25 kW]	6	27	6	8	8	8	7	6	6	5	
SFB Pellets [25 kW]	0	9	14	14	14	15	17	19	21	23	
SFB Wood chips [160 kW]	0	6	6	7	8	9	9	10	12	13	
Total Solid Fuel Boiler	29	91	71	72	69	79	88	99	112	129	
CHAE-S (< 400 kW)	24	106	117	130	144	157	171	185	197	210	
CHAE-L (> 400 kW)	5	18	19	20	21	21	22	23	24	25	
CHWE-S (≤ 400 kW)	2	9	10	12	13	14	15	16	18	19	
CHWE-M (> 400 kW; ≤ 1500 kW)	2	9	9	9	10	10	11	11	11	12	
CHWE-L (> 1500 kW)	2	6	6	6	6	7	7	7	7	8	
CHF	0	0	1	1	1	1	1	1	1	1	
HT PCH-AE-S	12	20	22	23	24	25	26	27	28	29	
HT PCH-AE-L	10	16	17	19	19	20	21	22	23	23	
HT PCH-WE-S	3	4	5	5	5	5	6	6	6	6	
HT PCH-WE-M	10	18	19	20	21	22	23	23	24	25	
HT PCH-WE-L	2	3	4	4	4	4	4	4	5	5	
AC rooftop	11	38	38	29	17	5	5	5	5	5	
AC splits	19	73	77	74	72	69	66	64	61	59	
AC VRF	0	166	218	318	402	486	565	638	699	743	
ACF	0	0	1	1	1	1	1	1	1	1	
SubTotal AHC Air Cooling	103	489	562	671	760	847	944	1033	1111	1170	
AC rooftop (rev)	7	23	22	18	10	3	0	0	0	0	
AC splits (rev)	13	47	49	48	46	44	43	41	39	38	
AC VRF (rev)	0	142	177	272	330	379	420	451	470	476	
ACF (rev)	0	1	1	1	2	2	2	2	3	3	
AHF	40	26	25	23	22	21	19	18	17	16	
AHE	0	0	0	0	0	0	0	0	0	0	
SubTotal AHC Air Heating (rev double)	60	240	274	362	410	449	484	513	529	532	
Total AHC Air Heating & Cooling	144	515	587	694	782	868	963	1052	1128	1186	

REV_RETAIL_BAU

db	REVENUE RETAIL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	117	168	166	166	165	164	163	163	163	163	163
LH closed fireplace/inset [8 kW]	74	197	216	236	239	243	243	243	243	243	243
LH wood stove [8 kW]	80	93	101	110	111	113	113	113	113	113	113
LH coal stove [8 kW]	22	18	16	15	11	7	7	7	7	7	7
LH cooker [10 kW]	68	135	160	186	191	196	196	196	196	196	196
LH SHR stove [8 kW]	74	102	124	147	165	182	186	186	186	186	186
LH pellet stove [8 kW]	0	76	94	112	120	128	130	130	130	130	130
LH Solid fuel sum	435	788	879	973	1003	1033	1039	1039	1039	1039	1039
LH Electric portable	18	21	22	22	22	22	22	22	22	22	22
LH Electric fixed > 250W	150	175	136	126	126	126	126	126	126	126	126
LH Electric fixed ≤ 250W	19	22	17	16	16	16	16	16	16	16	16
LH Electric storage	15	19	17	16	16	16	16	16	16	16	16
LH Electric underfloor	15	18	19	19	19	19	19	19	19	19	19
LH Electric visibly glowing > 1.2 kW	0	1	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	0
LH Electric Towel Heaters	27	45	45	45	45	45	45	45	45	45	45
LH Electric sum	244	300	257	245							
LH Gas luminous (commercial)	0	0	1	0	0	0	0	0	0	0	0
LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	0	0	0	0	0	0	0
LH Gas open front	1	1	1	1	1	1	1	1	1	1	1
LH Gas closed front	11	6	5	4	4	3	3	3	3	3	3
LH Gas balanced flue	17	7	5	4	3	3	3	3	3	3	3
LH Gas flueless	1	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	31	16	12	10	9	8	8	8	8	8	8
LH Liquid tube (commercial < 120 kW)	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
LH Liquid closed front	1	1	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	2	1	0	0	0	0	0	0	0	0	0
LH Liquid flueless	6	2	1	0	0	0	0	0	0	0	0
LH Liquid fuel sum	9	4	2	1							
LH Local Space Heaters total	720	1108	1150	1229	1257	1286	1292	1292	1292	1292	1292
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	22	214	160	177	196	215	235	263	301	349	
RAC fixed 6-12 kW, cooling	9	115	113	111	116	119	122	122	135	149	
RAC portable < 12 kW, cooling	1	20	18	13	14	14	15	15	15	16	16
RAC < 12 kW total, cooling mode	33	349	291	302	326	348	371	400	452	514	
RAC fixed < 6 kW, reversible, heating	2	82	77	106	137	172	212	263	301	349	
RAC fixed 6-12 kW, reversible, heating	1	44	54	67	81	96	109	122	135	149	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	3	126	131	173	219	267	321	385	436	498	
RAC Room Air Conditioner	36	475	422	475	544	615	692	784	888	1012	
1 CIRC Integrated circulators	51	83	93	97	105	111	111	111	111	111	111
1 CIRC Large standalone circulators	0	0	0	0	0	0	0	0	0	0	0
1 CIRC Small standalone circulators	41	62	62	58	53	46	46	46	46	46	46
1 CIRC Circulator pumps <2.5 kW	92	146	154	155	157						
TOTAL SPACE HEATING (incl. rev.AC)	2055	2951	2813	3100	3290	3495	3687	3890	4089	4315	
TOTAL SPACE COOLING	136	838	853	973	1085	1195	1315	1433	1562	1684	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	3	3	3	3	3	3	3
R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	0	0	1	1	1	1
R-BVU ≤ 100 m3/h for Habitable Spaces	1	10	17	37	189	208	229	320	386	419	
R-UVU 100-250 m3/h	12	37	39	45	42	42	44	47	45	46	
R-BVU 100-250 m3/h	1	9	11	17	77	84	90	121	143	154	
R-UVU 250-1000 m3/h	21	56	55	61	56	56	60	64	61	64	
R-BVU 250-1000 m3/h	3	17	20	30	138	149	159	213	252	271	
R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1	
R-BVU 1000-2500 m3/h	0	4	4	5	5	6	7	7	8	8	
RVU, Total residential (incl. instal.mat.)	39	137	150	199	511	548	593	776	900	967	
NR-UVU 250-1000 m3/h	8	8	8	8	7	7	7	6	6	5	
NR-BVU 250-1000 m3/h	0	17	17	20	23	27	30	33	37	39	
NR-UVU > 1000 m3/h	9	9	8	8	7	7	7	6	6	5	
NR-BVU 1000-2500 m3/h	0	34	33	38	41	47	51	55	60	64	
NR-AHU-S 2500-5500 m3/h	10	179	223	223	199	224	237	243	253	267	
NR-AHU-M 5500-14500 m3/h	116	308	349	340	301	326	335	338	347	357	
NR-AHU-L > 14500 m3/h	27	75	84	82	71	77	78	79	81	83	
NRVU, Total non-residential (incl. instal.mat.)	169	629	723	719	650	715	744	760	790	822	
VU Ventilation Units, res+nres (incl. instal.mat.)	208	766	873	918	1161	1263	1337	1536	1690	1789	
TOTAL VENTILATION	208	766	873	918	1161	1263	1337	1536	1690	1789	

REV_RETAIL_BAU

db	REVENUE RETAIL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	191	284	257	194	134	98	81	64	49	38	
HID (HPM, HPS, MH)	31	94	84	58	45	25	12	6	3	2	
CFLni (all shapes)	21	82	72	70	56	28	15	9	4	3	
CFLi (retrofit for GLS, HL)	26	336	219	263	157	116	63	43	27	17	
GLS (DLS & NDLS)	271	222	187	130	77	45	26	15	9	5	
HL (DLS & NDLS, LV & MV)	51	413	516	528	325	167	88	48	27	16	
LED replacing LFL (retrofit & luminaire)	0	0	48	179	242	324	356	413	497	586	
LED replacing HID (retrofit & luminaire)	0	0	15	93	108	137	164	195	227	259	
LED replacing CFLni (retrofit & luminaire)	0	0	3	11	17	22	25	29	32	34	
LED replacing DLS (retrofit & luminaire)	0	0	10	31	35	21	15	12	11	11	
LED replacing NDLS (retrofit & luminaire)	0	4	24	167	134	92	72	58	51	48	
SUBTOTAL non-LED	591	1432	1335	1243	793	479	286	185	119	81	
SUBTOTAL LED	0	4	100	481	537	596	631	708	817	938	
TOTAL LIGHTING	591	1436	1435	1724	1330	1076	917	894	937	1019	
DP TV all types	6769	11104	6345	7914	9132	10502	10654	10654	10654	10654	
DP Monitor	433	951	535	538	538	538	538	538	538	538	
DP Signage	0	64	280	642	481	481	481	481	481	481	
DP Electronic Displays, total	7202	12119	7159	9094	10151	11521	11673	11673	11673	11673	
SSTB	0	60	14	0	0	0	0	0	0	0	
CSTB	0	226	278	281	281	281	281	281	281	281	
Total STB set top boxes (Complex & Simple)	0	286	292	281							
Game consoles > 20 W	15	1202	1202	1202	1202	1202	1202	1202	1202	1202	
Game consoles < 20 W	54	303	303	303	303	303	303	303	303	303	
Total GC Game consoles	70	1506									
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	4929	7655	4050	4530	6250	6663	6904	6984	7011	7020	
PC Integrated Desktop	211	327	173	194	267	326	366	381	386	387	
PC Notebook	0	21154	18653	18606	24552	30964	35558	37224	37789	37976	
PC Tablet/slate	0	963	11032	10636	11562	12532	13108	13303	13368	13389	
PC Thin client	0	162	157	166	168	169	169	169	169	170	
PC Integrated Thin Client	0	13	12	13	13	13	13	13	13	13	
PC Small-scale Server	20	40	50	51	51	52	52	52	52	52	
PC Workstation	193	344	423	483	579	692	769	796	805	808	
Total PC, electricity	5353	30658	34550	34679	43442	51411	56939	58923	59593	59814	
Inkjet Printer	181	298	39	43	41	39	37	35	33	31	
Inkjet MFD	222	575	439	278	265	252	239	228	216	204	
EP / Laser Printer mono	116	115	134	127	100	80	63	48	33	19	
EP / Laser Printer colour	0	111	126	155	170	179	185	189	192	196	
EP / Laser Copier mono	575	242	60	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	81	145	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	188	252	240	229	217	206	196	186	176	
EP / Laser MFD colour	0	1260	1683	1607	1528	1453	1383	1314	1246	1177	
Total IE Imaging Equipment	1094	2870	2877	2450	2333	2220	2114	2010	1906	1803	
<i>Products regulated only for (networked) standby</i>											
SB Radios	156	126	102	89	82	74	66	58	51	43	
SB Electric toothbrushes	18	29	32	36	40	45	49	53	57	62	
SB Audio speakers (wired)	406	209	148	53	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	2	146	388	440	442	442	443	443	444	
SB Small appliances	471	761	780	801	810	819	828	837	846	855	
SB Media boxes /sticks	0	0	30	37	37	37	37	37	37	37	
SB Media players and recorders	0	230	200	26	0	0	0	0	0	0	
SB Projectors	1	73	62	25	11	0	0	0	0	0	
SB Home phones	82	381	396	376	353	341	334	327	320	313	
SB Office phones	82	149	137	129	128	130	127	124	122	119	
SB Home NAS	0	66	105	143	180	217	249	272	283	284	
SB Home Network Equipment	0	275	312	333	352	370	400	400	400	400	
SB Office Network Equipment	0	29	85	160	235	309	348	348	348	348	
SB Coffee makers	302	367	377	388	399	411	423	435	447	459	
Total (networked) SB (excl. double)	1519	2698	2912	2985	3066	3194	3303	3335	3354	3362	
Total EPS	0	0	0	0	0	0	0	0	0	0	
TOTAL ELECTRONICS	15237	50136	49297	50995	60779	70133	75815	77727	78312	78439	
RF Household refrigerator and freezer	2605	2908	2974	3043	3089	3136	3182	3228	3275	3321	
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0	

REV_RETAIL_BAU

db	REVENUE RETAIL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	19	26	27	28	30	31	33	34	35	37
	PF Storage cabinet Frozen Vertical (FV)	10	14	14	15	16	16	17	18	18	19
	PF Storage cabinet Chilled Horizontal (CH)	4	5	6	6	6	6	7	7	7	8
	PF Storage cabinet Frozen Horizontal (FH)	3	4	4	4	5	5	5	5	5	6
	PF Storage cabinets All types	36	49	51	54	56	59	61	64	66	69
	PF Process Chiller AC MT S < 300 kW	3	6	7	7	8	9	10	10	11	12
	PF Process Chiller AC MT L > 300 kW	3	6	6	7	8	8	9	10	10	11
	PF Process Chiller AC LT S ≤ 200 kW	2	5	5	6	7	7	8	8	9	10
	PF Process Chiller AC LT L > 200 kW	2	5	5	6	6	7	7	8	8	9
	PF Process Chiller WC MT S ≤ 300 kW	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC MT L > 300 kW	2	4	4	5	5	6	6	7	7	8
	PF Process Chiller WC LT S ≤ 200 kW	1	3	3	3	3	4	4	4	5	5
	PF Process Chiller WC LT L > 200 kW	2	3	4	4	4	5	5	6	6	6
	PF Process Chiller All MT&LT	16	33	37	41	45	49	54	58	62	66
	PF Condensing Unit MT S 0.2-1 kW	15	12	13	14	15	16	17	19	20	22
	PF Condensing Unit MT M 1-5 kW	32	27	27	30	32	34	37	40	43	46
	PF Condensing Unit MT L 5-20 kW	33	28	28	31	33	35	38	41	44	48
	PF Condensing Unit MT XL 20-50 kW	25	21	22	23	25	27	29	32	34	37
	PF Condensing Unit LT S 0.1-0.4 kW	3	2	2	2	3	3	3	3	3	4
	PF Condensing Unit LT M 0.4-2 kW	5	4	4	4	5	5	5	6	6	7
	PF Condensing Unit LT L 2-8 kW	12	10	11	11	12	13	14	15	16	18
	PF Condensing Unit LT XL 8-20 kW	11	9	9	10	11	11	12	13	14	15
0.6	PF Condensing Unit, All MT&LT	136	113	116	125	135	145	157	169	182	196
	PF Professional Refrigeration, Total	107	128	135	144	155	166	177	189	201	214
	TOTAL FOOD PRESERVATION	2712	3036	3109	3187	3244	3302	3359	3417	3476	3535
	CA Electric Hobs	925	2118	2277	2464	2599	2721	2836	2945	3046	3140
	CA Electric Ovens	1981	2391	2527	2751	2660	2680	2713	2748	2782	2817
	CA Gas Hobs	769	674	619	563	521	496	471	446	421	396
	CA Gas Ovens	265	276	265	258	250	243	235	228	221	213
	CA Range Hoods	481	597	629	663	697	733	768	804	839	875
	TOTAL COOKING	4421	6057	6316	6699	6728	6872	7024	7170	7309	7441
	WM Washing Machines	1422	2126	2141	2309	2217	2217	2217	2217	2217	2217
	WD Washer-Dryers	131	184	189	194	195	196	197	198	199	200
	Total WM-WD household Washing	1553	2310	2330	2503	2412	2413	2414	2415	2416	2417
	DW Household Dishwasher	611	1368	1597	1830	2052	2273	2494	2716	2937	3158
	LD condensing heat pump	0	22	33	53	79	113	143	169	198	231
	LD condensing electric heat element	96	260	382	499	477	434	391	358	337	315
	LD vented electric	163	131	146	151	149	146	146	146	146	146
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	260	415	562	703	705	693	680	673	681	693
	VC dom. Vacuum Cleaner	1382	4180	5906	7242	7894	7781	7910	7894	7845	7799
	VC nondom Vacuum Cleaner	103	111	117	123	130	136	142	149	155	161
	Total VC Vacuum Cleaner	1485	4291	6023	7366	8023	7917	8052	8043	8000	7960
	TOTAL CLEANING	3909	8384	10512	12402	13192	13296	13640	13847	14034	14228
0.5	FAN Axial<300Pa [247 W flow out]	33	113	131	148	148	148	148	148	148	148
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	46	165	175	185	185	185	185	185	185	185
0.5	FAN Centr.FC [141 W flow out]	29	75	87	99	99	99	99	99	99	99
0.5	FAN Centr.BC-free [2120 W flow out]	16	41	47	53	59	60	61	62	63	64
0.5	FAN Centr.BC [2052 W flow out]	36	99	113	128	143	146	160	174	189	203
0.5	FAN Cross-flow [31 W flow out]	7	15	17	20	22	22	24	26	29	31
	Total FAN, industrial (excl. box & roof fans)	83	255	285	316	328	330	339	348	356	365
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	47	76	78	77	73	70	66	61	57	52
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	28	44	45	44	41	39	35	32	27	25
0.45	Medium (L) 3-ph 75-375 kW no VSD	22	32	32	30	27	24	20	16	15	16
0.45	Total 3ph 0.75-375 kW no VSD	97	153	154	150	142	132	121	108	99	92
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	19	55	66	76	86	98	115	134	157	184
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	14	40	49	56	64	73	85	99	116	129
0.45	Medium (L) 3-ph 75-375 kW with VSD	10	31	37	43	49	56	65	76	78	79
0.45	Total 3-ph 0.75-375 kW with VSD	43	126	151	176	199	227	265	309	350	393
0.45	Total 3-ph 0.75-375 kW w/o VSD	139	278	305	326	341	359	386	417	450	485
0.45	Small 1 ph 0.12-0.75 kW no VSD	30	57	60	60	60	59	59	59	58	57
0.45	Small 1 ph 0.12-0.75 kW with VSD	5	39	47	50	53	56	60	63	67	72
0.45	Total Small 1-ph 0.12-0.75 kW	35	96	107	110	113	116	119	122	125	129
0.45	Small 3 ph 0.12-0.75 kW no VSD	16	28	29	30	30	29	29	29	28	28
0.45	Small 3 ph 0.12-0.75 kW with VSD	2	14	18	20	21	24	26	29	31	34
0.45	Total Small 3-ph 0.12-0.75 kW	18	43	47	49	51	53	55	57	59	62
0.45	Large 3-ph LV 375-1000 kW no VSD	10	13	11	11	11	11	11	10	10	9
0.45	Large 3-ph LV 375-1000kW with VSD	4	21	30	33	35	36	38	39	41	43
0.45	Total Large 3-ph LV 375-1000 kW	14	34	41	44	46	47	48	50	51	52

REV_RETAIL_BAU

db REVENUE RETAIL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45 Explosion motors (S) 3-ph 0.75-7.5 kW	3	5	5	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	3	4	4	4	4	4	4	4	4
0.45 Total Expl. 0.75-375 kW (no VSD)	8	13	14	14	14	14	14	14	14	15
0.45 Brake motors (S) 3-ph 0.75-7.5 kW	4	6	7	7	7	7	7	7	7	7
0.45 Brake motors (M) 3-ph 7.5-75 kW	3	6	6	6	6	6	6	6	6	6
0.45 Brake motors (L) 3-ph 75-375 kW	2	4	5	5	5	5	5	5	5	5
0.45 Total Brake 0.75-375 kW (no VSD)	9	17	17	18	18	18	18	18	18	18
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)	68	119	125	128	128	128	127	127	130	133
MT Elec. Motors LV 0.12-1000 kW	160	331	362	379	391	405	423	443	467	492
WP Water pumps	116	160	173	186	200	214	228	242	256	270
Total CP Standard Air Compressors	0	0	0	0	0	0	0	0	0	0
Total WE Welding Equipment	28	32	32	33	33	33	34	34	34	34
TOTAL INDUSTRY COMPONENTS	388	778	853	915	952	982	1024	1067	1114	1162
TRAFO Distribution, kWh/a	44	71	76	82	88	95	102	108	115	122
TRAFO Industry oil	23	38	41	44	47	51	54	58	61	65
TRAFO Industry dry	11	18	19	21	22	24	25	27	29	30
TRAFO Power	178	289	313	338	363	390	418	447	475	503
TRAFO DER oil	0	2	3	6	9	15	23	30	37	45
TRAFO DER dry	0	13	21	35	58	95	141	186	231	277
TRAFO Small	5	5	5	5	5	5	5	5	5	5
TOTAL ENERGY SECTOR	261	435	478	530	593	675	768	861	953	1046
Tyres C1, replacement for cars	3732	5152	5675	6459	7309	8255	8255	8255	8255	8255
Tyres C1, OEM for cars	1124	1540	1811	1945	2201	2486	2486	2486	2486	2486
Tyres C1, total	4856	6692	7486	8404	9511	10741	10741	10741	10741	10741
Tyres C2, replacement for vans	648	843	842	948	1063	1190	1190	1190	1190	1190
Tyres C2, OEM for vans	137	151	189	200	224	251	251	251	251	251
Tyres C2, total	784	995	1031	1148	1287	1441	1441	1441	1441	1441
Tyres C3, replacement for trucks/busses	1134	1147	1381	1762	2021	2314	2314	2314	2314	2314
Tyres C3, OEM for trucks/busses	316	270	377	491	563	645	645	645	645	645
Tyres C3, total	1451	1417	1758	2254	2584	2959	2959	2959	2959	2959
Tyres, total C1+C2+C3	7090	9103	10275	11806	13382	15141	15141	15141	15141	15141
TRANSPORT SECTOR	7090	9103	10275	11806	13382	15141	15141	15141	15141	15141
GENERAL TOTAL (in m euro 2015)	37425	84416	87297	93743	106257	117982	124608	127595	129265	130486
GENERAL TOTAL (in bn euro 2015)	37	84	87	94	106	118	125	128	129	130

SUMMARY BAU

retail revenue (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.7
SPACE HEATING	2.1	3.0	2.8	3.1	3.3	3.5	3.7	3.9	4.1	4.3
SPACE COOLING	0.1	0.8	0.9	1.0	1.1	1.2	1.3	1.4	1.6	1.7
VENTILATION	0.2	0.8	0.9	0.9	1.2	1.3	1.3	1.5	1.7	1.8
LIGHTING	0.6	1.4	1.4	1.7	1.3	1.1	0.9	0.9	0.9	1.0
ELECTRONICS	15.2	50.1	49.3	51.0	60.8	70.1	75.8	77.7	78.3	78.4
FOOD PRESERVATION	2.7	3.0	3.1	3.2	3.2	3.3	3.4	3.4	3.5	3.5
COOKING	4.4	6.1	6.3	6.7	6.7	6.9	7.0	7.2	7.3	7.4
CLEANING	3.9	8.4	10.5	12.4	13.2	13.3	13.6	13.8	14.0	14.2
INDUSTRY COMPONENTS	0.4	0.8	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2
ENERGY SECTOR	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.0
TRANSPORT SECTOR	7.1	9.1	10.3	11.8	13.4	15.1	15.1	15.1	15.1	15.1
TOTAL in bn euro 2015	37	84	87	94	106	118	125	128	129	130

Revenues for VSDs only (without motor)

VSD - Very Small 0.12 - 0.75 kW 1-phase	4	33	39	41	44	47	50	53	56	60
VSD - Very Small 0.12 - 0.75 kW 3-phase	1	11	13	14	16	17	19	21	24	26
VSD - Small 0.75 - 7.5 kW 3-phase	13	39	47	54	61	70	82	96	113	133
VSD - Medium 7.5 - 75kW 3-phase	10	28	34	39	44	50	59	69	81	90
VSD - Large 75 - 375kW 3-phase	5	16	19	22	25	28	33	39	40	41
VSD - Very Large 375 - 1,000kW 3-phase	2	14	19	21	22	23	24	25	27	28
Total revenues, VSDs only (BAU)	36	140	171	191	211	235	267	303	340	378

REV_RETAIL_ECO

db	REVENUE RETAIL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	3	4	4	5	5	5	5	5	5	5	5
EIWH Electric Instant. ≥ 12 kW (primary)	7	6	6	7	7	8	9	9	10	11	11
EIWHS Electric Instant. Shower (secondary)	11	14	14	14	14	15	16	17	18	19	19
ESWH Electric Storage ≤ 30 L (secondary)	17	19	19	20	21	23	24	26	27	28	28
ESWH Electric Storage > 30 L (primary)	96	114	104	109	117	124	132	139	147	155	155
GIWH Gas Instant. < 13 L/min (secondary)	30	21	17	17	17	17	17	16	16	16	16
GIWH Gas Instant. ≥ 13 L/min (primary)	9	8	7	7	7	7	7	7	7	6	6
GSWH Gas Storage, Condensing	0	0	0	1	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	13	8	6	4	3	3	2	2	2	1	1
Dedicated WH Heat Pump	0	2	6	9	14	18	23	28	33	37	37
Dedicated WH Solar (3.5 m2)	21	76	77	63	65	68	70	72	75	77	77
WH dedicated Water Heater	206	273	262	255	272	289	306	322	339	356	
CHB Gas Combi Instant. WH	59	99	102	105	98	91	84	76	68	59	59
CHB Gas + Cyl. WH	30	41	36	40	37	34	32	29	26	22	22
CHB Jet Burner Gas + Cyl. WH	13	6	4	4	4	4	4	4	5	5	5
CHB Jet Burner Oil + Cyl. WH	101	41	27	27	27	28	29	30	30	31	31
CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	1	1	1
CHB Hybrid Gas/Electric WH	0	0	1	2	6	11	16	22	30	37	37
CHB Electric HP + Cyl. WH	2	30	36	62	108	154	200	246	295	344	344
CHB Gas HP + Cyl. WH	0	0	1	3	5	7	9	12	14	17	17
CHB Gas mCHP + Cyl. WH	0	1	2	4	6	9	11	13	15	17	17
CHB Solar Combi (16 m2)	3	6	7	6	6	7	7	7	7	7	7
CHC Central Heating combi, water heating	210	225	219	255	301	348	394	441	491	541	
TOTAL WATER HEATING	416	498	481	510	573	636	700	763	830	897	
CHB Gas non-condensing	436	235	177	54	33	12	10	7	6	4	4
CHB Gas condensing	29	638	581	713	686	659	607	554	493	431	431
CHB Gas Jet burner non-condensing	92	30	10	3	3	2	2	1	1	1	1
CHB Gas Jet burner condensing	0	10	17	24	25	26	28	29	30	31	31
CHB Oil Jet burner non-condensing	647	199	67	22	18	14	11	9	7	6	6
CHB Oil Jet burner condensing	0	66	111	151	159	168	176	183	189	195	195
CHB Electric Joule-effect	6	10	10	11	10	9	8	8	7	6	6
CHB Hybrid (gas-electric)	0	1	4	10	35	61	92	123	167	210	210
CHB Electric Heat Pump	12	162	171	319	555	792	1027	1262	1513	1763	1763
CHB Gas Heat Pump	1	2	6	14	26	37	50	63	77	91	91
CHB micro CHP	3	4	12	23	35	47	59	70	82	94	94
CHB Solar combi (16 m2)	16	28	33	32	33	34	35	36	36	37	37
CHB Central Heating boiler < 400 kW, space heating	1243	1387	1199	1375	1618	1861	2103	2345	2607	2869	
SFB Wood Manual [18 kW]	22	13	12	9	5	5	4	3	3	3	3
SFB Wood Direct Draft [20 kW]	1	36	37	39	43	50	59	69	80	94	94
SFB Coal [25 kW]	6	27	6	8	8	8	7	6	6	5	5
SFB Pellets [25 kW]	0	9	14	14	14	15	17	19	21	23	23
SFB Wood chips [160 kW]	0	6	6	7	8	9	9	10	12	13	13
Total Solid Fuel Boiler	29	91	74	77	79	86	96	107	121	137	
CHAE-S (< 400 kW)	24	106	117	130	144	157	171	185	197	210	210
CHAE-L (> 400 kW)	5	18	19	20	21	21	22	23	24	25	25
CHWE-S (< 400 kW)	2	9	10	12	13	14	15	16	18	19	19
CHWE-M (> 400 kW; ≤ 1500 kW)	2	9	9	9	10	10	11	11	11	12	12
CHWE-L (> 1500 kW)	2	6	6	6	6	7	7	7	7	8	8
CHF	0	0	1	1	1	1	1	1	1	1	1
HT PCH-AE-S	12	20	22	23	24	25	26	27	28	29	29
HT PCH-AE-L	10	16	17	19	19	20	21	22	23	23	23
HT PCH-WE-S	3	4	5	5	5	5	6	6	6	6	6
HT PCH-WE-M	10	18	19	20	21	22	23	23	24	25	25
HT PCH-WE-L	2	3	4	4	4	4	4	4	5	5	5
AC rooftop	11	38	38	29	17	5	5	5	5	5	5
AC splits	19	73	77	74	72	69	66	64	61	59	59
AC VRF	0	166	218	318	402	486	565	638	699	743	743
ACF	0	0	1	1	1	1	1	1	1	1	1
SubTotal AHC Air Cooling	103	489	562	671	760	847	944	1033	1111	1170	
AC rooftop (rev)	7	23	22	18	10	3	0	0	0	0	0
AC splits (rev)	13	47	49	48	46	44	43	41	39	38	38
AC VRF (rev)	0	142	177	272	330	379	420	451	470	476	476
ACF (rev)	0	1	1	1	2	2	2	2	3	3	3
AHF	40	26	25	25	24	22	20	18	17	16	16
AHE	0	0	0	0	0	0	0	0	0	0	0
SubTotal AHC Air Heating (rev double)	60	240	274	364	412	451	485	513	529	532	
Total AHC Air Heating & Cooling	144	515	587	696	784	870	964	1052	1128	1186	

REV_RETAIL_ECO

db	REVENUE RETAIL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	117	168	166	205	224	215	207	199	192	185	
LH closed fireplace/inset [8 kW]	74	197	216	281	302	294	284	274	264	254	
LH wood stove [8 kW]	80	93	101	132	142	139	133	128	123	118	
LH coal stove [8 kW]	22	18	16	18	14	9	8	8	7	7	
LH cooker [10 kW]	68	135	160	204	217	213	206	198	196	196	
LH SHR stove [8 kW]	74	102	124	148	165	182	186	186	186	186	
LH pellet stove [8 kW]	0	76	94	112	120	128	130	130	130	130	
LH Solid fuel sum	435	788	879	1100	1184	1180	1154	1122	1099	1077	
LH Electric portable	18	21	23	23	22	22	22	22	22	22	
LH Electric fixed > 250W	150	175	137	126	126	126	126	126	126	126	
LH Electric fixed ≤ 250W	19	22	17	16	16	16	16	16	16	16	
LH Electric storage	15	19	19	21	20	20	19	18	17	16	
LH Electric underfloor	15	18	19	19	19	19	19	19	19	19	
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	27	45	45	45	45	45	45	45	45	45	
LH Electric sum	244	300	261	251	249	248	248	247	246	245	
LH Gas luminous (commercial)	0	0	1	1	0	0	0	0	0	0	
LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	1	0	0	0	0	0	
LH Gas open front	1	1	1	1	1	1	1	1	1	1	
LH Gas closed front	11	6	5	4	4	3	3	3	3	3	
LH Gas balanced flue	17	7	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	31	16	12	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	0	0	0	0	0	0	0	0	
LH Liquid balanced flue	2	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	9	4	2	1							
LH Local Space Heaters total	720	1108	1155	1363	1444	1437	1410	1378	1353	1331	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	22	253	199	217	229	234	239	263	301	349	
RAC fixed 6-12 kW, cooling	9	154	165	155	154	153	150	148	152	155	
RAC portable < 12 kW, cooling	1	23	22	16	15	15	15	15	16	16	
RAC < 12 kW total, cooling mode	33	429	386	388	399	401	403	426	468	520	
RAC fixed < 6 kW, reversible, heating	2	96	96	130	161	187	215	263	301	349	
RAC fixed 6-12 kW, reversible, heating	1	59	79	93	108	122	135	148	152	155	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	3	155	175	223	269	309	350	410	453	504	
RAC Room Air Conditioner	36	584	561	611	668	711	753	836	921	1024	
1 CIRC Integrated circulators	51	83	98	104	107	111	111	111	111	111	
1 CIRC Large standalone circulators	0	0	0	0	0	0	0	0	0	0	
1 CIRC Small standalone circulators	41	62	74	69	62	54	51	48	46	46	
1 CIRC Circulator pumps <2.5 kW	92	146	172	172	168	164	162	159	157	157	
TOTAL SPACE HEATING (incl. rev.AC)	2055	2981	2878	3402	3821	4144	4443	4753	5063	5373	
TOTAL SPACE COOLING	136	918	948	1059	1159	1249	1347	1459	1579	1690	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	3	4	4	4	4	4	4	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	198	210	229	320	386	419	
R-UVU 100-250 m3/h	12	37	44	57	54	52	55	58	53	53	
R-BVU 100-250 m3/h	1	9	11	18	80	85	90	121	143	154	
R-UVU 250-1000 m3/h	21	56	58	72	66	66	71	76	73	76	
R-BVU 250-1000 m3/h	3	17	20	30	138	149	159	213	252	271	
R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1	
R-BVU 1000-2500 m3/h	0	4	4	5	5	6	7	7	8	8	
RVU, Total residential (incl. instal.mat.)	39	137	159	228	546	573	615	799	920	987	
NR-UVU 250-1000 m3/h	8	8	8	9	8	8	8	7	7	7	
NR-BVU 250-1000 m3/h	0	17	17	21	23	27	30	33	37	39	
NR-UVU > 1000 m3/h	9	9	9	9	8	8	7	7	7	6	
NR-BVU 1000-2500 m3/h	0	34	33	38	41	47	51	55	60	64	
NR-AHU-S 2500-5500 m3/h	10	179	229	239	215	241	255	260	270	284	
NR-AHU-M 5500-14500 m3/h	116	308	359	367	327	352	360	360	369	378	
NR-AHU-L > 14500 m3/h	27	75	86	87	76	81	83	83	85	87	
NRVU, Total non-residential (incl. instal.mat.)	169	629	742	771	699	765	794	806	835	865	
VU Ventilation Units, res+nres (incl. instal.mat.)	208	766	901	999	1245	1338	1409	1605	1755	1851	
TOTAL VENTILATION	208	766	901	999	1245	1338	1409	1605	1755	1851	

REV_RETAIL_ECO

db	REVENUE RETAIL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	191	284	207	172	53	27	15	10	6	3	
HID (HPM, HPS, MH)	31	94	67	41	25	10	3	1	0	0	0
CFLni (all shapes)	21	82	62	45	28	8	2	1	0	0	0
CFLi (retrofit for GLS, HL)	26	461	149	80	0	0	0	0	0	0	0
GLS (DLS & NDLS)	271	115	10	0	0	0	0	0	0	0	0
HL (DLS & NDLS, LV & MV)	51	471	552	118	1	0	0	0	0	0	0
LED replacing LFL (retrofit & luminaire)	0	0	87	191	512	521	481	519	620	717	
LED replacing HID (retrofit & luminaire)	0	0	152	101	150	177	205	235	267	303	
LED replacing CFLni (retrofit & luminaire)	0	0	17	24	26	29	31	34	38	42	
LED replacing DLS (retrofit & luminaire)	0	12	79	52	42	10	11	12	13	14	
LED replacing NDLS (retrofit & luminaire)	0	6	242	358	164	91	47	50	55	61	
SUBTOTAL non-LED	591	1507	1047	457	107	45	20	12	6	4	
SUBTOTAL LED	0	18	577	726	894	828	775	850	993	1136	
TOTAL LIGHTING	591	1525	1623	1184	1001	873	796	861	999	1140	
DP TV all types	6769	11104	6345	7914	9132	10502	10654	10654	10654	10654	
DP Monitor	433	951	535	538	538	538	538	538	538	538	
DP Signage	0	64	280	642	481	481	481	481	481	481	
DP Electronic Displays, total	7202	12119	7159	9094	10151	11521	11673	11673	11673	11673	
SSTB	0	60	14	0	0	0	0	0	0	0	
CSTB	0	226	278	281	281	281	281	281	281	281	
Total STB set top boxes	0	286	292	281							
Game consoles > 20 W	15	1202	1202	1202	1202	1202	1202	1202	1202	1202	
Game consoles < 20 W	54	303	303	303	303	303	303	303	303	303	
Total Game consoles	70	1506									
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	4929	7655	4050	4530	6250	6663	6904	6984	7011	7020	
PC Integrated Desktop	211	327	173	194	267	326	366	381	386	387	
PC Notebook	0	21154	18653	18606	24552	30964	35558	37224	37789	37976	
PC Tablet/slate	0	963	11032	10636	11562	12532	13108	13303	13368	13389	
PC Thin client	0	162	157	166	168	169	169	169	169	170	
PC Integrated Thin Client	0	13	12	13	13	13	13	13	13	13	
PC Small-scale Server	20	40	50	51	51	52	52	52	52	52	
PC Workstation	193	344	423	483	579	692	769	796	805	808	
Total PC, electricity	5353	30658	34550	34679	43442	51411	56939	58923	59593	59814	
Inkjet Printer	181	298	39	43	41	39	37	35	33	31	
Inkjet MFD	222	575	439	278	265	252	239	228	216	204	
EP / Laser Printer mono	116	115	134	127	100	80	63	48	33	19	
EP / Laser Printer colour	0	111	126	155	170	179	185	189	192	196	
EP / Laser Copier mono	575	242	60	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	81	145	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	188	252	240	229	217	206	196	186	176	
EP / Laser MFD colour	0	1260	1683	1607	1528	1453	1383	1314	1246	1177	
Total IE Imaging Equipment	1094	2870	2877	2450	2333	2220	2114	2010	1906	1803	
<i>Products regulated only for (networked) standby</i>											
SB Radios	156	126	102	89	82	74	66	58	51	43	
SB Electric toothbrushes	18	29	32	36	40	45	49	53	57	62	
SB Audio speakers (wired)	406	209	148	53	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	2	146	388	440	442	442	443	443	444	
SB Small appliances	471	761	780	801	810	819	828	837	846	855	
SB Media boxes /sticks	0	0	30	37	37	37	37	37	37	37	
SB Media players and recorders	0	230	200	26	0	0	0	0	0	0	
SB Projectors	1	73	62	25	11	0	0	0	0	0	
SB Home phones	82	381	396	376	353	341	334	327	320	313	
SB Office phones	82	149	137	129	128	130	127	124	122	119	
SB Home NAS	0	66	105	143	180	217	249	272	283	284	
SB Home Network Equipment	0	275	312	333	352	370	400	400	400	400	
SB Office Network Equipment	0	29	85	160	235	309	348	348	348	348	
SB Coffee makers	302	367	377	388	399	411	423	435	447	459	
Total (networked) SB (excl. double)	1519	2698	2912	2985	3066	3194	3303	3335	3354	3362	
Total EPS	0	0	0	0	0	0	0	0	0	0	
TOTAL ELECTRONICS	15237	50136	49297	50995	60779	70133	75815	77727	78312	78439	
RF Household refrigerator and freezer	2605	3337	3639	3823	4364	4190	4589	4729	4854	4963	
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0	

REV_RETAIL_ECO

db	REVENUE RETAIL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	PF Storage cabinet Chilled Vertical (CV)	19	26	27	31	31	31	33	34	35	37
	PF Storage cabinet Frozen Vertical (FV)	10	14	14	16	16	16	17	18	18	19
	PF Storage cabinet Chilled Horizontal (CH)	4	5	6	6	6	6	7	7	7	8
	PF Storage cabinet Frozen Horizontal (FH)	3	4	4	5	5	5	5	5	5	6
	PF Storage cabinets All types	36	49	51	58	58	59	61	64	66	69
	PF Process Chiller AC MT S ≤ 300 kW	3	6	7	8	8	9	10	10	11	12
	PF Process Chiller AC MT L > 300 kW	3	6	6	7	8	8	9	10	10	11
	PF Process Chiller AC LT S ≤ 200 kW	2	5	5	6	7	7	8	8	9	10
	PF Process Chiller AC LT L > 200 kW	2	5	5	6	6	7	7	8	8	9
	PF Process Chiller WC MT S ≤ 300 kW	1	3	3	3	4	4	4	5	5	5
	PF Process Chiller WC MT L > 300 kW	2	4	4	5	5	6	6	7	7	8
	PF Process Chiller WC LT S ≤ 200 kW	1	3	3	3	3	4	4	4	5	5
	PF Process Chiller WC LT L > 200 kW	2	3	4	4	4	5	5	6	6	6
	PF Process Chiller All MT&LT	16	33	37	42	45	49	54	58	62	66
	PF Condensing Unit MT S 0.2-1 kW	15	12	13	14	15	16	17	19	20	22
	PF Condensing Unit MT M 1-5 kW	32	27	27	31	32	34	37	40	43	46
	PF Condensing Unit MT L 5-20 kW	33	28	28	33	33	35	38	41	44	48
	PF Condensing Unit MT XL 20-50 kW	25	21	22	25	26	27	29	32	34	37
	PF Condensing Unit LT S 0.1-0.4 kW	3	2	2	2	3	3	3	3	3	4
	PF Condensing Unit LT M 0.4-2 kW	5	4	4	4	5	5	5	6	6	7
	PF Condensing Unit LT L 2-8 kW	12	10	11	12	12	13	14	15	16	18
	PF Condensing Unit LT XL 8-20 kW	11	9	9	11	11	11	12	13	14	15
0.6	PF Condensing Unit, All MT&LT	136	113	116	132	136	145	157	169	182	196
	PF Professional Refrigeration, Total	107	128	135	153	157	166	177	189	201	214
	TOTAL FOOD PRESERVATION	2712	3465	3774	3976	4521	4356	4766	4919	5055	5177
	CA Electric Hobs	925	2118	2277	2567	2703	2825	2940	3049	3149	3243
	CA Electric Ovens	1981	2391	2561	2891	2792	2696	2713	2748	2782	2817
	CA Gas Hobs	769	674	619	595	543	496	471	446	421	396
	CA Gas Ovens	265	276	281	356	343	330	317	305	293	281
	CA Range Hoods	481	597	629	825	961	970	975	979	981	981
	TOTAL COOKING	4421	6057	6366	7234	7341	7316	7417	7526	7626	7717
	WM Washing Machines	1422	2564	2630	2817	2605	2479	2358	2244	2217	2217
	WD Washer-Dryers	131	184	189	194	195	196	197	198	199	200
	Total WM-WD household Washing	1553	2748	2820	3011	2800	2675	2556	2442	2416	2417
	DW Household Dishwasher	611	1816	2121	2382	2600	2804	2994	3170	3332	3482
	LD condensing heat pump	0	99	576	805	909	1077	1024	975	927	882
	LD condensing electric heat element	96	253	236	260	228	156	148	141	134	133
	LD vented electric	163	114	68	56	35	0	0	0	0	0
	LD vented gas	1	1	1	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	260	467	880	1122	1172	1233	1173	1116	1062	1015
	VC dom. Vacuum Cleaner	1382	4180	6092	7447	7894	7781	7910	7894	7845	7799
	VC nondom Vacuum Cleaner	103	111	120	127	130	136	142	149	155	161
	Total VC Vacuum Cleaner	1485	4291	6211	7574	8023	7917	8052	8043	8000	7960
	TOTAL CLEANING	3909	9322	12033	14089	14596	14629	14774	14771	14810	14874
0.5	FAN Axial<300Pa [247 W flow out]	33	113	163	206	197	188	180	172	164	157
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	46	165	175	192	185	185	185	185	185	185
0.5	FAN Centr.FC [141 W flow out]	29	75	113	156	149	142	136	130	124	118
0.5	FAN Centr.BC-free [2120 W flow out]	16	41	58	65	69	67	65	63	63	64
0.5	FAN Centr.BC [2052 W flow out]	36	99	158	182	194	189	199	207	214	221
0.5	FAN Cross-flow [31 W flow out]	7	15	50	67	71	69	72	75	77	79
	Total FAN, industrial (excl. box & roof fans)	83	255	358	434	432	420	418	416	414	412
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	47	77	83	79	80	78	74	71	67	64
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	28	45	43	39	38	36	34	32	29	28
0.45	Medium (L) 3-ph 75-375 kW no VSD	22	33	29	25	26	23	21	19	18	18
0.45	Total 3ph 0.75-375 kW no VSD	97	154	155	143	144	137	129	121	115	110
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	19	55	86	146	157	161	167	176	186	196
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	14	41	77	104	110	113	117	124	130	134
0.45	Medium (L) 3-ph 75-375 kW with VSD	10	31	56	68	74	76	79	82	83	84
0.45	Total 3-ph 0.75-375 kW with VSD	43	128	219	319	342	350	364	382	400	413
0.45	Total 3-ph 0.75-375 kW w/wo VSD	139	282	374	462	486	487	493	504	514	523
0.45	Small 1 ph 0.12-0.75 kW no VSD	30	57	60	60	77	75	73	70	68	66
0.45	Small 1 ph 0.12-0.75 kW with VSD	5	39	47	50	55	58	62	65	69	73
0.45	Total Small 1-ph 0.12-0.75 kW	35	96	107	110	132	133	134	136	137	139
0.45	Small 3 ph 0.12-0.75 kW no VSD	16	28	29	31	36	35	34	33	32	31
0.45	Small 3 ph 0.12-0.75 kW with VSD	2	14	18	20	24	25	27	30	32	35
0.45	Total Small 3-ph 0.12-0.75 kW	18	43	47	51	60	60	61	63	65	67

REV_RETAIL_ECO

db	REVENUE RETAIL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Large 3-ph LV 375-1000 kW no VSD	10	13	11	11	13	12	11	11	10	10
0.45	Large 3-ph LV 375-1000kW with VSD	4	21	30	33	37	37	39	40	42	43
0.45	Total Large 3-ph LV 375-1000 kW	14	34	41	44	50	49	50	51	52	53
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	3	5	5	6	7	7	7	7	7	7
0.45	Explosion motors (M) 3-ph 7.5-75 kW	3	5	5	5	6	6	6	6	6	6
0.45	Explosion motors (L) 3-ph 75-375 kW	2	3	4	4	4	4	4	4	4	4
0.45	Total Expl. 0.75-375 kW (no VSD)	8	13	14	15	17	17	17	17	16	16
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	4	6	7	7	10	10	9	9	9	9
0.45	Brake motors (M) 3-ph 7.5-75 kW	3	6	6	7	8	8	8	8	7	7
0.45	Brake motors (L) 3-ph 75-375 kW	2	4	5	5	6	6	6	5	5	5
0.45	Total Brake 0.75-375 kW (no VSD)	9	17	17	19	23	23	23	22	22	22
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)	68	119	125	128	143	144	145	146	146	147
	MT Elec. Motors LV 0.12-1000 kW	160	333	400	456	502	503	508	516	525	532
	WP Water pumps	116	160	173	186	200	214	228	242	256	270
	Total CP Standard Air Compressors	0	0	0	0	0	0	0	0	0	0
	Total WE Welding Equipment	28	32	32	33	34	34	34	34	34	34
	TOTAL INDUSTRY COMPONENTS	388	780	964	1109	1167	1172	1188	1208	1229	1249
	TRAFO Distribution, kWh/a	44	71	94	102	109	117	125	134	142	150
	TRAFO Industry oil	23	38	62	67	72	77	83	88	94	99
	TRAFO Industry dry	11	18	26	28	30	32	34	36	39	41
	TRAFO Power	178	289	313	338	363	390	418	447	475	503
	TRAFO DER oil	0	2	6	9	16	26	38	51	63	75
	TRAFO DER dry	0	13	28	46	76	125	184	244	303	363
	TRAFO Small	5	5	5	5	5	5	5	5	5	5
	TOTAL ENERGY SECTOR	261	435	533	594	670	772	888	1004	1120	1236
	Tyres C1, replacement for cars	3732	5365	6517	7849	8901	9948	9948	9948	9948	9948
	Tyres C1, OEM for cars	1124	1540	1811	2310	2680	2996	2996	2996	2996	2996
	Tyres C1, total	4856	6905	8328	10160	11582	12943	12943	12943	12943	12943
	Tyres C2, replacement for vans	648	843	878	1096	1269	1426	1426	1426	1426	1426
	Tyres C2, OEM for vans	137	151	189	208	263	301	301	301	301	301
	Tyres C2, total	784	995	1067	1304	1532	1727	1727	1727	1727	1727
	Tyres C3, replacement for trucks/busses	1134	1147	2011	2334	2687	2995	2995	2995	2995	2995
	Tyres C3, OEM for trucks/busses	316	270	377	511	749	835	835	835	835	835
	Tyres C3, total	1451	1417	2388	2845	3436	3830	3830	3830	3830	3830
	Tyres, total C1+C2+C3	7090	9316	11783	14309	16549	18500	18500	18500	18500	18500
	TRANSPORT SECTOR	7090	9316	11783	14309	16549	18500	18500	18500	18500	18500
	GENERAL TOTAL (in m euro 2015)	37425	86197	91581	99460	113424	125119	132043	135096	136879	138143
	GENERAL TOTAL (in bn euro 2015)	37	86	92	99	113	125	132	135	137	138
	SUMMARY ECO										
	Retail revenue (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.9
	SPACE HEATING	2.1	3.0	2.9	3.4	3.8	4.1	4.4	4.8	5.1	5.4
	SPACE COOLING	0.1	0.9	0.9	1.1	1.2	1.2	1.3	1.5	1.6	1.7
	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	1.6	1.2	1.0	0.9	0.8	0.9	1.0	1.1
	ELECTRONICS	15.2	50.1	49.3	51.0	60.8	70.1	75.8	77.7	78.3	78.4
	FOOD PRESERVATION	2.7	3.5	3.8	4.0	4.5	4.4	4.8	4.9	5.1	5.2
	COOKING	4.4	6.1	6.4	7.2	7.3	7.3	7.4	7.5	7.6	7.7
	CLEANING	3.9	9.3	12.0	14.1	14.6	14.6	14.8	14.8	14.8	14.9
	INDUSTRY COMPONENTS	0.4	0.8	1.0	1.1	1.2	1.2	1.2	1.2	1.2	1.2
	ENERGY SECTOR	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2
	TRANSPORT SECTOR	7.1	9.3	11.8	14.3	16.5	18.5	18.5	18.5	18.5	18.5
	TOTAL in bn euro 2015	37	86	92	99	113	125	132	135	137	138

REV_RETAIL_ECO

Retail revenue ECO-BAU (bn euro 2015)	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	0.5	0.6	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	0.5	0.3	0.2	0.1	0.0	0.1	0.1
ELECTRONICS	-	-	-	-	-	-	-	-	-	-
FOOD PRESERVATION	-	0.4	0.7	0.8	1.3	1.1	1.4	1.5	1.6	1.6
COOKING	-	-	0.1	0.5	0.6	0.4	0.4	0.4	0.3	0.3
CLEANING	-	0.9	1.5	1.7	1.4	1.3	1.1	0.9	0.8	0.6
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	0.1	0.2	0.2
TRANSPORT SECTOR	-	0.2	1.5	2.5	3.2	3.4	3.4	3.4	3.4	3.4
TOTAL in bn euro 2015	0.0	1.8	4.3	5.7	7.2	7.1	7.4	7.5	7.6	7.7

Revenues for VSDs only (without motor)

VSD - Very Small 0.12 - 0.75 kW 1-phase	4	33	39	41	44	47	50	53	56	60
VSD - Very Small 0.12 - 0.75 kW 3-phase	1	11	13	15	17	18	19	21	24	26
VSD - Small 0.75 - 7.5 kW 3-phase	13	39	59	97	103	105	110	117	125	134
VSD - Medium 7.5 - 75kW 3-phase	10	28	51	68	72	73	76	82	87	90
VSD - Large 75 - 375kW 3-phase	5	16	27	32	34	35	37	39	40	41
VSD - Very Large 375 - 1,000kW 3-phase	2	14	19	21	23	23	24	25	27	28
Total revenues, VSDs only (ECO)	36	141	209	275	292	300	316	337	359	379

REV_WHOLE_BAU

db	REVENUE WHOLESALE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	3	4	4	5	5	5	5	5	5	5	5
EIWH Electric Instant. ≥ 12 kW (primary)	7	6	6	7	7	8	9	9	10	11	11
EIWHS Electric Instant. Shower (secondary)	11	14	14	14	14	15	16	17	18	19	19
ESWH Electric Storage ≤ 30 L (secondary)	17	19	19	20	21	23	24	26	27	28	28
ESWH Electric Storage > 30 L (primary)	96	114	104	109	117	124	132	139	147	155	155
GIWH Gas Instant. < 13 L/min (secondary)	30	21	17	17	17	17	17	16	16	16	16
GIWH Gas Instant. ≥ 13 L/min (primary)	9	8	7	7	7	7	7	7	7	6	6
GSWH Gas Storage, Condensing	0	0	0	1	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	13	8	6	4	3	3	2	2	2	1	1
Dedicated WH Heat Pump	0	2	6	9	14	18	23	28	33	37	37
Dedicated WH Solar (3.5 m ²)	21	76	77	63	65	68	70	72	75	77	77
WH dedicated Water Heater	206	273	262	255	272	289	306	322	339	356	
CHB Gas Combi Instant. WH	59	99	102	110	111	112	112	112	111	109	
CHB Gas + Cyl. WH	30	41	42	46	46	46	47	46	46	45	
CHB Jet Burner Gas + Cyl. WH	13	6	4	4	4	4	4	4	5	5	
CHB Jet Burner Oil + Cyl. WH	101	41	27	27	27	28	29	30	30	31	
CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	1	1	
CHB Hybrid Gas/Electric WH	0	0	0	1	1	2	3	5	8	13	
CHB Electric HP + Cyl. WH	2	30	34	41	48	55	64	73	84	97	
CHB Gas HP + Cyl. WH	0	0	1	1	1	2	3	4	6	8	
CHB Gas mCHP + Cyl. WH	0	1	1	2	2	4	5	7	10	15	
CHB Solar Combi (16 m ²)	3	6	6	6	6	6	6	6	7	7	
CHC Central Heating combi, water heating	210	225	220	239	250	262	275	290	308	331	
TOTAL WATER HEATING	416	498	482	494	521	550	580	613	648	687	
CHB Gas non-condensing	436	235	217	213	196	180	165	150	135	121	
CHB Gas condensing	29	638	531	566	601	633	659	680	695	701	
CHB Gas Jet burner non-condensing	92	30	13	12	11	10	9	9	8	7	
CHB Gas Jet burner condensing	0	10	14	15	17	18	20	21	23	24	
CHB Oil Jet burner non-condensing	647	199	89	78	72	67	62	58	54	50	
CHB Oil Jet burner condensing	0	66	89	95	105	115	125	134	143	151	
CHB Electric Joule-effect	6	10	10	11	10	9	8	8	7	6	
CHB Hybrid (gas-electric)	0	1	2	4	6	10	17	28	47	78	
CHB Electric Heat Pump	12	162	184	226	264	308	358	416	483	561	
CHB Gas Heat Pump	1	2	3	5	7	11	15	22	32	45	
CHB micro CHP	3	4	6	9	13	19	28	40	58	83	
CHB Solar combi (16 m ²)	16	28	28	31	32	33	34	35	36	36	
CHB Central Heating boiler < 400 kW,	1243	1387	1187	1264	1335	1414	1501	1602	1720	1864	
SFB Wood Manual [18 kW]	22	13	9	5	3	3	3	2	2	2	
SFB Wood Direct Draft [20 kW]	1	36	37	39	36	45	52	61	72	86	
SFB Coal [25 kW]	6	27	6	8	8	8	7	6	6	5	
SFB Pellets [25 kW]	0	9	14	14	14	15	17	19	21	23	
SFB Wood chips [160 kW]	0	6	6	7	8	9	9	10	12	13	
Total Solid Fuel Boiler	29	91	71	72	69	79	88	99	112	129	
CHAE-S (< 400 kW)	24	106	117	130	144	157	171	185	197	210	
CHAE-L (> 400 kW)	5	18	19	20	21	21	22	23	24	25	
CHWE-S (≤ 400 kW)	2	9	10	12	13	14	15	16	18	19	
CHWE-M (> 400 kW; ≤ 1500 kW)	2	9	9	9	10	10	11	11	11	12	
CHWE-L (> 1500 kW)	2	6	6	6	6	7	7	7	7	8	
CHF	0	0	1	1	1	1	1	1	1	1	
HT PCH-AE-S	12	20	22	23	24	25	26	27	28	29	
HT PCH-AE-L	10	16	17	19	19	20	21	22	23	23	
HT PCH-WE-S	3	4	5	5	5	5	6	6	6	6	
HT PCH-WE-M	10	18	19	20	21	22	23	23	24	25	
HT PCH-WE-L	2	3	4	4	4	4	4	4	5	5	
AC rooftop	11	38	38	29	17	5	5	5	5	5	
AC splits	19	73	77	74	72	69	66	64	61	59	
AC VRF	0	166	218	318	402	486	565	638	699	743	
ACF	0	0	1	1	1	1	1	1	1	1	
SubTotal AHC Air Cooling	103	489	562	671	760	847	944	1033	1111	1170	
AC rooftop (rev)	7	23	22	18	10	3	0	0	0	0	
AC splits (rev)	13	47	49	48	46	44	43	41	39	38	
AC VRF (rev)	0	142	177	272	330	379	420	451	470	476	
ACF (rev)	0	1	1	1	2	2	2	2	3	3	
AHF	40	26	25	23	22	21	19	18	17	16	
AHE	0	0	0	0	0	0	0	0	0	0	
SubTotal AHC Air Heating (rev double)	60	240	274	362	410	449	484	513	529	532	
Total AHC Air Heating & Cooling	144	515	587	694	782	868	963	1052	1128	1186	

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db	REVENUE WHOLESALE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	99	142	141	140	139	139	138	138	138	138	138
LH closed fireplace/inset [8 kW]	63	167	183	200	203	205	206	206	206	206	206
LH wood stove [8 kW]	68	78	86	93	94	96	96	96	96	96	96
LH coal stove [8 kW]	18	15	14	13	9	6	6	6	6	6	6
LH cooker [10 kW]	58	114	136	157	161	165	166	166	166	166	166
LH SHR stove [8 kW]	63	86	105	125	139	154	157	157	157	157	157
LH pellet stove [8 kW]	0	64	80	95	102	109	110	110	110	110	110
LH Solid fuel sum	368	667	744	823	848	874	879	879	879	879	879
LH Electric portable	15	18	19	19	19	19	19	19	19	19	19
LH Electric fixed > 250W	127	148	115	107	107	107	107	107	107	107	107
LH Electric fixed ≤ 250W	16	19	14	13	13	13	13	13	13	13	13
LH Electric storage	13	16	14	14	14	14	14	14	14	14	14
LH Electric underfloor	13	15	16	16	16	16	16	16	16	16	16
LH Electric visibly glowing > 1.2 kW	0	1	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	0
LH Electric Towel Heaters	23	38	38	38	38	38	38	38	38	38	38
LH Electric sum	207	254	217	208	207						
LH Gas luminous (commercial)	0	0	1	0	0	0	0	0	0	0	0
LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	0	0	0	0	0	0	0
LH Gas open front	1	1	1	1	1	1	1	1	1	1	1
LH Gas closed front	10	5	4	4	3	3	3	3	3	3	3
LH Gas balanced flue	15	6	4	3	3	3	3	3	3	3	3
LH Gas flueless	1	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	26	13	10	9	8	7	7	7	7	7	7
LH Liquid tube (commercial < 120 kW)	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
LH Liquid closed front	1	1	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	1	1	0	0	0	0	0	0	0	0	0
LH Liquid flueless	5	2	1	0	0	0	0	0	0	0	0
LH Liquid fuel sum	8	3	2	1							
LH Local Space Heaters total	609	938	973	1040	1064	1088	1093	1093	1093	1093	1093
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	31	298	222	246	272	298	327	365	418	484	
RAC fixed 6-12 kW, cooling	13	159	157	155	161	166	169	169	187	207	
RAC portable < 12 kW, cooling	2	25	22	17	17	18	18	19	19	20	
RAC < 12 kW total, cooling mode	46	482	402	418	451	481	514	553	625	712	
RAC fixed < 6 kW, reversible, heating	3	114	107	148	191	238	294	365	418	484	
RAC fixed 6-12 kW, reversible, heating	1	61	76	93	113	133	152	169	187	207	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	4	175	182	241	304	371	446	534	606	692	
RAC Room Air Conditioner	49	657	584	658	754	853	960	1087	1231	1403	
1 CIRC Integrated circulators	177	290	323	338	364	385	385	385	385	385	385
1 CIRC Large standalone circulators	84	156	162	160	152	138	139	139	138	136	
1 CIRC Small standalone circulators	143	217	215	202	183	162	161	161	161	161	
1 CIRC Circulator pumps <2.5 kW	405	664	699	700	700	685	685	685	684	682	
TOTAL SPACE HEATING (incl. rev.AC)	1945	2830	2687	2979	3182	3402	3613	3841	4060	4310	
TOTAL SPACE COOLING	149	971	964	1088	1210	1329	1457	1586	1736	1882	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	3	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	16	35	178	195	215	301	364	395	
R-UVU 100-250 m3/h	11	35	37	42	40	39	42	45	42	43	
R-BVU 100-250 m3/h	1	9	10	16	73	79	84	114	135	145	
R-UVU 250-1000 m3/h	20	52	52	58	53	53	56	60	58	60	
R-BVU 250-1000 m3/h	3	16	19	28	129	140	150	200	237	255	
R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1	
R-BVU 1000-2500 m3/h	0	4	4	5	5	6	7	7	8	8	
RVU, Total residential (incl. instal.mat.)	37	129	141	188	481	516	558	731	847	911	
NR-UVU 250-1000 m3/h	8	8	8	8	7	7	7	6	6	5	
NR-BVU 250-1000 m3/h	0	17	17	20	23	27	30	33	37	39	
NR-UVU > 1000 m3/h	9	9	8	8	7	7	7	6	6	5	
NR-BVU 1000-2500 m3/h	0	34	33	38	41	47	51	55	60	64	
NR-AHU-S 2500-5500 m3/h	10	179	223	223	199	224	237	243	253	267	
NR-AHU-M 5500-14500 m3/h	116	308	349	340	301	326	335	338	347	357	
NR-AHU-L > 14500 m3/h	27	75	84	82	71	77	78	79	81	83	
NRVU, Total non-residential (incl. instal.mat.)	169	629	723	719	650	715	744	760	790	822	
VU Ventilation Units, res+nres (incl. instal.mat.)	206	758	864	906	1131	1231	1302	1490	1638	1732	
TOTAL VENTILATION	206	758	864	906	1131	1231	1302	1490	1638	1732	

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db	REVENUE WHOLESALE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	195	290	262	198	137	100	84	66	51	39	
HID (HPM, HPS, MH)	31	94	84	58	45	25	12	6	3	2	
CFLni (all shapes)	25	97	85	83	66	33	17	10	4	3	
CFLi (retrofit for GLS, HL)	29	374	244	294	175	130	71	49	30	19	
GLS (DLS & NDLS)	290	238	200	139	82	48	28	16	10	6	
HL (DLS & NDLS, LV & MV)	57	450	561	574	355	184	97	53	30	18	
LED replacing LFL (retrofit & luminaire)	0	0	51	181	245	327	359	417	501	589	
LED replacing HID (retrofit & luminaire)	0	0	15	93	108	137	164	195	227	259	
LED replacing CFLni (retrofit & luminaire)	0	0	3	12	19	24	27	30	32	35	
LED replacing DLS (retrofit & luminaire)	0	0	12	37	41	24	17	14	12	12	
LED replacing NDLS (retrofit & luminaire)	0	5	31	207	166	111	85	68	58	54	
SUBTOTAL non-LED	626	1543	1436	1346	860	520	310	201	129	86	
SUBTOTAL LED	0	6	113	530	579	623	651	724	830	949	
TOTAL LIGHTING	626	1548	1549	1876	1439	1143	960	925	959	1036	
DP TV all types	846	1388	793	989	1141	1313	1332	1332	1332	1332	
DP Monitor	249	547	308	309	309	309	309	309	309	309	
DP Signage	0	80	350	802	601	601	601	601	601	601	
DP Electronic Displays, total	1095	2015	1450	2101	2052	2224	2243	2243	2243	2243	
SSTB	0	300	68	0	0	0	0	0	0	0	
CSTB	0	1128	1392	1404	1404	1404	1404	1404	1404	1404	
Total STB set top boxes (Complex & Simple)	0	1428	1460	1404							
Game consoles > 20 W	2	154	154	154	154	154	154	154	154	154	
Game consoles < 20 W	7	39	39	39	39	39	39	39	39	39	
Total GC Game consoles	9	193									
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	573	890	471	527	727	775	803	812	815	816	
PC Integrated Desktop	24	38	20	23	31	38	43	44	45	45	
PC Notebook	0	2460	2169	2164	2855	3600	4135	4328	4394	4416	
PC Tablet/slate	0	120	1379	1330	1445	1567	1638	1663	1671	1674	
PC Thin client	0	202	197	207	209	211	212	212	212	212	
PC Integrated Thin Client	0	16	15	16	16	16	17	17	17	17	
PC Small-scale Server	25	50	63	64	64	65	65	65	65	65	
PC Workstation	222	395	487	556	665	796	884	915	926	929	
Total PC, electricity	845	4172	4800	4886	6013	7068	7795	8056	8144	8173	
Inkjet Printer	50	83	11	12	11	11	10	10	9	9	
Inkjet MFD	62	160	122	78	74	70	67	63	60	57	
EP / Laser Printer mono	96	96	112	106	83	67	53	40	28	15	
EP / Laser Printer colour	0	93	105	128	142	148	154	157	160	163	
EP / Laser Copier mono	478	201	50	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	67	120	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	157	209	200	190	181	172	163	155	146	
EP / Laser MFD colour	0	994	1328	1268	1206	1147	1091	1037	983	929	
Total IE Imaging Equipment	687	1850	2057	1791	1706	1624	1546	1470	1394	1319	
<i>Products regulated only for (networked) standby</i>											
SB Radios	389	315	254	223	204	185	165	146	126	107	
SB Electric toothbrushes	45	73	80	90	101	111	122	133	143	154	
SB Audio speakers (wired)	1016	523	370	132	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	6	365	970	1099	1105	1106	1107	1108	1109	
SB Small appliances	1177	1902	1951	2003	2025	2047	2070	2092	2114	2137	
SB Media boxes /sticks	0	0	76	93	94	94	94	94	94	94	
SB Media players and recorders	1	576	499	66	0	0	0	0	0	0	
SB Projectors	2	182	154	63	27	0	0	0	0	0	
SB Home phones	6	29	30	28	27	26	25	25	24	23	
SB Office phones	55	99	91	86	85	86	85	83	81	79	
SB Home NAS	0	332	524	715	900	1084	1245	1362	1417	1420	
SB Home Network Equipment	0	688	781	833	879	925	999	999	999	999	
SB Office Network Equipment	0	72	213	400	587	773	871	871	871	871	
SB Coffee makers	23	27	28	29	30	31	32	33	34	34	
Total (networked) SB (excl. double)	2714	4823	5416	5732	6057	6467	6813	6942	7011	7027	
db											
0.0 EPS ≤ 6W, low-V	3	37	26	18	13	7	3	1	1	0	
0.3 EPS 6–10 W	16	218	236	252	264	277	284	292	299	307	
0.6 EPS 10–12 W	0	180	216	232	235	236	237	239	240	242	
0.5 EPS 15–20 W	0	1	5	9	10	11	12	13	13	14	
1.0 EPS 20–30 W	1	26	27	25	24	22	21	19	17	15	
0.8 EPS 30–65 W, multiple-V	0	0	0	4	5	7	10	12	14	17	
1.0 EPS 30–65 W	0	0	0	4	10	18	18	18	18	18	
1.0 EPS 65–120 W	0	20	19	15	8	0	0	0	0	0	
0.5 EPS 65–120 W, multiple-V	0	119	43	13	13	13	13	13	13	13	
0.0 EPS 12–15 W	0	20	40	48	49	49	49	49	49	49	
EPS, total	20	621	611	620	631	641	647	655	664	674	
EPS, double counted subtracted	14	342	343	349	355	360	362	367	373	379	
TOTAL ELECTRONICS	5364	14823	15719	16456	17780	19339	20356	20675	20762	20738	

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db	REVENUE WHOLESALE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	RF Household refrigerator and freezer	195	218	223	228	232	235	239	242	246	249
	CF open vertical chilled multi deck (RVC2)	78	89	88	90	92	93	95	96	98	99
	CF open horizontal frozen island (RHF4)	9	11	11	11	11	11	11	11	12	12
	CF other supermarket display (non-BCs)	178	222	235	245	254	263	272	282	291	302
	CF Plug in one door beverage cooler	153	196	195	203	210	217	224	231	239	247
	CF Plug in horizontal ice cream freezer	63	81	80	84	87	90	92	96	99	102
	CF Spiral vending machine	102	80	66	68	71	74	77	80	83	86
	Total CF Commercial Refrigeration	583	678	675	700	724	747	771	795	821	847
	PF Storage cabinet Chilled Vertical (CV)	38	52	55	57	60	62	65	68	70	73
	PF Storage cabinet Frozen Vertical (FV)	20	27	29	30	31	33	34	35	37	38
	PF Storage cabinet Chilled Horizontal (CH)	8	11	11	12	12	13	13	14	14	15
	PF Storage cabinet Frozen Horizontal (FH)	6	8	9	9	9	10	10	11	11	11
	PF Storage cabinets All types	72	98	103	107	112	117	123	128	133	138
	PF Process Chiller AC MT S ≤ 300 kW	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC MT L > 300 kW	6	11	13	14	15	17	18	20	21	22
	PF Process Chiller AC LT S ≤ 200 kW	5	10	11	12	13	14	15	17	18	19
	PF Process Chiller AC LT L > 200 kW	4	9	10	11	12	13	15	16	17	18
	PF Process Chiller WC MT S ≤ 300 kW	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC MT L > 300 kW	4	8	9	10	11	12	13	14	15	16
	PF Process Chiller WC LT S ≤ 200 kW	3	5	6	6	7	8	8	9	10	10
	PF Process Chiller WC LT L > 200 kW	3	6	7	8	9	10	10	11	12	13
	PF Process Chiller All MT&LT	33	66	74	82	90	99	107	116	124	133
	PF Condensing Unit MT S 0.2-1 kW	30	25	25	28	30	32	34	37	40	43
	PF Condensing Unit MT M 1-5 kW	65	54	55	59	64	69	74	80	86	93
	PF Condensing Unit MT L 5-20 kW	66	55	57	61	66	71	76	82	89	96
	PF Condensing Unit MT XL 20-50 kW	51	42	43	47	50	54	58	63	68	73
	PF Condensing Unit LT S 0.1-0.4 kW	5	4	4	5	5	6	6	6	7	7
	PF Condensing Unit LT M 0.4-2 kW	9	8	8	8	9	10	11	11	12	13
	PF Condensing Unit LT L 2-8 kW	25	20	21	23	24	26	28	31	33	36
	PF Condensing Unit LT XL 8-20 kW	22	18	18	20	21	23	25	27	29	31
0.6	PF Condensing Unit, All MT&LT	272	226	232	251	270	291	313	337	364	392
	PF Professional Refrigeration, Total	214	255	270	289	310	332	355	378	402	427
	TOTAL FOOD PRESERVATION	992	1151	1167	1218	1266	1314	1364	1416	1469	1523
	CA Electric Hobs	69	159	171	185	195	204	213	221	228	236
	CA Electric Ovens	149	179	190	206	200	201	204	206	209	211
	CA Gas Hobs	58	51	46	42	39	37	35	33	32	30
	CA Gas Ovens	20	21	20	19	19	18	18	17	17	16
	CA Range Hoods	36	45	47	50	52	55	58	60	63	66
	TOTAL COOKING	332	454	474	502	505	515	527	538	548	558
	WM Washing Machines	107	159	161	173	166	166	166	166	166	166
	WD Washer-Dryers	10	14	14	15	15	15	15	15	15	15
	Total WM-WD household Washing	116	173	175	188	181	181	181	181	181	181
	DW Household Dishwasher	46	103	120	137	154	170	187	204	220	237
	LD condensing heat pump	0	2	2	4	6	8	11	13	15	17
	LD condensing electric heat element	7	20	29	37	36	33	29	27	25	24
	LD vented electric	12	10	11	11	11	11	11	11	11	11
	LD vented gas	0	0	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	20	31	42	53	53	52	51	51	51	52
	VC dom. Vacuum Cleaner	104	314	443	543	592	584	593	592	588	585
	VC nondom Vacuum Cleaner	138	148	156	165	173	181	190	198	207	215
	Total VC Vacuum Cleaner	241	462	599	708	765	783	790	795	800	
	TOTAL CLEANING	423	769	936	1086	1153	1168	1202	1226	1248	1270
0.5	FAN Axial<300Pa [247 W flow out]	77	261	301	341	341	341	341	341	341	341
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	106	380	402	425	425	425	425	425	425	425
0.5	FAN Centr.FC [141 W flow out]	66	173	201	228	228	228	228	228	228	228
0.5	FAN Centr.BC-free [2120 W flow out]	38	95	108	122	135	138	140	143	145	148
0.5	FAN Centr.BC [2052 W flow out]	82	227	261	295	328	335	368	401	435	468
0.5	FAN Cross-flow [31 W flow out]	15	35	40	45	50	51	56	61	66	71
	Total FAN, industrial (excl. box & roof fans)	192	585	657	728	754	759	779	799	820	840
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	108	175	178	176	169	161	151	140	130	119
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	64	101	102	100	95	89	81	73	63	57
0.45	Medium (L) 3-ph 75-375 kW no VSD	50	74	73	69	63	55	46	36	35	36
0.45	Total 3ph 0.75-375 kW no VSD	222	351	354	345	326	304	278	249	229	212
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	43	126	151	175	198	226	264	307	360	423
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	31	93	112	130	147	168	196	229	267	298
0.45	Medium (L) 3-ph 75-375 kW with VSD	24	71	85	99	113	129	150	174	178	183
0.45	Total 3-ph 0.75-375 kW with VSD	98	290	348	404	458	523	609	711	806	903
0.45	Total 3-ph 0.75-375 kW w/wo VSD	320	640	702	749	784	827	888	959	1035	1115

REV_WHOLE_BAU

db	REVENUE WHOLESALE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	69	131	138	138	138	137	136	135	133	132
0.45	Small 1 ph 0.12-0.75 kW with VSD	11	90	109	115	122	129	137	146	155	165
	Total Small 1-ph 0.12-0.75 kW	80	221	247	253	259	266	273	281	288	297
0.45	Small 3 ph 0.12-0.75 kW no VSD	38	65	68	68	68	67	66	66	65	63
0.45	Small 3 ph 0.12-0.75 kW with VSD	4	33	41	45	49	54	60	66	72	79
	Total Small 3-ph 0.12-0.75 kW	42	98	109	113	117	121	126	131	137	143
0.45	Large 3-ph LV 375-1000 kW no VSD	23	29	26	26	26	25	25	24	23	22
0.45	Large 3-ph LV 375-1000kW with VSD	8	49	68	75	79	83	87	91	94	98
	Total Large 3-ph LV 375-1000 kW	31	79	94	101	105	109	112	114	117	120
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	7	12	13	13	13	13	13	13	13	13
0.45	Explosion motors (M) 3-ph 7.5-75 kW	6	11	11	12	12	12	12	12	12	12
0.45	Explosion motors (L) 3-ph 75-375 kW	5	8	8	9	9	9	9	9	9	9
	Total Expl. 0.75-375 kW (no VSD)	17	31	32	33	33	33	33	33	33	34
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	9	15	16	16	16	16	16	16	16	17
0.45	Brake motors (M) 3-ph 7.5-75 kW	8	13	14	14	14	15	15	15	15	15
0.45	Brake motors (L) 3-ph 75-375 kW	6	10	10	11	11	11	11	11	11	11
	Total Brake 0.75-375 kW (no VSD)	22	38	40	41	41	41	41	41	42	43
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	0
	Total 8-pole 0.75-375 kW (no VSD)	1	2								
0.45	1-phase motors >0.75 kW (no VSD)	156	274	287	294	294	293	293	292	298	305
MT Elec. Motors LV 0.12-1000 kW		368	761	833	872	900	931	972	1020	1073	1132
WP Water pumps		268	369	399	429	461	493	525	557	590	622
Total CP Standard Air Compressors		0	0	0	0	0	0	0	0	0	0
Total WE Welding Equipment		46	53	53	53	54	54	55	55	56	56
TOTAL INDUSTRY COMPONENTS		874	1767	1941	2082	2168	2237	2332	2432	2538	2650
TRAFO Distribution, kWh/a		44	71	76	82	88	95	102	108	115	122
TRAFO Industry oil		23	38	41	44	47	51	54	58	61	65
TRAFO Industry dry		11	18	19	21	22	24	25	27	29	30
TRAFO Power		178	289	313	338	363	390	418	447	475	503
TRAFO DER oil		0	2	3	6	9	15	23	30	37	45
TRAFO DER dry		0	13	21	35	58	95	141	186	231	277
TRAFO Small		5	5	5	5	5	5	5	5	5	5
TOTAL ENERGY SECTOR		261	435	478	530	593	675	768	861	953	1046
Tyres C1, replacement for cars		1244	1717	1892	2153	2436	2752	2752	2752	2752	2752
Tyres C1, OEM for cars		375	513	604	648	734	829	829	829	829	829
Tyres C1, total		1619	2231	2495	2801	3170	3580	3580	3580	3580	3580
Tyres C2, replacement for vans		216	281	281	316	354	397	397	397	397	397
Tyres C2, OEM for vans		46	50	63	67	75	84	84	84	84	84
Tyres C2, total		261	332	344	383	429	480	480	480	480	480
Tyres C3, replacement for trucks/busses		378	382	460	587	674	771	771	771	771	771
Tyres C3, OEM for trucks/busses		105	90	126	164	188	215	215	215	215	215
Tyres C3, total		484	472	586	751	861	986	986	986	986	986
Tyres, total C1+C2+C3		2363	3034	3425	3935	4461	5047	5047	5047	5047	5047
TRANSPORT SECTOR		2363	3034	3425	3935	4461	5047	5047	5047	5047	5047
GENERAL TOTAL (in m euro 2015)		13951	29038	30686	33152	35408	37951	39509	40649	41605	42479
GENERAL TOTAL (in bn euro 2015)		14	29	31	33	35	38	40	41	42	42
SUMMARY BAU											
Wholesale revenue BAU (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	0.4	0.5	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.7
SPACE HEATING	1.9	2.8	2.7	3.0	3.2	3.4	3.6	3.8	4.1	4.3	
SPACE COOLING	0.1	1.0	1.0	1.1	1.2	1.3	1.5	1.6	1.7	1.9	
VENTILATION	0.2	0.8	0.9	0.9	1.1	1.2	1.3	1.5	1.6	1.7	
LIGHTING	0.6	1.5	1.5	1.9	1.4	1.1	1.0	0.9	1.0	1.0	
ELECTRONICS	5.4	14.8	15.7	16.5	17.8	19.3	20.4	20.7	20.8	20.7	
FOOD PRESERVATION	1.0	1.2	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	
COOKING	0.3	0.5	0.6								
CLEANING	0.4	0.8	0.9	1.1	1.2	1.2	1.2	1.2	1.2	1.3	
INDUSTRY COMPONENTS	0.9	1.8	1.9	2.1	2.2	2.2	2.3	2.4	2.5	2.7	
ENERGY SECTOR	0.3	0.4	0.5	0.5	0.6	0.7	0.8	0.9	1.0	1.0	
TRANSPORT SECTOR	2.4	3.0	3.4	3.9	4.5	5.0	5.0	5.0	5.0	5.0	
TOTAL in bn euro 2015	14	29	31	33	35	38	40	41	42	42	

REV_WHOLE_BAU

Revenues for VSDs only (without motor, m euros)

VSD - Very Small 0.12 - 0.75 kW 1-phase	9	75	91	95	101	107	114	122	129	138
VSD - Very Small 0.12 - 0.75 kW 3-phase	3	25	30	33	36	40	44	49	54	60
VSD - Small 0.75 - 7.5 kW 3-phase	31	90	108	125	141	160	188	221	260	305
VSD - Medium 7.5 - 75kW 3-phase	22	64	77	89	101	115	135	158	186	208
VSD - Large 75 - 375kW 3-phase	12	36	44	51	57	65	76	90	93	95
VSD - Very Large 375 - 1,000kW 3-phase	6	32	43	48	50	52	55	58	61	64
Total revenues, VSDs only (BAU)	83	323	394	440	486	540	613	698	783	869

REV_WHOLE_ECO

db	REVENUE WHOLESALE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	3	4	4	5	5	5	5	5	5	5	5
EIWH Electric Instant. ≥ 12 kW (primary)	7	6	6	7	7	8	9	9	10	10	11
EIWHS Electric Instant. Shower (secondary)	11	14	14	14	14	15	16	17	18	18	19
ESWH Electric Storage ≤ 30 L (secondary)	17	19	19	20	21	23	24	26	27	27	28
ESWH Electric Storage > 30 L (primary)	96	114	104	109	117	124	132	139	147	147	155
GIWH Gas Instant. < 13 L/min (secondary)	30	21	17	17	17	17	17	16	16	16	16
GIWH Gas Instant. ≥ 13 L/min (primary)	9	8	7	7	7	7	7	7	7	7	6
GSWH Gas Storage, Condensing	0	0	0	1	1	1	1	1	1	1	1
GSWH Gas Storage, Non-condensing	13	8	6	4	3	3	2	2	2	2	1
Dedicated WH Heat Pump	0	2	6	9	14	18	23	28	33	37	
Dedicated WH Solar (3.5 m2)	21	76	77	63	65	68	70	72	75	77	
WH dedicated Water Heater	206	273	262	255	272	289	306	322	339	356	
CHB Gas Combi Instant. WH	59	99	102	105	98	91	84	76	68	59	
CHB Gas + Cyl. WH	30	41	36	40	37	34	32	29	26	22	
CHB Jet Burner Gas + Cyl. WH	13	6	4	4	4	4	4	4	5	5	
CHB Jet Burner Oil + Cyl. WH	101	41	27	27	27	28	29	30	30	31	
CHB Electric (Joule) + Cyl. WH	1	2	2	2	2	2	2	2	1	1	
CHB Hybrid Gas/Electric WH	0	0	1	2	6	11	16	22	30	37	
CHB Electric HP + Cyl. WH	2	30	36	62	108	154	200	246	295	344	
CHB Gas HP + Cyl. WH	0	0	1	3	5	7	9	12	14	17	
CHB Gas mCHP + Cyl. WH	0	1	2	4	6	9	11	13	15	17	
CHB Solar Combi (16 m2)	3	6	7	6	6	7	7	7	7	7	
CHC Central Heating combi, water heating	210	225	219	255	301	348	394	441	491	541	
TOTAL WATER HEATING	416	498	481	510	573	636	700	763	830	897	
CHB Gas non-condensing	436	235	177	54	33	12	10	7	6	4	
CHB Gas condensing	29	638	581	713	686	659	607	554	493	431	
CHB Gas Jet burner non-condensing	92	30	10	3	3	2	2	1	1	1	
CHB Gas Jet burner condensing	0	10	17	24	25	26	28	29	30	31	
CHB Oil Jet burner non-condensing	647	199	67	22	18	14	11	9	7	6	
CHB Oil Jet burner condensing	0	66	111	151	159	168	176	183	189	195	
CHB Electric Joule-effect	6	10	10	11	10	9	8	8	7	6	
CHB Hybrid (gas-electric)	0	1	4	10	35	61	92	123	167	210	
CHB Electric Heat Pump	12	162	171	319	555	792	1027	1262	1513	1763	
CHB Gas Heat Pump	1	2	6	14	26	37	50	63	77	91	
CHB micro CHP	3	4	12	23	35	47	59	70	82	94	
CHB Solar combi (16 m2)	16	28	33	32	33	34	35	36	36	37	
CHB Central Heating boiler < 400 kW, space heating	1243	1387	1199	1375	1618	1861	2103	2345	2607	2869	
SFB Wood Manual [18 kW]	22	13	12	9	5	5	4	3	3	3	
SFB Wood Direct Draft [20 kW]	1	36	37	39	43	50	59	69	80	94	
SFB Coal [25 kW]	6	27	6	8	8	8	7	6	6	5	
SFB Pellets [25 kW]	0	9	14	14	14	15	17	19	21	23	
SFB Wood chips [160 kW]	0	6	6	7	8	9	9	10	12	13	
Total Solid Fuel Boiler	29	91	74	77	79	86	96	107	121	137	
CHAE-S (< 400 kW)	24	106	117	130	144	157	171	185	197	210	
CHAE-L (> 400 kW)	5	18	19	20	21	21	22	23	24	25	
CHWE-S (< 400 kW)	2	9	10	12	13	14	15	16	18	19	
CHWE-M (> 400 kW; ≤ 1500 kW)	2	9	9	9	10	10	11	11	11	12	
CHWE-L (> 1500 kW)	2	6	6	6	6	7	7	7	7	8	
CHF	0	0	1	1	1	1	1	1	1	1	
HT PCH-AE-S	12	20	22	23	24	25	26	27	28	29	
HT PCH-AE-L	10	16	17	19	19	20	21	22	23	23	
HT PCH-WE-S	3	4	5	5	5	5	6	6	6	6	
HT PCH-WE-M	10	18	19	20	21	22	23	23	24	25	
HT PCH-WE-L	2	3	4	4	4	4	4	4	5	5	
1 AC rooftop	11	38	38	29	17	5	5	5	5	5	
1 AC splits	19	73	77	74	72	69	66	64	61	59	
1 AC VRF	0	166	218	318	402	486	565	638	699	743	
ACF	0	0	1	1	1	1	1	1	1	1	
SubTotal AHC Air Cooling	103	489	562	671	760	847	944	1033	1111	1170	
1 AC rooftop (rev)	7	23	22	18	10	3	0	0	0	0	0
AC splits (rev)	13	47	49	48	46	44	43	41	39	38	
1 AC VRF (rev)	0	142	177	272	330	379	420	451	470	476	
1 ACF (rev)	0	1	1	1	2	2	2	3	3	3	
1 AHF	40	26	25	25	24	22	20	18	17	16	
AHE	0	0	0	0	0	0	0	0	0	0	
SubTotal AHC Air Heating (rev double)	60	240	274	364	412	451	485	513	529	532	
Total AHC Air Heating & Cooling	144	515	587	696	784	870	964	1052	1128	1186	

REV_WHOLE_ECO

db	REVENUE WHOLESALE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	99	142	141	173	190	182	175	169	162	157	157
LH closed fireplace/inset [8 kW]	63	167	183	238	255	249	241	232	223	215	215
LH wood stove [8 kW]	68	78	86	112	120	117	113	109	104	100	100
LH coal stove [8 kW]	18	15	14	15	12	8	7	6	6	6	6
LH cooker [10 kW]	58	114	136	173	184	181	174	167	166	166	166
LH SHR stove [8 kW]	63	86	105	125	140	154	157	157	157	157	157
LH pellet stove [8 kW]	0	64	80	95	102	109	110	110	110	110	110
LH Solid fuel sum	368	667	744	931	1002	999	976	950	930	911	
LH Electric portable	15	18	20	19	19	19	19	19	19	19	19
LH Electric fixed > 250W	127	148	116	107	107	107	107	107	107	107	107
LH Electric fixed ≤ 250W	16	19	15	13	13	13	13	13	13	13	13
LH Electric storage	13	16	16	18	17	17	16	15	15	15	14
LH Electric underfloor	13	15	16	16	16	16	16	16	16	16	16
LH Electric visibly glowing > 1.2 kW	0	1	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	0
LH Electric Towel Heaters	23	38	38	38	38	38	38	38	38	38	38
LH Electric sum	207	254	221	212	211	210	210	209	208	208	
LH Gas luminous (commercial)	0	0	1	1	0	0	0	0	0	0	0
LH Gaseous Tube (commercial < 120 kW)	0	1	1	1	1	0	0	0	0	0	0
LH Gas open front	1	1	1	1	1	1	1	1	1	1	1
LH Gas closed front	10	5	4	4	3	3	3	3	3	3	3
LH Gas balanced flue	15	6	4	4	3	3	3	3	3	3	3
LH Gas flueless	1	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	26	13	11	9	8	7	7	7	7	7	
LH Liquid tube (commercial < 120 kW)	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
LH Liquid closed front	1	1	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	1	1	0	0	0	0	0	0	0	0	0
LH Liquid flueless	5	2	1	0	0	0	0	0	0	0	0
LH Liquid fuel sum	8	3	2	1							
LH Local Space Heaters total	609	938	977	1154	1222	1216	1193	1166	1145	1126	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	31	351	277	302	319	325	331	365	418	484	
RAC fixed 6-12 kW, cooling	13	213	229	215	214	212	208	205	210	216	
RAC portable < 12 kW, cooling	2	29	27	20	19	18	18	19	19	20	
RAC < 12 kW total, cooling mode	46	593	533	537	552	556	558	589	648	720	
RAC fixed < 6 kW, reversible, heating	3	134	133	181	223	260	298	365	418	484	
RAC fixed 6-12 kW, reversible, heating	1	81	110	129	150	170	188	205	210	216	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	4	215	243	310	373	430	486	570	629	700	
RAC Room Air Conditioner	49	808	776	846	926	985	1044	1159	1277	1420	
1 CIRC Integrated circulators	177	290	343	361	371	385	385	385	385	385	
1 CIRC Large standalone circulators	84	156	261	244	217	186	177	168	160	152	
1 CIRC Small standalone circulators	143	217	257	240	214	186	177	169	161	161	
1 CIRC Circulator pumps <2.5 kW	405	664	861	844	803	758	739	722	706	699	
TOTAL SPACE HEATING (incl. rev.AC)	1945	2871	2768	3280	3704	4043	4363	4701	5031	5364	
TOTAL SPACE COOLING	149	1082	1095	1207	1312	1403	1502	1622	1759	1890	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	3	4	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	10	16	38	187	198	215	301	364	395	
R-UVU 100-250 m3/h	11	35	41	54	51	49	51	54	50	50	
R-BVU 100-250 m3/h	1	9	11	17	75	80	84	114	135	145	
R-UVU 250-1000 m3/h	20	52	55	68	62	62	67	72	68	71	
R-BVU 250-1000 m3/h	3	16	19	29	129	140	150	200	237	255	
R-UVU > 1000 m3/h	1	1	1	1	1	1	1	1	1	1	
R-BVU 1000-2500 m3/h	0	4	4	5	5	6	7	7	8	8	
RVU, Total residential (incl. instal.mat.)	37	129	150	215	515	540	579	753	866	929	
NR-UVU 250-1000 m3/h	8	8	8	9	8	8	8	8	7	7	
NR-BVU 250-1000 m3/h	0	17	17	21	23	27	30	33	37	39	
NR-UVU > 1000 m3/h	9	9	9	9	8	8	8	7	7	6	
NR-BVU 1000-2500 m3/h	0	34	33	38	41	47	51	55	60	64	
NR-AHU-S 2500-5500 m3/h	10	179	229	239	215	241	255	260	270	284	
NR-AHU-M 5500-14500 m3/h	116	308	359	367	327	352	360	360	369	378	
NR-AHU-L > 14500 m3/h	27	75	86	87	76	81	83	83	85	87	
NRVU, Total non-residential (incl. instal.mat.)	169	629	742	771	699	765	794	806	835	865	
VU Ventilation Units, res+nres (incl. instal.mat.)	206	758	892	986	1213	1305	1373	1559	1701	1794	
TOTAL VENTILATION	206	758	892	986	1213	1305	1373	1559	1701	1794	

REV_WHOLE_ECO

db	REVENUE WHOLESALE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	195	290	212	176	54	27	15	10	6	3	
HID (HPM, HPS, MH)	31	94	67	41	25	10	3	1	0	0	
CFLni (all shapes)	25	97	74	53	32	9	2	1	0	0	
CFLi (retrofit for GLS, HL)	29	513	166	90	0	0	0	0	0	0	
GLS (DLS & NDLS)	290	123	10	0	0	0	0	0	0	0	
HL (DLS & NDLS, LV & MV)	57	512	596	131	1	0	0	0	0	0	
LED replacing LFL (retrofit & luminaire)	0	1	89	194	518	529	490	526	624	722	
LED replacing HID (retrofit & luminaire)	0	0	152	101	150	177	205	235	267	303	
LED replacing CFLni (retrofit & luminaire)	0	0	18	26	28	31	33	35	39	44	
LED replacing DLS (retrofit & luminaire)	0	15	98	62	49	11	12	13	14	16	
LED replacing NDLS (retrofit & luminaire)	0	9	313	445	195	107	54	56	61	67	
SUBTOTAL non-LED	626	1628	1126	491	112	47	21	12	7	4	
SUBTOTAL LED	0	24	670	827	940	855	794	865	1005	1150	
TOTAL LIGHTING	626	1653	1795	1318	1053	902	815	878	1012	1154	
DP TV all types	846	1388	793	989	1141	1313	1332	1332	1332	1332	
DP Monitor	249	547	308	309	309	309	309	309	309	309	
DP Signage	0	80	350	802	601	601	601	601	601	601	
DP Electronic Displays, total	1095	2015	1450	2101	2052	2224	2243	2243	2243	2243	
SSTB	0	300	68	0	0	0	0	0	0	0	
CSTB	0	1128	1392	1404	1404	1404	1404	1404	1404	1404	
Total STB set top boxes (Complex & Simple)	0	1428	1460	1404							
Game consoles > 20 W	2	154	154	154	154	154	154	154	154	154	
Game consoles < 20 W	7	39	39	39	39	39	39	39	39	39	
Total GC Game consoles	9	193									
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	573	890	471	527	727	775	803	812	815	816	
PC Integrated Desktop	24	38	20	23	31	38	43	44	45	45	
PC Notebook	0	2460	2169	2164	2855	3600	4135	4328	4394	4416	
PC Tablet/slate	0	120	1379	1330	1445	1567	1638	1663	1671	1674	
PC Thin client	0	202	197	207	209	211	212	212	212	212	
PC Integrated Thin Client	0	16	15	16	16	16	17	17	17	17	
PC Small-scale Server	25	50	63	64	64	65	65	65	65	65	
PC Workstation	222	395	487	556	665	796	884	915	926	929	
Total PC, electricity	845	4172	4800	4886	6013	7068	7795	8056	8144	8173	
Inkjet Printer	50	83	11	12	11	11	10	10	9	9	
Inkjet MFD	62	160	122	78	74	70	67	63	60	57	
EP / Laser Printer mono	96	96	112	106	83	67	53	40	28	15	
EP / Laser Printer colour	0	93	105	128	142	148	154	157	160	163	
EP / Laser Copier mono	478	201	50	0	0	0	0	0	0	0	
EP / Laser Copier colour	0	67	120	0	0	0	0	0	0	0	
EP / Laser MFD mono	0	157	209	200	190	181	172	163	155	146	
EP / Laser MFD colour	0	994	1328	1268	1206	1147	1091	1037	983	929	
Total IE Imaging Equipment	687	1850	2057	1791	1706	1624	1546	1470	1394	1319	
<i>Products regulated only for (networked) standby</i>											
SB Radios	389	315	254	223	204	185	165	146	126	107	
SB Electric toothbrushes	45	73	80	90	101	111	122	133	143	154	
SB Audio speakers (wired)	1016	523	370	132	0	0	0	0	0	0	
SB Audio speakers (wireless)	0	6	365	970	1099	1105	1106	1107	1108	1109	
SB Small appliances	1177	1902	1951	2003	2025	2047	2070	2092	2114	2137	
SB Media boxes /sticks	0	0	76	93	94	94	94	94	94	94	
SB Media players and recorders	1	576	499	66	0	0	0	0	0	0	
SB Projectors	2	182	154	63	27	0	0	0	0	0	
SB Home phones	6	29	30	28	27	26	25	25	24	23	
SB Office phones	55	99	91	86	85	86	85	83	81	79	
SB Home NAS	0	332	524	715	900	1084	1245	1362	1417	1420	
SB Home Network Equipment	0	688	781	833	879	925	999	999	999	999	
SB Office Network Equipment	0	72	213	400	587	773	871	871	871	871	
SB Coffee makers	23	27	28	29	30	31	32	33	34	34	
Total (networked) SB (excl. double)	2714	4823	5416	5732	6057	6467	6813	6942	7011	7027	
db											
0.0 EPS ≤ 6W, low-V	3	38	30	23	16	8	4	2	1	0	
0.3 EPS 6–10 W	16	219	236	252	264	277	284	292	299	307	
0.6 EPS 10–12 W	0	181	216	233	235	236	237	239	240	242	
0.5 EPS 15–20 W	0	1	5	10	11	12	12	13	13	14	
1.0 EPS 20–30 W	1	26	29	27	26	24	21	19	17	15	
0.8 EPS 30–65 W, multiple-V	0	0	0	4	5	7	10	12	14	17	
1.0 EPS 30–65 W	0	0	0	4	10	18	18	18	18	18	
1.0 EPS 65–120 W	0	20	19	15	8	0	0	0	0	0	
0.5 EPS 65–120 W, multiple-V	0	119	43	13	13	13	13	13	13	13	
0.0 EPS 12–15 W	0	20	40	48	49	49	49	49	49	49	
EPS, total	20	624	619	630	637	645	648	656	665	674	
EPS, double counted subtracted	14	344	348	355	359	362	363	367	373	379	
TOTAL ELECTRONICS	5364	14825	15724	16462	17784	19341	20357	20676	20762	20738	

REV_WHOLE_ECO

db	REVENUE WHOLESALE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	RF Household refrigerator and freezer	195	250	273	287	327	314	344	355	364	372
	CF open vertical chilled multi deck (RVC2)	78	89	88	90	107	117	113	110	107	103
	CF open horizontal frozen island (RHF4)	9	11	11	11	11	11	11	11	12	12
	CF other supermarket display (non-BCs)	178	222	235	245	254	263	272	282	291	302
	CF Plug in one door beverage cooler	153	196	195	203	218	222	224	231	239	247
	CF Plug in horizontal ice cream freezer	63	81	80	84	87	90	92	96	99	102
	CF Spiral vending machine	102	80	66	68	71	74	77	80	83	86
	Total CF Commercial Refrigeration	583	678	675	700	748	777	790	809	830	851
	PF Storage cabinet Chilled Vertical (CV)	38	52	55	62	62	62	65	68	70	73
	PF Storage cabinet Frozen Vertical (FV)	20	27	29	32	32	33	34	35	37	38
	PF Storage cabinet Chilled Horizontal (CH)	8	11	11	13	13	13	13	14	14	15
	PF Storage cabinet Frozen Horizontal (FH)	6	8	9	10	10	10	10	11	11	11
	PF Storage cabinets All types	72	98	103	116	116	117	123	128	133	138
	PF Process Chiller AC MT S ≤ 300 kW	6	12	13	15	16	18	19	21	22	24
	PF Process Chiller AC MT L > 300 kW	6	11	13	14	15	17	18	20	21	22
	PF Process Chiller AC LT S ≤ 200 kW	5	10	11	12	13	14	15	17	18	19
	PF Process Chiller AC LT L > 200 kW	4	9	10	11	12	13	15	16	17	18
	PF Process Chiller WC MT S ≤ 300 kW	3	5	6	7	7	8	9	9	10	11
	PF Process Chiller WC MT L > 300 kW	4	8	9	10	11	12	13	14	15	16
	PF Process Chiller WC LT S ≤ 200 kW	3	5	6	7	7	8	8	9	10	10
	PF Process Chiller WC LT L > 200 kW	3	6	7	8	9	10	10	11	12	13
	PF Process Chiller All MT&LT	33	66	74	83	90	99	107	116	124	133
	PF Condensing Unit MT S 0.2-1 kW	30	25	25	29	30	32	34	37	40	43
	PF Condensing Unit MT M 1-5 kW	65	54	55	61	64	69	74	80	86	93
	PF Condensing Unit MT L 5-20 kW	66	55	57	65	67	71	76	82	89	96
	PF Condensing Unit MT XL 20-50 kW	51	42	43	50	51	54	58	63	68	73
	PF Condensing Unit LT S 0.1-0.4 kW	5	4	4	5	5	6	6	6	7	7
	PF Condensing Unit LT M 0.4-2 kW	9	8	8	9	9	10	11	11	12	13
	PF Condensing Unit LT L 2-8 kW	25	20	21	24	25	26	28	31	33	36
	PF Condensing Unit LT XL 8-20 kW	22	18	18	21	22	23	25	27	29	31
0.6	PF Condensing Unit, All MT&LT	272	226	232	265	272	291	313	337	364	392
	PF Professional Refrigeration, Total	214	255	270	305	315	332	355	378	402	427
	TOTAL FOOD PRESERVATION	992	1184	1217	1292	1390	1423	1489	1542	1596	1651
	CA Electric Hobs	69	159	171	193	203	212	221	229	236	243
	CA Electric Ovens	149	179	192	217	209	202	204	206	209	211
	CA Gas Hobs	58	51	46	45	41	37	35	33	32	30
	CA Gas Ovens	20	21	21	27	26	25	24	23	22	21
	CA Range Hoods	36	45	47	62	72	73	73	73	74	74
	TOTAL COOKING	332	454	477	543	551	549	556	564	572	579
	WM Washing Machines	107	192	197	211	195	186	177	168	166	166
	WD Washer-Dryers	10	14	14	15	15	15	15	15	15	15
	Total WM-WD household Washing	116	206	211	226	210	201	192	183	181	181
	DW Household Dishwasher	46	136	159	179	195	210	225	238	250	261
	LD condensing heat pump	0	7	43	60	68	81	77	73	70	66
	LD condensing electric heat element	7	19	18	20	17	12	11	11	10	10
	LD vented electric	12	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	20	35	66	84	88	92	88	84	80	76
	VC dom. Vacuum Cleaner	104	314	457	559	592	584	593	592	588	585
	VC nondom Vacuum Cleaner	138	148	160	169	173	181	190	198	207	215
	Total VC Vacuum Cleaner	241	462	617	728	765	783	790	795	800	
	TOTAL CLEANING	423	839	1053	1216	1258	1268	1287	1295	1306	1318
0.5	FAN Axial<300Pa [247 W flow out]	77	261	375	473	452	432	414	395	378	362
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	106	380	402	442	425	425	425	425	425	425
0.5	FAN Centr.FC [141 W flow out]	66	173	259	359	343	327	312	298	285	272
0.5	FAN Centr.BC-free [2120 W flow out]	38	95	133	149	158	154	150	146	145	148
0.5	FAN Centr.BC [2052 W flow out]	82	227	364	419	446	435	457	476	493	507
0.5	FAN Cross-flow [31 W flow out]	15	35	115	153	162	158	165	172	177	182
	Total FAN, industrial (excl. box & roof fans)	192	585	824	998	993	966	961	956	952	948
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	108	177	192	181	185	178	171	163	155	147
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	64	102	99	89	88	83	78	73	68	65
0.45	Medium (L) 3-ph 75-375 kW no VSD	50	75	66	58	59	54	48	44	42	41
0.45	Total 3-ph 0.75-375 kW no VSD	222	354	357	328	332	315	297	279	264	253
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	43	127	198	336	361	370	385	406	428	451
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	31	95	177	240	254	260	270	285	300	308
0.45	Medium (L) 3-ph 75-375 kW with VSD	24	72	128	157	171	176	182	189	191	192
0.45	Total 3-ph 0.75-375 kW with VSD	98	294	504	733	786	806	837	880	919	951
0.45	Total 3-ph 0.75-375 kW w/wo VSD	320	649	860	1061	1117	1121	1134	1159	1183	1204

REV_WHOLE_ECO

db	REVENUE WHOLESALE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Small 1 ph 0.12-0.75 kW no VSD	69	131	138	138	177	172	167	162	157	152
0.45	Small 1 ph 0.12-0.75 kW with VSD	11	90	109	115	127	134	142	150	159	168
0.45	Total Small 1-ph 0.12-0.75 kW	80	221	247	253	303	306	309	312	316	321
0.45	Small 3 ph 0.12-0.75 kW no VSD	38	65	68	71	83	81	79	76	74	72
0.45	Small 3 ph 0.12-0.75 kW with VSD	4	33	41	47	54	57	62	68	74	81
0.45	Total Small 3-ph 0.12-0.75 kW	42	98	109	118	137	138	141	144	149	153
0.45	Large 3-ph LV 375-1000 kW no VSD	23	29	26	26	29	28	26	25	24	22
0.45	Large 3-ph LV 375-1000kW with VSD	8	49	68	76	85	86	89	92	96	99
0.45	Total Large 3-ph LV 375-1000 kW	31	79	94	102	114	113	115	117	119	122
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	7	12	13	13	16	16	16	16	15	15
0.45	Explosion motors (M) 3-ph 7.5-75 kW	6	11	11	12	14	14	13	13	13	13
0.45	Explosion motors (L) 3-ph 75-375 kW	5	8	8	9	10	10	10	10	9	9
0.45	Total Expl. 0.75-375 kW (no VSD)	17	31	32	34	40	39	39	38	38	37
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	9	15	16	17	22	22	22	21	21	21
0.45	Brake motors (M) 3-ph 7.5-75 kW	8	13	14	15	18	18	18	18	17	17
0.45	Brake motors (L) 3-ph 75-375 kW	6	10	10	12	13	13	13	13	12	12
0.45	Total Brake 0.75-375 kW (no VSD)	22	38	40	44	54	53	52	51	50	49
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	2	2	2
0.45	1-phase motors >0.75 kW (no VSD)	156	274	287	294	329	331	333	335	336	337
MT Elec.	Motors LV 0.12-1000 kW	368	765	920	1050	1154	1157	1169	1187	1207	1224
WP Water pumps		268	369	399	429	461	493	525	557	590	622
Total CP Standard Air Compressors		0									
Total WE Welding Equipment		46	53	53	53	55	56	55	55	56	56
TOTAL INDUSTRY COMPONENTS		874	1772	2195	2530	2663	2672	2710	2756	2804	2850
TRAFO Distribution, kWh/a		44	71	94	102	109	117	125	134	142	150
TRAFO Industry oil		23	38	62	67	72	77	83	88	94	99
TRAFO Industry dry		11	18	26	28	30	32	34	36	39	41
TRAFO Power		178	289	313	338	363	390	418	447	475	503
TRAFO DER oil		0	2	6	9	16	26	38	51	63	75
TRAFO DER dry		0	13	28	46	76	125	184	244	303	363
TRAFO Small		5	5	5	5	5	5	5	5	5	5
TOTAL ENERGY SECTOR		261	435	533	594	670	772	888	1004	1120	1236
Tyres C1, replacement for cars		1244	1788	2172	2616	2967	3316	3316	3316	3316	3316
Tyres C1, OEM for cars		375	513	604	770	893	999	999	999	999	999
Tyres C1, total		1619	2302	2776	3387	3861	4314	4314	4314	4314	4314
Tyres C2, replacement for vans		216	281	293	365	423	475	475	475	475	475
Tyres C2, OEM for vans		46	50	63	69	88	100	100	100	100	100
Tyres C2, total		261	332	356	435	511	576	576	576	576	576
Tyres C3, replacement for trucks/busses		378	382	670	778	896	998	998	998	998	998
Tyres C3, OEM for trucks/busses		105	90	126	170	250	278	278	278	278	278
Tyres C3, total		484	472	796	948	1145	1277	1277	1277	1277	1277
Tyres, total C1+C2+C3		2363	3105	3928	4770	5516	6167	6167	6167	6167	6167
TRANSPORT SECTOR		2363	3105	3928	4770	5516	6167	6167	6167	6167	6167
GENERAL TOTAL (in m euro 2015)		13951	29475	32159	34708	37687	40480	42206	43527	44660	45638
GENERAL TOTAL (in bn euro 2015)		14	29	32	35	38	40	42	44	45	46
SUMMARY ECO											
Wholesale revenue (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	0.4	0.5	0.5	0.5	0.6	0.6	0.7	0.8	0.8	0.9	
SPACE HEATING	1.9	2.9	2.8	3.3	3.7	4.0	4.4	4.7	5.0	5.4	
SPACE COOLING	0.1	1.1	1.1	1.2	1.3	1.4	1.5	1.6	1.8	1.9	
VENTILATION	0.2	0.8	0.9	1.0	1.2	1.3	1.4	1.6	1.7	1.8	
LIGHTING	0.6	1.7	1.8	1.3	1.1	0.9	0.8	0.9	1.0	1.2	
ELECTRONICS	5.4	14.8	15.7	16.5	17.8	19.3	20.4	20.7	20.8	20.7	
FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.7	
COOKING	0.3	0.5	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.6	
CLEANING	0.4	0.8	1.1	1.2	1.3	1.3	1.3	1.3	1.3	1.3	
INDUSTRY COMPONENTS	0.9	1.8	2.2	2.5	2.7	2.7	2.7	2.8	2.8	2.8	
ENERGY SECTOR	0.3	0.4	0.5	0.6	0.7	0.8	0.9	1.0	1.1	1.2	
TRANSPORT SECTOR	2.4	3.1	3.9	4.8	5.5	6.2	6.2	6.2	6.2	6.2	
TOTAL in bn euro 2015	14	29	32	35	38	40	42	44	45	46	

REV_WHOLE_ECO

Wholesale revenue ECO-BAU (bn euro 2015)	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	0.1	0.3	0.5	0.6	0.7	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	0.2	-0.6	-0.4	-0.2	-0.1	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	0.0	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	0.0
INDUSTRY COMPONENTS	0.0	0.0	0.3	0.4	0.5	0.4	0.4	0.3	0.3	0.2
ENERGY SECTOR	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2
TRANSPORT SECTOR	0.0	0.1	0.5	0.8	1.1	1.1	1.1	1.1	1.1	1.1
TOTAL in bn euro 2015	0.0	0.4	1.5	1.6	2.3	2.5	2.7	2.9	3.1	3.2

Revenues for VSDs only (without motor, m euros)

VSD - Very Small 0.12 - 0.75 kW 1-phase	9	75	91	95	101	107	114	122	129	138
VSD - Very Small 0.12 - 0.75 kW 3-phase	3	25	30	34	39	41	44	49	54	60
VSD - Small 0.75 - 7.5 kW 3-phase	31	91	137	223	237	242	253	270	288	307
VSD - Medium 7.5 - 75kW 3-phase	22	65	118	156	165	168	176	188	200	208
VSD - Large 75 - 375kW 3-phase	12	37	62	74	78	80	85	90	93	95
VSD - Very Large 375 - 1,000kW 3-phase	6	32	43	48	53	53	55	58	61	64
Total revenues, VSDs only (ECO)	83	325	481	632	671	691	727	776	825	871

REV_INST_BAU

db	REVENUE INSTALL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	15	23	25	28	28	28	28	28	28	28	28
EIWH Electric Instant. ≥ 12 kW (primary)	44	38	38	39	43	48	52	56	60	64	
EIWHS Electric Instant. Shower (secondary)	63	83	82	80	85	90	95	100	105	110	
ESWH Electric Storage ≤ 30 L (secondary)	99	112	113	118	126	134	143	151	159	167	
ESWH Electric Storage > 30 L (primary)	564	670	616	645	690	734	778	823	867	912	
GIWH Gas Instant. < 13 L/min (secondary)	175	122	100	102	100	99	97	96	95	93	
GIWH Gas Instant. ≥ 13 L/min (primary)	51	48	41	41	41	40	40	39	39	38	
GSWH Gas Storage, Condensing	0	2	3	4	4	5	6	6	7	8	
GSWH Gas Storage, Non-condensing	79	47	34	21	19	17	14	12	9	7	
Dedicated WH Heat Pump	0	13	37	53	81	109	137	165	192	220	
Dedicated WH Solar (3.5 m2)	126	451	456	372	385	399	413	427	441	455	
WH dedicated Water Heater	1216	1608	1545	1504	1603	1703	1803	1902	2002	2102	
CHB Gas Combi Instant. WH	298	501	520	557	564	569	570	569	565	555	
CHB Gas + Cyl. WH	186	254	263	282	285	288	289	288	286	281	
CHB Jet Burner Gas + Cyl. WH	91	40	28	28	28	29	30	31	31	32	
CHB Jet Burner Oil + Cyl. WH	692	278	187	183	188	193	198	204	208	213	
CHB Electric (Joule) + Cyl. WH	6	10	9	10	9	9	8	7	6	6	
CHB Hybrid Gas/Electric WH	1	2	3	5	8	13	21	35	57	93	
CHB Electric HP + Cyl. WH	18	257	291	355	410	473	545	627	721	829	
CHB Gas HP + Cyl. WH	1	3	4	5	8	11	16	23	33	46	
CHB Gas mCHP + Cyl. WH	3	6	8	12	18	25	36	51	73	104	
CHB Solar Combi (16 m2)	18	32	32	34	35	36	36	37	38	38	
CHC Central Heating combi, water heating	1314	1381	1344	1472	1553	1646	1750	1873	2018	2199	
TOTAL WATER HEATING	2530	2989	2889	2975	3156	3349	3552	3775	4021	4300	
CHB Gas non-condensing	2042	1098	1017	995	918	844	771	700	632	564	
CHB Gas condensing	170	3730	3103	3308	3514	3701	3854	3978	4065	4102	
CHB Gas Jet burner non-condensing	593	191	86	76	70	65	60	56	52	48	
CHB Gas Jet burner condensing	0	75	104	116	128	140	152	163	173	183	
CHB Oil Jet burner non-condensing	4165	1283	570	501	466	432	402	373	345	319	
CHB Oil Jet burner condensing	0	505	679	719	797	872	947	1020	1086	1149	
CHB Electric Joule-effect	27	45	43	48	44	41	38	34	31	27	
CHB Hybrid (gas-electric)	3	10	16	28	46	76	126	208	344	568	
CHB Electric Heat Pump	102	1419	1607	1977	2308	2692	3131	3638	4224	4901	
CHB Gas Heat Pump	4	14	20	30	44	63	91	131	188	271	
CHB micro CHP	19	32	44	68	98	142	204	294	424	609	
CHB Solar combi (16 m2)	96	166	166	180	186	192	197	202	208	213	
CHB Central Heating boiler < 400 kW, space heating	7221	8568	7456	8045	8619	9261	9973	10799	11771	12955	
SFB Wood Manual [18 kW]	308	183	121	71	42	39	36	34	31	29	
SFB Wood Direct Draft [20 kW]	7	299	306	323	300	374	438	513	601	718	
SFB Coal [25 kW]	62	286	63	81	88	79	72	65	59	53	
SFB Pellets [25 kW]	0	85	130	129	129	142	157	173	191	211	
SFB Wood chips [160 kW]	0	19	18	22	25	28	31	34	38	41	
Total Solid Fuel Boiler	376	872	639	624	583	662	734	819	919	1052	
CHAE-S (≤ 400 kW)	88	388	427	474	524	573	623	672	719	763	
CHAE-L (> 400 kW)	20	68	70	73	76	79	82	85	88	91	
CHWE-S (≤ 400 kW)	5	23	25	28	30	33	36	39	42	44	
CHWE-M (> 400 kW; ≤ 1500 kW)	6	21	22	23	24	24	25	26	27	28	
CHWE-L (> 1500 kW)	2	8	9	9	10	10	10	10	11	11	
CHF	0	1	2	2	3	3	4	4	4	5	
HT PCH-AE-S	45	75	80	85	89	93	96	100	104	107	
HT PCH-AE-L	36	60	64	68	71	74	77	80	83	86	
HT PCH-WE-S	10	16	18	19	19	20	21	22	23	23	
HT PCH-WE-M	25	42	45	48	50	52	54	56	59	61	
HT PCH-WE-L	3	5	5	5	6	6	6	6	7	7	
AC rooftop	82	277	281	215	125	33	33	33	33	33	
AC splits	82	312	328	317	306	294	283	272	261	250	
AC VRF	0	1000	1309	1914	2420	2922	3398	3837	4205	4471	
ACF	0	1	2	2	3	3	4	4	5	5	
SubTotal AHC Air Cooling	404	2298	2686	3282	3755	4220	4754	5248	5669	5985	
AC rooftop (rev)	50	170	164	132	74	19	0	0	0	0	
AC splits (rev)	55	200	210	204	197	189	182	175	168	161	
AC VRF (rev)	0	854	1063	1633	1985	2280	2523	2711	2827	2859	
ACF (rev)	0	3	4	5	6	7	8	9	10	11	
AHF	269	175	164	154	146	137	129	121	113	105	
AHE	0	0	0	0	0	0	0	0	0	0	
SubTotal AHC Air Heating (rev double)	375	1403	1605	2129	2408	2632	2843	3016	3118	3136	
Total AHC Air Heating & Cooling	673	2473	2851	3437	3902	4358	4884	5370	5783	6092	

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db	REVENUE INSTALL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	329	472	467	466	463	460	459	459	459	459	459
LH closed fireplace/inset [8 kW]	201	535	587	642	650	658	660	660	660	660	660
LH wood stove [8 kW]	155	180	196	213	216	219	219	219	219	219	219
LH coal stove [8 kW]	63	52	47	43	32	22	20	20	20	20	20
LH cooker [10 kW]	114	225	267	310	318	326	327	327	327	327	327
LH SHR stove [8 kW]	981	1348	1647	1948	2178	2408	2455	2455	2455	2455	2455
LH pellet stove [8 kW]	0	103	128	153	164	175	177	177	177	177	177
LH Solid fuel sum	1842	2915	3340	3776	4022	4268	4318	4318	4318	4318	4318
LH Electric portable	0	0	0	0	0	0	0	0	0	0	0
LH Electric fixed > 250W	154	179	139	129	129	129	129	129	129	129	129
LH Electric fixed ≤ 250W	38	45	35	32	32	32	32	32	32	32	32
LH Electric storage	15	18	17	16	16	16	16	16	16	16	16
LH Electric underfloor	129	158	166	165	164	164	164	164	164	164	164
LH Electric visibly glowing > 1.2 kW	3	4	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	1
LH Electric Towel Heaters	28	47	47	47	47	47	47	47	47	47	47
LH Electric sum	369	452	409	395	393	393	393	393	393	393	393
LH Gas luminous (commercial)	1	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	1
LH Gas open front	2	2	2	2	2	1	1	1	1	1	1
LH Gas closed front	11	6	5	4	3	3	3	3	3	3	3
LH Gas balanced flue	24	10	7	6	5	4	4	4	4	4	4
LH Gas flueless	0	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	38	20	15	13	12	10	10	10	10	10	10
LH Liquid tube (commercial < 120 kW)	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
LH Liquid closed front	1	1	0	0	0	0	0	0	0	0	0
LH Liquid balanced flue	2	1	1	1	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	4	2	1	1							
LH Local Space Heaters total	2253	3388	3765	4185	4428	4672	4722	4722	4722	4722	4722
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	153	1486	1108	1228	1358	1486	1628	1821	2086	2415	
RAC fixed 6-12 kW, cooling	32	384	379	373	388	400	407	408	451	500	
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, cooling mode	184	1870	1487	1601	1747	1886	2036	2228	2538	2914	
RAC fixed < 6 kW, reversible, heating	13	567	532	737	951	1189	1466	1821	2086	2415	
RAC fixed 6-12 kW, reversible, heating	3	147	182	224	272	320	366	408	451	500	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	16	714	714	961	1223	1509	1832	2228	2538	2914	
RAC Room Air Conditioner	200	2583	2201	2562	2970	3395	3867	4457	5075	5828	
1 CIRC Integrated circulators	466	762	847	886	956	1011	1011	1011	1011	1011	
1 CIRC Large standalone circulators	29	54	56	56	53	48	48	48	48	47	
1 CIRC Small standalone circulators	287	434	429	404	367	324	322	322	322	322	
1 CIRC Circulator pumps <2.5 kW	782	1251	1333	1346	1375	1382	1381	1381	1381	1380	
TOTAL SPACE HEATING (incl. rev.AC)	10241	14945	14180	15944	17261	18736	20104	21584	23067	24779	
TOTAL SPACE COOLING	589	4167	4174	4883	5502	6106	6789	7476	8207	8899	
R-UVU ≤ 100 m3/h for Extract Spaces	2	5	5	6	6	6	7	7	7	7	
R-UVU ≤ 100 m3/h for Habitable Spaces	0	0	0	0	0	1	1	1	1	1	
R-BVU ≤ 100 m3/h for Habitable Spaces	1	11	18	40	203	223	243	325	387	419	
R-UVU 100-250 m3/h	24	74	76	87	86	92	101	109	112	119	
R-BVU 100-250 m3/h	5	29	32	50	273	310	337	378	415	451	
R-UVU 250-1000 m3/h	48	145	148	170	166	180	196	213	218	232	
R-BVU 250-1000 m3/h	9	57	63	98	535	607	660	736	807	877	
R-UVU > 1000 m3/h	12	10	8	8	6	6	6	5	5	4	
R-BVU 1000-2500 m3/h	0	35	33	37	39	44	47	50	54	56	
RVU, Total residential (install.labour only)	101	365	384	496	1314	1469	1597	1825	2004	2168	
NR-UVU 250-1000 m3/h	51	48	42	42	36	37	35	32	29	27	
NR-BVU 250-1000 m3/h	0	126	116	129	132	151	158	165	173	180	
NR-UVU > 1000 m3/h	110	92	77	73	58	58	54	49	44	39	
NR-BVU 1000-2500 m3/h	0	325	307	345	361	410	435	461	494	518	
NR-AHU-S 2500-5500 m3/h	126	2333	2814	2739	2330	2573	2639	2680	2738	2808	
NR-AHU-M 5500-14500 m3/h	1364	3891	4318	4176	3554	3881	3948	3989	4057	4128	
NR-AHU-L > 14500 m3/h	352	1030	1143	1103	931	1017	1032	1044	1059	1075	
NRVU, Total non-residential (install.labour only)	2003	7844	8818	8606	7401	8126	8300	8420	8595	8775	
VU Ventilation Units, res+nres (install.labour only)	2103	8209	9202	9102	8715	9595	9897	10246	10599	10942	
TOTAL VENTILATION	2103	8209	9202	9102	8715	9595	9897	10246	10599	10942	

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db	REVENUE INSTALL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1325	1994	1803	1373	935	694	561	427	331	258
	HID (HPM, HPS, MH)	129	337	291	199	153	85	42	21	11	6
	CFLni (all shapes)	83	325	307	290	220	113	48	19	8	3
	CFLi (retrofit for GLS, HL)	17	221	147	180	113	84	48	34	21	14
	GLS (DLS & NDLS)	512	426	355	246	143	84	49	29	17	10
	HL (DLS & NDLS, LV & MV)	60	270	322	362	243	135	76	44	25	15
	LED replacing LFL (retrofit & luminaire)	0	0	23	190	509	884	970	1126	1357	1604
	LED replacing HID (retrofit & luminaire)	0	0	4	36	78	125	148	176	203	231
	LED replacing CFLni (retrofit & luminaire)	0	0	6	46	132	228	260	308	356	380
	LED replacing DLS (retrofit & luminaire)	0	0	4	36	72	64	53	48	47	49
	LED replacing NDLS (retrofit & luminaire)	0	0	5	167	236	259	247	225	215	220
	SUBTOTAL non-LED	2127	3571	3226	2650	1808	1195	825	573	413	306
	SUBTOTAL LED	0	0	42	475	1028	1561	1678	1883	2178	2484
	TOTAL LIGHTING	2127	3571	3268	3125	2836	2756	2502	2456	2591	2790
	TOTAL ELECTRONICS	0									
	RF Household refrigerator and freezer	0									
	CF open vertical chilled multi deck (RVC2)	26	30	29	30	31	31	32	32	33	33
	CF open horizontal frozen island (RHF4)	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	86	106	113	117	122	126	131	135	140	145
	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	114	140	146	151	156	161	166	171	176	182
	PF Storage cabinets All types	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT<	0	0	0	0	0	0	0	0	0	0
0.6	PF Condensing Unit, All MT<	0	0	0	0	0	0	0	0	0	0
	PF Professional Refrigeration, Total	0	0	0	0	0	0	0	0	0	0
	TOTAL FOOD PRESERVATION	114	140	146	151	156	161	166	171	176	182
	TOTAL COOKING	0									
	Total WM-WD household Washing	0									
	DW Household Dishwasher	0									
	LD condensing heat pump	0	2	2	4	6	8	10	12	14	16
	LD condensing electric heat element	12	33	49	64	61	56	50	46	43	40
	LD vented electric	90	72	81	83	82	81	81	81	81	81
	LD vented gas	1	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	103	108	132	151	149	144	141	139	138	138
	TOTAL CLEANING	103	108	132	151	149	144	141	139	138	138
0.5	FAN Axial<300Pa [247 W flow out]	37	126	145	165	165	165	165	165	165	165
0.5	FAN Axial>300Pa [489 W fluid-dyn out]	38	138	146	154	154	154	154	154	154	154
0.5	FAN Centr.FC [141 W flow out]	19	50	58	66	66	66	66	66	66	66
0.5	FAN Centr.BC-free [2120 W flow out]	16	41	47	53	59	60	61	62	63	64
0.5	FAN Centr.BC [2052 W flow out]	36	99	113	128	143	146	160	174	189	203
0.5	FAN Cross-flow [31 W flow out]	5	13	15	16	18	19	20	22	24	26
	Total FAN, industrial (excl. box & roof fans)	76	233	262	291	302	304	313	322	330	339
0.45	Medium (S) 3-ph 0.75-7.5 kW no VSD	125	203	207	204	196	186	175	162	151	138
0.45	Medium (M) 3-ph 7.5-75 kW no VSD	37	59	59	58	55	51	47	42	37	33
0.45	Medium (L) 3-ph 75-375 kW no VSD	9	13	13	13	11	10	8	6	6	6
0.45	Total 3ph 0.75-375 kW no VSD	172	275	279	275	262	247	231	211	194	178
0.45	Medium (S) 3-ph 0.75-7.5 kW with VSD	79	232	279	323	366	417	486	567	665	781
0.45	Medium (M) 3-ph 7.5-75 kW with VSD	51	151	181	210	238	272	318	371	433	483
0.45	Medium (L) 3-ph 75-375 kW with VSD	27	79	95	111	126	144	168	195	200	204
0.45	Total 3-ph 0.75-375 kW with VSD	156	462	555	644	730	833	972	1133	1297	1467
0.45	Total 3-ph 0.75-375 kW w/wo VSD	328	737	835	919	992	1080	1202	1344	1491	1645
0.45	Small 1 ph 0.12-0.75 kW no VSD	75	143	150	150	150	149	148	146	145	143
0.45	Small 1 ph 0.12-0.75 kW with VSD	22	179	217	229	243	258	274	291	309	328
0.45	Total Small 1-ph 0.12-0.75 kW	96	322	367	379	392	406	422	437	454	472
0.45	Small 3 ph 0.12-0.75 kW no VSD	47	80	84	85	84	84	83	81	80	79
0.45	Small 3 ph 0.12-0.75 kW with VSD	8	64	79	87	95	105	115	127	139	153
0.45	Total Small 3-ph 0.12-0.75 kW	55	144	164	172	180	188	198	208	220	232
0.45	Large 3-ph LV 375-1000 kW no VSD	6	8	7	7	7	7	6	6	6	6
0.45	Large 3-ph LV 375-1000kW with VSD	12	69	96	106	111	117	122	127	132	138
0.45	Total Large 3-ph LV 375-1000 kW	18	77	103	112	118	123	128	133	138	143
0.45	Explosion motors (S) 3-ph 0.75-7.5 kW	8	14	15	15	15	15	15	15	15	15
0.45	Explosion motors (M) 3-ph 7.5-75 kW	4	6	7	7	7	7	7	7	7	7
0.45	Explosion motors (L) 3-ph 75-375 kW	1	1	2	2	2	2	2	2	2	2
0.45	Total Expl. 0.75-375 kW (no VSD)	12	21	23	24						

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db	REVENUE INSTALL BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
0.45	Brake motors (S) 3-ph 0.75-7.5 kW	10	17	18	19	19	19	18	18	19	19
0.45	Brake motors (M) 3-ph 7.5-75 kW	4	8	8	8	8	8	8	8	8	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)	15	27	28	29	29	29	29	29	29	30
0.45	8-pole motors (S) 3-ph 0.75-7.5 kW	0	0	0	0	0	0	0	0	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								
0.45	1-phase motors >0.75 kW (no VSD)	161	282	296	302	302	302	301	301	307	314
MT Elec. Motors LV 0.12-1000 kW		377	886	998	1065	1120	1184	1267	1362	1465	1573
WP Water pumps		534	735	795	855	919	983	1048	1112	1176	1240
CP Fixed Speed 5-1280 l/s		16	14	13	14	14	15	16	16	17	18
CP Variable speed 5-1280 l/s		0	6	9	10	10	11	11	11	12	12
CP Pistons 2-64 l/s		5	5	6	6	7	7	8	8	8	9
Total CP Standard Air Compressors		20	25	28	30	31	33	34	36	37	39
Total WE Welding Equipment		153	173	175	176	178	180	181	183	184	185
TOTAL INDUSTRY COMPONENTS		1160	2053	2258	2417	2551	2685	2843	3014	3192	3377
TOTAL ENERGY SECTOR		0									
TRANSPORT SECTOR		0									
GENERAL TOTAL (in m euro 2015)		18967	36182	36249	38749	40327	43532	45994	48860	51991	55407
GENERAL TOTAL (in bn euro 2015)		19	36	36	39	40	44	46	49	52	55
SUMMARY BAU											
INSTALL excl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	2.5	3.0	2.9	3.0	3.2	3.3	3.6	3.8	4.0	4.3	
SPACE HEATING	10.2	14.9	14.2	15.9	17.3	18.7	20.1	21.6	23.1	24.8	
SPACE COOLING	0.6	4.2	4.2	4.9	5.5	6.1	6.8	7.5	8.2	8.9	
VENTILATION	2.1	8.2	9.2	9.1	8.7	9.6	9.9	10.2	10.6	10.9	
LIGHTING	2.1	3.6	3.3	3.1	2.8	2.8	2.5	2.5	2.6	2.8	
ELECTRONICS	-	-	-	-	-	-	-	-	-	-	
FOOD PRESERVATION	0.1	0.1	0.1	0.2							
COOKING	-	-	-	-	-	-	-	-	-	-	
CLEANING	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	
INDUSTRY COMPONENTS	1.2	2.1	2.3	2.4	2.6	2.7	2.8	3.0	3.2	3.4	
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-	
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-	
TOTAL in bn euro 2015	19	36	36	39	40	44	46	49	52	55	
<u>Revenues for VSDs only (without motor)</u>											
VSD - Very Small 0.12 - 0.75 kW 1-phase	21	164	197	207	219	233	248	264	281	299	
VSD - Very Small 0.12 - 0.75 kW 3-phase	7	54	66	72	79	87	96	107	118	130	
VSD - Small 0.75 - 7.5 kW 3-phase	67	196	235	271	306	349	410	481	565	663	
VSD - Medium 7.5 - 75kW 3-phase	48	140	168	194	219	250	293	344	404	451	
VSD - Large 75 - 375kW 3-phase	27	79	95	110	124	141	166	195	202	207	
VSD - Very Large 375 - 1,000kW 3-phase	11	66	90	99	104	109	115	121	127	133	
Total revenues, VSDs only (BAU)	180	699	852	953	1052	1170	1329	1512	1696	1884	

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db REVENUE INSTALL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	15	23	25	28	28	28	28	28	28	28
EIWH Electric Instant. ≥ 12 kW (primary)	44	38	38	39	43	48	52	56	60	64
EIWS Electric Instant. Shower (secondary)	63	83	82	80	85	90	95	100	105	110
ESWH Electric Storage ≤ 30 L (secondary)	99	112	113	118	126	134	143	151	159	167
ESWH Electric Storage > 30 L (primary)	564	670	616	645	690	734	778	823	867	912
GIWH Gas Instant. < 13 L/min (secondary)	175	122	100	102	100	99	97	96	95	93
GIWH Gas Instant. ≥ 13 L/min (primary)	51	48	41	41	41	40	40	39	39	38
GSWH Gas Storage, Condensing	0	2	3	4	4	5	6	6	7	8
GSWH Gas Storage, Non-condensing	79	47	34	21	19	17	14	12	9	7
Dedicated WH Heat Pump	0	13	37	53	81	109	137	165	192	220
Dedicated WH Solar (3.5 m ²)	126	451	456	372	385	399	413	427	441	455
WH dedicated Water Heater	1216	1608	1545	1504	1603	1703	1803	1902	2002	2102
CHB Gas Combi Instant. WH	298	501	519	534	499	464	426	388	344	301
CHB Gas + Cyl. WH	186	254	224	246	230	213	196	179	158	138
CHB Jet Burner Gas + Cyl. WH	91	40	28	28	28	29	30	31	31	32
CHB Jet Burner Oil + Cyl. WH	692	278	187	183	188	193	198	204	208	213
CHB Electric (Joule) + Cyl. WH	6	10	9	10	9	9	8	7	6	6
CHB Hybrid Gas/Electric WH	1	2	5	13	45	77	117	157	212	268
CHB Electric HP + Cyl. WH	18	257	312	532	926	1320	1713	2105	2523	2940
CHB Gas HP + Cyl. WH	1	3	7	15	28	40	54	68	83	99
CHB Gas mCHP + Cyl. WH	3	6	16	30	46	62	78	93	109	124
CHB Solar Combi (16 m ²)	18	32	38	36	37	38	39	40	41	42
CHC Central Heating combi, water heating	1314	1381	1344	1626	2036	2446	2859	3271	3717	4162
TOTAL WATER HEATING	2530	2989	2889	3130	3639	4149	4661	5174	5719	6264
CHB Gas non-condensing	2042	1098	826	253	155	57	45	33	26	19
CHB Gas condensing	170	3730	3397	4169	4011	3852	3547	3242	2881	2519
CHB Gas Jet burner non-condensing	593	191	65	22	18	14	12	9	7	6
CHB Gas Jet burner condensing	0	75	128	180	190	200	209	219	226	233
CHB Oil Jet burner non-condensing	4165	1283	430	141	116	91	74	57	46	36
CHB Oil Jet burner condensing	0	505	844	1145	1211	1276	1335	1394	1438	1483
CHB Electric Joule-effect	27	45	43	48	44	41	38	34	31	27
CHB Hybrid (gas-electric)	3	10	31	73	258	444	673	902	1219	1537
CHB Electric Heat Pump	102	1419	1496	2789	4854	6919	8975	11031	13220	15410
CHB Gas Heat Pump	4	14	38	84	153	221	298	374	459	543
CHB micro CHP	19	32	86	165	254	343	428	514	600	685
CHB Solar combi (16 m ²)	96	166	196	187	192	197	203	208	213	218
CHB Central Heating boiler < 400 kW, space heating	7221	8568	7582	9255	11455	13655	15836	18016	20367	22717
SFB Wood Manual [18 kW]	308	183	162	126	72	63	55	48	42	37
SFB Wood Direct Draft [20 kW]	7	299	307	328	357	418	489	573	671	785
SFB Coal [25 kW]	62	286	63	81	88	79	72	65	59	53
SFB Pellets [25 kW]	0	85	130	129	134	142	157	173	191	211
SFB Wood chips [160 kW]	0	19	19	23	26	28	31	34	38	41
Total Solid Fuel Boiler	376	872	682	686	676	730	803	893	1000	1127
CHAE-S (< 400 kW)	88	388	427	474	524	573	623	672	719	763
CHAE-L (> 400 kW)	20	68	70	73	76	79	82	85	88	91
CHWE-S (≤ 400 kW)	5	23	25	28	30	33	36	39	42	44
CHWE-M (> 400 kW; ≤ 1500 kW)	6	21	22	23	24	24	25	26	27	28
CHWE-L (> 1500 kW)	2	8	9	9	9	10	10	10	11	11
CHF	0	1	2	3	3	3	4	4	4	5
HT PCH-AE-S	45	75	80	85	89	93	96	100	104	107
HT PCH-AE-L	36	60	64	68	71	74	77	80	83	86
HT PCH-WE-S	10	16	18	19	19	20	21	22	23	23
HT PCH-WE-M	25	42	45	48	50	52	54	56	59	61
HT PCH-WE-L	3	5	5	5	6	6	6	6	7	7
AC rooftop	82	277	281	215	125	33	33	33	33	33
AC splits	82	312	328	317	306	294	283	272	261	250
AC VRV	0	1000	1309	1914	2420	2922	3398	3837	4205	4471
ACF	0	1	2	3	3	4	4	4	5	5
SubTotal AHC Air Cooling	404	2298	2686	3283	3756	4221	4754	5248	5669	5985
AC rooftop (rev)	50	170	164	132	74	19	0	0	0	0
AC splits (rev)	55	200	210	204	197	189	182	175	168	161
AC VRV (rev)	0	854	1063	1633	1985	2280	2523	2711	2827	2859
ACF (rev)	0	3	4	5	6	7	8	9	10	11
AHF	269	175	164	168	161	149	134	121	113	105
AHE	0	0	0	0	0	0	0	0	0	0
SubTotal AHC Air Heating (rev double)	375	1403	1605	2143	2423	2644	2848	3016	3118	3136
Total AHC Air Heating & Cooling	673	2473	2851	3451	3917	4370	4889	5370	5783	6092

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db	REVENUE INSTALL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	329	472	467	574	629	603	580	559	539	520	
LH closed fireplace/inset [8 kW]	201	535	587	763	818	799	772	744	717	691	
LH wood stove [8 kW]	155	180	196	256	276	269	259	249	239	230	
LH coal stove [8 kW]	63	52	47	51	41	26	23	22	21	21	
LH cooker [10 kW]	114	225	267	340	362	356	343	329	327	327	
LH SHR stove [8 kW]	981	1348	1647	1959	2183	2408	2455	2455	2455	2455	
LH pellet stove [8 kW]	0	103	128	153	164	175	177	177	177	177	
LH Solid fuel sum	1842	2915	3340	4098	4474	4635	4609	4535	4476	4420	
LH Electric portable	0	0	0	0	0	0	0	0	0	0	
LH Electric fixed > 250W	154	179	140	129	129	129	129	129	129	129	
LH Electric fixed ≤ 250W	38	45	35	32	32	32	32	32	32	32	
LH Electric storage	15	18	19	21	20	19	19	18	17	16	
LH Electric underfloor	129	158	168	170	165	164	164	164	164	164	
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	28	47	47	47	47	47	47	47	47	47	
LH Electric sum	369	452	415	404	399	397	396	395	394	394	
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	24	10	7	6	5	4	4	4	4	4	
LH Gas flueless	0	0	0	0	0	0	0	0	0	0	
LH Gaseous fuel sum	38	20	16	14	12	10	10	10	10	10	
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	2	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	1								
LH Local Space Heaters total	2253	3388	3772	4517	4886	5043	5016	4942	4881	4825	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	153	1750	1381	1504	1589	1620	1653	1821	2086	2415	
RAC fixed 6-12 kW, cooling	32	514	552	517	516	511	502	494	507	520	
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, cooling mode	184	2264	1933	2021	2106	2131	2155	2315	2593	2934	
RAC fixed < 6 kW, reversible, heating	13	668	663	902	1113	1296	1487	1821	2086	2415	
RAC fixed 6-12 kW, reversible, heating	3	196	265	310	361	409	452	494	507	520	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	16	864	928	1213	1474	1705	1939	2315	2593	2934	
RAC Room Air Conditioner	200	3128	2861	3234	3580	3836	4094	4629	5186	5869	
1 CIRC Integrated circulators	466	762	899	946	975	1011	1011	1011	1011	1011	
1 CIRC Large standalone circulators	29	54	91	85	76	65	62	59	56	53	
1 CIRC Small standalone circulators	287	434	515	480	428	373	355	337	322	322	
1 CIRC Circulator pumps <2.5 kW	782	1251	1505	1511	1478	1448	1427	1407	1388	1386	
TOTAL SPACE HEATING (incl. rev.AC)	10241	15095	14569	17814	20914	23777	26442	29181	31958	34740	
TOTAL SPACE COOLING	589	4562	4619	5304	5862	6352	6909	7563	8262	8920	
R-UVU ≤ 100 m3/h for Extract Spaces	2	5	5	7	7	7	7	8	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	11	18	42	214	235	256	339	402	435	
R-UVU 100-250 m3/h	24	74	77	88	86	93	102	110	113	120	
R-BVU 100-250 m3/h	5	29	32	50	274	311	338	379	417	453	
R-UVU 250-1000 m3/h	48	145	148	170	166	180	196	213	218	232	
R-BVU 250-1000 m3/h	9	57	63	98	535	607	660	737	807	878	
R-UVU > 1000 m3/h	12	10	8	8	6	6	6	5	5	4	
R-BVU 1000-2500 m3/h	0	35	33	37	39	44	47	50	54	56	
RVU, Total residential (install.labour only)	101	365	385	500	1328	1485	1614	1843	2023	2189	
NR-UVU 250-1000 m3/h	51	48	42	42	36	37	35	32	29	27	
NR-BVU 250-1000 m3/h	0	126	116	129	132	151	158	165	173	180	
NR-UVU > 1000 m3/h	110	92	77	73	58	58	54	49	44	39	
NR-BVU 1000-2500 m3/h	0	325	307	345	361	410	435	461	494	519	
NR-AHU-S 2500-5500 m3/h	126	2333	2814	2739	2330	2573	2639	2680	2738	2808	
NR-AHU-M 5500-14500 m3/h	1364	3891	4318	4176	3554	3881	3948	3989	4057	4128	
NR-AHU-L > 14500 m3/h	352	1030	1143	1103	931	1017	1032	1044	1059	1075	
NRVU, Total non-residential (install.labour only)	2003	7844	8818	8606	7401	8126	8300	8420	8595	8775	
VU Ventilation Units, res+nres (install.labour only)	2103	8209	9202	9106	8729	9611	9914	10264	10619	10964	
TOTAL VENTILATION	2103	8209	9202	9106	8729	9611	9914	10264	10619	10964	

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db	REVENUE INSTALL ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	LFL (T12,T8h,T8t,T5,other)	1325	1994	1440	1216	395	202	106	63	38	24
	HID (HPM, HPS, MH)	129	337	233	141	87	34	10	3	1	0
	CFLni (all shapes)	83	325	266	183	95	27	4	1	0	0
	CFLi (retrofit for GLS, HL)	17	303	103	57	0	0	0	0	0	0
	GLS (DLS & NDLS)	512	217	14	0	0	0	0	0	0	0
	HL (DLS & NDLS, LV & MV)	60	299	324	112	1	0	0	0	0	0
	LED replacing LFL (retrofit & luminaire)	0	0	59	263	1022	1189	1108	1216	1480	1714
	LED replacing HID (retrofit & luminaire)	0	0	50	53	108	140	159	182	207	234
	LED replacing CFLni (retrofit & luminaire)	0	0	48	134	175	254	276	310	360	378
	LED replacing DLS (retrofit & luminaire)	0	1	41	83	77	28	32	36	41	46
	LED replacing NDLS (retrofit & luminaire)	0	0	66	460	295	221	136	149	169	191
	SUBTOTAL non-LED	2127	3473	2380	1708	579	263	120	68	39	24
	SUBTOTAL LED	0	2	265	992	1677	1832	1712	1893	2256	2564
	TOTAL LIGHTING	2127	3475	2645	2700	2256	2095	1832	1961	2296	2588
	TOTAL ELECTRONICS	0									
	RF Household refrigerator and freezer	0									
	CF open vertical chilled multi deck (RVC2)	26	30	29	30	36	39	38	37	36	34
	CF open horizontal frozen island (RHF4)	3	4	4	4	4	4	4	4	4	4
	CF other supermarket display (non-BCs)	86	106	113	117	122	126	131	135	140	145
	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	114	140	146	151	161	169	172	176	179	183
	PF Storage cabinets All types	0	0	0	0	0	0	0	0	0	0
	PF Process Chiller All MT<	0	0	0	0	0	0	0	0	0	0
0.6	PF Condensing Unit, All MT&LT	0									
	PF Professional Refrigeration, Total	0									
	TOTAL FOOD PRESERVATION	114	140	146	151	161	169	172	176	179	183
	TOTAL COOKING	0									
	Total WM-WD household Washing	0									
	DW Household Dishwasher	0									
	LD condensing heat pump	0	7	41	57	65	77	73	69	66	63
	LD condensing electric heat element	12	32	30	33	29	20	19	18	17	17
	LD vented electric	90	63	37	31	20	0	0	0	0	0
	LD vented gas	1	1	0	0	0	0	0	0	0	0
	Total LD household Laundry Dryer	103	103	109	122	114	97	92	88	83	80
	TOTAL CLEANING	103	103	109	122	114	97	92	88	83	80
	0.5 FAN Axial<300Pa [247 W flow out]	37	126	181	229	219	209	200	191	183	175
	0.5 FAN Axial>300Pa [489 W fluid-dyn out]	38	138	146	160	154	154	154	154	154	154
	0.5 FAN Centr.FC [141 W flow out]	19	50	75	104	99	95	91	86	82	79
	0.5 FAN Centr.BC-free [2120 W flow out]	16	41	58	65	69	67	65	63	63	64
	0.5 FAN Centr.BC [2052 W flow out]	36	99	158	182	194	189	199	207	214	221
	0.5 FAN Cross-flow [31 W flow out]	5	13	42	55	59	57	60	62	64	66
	Total FAN, industrial (excl. box & roof fans)	76	233	330	398	397	385	384	382	380	379
	0.45 Medium (S) 3-ph 0.75-7.5 kW no VSD	125	205	223	209	214	207	198	189	179	170
	0.45 Medium (M) 3-ph 7.5-75 kW no VSD	37	59	57	52	51	48	45	42	39	38
	0.45 Medium (L) 3-ph 75-375 kW no VSD	9	14	12	11	11	10	9	8	8	7
	0.45 Total 3ph 0.75-375 kW no VSD	172	278	292	272	276	265	252	239	226	215
	0.45 Medium (S) 3-ph 0.75-7.5 kW with VSD	79	235	365	620	666	683	710	748	789	832
	0.45 Medium (M) 3-ph 7.5-75 kW with VSD	51	153	288	389	412	421	438	461	487	499
	0.45 Medium (L) 3-ph 75-375 kW with VSD	27	81	144	176	191	196	204	212	214	215
	0.45 Total 3-ph 0.75-375 kW with VSD	156	469	796	1185	1269	1300	1351	1421	1489	1546
	0.45 Total 3-ph 0.75-375 kW w/wo VSD	328	748	1088	1457	1545	1565	1603	1660	1716	1761
	0.45 Small 1 ph 0.12-0.75 kW no VSD	75	143	150	150	192	187	181	176	171	166
	0.45 Small 1 ph 0.12-0.75 kW with VSD	22	179	217	229	253	267	283	299	317	335
	0.45 Total Small 1-ph 0.12-0.75 kW	96	322	367	379	445	454	464	475	488	501
	0.45 Small 3 ph 0.12-0.75 kW no VSD	47	80	84	89	103	101	98	95	92	89
	0.45 Small 3 ph 0.12-0.75 kW with VSD	8	64	79	90	105	111	120	131	144	157
	0.45 Total Small 3-ph 0.12-0.75 kW	55	144	164	179	208	211	218	226	236	246
	0.45 Large 3-ph LV 375-1000 kW no VSD	6	8	7	7	8	7	7	6	6	6
	0.45 Large 3-ph LV 375-1000kW with VSD	12	69	96	107	120	120	124	129	134	139
	0.45 Total Large 3-ph LV 375-1000 kW	18	77	103	114	127	127	131	135	140	145
	0.45 Explosion motors (S) 3-ph 0.75-7.5 kW	8	14	15	15	19	18	18	18	18	18
	0.45 Explosion motors (M) 3-ph 7.5-75 kW	4	6	7	7	8	8	8	8	8	7
	0.45 Explosion motors (L) 3-ph 75-375 kW	1	1	2	2	2	2	2	2	2	2
	0.45 Total Expl. 0.75-375 kW (no VSD)	12	21	23	24	28	28	28	27	27	27
	0.45 Brake motors (S) 3-ph 0.75-7.5 kW	10	17	18	20	26	25	25	25	24	24
	0.45 Brake motors (M) 3-ph 7.5-75 kW	4	8	8	9	11	11	10	10	10	10
	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)	15	27	28	31	39	38	38	37	36	36

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db	REVENUE INSTALL ECO (m euro 2015)	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	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)	161	282	296	302	339	341	343	344	346	347
MT Elec. Motors LV 0.12-1000 kW		377	892	1138	1367	1502	1521	1554	1599	1644	1685
WP Water pumps		534	735	795	855	919	983	1048	1112	1176	1240
CP Fixed Speed 5-1280 l/s		16	14	14	15	16	16	17	17	18	18
CP Variable speed 5-1280 l/s		0	6	9	10	11	11	11	12	12	12
CP Pistons 2-64 l/s		5	5	7	8	8	9	9	9	9	10
Total CP Standard Air Compressors		20	25	29	33	35	36	37	38	39	40
Total WE Welding Equipment		153	173	175	176	182	184	181	183	184	185
TOTAL INDUSTRY COMPONENTS		1160	2059	2467	2829	3034	3109	3204	3313	3424	3530
TOTAL ENERGY SECTOR		0									
TRANSPORT SECTOR		0									
GENERAL TOTAL (in m euro 2015)		18967	36631	36646	41156	44709	49358	53226	57719	62540	67268
GENERAL TOTAL (in bn euro 2015)		19	37	37	41	45	49	53	58	63	67
SUMMARY ECO											
INSTALL excl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	2.5	3.0	2.9	3.1	3.6	4.1	4.7	5.2	5.7	6.3	
SPACE HEATING	10.2	15.1	14.6	17.8	20.9	23.8	26.4	29.2	32.0	34.7	
SPACE COOLING	0.6	4.6	4.6	5.3	5.9	6.4	6.9	7.6	8.3	8.9	
VENTILATION	2.1	8.2	9.2	9.1	8.7	9.6	9.9	10.3	10.6	11.0	
LIGHTING	2.1	3.5	2.6	2.7	2.3	2.1	1.8	2.0	2.3	2.6	
ELECTRONICS	-	-	-	-	-	-	-	-	-	-	
FOOD PRESERVATION	0.1	0.1	0.1	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	1.2	2.1	2.5	2.8	3.0	3.1	3.2	3.3	3.4	3.5	
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-	
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-	
TOTAL in bn euro 2015	19	37	37	41	45	49	53	58	63	67	
INSTALL excl. VAT, ECO-BAU (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050	
WATER HEATING	0.0	-	-	0.0	0.2	0.5	0.8	1.1	1.4	1.7	2.0
SPACE HEATING	-	0.2	0.4	1.9	3.7	5.0	6.3	7.6	8.9	10.0	
SPACE COOLING	-	0.4	0.4	0.4	0.4	0.2	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	-	0.6	-	0.4	-	0.7	-	0.5	-
ELECTRONICS	-	-	-	-	-	-	-	-	-	-	
FOOD PRESERVATION	-	-	-	-	-	0.0	0.0	0.0	0.0	0.0	
COOKING	-	-	-	-	-	-	-	-	-	-	
CLEANING	-	-	0.0	-	0.0	-	0.0	-	0.1	-	0.1
INDUSTRY COMPONENTS	-	0.0	0.2	0.4	0.5	0.4	0.4	0.3	0.2	0.2	
ENERGY SECTOR	-	-	-	-	-	-	-	-	-	-	
TRANSPORT SECTOR	-	-	-	-	-	-	-	-	-	-	
TOTAL in bn euro 2015	0	0	0	2	4	6	7	9	11	12	

Revenues for VSDs only (without motor, m euros)

VSD - Very Small 0.12 - 0.75 kW 1-phase	21	164	197	207	219	233	248	264	281	299
VSD - Very Small 0.12 - 0.75 kW 3-phase	7	54	66	74	84	88	96	107	118	130
VSD - Small 0.75 - 7.5 kW 3-phase	67	197	297	486	514	525	550	587	626	668
VSD - Medium 7.5 - 75kW 3-phase	48	142	257	340	358	365	382	408	435	451
VSD - Large 75 - 375kW 3-phase	27	80	135	161	170	175	184	195	202	207
VSD - Very Large 375 - 1,000kW 3-phase	11	66	90	100	109	109	115	121	127	133
Total revenues, VSDs only (ECO)	180	704	1042	1368	1455	1497	1576	1681	1789	1888

REV_MAINT_BAU

db	REVENUE MAINTENANCE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	43	55	62	72	80	84	85	85	85	85	85
EIWH Electric Instant. ≥ 12 kW (primary)	145	165	157	147	143	149	161	175	190	205	
EIWS Electric Instant. Shower (secondary)	171	240	251	246	243	251	264	279	294	309	
ESWH Electric Storage ≤ 30 L (secondary)	663	833	838	839	860	907	962	1022	1082	1142	
ESWH Electric Storage > 30 L (primary)	1421	1860	1864	1835	1783	1800	1975	2097	2220	2342	
GIWH Gas Instant. < 13 L/min (secondary)	902	912	781	656	583	569	561	553	545	537	
GIWH Gas Instant. ≥ 13 L/min (primary)	146	170	159	148	130	130	128	126	124	123	
GSWH Gas Storage, Condensing	0	1	3	6	8	9	11	12	14	15	
GSWH Gas Storage, Non-condensing	168	159	128	95	68	51	41	35	30	24	
Dedicated WH Heat Pump	0	18	49	101	175	262	360	464	567	670	
Dedicated WH Solar (3.5 m ²)	92	680	879	959	992	952	929	961	994	1027	
WH dedicated Water Heater	3752	5093	5171	5104	5064	5225	5477	5811	6145	6480	
CHB Gas Combi Instant. WH	504	1238	1335	1408	1430	1483	1532	1545	1547	1540	
CHB Gas + Cyl. WH	232	382	397	407	411	424	438	441	442	440	
CHB Jet Burner Gas + Cyl. WH	73	66	55	44	34	26	24	24	25	26	
CHB Jet Burner Oil + Cyl. WH	559	484	397	314	239	179	159	163	167	171	
CHB Electric (Joule) + Cyl. WH	5	6	7	8	8	8	8	7	7	6	
CHB Hybrid Gas/Electric WH	0	0	1	1	2	4	6	10	16	27	
CHB Electric HP + Cyl. WH	4	27	41	56	71	81	95	110	127	146	
CHB Gas HP + Cyl. WH	0	0	1	1	2	3	4	6	8	12	
CHB Gas mCHP + Cyl. WH	0	1	1	2	3	4	6	9	12	17	
CHB Solar Combi (16 m ²)	3	5	5	6	7	7	7	7	8	8	
CHC Central Heating combi, water heating	1381	2211	2241	2248	2207	2219	2279	2322	2359	2392	
TOTAL WATER HEATING	5133	7304	7412	7352	7271	7443	7756	8133	8504	8873	
CHB Gas non-condensing	4680	6869	5879	4736	3642	3333	3080	2769	2526	2290	
CHB Gas condensing	65	2860	4485	6154	7573	8310	8837	9127	9480	9747	
CHB Gas Jet burner non-condensing	577	500	403	306	214	125	78	69	63	59	
CHB Gas Jet burner condensing	0	10	24	41	60	80	92	100	108	117	
CHB Oil Jet burner non-condensing	4050	3471	2787	2102	1454	837	519	454	421	391	
CHB Oil Jet burner condensing	0	69	163	269	384	507	577	623	677	729	
CHB Electric Joule-effect	24	31	34	39	42	41	39	36	32	29	
CHB Hybrid (gas-electric)	2	3	4	7	13	22	36	60	99	164	
CHB Electric Heat Pump	22	158	235	323	414	477	559	642	747	868	
CHB Gas Heat Pump	1	3	4	7	11	16	23	33	48	69	
CHB micro CHP	2	7	8	11	16	24	35	49	71	103	
CHB Solar combi (16 m ²)	16	26	29	33	37	39	40	41	42	43	
CHB Central Heating boiler < 400 kW, space heating	9438	14007	14057	14029	13860	13809	13916	14003	14316	14608	
SFB Wood Manual [18 kW]	291	128	109	87	62	39	26	19	17	15	
SFB Wood Direct Draft [20 kW]	3	45	90	133	166	171	182	206	249	303	
SFB Coal [25 kW]	275	131	138	119	91	60	45	44	40	37	
SFB Pellets [25 kW]	0	13	24	36	46	54	58	62	68	75	
SFB Wood chips [160 kW]	0	5	6	7	7	7	8	9	10	11	
Total Solid Fuel Boiler	569	322	367	382	373	332	318	340	384	441	
CHAЕ-S (< 400 kW)	196	843	1072	1268	1414	1558	1715	1876	2036	2192	
CHAЕ-L (> 400 kW)	49	181	223	260	285	297	308	320	331	344	
CHWE-S (< 400 kW)	16	71	90	106	118	130	143	157	170	183	
CHWE-M (> 400 kW; ≤ 1500 kW)	22	82	101	118	130	137	142	148	154	160	
CHWE-L (> 1500 kW)	11	41	51	59	65	68	71	74	77	80	
CHF	0	7	13	18	22	27	32	37	41	45	
HT PCH-AE-S	102	182	207	230	246	259	270	281	292	303	
HT PCH-AE-L	99	178	202	224	240	253	264	274	285	296	
HT PCH-WE-S	22	39	45	49	53	56	58	61	63	65	
HT PCH-WE-M	97	175	198	220	236	248	259	269	280	290	
HT PCH-WE-L	11	20	23	25	28	29	31	32	33	35	
AC rooftop	99	406	450	443	376	254	139	72	52	52	
AC splits	204	891	986	1025	1031	1006	967	931	895	859	
AC VRF	1	958	1559	2367	3143	4123	5094	5976	6808	7533	
ACF	0	2	4	6	8	9	11	13	15	16	
SubTotal AHC Air Cooling	929	4077	5223	6418	7396	8456	9505	10519	11532	12453	
AC rooftop (rev)	62	252	276	267	224	150	75	23	2	0	
AC splits (rev)	148	615	680	708	712	695	669	644	619	595	
AC VRF (rev)	0	843	1352	2013	2671	3452	4158	4646	5041	5313	
ACF (rev)	0	5	9	13	16	19	22	26	29	32	
AHF	98	94	87	82	77	72	68	64	60	56	
AHE	0	2	1	1	1	1	1	1	1	1	
SubTotal AHC Air Heating (rev double)	308	1810	2406	3083	3701	4390	4993	5404	5753	5997	
Total AHC Air Heating & Cooling	1027	4172	5312	6501	7473	8529	9574	10585	11594	12510	

REV_MAINT_BAU

db	REVENUE MAINTENANCE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	158	231	249	263	273	278	278	276	275	275	275
LH closed fireplace/inset [8 kW]	79	216	268	318	364	399	421	433	438	440	440
LH wood stove [8 kW]	113	133	139	147	155	162	169	173	175	176	176
LH coal stove [8 kW]	69	45	43	40	38	34	28	24	20	17	17
LH cooker [10 kW]	154	310	367	430	487	528	548	555	558	558	558
LH SHR stove [8 kW]	62	86	95	107	122	138	156	170	179	185	185
LH pellet stove [8 kW]	0	58	88	116	139	156	168	173	176	176	176
LH Solid fuel sum	635	1081	1248	1422	1577	1694	1766	1804	1821	1826	
LH Electric portable	0	0	0	0	0	0	0	0	0	0	0
LH Electric fixed > 250W	0	0	0	0	0	0	0	0	0	0	0
LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0	0	0	0
LH Electric storage	0	0	0	0	0	0	0	0	0	0	0
LH Electric underfloor	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
LH Electric visibly glowing ≤ 1.2 kW	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
LH Electric sum	0	0	0	0	0	0	0	0	0	0	0
LH Gas luminous (commercial)	2	3	3	3	3	2	2	2	2	2	2
LH Gaseous Tube (commercial < 120 kW)	3	3	3	3	3	3	3	3	3	3	3
LH Gas open front	12	12	12	12	11	11	10	9	9	9	8
LH Gas closed front	59	45	38	32	27	22	19	18	17	17	17
LH Gas balanced flue	135	94	74	57	43	33	27	25	24	24	24
LH Gas flueless	0	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	211	157	131	107	87	71	62	57	54	53	
LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0
LH Liquid open front	1	1	1	1	1	1	1	1	1	1	1
LH Liquid closed front	6	5	4	3	3	2	2	2	2	2	2
LH Liquid balanced flue	13	9	7	6	4	3	3	3	2	2	2
LH Liquid flueless	0	0	0	0	0	0	0	0	0	0	0
LH Liquid fuel sum	21	15	13	10	8	7	6	5	5	5	
LH Local Space Heaters total	866	1253	1392	1539	1673	1773	1834	1866	1880	1884	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	57	563	530	427	443	496	550	609	681	775	
RAC fixed 6-12 kW, cooling	13	136	145	126	130	137	146	155	167	182	
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, cooling mode	70	699	675	553	573	633	697	764	848	957	
RAC fixed < 6 kW, reversible, heating	5	157	192	204	263	346	439	546	660	774	
RAC fixed 6-12 kW, reversible, heating	1	39	54	60	76	95	116	139	161	182	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	6	196	246	265	339	441	555	685	822	956	
RAC Room Air Conditioner	76	895	921	818	912	1075	1251	1450	1670	1913	
1 CIRC Integrated circulators	34	53	60	66	72	77	80	81	81	81	
1 CIRC Large standalone circulators	36	53	53	51	49	45	42	41	41	41	
1 CIRC Small standalone circulators	75	112	113	111	107	100	94	92	92	92	
1 CIRC Circulator pumps <2.5 kW	145	218	226	229	227	222	217	215	215	215	
TOTAL SPACE HEATING (incl. rev.AC)	11187	17587	18468	19297	19945	20744	21616	22300	23156	23886	
TOTAL SPACE COOLING	999	4776	5899	6972	7968	9089	10201	11284	12380	13410	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	2	3	3	3	3	3	3	
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	18	29	50	151	311	481	662	847	1046	
R-UVU 100-250 m3/h	16	40	46	51	55	58	60	61	61	61	
R-BVU 100-250 m3/h	1	12	17	23	49	89	131	177	223	273	
R-UVU 250-1000 m3/h	85	215	245	274	294	309	320	325	328	330	
R-BVU 250-1000 m3/h	2	28	40	55	115	209	310	417	525	642	
R-UVU > 1000 m3/h	3	7	8	8	9	9	9	8	8	8	
R-BVU 1000-2500 m3/h	0	3	5	6	8	9	11	12	14	15	
RVU, Total residential	108	325	391	469	682	997	1324	1665	2010	2379	
NR-UVU 250-1000 m3/h	37	83	91	97	100	102	103	102	100	97	
NR-BVU 250-1000 m3/h	0	46	68	89	111	131	153	176	198	221	
NR-UVU > 1000 m3/h	28	64	71	75	78	79	80	79	78	75	
NR-BVU 1000-2500 m3/h	0	29	43	57	71	84	98	112	127	141	
NR-AHU-S 2500-5500 m3/h	5	76	121	167	205	238	272	306	339	371	
NR-AHU-M 5500-14500 m3/h	459	711	792	871	930	977	1022	1068	1114	1158	
NR-AHU-L > 14500 m3/h	168	260	289	318	340	357	374	390	407	423	
NRVU, Total non-residential	697	1269	1473	1675	1834	1968	2102	2233	2363	2488	
VU Ventilation Units, res + non-res.	805	1594	1865	2143	2516	2965	3426	3899	4373	4867	
TOTAL VENTILATION	805	1594	1865	2143	2516	2965	3426	3899	4373	4867	

REV_MAINT_BAU

db	REVENUE MAINTENANCE BAU (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	406	698	782	836	810	687	532	413	322	251	
HID (HPM, HPS, MH)	211	520	575	583	486	318	164	86	46	25	
CFLni (all shapes)	202	877	946	953	848	547	240	101	42	17	
CFLi (retrofit for GLS, HL)	60	795	1033	1053	909	762	511	337	216	144	
GLS (DLS & NDLS)	563	479	403	290	169	99	58	34	20	12	
HL (DLS & NDLS, LV & MV)	103	488	596	680	542	308	176	102	60	35	
LED replacing LFL (retrofit & luminaire)	0	0	3	49	191	446	749	1037	1318	1604	
LED replacing HID (retrofit & luminaire)	0	0	3	73	256	522	786	989	1170	1351	
LED replacing CFLni (retrofit & luminaire)	0	0	4	75	316	773	1255	1592	1874	2151	
LED replacing DLS (retrofit & luminaire)	0	0	2	56	199	379	521	644	762	882	
LED replacing NDLS (retrofit & luminaire)	0	0	5	220	776	1385	2049	2631	3181	3723	
SUBTOTAL non-LED	1545	3857	4335	4395	3765	2720	1681	1073	705	483	
SUBTOTAL LED	0	0	17	473	1738	3505	5360	6892	8305	9710	
TOTAL LIGHTING	1545	3857	4352	4868	5502	6224	7041	7965	9010	10194	
DP TV all types	132	226	268	315	331	388	432	446	446	446	
DP Monitor	9	118	90	69	69	69	69	69	69	69	
DP Signage	0	0	5	17	24	24	24	24	24	24	
DP Electronic Displays, total	141	345	364	401	425	481	525	539	539	539	
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	581	594	519	424	333	265	209	162	117	73	
EP / Laser Printer colour	0	663	1042	1513	1746	1879	1964	2019	2058	2097	
EP / Laser Copier mono	402	184	110	24	0	0	0	0	0	0	
EP / Laser Copier colour	0	99	261	170	0	0	0	0	0	0	
EP / Laser MFD mono	0	1141	1608	1803	1716	1632	1552	1474	1399	1324	
EP / Laser MFD colour	0	2714	3824	4286	4081	3881	3693	3512	3333	3154	
Total IE Imaging Equipment	983	5395	7364	8219	7876	7657	7417	7166	6907	6648	
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	1124	5740	7728	8620	8301	8138	7942	7705	7446	7187	
RF Household refrigerator and freezer	0	0	0	0	0	0	0	0	0	0	
CF open vertical chilled multi deck (RVC2)	175	195	202	205	207	210	213	217	220	223	
CF open horizontal frozen island (RHF4)	20	22	23	23	23	24	24	24	25	25	
CF other supermarket display (non-BCs)	563	650	710	753	786	815	844	874	904	936	
CF Plug in one door beverage cooler	150	187	196	199	206	214	221	228	236	243	
CF Plug in horizontal ice cream freezer	48	60	63	64	66	69	71	73	76	78	
CF Spiral vending machine	50	52	41	34	34	35	36	38	39	41	
Total CF Commercial Refrigeration	1005	1166	1236	1278	1322	1366	1409	1454	1500	1547	
PF Professional Refrigeration, Total	0	0	0	0	0	0	0	0	0	0	
TOTAL FOOD PRESERVATION	1005	1166	1236	1278	1322	1366	1409	1454	1500	1547	
TOTAL COOKING	0	0	0	0	0	0	0	0	0	0	
WM Washing Machines	298	459	490	506	515	522	520	517	517	517	
WD Washer-Dryers	13	19	20	21	21	21	22	22	22	22	
Total WM-WD household Washing	311	477	510	527	536	544	542	539	539	539	
Total DW Household Dishwasher	0	0	0	0	0	0	0	0	0	0	
LD condensing heat pump	0	1	3	6	10	15	22	30	37	45	
LD condensing electric heat element	12	91	99	119	141	148	143	136	128	121	
LD vented electric	64	77	69	67	70	70	71	71	71	71	
LD vented gas	0	1	0	0	0	0	0	0	0	0	
Total LD household Laundry Dryer	76	169	171	192	220	233	236	237	237	237	
Total VC Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0	
TOTAL CLEANING	387	646	681	718	757	777	778	776	776	776	
0.5 FAN Axial<300Pa [247 W flow out]	133	374	444	499	551	584	593	593	593	593	
0.5 FAN Axial>300Pa [489 W fluid-dyn out]	184	554	641	684	715	734	739	739	739	739	
0.5 FAN Centr.FC [141 W flow out]	114	246	301	339	368	391	397	397	397	397	
0.5 FAN Centr.BC-free [2120 W flow out]	65	139	166	184	203	222	235	242	247	251	
0.5 FAN Centr.BC [2052 W flow out]	119	274	332	368	407	447	483	518	562	611	
0.5 FAN Cross-flow [31 W flow out]	26	48	56	65	75	82	88	95	103	111	
Total FAN, industrial (excl. box & roof fans)	321	818	970	1069	1160	1229	1267	1291	1320	1351	

REV_MAINT_BAU

db	REVENUE MAINTENANCE BAU (m euro 2015)	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	430	579	620	643	642	624	595	559	512	458
0.45	Medium (L) 3-ph 75-375 kW no VSD	260	337	355	364	360	341	311	273	237	214
0.45	Total 3ph 0.75-375 kW no VSD	689	917	975	1007	1002	965	907	831	749	671
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	67	172	218	268	322	379	445	523	614	715
0.45	Medium (L) 3-ph 75-375 kW with VSD	60	152	193	240	291	346	408	479	547	599
0.45	Total 3-ph 0.75-375 kW with VSD	127	324	410	509	613	726	853	1001	1161	1314
0.45	Total 3-ph 0.75-375 kW w/o VSD	817	1241	1385	1516	1615	1690	1759	1833	1909	1985
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									
0.45	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									
0.45	Large 3-ph LV 375-1000 kW no VSD	105	128	126	120	113	108	106	106	105	104
0.45	Large 3-ph LV 375-1000kW with VSD	8	43	64	89	111	127	136	143	150	158
0.45	Total Large 3-ph LV 375-1000 kW	113	171	190	209	224	235	242	248	255	262
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	27	39	44	47	49	51	52	53	55	56
0.45	Explosion motors (L) 3-ph 75-375 kW	15	22	25	27	29	30	31	32	32	33
0.45	Total Expl. 0.75-375 kW (no VSD)	42	62	69	74	78	81	83	85	87	89
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	33	49	55	59	62	64	65	67	69	70
0.45	Brake motors (L) 3-ph 75-375 kW	19	28	31	34	36	38	39	40	41	42
0.45	Total Brake 0.75-375 kW (no VSD)	52	77	86	93	98	101	104	106	109	112
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	2	3	3	3	3	3
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	2	2	2	2	2
0.45	Total 8-pole 0.75-375 kW (no VSD)	2	3	3	4						
0.45	1-phase motors >0.75 kW (no VSD)	0									
	MT Elec. Motors LV 0.12-1000 kW	564	855	953	1043	1111	1161	1206	1252	1301	1349
	WP Water pumps	994	1356	1474	1594	1717	1843	1971	2100	2229	2357
	CP Fixed Speed 5-1280 l/s	327	705	638	581	584	603	624	644	663	683
	CP Variable speed 5-1280 l/s	0	78	168	249	294	309	320	330	340	350
	CP Pistons 2-64 l/s	78	101	100	101	105	108	112	116	119	123
	Total CP Standard Air Compressors	405	884	905	930	983	1021	1056	1089	1122	1156
	Total WE Welding Equipment	92	105	108	108	109	110	111	112	113	113
	TOTAL INDUSTRY COMPONENTS	2376	4017	4410	4744	5078	5364	5611	5845	6084	6327
	TOTAL ENERGY SECTOR	0									
	TRANSPORT SECTOR	0									
	GENERAL TOTAL (in m euro 2015)	24562	46686	52050	55992	58660	62110	65782	69360	73230	77066
	GENERAL TOTAL (in bn euro 2015)	25	47	52	56	59	62	66	69	73	77
	SUMMARY										
	MAINTENANCE BAU excl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
	WATER HEATING	5.1	7.3	7.4	7.4	7.3	7.4	7.8	8.1	8.5	8.9
	SPACE HEATING	11.2	17.6	18.5	19.3	19.9	20.7	21.6	22.3	23.2	23.9
	SPACE COOLING	1.0	4.8	5.9	7.0	8.0	9.1	10.2	11.3	12.4	13.4
	VENTILATION	0.8	1.6	1.9	2.1	2.5	3.0	3.4	3.9	4.4	4.9
	LIGHTING	1.5	3.9	4.4	4.9	5.5	6.2	7.0	8.0	9.0	10.2
	ELECTRONICS	1.1	5.7	7.7	8.6	8.3	8.1	7.9	7.7	7.4	7.2
	FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
	COOKING	0.0									
	CLEANING	0.4	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
	INDUSTRY COMPONENTS	2.4	4.0	4.4	4.7	5.1	5.4	5.6	5.8	6.1	6.3
	ENERGY SECTOR	0.0									
	TRANSPORT SECTOR	0.0									
	TOTAL in bn euro 2015	25	47	52	56	59	62	66	69	73	77

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	15	38	48	59	71	83	98	115	135	157
VSD - Large 75 - 375kW 3-phase	14	36	45	57	69	82	96	113	129	141
VSD - Very Large 375 - 1,000kW 3-phase	1	4	5	8	9	11	12	12	13	13
Total revenues, VSDs only (BAU)	30	77	99	123	149	176	205	240	277	312

REV_MAINT_ECO

db	REVENUE MAINTENANCE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
EIWH Electric Instant. < 12 kW (secondary)	43	55	62	72	80	84	85	85	85	85	85
EIWH Electric Instant. ≥ 12 kW (primary)	145	165	157	147	143	149	161	175	190	205	205
EIWS Electric Instant. Shower (secondary)	171	240	251	246	243	251	264	279	294	309	309
ESWH Electric Storage ≤ 30 L (secondary)	663	833	838	839	860	907	962	1022	1082	1142	1142
ESWH Electric Storage > 30 L (primary)	1421	1860	1864	1835	1783	1860	1975	2097	2220	2342	2342
GIWH Gas Instant. < 13 L/min (secondary)	902	912	781	656	583	569	561	553	545	537	537
GIWH Gas Instant. ≥ 13 L/min (primary)	146	170	159	148	130	130	128	126	124	123	123
GSWH Gas Storage, Condensing	0	1	3	6	8	9	11	12	14	15	15
GSWH Gas Storage, Non-condensing	168	159	128	95	68	51	41	35	30	24	24
Dedicated WH Heat Pump	0	18	49	101	175	262	360	464	567	670	670
Dedicated WH Solar (3.5 m ²)	92	680	879	959	992	952	929	961	994	1027	1027
WH dedicated Water Heater	3752	5093	5171	5104	5064	5225	5477	5811	6145	6480	
CHB Gas Combi Instant. WH	504	1238	1332	1393	1378	1365	1322	1229	1125	1015	
CHB Gas + Cyl. WH	232	382	389	385	369	354	343	319	292	263	
CHB Jet Burner Gas + Cyl. WH	73	66	55	44	34	26	24	24	25	26	
CHB Jet Burner Oil + Cyl. WH	559	484	397	314	239	179	159	163	167	171	
CHB Electric (Joule) + Cyl. WH	5	6	7	8	8	8	8	7	7	6	
CHB Hybrid Gas/Electric WH	0	0	1	2	7	18	33	53	77	104	
CHB Electric HP + Cyl. WH	4	27	42	64	102	156	232	317	405	494	
CHB Gas HP + Cyl. WH	0	0	1	2	5	9	14	19	25	32	
CHB Gas mCHP + Cyl. WH	0	1	2	3	6	10	15	19	23	28	
CHB Solar Combi (16 m ²)	3	5	6	7	7	8	8	8	8	8	
CHC Central Heating combi, water heating	1381	2211	2232	2223	2157	2132	2157	2159	2154	2147	
TOTAL WATER HEATING	5133	7304	7403	7327	7221	7357	7634	7970	8300	8627	
CHB Gas non-condensing	4680	6869	5782	3955	2156	1124	477	269	152	110	
CHB Gas condensing	65	2860	4577	6868	8723	9652	9797	9083	8413	7618	
CHB Gas Jet burner non-condensing	577	500	402	296	192	93	36	18	13	10	
CHB Gas Jet burner condensing	0	10	26	50	78	107	128	143	151	157	
CHB Oil Jet burner non-condensing	4050	3471	2775	2034	1310	620	232	117	84	67	
CHB Oil Jet burner condensing	0	69	173	327	506	691	821	910	963	1004	
CHB Electric Joule-effect	24	31	34	39	42	41	39	36	32	29	
CHB Hybrid (gas-electric)	2	3	6	14	44	103	194	312	450	608	
CHB Electric Heat Pump	22	158	236	353	560	845	1249	1698	2168	2645	
CHB Gas Heat Pump	1	3	6	13	28	50	78	109	143	178	
CHB micro CHP	2	7	10	19	35	57	82	107	132	157	
CHB Solar combi (16 m ²)	16	26	31	36	40	42	42	42	43	44	
CHB Central Heating boiler < 400 kW, space heating	9438	14007	14056	14005	13715	13426	13176	12844	12744	12628	
SFB Wood Manual [18 kW]	291	128	109	87	62	39	26	19	17	15	
SFB Wood Direct Draft [20 kW]	3	45	90	133	166	171	182	206	249	303	
SFB Coal [25 kW]	275	131	138	119	91	60	45	44	40	37	
SFB Pellets [25 kW]	0	13	24	36	46	54	58	62	68	75	
SFB Wood chips [160 kW]	0	5	6	7	7	7	8	9	10	11	
Total Solid Fuel Boiler	569	322	367	382	373	332	318	340	384	441	
CHAЕ-S (≤ 400 kW)	196	843	1072	1268	1414	1558	1715	1876	2036	2192	
CHAЕ-L (> 400 kW)	49	181	223	260	285	297	308	320	331	344	
CHWE-S (≤ 400 kW)	16	71	90	106	118	130	143	157	170	183	
CHWE-M (> 400 kW; ≤ 1500 kW)	22	82	101	118	130	137	142	148	154	160	
CHWE-L (> 1500 kW)	11	41	51	59	65	68	71	74	77	80	
CHF	0	7	13	18	22	27	32	37	41	45	
HT PCH-AE-S	102	182	207	230	246	259	270	281	292	303	
HT PCH-AE-L	99	178	202	224	240	253	264	274	285	296	
HT PCH-WE-S	22	39	45	49	53	56	58	61	63	65	
HT PCH-WE-M	97	175	198	220	236	248	259	269	280	290	
HT PCH-WE-L	11	20	23	25	28	29	31	32	33	35	
AC rooftop	99	406	450	443	376	254	139	72	52	52	
AC splits	204	891	986	1025	1031	1006	967	931	895	859	
AC VRF	1	958	1559	2367	3143	4123	5094	5976	6808	7533	
ACF	0	2	4	6	8	9	11	13	15	16	
SubTotal AHC Air Cooling	929	4077	5223	6418	7396	8456	9505	10519	11532	12453	
AC rooftop (rev)	62	252	276	267	224	150	75	23	2	0	
AC splits (rev)	148	615	680	708	712	695	669	644	619	595	
AC VRF (rev)	0	843	1352	2013	2671	3452	4158	4646	5041	5313	
ACF (rev)	0	5	9	13	16	19	22	26	29	32	
AHF	98	94	87	82	77	72	68	64	60	56	
AHE	0	2	1	1	1	1	1	1	1	1	
SubTotal AHC Air Heating (rev double)	308	1810	2406	3083	3701	4390	4993	5404	5753	5997	
Total AHC Air Heating & Cooling	1027	4172	5312	6501	7473	8529	9574	10585	11594	12510	

REV_MAINT_ECO

db	REVENUE MAINTENANCE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LH open fireplace [8 kW]	158	231	249	263	273	278	278	276	275	275	275
LH closed fireplace/inset [8 kW]	79	216	268	318	364	399	421	433	438	440	440
LH wood stove [8 kW]	113	133	139	147	155	162	169	173	175	176	176
LH coal stove [8 kW]	69	45	43	40	38	34	28	24	20	17	17
LH cooker [10 kW]	154	310	367	430	487	528	548	555	558	558	558
LH SHR stove [8 kW]	62	86	95	107	122	138	156	170	179	185	185
LH pellet stove [8 kW]	0	58	88	116	139	156	168	173	176	176	176
LH Solid fuel sum	635	1081	1248	1422	1577	1694	1766	1804	1821	1826	
LH Electric portable	0	0	0	0	0	0	0	0	0	0	0
LH Electric fixed > 250W	0	0	0	0	0	0	0	0	0	0	0
LH Electric fixed ≤ 250W	0	0	0	0	0	0	0	0	0	0	0
LH Electric storage	0	0	0	0	0	0	0	0	0	0	0
LH Electric underfloor	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
LH Electric visibly glowing ≤ 1.2 kW	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
LH Electric sum	0	0	0	0	0	0	0	0	0	0	0
LH Gas luminous (commercial)	2	3	3	3	3	2	2	2	2	2	2
LH Gaseous Tube (commercial < 120 kW)	3	3	3	3	3	3	3	3	3	3	3
LH Gas open front	12	12	12	12	11	11	10	9	9	9	8
LH Gas closed front	59	45	38	32	27	22	19	18	17	17	17
LH Gas balanced flue	135	94	74	57	43	33	27	25	24	24	24
LH Gas flueless	0	0	0	0	0	0	0	0	0	0	0
LH Gaseous fuel sum	211	157	131	107	87	71	62	57	54	53	
LH Liquid tube (commercial < 120 kW)	0	0	0	0	0	0	0	0	0	0	0
LH Liquid open front	1	1	1	1	1	1	1	1	1	1	1
LH Liquid closed front	6	5	4	3	3	2	2	2	2	2	2
LH Liquid balanced flue	13	9	7	6	4	3	3	3	2	2	2
LH Liquid flueless	0	0	0	0	0	0	0	0	0	0	0
LH Liquid fuel sum	21	15	13	10	8	7	6	5	5	5	
LH Local Space Heaters total	866	1253	1392	1539	1673	1773	1834	1866	1880	1884	
<i>Revenues partitioned over cooling and heating</i>											
RAC fixed < 6 kW, cooling	57	563	530	427	443	496	550	609	681	775	
RAC fixed 6-12 kW, cooling	13	136	145	126	130	137	146	155	167	182	
RAC portable < 12 kW, cooling	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, cooling mode	70	699	675	553	573	633	697	764	848	957	
RAC fixed < 6 kW, reversible, heating	5	157	192	204	263	346	439	546	660	774	
RAC fixed 6-12 kW, reversible, heating	1	39	54	60	76	95	116	139	161	182	
RAC portable < 12 kW, reversible, heating	0	0	0	0	0	0	0	0	0	0	
RAC < 12 kW total, heating mode	6	196	246	265	339	441	555	685	822	956	
RAC Room Air Conditioner	76	895	921	818	912	1075	1251	1450	1670	1913	
1 CIRC Integrated circulators	34	53	60	66	72	77	80	81	81	81	
1 CIRC Large standalone circulators	36	53	53	51	49	45	42	41	41	41	
1 CIRC Small standalone circulators	75	112	113	111	107	100	94	92	92	92	
1 CIRC Circulator pumps <2.5 kW	145	218	226	229	227	222	217	215	215	215	
TOTAL SPACE HEATING (incl. rev.AC)	11187	17587	18467	19273	19800	20362	20877	21141	21583	21906	
TOTAL SPACE COOLING	999	4776	5899	6972	7968	9089	10201	11284	12380	13410	
R-UVU ≤ 100 m3/h for Extract Spaces	1	2	2	2	3	3	3	3	3	3	
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	18	29	50	151	311	481	662	847	1046	
R-UVU 100-250 m3/h	16	40	46	51	55	58	60	61	61	61	
R-BVU 100-250 m3/h	1	12	17	23	49	89	131	177	223	273	
R-UVU 250-1000 m3/h	85	215	245	274	294	309	320	325	328	330	
R-BVU 250-1000 m3/h	2	28	40	55	115	209	310	417	525	642	
R-UVU > 1000 m3/h	3	7	8	8	8	9	9	9	8	8	
R-BVU 1000-2500 m3/h	0	3	5	6	8	9	11	12	14	15	
RVU, Total residential	108	325	391	469	682	997	1324	1665	2010	2379	
NR-UVU 250-1000 m3/h	37	83	91	97	100	102	103	102	100	97	
NR-BVU 250-1000 m3/h	0	46	68	89	111	131	153	176	198	221	
NR-UVU > 1000 m3/h	28	64	71	75	78	79	80	79	78	75	
NR-BVU 1000-2500 m3/h	0	29	43	57	71	84	98	112	127	141	
NR-AHU-S 2500-5500 m3/h	5	76	121	167	205	238	272	306	339	371	
NR-AHU-M 5500-14500 m3/h	459	711	792	871	930	977	1022	1068	1114	1158	
NR-AHU-L > 14500 m3/h	168	260	289	318	340	357	374	390	407	423	
NRVU, Total non-residential	697	1269	1473	1675	1834	1968	2102	2233	2363	2488	
VU Ventilation Units, res + non-res.	805	1594	1865	2143	2516	2965	3426	3899	4373	4867	
TOTAL VENTILATION	805	1594	1865	2143	2516	2965	3426	3899	4373	4867	

REV_MAINT_ECO

db	REVENUE MAINTENANCE ECO (m euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
LFL (T12,T8h,T8t,T5,other)	406	695	772	800	652	376	179	93	55	33	
HID (HPM, HPS, MH)	211	520	500	434	314	158	58	19	7	2	
CFLni (all shapes)	202	877	912	735	458	191	47	8	1	0	
CFLi (retrofit for GLS, HL)	60	980	1256	987	363	97	0	0	0	0	
GLS (DLS & NDLS)	563	299	28	0	0	0	0	0	0	0	
HL (DLS & NDLS, LV & MV)	103	525	622	358	32	0	0	0	0	0	
LED replacing LFL (retrofit & luminaire)	0	0	8	79	342	749	1093	1347	1575	1810	
LED replacing HID (retrofit & luminaire)	0	0	81	226	433	686	898	1062	1217	1382	
LED replacing CFLni (retrofit & luminaire)	0	0	39	295	709	1131	1450	1686	1915	2168	
LED replacing DLS (retrofit & luminaire)	0	1	54	240	490	576	651	737	834	943	
LED replacing NDLS (retrofit & luminaire)	0	0	57	744	1742	2297	2708	3064	3466	3922	
SUBTOTAL non-LED	1545	3896	4089	3314	1819	823	284	121	63	36	
SUBTOTAL LED	0	1	239	1583	3716	5439	6800	7895	9006	10224	
TOTAL LIGHTING	1545	3897	4329	4897	5535	6261	7084	8015	9069	10260	
DP TV all types	132	226	268	315	331	388	432	446	446	446	
DP Monitor	9	118	90	69	69	69	69	69	69	69	
DP Signage	0	0	5	17	24	24	24	24	24	24	
DP Electronic Displays, total	141	345	364	401	425	481	525	539	539	539	
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	581	594	519	424	333	265	209	162	117	73	
EP / Laser Printer colour	0	663	1042	1513	1746	1879	1964	2019	2058	2097	
EP / Laser Copier mono	402	184	110	24	0	0	0	0	0	0	
EP / Laser Copier colour	0	99	261	170	0	0	0	0	0	0	
EP / Laser MFD mono	0	1141	1608	1803	1716	1632	1552	1474	1399	1324	
EP / Laser MFD colour	0	2714	3824	4286	4081	3881	3693	3512	3333	3154	
Total IE Imaging Equipment	983	5395	7364	8219	7876	7657	7417	7166	6907	6648	
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	1124	5740	7728	8620	8301	8138	7942	7705	7446	7187	
RF Household refrigerator and freezer	0	0	0	0	0	0	0	0	0	0	
CF open vertical chilled multi deck (RVC2)	175	195	202	205	207	210	213	217	220	223	
CF open horizontal frozen island (RHF4)	20	22	23	23	23	24	24	24	25	25	
CF other supermarket display (non-BCs)	563	650	710	753	786	815	844	874	904	936	
CF Plug in one door beverage cooler	150	187	196	199	206	214	221	228	236	243	
CF Plug in horizontal ice cream freezer	48	60	63	64	66	69	71	73	76	78	
CF Spiral vending machine	50	52	41	34	34	35	36	38	39	41	
Total CF Commercial Refrigeration	1005	1166	1236	1278	1322	1366	1409	1454	1500	1547	
PF Professional Refrigeration, Total	0	0	0	0	0	0	0	0	0	0	
TOTAL FOOD PRESERVATION	1005	1166	1236	1278	1322	1366	1409	1454	1500	1547	
TOTAL COOKING	0	0	0	0	0	0	0	0	0	0	
WM Washing Machines	298	459	490	506	515	522	520	517	517	517	
WD Washer-Dryers	13	19	20	21	21	21	22	22	22	22	
Total WM-WD household Washing	311	477	510	527	536	544	542	539	539	539	
DW Household Dishwasher	0	0	0	0	0	0	0	0	0	0	
LD condensing heat pump	0	2	26	75	124	154	177	189	190	190	
LD condensing electric heat element	12	90	89	80	71	63	54	48	47	47	
LD vented electric	64	76	56	36	25	15	6	0	0	0	
LD vented gas	0	1	0	0	0	0	0	0	0	0	
Total LD household Laundry Dryer	76	169	171	192	220	233	236	237	237	237	
Total VC Vacuum Cleaner	0	0	0	0	0	0	0	0	0	0	
TOTAL CLEANING	387	646	681	718	757	777	778	776	776	776	
0.5 FAN Axial<300Pa [247 W flow out]	133	374	444	499	551	584	593	593	593	593	
0.5 FAN Axial>300Pa [489 W fluid-dyn out]	184	554	641	684	715	734	739	739	739	739	
0.5 FAN Centr.FC [141 W flow out]	114	246	301	339	368	391	397	397	397	397	
0.5 FAN Centr.BC-free [2120 W flow out]	65	139	166	184	203	222	235	242	247	251	
0.5 FAN Centr.BC [2052 W flow out]	119	274	332	368	407	447	483	518	562	611	
0.5 FAN Cross-flow [31 W flow out]	26	48	56	65	75	82	88	95	103	111	
Total FAN, industrial (excl. box & roof fans)	321	818	970	1069	1160	1229	1267	1291	1320	1351	

REV_MAINT_ECO

db	REVENUE MAINTENANCE ECO (m euro 2015)	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	430	579	601	545	474	454	446	437	426	417
0.45	Medium (L) 3-ph 75-375 kW no VSD	260	337	343	319	283	245	231	219	209	205
0.45	Total 3ph 0.75-375 kW no VSD	689	916	944	864	756	700	678	656	635	622
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	67	172	243	394	538	596	636	679	724	768
0.45	Medium (L) 3-ph 75-375 kW with VSD	60	152	208	300	392	471	512	549	583	610
0.45	Total 3-ph 0.75-375 kW with VSD	127	325	450	694	930	1068	1148	1228	1307	1377
0.45	Total 3-ph 0.75-375 kW w/o VSD	817	1241	1394	1558	1686	1768	1826	1884	1942	2000
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									
0.45	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									
0.45	Large 3-ph LV 375-1000 kW no VSD	105	128	126	120	113	108	106	106	105	104
0.45	Large 3-ph LV 375-1000kW with VSD	8	43	64	89	111	127	136	143	150	158
0.45	Total Large 3-ph LV 375-1000 kW	113	171	190	209	224	235	242	248	255	262
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	27	39	44	47	49	51	52	53	55	56
0.45	Explosion motors (L) 3-ph 75-375 kW	15	22	25	27	29	30	31	32	32	33
0.45	Total Expl. 0.75-375 kW (no VSD)	42	62	69	74	78	81	83	85	87	89
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	33	49	55	59	62	64	65	67	69	70
0.45	Brake motors (L) 3-ph 75-375 kW	19	28	31	34	36	38	39	40	41	42
0.45	Total Brake 0.75-375 kW (no VSD)	52	77	86	93	98	101	104	106	109	112
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	2	3	3	3	3	3
0.45	8-pole motors (L) 3-ph 75-375 kW	1	1	1	1	1	2	2	2	2	2
0.45	Total 8-pole 0.75-375 kW (no VSD)	2	3	3	4						
0.45	1-phase motors >0.75 kW (no VSD)	0									
	MT Elec. Motors LV 0.12-1000 kW	564	855	958	1066	1150	1203	1242	1280	1319	1357
	WP Water pumps	994	1356	1474	1594	1717	1843	1971	2100	2229	2357
	CP Fixed Speed 5-1280 l/s	327	705	638	581	584	603	624	644	663	683
	CP Variable speed 5-1280 l/s	0	78	168	249	294	309	320	330	340	350
	CP Pistons 2-64 l/s	78	101	100	101	105	108	112	116	119	123
	Total CP Standard Air Compressors	405	884	905	930	983	1021	1056	1089	1122	1156
	Total WE Welding Equipment	92	105	108	108	109	110	111	112	113	113
	TOTAL INDUSTRY COMPONENTS	2376	4017	4415	4767	5117	5407	5648	5872	6102	6334
	TOTAL ENERGY SECTOR	0									
	TRANSPORT SECTOR	0									
	GENERAL TOTAL (in m euro 2015)	24562	46726	52022	55996	58537	61721	65000	68116	71530	74915
	GENERAL TOTAL (in bn euro 2015)	25	47	52	56	59	62	65	68	72	75

SUMMARY

MAINTENANCE ECO excl. VAT (bn euro 2015)	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
WATER HEATING	5.1	7.3	7.4	7.3	7.2	7.4	7.6	8.0	8.3	8.6
SPACE HEATING	11.2	17.6	18.5	19.3	19.8	20.4	20.9	21.1	21.6	21.9
SPACE COOLING	1.0	4.8	5.9	7.0	8.0	9.1	10.2	11.3	12.4	13.4
VENTILATION	0.8	1.6	1.9	2.1	2.5	3.0	3.4	3.9	4.4	4.9
LIGHTING	1.5	3.9	4.3	4.9	5.5	6.3	7.1	8.0	9.1	10.3
ELECTRONICS	1.1	5.7	7.7	8.6	8.3	8.1	7.9	7.7	7.4	7.2
FOOD PRESERVATION	1.0	1.2	1.2	1.3	1.3	1.4	1.4	1.5	1.5	1.5
COOKING	0.0									
CLEANING	0.4	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.8
INDUSTRY COMPONENTS	2.4	4.0	4.4	4.8	5.1	5.4	5.6	5.9	6.1	6.3
ENERGY SECTOR	0.0									
TRANSPORT SECTOR	0.0									
TOTAL in bn euro 2015	25	47	52	56	59	62	65	68	72	75

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	15	38	53	86	118	131	140	149	159	168
VSD - Large 75 - 375kW 3-phase	14	36	49	71	92	111	121	129	137	144
VSD - Very Large 375 - 1,000kW 3-phase	1	4	5	8	9	11	12	12	13	13
Total revenues, VSDs only (ECO)	30	77	108	165	220	253	272	291	309	326

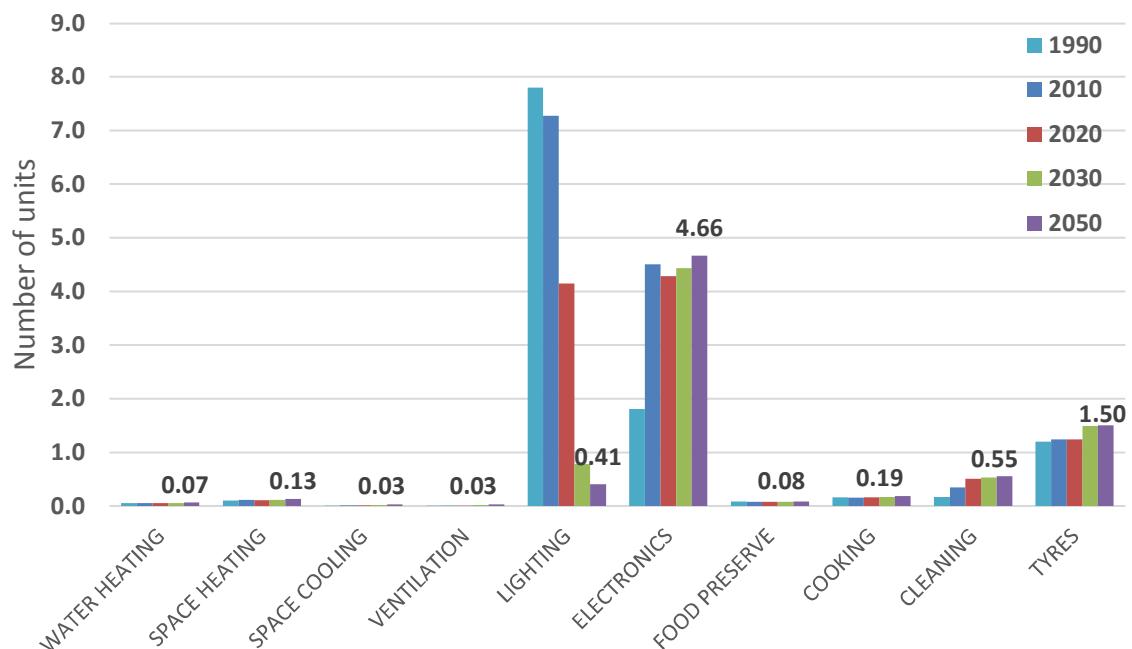
Households

Parameters per Household (hh)	Sales, units / household					Stock, units / household				
	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	0.04	0.03	0.03	0.03	0.04	0.50	0.53	0.49	0.49	0.61
CHC Central Heating combi,	0.02	0.02	0.02	0.02	0.02	0.27	0.39	0.38	0.38	0.42
TOTAL WATER HEATING	0.05	0.05	0.05	0.06	0.07	0.77	0.92	0.87	0.86	1.03
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
TOTAL SPACE HEATING (incl. rev.AC)	0.10	0.12	0.11	0.11	0.13	1.54	1.71	1.71	1.73	2.02
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	0.01	0.02	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 Cleaner, household (excl. cons.)	0.09	0.24	0.39	0.41	0.41	0.81	1.60	1.77	2.09	2.06
VC bags & filters costs										
TOTAL CLEANING	0.17	0.35	0.51	0.53	0.55	1.76	3.00	3.31	3.80	4.04
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

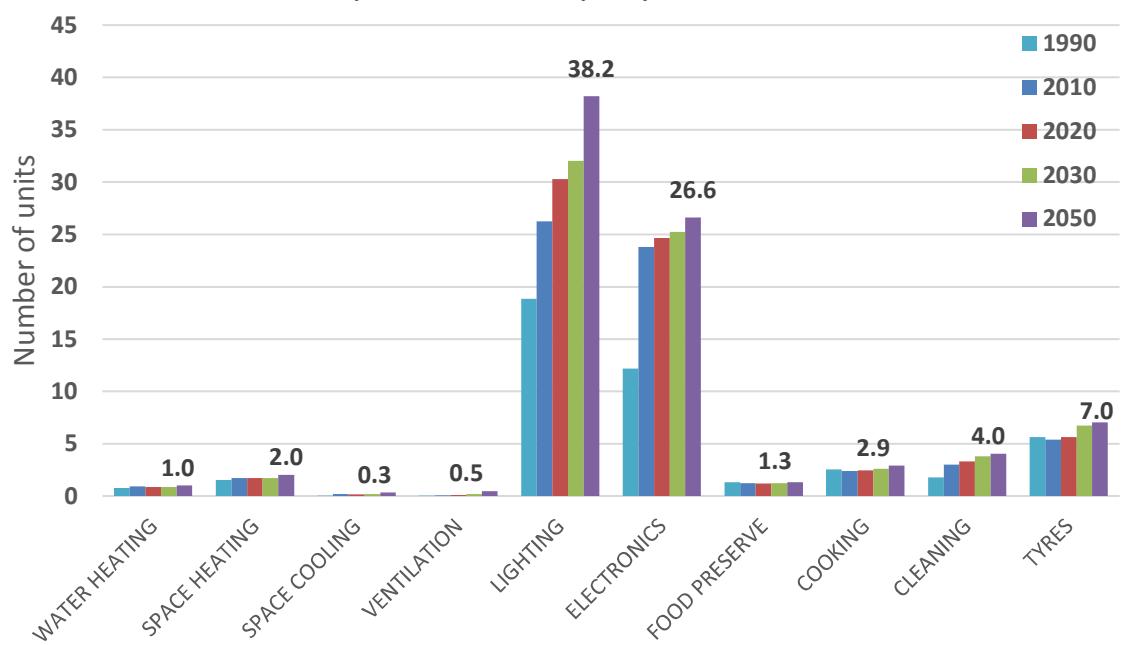
Households

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	0.06	0.07	0.8	0.9	0.9	0.9	1.0
SPACE HEATING	0.10	0.12	0.11	0.11	0.13	1.5	1.7	1.7	1.7	2.0
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	0.35	0.51	0.53	0.55	1.8	3.0	3.3	3.8	4.0
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	11	8	8	45	65	70	75	84
TOTAL per EU household (indirect)	5	7	6	4	5	19	33	38	45	66
TOTAL per EU household (direct and indirect)	16	21	16	12	13	64	98	108	119	150

Unit sales per household per year



Unit stock per household per year



Households

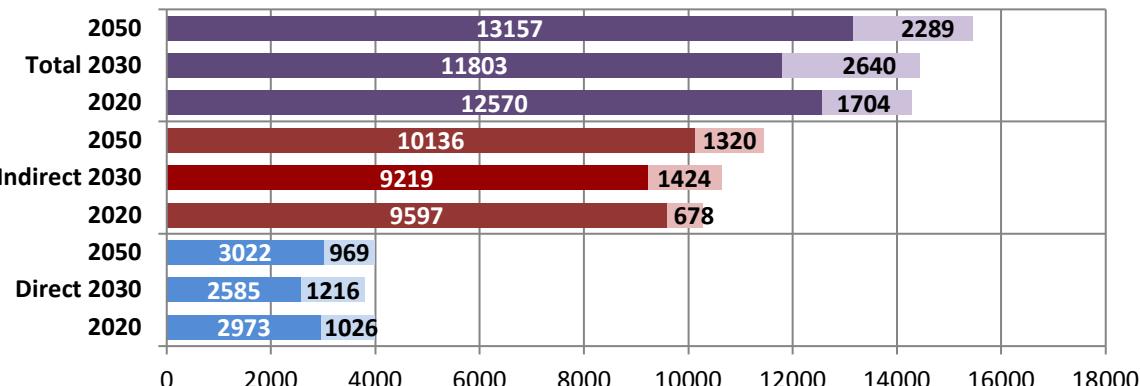
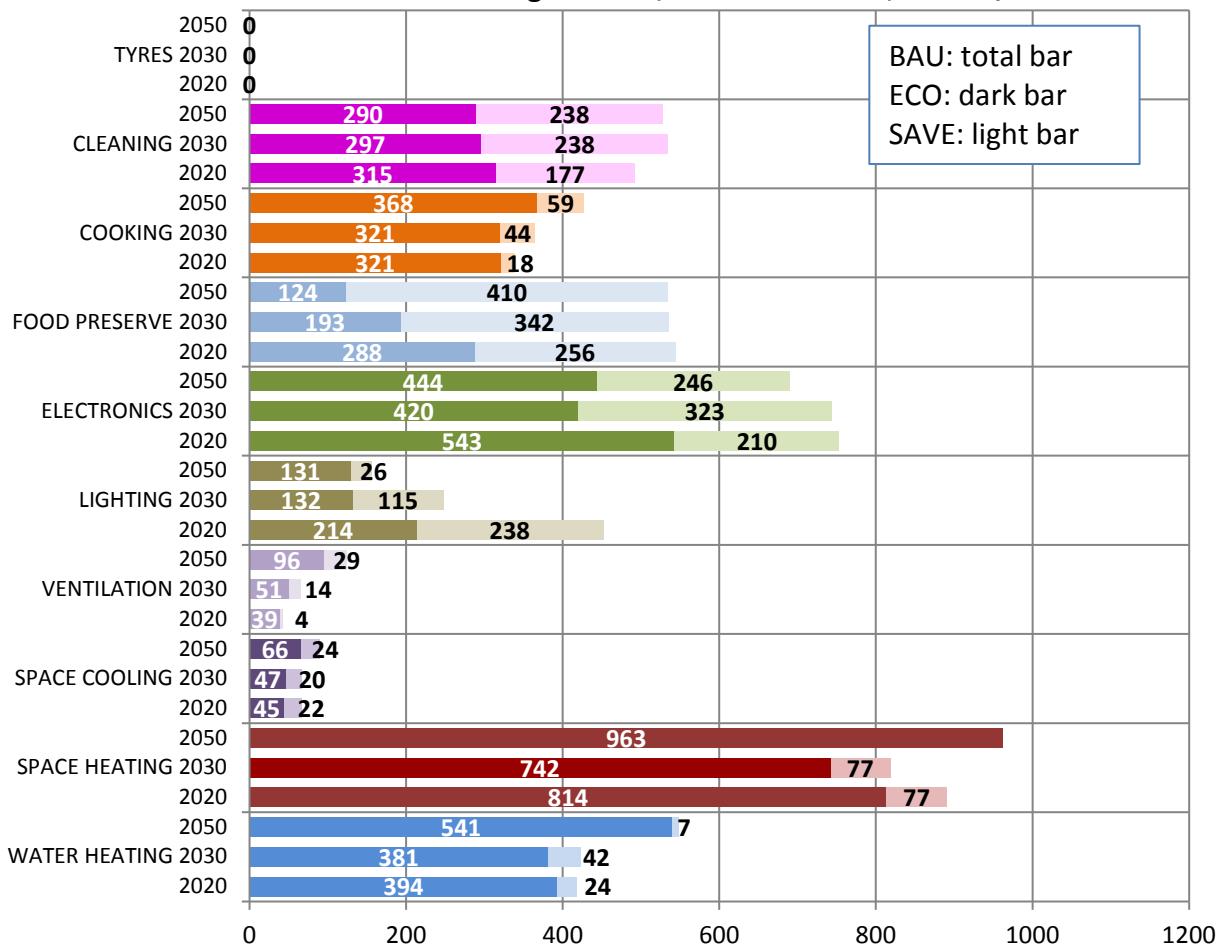
Parameters per Household (hh)	Electricity, kWh/a / household											
	1990 2010			2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
WH dedicated Water Heater	321	385		373	349	24	375	324	51	484	419	65
CHC Central Heating combi,	27	40		45	45	0	48	57	-9	64	121	-57
TOTAL WATER HEATING	348	426		418	394	24	424	381	42	548	541	7
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
TOTAL SPACE HEATING (incl. rev.AC)	1110	1021		891	814	77	819	742	77	893	963	-70
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 mfd's	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 Cleaner, household (excl. cons.)	55	76		101	43	58	150	47	104	145	27	118
VC bags & filters costs												
TOTAL CLEANING	486	491		492	315	177	535	297	238	528	290	238
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

Households

Summary per functional group per household	Electricity, kWh/a / household										
	1990 2010		2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
			BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save
WATER HEATING	348	426	418	394	24	424	381	42	548	541	7
SPACE HEATING	1110	1021	891	814	77	819	742	77	893	963	-70
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	486	491	492	315	177	535	297	238	528	290	238
TYRES	0	0	0	0	0	0	0	0	0	0	0
TOTAL per EU household (direct)	3681	4173	3999	2973	1026	3801	2585	1216	3991	3022	969
TOTAL per EU household (indirect)	7459	9607	10276	9597	678	10642	9219	1424	11456	10136	1320
TOTAL per EU household (direct and indirect)	11139	13780	14274	12570	1704	14443	11803	2640	15447	13157	2289

Electricity per household

ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



Households

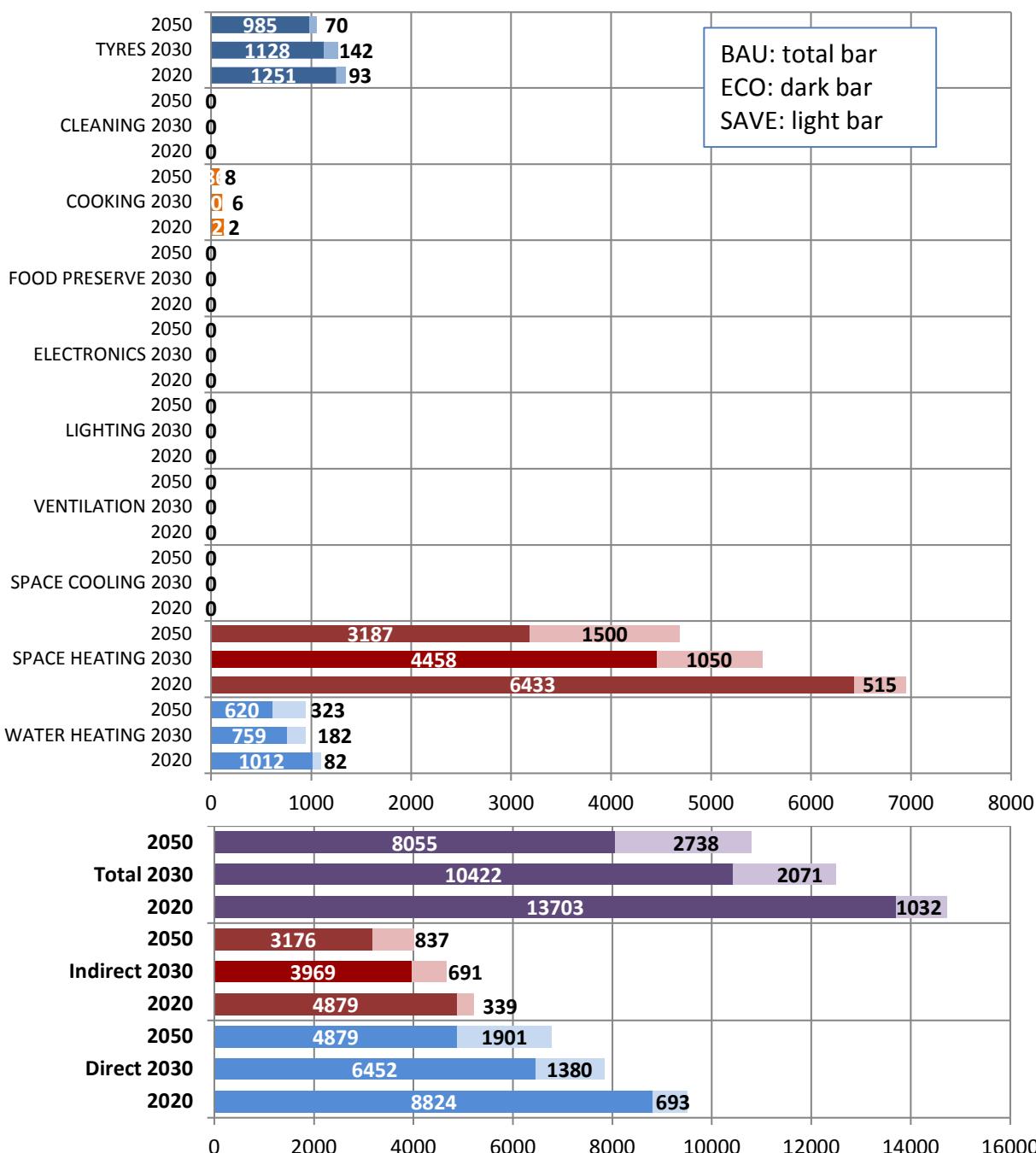
Parameters per Household (hh)	Fuel, kWh NCV/a / household											
	1990 2010			2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
WH dedicated Water Heater	198	168	112	93	19		80	56	24	62	48	15
CHC Central Heating combi,	896	1146	982	919	63		861	703	158	881	573	309
TOTAL WATER HEATING	1094	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
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 Cleaner, household (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
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

Households

Summary per functional group per household	Fuel, kWh NCV/a / household										
	1990 2010		2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
			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
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



Households

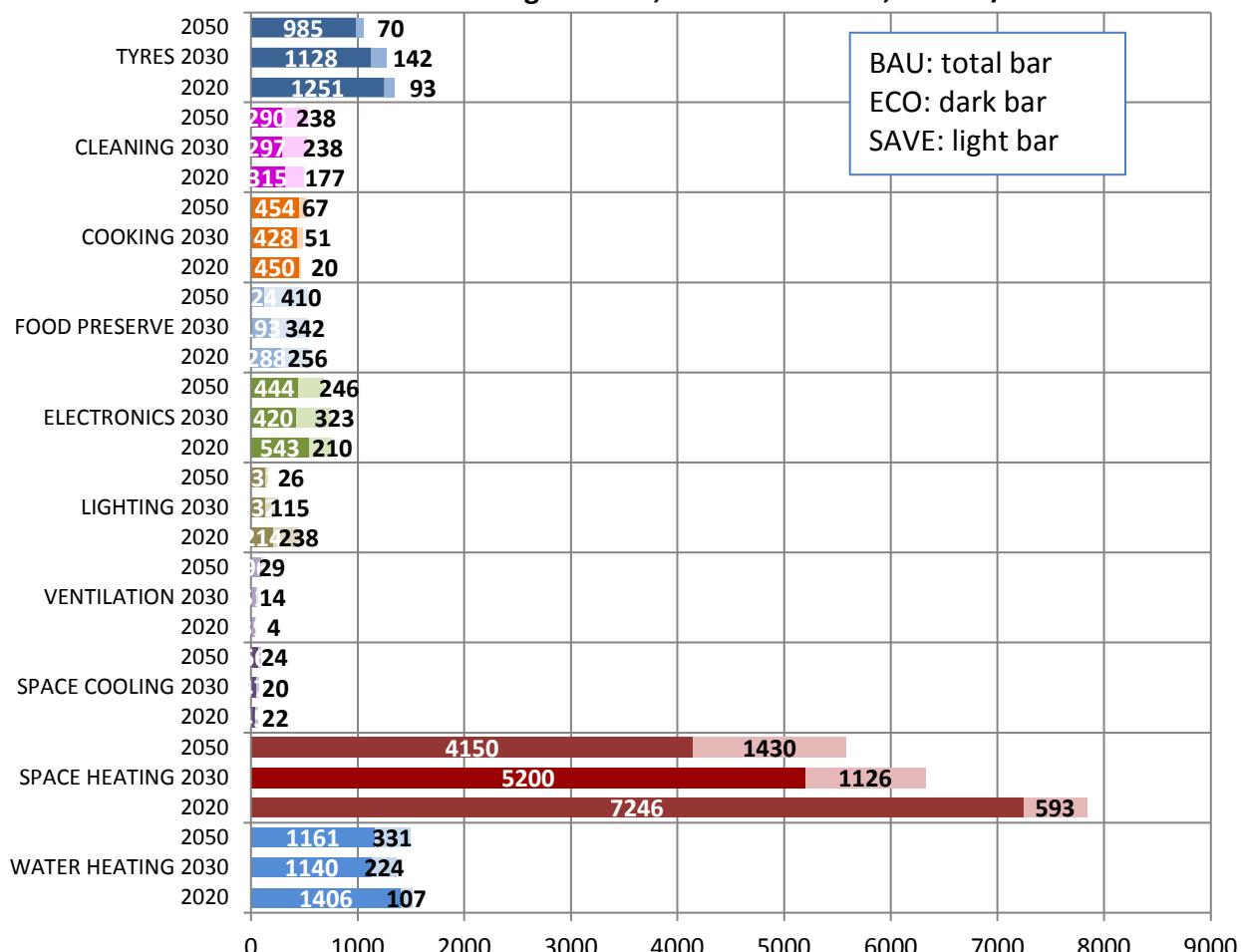
Parameters per Household (hh)	Final Energy, kWh/a / household													
	(residential products only)		1990			2020			2030			2050		
			BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save
WH dedicated Water Heater	519	554	486	442	43	455	380	75	547	467	79			
CHC Central Heating combi,	923	1186	1027	964	63	910	761	149	945	694	251			
TOTAL WATER HEATING	1443	1740	1513	1406	107	1364	1140	224	1492	1161	331			
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			
TOTAL SPACE HEATING (incl. rev.AC)	14539	9889	7839	7246	593	6326	5200	1126	5580	4150	1430			
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 Cleaner, household (excl. cons.)	55	76	101	43	58	150	47	104	145	27	118			
VC bags & filters costs														
TOTAL CLEANING	486	491	492	315	177	535	297	238	528	290	238			
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			

Households

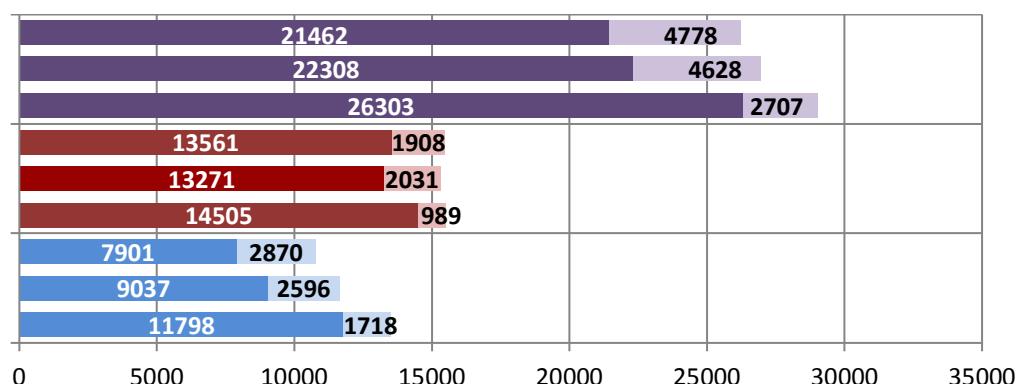
Summary per functional group per household	Final Energy, kWh/a / household											
	1990 2010		2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save			
			BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	
WATER HEATING	1443	1740	1513	1406	107	1364	1140	224	1492	1161	331	
SPACE HEATING	14539	9889	7839	7246	593	6326	5200	1126	5580	4150	1430	
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	486	491	492	315	177	535	297	238	528	290	238	
TYRES	2553	1596	1344	1251	93	1271	1128	142	1055	985	70	
TOTAL per EU household (direct)	20990	16106	13516	11798	1718	11633	9037	2596	10771	7901	2870	
TOTAL per EU household (indirect)	16143	15937	15494	14505	989	15302	13271	2031	15469	13561	1908	
TOTAL per EU household (direct and indirect)	37133	32043	29010	26303	2707	26936	22308	4628	26240	21462	4778	

Final Energy per household

ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



BAU: total bar
ECO: dark bar
SAVE: light bar



Households

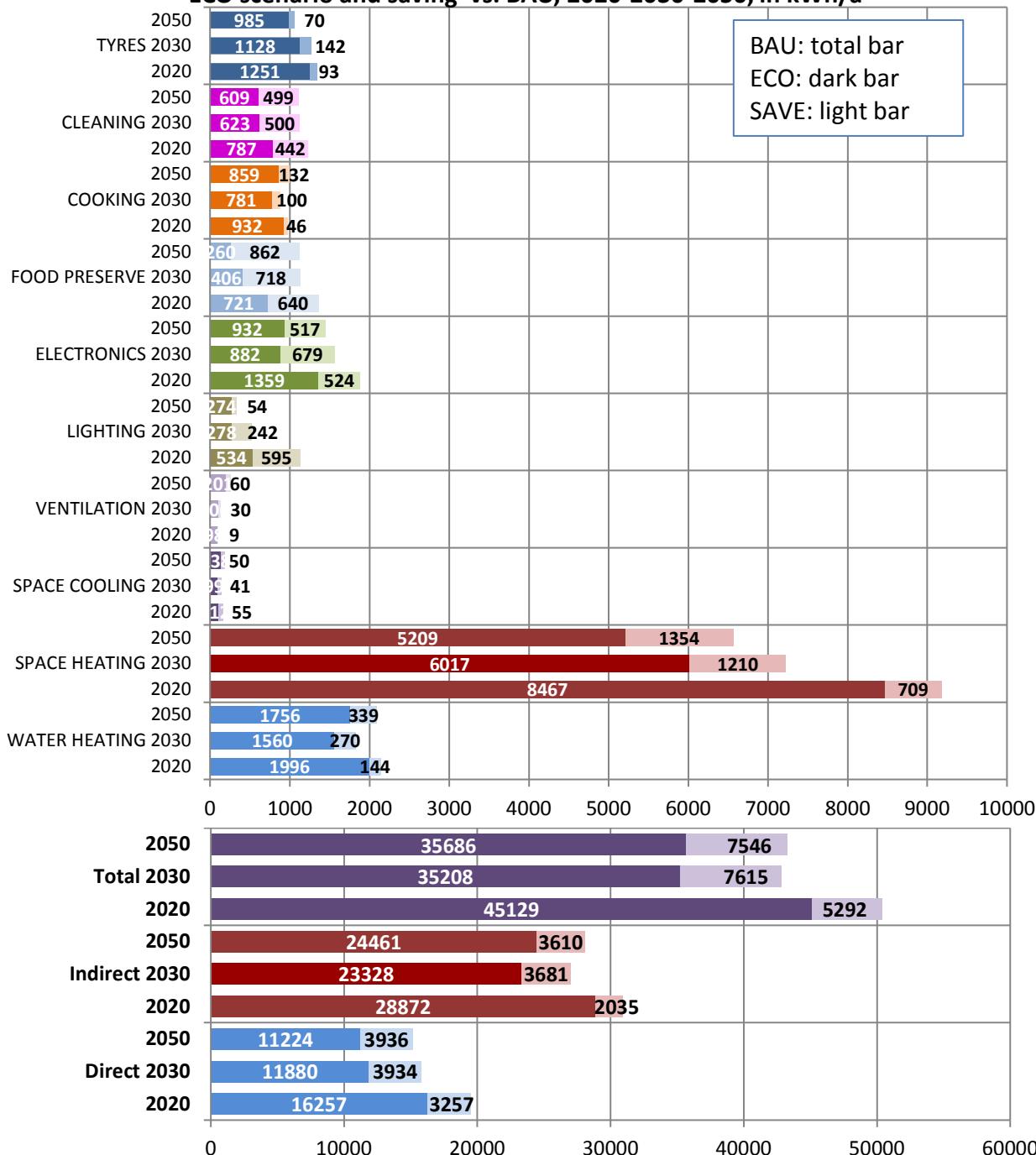
Parameters per Household (hh)	Primary Energy, kWh/a / household											
	1990 2010			2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
	residential products only	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.1	2.1	2.1
Primary Energy Factor for electricity	2.5	2.5	2.5	2.5	2.5	2.5	2.1	2.1	2.1	2.1	2.1	2.1
WH dedicated Water Heater	1001	1132	1045	966	80	867	736	132	1079	929	150	
CHC Central Heating combi,	964	1246	1095	1031	64	963	824	139	1016	828	188	
TOTAL WATER HEATING	1965	2378	2140	1996	144	1830	1560	270	2095	1756	339	
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	
TOTAL SPACE HEATING (incl. rev.AC)	16204	11422	9176	8467	709	7227	6017	1210	6563	5209	1354	
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 Cleaner, household (excl. cons.)	136	189	252	107	145	316	98	218	304	56	248	
VC bags & filters costs												
TOTAL CLEANING	1214	1227	1229	787	442	1123	623	500	1108	609	499	
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	

Households

Summary per functional group per household	Primary Energy, kWh/a / household											
	1990 2010		2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save			
			BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	
WATER HEATING	1965	2378	2140	1996	144	1830	1560	270	2095	1756	339	
SPACE HEATING	16204	11422	9176	8467	709	7227	6017	1210	6563	5209	1354	
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	1214	1227	1229	787	442	1123	623	500	1108	609	499	
TYRES	2553	1596	1344	1251	93	1271	1128	142	1055	985	70	
TOTAL per EU household (direct)	26511	22366	19514	16257	3257	15814	11880	3934	15161	11224	3936	
TOTAL per EU household (indirect)	27331	30348	30907	28872	2035	27009	23328	3681	28071	24461	3610	
TOTAL per EU household (direct and indirect)	53842	52714	50421	45129	5292	42823	35208	7615	43232	35686	7546	

Primary Energy per household

ECO scenario and saving vs. BAU, 2020-2030-2050, in kWh/a



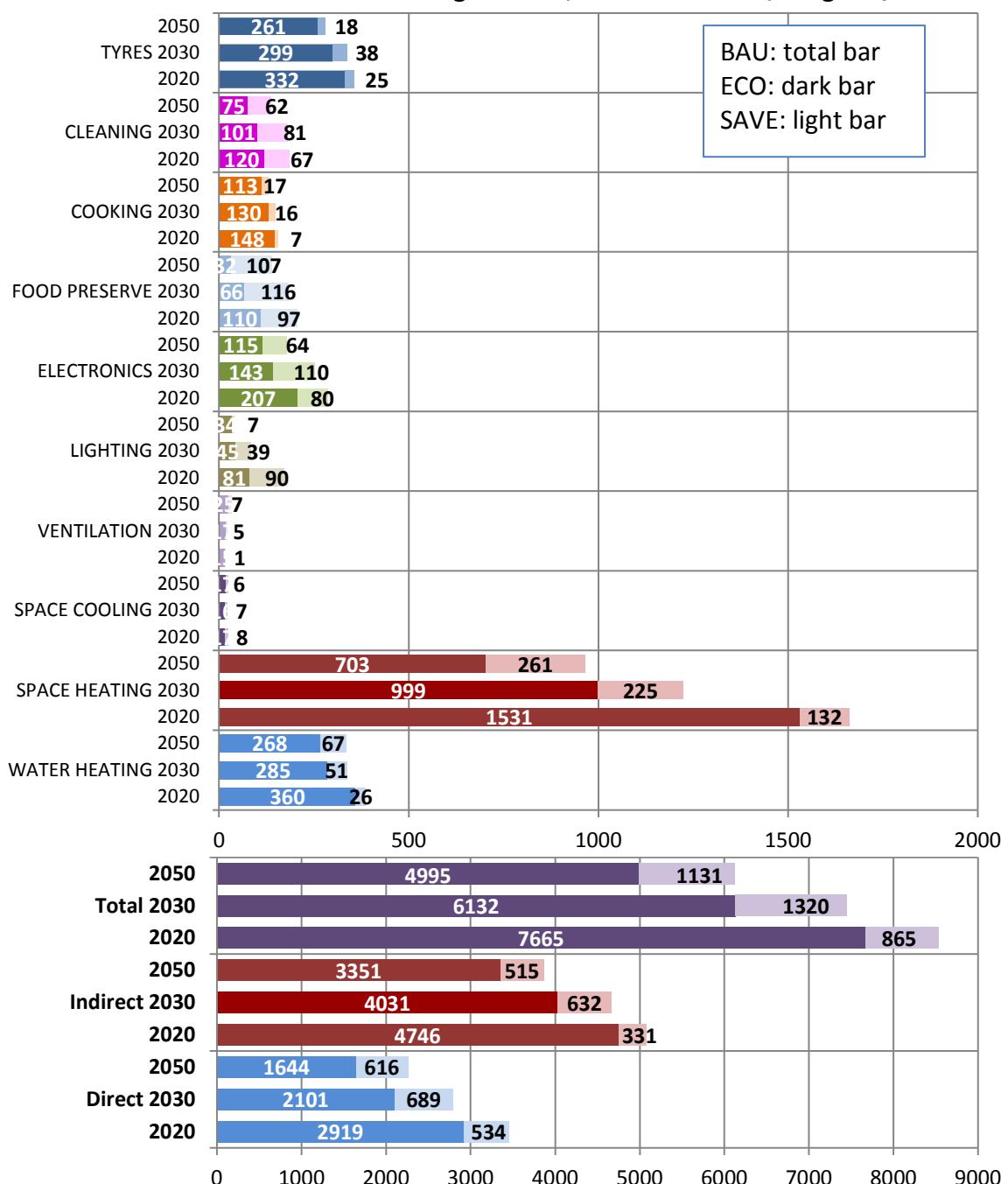
Households

Parameters per Household (hh)	GHG Emissions, kgCO2eq/a / household											
	1990 2010			2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
WH dedicated Water Heater	200	191	164	151	13		143	121	22	138	119	20
CHC Central Heating combi,	217	262	222	209	13		193	164	29	196	149	47
TOTAL WATER HEATING	417	453	387	360	26		336	285	51	334	268	67
CHB Central Heating boiler, space heating	2120	1659	1207	1100	107		912	724	188	726	495	231
SFB Solid Fuel Boilers	892	220	167	165	2		78	73	5	46	42	5
AHC central Air Cooling	1	2	2	2	0		2	2	0	1	1	0
AHC central Air Heating	7	6	5	5	0		4	3	1	2	2	0
LH Local Space Heaters	512	320	240	231	9		175	157	18	115	101	14
RAC Room Air Conditioners < 12 kW, cooling	6	38	23	15	8		21	14	7	22	16	6
RAC Room Air Conditioners < 12 kW, heating	2	43	44	30	13		55	42	14	74	63	11
TOTAL SPACE HEATING (incl. rev.AC)	3534	2249	1662	1531	132		1224	999	225	964	703	261
TOTAL SPACE COOLING	7	40	25	17	8		23	16	7	23	17	6
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		2	2	0	6	5	1
R-UVU > 100 m3/h, large unidirectional	9	14	13	12	1		13	9	3	10	7	3
R-BVU > 100 m3/h, large, bidirectional	0	2	2	2	0		7	6	1	16	13	3
TOTAL VENTILATION	9	16	16	15	1		22	17	5	32	25	7
non-LED light sources	225	202	166	61	105		62	11	51	9	1	8
LED light sources	0	0	6	21	-15		22	34	-12	32	33	-2
TOTAL LIGHTING	225	203	172	81	90		84	45	39	41	34	7
DP Electronic displays, TVs	79	129	139	108	31		128	61	67	89	54	35
DP Electronic displays, Monitors	1	14	5	3	3		4	1	3	2	1	1
STB Set Top Boxes	0	21	32	23	9		24	18	6	18	14	4
GC Game consoles	0	11	18	10	8		15	8	7	11	6	5
PC Personal Computers	35	44	24	24	0		24	24	0	17	17	0
Inkjet printers and multi-functional devices	3	2	1	0	1		1	0	1	1	0	0
Laser printers, copiers and mfd's	5	2	2	1	1		1	0	1	1	0	1
Consumables: paper, ink, toner												
Standby of devices regulated only for Standby	20	58	53	29	24		47	25	22	35	19	16
EPS External Power Supplies (excl. double)	0	11	12	8	4		10	6	4	6	5	2
TOTAL ELECTRONICS	145	291	286	207	80		253	143	110	179	115	64
RF Household Refrigeration	340	235	207	110	97		182	66	116	139	32	107
TOTAL FOOD PRESERVATION	340	235	207	110	97		182	66	116	139	32	107
CA Electric Hobs	62	68	72	70	2		72	69	3	66	64	3
CA Electric Ovens	56	44	38	33	4		34	25	8	27	20	8
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	20	20	19	1		19	15	4	17	12	5
TOTAL COOKING	188	163	155	148	7		147	130	16	130	113	17
WM Washing Machines (excl. cons.)	137	78	61	38	24		46	28	18	26	21	5
WD Washer-Dryers (excl. cons.)	23	19	15	12	3		12	10	2	8	8	0
WM & WD detergent and water costs												
DW Household Dishwashers (excl. cons.)	31	40	46	33	13		49	33	16	49	31	18
DW detergent and water costs												
LD Household Laundry Dryer	24	34	26	21	6		23	14	10	17	9	8
VC Vacuum Cleaner, household (excl. cons.)	27	31	38	16	22		51	16	35	38	7	31
VC bags & filters costs												
TOTAL CLEANING	243	201	187	120	67		182	101	81	137	75	62
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

Households

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	BAU	ECO	Save
WATER HEATING	417	453	26	387	360	26	336	285	51	334	268	67
SPACE HEATING	3534	2249	132	1662	1531	132	1224	999	225	964	703	261
SPACE COOLING	7	40	8	25	17	8	23	16	7	23	17	6
VENTILATION	9	16	1	16	15	1	22	17	5	32	25	7
LIGHTING	225	203	90	172	81	90	84	45	39	41	34	7
ELECTRONICS	145	291	80	286	207	80	253	143	110	179	115	64
FOOD PRESERVE	340	235	97	207	110	97	182	66	116	139	32	107
COOKING	188	163	7	155	148	7	147	130	16	130	113	17
CLEANING	243	201	67	187	120	67	182	101	81	137	75	62
TYRES	677	423	25	357	332	25	337	299	38	280	261	18
TOTAL per EU household (direct)	5785	4273	534	3453	2919	534	2789	2101	689	2260	1644	616
TOTAL per EU household (indirect)	5811	5386	331	5077	4746	331	4663	4031	632	3866	3351	515
TOTAL per EU household (direct and indirect)	11596	9660	865	8530	7665	865	7452	6132	1320	6126	4995	1131

**Greenhouse gas emissions per household
ECO scenario and saving vs. BAU, 2020-2030-2050, in kgCO2/a**



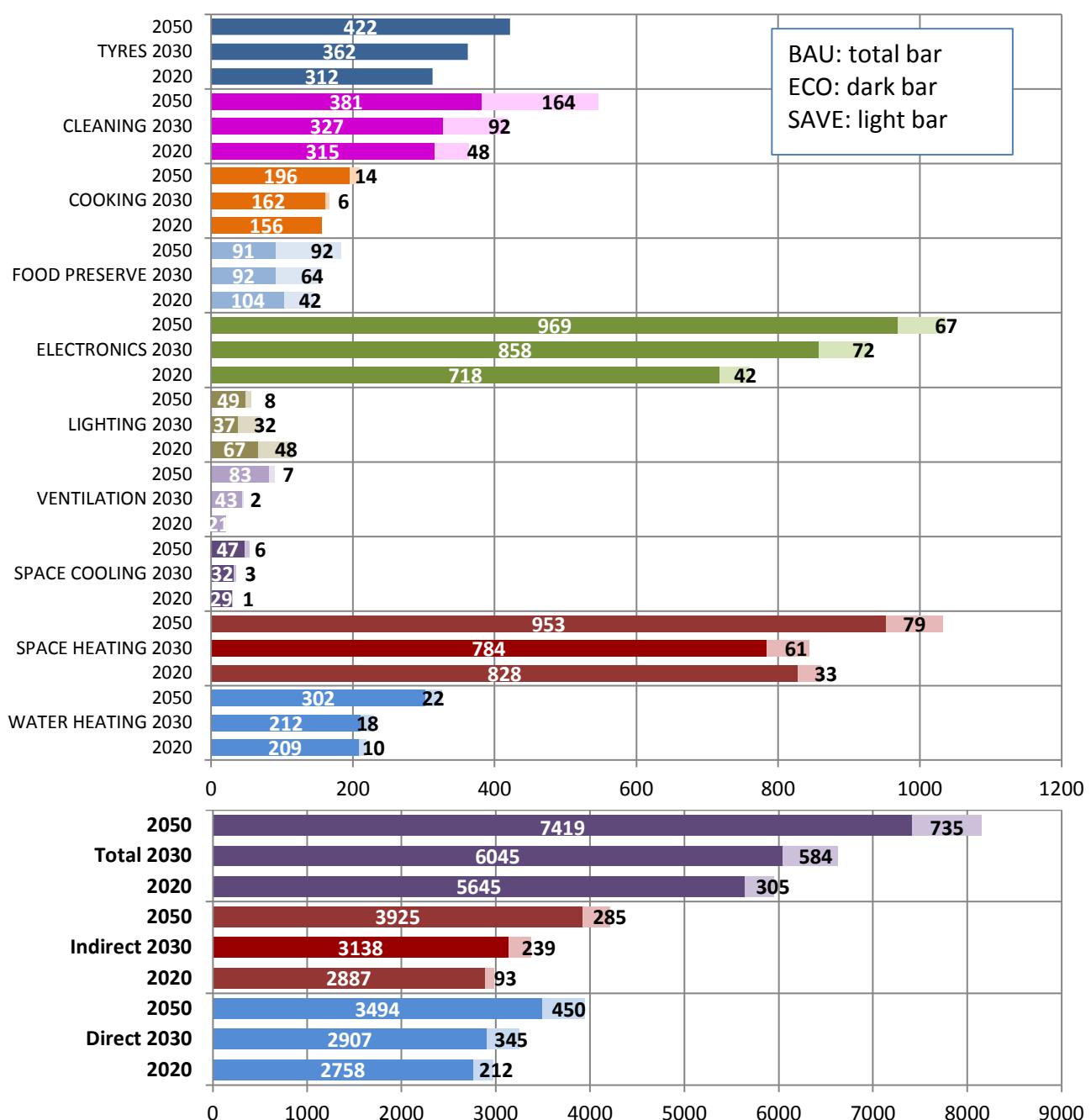
Households

Parameters per Household (hh)	User Expense, 2015 euros/a / household (incl. VAT)													
	(residential products only)		1990 2010			2020 BAU ECO Save			2030 BAU ECO Save			2050 BAU ECO Save		
			BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save
WH dedicated Water Heater	110	118	115	109	6	123	110	13	180	161	19			
CHC Central Heating combi,	78	116	103	100	3	106	102	5	145	142	3			
TOTAL WATER HEATING	188	234	219	209	10	230	212	18	325	302	22			
CHB Central Heating boiler, space heating	602	696	540	510	30	507	461	46	580	534	46			
SFB Solid Fuel Boilers	108	57	57	57	0	54	53	1	87	84	2			
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	3	0			
LH Local Space Heaters	259	224	230	232	-2	231	225	6	259	240	19			
RAC Room Air Conditioners < 12 kW, cooling	5	36	27	26	1	30	28	3	49	43	6			
RAC Room Air Conditioners < 12 kW, heating	1	26	32	26	5	49	42	7	104	92	11			
TOTAL SPACE HEATING (incl. rev.AC)	973	1007	861	828	33	844	784	61	1032	953	79			
TOTAL SPACE COOLING	6	39	30	29	1	34	32	3	53	47	6			
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	6	12	14	14	0	15	13	2	19	16	3			
R-BVU > 100 m3/h, large, bidirectional	0	3	5	5	0	19	19	1	43	40	3			
TOTAL VENTILATION	7	16	21	21	0	45	43	2	90	83	7			
non-LED light sources	102	107	102	36	66	47	6	41	9	0	9			
LED light sources	0	0	13	30	-18	22	32	-9	47	48	-1			
TOTAL LIGHTING	102	108	115	67	48	69	37	32	57	49	8			
DP Electronic displays, TVs	136	198	168	151	16	205	161	44	217	181	37			
DP Electronic displays, Monitors	6	17	9	7	1	8	7	2	8	7	1			
STB Set Top Boxes	0	38	43	38	5	41	37	4	44	40	4			
GC Game consoles	1	26	29	25	4	29	24	5	31	25	6			
PC Personal Computers	70	292	331	331	0	464	464	0	540	540	0			
Inkjet printers and multi-functional devices	5	8	3	3	0	3	2	0	2	2	0			
Laser printers, copiers and mfds	6	8	9	8	1	8	8	1	7	6	1			
Consumables: paper, ink, toner	20	29	14	13	0	9	8	0	6	6	0			
Standby of devices regulated only for Standby	81	129	139	127	13	147	133	14	163	147	17			
EPS External Power Supplies (excl. double)	1	14	16	14	2	15	13	2	16	15	1			
TOTAL ELECTRONICS	326	761	760	718	42	930	858	72	1036	969	67			
RF Household Refrigeration	181	142	146	104	42	155	92	64	184	91	92			
TOTAL FOOD PRESERVATION	181	142	146	104	42	155	92	64	184	91	92			
CA Electric Hobs	41	59	70	70	0	81	80	0	109	107	1			
CA Electric Ovens	50	47	49	48	1	50	44	5	58	50	8			
CA Gas Hobs	20	16	13	13	0	12	12	0	11	11	0			
CA Gas Ovens	8	7	5	6	-1	5	6	-1	5	5	0			
CA Range Hoods	16	16	17	19	-1	20	20	0	27	23	4			
TOTAL COOKING	136	144	154	156	-2	167	162	6	210	196	14			
WM Washing Machines (excl. cons.)	82	66	64	58	6	60	51	9	57	52	6			
WD Washer-Dryers (excl. cons.)	12	11	11	9	2	10	9	1	11	11	0			
WM & WD detergent and water costs	70	71	77	50	27	96	53	43	153	76	77			
DW Household Dishwashers (excl. cons.)	23	35	46	46	0	59	55	4	88	73	15			
DW detergent and water costs	8	14	21	15	6	31	19	11	67	37	30			
LD Household Laundry Dryer	16	22	24	27	-2	26	25	0	28	24	5			
VC Vacuum Cleaner, household (excl. cons.)	34	71	113	104	9	130	107	23	137	105	32			
VC bags & filters costs	6	7	7	7	0	7	7	0	4	4	0			
TOTAL CLEANING	249	299	363	315	48	419	327	92	546	381	164			
Tyres C1, for cars, total	342	326	303	312	-10	359	362	-3	412	422	-10			
TRANSPORT SECTOR	342	326	303	312	-10	359	362	-3	412	422	-10			

Households

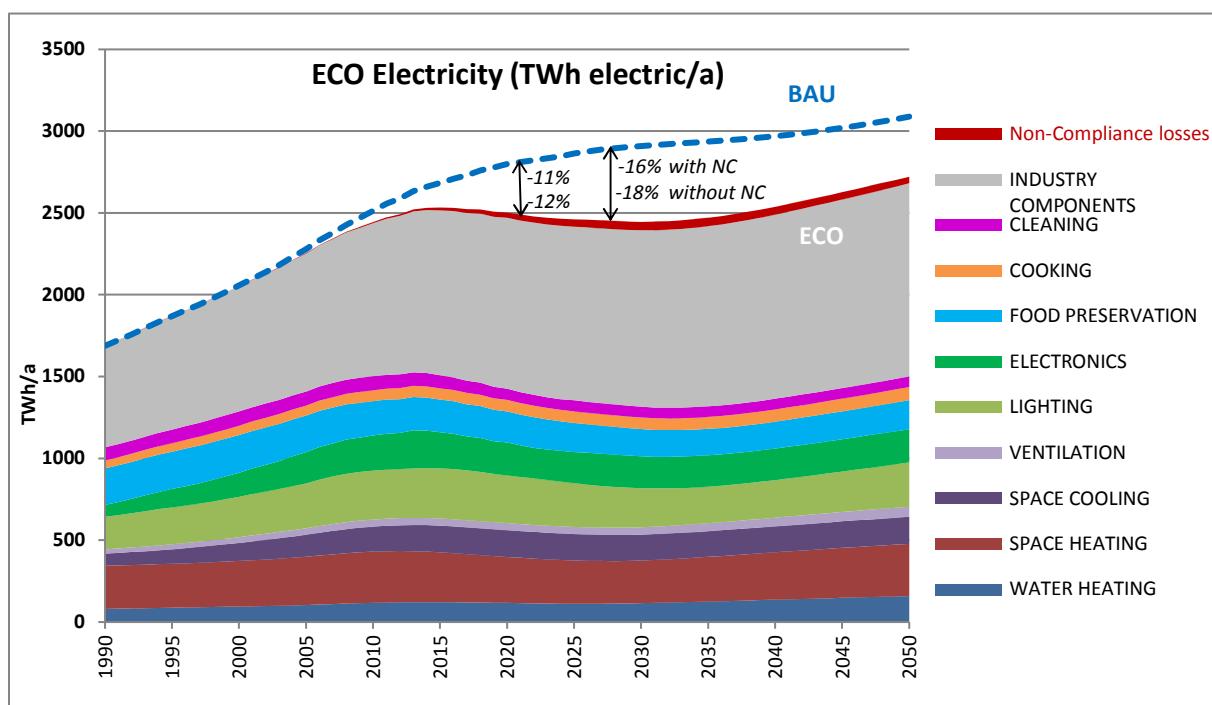
Summary per functional group per household	User Expense, 2015 euros/a / household (incl. VAT)												
	1990		2010		2020			2030			2050		
	BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	BAU	ECO	Save	
WATER HEATING	188	234	46	219	209	10	230	212	18	325	302	22	
SPACE HEATING	973	1007	34	861	828	33	844	784	61	1032	953	79	
SPACE COOLING	6	39	33	30	29	1	34	32	3	53	47	6	
VENTILATION	7	16	9	21	21	0	45	43	2	90	83	7	
LIGHTING	102	108	6	115	67	48	69	37	32	57	49	8	
ELECTRONICS	326	761	435	760	718	42	930	858	72	1036	969	67	
FOOD PRESERVE	181	142	39	146	104	42	155	92	64	184	91	92	
COOKING	136	144	8	154	156	-2	167	162	6	210	196	14	
CLEANING	249	299	50	363	315	48	419	327	92	546	381	164	
TYRES	342	326	16	303	312	-10	359	362	-3	412	422	-10	
TOTAL per EU household (direct)	2510	3075	565	2970	2758	212	3252	2907	345	3944	3494	450	
TOTAL per EU household (indirect)	2120	2849	739	2979	2887	93	3377	3138	239	4210	3925	285	
TOTAL per EU household (direct and indirect)	4630	5924	1553	5950	5645	305	6629	6045	584	8154	7419	735	

**User expense per household (incl. VAT, 2015 euros)
ECO scenario and saving vs. BAU, 2020-2030-2050, in euros/a**



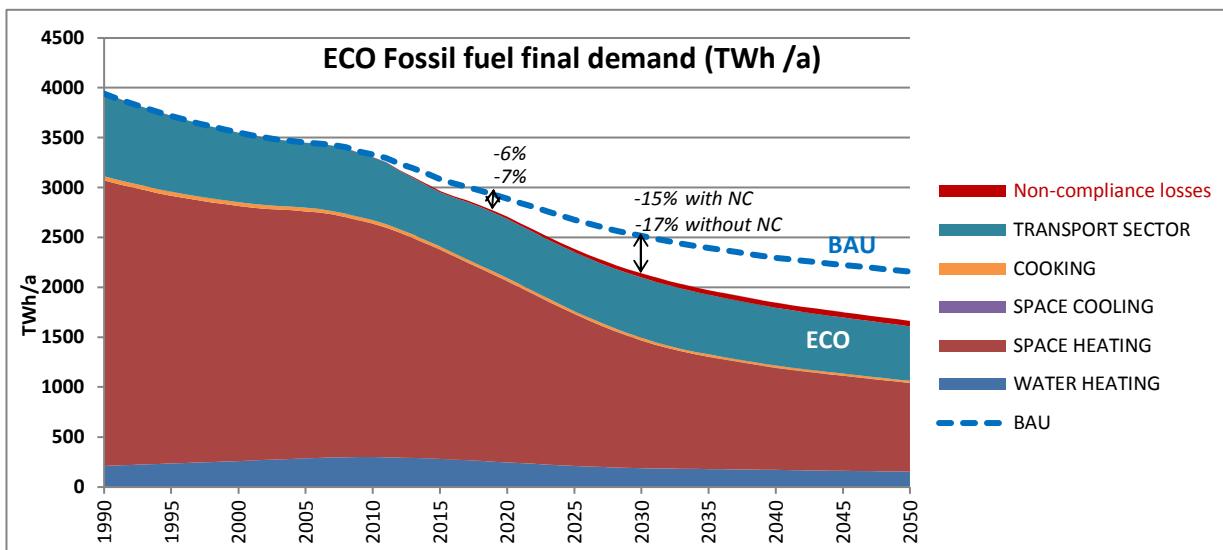
NONCOMPLIANCE

Effects of Non-Compliance (NC) on EIA Totals		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
Savings lost due to non-compliance (NCloss)		10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
<u>ELECTRICITY, Totals incl. Energy sector</u>	TWh										
ELECBAU		1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
ELECECO (without Non-Compliance)		1689	2436	2513	2464	2405	2377	2395	2457	2541	2630
ELECSAVE (without Non-Compliance)		0	76	169	334	459	532	542	512	479	458
ELEC savings lost due to Non-Compliance		0	8	17	33	46	53	54	51	48	46
ELECECO-NC (with Non-Compliance)		1689	2444	2530	2497	2451	2430	2449	2508	2588	2676
ELECSAVE-NC (with Non-Compliance)		0	68	152	301	413	478	488	461	431	412
% saving vs BAU (without Non-Compliance)		0%	-3%	-6%	-12%	-16%	-18%	-18%	-17%	-16%	-15%
% saving vs BAU (with Non-Compliance)		0%	-3%	-6%	-11%	-14%	-16%	-17%	-16%	-14%	-13%
<u>ELECTRICITY, Totals excl. Energy sector</u>	TWh										
ELECBAU		1689	2512	2683	2798	2864	2909	2936	2968	3020	3088
ELECECO (without Non-Compliance)		1689	2436	2515	2469	2416	2394	2419	2489	2581	2680
ELECSAVE (without Non-Compliance)		0	76	168	328	448	515	517	479	438	408
ELEC savings lost due to Non-Compliance		0	8	17	33	45	51	52	48	44	41
ELECECO-NC (with Non-Compliance)		1689	2444	2532	2502	2461	2445	2471	2537	2625	2721
ELECSAVE-NC (with Non-Compliance)		0	68	151	295	403	463	466	431	395	367
% saving vs BAU (without Non-Compliance)		0%	-3%	-6%	-12%	-16%	-18%	-18%	-16%	-15%	-13%
% saving vs BAU (with Non-Compliance)		0%	-3%	-6%	-11%	-14%	-16%	-17%	-16%	-15%	-13%



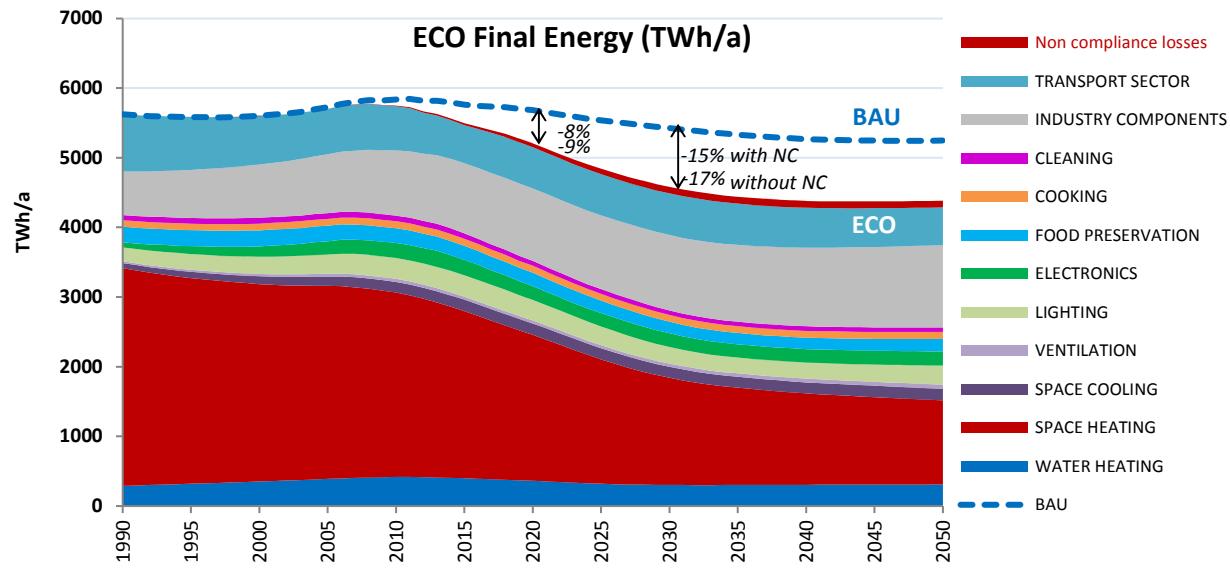
Effects of Non-Compliance (NC) on EIA Totals		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
<u>FUEL, Totals (Energy sector vs BAU is zero)</u>	TWh										
FUELBAU		3940	3329	3082	2888	2678	2516	2395	2297	2226	2158
FUELECO (without Non-Compliance)		3940	3303	2954	2686	2351	2099	1925	1795	1698	1610
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%

NONCOMPLIANCE



Effects of Non-Compliance (NC) on EIA Totals

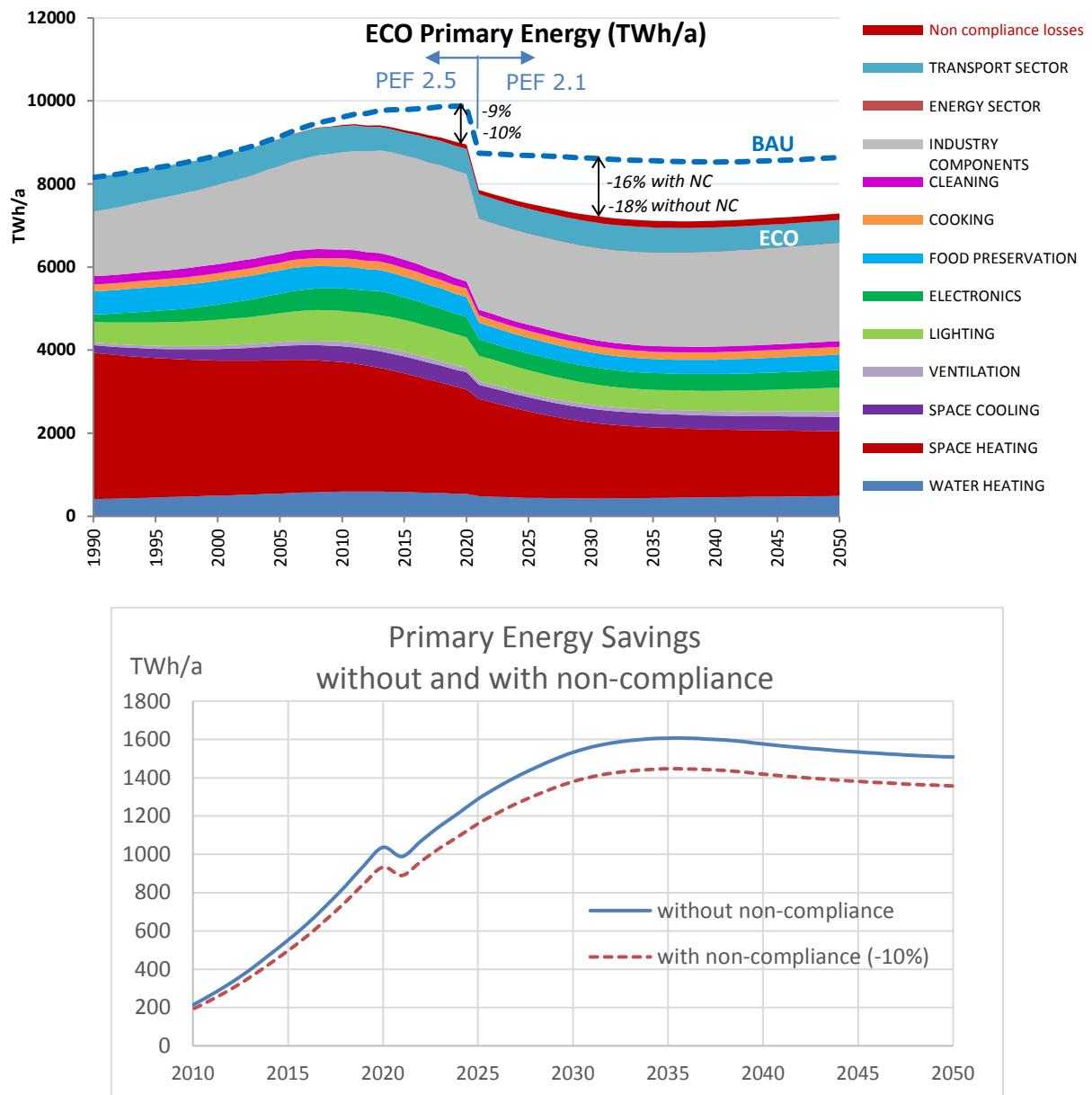
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
FINAL ENERGY, Totals excl. Energy sector	TWh									
FNRGBAU	5629	5840	5765	5685	5541	5424	5331	5265	5245	5246
FNRGECO (without Non-Compliance)	5629	5739	5468	5155	4766	4493	4344	4284	4279	4290
FNRS SAVE (without Non-Compliance)	0	101	297	531	775	932	987	981	966	955
FNRGECO-NC (with Non-Compliance)	5629	5749	5498	5208	4844	4586	4443	4382	4376	4386
FNRS SAVE-NC (with Non-Compliance)	0	91	267	477	697	839	888	883	869	860
NRG savings lost due to Non-Compliance	0	10	30	53	77	93	99	98	97	96
% saving vs BAU (without Non-Compliance)	0%	-2%	-5%	-9%	-14%	-17%	-19%	-19%	-18%	-18%
% saving vs BAU (with Non-Compliance)	0%	-2%	-5%	-8%	-13%	-15%	-17%	-17%	-17%	-16%



Effects of Non-Compliance (NC) on EIA Totals

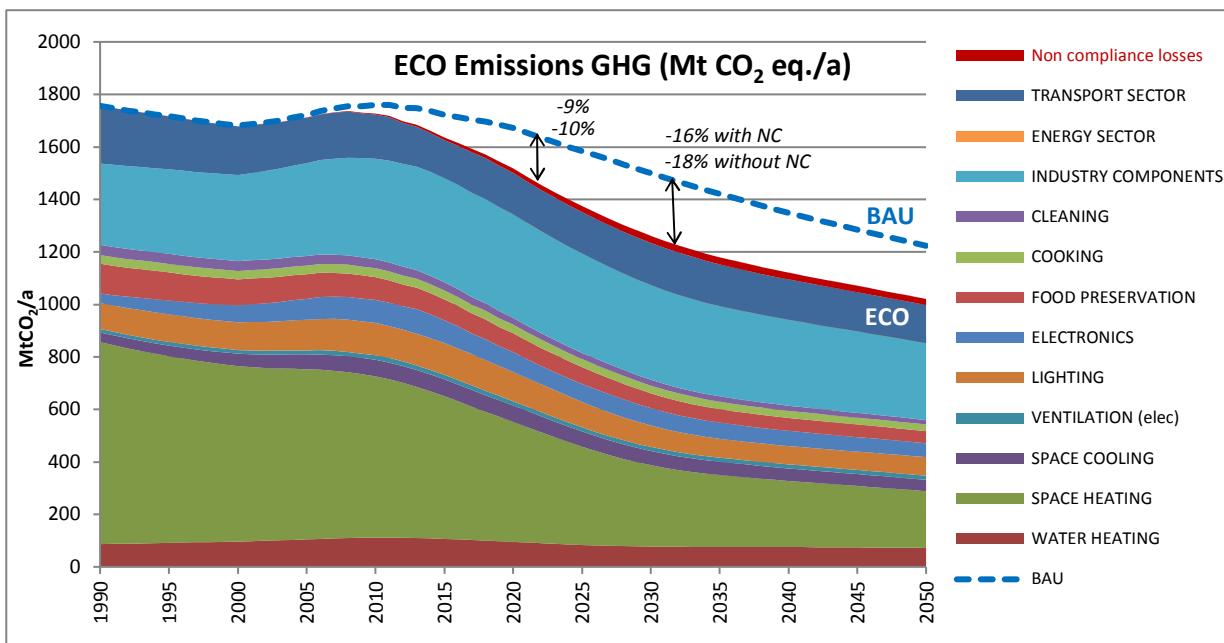
	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
PRIMARY ENERGY, Totals incl. Energy sector vs BAU	TWh									
NRGBAU	8162	9608	9789	9882	8691	8624	8561	8530	8567	8642
NRGECO (without Non-Compliance)	8162	9393	9237	8845	7402	7091	6954	6954	7033	7134
NRGSAVE (without Non-Compliance)	0	214	552	1037	1290	1533	1607	1577	1534	1508
NRGECO-NC (with Non-Compliance)	8162	9415	9292	8948	7531	7244	7114	7111	7187	7285
NRGSAVE-NC (with Non-Compliance)	0	193	497	933	1161	1380	1446	1419	1381	1358
NRG savings lost due to Non-Compliance	0	21	55	104	129	153	161	158	153	151
% saving vs BAU (without Non-Compliance)	0%	-2%	-6%	-10%	-15%	-18%	-19%	-18%	-18%	-17%
% saving vs BAU (with Non-Compliance)	0%	-2%	-5%	-9%	-13%	-16%	-17%	-17%	-16%	-16%

NONCOMPLIANCE



Effects of Non-Compliance (NC) on EIA Totals		1990	2010	2015	2020	2025	2030	2035	2040	2045	2050		
<u>GHG-emissions, Totals incl. Energy sector vs BAU</u>		MtCO2eq	Temporary data (first estimate)										
EMISSBAU			1758	1761	1723	1672	1584	1501	1421	1349	1285	1225	
EMISSECO (without Non-Compliance)			1758	1724	1626	1502	1351	1235	1153	1096	1047	999	
EMISSSAVE (without Non-Compliance)			0	37	96	170	233	266	268	253	238	226	
EMISS savings lost due to Non-Compliance			0	4	10	17	23	27	27	25	24	23	
EMISSECO-NC (with Non-Compliance)			1758	1728	1636	1519	1375	1261	1180	1121	1071	1021	
EMISSSAVE-NC (with Non-Compliance)			0	33	87	153	210	239	241	228	214	203	
% saving vs BAU (without Non-Compliance)			0%	-2%	-6%	-10%	-15%	-18%	-19%	-19%	-19%	-18%	
% saving vs BAU (with Non-Compliance)			0%	-2%	-5%	-9%	-13%	-16%	-17%	-17%	-17%	-17%	

NONCOMPLIANCE



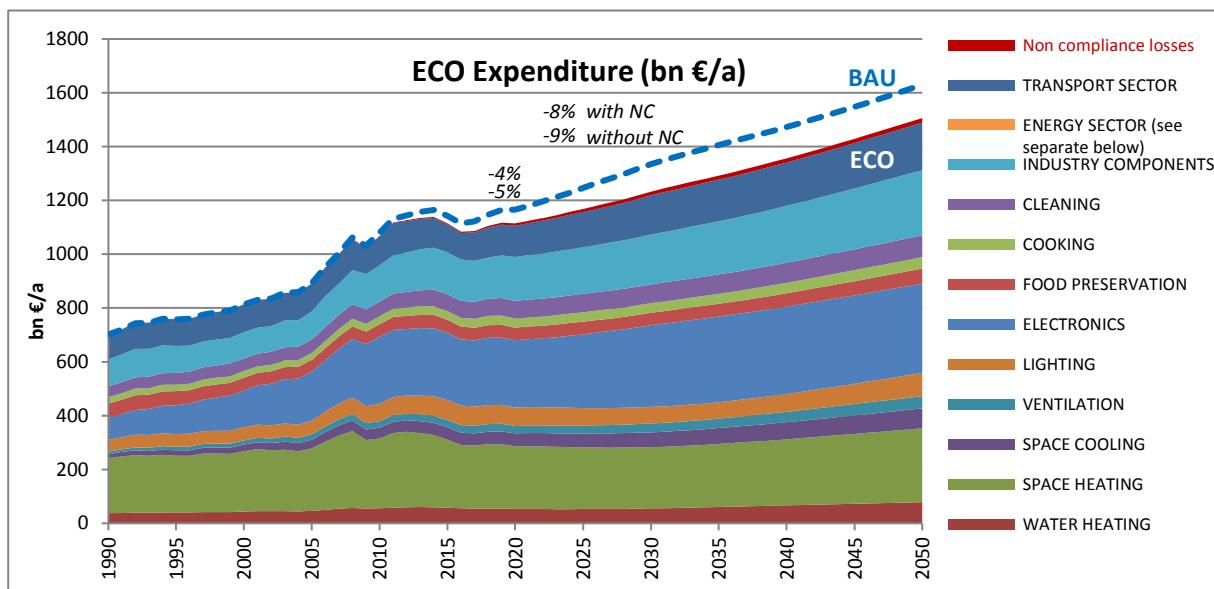
Effects of Non-Compliance (NC) on EIA Totals

	1990	2010	2015	2020	2025	2030	2035	2040	2045	2050
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<u>Energy costs, Totals incl. Energy sector vs BAU</u>	bn euros										
NRGCOSTBAU		490	629	682	673	711	753	795	841	896	958
NRGCOSTECO (without Non-Compliance)		490	614	637	597	599	615	643	685	736	793
NRGCOSTSAVE (without Non-Compliance)		0	15	45	76	112	138	152	156	159	165
NRGCOST savings lost due to Non-Compliance		0	2	5	8	11	14	15	16	16	16
NRGCOSTECO-NC (with Non-Compliance)		490	615	641	605	611	628	658	700	752	810
NRGCOSTSAVE-NC (with Non-Compliance)		0	14	41	68	101	124	137	140	143	148
% saving vs BAU (without Non-Compliance)		0%	-2%	-7%	-11%	-16%	-18%	-19%	-19%	-18%	-17%
% saving vs BAU (with Non-Compliance)		0%	-2%	-6%	-10%	-14%	-17%	-17%	-17%	-16%	-15%

User Expense, Totals incl. Energy sector vs BAU

<u>User Expense, Totals incl. Energy sector vs BAU</u>	bn euros										
EXPENSBAU		702	1080	1144	1166	1246	1335	1405	1473	1548	1630
EXPENSECO (without Non-Compliance)		702	1067	1110	1106	1156	1217	1274	1337	1408	1483
EXPENSSAVE (without Non-Compliance)		0	13	33	60	90	118	131	136	140	147
EXPENS savings lost due to Non-Compliance		0	2	5	8	11	14	15	16	16	16
EXPENSECO-NC (with Non-Compliance)		702	1068	1115	1114	1167	1231	1289	1352	1424	1500
EXPENSSAVE-NC (with Non-Compliance)		0	12	29	52	79	104	116	120	124	130
% saving vs BAU (without Non-Compliance)		0%	-1%	-3%	-5%	-7%	-9%	-9%	-9%	-9%	-9%
% saving vs BAU (with Non-Compliance)		0%	-1%	-3%	-4%	-6%	-8%	-8%	-8%	-8%	-8%



NONCOMPLIANCE

Effects of Non-Compliance (NC), Summary

year 2020

	BAU	ECO	ECO	SAVE	SAVE	loss due
	no NC with NC no NC with NC to NC					
Electricity (TWh/a)	2798	2464	2497	334	301	33
Final Fuel (TWh/a)	2888	2686	2706	202	182	20
Final Energy (TWh/a)	5685	5155	5208	531	477	53
Primary Energy (TWh/a)	9882	8845	8948	1037	933	104
GHG-emissions (MtCO2eq/a)	1672	1502	1519	170	153	17
Energy costs (bn euros/a)	673	597	605	76	68	8
User expense (bn euros/a)	1166	1106	1114	60	52	8

year 2030

	BAU	ECO	ECO	SAVE	SAVE	loss due
	no NC with NC no NC with NC to NC					
Electricity (TWh/a)	2909	2377	2430	532	478	53
Final Fuel (TWh/a)	2516	2099	2141	417	375	42
Final Energy (TWh/a)	5424	4493	4586	932	839	93
Primary Energy (TWh/a)	8624	7091	7244	1533	1380	153
GHG-emissions (MtCO2eq/a)	1501	1235	1261	266	239	27
Energy costs (bn euros/a)	753	615	628	138	124	14
User expense (bn euros/a)	1335	1217	1231	118	104	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: MEASURES

ANNEX B: Status of measures per 31.12.2020

Ecodesign, Energy Labelling, Energy Star & Voluntary Agreements [status 31.12.2020]

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		
Lot	Product	repealed	ED	EL	ES (*)/ VA etc.	
<u>Space- and water heating/cooling</u>						
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.
<u>Lighting</u>						
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				
<u>Electronics</u>						
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 (IE) 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.
<u>Food preservation</u>						
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		

ANNEX B: MEASURES

Lot	Product	repealed	ED	EL	ES (*)/ VA etc.
<u>Cooking</u>					
22 /23	CA Cooking Appliances	CD 2002/40	CR 66/2014	CDR 65/2014	
25	CM household Coffee Makers		in CR 801/2013		see Lot 6/26
<u>Cleaning</u>					
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. 2016 on durability
<u>Industrial components</u>					
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. 2016, incl. also Lot 28 & 29
28	Wastewater Pumps				rev. 2016
29	Pool- & aquarium pumps				rev. 2016
31	CP Standard Air Compressors				WD draft 10/2014; IA draft 9/2015; additional PS completed 2017
E5	Welding Equipment		CR 2019/1784		
<u>Energy sector</u>					
E2	TRAFO Utility Transformers		CR 548/2014 am. 2019/1783		
<u>Transportation sector</u>					
T	TYRE Tyres (replacement and OEM)	Reg. 1222/2009		Reg. 2020/740	
<u>Other (No measures; no data inserted in EIA)</u>					
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.			

ANNEX B: MEASURES

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>).

Awaiting the results of a review study (started in 2021), EIA data do not consider the impacts of this annulment.

ANNEX C: STUDIES

ANNEX C: Studies per 31.12.2020

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	
<u>Space- and water heating/cooling</u>				
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	
<u>Lighting</u>				
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	
37	Lighting Systems	VITO et al, completed 12/2016	SWD(2012)419	
<u>Electronics</u>				
5	DP electronic DisPlays	Fh IZM, Aug. 2007 VHK Aug. 2012 review	SEC(2009)1011 SWD(2019) 354	Guide 2009
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

ANNEX C: STUDIES

Lot	Product	Preparatory study, author(s) and year of publication	EC IA reports	COM, Guide on tests & calculations
<u>Food preservation</u>				
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	
<u>Cooking</u>				
22 /23	CA Cooking Appliances	BIOIS/ERA, Aug. 2011 (hobs, ovens); Armines, Mar.2009 (hoods)	SWD(2014)3 SWD(2014)4 SEC(2014)43	
25	CM household Coffee Makers	BIOIS/ARTS, July 2011		
<u>Cleaning</u>				
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. started 2021	SWD(2013)240 SWD(2013)241 SEC(2013)385	
<u>Industrial components</u>				
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 2016 all pumps	SWD(2012)178 SWD(2012)179 SEC(2012)392	
28	Wastewater Pumps	BIOIS/ Atkins, Jan/Feb 2014		
29	Pool- & aquarium 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	
<u>Energy sector</u>				
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		
<u>Transportation sector</u>				
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	
<u>Other (more information on sheet 'Measures')</u>				
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

ANNEX C: STUDIES

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 und 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
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 31.12.2020

Lot	Acro	Base cases
1	CHB Boilers and combiboilers	
	SH	<i>Base cases for space heating (rated heat output ≤ 400 kW):</i>
		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 m ²)
	WH	<i>Base cases for water heating (rated heat output ≤ 400 kW):</i>
		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 m ²)
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 m ²)
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)
		Scanners (not covered by VA, not in IA 2013, limited data in Review study)
		disappearing from market)
		not in EIA
		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	<ul style="list-style-type: none"> a. 5W low voltage (e.g. mobile phone and rechargeable grooming products) b. 10W normal voltage (e.g. tablets, smart phones etc.) c. 12W normal voltage (e.g. small network equipment and set-top boxes etc.) d. 18W normal voltage (e.g. portable devices and portable game consoles etc.) e. 30W normal voltage (e.g. notebook computer) f. 36W multiple voltage output (e.g. multi-device universal chargers etc.) g. 65W normal voltage (e.g. high-end notebooks computers) h. 120W normal voltage (e.g. high-end notebook computers) i. 120W Multiple voltage output (e.g. stationary game consoles) j. 15 W normal voltage (e.g. loudspeakers and sound systems) 	EIA name: EPS ≤ 6W, low-V EPS 6–10 W EPS 10–12 W EPS 15–20 W EPS 20–30 W EPS 30–65 W, multiple-V EPS 30–65 W EPS 65–120 W EPS 65–120 W, multiple-V EPS 12–15 W
8/9	LS Tertiary Lighting, Lot 8–9	LFL T12 (Linear Fluorescent Lamps diameter 38 mm, incl. ballast) (res & nres) 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) 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) LED replacing CFLni incl. control gear (retrofit & luminaire) (res & nres)	EIA aggregated BC: LFL
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 <i>Residential ventilation and kitchen hoods Lot 10 (now in ENTR Lot 6 Ventilation for ventilation; in Lot 22/23 for hoods)</i>	EIA: CFLni
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), Small End Suction Own Bearings (ESOB), Large End Suction Close Coupled (ESCC), Small End Suction Close Coupled (ESCC), Large End Suction Close Coupled, Inline, (ESCCI), Small End Suction Close Coupled, Inline, (ESCCI), Large Submersible Multistage (MSS), Small Submersible Multistage (MSS), Large Vertical Multistage(MS), Small Vertical Multistage(MS), Large	single aggregated base case in EIA

Lot	Acro	Base cases
12	CF (now: refrigerating appliances with a direct sales function)	<p>Commercial refrigerators and freezers, Lot 12</p> <ul style="list-style-type: none"> 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	<p>Total (aggregate from)</p> <ul style="list-style-type: none"> Domestic Refrigerators (incl. fridge-freezers) Domestic Freezers
14	WM Domestic washing machines, Lot 14	<p>Domestic washing machines (6, 7, 8, 9 kg capacity; aggregate in EIA)</p> <ul style="list-style-type: none"> Domestic washer-dryers
14	DW Domestic dishwashers, Lot 14	<p>Domestic dishwashers</p>
15	SFB Solid fuel small combustion installations, Lot 15	<p>Small domestic man. Boiler (Wood logs): WOODMANB</p> <ul style="list-style-type: none"> Small domestic DD (DownDraft) gasifying boiler (Wood) WOODDBB Retort boiler (Coal) COALB Pellet boiler (Pellets) PELLB Non-domestic chip boiler (Wood chips) CHIPB
16	LD Domestic laundry driers (LD), Lot 16	<p>LD condensing heat pump</p> <ul style="list-style-type: none"> LD condensing electric heat element LD vented electric LD vented gas
17	VC Vacuum cleaners (VC), Lot 17	<p>Domestic VCs</p> <ul style="list-style-type: none"> Non-domestic (dry vac) VCs
18	STB Complex set-top boxes (CSTB), Lot 18	<p>Basic CSTB with SD (Standard Definition signal)</p> <ul style="list-style-type: none"> 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	<p>SSTB</p> <ul style="list-style-type: none"> SSTB /PVR (Personal Video Recorder)
19	LS Non-directional (NDLS) and Directional Light Sources (DLS) Lot 19	<p>GLS R (General Lighting Service incandescent lamp, with reflector, DLS) (res & nres)</p> <p>GLS X (General Lighting Service incandescent lamp, all other shapes, NDLS) (res & nres)</p> <p>HL LV R (Low Voltage Halogen Reflector lamps, MR11, MR16, etc., GU4, GU5.3 cap, DLS) (res & nres)</p> <p>HL MV X (Mains Voltage Halogen Reflector lamps, R- & PAR-lamps, etc. GU10 or E-cap, DLS) (res & nres)</p> <p>HL LV C (Low Voltage Halogen capsules, G4, GY6.35 caps, NDLS) (res & nres)</p> <p>HL MV C (Mains Voltage Halogen capsules, G9 cap, NDLS) (res & nres)</p> <p>HL MV E (Mains Voltage Halogen lamps, E-cap, substitute for GLS, NDLS) (res & nres)</p> <p>HL MV L (Mains Voltage Linear Halogen lamps, R7s cap, NDLS) (res & nres)</p> <p>CFLi (Compact Fluorescent Lamp with integrated control gear, substitute for HL & GLS, NDLS) (res & nres)</p> <p>LED replacing DLS, incl. control gear (retrofit & luminaire) (res & nres)</p> <p>LED replacing NDLS, incl. control gear (retrofit & luminaire) (res & nres)</p>

EIA aggregated BC : GLS

EIA aggregated BC : HL

EIA: CFLi

Lot	Acro	Base cases
20	LH Local room heating products, Lot 20	<ul style="list-style-type: none"> 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)	<p>Cooling:</p> <ul style="list-style-type: none"> 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) <p>Heating:</p> <ul style="list-style-type: none"> 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)	<ul style="list-style-type: none"> 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 <i>(currently 20 basecase in IA, but probably to reduce to 9 below)</i>
		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
		Pad filter coffeemaker	data only (under SB heading). On-mode data removed in EIA 2019
		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)	
		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)	
		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)	
		<i>Smart phones</i>	
		<i>Classic cell phones</i>	
		<i>Faxes</i>	
		<i>Charging stands</i>	
		<i>Hair clippers and dryers</i>	
		<i>Motor-operated building elements</i>	
		<i>Elevation beds</i>	
		<i>Height-adjustable desks</i>	
		<i>Simple Set-Top Boxes (SSTB)</i>	
		<i>Desktop PCs</i>	
		<i>Notebooks and tablets</i>	
		<i>Simple TV</i>	
		<i>Complex TV</i>	
		<i>Displays (Monitors)</i>	
		<i>LV-EPS</i>	

Lot	Acro	Base cases	
27	UPS	Uninterruptible power supplies (UPS), Lot 27 (no regulation)	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)	
29	PP	Large pumps and pumps for pools, fountains, aquariums, Lot 29 (no final regulation)	not in EIA
		Swimming Pool pumps(integrated motor+pump) Fountain, pond, aquarium, spa and counter-current pumps End Suction water pumps(over 150kW-P2) Submersible bore-hole pumps Vertical multi-stage pumps	
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)	
		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)
		<i>Blast cabinets (only information requirements in CR 2015/1095, no energy efficiency effects: not included in EIA)</i>
		<i>Walk in cold rooms (not in scope of CR 2015/1095: not included in EIA)</i>
		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
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
E4	IO	Industrial ovens, ENTR Lot 4 (product group abandoned for Ecodesign)
		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)
		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)	EIA single aggregated BC, Welding Equipment
		Manual metal arc welding (MMA) 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)	
		<u>Residential</u> 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 <u>Non-Residential</u> 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
		<i>The base cases from the prep. study represent typical electric circuits in line with the market structure:</i> 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 NQ 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 C₀2), solar assisted WHs.

WH Dedicated Water Heater	unit	1990		2010		2020		2030	
		Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc
Sales volume	'000		8,395	9,499	9,499	0	9,303	9,303	0
Stock of units in use	'000		116,775	149,821	149,821	0	146,884	146,884	0
Effective heat output per unit	kWh/a		632	719	719	0	758	758	0
EU effective heat output	TWh heat/a		74	108	108	0	111	111	0
EU hot water (60 °C) use	M m ³ /a		1,264	1,847	1,847	0	1,909	1,909	0
Primary energy	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
o/w electricity	TWh prim/a	234	317	317	0	315	291	-24	269
o/w fuel	TWh elec/a	75	108	108	0	113	105	-7	116
Final energy	TWh fuel/a	46	47	47	0	34	28	-6	25
GWP emissions	TWh final/a	121	155	155	0	146	133	-13	141
Acquisition costs (incl. install)	MtCO ₂ /a	47	54	54	0	49	46	-4	44
Energy costs	bn €	3	4	4	0	3	3	0	4
Maintenance costs	bn €	17	22	22	0	23	22	-2	26
Total running costs	bn €	4	6	6	0	6	6	0	6
Total expenditure	bn €	21	28	28	0	29	27	-2	32
Revenue Industry	m €	1216	1608	1608	0	1504	1504	0	1703
Revenue Wholesale	m €	3752	5093	5093	0	5104	5104	0	5225
Revenue Retail	m €	15	20	20	0	18	18	0	21
Revenue Installation	m €	1	1	1	0	1	1	0	1
Revenue Maintenance (excl. VAT)	m €	1	1	1	0	1	1	0	1
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	1	1	1	0	1	1	0	1
Jobs Wholesale	'000 jobs	49	66	66	0	65	65	0	69
Jobs Retail/ installation/ maintenance	'000 jobs	65	87	87	0	84	84	0	91
Jobs Total	'000 jobs	65	87	87	0	84	84	0	91

ANNEX: KEY FACTS

(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. O₂ 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
Sales	'000	3,362	4,643	4,643	0	5,092	5,036	-56	5,329
Stock	'000	49,793	85,552	85,552	0	90,621	89,981	-640	92,230
Effective heat output per unit	kWh/a	2,106	2,163	2,163	0	2,143	2,143	0	2,120
EU effective heat output	TWh heat/a	105	185	185	0	194	193	-1	196
EU hot water (60 °C) use	M m ³ /a	1,797	3,172	3,172	0	3,329	3,306	-23	3,353
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	177	276	276	0	260	245	-15	235
o/w electricity	TWh elec/a	5	9	9	0	11	11	0	12
o/w fuel	TWh fuel/a	165	254	254	0	234	219	-15	211
Final energy	TWh final/a	170	262	262	0	244	229	-15	222
GWP emissions	MtCO ₂ /a	40	58	58	0	53	50	-3	47
Acquisition costs (incl. install)	bn €	3	3	3	0	3	4	0	4
Energy costs	bn €	9	19	19	0	18	17	-1	19
Maintenance costs (incl. VAT)	bn €	2	3	3	0	3	3	0	3
Total running costs	bn €	11	22	22	0	20	19	-1	21
Total expenditure	bn €	14	25	25	0	24	23	-1	25
Revenue Industry	m €	783	839	839	0	890	949	59	974
Revenue Wholesale	m €	210	225	225	0	239	255	16	262
Revenue Retail	m €	210	225	225	0	239	255	16	262
Revenue Installation	m €	1314	1381	1381	0	1472	1626	155	1646
Revenue Maintenance (excl. VAT)	m €	1381	2211	2211	0	2248	2223	0	2219
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	15	16	16	0	16	18	1	18
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1
Jobs Retail/ installation/ maintenance	'000 jobs	28	37	37	0	38	40	1	40
Jobs Total	'000 jobs	43	53	53	0	56	58	3	59
									73
									14

CHB Central Heating boiler < 400 kW space heating	unit	1990		2010		2020		2030	
		Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc
Sales	'000	4,121	5,098	5,098	0	5,548	5,548	0	5,904
Stock	'000	61,069	98,280	98,280	0	102,939	102,939	0	105,357
Effective heat output per unit	kWh/a	14,599	10,825	10,825	0	9,339	9,263	-76	8,131
EU effective heat output	TWh heat/a	892	1,064	1,064	0	961	954	-8	857
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	1957	1973	1950	-23	1610	1462	-148	1288
o/w electricity	TWh elec/a	54	65	64	-1	69	63	-5	69
o/w fuel	TWh fuel/a	1821	1811	1791	-21	1439	1304	-135	1143
Final energy	TWh final/a	1875	1876	1854	-22	1507	1367	-140	1212
GWP emissions	MtCO ₂ /a	459	432	427	-5	338	308	-30	262
Acquisition costs (incl. install)	bn €	17	19	19	0	18	20	2	20
Energy costs	bn €	96	136	135	-2	108	98	-10	101
Maintenance costs (incl. VAT)	bn €	11	16	16	0	16	16	0	16
Total running costs	bn €	106	152	151	-2	124	114	-10	116
Total expenditure	bn €	123	171	170	-2	142	134	-8	136
Revenue Industry	m €	4784	5337	5337	0	4863	5291	428	5442
Revenue Wholesale	m €	1243	1387	1387	0	1264	1375	111	1414
Revenue Retail	m €	1243	1387	1387	0	1264	1375	111	1414
Revenue Installation	m €	7221	8568	8568	0	8045	9255	1210	9261
Revenue Maintenance (excl. VAT)	m €	9438	14007	14007	0	14029	14005	-24	13809
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	89	99	99	0	90	98	8	101
Jobs Wholesale	'000 jobs	5	5	5	0	5	5	0	5
Jobs Retail/ installation/ maintenance	'000 jobs	173	230	230	0	224	237	13	235
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			
		'000	274	'000	610	'000	400	'000	403		
Sales	'000	13,738		7,699		9,068		7,783			
Stock	'000	17,501		18,691		17,300		15,763			
Effective heat output per unit	kWh/a	240		144		157		123			
EU effective heat output	TWh heat/a										
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 €	16	8	8	0	10	10	0	10	9	-1
Maintenance costs (incl. VAT)	bn €	1	0	0	0	0	0	0	0	0	0
Total running costs	bn €	17	8	8	0	10	10	0	10	9	-1
Total expenditure	bn €	18	12	12	0	13	13	0	13	13	0
Revenue Industry	m €	746	2359	2359	0	1861	1988	128	2044	2223	180
Revenue Wholesale	m €	29	91	91	0	72	77	5	79	86	7
Revenue Retail	m €	29	91	91	0	72	77	5	79	86	7
Revenue Installation	m €	376	872	872	0	624	686	61	662	730	68
Revenue Maintenance (excl. VAT)	m €	569	322	322	0	382	382	0	332	332	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	14	44	44	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	49	53	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 °C; 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, CO₂ 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			
		'000	124	'000	526	'000	620	'000	684		
<i>o/w CH, comfort chillers</i>	'000	22		94		113		136			
<i>o/w AC, air conditioners</i>	'000	87		408		479		517			
<i>o/w HT PCH, high temp. process chillers</i>	'000	15		24		28		30			
Stock comfort chillers & reversibles	'000	1,471		6,539		8,793		10,113			
<i>o/w CH, comfort chillers</i>	'000	300		1,276		1,913		2,338			
<i>o/w AC, air conditioners</i>	'000	1,004		4,963		6,502		7,348			
<i>o/w HT PCH, high temp. process chillers</i>	'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
<i>o/w electricity</i>	TWh elec/a	70	133	133	0	155	151	-3	157	145	-12
<i>o/w fuel</i>	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	MtCO ₂ /a	35	55	55	0	59	58	-1	53	49	-4
Acquisition costs (incl. install)	bn €	1	7	7	0	10	10	0	13	13	0
Energy costs	bn €	12	20	20	0	25	24	-1	28	25	-2
Maintenance costs (incl. VAT)	bn €	1	4	4	0	6	6	0	8	8	0
Total running costs	bn €	13	24	24	0	31	31	-1	36	34	-2
Total expenditure	bn €	14	31	31	0	41	41	-1	49	47	-2
Revenue Industry	m €	822	3886	3886	0	5337	5339	2	6744	6745	1
Revenue Wholesale	m €	103	489	489	0	671	671	0	847	847	0
Revenue Retail	m €	103	489	489	0	671	671	0	847	847	0
Revenue Installation	m €	404	2298	2298	0	3282	3283	1	4220	4221	1
Revenue Maintenance (excl. VAT)	m €	929	4077	4077	0	6418	6418	0	8456	8456	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	15	72	72	0	99	99	0	125	125	0
Jobs Wholesale	'000 jobs	0	2	2	0	2	2	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	14	67	67	0	100	100	0	130	130	0
Jobs Total	'000 jobs	30	140	140	0	202	202	0	258	259	0

ANNEX: KEY FACTS

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	49	49	0	41	39	-2	34	28	-6
Acquisition costs (incl. install, excl. rev.AC)	bn €	0.7	0.4	0.4	0.0	0.4	0.4	0.0	0.3	0.4	0.0
Energy costs	bn €	10	14	14	0	13	13	-1	14	11	-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	14	14	0	14	13	-1	14	12	-2
Total expenditure (excl. acq & maint rev AC)	bn €	11	15	15	0	14	13	-1	14	12	-2
Revenue Industry (excl. rev. AC)	m €	323	211	211	0	186	203	18	166	180	14
Revenue Wholesale (")	m €	41	27	27	0	23	26	2	21	23	2
Revenue Retail (")	m €	41	27	27	0	23	26	2	21	23	2
Revenue Installation (")	m €	269	175	175	0	154	169	15	138	149	12
Revenue Maintenance (", excl. VAT)	m €	98	96	96	0	83	83	0	73	73	0
Jobs Industry (%), OEM (%) & services (%)	'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 biomass, 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 positively corrected for the effects of controls. The regulation also limits the emission of particulate matter (PM), organic gaseous compounds (OGCs), carbon monoxide (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 positively 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		
EU effective heat output	TWh heat/a	209	234	234	0	239	237	-1	234		
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	84	84	0	67	64	-3	50	45	-5
Acquisition costs (incl. install)	bn €	9	14	14	0	16	18	2	17	19	2
Energy costs	bn €	42	37	37	0	38	36	-1	38	34	-4
Maintenance costs (incl. VAT)	bn €	1	1	1	0	2	2	0	2	2	0
Total running costs	bn €	43	38	38	0	40	38	-1	40	36	-4
Total expenditure	bn €	52	52	52	0	56	56	0	57	55	-2
Revenue Industry	m €	4317	6601	6601	0	7283	8069	786	7614	8501	887
Revenue Wholesale	m €	609	938	938	0	1040	1154	113	1088	1216	128
Revenue Retail	m €	720	1108	1108	0	1229	1363	134	1286	1437	151
Revenue Installation	m €	2253	3388	3388	0	4185	4517	332	4672	5043	371
Revenue Maintenance (excl. VAT)	m €	866	1253	1253	0	1539	1539	0	1773	1773	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	80	122	122	0	135	149	15	141	157	16
Jobs Wholesale	'000 jobs	2	3	3	0	4	4	0	4	5	0
Jobs Retail/ installation/ maintenance	'000 jobs	40	60	60	0	72	77	5	80	85	6
Jobs Total	'000 jobs	122	186	186	0	211	231	20	225	247	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 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
Effective heat output per reversible unit	kWh heat/a	5,999	5,109	5,109	0	4,794	4,751	-42
EU effective cooling output	TWh cool/a	6	69	69	0	65	65	0
EU effective heat output	TWh heat/a	2	66	66	0	96	96	-1
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc
Primary energy total (100% electric)	TWh prim/a	10.1	143	110	-33	139	93	-46
Electricity total	TWh elec/a	4.1	57	44	-13	56	37	-18
o/w electricity cooling	TWh elec/a	2.9	27	20	-7	19	12	-7
o/w electricity heating	TWh elec/a	1.1	31	24	-6	36	25	-11
Final energy	TWh final/a	4	57	44	-13	56	37	-18
GWP emissions total	MtCO ₂ /a	2.0	23.4	18.1	-5.4	21.1	14.1	-7.0
o/w GWP emissions for cooling	MtCO ₂ /a	1.5	10.9	8.2	-2.7	7.3	4.6	-2.7
o/w GWP emissions for heating	MtCO ₂ /a	0.6	12.5	9.9	-2.7	13.8	9.5	-4.3
Acquisition costs (incl. install)	bn €	0	6	7	1	6	7	2
Energy costs total	bn €	1	10	8	-2	10	7	-3
o/w energy cooling	bn €	1	5	3	-1	4	2	-1
o/w energy heating	bn €	0	5	4	-1	7	5	-2
Maintenance costs (incl. VAT)	bn €	0	1	1	0	1	1	0
Total running costs	bn €	1	11	9	-2	11	8	-3
Total expenditure	bn €	1	16	15	-1	17	15	-2
Revenue Industry	m €	94	1260	1551	291	1249	1608	358
Revenue Wholesale	m €	49	657	808	152	658	846	188
Revenue Retail	m €	36	475	584	110	475	611	136
Revenue Installation	m €	200	2583	3128	545	2562	3234	673
Revenue Maintenance (excl. VAT)	m €	76	895	895	0	818	818	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	2	23	29	5	23	30	7
Jobs Wholesale	'000 jobs	0	2	3	1	2	3	1
Jobs Retail/ installation/ maintenance	'000 jobs	3	40	46	7	39	47	8
Jobs Total	'000 jobs	5	65	78	13	64	80	16

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: all presented data are double counted with space heating and not counted in EIA totals.

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 · m³/s; kWh=10³·W·h)	kWh flow/a	158	158		158			158			
EU load (1 TWh=10¹²·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	16	16	0	14	9	-5	12	7	-5
Acquisition costs (incl. install)	bn €	3	5	5	0	5	6	1	5	5	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	7	5	-3
Total expenditure	bn €	8	12	12	0	12	11	-2	12	10	-2
Revenue Industry	m €	1196	1964	1964	0	2070	2507	437	2021	2244	222
Revenue Wholesale	m €	405	664	664	0	700	844	144	685	758	73
Revenue Retail	m €	92	146	146	0	155	172	17	157	164	7
Revenue Installation	m€	782	1251	1251	0	1346	1511	165	1382	1448	66
Revenue Maintenance (excl. VAT)	m€	145	218	218	0	229	229	0	222	222	0
Jobs Industry (%), OEM (%) & services (%)	'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 load 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		
		'000	568	'000	1,490	'000	2,119	'000	4,169	
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 m ³ /a	45	94			131		162		
o/w non-residential	T m ³ /a	39	73			100		117		
o/w residential	T m ³ /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	18	18	0	17	16	-1	18	15 -3
GWP emissions (from heat savings vs. BAU)	MtCO ₂ /a (2)	0	0	0	0	0	-4	-4	0	-9 -9
Acquisition costs (incl. install)	bn €	4	15	15	0	18	18	1	20	21 1
Energy costs (from own VU electricity)	bn € (1)	5	7	7	0	8	7	0	10	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)	6	8	8	0	10	10	0	13	12 -2
Total expenditure (own elec. +acq. +maint.)	bn € (1)	10	24	24	0	28	28	0	34	33 -1
Total expenditure (from heat savings vs. BAU)	bn € (2)	0	0	0	0	0	-1	-1	0	-4 -4
Revenue Industry	m €	1469	5455	5455	0	6359	6865	506	7364	7841 477
Revenue Wholesale	m €	206	758	758	0	906	986	80	1231	1305 74
Revenue Retail	m €	208	766	766	0	918	999	82	1263	1338 75
Revenue Installation	m €	2103	8209	8209	0	9102	9106	4	9595	9611 15
Revenue Maintenance (excl. VAT)	m €	805	1594	1594	0	2143	2143	0	2965	2965 0
Jobs Industry (%), OEM (%) & services (%)	'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
Sales	m	1,743	2,383	2,181	-202	2,310	1,509	-801	1,364
Stock	m	4,620	8,659	8,606	-53	10,767	10,793	26	12,641
EU output capacity in lm	Tlm	4.6	8.9	8.9	0.0	12.7	13.0	0.3	16.2
EU accumulated operating hours total	Tlm	3.9	7.4	7.4	0.0	9.4	9.4	0.1	11.5
incl. CG and sb, excl. SPL and ctrl.	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	494	789	751	-38	936	734	-202	703
o/w electricity	TWh elec/a	198	316	300	-15	375	294	-81	335
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0
Final energy	TWh final/a	198	316	300	-15	375	294	-81	335
GWP emissions	MtCO ₂ /a	99	129	123	-6	142	112	-31	114
Acquisition costs (incl. install)	bn €	6	12	12	0	15	14	-1	12
Energy costs	bn €	36	50	48	-3	64	49	-15	62
Maintenance costs	bn €	2	4	4	0	5	5	0	6
Total running costs	bn €	36	52	51	0	67	54	-13	67
Total expenditure	bn €	44	66	64	-2	84	68	-16	80
Revenue Industry	m €	2435	4944	5205	261	7765	8242	477	6467
Revenue Wholesale	m €	626	1548	1653	104	1876	1318	-558	1143
Revenue Retail	m €	591	1436	1525	89	1724	1184	-540	1076
Revenue Installation	m €	2127	3571	3475	-97	3125	2700	-425	2756
Revenue Maintenance (excl. VAT)	m €	1545	3857	3897	40	4868	4897	29	6224
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	45	92	96	5	144	153	9	120
Jobs Wholesale	'000 jobs	2	6	6	0	7	5	-2	4
Jobs Retail/ installation/ maintenance	'000 jobs	43	91	92	1	101	89	-12	100
Jobs Total	'000 jobs	91	188	194	6	251	246	-5	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	dm ²	10	28		51		68		
Viewable area per Monitor	dm ²	5	11		16		20		
Viewable area per Signage display	dm ²	16	46		84		113		
EU total viewable area for all DPs	km ²	18	101		242		398		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	69	194	194	0	264	213	-51	238
o/w on-mode electricity	TWh elec/a	24	75	75	0	98	77	-20	102
o/w standby- and off-mode electricity	TWh elec/a	3	3	3	0	8	8	0	11
total electricity (on-mode, off-mode, standby)	TWh elec/a	27	78	78	0	106	85	-20	113
Final energy	TWh final/a	27	78	78	0	106	85	-20	113
GWP emissions	MtCO ₂ /a	14	32	32	0	40	32	-8	39
Acquisition costs (incl. install)	bn €	19	32	32	0.0	25	25	0.0	31
Energy costs	bn €	6	14	14	0.0	20	16	-4.0	24
Maintenance costs (incl. VAT)	bn €	0.2	0.4	0.4	0.0	0.5	0.5	0.0	0.6
Total running costs	bn €	6	14	14	0.0	21	17	-4.0	24
Total expenditure	bn €	24	46	46	0.0	46	42	-4.0	55
Revenue Industry	m €	7556	13032	13032	0	10660	10660	0	12790
Revenue Wholesale	m €	1095	2015	2015	0	2101	2101	0	2224
Revenue Retail	m €	7202	12119	12119	0	9094	9094	0	11521
Revenue Installation	m€	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	141	345	345	0	401	401	0	481
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	140	241	241	0	197	197	0	237
Jobs Wholesale	'000 jobs	4	7	7	0	8	8	0	8
Jobs Retail/ installation/ maintenance	'000 jobs	112	190	190	0	144	144	0	182
Jobs Total	'000 jobs	256	439	439	0	349	349	0	427

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, terrestrial, 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			
		'000	0		50,060		34,666		34,666		
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	4	4	0	7	5	-2	5	4	-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	7	0	9	8	-1	9	8	-1
Revenue Industry	m €	0	3127	3127	0	3074	3074	0	3074	3074	0
Revenue Wholesale	m €	0	1428	1428	0	1404	1404	0	1404	1404	0
Revenue Retail	m €	0	286	286	0	281	281	0	281	281	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 (%), OEM (%) & services (%)	'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	68	68	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
EU billion hours in 'on'-mode per year	bn h 'on'/a	0	44	43	-1	75	60	-15	75
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
o/w electricity	TWh elec/a	0	5	5	0.0	9	5	-4.0	9
o/w fuel	TWh fuel/a	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
GWP emissions	MtCO ₂ /a	0	2	2	0.0	3	2	-1.5	3
Acquisition costs (incl. install)	bn €	0	4	4	0.0	4	4	0.0	4
Energy costs	bn €	0	1	1	0.0	2	1	-0.8	2
Total expenditure	bn €	0	5	5	0.0	6	5	-0.8	6
Revenue Industry	m €	70	1519	1519	0.0	1519	1519	0.0	1519
Revenue Wholesale	m €	9	193	193	0.0	193	193	0.0	193
Revenue Retail	m €	70	1506	1506	0.0	1506	1506	0.0	1506
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 (%), OEM (%) & services (%)	'000 jobs	1	28	28	0	28	28	0	28
Jobs Wholesale	'000 jobs	0	1	1	0	1	1	0	1
Jobs Retail/ installation/ maintenance	'000 jobs	1	23	23	0	23	23	0	23
Jobs Total	'000 jobs	2	52	52	0	52	52	0	52

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	
		'000	171		3,631		3,771		5,084
Sales	'000		707		18,605		20,263		27,041
Stock	'000								
EU demand for PSU output for ES & DS	TWh elec/a	2		38		42		62	
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	5	121	121	0.0	125	120	-4.9	147
o/w electricity	TWh elec/a	2	48	48	0.0	50	48	-2.0	70
o/w fuel	TWh fuel/a	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
GWP emissions	MtCO ₂ /a	1	20	20	0.0	19	18	-0.7	24
Acquisition costs	bn €	1	31	31	0.0	31	31	0.0	41
Energy costs	bn €	0	7	7	0.0	8	8	-0.3	13
Total expenditure	bn €	2	39	39	0.0	40	39	-0.3	54
Revenue Industry	m€	1379	31490	31490	0	31320	31320	0	41377
Revenue Wholesale	m€	0	0	0	0	0	0	0	0
Revenue Retail	m€	0	0	0	0	0	0	0	0
Revenue Installation	m€	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	26	583	583	0	580	580	0	766
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	0	0	0	0	0	0	0	0
Jobs Total	'000 jobs	26	583	583	0	580	580	0	766

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	Stock '000	55,495	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	13	13	0	8	8	0	8	8	0
Acquisition costs (incl. install)	bn €	13	73	73	0	84	84	0	124	124	0
Energy costs	bn €	3	5	5	0	4	4	0	5	5	0
Total expenditure	bn €	16	78	78	0	88	88	0	129	129	0
Revenue Industry	m €	5428	29860	29860	0	34465	34465	0	50673	50673	0
Revenue Wholesale	m €	845	4172	4172	0	4886	4886	0	7068	7068	0
Revenue Retail	m €	5353	30658	30658	0	34679	34679	0	51411	51411	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 (%), OEM (%) & services (%)	'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	
		'000	14,104	'000	26,825	'000	19,707	'000	17,823
Sales	'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
EU total sheets of paper used per year	bn A4 sheets	372	520	503	-16	315	269	-47	201
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
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
IJ Stock average unit electricity	kWh/a/unit	63	18	12	-7	17	6	-11	17
EP Stock average unit electricity	kWh/a/unit	831	276	215	-60	258	102	-156	263
Electricity	TWh elec/a	19	11	8	-3	12	5	-7	11
Primary Energy (for electricity)	TWh prim/a	47	27	21	-6	29	11	-18	22
Primary Energy (for paper, ink, toner) *	TWh prim/a	21	29	28	-1	18	15	-3	11
GWP emissions (from electricity)	MtCO ₂ /a	9.4	4.4	3.4	-1.1	4.4	1.7	-2.7	3.6
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
Acquisition costs (Imag. Equip. only)	bn €	5.0	13.1	13.1	0.0	12.2	12.2	0.0	11.1
Electricity costs	bn €	3.5	1.7	1.3	-0.4	2.1	0.8	-1.3	2.1
Repair and Maintenance costs	bn €	1.0	5.5	5.5	0.0	8.3	8.3	0.0	7.8
Consumable costs, paper	bn €	4.8	6.7	6.5	-0.2	4.1	3.5	-0.6	2.6
Consumable costs, ink and toner	bn €	11.2	18.3	18.3	0.0	10.5	10.5	0.0	6.8
Total running costs	bn €	20	32	32	-0.6	25	23	-1.9	19
Total expenditure (incl. consumables)	bn €	25	45	45	-0.6	37	35	-1.9	30
Revenue Industry **	m €	2994	8059	8059	0	7777	7777	0	7049
Revenue Wholesale **	m €	687	1850	1850	0	1791	1791	0	1624
Revenue Retail **	m €	1094	2870	2870	0	2450	2450	0	2220
Revenue Installation	m€	0	0	0	0	0	0	0	0
Revenue Maintenance	m€	983	5395	5395	0	8219	8219	0	7657
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	55	149	149	0	144	144	0	131
Jobs Wholesale	'000 jobs	3	7	7	0	7	7	0	6
Jobs Retail/ installation/ maintenance	'000 jobs	26	94	94	0	114	114	0	105
Jobs Total **	'000 jobs	84	250	250	0	265	265	0	242

* 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	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	0	0
Final energy	TWh final/a	7	30	29	-1	32	18	-14	35	18	-16		
GWP emissions	MtCO ₂ /a	4	12	12	-1	12	7	-5	12	6	-5		
Acquisition costs (incl. install)	bn €	12	21	21	0	25	25	0	28	28	0		
Energy costs	bn €	1	5	5	0	6	4	-3	7	4	-3		
Total expenditure	bn €	13	26	26	0	31	28	-3	35	32	-3		
Revenue Industry	m €	5689	10374	10374	0	12347	12347	0	14037	14037	0		
Revenue Wholesale	m €	2714	4823	4823	0	5732	5732	0	6467	6467	0		
Revenue Retail	m €	1519	2698	2698	0	2985	2985	0	3194	3194	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 (%), OEM (%) & services (%)	'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	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	21	20	-2	25	14	-11	22	11	-11		
Acquisition costs (incl. install)	bn €	12	21	21	0	25	25	0	28	28	0		
Energy costs	bn €	4	9	9	-1	13	7	-6	14	7	-7		
Total expenditure	bn €	16	30	30	-1	38	32	-6	41	34	-7		
Revenue Industry	m €	5689	10374	10374	0	12347	12347	0	14037	14037	0		
Revenue Wholesale	m €	2714	4823	4823	0	5732	5732	0	6467	6467	0		
Revenue Retail	m €	1519	2698	2698	0	2985	2985	0	3194	3194	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 (%), OEM (%) & services (%)	'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			
		'000	18,712	'000	400,937	'000	429,653	'000	436,316		
Sales	'000	51,071	400,937			1,708,761		1,738,987			
Stock	'000										
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	4.9	4.9	-0.1	6.3	4.4	-1.9	5.3	3.4	-1.8
Acquisition costs	bn €	0.1	4.2	4.2	0.0	4.2	4.3	0.1	4.3	4.4	0.0
Energy costs, active mode	bn €	0.0	1.9	1.8	0.0	2.9	2.1	-0.8	3.0	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	2.1	0.0	3.2	2.3	-1.0	3.3	2.1	-1.2
Total expenditure	bn €	0.2	6.3	6.3	0.0	7.4	6.5	-0.9	7.7	6.5	-1.1
Revenue Industry	m€	66	2081	2091	10	2078	2112	33	2150	2162	11
Revenue Wholesale	m€	20	621	624	3	620	630	10	641	645	3
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 (%), OEM (%) & services (%)	'000 jobs	1	39	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	Sales '000	15,991	Sales '000	16,732	Sales '000	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 @ -18°C	10		14		17		20			
EU refrigerator net volume RF	M m³ @ 5°C	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	47	35	-12	44	23	-21	40	14	-25
Acquisition costs (incl. install)	bn €	7	7	8	1	8	10	2	8	10	3
Energy costs	bn €	23	21	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 €	23	21	15	-5	23	12	-11	26	9	-16
Total expenditure	bn €	29	28	24	-4	31	22	-9	34	20	-14
Revenue Industry	m €	2700	3014	3459	445	3154	3963	809	3250	4343	1093
Revenue Wholesale	m €	195	218	250	32	228	287	59	235	314	79
Revenue Retail	m €	2605	2908	3337	429	3043	3823	781	3136	4190	1055
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 (%), OEM (%) & services (%)	'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	52	7	47	59	12	48	65	16
Jobs Total	'000 jobs	91	102	117	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 RH4 (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			
		'000	1,241	'000	1,525	'000	1,587	'000	1,696		
Sales	'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	24	24	0	20	20	0	18	13	-5
Acquisition costs (incl. install)	bn €	2	2	2	0	2	2	0	3	3	0
Energy costs	bn €	11	9	9	0	9	9	0	10	7	-3
Maintenance costs (incl. VAT)	bn €	1	1	1	0	1	1	0	1	1	0
Total running costs	bn €	12	10	10	0	10	10	0	11	8	-3
Total expenditure	bn €	14	13	13	0	13	13	0	14	11	-3
Revenue Industry	m €	1360	1583	1583	0	1634	1634	0	1743	1812	69
Revenue Wholesale	m €	583	678	678	0	700	700	0	747	777	30
Revenue Retail	m €	0	0	0	0	0	0	0	0	0	0
Revenue Installation	m €	114	140	140	0	151	151	0	161	169	8
Revenue Maintenance (excl. VAT)	m €	1005	1166	1166	0	1278	1278	0	1366	1366	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	25	29	29	0	30	30	0	32	34	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	51	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	
		'000	939	'000	917	'000	1,011	'000	1,149
Sales	'000	939	917	'000	1,011	'000	1,149		
Stock	'000	7,778	7,680	'000	8,122	'000	9,225		
EU freezer net volume Storage cabinets	M m ³ @ -18°C°	0.3	0.4	'000	0.5	'000	0.5		
EU refrigerator net volume Storage cabinets	M m ³ @ 5°C°	0.7	1.0	'000	1.1	'000	1.2		
EU cooling demand LT&MT process chillers	TWhcool/a	38	83	'000	113	'000	140		
EU cooling demand LT&MT condensing units (60% double counting included)	TWhcool/a	155	127	'000	130	'000	151		
	Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	128	167	167	0	201	193	-8	203
<i>o/w electricity</i>	TWh elec/a	51	67	67	0	80	77	-3	96
<i>o/w fuel</i>	TWh fuel/a	0	0	0	0	0	0	0	0
Final energy	TWh final/a	51	67	67	0	80	77	-3	96
GWP emissions	MtCO ₂ /a	26	27	27	0	31	29	-1	33
Acquisition costs	bn €	1	1	1	0	1	2	0	2
Energy costs	bn €	8	9	9	0	11	11	-1	15
Total expenditure	bn €	9	10	10	0	13	12	0	17
Revenue Industry	m €	748	893	893	0	1011	1068	57	1163
Revenue Wholesale	m €	214	255	255	0	289	305	16	332
Revenue Retail	m €	107	128	128	0	144	153	8	166
Revenue Installation	m€	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	14	17	17	0	19	20	1	22
Jobs Wholesale	'000 jobs	1	1	1	0	1	1	0	1
Jobs Retail/ installation/ maintenance	'000 jobs	2	2	2	0	2	2	0	3
Jobs Total	'000 jobs	16	19	19	0	22	23	1	25

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		
		'000	28,835	33,252		37,026		38,898		605,113		
Sales	'000	456,198		510,031		557,536		605,113				
EU load hobs, volume boiled water (food)	Mm ³ /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	34	34	0	34	33	-2	33	29	-4	
Acquisition costs (incl. install)	bn €	11	15	15	0	17	18	1	17	18	1	
Energy costs	bn €	12	14	14	0	17	16	-1	20	18	-2	
Total expenditure	bn €	24	29	29	0	33	34	0	37	36	-1	
Revenue Industry	m €	4700	6380	6380	0	7050	7617	567	7219	7688	469	
Revenue Wholesale	m €	332	454	454	0	502	543	40	515	549	33	
Revenue Retail	m €	4421	6057	6057	0	6699	7234	535	6872	7316	444	
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 (%), OEM (%) & services (%)	'000 jobs	87	118	118	0	131	141	10	134	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	112	8	106	113	7	
Jobs Total	'000 jobs	156	213	213	0	236	255	19	242	257	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			
		'000	7,707		11,441		12,464		11,993		
Sales	'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	18	15	-4	15	10	-5	12	8	-4
Acquisition costs (incl. install)	bn €	4	6	7	1	6	8	1	6	7	1
Energy costs	bn €	10	8	7	-2	8	5	-3	8	5	-3
Consumable resources	bn €	11	13	11	-3	16	10	-5	20	11	-9
Total running costs	bn €	22	22	18	-4	24	16	-8	28	17	-12
Total expenditure	bn €	25	28	25	-3	31	24	-7	34	24	-11
Revenue Industry	m €	1582	2354	2800	446	2550	3068	517	2458	2725	267
Revenue Wholesale	m €	116	173	206	33	188	226	38	181	201	20
Revenue Retail	m €	1553	2310	2748	438	2503	3011	508	2413	2675	262
Revenue Installation	m €	0	0	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m €	311	477	477	0	527	527	0	544	544	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	29	44	52	8	47	57	10	46	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	44	51	8	42	46	4
Jobs Total	'000 jobs	57	84	99	15	91	109	18	88	98	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			
		'000	2,614	'000	5,852	'000	7,833	'000	9,727		
Sales	'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	8	6	-2	10	7	-3	11	7	-3
Acquisition costs (incl. install)	bn €	2	3	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	7	4	-3
Total running costs	bn €	3	6	5	-1	9	7	-3	14	9	-5
Total expenditure	bn €	5	10	10	0	14	13	-1	19	16	-3
Revenue Industry	m €	631	1413	1876	462	1891	2460	569	2348	2897	549
Revenue Wholesale	m €	46	103	136	34	137	179	41	170	210	40
Revenue Retail	m €	611	1368	1816	448	1830	2382	551	2273	2804	531
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 (%), OEM (%) & services (%)	'000 jobs	12	26	35	9	35	46	11	43	54	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	9	35	43	8
Jobs Total	'000 jobs	21	48	63	16	64	83	19	79	98	19

Household Laundry Driers

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
<i>o/w electricity</i>	<i>TWh elec/a</i>	8	16	16	0	14	11	-3	14	9	-6
<i>o/w fuel</i>	<i>TWh fuel/a</i>	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	7	6	0	5	4	-1	5	3	-2
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 €	2	4	4	0	5	5	0	5	5	0
Revenue Industry	m €	267	425	479	53	721	1151	430	711	1264	553
Revenue Wholesale	m €	20	31	35	4	53	84	31	52	92	40
Revenue Retail	m €	260	415	467	52	703	1122	419	693	1233	540
Revenue Installation	m €	103	108	103	-5	151	122	-29	144	97	-48
Revenue Maintenance (excl. VAT)	m €	76	169	169	0	192	192	0	233	233	0
Jobs Industry (%), OEM (%) & services (%)	'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

Design options for vacuum cleaners include maximising fan and motor efficiency (reduce energy losses in fan/motor/drive from current 60-70% to 45% through improved fan case and impeller design), improving efficiency of airways (reduce energy loss of current 5-10% to the BAT level of 5%), increasing the filtration area surface to lower pressure loss, using better seals to reduce the current 10-20% leakage loss to 5%, improving nozzle design to reduce current pressure loss at the nozzle from current 15-25% to 10%, weight-reduction (may reduce product mass by up to 50%), using best materials options (e.g. foamed plastics), increasing product lifetime by using better and – probably – more materials (this option may counteract with the previous one).

VC Vacuum Cleaners	unit	1990	2010			2020			2030		
Sales	'000	14,517	45,130			77,477			83,279		
Stock	'000	127,940	299,151			354,431			428,598		
EU surface vacumed	1000 km ² /a	750	983			1,092			1,117		
Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	
Primary energy	TWh prim/a	27	45	45	0	63	30	-33	77	27	-49
<i>o/w electricity</i>	<i>TWh elec/a</i>	11	18	18	0	25	12	-13	36	13	-23
<i>o/w fuel</i>	<i>TWh fuel/a</i>	0	0	0	0	0	0	0	0	0	0
Final energy	TWh final/a	11	18	18	0	25	12	-13	36	13	-23
GWP emissions	MtCO ₂ /a	5	7	7	0	10	5	-5	12	4	-8
Acquisition costs (incl. install)	bn €	4.1	11.2	11.2	0	18.9	19.5	0.5	20.4	20.4	0.0
Energy costs	bn €	2.2	3.2	3.2	0	4.9	2.3	-2.6	7.9	2.7	-5.1
Maintenance costs (incl. VAT)	bn €	0.0	0.0	0.0	0	0.0	0.0	0.0	0.0	0.0	0.0
Consumable resources (VC bags)	bn €	1.3	1.7	1.7	0	1.9	1.9	0.0	1.9	1.9	0.0
Total running costs	bn €	3.5	4.9	4.9	0	6.8	4.2	-2.6	9.8	4.7	-5.1
Total expenditure	bn €	7.6	16.0	16.0	0.0	25.7	23.6	-2.1	30.2	25.0	-5.1
Revenue Industry	m €	1841	4696	4696	0	7837	8060	222	8436	8436	0
Revenue Wholesale	m €	241	462	462	0	708	728	20	765	765	0
Revenue Retail	m €	1485	4291	4291	0	7366	7574	209	7917	7917	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 (%), OEM (%) & services (%)	'000 jobs	34	87	87	0	145	149	4	156	156	0
Jobs Wholesale	'000 jobs	1	2	2	0	3	3	0	3	3	0
Jobs Retail/ installation/ maintenance	'000 jobs	23	66	66	0	114	117	3	122	122	0
Jobs Total	'000 jobs	58	155	155	0	261	269	7	281	281	0

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 * m³/s ; TWh=10¹²* 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	47	47	0	57	52	-5	59	48	-10
Acquisition costs (incl. install)	bn €	1	3	3	0	3	5	1	4	5	1
Energy costs	bn €	8	17	17	0	24	22	-2	30	25	-5
Total expenditure	bn €	9	21	21	0	28	27	-1	35	31	-4
Revenue Industry	m €	558	1706	1706	0	2120	2907	787	2210	2813	603
Revenue Wholesale	m €	192	585	585	0	728	998	270	759	966	207
Revenue Retail	m €	83	255	255	0	316	434	117	330	420	90
Revenue Installation	m €	76	233	233	0	291	398	107	304	385	81
Revenue Maintenance (excl. VAT)	m €	321	818	818	0	1069	1069	0	1229	1229	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	10	32	32	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	78	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 commutators 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	BAU	ECO	inc	BAU	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	BAU	ECO	inc	BAU	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	269	269	0	288	277	-11	271	251	-20		
Acquisition costs (incl. install)	bn €	2	4	4	0	5	6	1	5	7	1		
o/w for VSDs	bn €	1	2	2	0	3	4	1	4	4	1		
Energy costs	bn €	66	79	79	0	98	94	-4	114	106	-8		
Maintenance costs (incl. VAT)	bn €	1	1	1	0	1	1	0	1	1	0		
Total running costs	bn €	67	80	80	0	99	96	-4	115	107	-8		
Total expenditure	bn €	69	85	85	0	104	101	-3	120	113	-7		
Revenue Industry	m €	1073	2216	2229	13	2541	3058	517	2712	3372	659		
o/w for VSDs	m €	242	940	947	7	1283	1840	557	1574	2012	438		
Revenue Wholesale	m €	368	761	765	5	872	1050	177	931	1157	226		
Revenue Retail	m €	160	331	333	2	379	456	77	405	503	98		
Revenue Installation (of extra VSD only)	m €	377	886	892	6	1065	1367	302	1184	1521	337		
Revenue Maintenance (excl. VAT)	m €	564	855	855	0	1043	1066	23	1161	1203	42		
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	20	41	41	0	47	57	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	30	4	28	33	5		
Jobs Total	'000 jobs	32	65	65	0	76	90	14	82	100	18		

Water pumps

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.

WP Water pumps	unit	1990		2010		2020		2030			
		'000	1,099	'000	1,513	'000	1,760	'000	2,024		
Sales	'000	11,220	15,311			18,001		20,810			
Stock	'000	4,593	4,593			4,593		4,593			
Unit load (W=Pa * m³/s ;kWh=1000*W*h)	kWh flow/a										
EU load (TWh=10 ¹² * W * h)	TWh flow/a	52	70			83		96			
Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO inc		
Primary energy (for 100% electricity)	TWh prim/a	197	264	264	0	311	303	-7	302	293	-9
o/w electricity	TWh elec/a	79	106	106	0	124	121	-3	144	140	-4
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
Final energy	TWh final/a	79	106	106	0	124	121	-3	144	140	-4
GWP emissions	MtCO ₂ /a	39	43	43	0	47	46	-1	49	47	-1
Acquisition costs (incl. install)	bn €	2	2	2	0	3	3	0	3	3	0
Energy costs	bn €	13	15	15	0	19	18	0	24	23	-1
Maintenance costs (incl. VAT)	bn €	1	1	1	0	2	2	0	2	2	0
Total running costs	bn €	14	16	16	0	20	20	0	26	25	-1
Total expenditure	bn €	15	18	18	0	23	23	0	29	28	-1
Revenue Industry	m €	780	1074	1074	1	1249	1249	0	1437	1437	0
Revenue Wholesale	m €	268	369	369	0	429	429	0	493	493	0
Revenue Retail	m €	116	160	160	0	186	186	0	214	214	0
Revenue Installation	m €	534	735	735	0	855	855	0	983	983	0
Revenue Maintenance (excl. VAT)	m €	994	1356	1356	0	1594	1594	0	1843	1843	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	14	20	20	0	23	23	0	27	27	0
Jobs Wholesale	'000 jobs	1	1	1	0	2	2	0	2	2	0
Jobs Retail/ installation/ maintenance	'000 jobs	16	22	22	0	26	26	0	29	29	0
Jobs Total	'000 jobs	31	43	43	0	50	50	0	58	58	0

Standard Air Compressors

The data in EIA are based on the draft Working Document (WD) prepared for the C.F. of 23 october 2014 and on the last available version of the Impact Assessment (IA, september 2015). Option A with Averaged replacement scheme of the IA has been used, being most representative on the long term. The scope for regulation proposed in the WD is rotary standard air compressors with a volume flow rate between 5 to 1280 l/s and piston standard air compressors with a volume flow rate between 2 to 64 l/s, when driven by a three-phase electric motor. The proposed regulation does NOT apply to compressors designed to handle gas mixtures (or single constituent gases) other than filtered ambient air, such as hazardous gases; designed specifically to operate in potentially explosive atmospheres; designed to function where ambient temperatures exceed 40°C and/or where average inlet air temperatures are below -15°C or above 100°C.

The WD proposes ecodesign requirements in two tiers: tier 1 from January 2018 and tier 2 from January 2020. The requirements are formulated in terms of minimum isentropic efficiency that depends on volume flow rate (V_1) and proportional loss factor (d). A d-value of 0 represents the current average efficiency; a d-value of 100 the theoretical maximum efficiency (not attainable; current BAT has d=30). The required value of 'd' is -5 in tier 1 and 0 in tier 2:

Standard air compressor type	Formula to calculate the minimum isentropic efficiency, depending on flow rate (V_1) and proportional loss factor (d)
Fixed speed rotary standard air compressor	$(-0.928 \ln^2(V_1) + 13.911 \ln(V_1) + 27.110) + (100 - (-0.928 \ln^2(V_1) + 13.911 \ln(V_1) + 27.110)) * d/100$
Variable speed rotary standard air compressor	$(-1.549 \ln^2(V_1) + 21.573 \ln(V_1) + 0.905) + (100 - (-1.549 \ln^2(V_1) + 21.573 \ln(V_1) + 0.905)) * d/100$
Piston standard air compressor	$(8.931 \ln(V_1) + 31.477) + (100 - (8.931 \ln(V_1) + 31.477)) * d/100$

CP Standard Air Compressors	unit	1990		2010		2020		2030			
		'000	89	95		102		109			
Sales	'000		598	1,038		1,028		1,112			
Stock	'000										
Avg. Unit load (W=Pa*m³/s;kWh=1000*W*h)	kWh flow/a	21,370		32,063		32,112		31,770			
EU load (TWh=10¹²* W * h)	TWh flow/a	13		33		33		35			
Scenario	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO inc		
Primary energy (for 100% electricity)	TWh prim/a	56	132	132	0	130	128	-2	115	112	-3
o/w electricity	TWh elec/a	22	53	53	0	52	51	-1	55	53	-2
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0	0	0
Final energy	TWh final/a	22	53	53	0	52	51	-1	55	53	-2
GWP emissions	MtCO₂/a	11	22	22	0	20	19	0	19	18	-1
Acquisition costs (incl. install)	bn €	0	1	1	0	1	1	0	1	1	0
Energy costs	bn €	3	6	6	0	6	6	0	7	7	0
Maintenance costs (incl. VAT)	bn €	0	1	1	0	1	1	0	1	1	0
Total running costs	bn €	3	7	7	0	7	7	0	8	8	0
Total expenditure	bn €	4	8	8	0	8	8	0	9	9	0
Revenue Industry	m €	444	550	550	0	659	723	65	728	786	58
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 €	20	25	25	0	30	33	3	33	36	3
Revenue Maintenance (excl. VAT)	m €	405	884	884	0	930	930	0	1021	1021	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	8	10	10	0	12	13	1	13	15	1
Jobs Wholesale	'000 jobs	0	0	0	0	0	0	0	0	0	0
Jobs Retail/ installation/ maintenance	'000 jobs	4	8	8	0	9	9	0	10	10	0
Jobs Total	'000 jobs	12	19	19	0	21	22	1	23	24	1

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 requirements. 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	
		'000	422	'000	479	'000	486	'000	497
Sales	'000	2,611	2,969			3,049		3,111	
Stock	'000	1,560	1,560			1,560		1,560	
Unit load (3.4 kW; 440 h/a arc-on)	kWh/a	3.9	4.5			4.6		4.7	
EU Load (output of welding equipment)	TWh/a								
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	2.6	2.6	0.0	2.4	2.4	0.0	2.2 1.9 -0.3
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 €	0.44	0.50	0.50	0.00	0.50	0.50	0.00	0.51 0.52 0.01
Energy costs	bn €	0.86	0.72	0.72	0.00	0.75	0.75	0.00	0.85 0.73 -0.11
Repair and Maintenance costs	bn €	0.09	0.10	0.10	0.00	0.11	0.11	0.00	0.11 0.11 0.00
Consumable costs (gas, filler wire, electrode)	bn €	1.79	2.04	2.04	0.00	2.10	2.10	0.00	2.14 1.96 -0.18
Total expenditure (incl. consumables)	bn €	3.18	3.36	3.36	0.00	3.46	3.46	0.00	3.61 3.33 -0.28
Revenue Industry (excl. consumables)	m €	209	237	237	0	241	241	0	246 251 5
Revenue Wholesale (excl. consumables)	m €	46	53	53	0	53	53	0	54 56 1
Revenue Retail (excl. consumables)	m €	28	32	32	0	33	33	0	33 34 1
Revenue Installation	m €	153	173	173	0	176	176	0	180 184 4
Revenue Maintenance	m €	92	105	105	0	108	108	0	110 110 0
Jobs Industry (%), OEM (%) & services (%)	'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	BAU	ECO	inc	BAU	ECO	inc
Stock	'000	2,387		3,597			4,401		5,355
Scenario		BAU	BAU	ECO	inc	BAU	ECO	inc	BAU
Primary energy	TWh prim/a	131	215	215	0	277	263	-14	302
o/w electricity	TWh elec/a	53	86	86	0	111	105	-6	144
o/w fuel	TWh fuel/a	0	0	0	0	0	0	0	0
Final energy	TWh final/a	0	0	0	0	0	0	0	0
GWP emissions	MtCO ₂ /a	26	35	35	0	42	40	-2	49
Acquisition costs (incl. install)	bn €	3	4	4	0	5	6	1	7
Energy costs	bn €	7	10	10	0	13	12	-1	19
Total expenditure	bn €	9	14	14	0	18	18	0	26
Revenue Industry	m €	2089	3477	3477	0	4239	4755	516	5400
Revenue Wholesale	m €	261	435	435	0	530	594	65	675
Revenue Retail	m €	261	435	435	0	530	594	65	675
Revenue Installation	m€	0	0	0	0	0	0	0	0
Revenue Maintenance (excl. VAT)	m€	0	0	0	0	0	0	0	0
Jobs Industry (%), OEM (%) & services (%)	'000 jobs	39	64	64	0	79	88	10	100
Jobs Wholesale	'000 jobs	1	2	2	0	2	2	0	3
Jobs Retail/ installation/ maintenance	'000 jobs	4	7	7	0	8	9	1	10
Jobs Total	'000 jobs	44	73	73	0	89	99	11	113
									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			
		mln	263	mln	323	mln	353	mln	434		
Sales	mln			1,207				1,564			
Stock	mln				1,387				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
<i>o/w fuel</i>	<i>TWh fuel/a</i>	<i>826</i>	<i>637</i>	<i>632</i>	<i>-5</i>	<i>625</i>	<i>593</i>	<i>-32</i>	<i>660</i>	<i>603</i>	<i>-58</i>
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 €	21	27	28	1	35	42	7	45	55	10
Energy costs (for fuel losses due to RRC)	bn €	71	81	80	-1	79	75	-4	100	91	-9
Total expenditure	bn €	92	108	108	0	114	117	3	145	146	1
Revenue Industry	m €	9454	12138	12422	284	15741	19078	3337	20188	24666	4478
Revenue Wholesale	m €	2363	3034	3105	71	3935	4770	834	5047	6167	1120
Revenue Retail	m €	7090	9103	9316	213	11806	14309	2503	15141	18500	3359
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 (%), OEM (%) & services (%)	'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**Revenue Industry (in m €)**

	1990 BAU	2010			2020			2030		
		BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	804	1063	1063	0	994	994	0	1126	1126	0
CHC Central Heating combi, water heating	783	839	839	0	890	949	59	974	1294	320
CH Central Heating boiler, space heating	4784	5337	5337	0	4863	5291	428	5442	7159	1717
SFB Solid Fuel Boilers	746	2359	2359	0	1861	1988	128	2044	2223	180
AHC central Air Cooling	822	3886	3886	0	5337	5339	2	6744	6745	1
AHC central Air Heating (excl. reversible AC)	323	211	211	0	186	203	18	166	180	14
LH Local Heaters	4317	6601	6601	0	7283	8069	786	7614	8501	887
RAC Room Air Conditioner	94	1260	1551	291	1249	1608	358	1606	1858	252
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	1469	5455	5455	0	6359	6865	506	7364	7841	477
LS Light Sources	2435	4944	5205	261	7765	8242	477	6467	7011	544
DP electronic DisPlays	7556	13032	13032	0	10660	10660	0	12790	12790	0
STB Set Top Boxes	0	3127	3127	0	3074	3074	0	3074	3074	0
VIDEO (Game Consoles)	70	1519	1519	0	1519	1519	0	1519	1519	0
ES+DS Enterprise Servers and Data Storage	1379	31490	31490	0	31320	31320	0	41377	41377	0
PC Personal Computers	5428	29860	29860	0	34465	34465	0	50673	50673	0
IE Imaging equipment	2994	8059	8059	0	7777	7777	0	7049	7049	0
SB (networked) Stand-By	5689	10374	10374	0	12347	12347	0	14037	14037	0
EPS External Power Supplies	66	2081	2091	10	2078	2112	33	2150	2162	11
RF Household Refrigeration	2700	3014	3459	445	3154	3963	809	3250	4343	1093
CF Commercial Refrigeration	1360	1583	1583	0	1634	1634	0	1743	1812	69
PF Professional Refrigeration	748	893	893	0	1011	1068	57	1163	1163	0
CA Cooking Appliances	4700	6380	6380	0	7050	7617	567	7219	7688	469
WM-WD household Washing Machines	1582	2354	2800	446	2550	3068	517	2458	2725	267
DW Household Dishwashers	631	1413	1876	462	1891	2460	569	2348	2897	549
LD household Laundry Drier	267	425	479	53	721	1151	430	711	1264	553
VC Vacuum Cleaners	1841	4696	4696	0	7837	8060	222	8436	8436	0
FAN Industrial Fans >125W	558	1706	1706	0	2120	2907	787	2210	2813	603
MT Motors AC, LV, 0.12-1000 kW	1073	2216	2229	13	2541	3058	517	2712	3372	659
WP Water pumps	780	1074	1074	1	1249	1249	0	1437	1437	0
CP Standard air compressors	444	550	550	0	659	723	65	728	786	58
WE Welding Equipment	209	237	237	0	241	241	0	246	251	5
TRAFO Utility Transformers	2089	3477	3477	0	4239	4755	516	5400	6180	779
TYRE Replacement and OEM Tyres	9454	12138	12422	284	15741	19078	3337	20188	24666	4478
TOTAL in bn euros	68	174	176	2	193	204	11	232	246	14

ANNEX F: Business Revenues

Revenue Wholesale (in m €)

	1990 BAU	2010			inc	2020			2030		
		BAU	ECO			BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	206	273	273	0		255	255	0	289	289	0
CHC Central Heating combi, water heat	210	225	225	0		239	255	16	262	348	86
CH Central Heating boiler, space heat	1243	1387	1387	0		1264	1375	111	1414	1861	446
SFB Solid Fuel Boilers	29	91	91	0		72	77	5	79	86	7
AHC central Air Cooling	103	489	489	0		671	671	0	847	847	0
AHC central Air Heating (excl. reversible AC)	41	27	27	0		23	26	2	21	23	2
LH Local Heaters	609	938	938	0		1040	1154	113	1088	1216	128
RAC Room Air Conditioner	49	657	808	152		658	846	188	853	985	133
CIRC Circulator pumps <2.5 kW	0	0	0	0		0	0	0	0	0	0
VU Ventilation Units (res & nonres)	206	758	758	0		906	986	80	1231	1305	74
LS Light Sources	626	1548	1653	104		1876	1318	-558	1143	902	-242
DP electronic DisPlays	1095	2015	2015	0		2101	2101	0	2224	2224	0
STB set top boxes (Complex & Simple)	0	1428	1428	0		1404	1404	0	1404	1404	0
VIDEO (Game Consoles)	9	193	193	0		193	193	0	193	193	0
ES+DS Enterprise Servers and Data Storage	0	0	0	0		0	0	0	0	0	0
PC Personal Computers	845	4172	4172	0		4886	4886	0	7068	7068	0
IE imaging equipment	687	1850	1850	0		1791	1791	0	1624	1624	0
SB (networked) Stand-By	2714	4823	4823	0		5732	5732	0	6467	6467	0
EPS External Power Supplies	20	621	624	3		620	630	10	641	645	3
RF Household Refrigerators & freezers	195	218	250	32		228	287	59	235	314	79
Total CF Commercial Refrigeration	583	678	678	0		700	700	0	747	777	30
Total PF Professional Refrigeration (excl.)	214	255	255	0		289	305	16	332	332	0
Total CA Cooking Appliances	332	454	454	0		502	543	40	515	549	33
WM-WD household Washing Machines	116	173	206	33		188	226	38	181	201	20
DW Household Dishwashers	46	103	136	34		137	179	41	170	210	40
LD household Laundry Drier	20	31	35	4		53	84	31	52	92	40
VC Vacuum Cleaners	241	462	462	0		708	728	20	765	765	0
FAN Industrial Fans >125W (excl. box/ roof)	192	585	585	0		728	998	270	759	966	207
MT Motors AC, LV, 0.12-1000 kW	368	761	765	5		872	1050	177	931	1157	226
WP Water pumps	268	369	369	0		429	429	0	493	493	0
CP Standard air compressors	0	0	0	0		0	0	0	0	0	0
WE Welding Equipment	46	53	53	0		53	53	0	54	56	1
TRAFO Utility Transformers	261	435	435	0		530	594	65	675	772	97
TYRE Replacement and OEM Tyres	2363	3034	3105	71		3935	4770	834	5047	6167	1120
TOTAL in bn euros	14	29	30	0		33	35	2	38	40	3

ANNEX F: Business Revenues

Revenue Retail (in m €)

product groups	1990			2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
WH dedicated Water Heater	206	273	273	0	255	255	0	289	289	0		
CHC Central Heating combi, water heat	210	225	225	0	239	255	16	262	348	86		
CH Central Heating boiler, space heat	1243	1387	1387	0	1264	1375	111	1414	1861	446		
SFB Solid Fuel Boilers	29	91	91	0	72	77	5	79	86	7		
AHC central Air Cooling	103	489	489	0	671	671	0	847	847	0		
AHC central Air Heating (excl. reversible AC)	41	27	27	0	23	26	2	21	23	2		
LH Local Heaters	720	1108	1108	0	1229	1363	134	1286	1437	151		
RAC Room Air Conditioner	36	475	584	110	475	611	136	615	711	96		
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0		
VU Ventilation Units (res & nonres)	208	766	766	0	918	999	82	1263	1338	75		
LS Light Sources	591	1436	1525	89	1724	1184	-540	1076	873	-202		
DP electronic DisPlays	7202	12119	12119	0	9094	9094	0	11521	11521	0		
STB set top boxes (Complex & Simple)	0	286	286	0	281	281	0	281	281	0		
VIDEO (Game Consoles)	70	1506	1506	0	1506	1506	0	1506	1506	0		
ES+DS Enterprise Servers and Data Storage	0	0	0	0	0	0	0	0	0	0		
PC Personal Computers	5353	30658	30658	0	34679	34679	0	51411	51411	0		
IE Imaging equipment	1094	2870	2870	0	2450	2450	0	2220	2220	0		
SB (networked) Stand-By	1519	2698	2698	0	2985	2985	0	3194	3194	0		
EPS External Power Supplies	0	0	0	0	0	0	0	0	0	0		
RF Household Refrigerators & freezers	2605	2908	3337	429	3043	3823	781	3136	4190	1055		
Total CF Commercial Refrigeration	0	0	0	0	0	0	0	0	0	0		
Total PF Professional Refrigeration (excl.)	107	128	128	0	144	153	8	166	166	0		
Total CA Cooking Appliances	4421	6057	6057	0	6699	7234	535	6872	7316	444		
WM-WD household Washing Machines	1553	2310	2748	438	2503	3011	508	2413	2675	262		
DW Household Dishwashers	611	1368	1816	448	1830	2382	551	2273	2804	531		
LD Household Laundry Drier	260	415	467	52	703	1122	419	693	1233	540		
VC Vacuum Cleaners	1485	4291	4291	0	7366	7574	209	7917	7917	0		
FAN Industrial Fans >125W (excl. box/ roof)	83	255	255	0	316	434	117	330	420	90		
MT Motors AC, LV, 0.12-1000 kW	160	331	333	2	379	456	77	405	503	98		
WP Water pumps	116	160	160	0	186	186	0	214	214	0		
CP Standard air compressors	0	0	0	0	0	0	0	0	0	0		
WE Welding Equipment	28	32	32	0	33	33	0	33	34	1		
TRAFO Utility Transformers	261	435	435	0	530	594	65	675	772	97		
TYRE Replacement and OEM Tyres	7090	9103	9316	213	11806	14309	2503	15141	18500	3359		
TOTAL in bn euros	37	84	86	2	93	99	6	118	125	7		

ANNEX F: Business Revenues

Revenue Installation (in m €)

	1990 BAU	2010			inc	2020			inc	2030		
		BAU	ECO			BAU	ECO			BAU	ECO	inc
WH dedicated Water Heater	1216	1608	1608	0		1504	1504	0		1703	1703	0
CHC Central Heating combi, water heat	1314	1381	1381	0		1472	1626	155		1646	2446	800
CH Central Heating boiler, space heat	7221	8568	8568	0		8045	9255	1210		9261	13655	4394
SFB Solid Fuel Boilers	376	872	872	0		624	686	61		662	730	68
AHC central Air Cooling	404	2298	2298	0		3282	3283	1		4220	4221	1
AHC central Air Heating (excl. reversible AC)	269	175	175	0		154	169	15		138	149	12
LH Local Heaters	2253	3388	3388	0		4185	4517	332		4672	5043	371
RAC Room Air Conditioner	200	2583	3128	545		2562	3234	673		3395	3836	442
CIRC Circulator pumps <2.5 kW	0	0	0	0		0	0	0		0	0	0
VU Ventilation Units (res & nonres)	2103	8209	8209	0		9102	9106	4		9595	9611	15
LS Light Sources	2127	3571	3475	-97		3125	2700	-425		2756	2095	-661
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	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	114	140	140	0		151	151	0		161	169	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	103	108	103	-5		151	122	-29		144	97	-48
VC Vacuum Cleaners	0	0	0	0		0	0	0		0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	76	233	233	0		291	398	107		304	385	81
MT Motors AC, LV, 0.12-1000 kW	377	886	892	6		1065	1367	302		1184	1521	337
WP Water pumps	534	735	735	0		855	855	0		983	983	0
CP Standard air compressors	20	25	25	0		30	33	3		33	36	3
WE Welding Equipment	153	173	173	0		176	176	0		180	184	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	19	35	35	0		37	39	2		41	47	6

ANNEX F: Business Revenues

Revenue Maintenance (excl. VAT, in m€)

	1990			2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
WH dedicated Water Heater	3752	5093	5093	0	5104	5104	0	5225	5225	0		
CHC Central Heating combi, water heat	1381	2211	2211	0	2248	2223	0	2219	2132	0		
CH Central Heating boiler, space heat	9438	14007	14007	0	14029	14005	-24	13809	13426	-383		
SFB Solid Fuel Boilers	569	322	322	0	382	382	0	332	332	0		
AHC central Air Cooling	929	4077	4077	0	6418	6418	0	8456	8456	0		
AHC central Air Heating (excl. reversible AC)	98	96	96	0	83	83	0	73	73	0		
LH Local Heaters	866	1253	1253	0	1539	1539	0	1773	1773	0		
RAC Room Air Conditioner	76	895	895	0	818	818	0	1075	1075	0		
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0		
VU Ventilation Units (res & nonres)	805	1594	1594	0	2143	2143	0	2965	2965	0		
LS Light Sources	1545	3857	3897	40	4868	4897	29	6224	6261	37		
DP electronic DisPlays	141	345	345	0	401	401	0	481	481	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	983	5395	5395	0	8219	8219	0	7657	7657	0		
SB (networked) Stand-By	0	0	0	0	0	0	0	0	0	0		
EPS External Power Supplies	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	1005	1166	1166	0	1278	1278	0	1366	1366	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	311	477	477	0	527	527	0	544	544	0		
DW Household Dishwashers	0	0	0	0	0	0	0	0	0	0		
LD household Laundry Drier	76	169	169	0	192	192	0	233	233	0		
VC Vacuum Cleaners	0	0	0	0	0	0	0	0	0	0		
FAN Industrial Fans >125W (excl. box/ roof)	321	818	818	0	1069	1069	0	1229	1229	0		
MT Motors AC, LV, 0.12-1000 kW	564	855	855	0	1043	1066	23	1161	1203	42		
WP Water pumps	994	1356	1356	0	1594	1594	0	1843	1843	0		
CP Standard air compressors	405	884	884	0	930	930	0	1021	1021	0		
WE Welding Equipment	92	105	105	0	108	108	0	110	110	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	24	45	45	0	53	53	0	58	57	0		

ANNEX F: Business Revenues

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	6184	8309	8309	0	8111	8111	0	8631	8631	0
CHC Central Heating combi, water heat	3899	4881	4881	0	5089	5309	245	5362	6567	1292
CH Central Heating boiler, space heat	23930	30686	30686	0	29464	31301	1836	31341	37962	6621
SFB Solid Fuel Boilers	1748	3736	3736	0	3011	3210	199	3196	3457	261
AHC central Air Cooling	2361	11238	11238	0	16379	16381	3	21114	21116	2
AHC central Air Heating (excl. reversible AC)	771	535	535	0	469	506	37	419	448	29
LH Local Heaters	8765	13287	13287	0	15276	16641	1366	16433	17971	1538
RAC Room Air Conditioner	455	5869	6967	1098	5763	7118	1355	7543	8465	921
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	4791	16782	16782	0	19428	20100	672	22418	23060	642
LS Light Sources	7323	15355	15754	398	19358	18341	-1017	17666	17142	-524
DP electronic DisPlays	15995	27510	27510	0	22255	22255	0	27015	27015	0
STB set top boxes (Complex & Simple)	0	4840	4840	0	4759	4759	0	4759	4759	0
VIDEO (Game Consoles)	149	3217	3217	0	3217	3217	0	3217	3217	0
ES+DS Enterprise Servers and Data Storage	1379	31490	31490	0	31320	31320	0	41377	41377	0
PC Personal Computers	11626	64690	64690	0	74030	74030	0	109152	109152	0
IE imaging equipment	5758	18174	18174	0	20238	20238	0	18550	18550	0
SB (networked) Stand-By	9921	17895	17895	0	21064	21064	0	23698	23698	0
EPS External Power Supplies	86	2701	2715	13	2698	2742	43	2791	2806	15
RF Household Refrigerators & freezers	5500	6140	7047	907	6425	8073	1648	6621	8848	2227
Total CF Commercial Refrigeration	3063	3567	3567	0	3763	3763	0	4016	4123	107
Total PF Professional Refrigeration (excl.)	1069	1275	1275	0	1445	1526	82	1661	1661	0
Total CA Cooking Appliances	9452	12891	12891	0	14252	15393	1141	14607	15553	946
WM-WD household Washing Machines	3562	5314	6231	917	5768	6832	1064	5596	6145	549
DW Household Dishwashers	1288	2884	3827	944	3858	5020	1162	4792	5911	1119
LD household Laundry Drier	726	1148	1252	104	1819	2671	851	1833	2919	1086
VC Vacuum Cleaners	3568	9449	9449	0	15911	16362	451	17118	17118	0
FAN Industrial Fans >125W (excl. box/ roof)	1230	3596	3596	0	4525	5806	1281	4832	5813	981
MT Motors AC, LV, 0.12-1000 kW	2542	5049	5074	26	5901	6997	1096	6394	7757	1363
WP Water pumps	2692	3693	3695	1	4314	4314	0	4970	4970	0
CP Standard air compressors	869	1458	1458	0	1619	1687	68	1782	1843	61
WE Welding Equipment	529	600	600	0	611	611	0	624	634	11
TRAFO Utility Transformers	2612	4346	4346	0	5299	5944	645	6750	7725	974
TYRE Replacement and OEM Tyres	18907	24276	24843	568	31482	38157	6675	40377	49333	8956
TOTAL in bn euros	163	367	372	5	409	430	21	487	516	29

Total Revenue by functional group (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WATER HEATING	10	13	13	0	13	13	0	14	15	1
SPACE HEATING	35	51	52	1	51	55	4	55	64	9
SPACE COOLING	3	14	15	1	19	20	1	25	25	0
VENTILATION	5	17	17	0	19	20	1	22	23	1
LIGHTING	7	15	16	0	19	18	-1	18	17	-1
ELECTRONICS	45	171	171	0	180	180	0	231	231	0
FOOD PRESERVATION	10	11	12	1	12	13	2	12	15	2
COOKING	9	13	13	0	14	15	1	15	16	1
CLEANING	9	19	21	2	27	31	4	29	32	3
INDUSTRY COMPONENTS	8	14	14	0	17	19	2	19	21	2
ENERGY SECTOR	3	4	4	0	5	6	1	7	8	1
TRANSPORT SECTOR	19	24	25	1	31	38	7	40	49	9
TOTAL in bn euros	163	367	372	5	409	430	21	487	516	29

Total Revenue by sector (in bn €)

	1990	2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
Industry	68	174	176	2	193	204	11	232	246	14
Wholesale	14	29	30	0	33	35	2	38	40	3
Retail	37	84	86	2	93	99	6	118	125	7
Installation	19	35	35	0	37	39	2	41	47	6
Maintenance	24	45	45	0	53	53	0	58	57	0
TOTAL in bn euros	163	367	372	5	409	430	21	487	516	29

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 BAU	2010			2020			2030		
		BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc
WH dedicated Water Heater	15	20	20	0	18	18	0	21	21	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	44	44	0	34	37	2	38	41	3
AHC central Air Cooling	15	72	72	0	99	99	0	125	125	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	135	149	15	141	157	16
RAC Room Air Conditioner	2	23	29	5	23	30	7	30	34	5
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0
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	140	241	241	0	197	197	0	237	237	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	26	583	583	0	580	580	0	766	766	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	1	39	39	0	38	39	1	40	40	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	34	1
Total PF Professional Refrigeration (excl.)	14	17	17	0	19	20	1	22	22	0
Total CA Cooking Appliances	87	118	118	0	131	141	10	134	142	9
WM-WD household Washing Machines	29	44	52	8	47	57	10	46	50	5
DW Household Dishwashers	12	26	35	9	35	46	11	43	54	10
LD Household Laundry Drier	5	8	9	1	13	21	8	13	23	10
VC Vacuum Cleaners	34	87	87	0	145	149	4	156	156	0
FAN Industrial Fans >125W (excl. box/ roof)	10	32	32	0	39	54	15	41	52	11
MT Motors AC, LV, 0.12-1000 kW	20	41	41	0	47	57	10	50	62	12
WP Water pumps	14	20	20	0	23	23	0	27	27	0
CP Standard air compressors	8	10	10	0	12	13	1	13	15	1
WE Welding Equipment	4	4	4	0	4	4	0	5	5	0
TRAFO Utility Transformers	39	64	64	0	79	88	10	100	114	14
TYRE Replacement and OEM Tyres	175	225	230	5	292	353	62	374	457	83
TOTAL in 1000 jobs	1263	3216	3258	42	3568	3775	207	4305	4564	259

ANNEX G: Direct employment impacts

Jobs Wholesale (in 1000 jobs)

	1990 BAU	2010			inc	2020			inc	2030		
		BAU	ECO			BAU	ECO			BAU	ECO	inc
WH dedicated Water Heater	1	1	1	0		1	1	0		1	1	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	5	0
RAC Room Air Conditioner	0	2	3	1		2	3	1		3	4	0
CIRC Circulator pumps <2.5 kW	0	0	0	0		0	0	0		0	0	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	0	2	2	0		2	2	0		2	2	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	1	2	2	0		3	3	0		3	3	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	1	1	1	0		2	2	0		2	2	0
CP Standard air compressors	0	0	0	0		0	0	0		0	0	0
WE Welding Equipment	0	0	0	0		0	0	0		0	0	0
TRAFO Utility Transformers	1	2	2	0		2	2	0		3	3	0
TYRE Replacement and OEM Tyres	9	11	12	0		15	18	3		19	23	4
TOTAL in 1000 jobs	52	108	109	2		123	128	6		140	149	9

ANNEX G: Direct employment impacts

Jobs Retail (in 1000 jobs)

	1990 BAU	2010			inc	2020			inc	2030		
		BAU	ECO			BAU	ECO			BAU	ECO	inc
WH dedicated Water Heater	3	4	4	0		4	4	0		4	4	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	0	0	0	0		0	0	0		0	0	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	187	187	0		140	140	0		178	178	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	0	0	0	0		0	0	0		0	0	0
RF Household Refrigerators & freezers	40	45	52	7		47	59	12		48	65	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	112	8		106	113	7
WM-WD household Washing Machines	24	36	42	7		39	46	8		37	41	4
DW Household Dishwashers	9	21	28	7		28	37	9		35	43	8
LD household Laundry Drier	4	6	7	1		11	17	6		11	19	8
VC Vacuum Cleaners	23	66	66	0		114	117	3		122	122	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	2	2	2	0		3	3	0		3	3	0
CP Standard air compressors	0	0	0	0		0	0	0		0	0	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	2
TYRE Replacement and OEM Tyres	109	140	144	3		182	221	39		234	286	52
TOTAL in 1000 jobs	577	1300	1327	27		1442	1530	88		1814	1924	110

ANNEX G: Direct employment impacts

Jobs Installation (in 1000 jobs)

	1990			2010			2020			2030		
	BAU	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO	inc	BAU	ECO
WH dedicated Water Heater	11	15	15	0	14	14	0	16	16	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	0	0	0	0	0	0	0	0	0	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	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	5	7	7	0	8	8	0	9	9	0		
CP Standard air compressors	0	0	0	0	0	0	0	0	0	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	175	324	328	4	341	363	22	380	434	54		

ANNEX G: Direct employment impacts

Jobs Maintenance (in 1000 jobs)

	1990 BAU	2010			inc	2020			2030		
		BAU	ECO			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	0	0	0	0		0	0	0	0	0	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	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	0	0	0	0		0	0	0	0	0	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	9	13	13	0		15	15	0	17	17	0
CP Standard air compressors	4	8	8	0		9	9	0	9	9	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	225	416	417	0		491	491	0	535	532	-3

ANNEX G: Direct employment impacts

TOTAL direct jobs by product group (in 1000 jobs)

	1990 BAU	2010				2020				2030		
	BAU	ECO	inc		BAU	ECO	inc		BAU	ECO	inc	
WH dedicated Water Heater	65	87	87	0	84	84	0	91	91	0	0	0
CHC Central Heating combi, water heat	43	53	53	0	56	58	3	59	73	15	15	15
CH Central Heating boiler, space heat	267	334	334	0	319	340	21	341	419	77	77	77
SFB Solid Fuel Boilers	23	56	56	0	45	48	3	49	53	4	4	4
AHC central Air Cooling	30	140	140	0	202	202	0	258	259	0	0	0
AHC central Air Heating (excl. AC rev)	10	7	7	0	6	7	1	5	6	0	0	0
LH Local Heaters	122	186	186	0	211	231	20	225	247	23	23	23
RAC Room Air Conditioner	5	65	78	13	64	80	16	84	95	11	11	11
CIRC Circulator pumps <2.5 kW	0	0	0	0	0	0	0	0	0	0	0	0
VU Ventilation Units (res & nonres)	58	206	206	0	239	250	11	277	287	10	10	10
LS Light Sources	91	188	194	6	251	246	-5	224	224	0	0	0
DP electronic DisPlays	256	439	439	0	349	349	0	427	427	0	0	0
STB set top boxes (Complex & Simple)	0	68	68	0	66	66	0	66	66	0	0	0
VIDEO (Game Consoles)	2	52	52	0	52	52	0	52	52	0	0	0
ES+DS Enterprise Servers and Data Storage	26	583	583	0	580	580	0	766	766	0	0	0
PC Personal Computers	186	1042	1042	0	1192	1192	0	1758	1758	0	0	0
IE imaging equipment	84	250	250	0	265	265	0	242	242	0	0	0
SB (networked) Stand-By	139	252	252	0	296	296	0	333	333	0	0	0
EPS External Power Supplies	1	41	41	0	41	41	1	42	42	0	0	0
RF Household Refrigerators & freezers	91	102	117	15	106	133	27	109	146	37	37	37
Total CF Commercial Refrigeration	38	44	44	0	46	46	0	49	51	1	1	1
Total PF Professional Refrigeration (excl.)	16	19	19	0	22	23	1	25	25	0	0	0
Total CA Cooking Appliances	156	213	213	0	236	255	19	242	257	16	16	16
WM-WD household Washing Machines	57	84	99	15	91	109	18	88	98	9	9	9
DW Household Dishwashers	21	48	63	16	64	83	19	79	98	19	19	19
LD household Laundry Drier	11	17	19	2	28	42	14	28	46	18	18	18
VC Vacuum Cleaners	58	155	155	0	261	269	7	281	281	0	0	0
FAN Industrial Fans >125W (excl. box/ roof)	16	47	47	0	59	78	18	63	77	14	14	14
MT Motors AC, LV, 0.12-1000 kW	32	65	65	0	76	90	14	82	100	18	18	18
WP Water pumps	31	43	43	0	50	50	0	58	58	0	0	0
CP Standard air compressors	12	19	19	0	21	22	1	23	24	1	1	1
WE Welding Equipment	7	8	8	0	8	8	0	8	8	0	0	0
TRAFO Utility Transformers	44	73	73	0	89	99	11	113	129	16	16	16
TYRE Replacement and OEM Tyres	293	377	385	9	488	592	104	626	765	139	139	139
TOTAL in 1000 jobs	2292	5363	5439	76	5963	6287	324	7175	7604	430		

TOTAL direct jobs by functional group (in 1000 jobs)

Functional group	1990 BAU	2010				2020				2030		
	BAU	BAU	ECO	inc		BAU	ECO	inc		BAU	ECO	inc
WATER HEATING	108	140	140	0	140	143	3	149	164	15	15	15
SPACE HEATING (excl. reversible AC)	425	616	623	6	613	665	53	662	772	110	110	110
SPACE COOLING	32	173	179	6	234	241	8	300	306	5	5	5
VENTILATION	58	206	206	0	239	250	11	277	287	10	10	10
LIGHTING	91	188	194	6	251	246	-5	224	224	0	0	0
ELECTRONICS	695	2726	2727	0	2841	2841	1	3687	3688	0	0	0
FOOD PRESERVATION	145	165	180	15	174	203	28	184	222	38	38	38
COOKING	156	213	213	0	236	255	19	242	257	16	16	16
CLEANING	146	304	336	33	444	503	58	476	522	46	46	46
INDUSTRY COMPONENTS	99	182	182	0	214	248	34	234	267	33	33	33
ENERGY SECTOR	44	73	73	0	89	99	11	113	129	16	16	16
TRANSPORT SECTOR	293	377	385	9	488	592	104	626	765	139	139	139
TOTAL in 1000 jobs	2292	5363	5439	76	5963	6287	324	7175	7604	430		

TOTAL direct jobs by sector (in 1000 jobs)

Sector	1990 BAU	2010				2020				2030		
	BAU	BAU	ECO	inc		BAU	ECO	inc		BAU	ECO	inc
Industry (incl. OEM & business services)	1263	3216	3258	42	3568	3775	207	4305	4564	259	259	259
Wholesale	52	108	109	2	123	128	6	140	149	9	9	9
Retail	577	1300	1327	27	1442	1530	88	1814	1924	110	110	110
Installation	175	324	328	4	341	363	22	380	434	54	54	54
Maintenance	225	416	417	0	491	491	0	535	532	-3	-3	-3
TOTAL in 1000 jobs	2292	5363	5439	76	5963	6287	324	7175	7604	430		

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Commission Regulations (Ecodesign)

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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
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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
COMMISSION REGULATION (EU) No 327/2011 of 30 March 2011 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for fans driven by motors with an electric input power between 125 W and 500kW, OJ L 90, 6.4.2011, p.8
COMMISSION REGULATION (EU) No 206/2012 of 6 March 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for air conditioners and comfort fans, OJ L 72, 10.3.2012, p.7
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
COMMISSION REGULATION (EU) No 622/2012 of 11 July 2012 amending Regulation (EC) No 641/2009 with regard to ecodesign requirements for glandless standalone circulators and glandless circulators integrated in products, OJ L 180, 12.7.2012, p.4
COMMISSION REGULATION (EU) No 932/2012 of 3 October 2012 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for household tumble driers, OJ L 278, 12.10.2012, p.1
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COMMISSION REGULATION (EU) No 813/2013 of 2 August 2013 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for space heaters and combination heaters, OJ L 239, 6.9.2013, p.136
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COMMISSION REGULATION (EU) 2015/1189 of 28 April 2015 implementing Directive 2009/125/EC of the European Parliament and of the Council with regard to ecodesign requirements for solid fuel boilers, OJ L 193, 21.7.2015, p.100
COMMISSION REGULATION (EU) 2016/2281 of 30 November 2016 implementing Directive 2009/125/EC of the European Parliament and of the Council, with regard to ecodesign requirements for air heating products, cooling products, high temperature process chillers and fan coil units, OJ L 346, 20.12.2016, p.1
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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 appliance, OJ L 314, 30.11.2010, p.17
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COMMISSION DELEGATED REGULATION (EU) No 1062/2010 of 28 September 2010 supplementing Directive 2010/30/EU of the European Parliament and of the Council with regard to energy labelling of televisions, OJ L 314, 30.11.2010, p.64
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