

Energy, transport and environment statistics

2019 edition



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Energy, transport and environment statistics

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Foreword

Reconciling economic efficiency, social inclusion and environmental responsibility is essential for sustainable development. Since the adoption of the 2030 Agenda for Sustainable Development in 2015, the European Union has made significant progress towards delivering the Sustainable Development Goals and continues to do so.

The EU is fully committed to implementing the 2030 Agenda, and has embarked on a transition towards a low-carbon, climate-neutral, resource-efficient and circular economy. The EU's 2030 Climate and Energy Framework sets out the objectives of: a 40 % cut in greenhouse gas emissions; a 32 % share of energy from renewable sources; and a 32.5 % improvement in energy efficiency, compared to 1990 levels.

The aim of the EU's 'Energy Union' is to diversify Europe's energy sources and ensure energy security, create a fully-integrated internal energy market, improve energy efficiency, cut emissions and support research and innovation in low-carbon and clean energy technologies.

The European Commission's 'Roadmap to a Single European Transport Area', contains 40 concrete initiatives to build a competitive transport system that will increase mobility, remove major barriers in key areas and fuel growth and employment. Furthermore, the strategy will dramatically reduce Europe's dependence on imported oil and cut carbon emissions in transport by 60% by 2050.

The Commission's 7th Environment Action Programme guides European environment policy towards 2020. It aims to protect, conserve and enhance the EU's natural capital, transform the EU into a resource-efficient, green and competitive low-carbon economy, and safeguard the EU's citizens from environment-related pressures. The 2015 Circular Economy Action Plan has accelerated the transition towards a circular economy in Europe, creating new jobs and business opportunities, giving rise to new business models and developing new markets.

In order to design, implement and monitor these EU policies and strategies, there is a need for high quality statistics on energy, transport and the environment; trusted statistics are essential for providing reliable information to the public and to policy makers.

This year's edition of the Statistical Book on Energy, transport and environment statistics includes features that will help the reader understand the main messages provided by the data. As far as possible, data are presented through charts, maps or infographics, rather than tables. In addition, the main messages have been highlighted in an overview infographic for each chapter.

The contents of this book, complemented with further details, can be found online in Eurostat's Statistics explained articles. The most up-to-date European statistics on energy, transport and the environment can be freely downloaded from Eurostat's dissemination database.

I wish you enjoyable reading!



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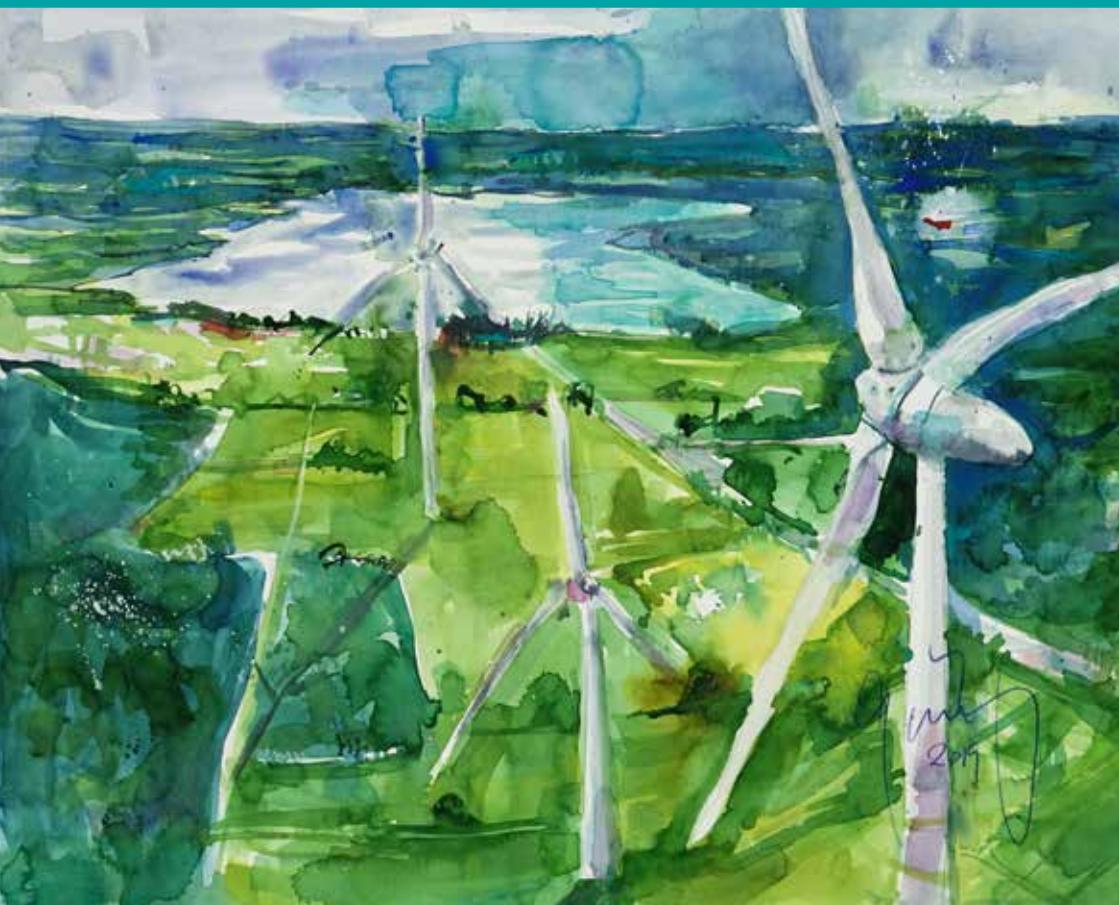
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1

Energy





Introduction

The European Union's energy policy includes the need for secure energy supplies, sustainable energy consumption, lower fossil fuel dependence and improvements in energy efficiency. The European Energy Strategy and Energy Union need to be underpinned by statistical evidence for sound decision making. To this end, energy statistics is one of the key inputs for monitoring progress towards the existing targets and goals (Europe 2020 and Europe 2030) and developing new energy policies. As energy is vital to many sectors of the economy, energy data contribute also to explaining developments in other areas such as transport and climate change.

In order to meet the requirements of policymakers for Energy Union monitoring, Eurostat has developed a coherent and harmonised system of energy statistics. Detailed data are collected for all Member States of the EU, the European Economic Area countries, the candidate countries and potential candidates, and the Energy Community Contracting Parties. Eurostat and the reporting countries meet twice per year in the Energy Statistics Working Group meetings.

Annual energy statistics provide the most comprehensive coverage. On the supply side, data cover production, trade and stock changes, as well as transformation of energies. On the demand side, disaggregated data are collected on consumption in industry, transport, households and services. In addition, complementing indicators are collected, such as calorific values and capacities of production. Statistics are compiled for crude oil, various oil products, natural gas, electricity, derived heat, different types of solid fossil fuels, renewables (including biofuels) and wastes. On a monthly basis, more limited information is available on the consumption of energies. The legal basis

for monthly and annual energy data collections is Regulation (EC) No 1099/2008 on energy statistics.

Furthermore, Eurostat collects and publishes electricity and natural gas prices based on Regulation (EU) No 2016/1952 on European statistics on natural gas and electricity prices and cooperates with DG Energy on the reports on energy prices and costs in Europe. To complement the market overview, Eurostat collects on a voluntary basis 'competition indicators' for natural gas and electricity markets.

The Europe 2020 strategy emphasises smart, sustainable and inclusive growth in order to improve Europe's competitiveness and productivity. For energy, the goals for 2020 are reaching the 20 % share of energy from renewable sources and improving energy efficiency by 20 %. Eurostat provides main indicators monitoring progress towards these targets as well as complementary data that can provide additional insights into the developments. Especially for the share of energy from renewable sources, Eurostat has developed the SHARES tool that implements Directive 2009/28/EC on the use of energy from renewable energy.

The growing demand for energy data is a continuous challenge for statisticians. The cost effectiveness of the development, production and dissemination of statistics is often highlighted as one of the governing principles. This means that the production of statistics and the related reporting burden must be in proportion to the importance of the results and the benefits sought. Keeping this in mind, reporting countries and Eurostat worked together in the Task Force on the Future of Energy Statistics and produced a list of recommendations and conclusions.

Energy in the EU: 2017 facts and figures...

Renewable energy represented 17.5 % of energy consumed, on a path to the 2020 target of 20 %



Nuclear plants generated around 25 % of the electricity produced

+ 5 % since 1990



Russia was the main supplier of crude oil, natural gas and solid fuels



Natural gas imports increased by 19 % in the last decade



The share of energy from renewable sources used in transport activities reached 7.6 %

Oil remains the most important energy source for the European economy

... and during the second half of 2018

Household electricity prices highest in Denmark and lowest in Bulgaria

Denmark: EUR 0.31 per kWh

Bulgaria: EUR 0.10 per kWh



Almost a third of the gross electricity generation came from renewables and biofuels



The primary production of renewables and biofuels increased compared to 2016 by 4.5 %



Household gas prices highest in Sweden and lowest in Hungary

Sweden: EUR 0.12 per kWh

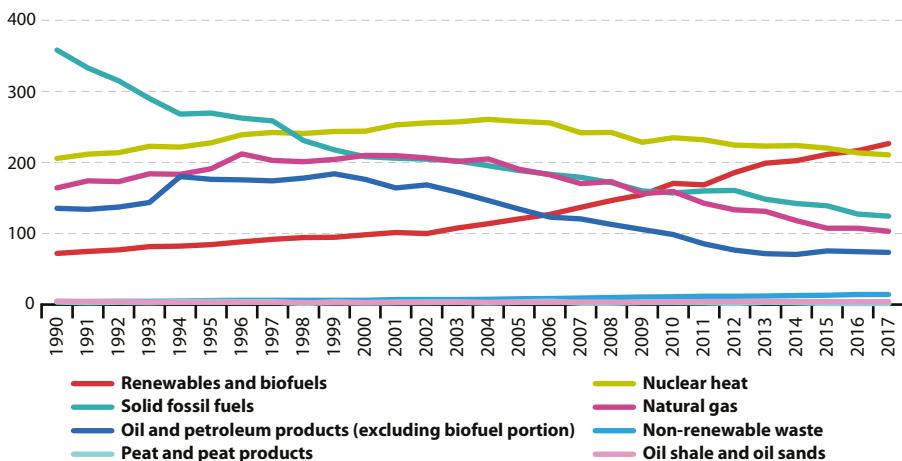
Hungary: EUR 0.03 per kWh



1.1 Primary energy production

Figure 1.1.1: Primary energy production by fuel, EU-28, 1990-2017

(Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

Primary production of energy within the EU-28 in 2017 was slightly over 758 million tonnes of oil equivalent (Mtoe). This was only 0.1 % lower than the year before and continued the generally downward development observed in recent years, except 2010 when production rebounded following a relatively strong fall in 2009 coinciding with the global financial and economic crisis. When viewed over a longer period, the production of primary energy in the EU-28 was 12.1 % lower in 2017 than it had been a decade earlier. The general downward development of EU-28 primary energy production may, at least partly, be attributed to supplies of raw materials becoming exhausted and/or producers considering the exploitation of limited resources uneconomical.

The biggest decrease was in natural gas (3.9 %) which continues to decrease year by year, followed by solid fossil fuels with a similar downward trend (2.1 % decrease) and oil and petroleum products (1.5 % decrease).

An increase was registered for renewable energies with 4.6 % while non-renewable waste remained constant (Figure 1.1.1). Renewable energies accounted for the highest share in primary energy production in EU-28 in 2017 (29.9 %), followed by nuclear heat (27.8 %), solid fossil fuels (16.4 %), natural gas (13.6 %), oil and petroleum products (9.7 %) and non-renewable wastes (1.9 %).

Over the past decade (2007-2017), the trend in primary energy production was generally negative for solid fossil fuels, oil, natural gas and nuclear energy. The production of natural gas and oil and petroleum products accounted for the biggest decrease (with 39.4 % and 39.1 % respectively) while solid fossil fuels production fell by 30.5 %. By contrast, there was a positive trend in the production of renewable energies over the same period (with an exception in 2011), with a 65.6 % increase, as well as for waste (non-renewable) with a 57.8 % increase.

**Table 1.1.1: Energy production, 2007-2017**

	Total production of primary energy		Share of total production, 2017					
	2007	2017	Nuclear energy	Solid fossil fuels	Natural gas	Crude oil	Renewable energy	Other
	(Mtoe)				(%)			
EU-28	862.9	758.2	27.8	16.4	13.6	8.8	29.9	3.5
Belgium	14.2	14.9	74.0	0.0	0.0	0.0	21.6	4.4
Bulgaria	9.9	11.7	33.8	48.6	0.6	0.2	16.6	0.3
Czechia	34.0	27.3	25.7	55.5	0.7	0.4	16.3	1.5
Denmark	27.2	15.9	0.0	0.0	27.4	43.6	26.5	2.4
Germany	136.4	115.8	17.0	34.1	5.2	1.9	36.8	5.0
Estonia	4.4	5.8	0.0	0.0	0.0	0.0	27.0	73.0
Ireland	1.4	4.9	0.0	0.0	58.6	0.0	23.5	17.9
Greece	10.2	7.5	0.0	60.9	0.1	1.9	37.1	0.0
Spain	30.1	34.2	44.2	3.3	0.1	0.4	51.3	0.8
France	133.5	132.2	78.6	0.0	0.0	0.6	19.6	1.2
Croatia	4.9	4.2	0.0	0.0	29.2	16.7	52.1	1.9
Italy	31.1	36.7	0.0	0.0	12.4	11.3	72.4	4.0
Cyprus	0.1	0.1	0.0	0.0	0.0	0.0	97.5	2.5
Latvia	1.8	2.6	0.0	0.0	0.0	0.0	99.7	0.3
Lithuania	3.8	1.8	0.0	0.0	0.0	3.2	94.4	2.3
Luxembourg	0.1	0.2	0.0	0.0	0.0	0.0	80.8	19.2
Hungary	10.8	11.1	36.6	11.5	12.7	6.4	28.6	4.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	100.0	0.0
Netherlands	60.2	41.7	1.9	0.0	79.5	2.3	13.4	2.8
Austria	10.6	12.3	0.0	0.0	8.5	5.7	79.6	6.2
Poland	71.7	64.0	0.0	77.4	5.5	1.6	14.2	1.4
Portugal	4.6	5.2	0.0	0.0	0.0	0.0	97.1	2.9
Romania	27.8	25.5	11.4	17.5	33.5	13.8	22.9	0.9
Slovenia	3.4	3.5	42.3	26.6	0.2	0.0	29.4	1.5
Slovakia	5.8	6.4	62.6	7.0	1.8	0.1	25.4	3.1
Finland	16.0	18.1	29.8	0.0	0.0	0.0	64.5	5.6
Sweden	32.9	36.6	44.7	0.0	0.0	0.0	53.0	2.3
United Kingdom	175.8	118.1	12.8	1.6	30.5	37.8	13.2	4.2
Iceland	3.9	4.8	0.0	0.0	0.0	0.0	100.0	0.0
Norway	214.9	213.4	0.0	0.0	50.9	37.1	6.6	5.3
Montenegro	0.5	0.6	0.0	51.5	0.0	0.0	48.5	0.0
North Macedonia	1.6	1.2	0.0	73.4	0.0	0.0	26.6	0.0
Albania	1.1	1.6	0.0	4.1	2.3	58.7	34.9	0.0
Serbia	10.5	10.5	0.0	68.8	3.7	8.9	18.1	0.5
Turkey	27.5	36.5	0.0	43.0	0.8	7.4	48.6	0.2
Bosnia and Herzegovina	4.6	0.0	78.1	0.0	0.0	0.0	21.9	0.0
Kosovo ⁽¹⁾	1.4	1.8	0.0	78.7	0.0	0.0	21.3	0.0
Ukraine	82.2	58.4	38.6	23.2	26.5	2.6	7.7	1.5
Georgia	1.3	0.0	8.2	0.5	2.4	88.9	0.0	

Note: Category 'other' includes natural gas liquids, additives and oxygenates (excluding biofuel portion), other hydrocarbons, peat, oil shale and oil sands, industrial waste (non-renewable) and non-renewable municipal waste.

(¹) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_c)

Production of primary energy in EU-28 and all reporting countries is illustrated in Table 1.1.1. In 2017, primary energy production among the EU Member States was the highest in France, with a 17.4 % share of the EU-28 total, followed by the United Kingdom (15.6 %) and Germany

(15.3 %). Compared with a decade earlier, some of the main changes were increases of 17.8, 13.5 and 11.3 percentage points in the shares of Italy, Spain and Sweden and falls of 41.7, 32.8 and 30.7 percentage points in the shares of Denmark, the United Kingdom and the Netherlands.

In absolute terms, 17 out of the 28 EU Member States recorded an expansion in their primary energy production in the period 2007 to 2017. The largest expansion in production was registered in Italy (an increase of 5.5 Mtoe), followed by Spain (4.1 Mtoe), Sweden (3.7 Mtoe), Ireland (3.4 Mtoe), and Finland (2.0 Mtoe). By contrast, the production of primary energy in the United Kingdom fell by as much as 57.6 Mtoe, while Germany (-20.6 Mtoe), the Netherlands (-18.5 Mtoe) and Denmark (-11.3 Mtoe) also reported contractions in excess of 10 Mtoe.

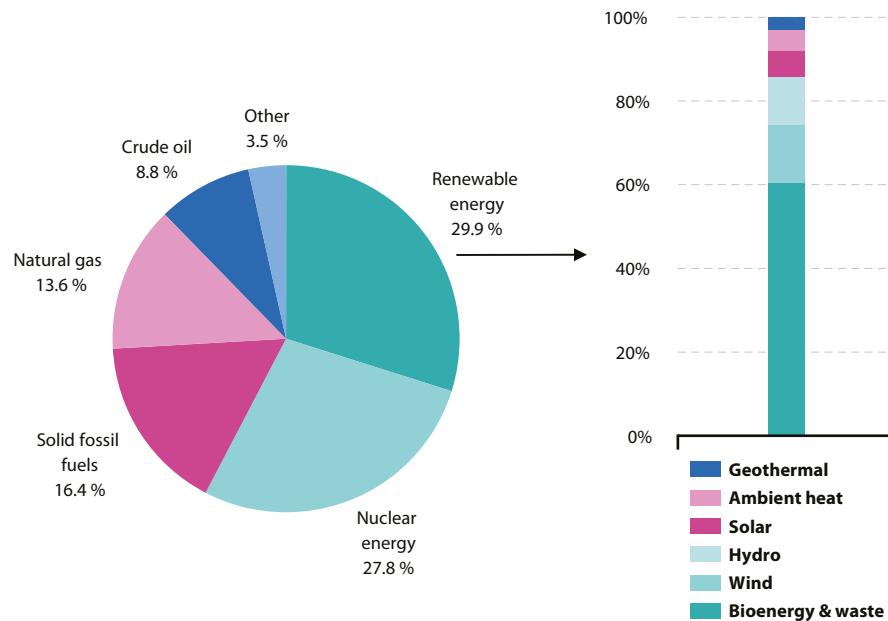
Primary energy production in the EU-28 in 2017 was spread across a range of different energy sources, with renewable energy sources being the most important, accounting for more than one quarter (29.9 %) of the EU-28's total production.

Nuclear energy comes second, accounting for 27.8 % of the total primary energy production. The significance of nuclear energy was particularly high in France where it accounted for almost 79 % of the national primary energy production, while in Belgium this share was almost three quarters and in Slovakia it was over three fifths (62.6 %). In 11 other Member States the share of nuclear energy in primary production was less than half of the total. There was no nuclear energy production in 14 EU Member States.

The share of solid fossil fuels (16.4 %, largely coal) was just below one fifth and the share of natural gas was somewhat lower (13.6 %). Crude oil (8.8 %) was the only other major source of primary energy production, as it is shown in Figure 1.1.2.

Figure 1.1.2: Production of primary energy, EU-28, 2017

(% of total, based on tonnes of oil equivalent)

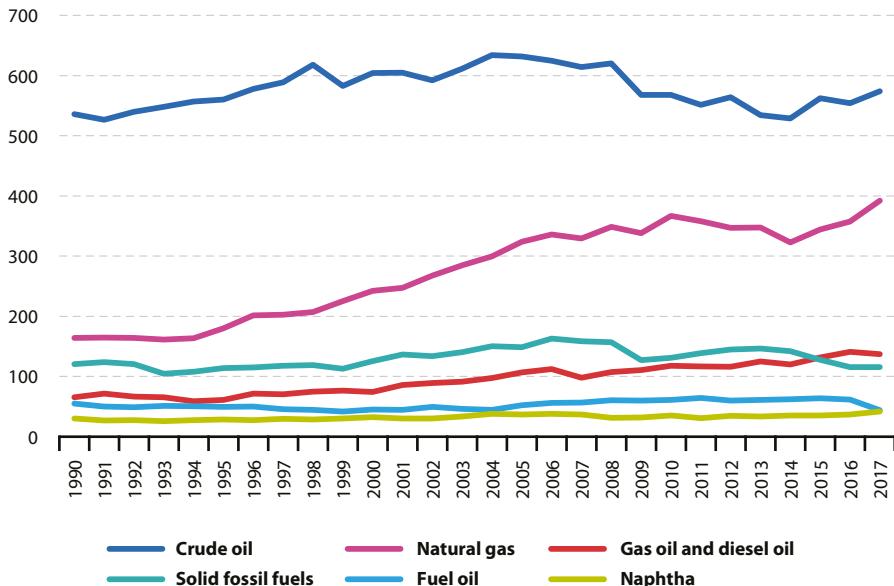


Source: Eurostat (online data codes: nrg_bal_c)

1.2 Energy trade & dependency

Figure 1.2.1: Imports of selected energy products, EU-28, 1990-2017

(Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

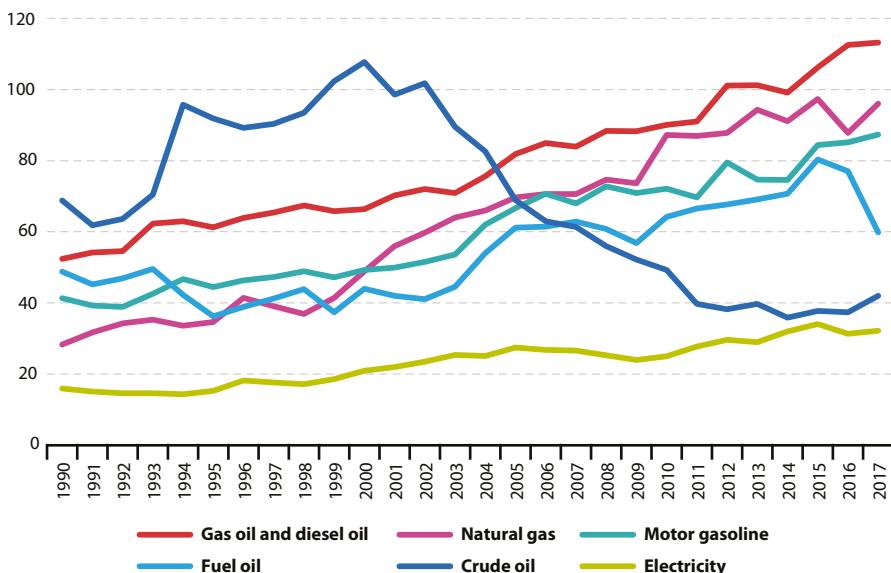
The decrease of primary energy production in the EU-28 over the past decades resulted in increased imports of primary energy and energy products.

Natural gas imports more than doubled over the period 1990–2017 to 392 Mtoe (Figure 1.2.1), although there was a slight decrease from 2010 till 2015, when they started to increase again, and in 2017 they reached their highest value, making natural gas the second most imported energy product.

Crude oil ranked first in terms of quantities imported, though for 2017, the figure was 574 Mtoe, 6.6 % lower than 10 years ago.

Exports quantities are much lower than imports (Figure 1.2.2). In 2017, gas oil and diesel oil (around 113 Mtoe) ranked first, followed by natural gas (96 Mtoe) and motor gasoline (87 Mtoe).

Figure 1.2.2: Exports of selected energy products, EU-28, 1990-2017
(Mtoe)



Source: Eurostat (online data code: [nrg_bal_c](#))

The main origins of EU-28 energy imports have changed somewhat in recent years. Russia has maintained throughout the whole period 2007-2017 its position as the leading EU supplier of the main primary energy commodities – hard coal, crude oil and natural gas (see Table 1.2.1).

In 2017, 38.9 % of the EU's imports of hard coal were from Russia. Russia has been the largest

hard coal supplier to the EU for the last decade. Between 2007 and 2015 the share of EU-28 hard coal imports originating from Colombia almost doubled, rising from 11.8 % to 22.2 % of the total, with this share falling to 16.9 % in 2017. The United States had been the third main supplier of hard coal imports to the EU-28 in 2017 with 16.9 % of the total.

Table 1.2.1: Main origin of primary energy imports, EU-28, 2007-2017
 (% of extra EU-28 imports)

	Hard coal (based on tonnes)										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	25.2	26.1	31.1	27.4	26.7	26.2	30.0	31.0	29.8	30.7	38.9
Colombia	11.8	11.9	16.4	18.7	21.3	22.2	19.4	19.8	22.2	21.1	16.9
United States	9.7	14.7	14.3	17.6	18.6	22.9	22.3	20.5	14.7	13.2	16.9
Australia	14.2	12.5	7.9	11.3	9.4	8.0	8.5	7.2	11.2	16.3	11.8
South Africa	20.2	16.8	15.6	9.8	8.3	6.6	6.1	7.9	7.4	5.3	4.9
Indonesia	7.8	7.2	6.7	5.5	5.1	4.6	3.3	3.7	4.0	3.4	3.4
Canada	3.3	2.8	1.5	2.1	2.3	1.8	2.0	2.9	1.7	2.3	2.5
Mozambique	0.0	0.0	0.0	0.0	0.1	0.0	0.3	0.4	0.5	0.8	1.2
Kazakhstan	0.1	0.3	0.2	0.2	0.3	0.3	0.3	0.6	0.6	1.0	0.7
Others	5.1	5.5	4.2	3.5	4.0	3.0	3.1	3.6	2.4	2.5	2.4
	Crude oil (based on tonnes)										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	33.7	31.8	33.6	34.7	34.7	33.6	33.7	30.4	29.0	31.9	30.3
Norway	15.0	15.0	15.1	13.7	12.6	11.3	11.8	13.1	12.1	12.5	11.4
Iraq	3.4	3.3	3.8	3.2	3.6	4.1	3.6	4.6	7.6	8.3	8.2
Kazakhstan	4.6	4.8	5.3	5.5	5.7	5.1	5.7	6.4	6.6	6.8	7.4
Saudi Arabia	7.2	6.8	5.7	5.9	8.0	8.8	8.7	8.9	7.9	7.8	6.6
Nigeria	2.7	4.0	4.5	4.1	6.1	8.2	8.1	9.1	8.4	5.7	6.4
Iran	6.2	5.3	4.7	5.7	5.8	1.3	0.0	0.1	0.0	2.9	5.2
Libya	9.7	9.9	8.9	10.1	2.8	8.1	5.6	3.3	2.4	2.3	5.2
Azerbaijan	3.0	3.2	4.0	4.4	4.9	3.9	4.8	4.4	5.2	4.5	4.5
Others	14.6	16.0	14.4	12.7	15.9	15.6	17.9	19.6	20.7	17.4	14.8
	Natural gas (based on terajoule (gross calorific value - GCV))										
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Russia	38.7	37.4	33.0	31.9	34.4	34.9	41.1	37.4	37.7	39.8	38.7
Norway	28.1	28.5	29.7	27.9	27.6	31.8	30.4	32.1	32.1	25.1	25.3
Algeria	15.3	14.7	14.1	13.9	13.1	13.3	12.6	12.0	10.8	12.5	10.6
Qatar	2.2	2.3	5.9	9.7	11.6	8.4	6.5	6.8	7.7	5.7	5.2
Nigeria	4.6	4.0	2.4	4.0	4.4	3.1	1.7	1.5	2.0	2.0	2.5
Libya	3.0	2.9	2.9	2.7	0.7	1.9	1.7	2.1	2.1	1.3	1.1
Peru	0.0	0.0	0.0	0.0	0.0	0.8	0.5	0.5	0.3	0.5	0.9
United States	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.4
Trinidad and Tobago	0.8	1.7	2.0	1.4	1.2	0.9	0.7	0.9	0.6	0.3	0.3
Others	7.3	8.5	9.9	8.3	6.9	5.0	4.7	6.7	6.6	12.9	15.0

Source: Eurostat (online data codes: nrg_ti_sff, nrg_ti_oil and nrg_ti_gas)



Russia was also the principal supplier of EU crude oil imports. Its share stood at 33.7 % in 2007 and fluctuated between 34.7 % (which was also the peak recorded in 2011) and 29.0 % (the lowest share, recorded in 2015). In 2017, its share stood at 30.3 %. During the same period there was a relatively slow decline in the share of EU-28 crude oil imports originating from Norway, falling from 15.0 % in 2007 to 11.4 % in 2017. The relative shares of EU-28 crude oil supplies from Iraq and Kazakhstan increased at a rapid pace between 2007 and 2017 reaching 8.2 % and 7.4 % respectively, thus making Iraq and Kazakhstan the third and fourth largest crude oil suppliers, before Saudi Arabia.

Russia's share of EU imports of natural gas in 2007 and in 2017 was 38.7 %; nevertheless, it did not remain stable during the whole decade: the lowest level was recorded in 2010 (31.9 %) and its peak of 41.1 % was recorded in 2013. During the period shown in Table 1.2.1, Norway remained the second largest supplier of EU imports of natural gas, its share slowly falling from 28.1 % in 2007 to 25.3 % in 2017. The share of EU-28 natural gas supplies that originated from Algeria, the third largest supplier, declined between 2007 and 2017, whereas the share from Qatar more than doubled.

A high concentration among relatively few partners, combined with the inability to be able to switch rapidly to another supplier may constitute a threat of the security of the EU's primary energy supplies.

Therefore, data on imports should be taken into account when analysing Europe's energy security.

Almost three quarters (74.6 %) of the EU-28 imports of natural gas in 2017 came from Russia, Norway and Algeria. A similar analysis shows that close to three quarters (72.7 %) of EU-28 hard coal imports originated from Russia, Colombia and the United States, while imports of crude oil were slightly less concentrated among the principal suppliers, as Russia, Norway and Iraq accounted for roughly half (49.9 %) of the EU-28 imports.

The drop of the primary production of hard coal, lignite, crude oil, natural gas and more recently nuclear energy has led to a situation where the EU has become increasingly reliant on imports of primary energy commodities and also secondary derived products (e.g. gas/diesel oil) in order to satisfy its demand, although the situation stabilised in the aftermath of the global financial and economic crisis. The EU-28 imports of energy exceeded exports by 948 Mtoe in 2017. The largest net importers of energy in absolute terms were Germany, Italy, France and Spain. In 2007, Denmark had been the only net exporter of energy among the EU Member States, but since 2013, Danish energy imports have exceeded energy exports. Hence, since 2013 all 28 Member States of the EU are net importers of energy (see Table 1.2.2). Relative to population size, the largest net importers in 2017 were Luxembourg, Malta and Belgium.

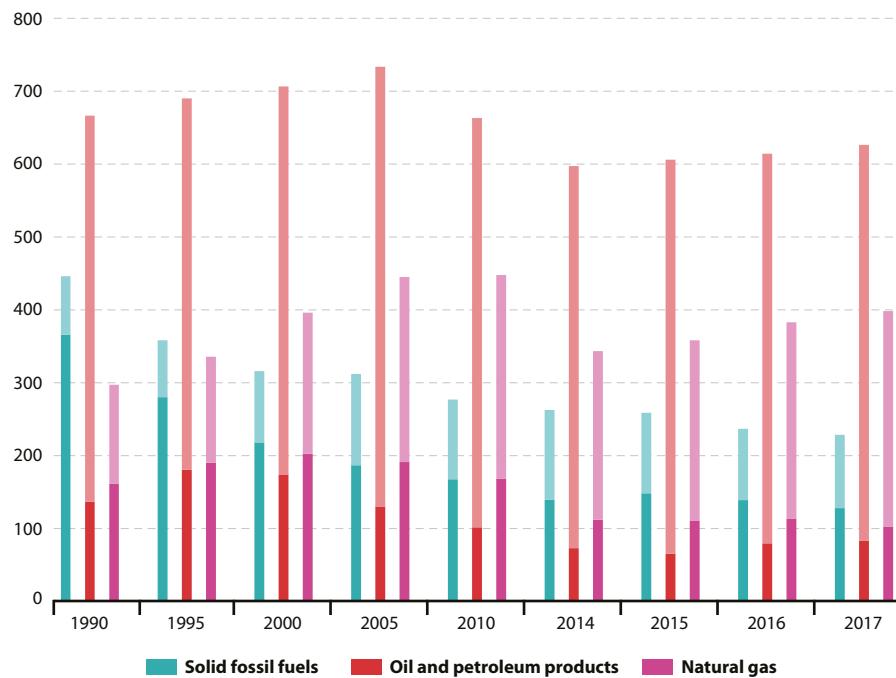
Table 1.2.2: Net imports of energy, in selected years, 2007-2017

	2007	2009	2011	2013	2015	2017	2007	2009	2011	2013	2015	2017
	(Mtoe)						(toe per inhabitant)					
EU-28	989	939	953	916	906	948	2.0	1.9	1.9	1.8	1.8	1.8
Belgium	51	48	48	49	50	48	4.8	4.5	4.4	4.3	4.4	4.2
Bulgaria	10	8	7	7	7	7	1.4	1.1	1.0	0.9	1.0	1.1
Czechia	12	12	13	12	13	16	1.1	1.1	1.2	1.1	1.3	1.5
Denmark	-5	-4	-1	2	2	2	-1.0	-0.7	-0.2	0.4	0.4	0.4
Germany	200	198	199	207	198	207	2.4	2.4	2.5	2.6	2.4	2.5
Estonia	2	1	1	1	1	0	1.2	0.9	0.6	0.7	0.4	0.2
Ireland	14	13	13	12	13	10	3.2	2.9	2.7	2.7	2.7	2.1
Greece	24	22	19	16	18	19	2.2	2.0	1.8	1.5	1.7	1.7
Spain	124	111	105	90	95	102	2.7	2.4	2.3	1.9	2.1	2.2
France	138	134	131	129	120	125	2.2	2.1	2.0	1.9	1.8	1.9
Croatia	5	4	5	4	4	5	1.2	1.0	1.1	1.0	1.0	1.2
Italy	158	141	141	123	121	125	2.7	2.4	2.4	2.0	2.0	2.1
Cyprus	3	3	3	2	2	3	3.8	3.6	3.1	2.7	2.9	3.1
Latvia	3	3	3	3	2	2	1.4	1.4	1.3	1.3	1.2	1.1
Lithuania	6	4	6	5	5	6	1.8	1.4	2.0	1.8	1.9	2.0
Luxembourg	4	4	4	4	4	4	9.3	8.5	8.5	7.7	7.0	6.9
Hungary	17	15	13	12	14	17	1.7	1.5	1.3	1.2	1.4	1.7
Malta	2	2	2	2	2	3	4.4	4.9	5.5	5.0	5.0	6.4
Netherlands	37	32	28	22	43	47	2.3	2.0	1.7	1.3	2.5	2.7
Austria	23	21	24	21	20	22	2.8	2.5	2.8	2.5	2.3	2.5
Poland	25	30	35	26	29	40	0.7	0.8	0.9	0.7	0.8	1.1
Portugal	22	21	19	17	18	20	2.1	2.0	1.8	1.6	1.8	1.9
Romania	12	7	8	6	5	8	0.6	0.3	0.4	0.3	0.3	0.4
Slovenia	4	3	4	3	3	3	1.9	1.7	1.7	1.6	1.6	1.7
Slovakia	12	11	11	10	10	11	2.3	2.1	2.1	1.9	1.8	2.1
Finland	20	19	19	17	16	15	3.8	3.5	3.6	3.1	2.9	2.7
Sweden	19	18	19	17	15	14	2.1	1.9	2.0	1.8	1.5	1.4
United Kingdom	46	57	74	96	73	66	0.7	0.9	1.2	1.5	1.1	1.0
Iceland	1	1	1	1	1	1	3.6	3.7	2.5	2.5	2.9	3.2
Norway	-187	-187	-169	-161	-176	-184	-39.5	-38.5	-34.0	-31.6	-33.8	-34.7
Montenegro	1	0	0	0	0	0	1.0	0.7	0.7	0.4	0.5	0.7
North Macedonia	1	1	1	1	1	2	0.7	0.6	0.7	0.6	0.7	0.7
Albania	1	1	1	1	0	1	0.3	0.3	0.3	0.2	0.1	0.3
Serbia	6	5	5	4	4	5	0.8	0.7	0.7	0.5	0.6	0.8
Turkey	76	70	80	87	104	117	1.1	1.0	1.1	1.1	1.3	1.4
Bosnia and Herzegovina	:	:	:	:	2	2	:	:	:	:	:	:
Kosovo (1)	1	1	1	1	1	1	0.3	0.3	:	:	0.4	0.4
Ukraine	57	41	48	31	30	33	1.2	0.9	1.0	0.7	0.7	0.8
Georgia	:	:	:	3	3	4	:	:	:	0.6	0.9	1.0

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: [nrg_bal_s](#) and [demo_pjan](#))

**Figure 1.2.3: Energy dependency by fuel, EU-28, in selected years, 1990-2017
(Mtoe)**



Note: the light coloured proportion of the column shows net imports with respect to gross inland energy consumption (including international maritime bunkers), which is represented by total column height.

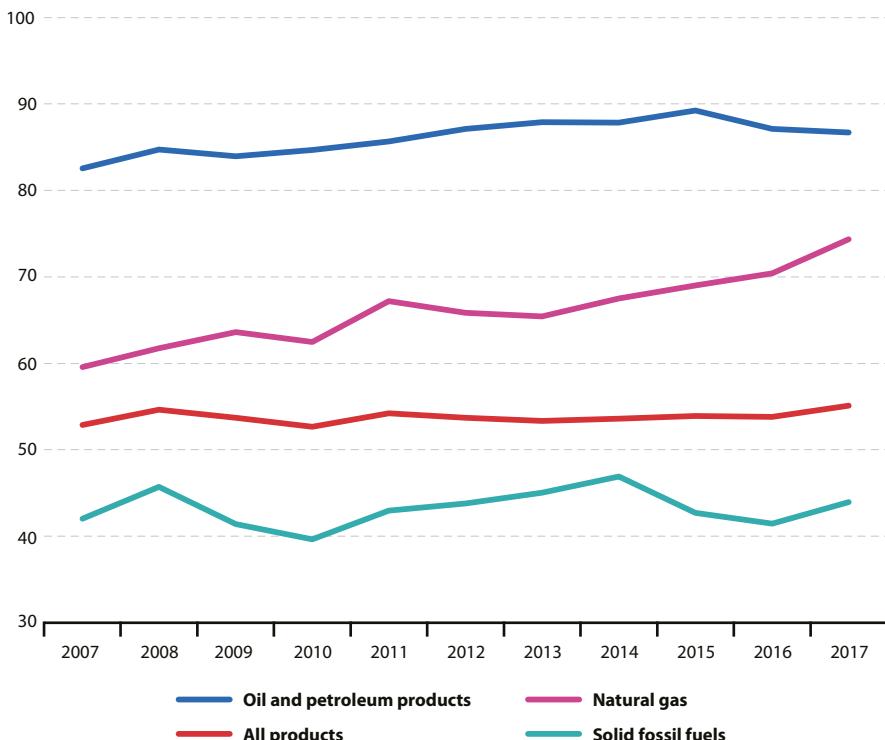
Source: Eurostat (online data code: nrg_bal_s)

Gross available energy represents the quantity of energy necessary to satisfy the energy needs of a country or a region. The ratio between net imports and gross available energy indicates the ability of a country or region to meet all its energy needs. In other words, it shows the extent to which a country or a region is dependent on energy imports. This is illustrated in Figure 1.2.3, where the light coloured proportion of the column shows net imports with respect to gross available energy (the sum of gross inland consumption and international maritime bunkers), which is represented by total column height.

In 2017 in the EU-28, the highest need for energy (the sum of gross inland consumption and international maritime bunkers) was for oil and petroleum products, 626.5 Mtoe, of which 86.7 % were imported. For natural gas the need for energy in 2017 was 398.4 Mtoe, while 74.3 % of it was covered by imports. The production of solid fossil fuels in the EU-28 has been in decline over the last two decades as was its gross inland consumption. In 2017, 43.9 % of solid fuels consumed at EU-28 level were imported.



Figure 1.2.4: Energy dependency rate, EU-28, 2007-2017
(% of net imports in gross available energy)



Note: the y-axis is cut.

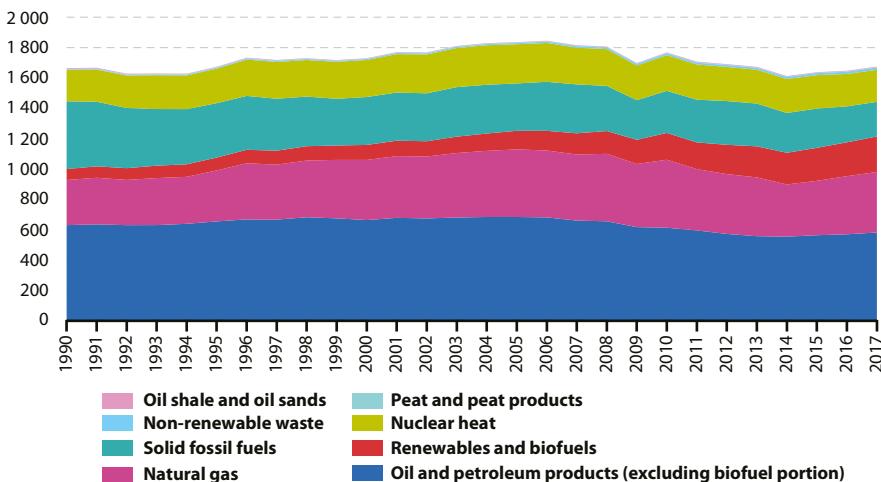
Source: Eurostat (online data code: nrg_ind_id)

EU-28 dependency on energy imports increased from slightly more than 44 % of gross available energy in 1990 to 52.9 % in 2007 and then to 55.1 % by 2017 (see Figure 1.2.4). Since 2004, the EU-28 net imports of energy have been greater than its primary production; in other words, more than half of the EU-28 gross available energy was supplied by net imports and the dependency rate exceeded 50.0 %.

In 2017, the energy dependency rate rose to the highest level (55.1 %). Between 2007 and 2017, some few variations were noticed: a relative peak of 54.6 % was registered in 2008, while 52.7 % was the lowest dependency, registered in 2010. Looking in more detail, the highest rates in 2017 were recorded for oil (86.7 %) and for natural gas (74.3 %), while the latest rate available for solid fossil fuels was 43.9 %.

1.3 Energy consumption, energy savings, efficiency & intensity

Figure 1.3.1: Gross inland energy consumption by fuel, EU-28, 1990-2017 (Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

Gross inland energy consumption in the EU-28 in 2017 was 1 675 Mtoe, 1.6 % higher than in 2016 (Figure 1.3.1). It was relatively stable during the period 1990-2010, with a strong decrease in 2009, mostly as a result of the financial and economic crisis.

In 2009, gross inland energy consumption decreased by 6.0 % compared to 2008, with the sharpest decrease in solid fossil fuels (12.3 %), followed by natural gas (6.4 %) and oil and petroleum products with 5.9 % (Figure 1.3.2). There was a recovery in 2010, when gross inland energy consumption increased by 4.0 %, but it was followed by consecutive decreases until 2015 when gross inland energy consumption started increasing again. Gross inland consumption in 2014 was just below the level recorded in 1990 (actually in 2014 it reached its lowest level since the historic time series allows for comparison (since 1990)), and in 2017 it was 1.6 % above the 1990 levels.

A rise of over 200 % in renewable energies and a 34.1 % rise in natural gas contributed the most to the 2017 increase compared to 1990.

As for the structure of gross inland energy consumption in 2017, oil and petroleum products held the biggest share (34.8 %), followed by natural gas (23.8 %) and solid fossil fuels (13.6 %), which means that 72.2 % of all energy in the EU-28 was produced from coal, crude oil and natural gas. The share of nuclear heat and renewable energies accounted for 12.6 % and 13.9 % respectively (Figure 1.3.3).

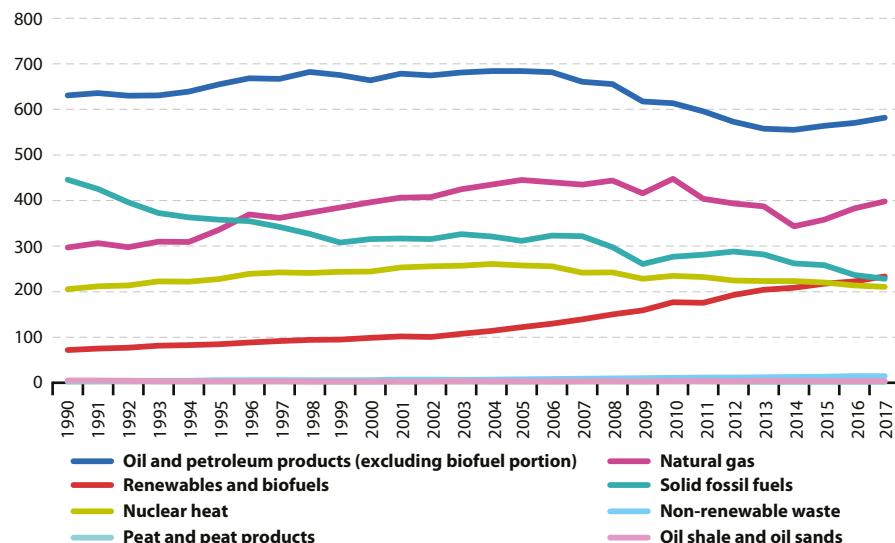
The mixture of fuels and their shares in gross inland energy consumption in different countries depends on the natural resources available, the structure of their economies and also national choices in energy systems.

The cumulated share of solid fossil fuels, crude oil and petroleum products and natural gas (constituting the main fossil fuels) in gross inland energy consumption is below 50 % only in four



Figure 1.3.2: Gross inland energy consumption by fuel, EU-28, 1990-2017

(Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

EU countries: Estonia 10.9 %, Sweden 27.5 %, Finland 39.6 % and France 49.8 % (Figure 1.3.3). It should be noted that France and Sweden are the countries with the highest contribution of nuclear heat to gross inland energy consumption (40.6 % and 32.4 % respectively).

In 2017, the share of solid fossil fuels in gross inland consumption was highest in Poland (47.3 %) and Czechia (36.5 %). The EU-28 average was 13.6 %. The smallest shares of solid fossil fuels in gross inland energy consumption (under 2 %) in 2017 were observed in Luxembourg, Latvia, Estonia, Cyprus and Malta (Figure 1.3.3).

However, in Estonia, oil shale and oil sands cover 72.9 % of gross inland consumption while in Finland and Ireland the share of peat and peat products in gross inland consumption is 3.8 % and 4.6 % respectively.

The largest shares of oil and petroleum products in gross inland energy consumption were observed in Cyprus (92.5 %), Luxembourg (63.5 %) and Malta (57.1 %). This is due to specific national characteristics: Malta and Cyprus are

small islands while consumption in Luxembourg is affected by 'fuel tourism' due to lower prices of fuels used in the transport sector.

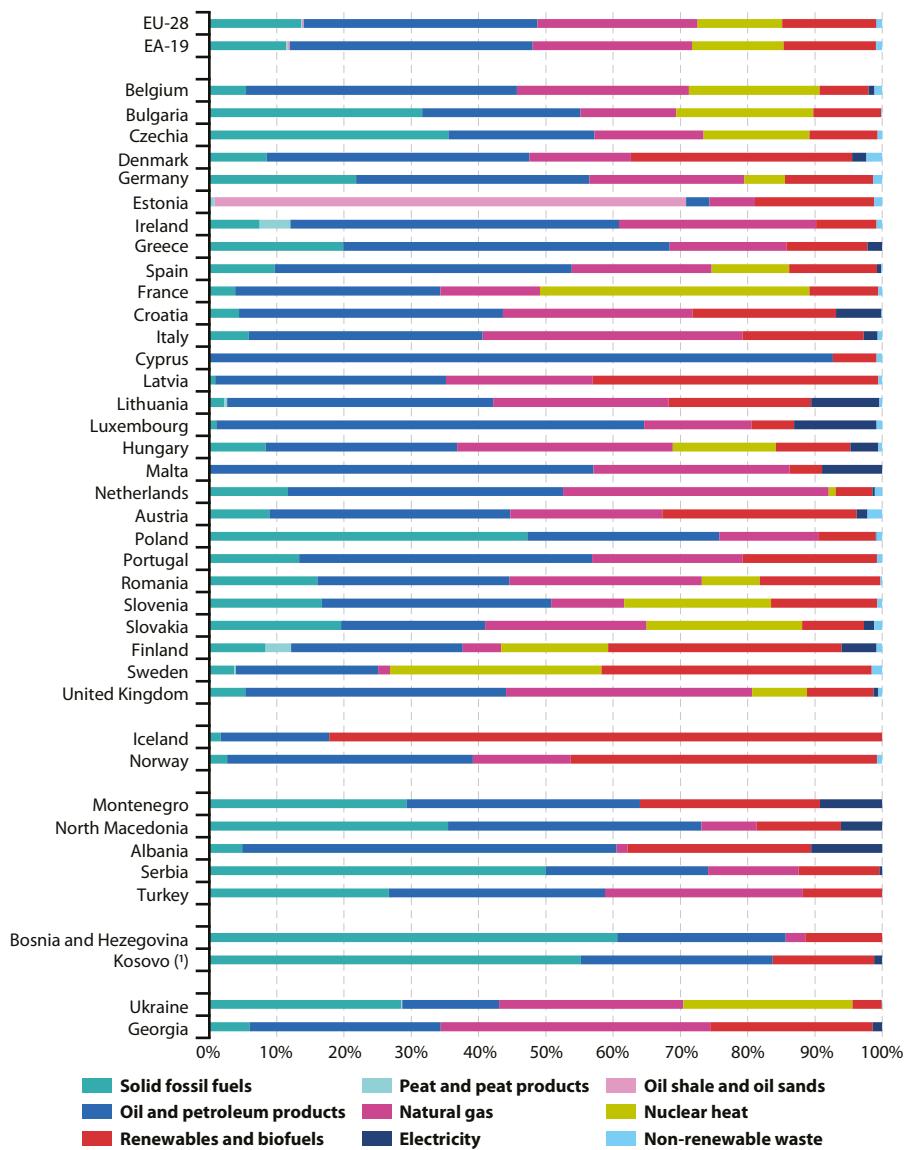
Natural gas accounted for shares ranging from 39.5 % in the Netherlands to under 2 % in Sweden and Cyprus. Natural gas was also an important energy source in Italy, the United Kingdom and Hungary with shares of over 30 %, as well as Ireland where it reached nearly the 30 % mark.

In two countries, Latvia and Sweden, renewable energies accounted for over 40 % of their gross inland energy consumption in 2017 (42.5 % and 41.5 % respectively). The lowest shares of renewable energies in gross inland consumption were in Malta (4.9 %), the Netherlands (5.5 %) and Luxembourg (6.3 %).

In 2017, there were 14 Member States with nuclear power plants. The highest nuclear share was in France (a 40.6 % share of nuclear heat in gross inland energy consumption), followed by Sweden (32.4 %), Slovakia (23.1 %), Slovenia (21.9 %) and Bulgaria (20.9 %).

Figure 1.3.3: Gross inland energy consumption by fuel, 2017

(%)

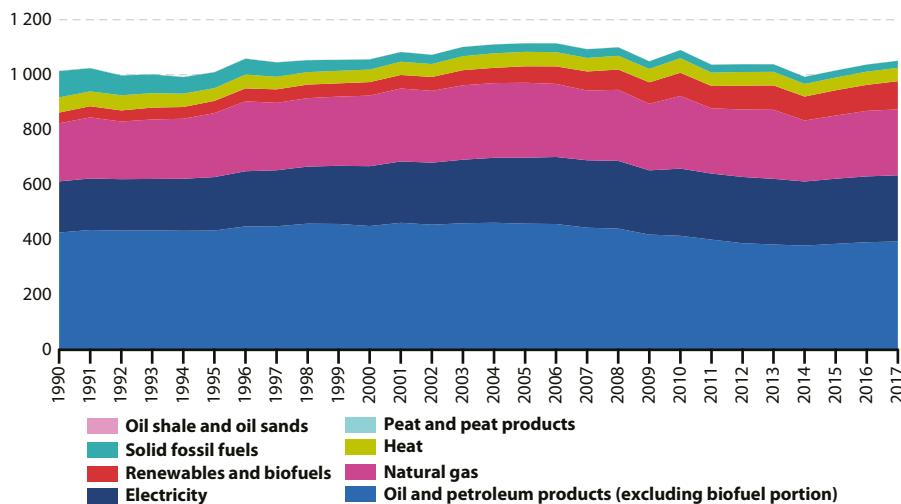


(I) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_c)



Figure 1.3.4: Final energy consumption by fuel, EU-28, 1990-2017
(Mtoe)



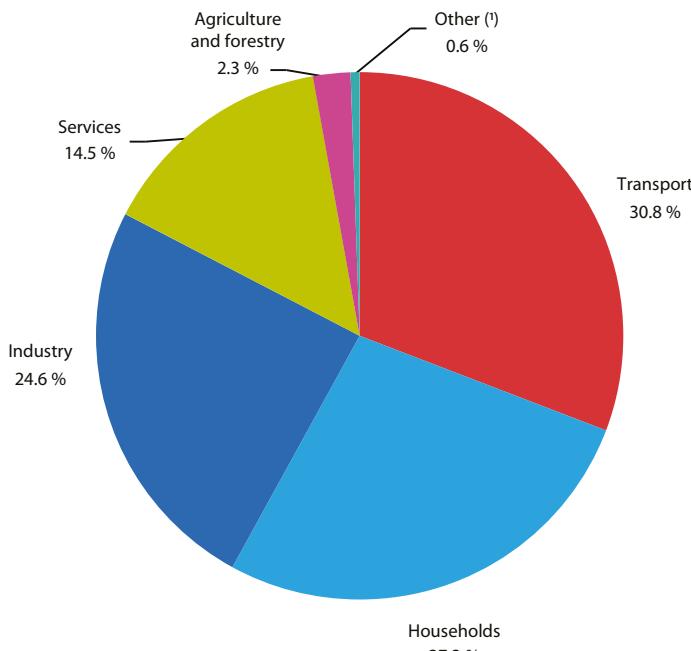
Source: Eurostat (online data code: nrg_bal_c)

Figure 1.3.4. illustrates the evolution of final energy consumption since 1990. Final energy consumption in EU-28 in 2017 was 1 060 Mtoe, 1.3 % higher than in 2016. Final energy consumption has increased slowly since 1994, reaching its highest value, 1 123 Mtoe, in 2006. By 2017, final energy consumption had decreased from its peak level by 5.3 %. Since 1990, the amount and share of solid fossil fuels has fallen significantly (from 9.3 % in 1990, to 3.5 % in 2000, to 2.7 % in 2010, to 2.4 % in 2017). By contrast, the share of renewable energy sources has increased

from 3.8 % in 1990, to 4.6 % in 2000, to 7.7 % in 2010, to 9.7 % in 2017, while natural gas has remained quite stable over the same period, with small variations between 20.4 % (in 1990) and 24.4 % (in 2013), reaching 22.6 % in 2017.

In 2017, the biggest share of final energy consumption was for oil and petroleum products (37.2 %), followed by electricity (22.7 %) and natural gas (22.6 %). Solid fossil fuels contributed only by 2.4 % to the final energy consumption at the end-use level.

Figure 1.3.5: Final energy consumption by sector, EU-28, 2017
 (% of total, based on toe)



(l) Data on "international aviation" are not included in category Transport and hence are included in the category "Other".

Source: Eurostat (online data code: [nrg_bal_s](#))

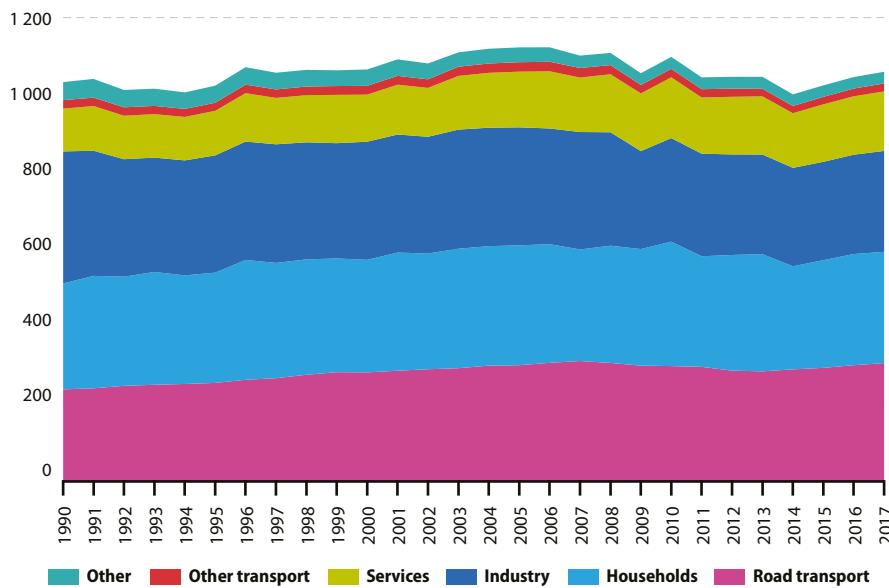
An analysis of final end use of energy in the EU-28 in 2017 shows three dominant categories: transport (30.8 %), households (27.2 %) and industry (24.6 %) — see Figure 1.3.5.

Total energy consumption of all transport modes in the EU-28 amounted to 327 Mtoe in 2017. There was a marked change in the development of energy consumption for transport after 2007. Until that year consumption had consistently increased, rising each year from 1990 (except in 2000). However, in 2008, due to the global financial and economic crisis, the consumption

of energy for transport purposes fell by 1.8 %. This fall intensified in 2009 (-2.6 %), continued at a more subdued pace in 2010 (-0.4 %) and 2011 (-0.8 %), and became greater again in 2012 (-3.1 %) and 2013 (-1.1 %), before an increase of 1.4 %, was registered in both 2014 and 2015, followed by further increases in 2016 and 2017 (2.4 % and 1.9 % respectively). Overall, between the relative peak of 2007 and the low of 2013, final energy consumption for transport in the EU-28 fell by 9.5 %.



Figure 1.3.6: Final energy consumption by sector, EU-28, 1990-2017
(Mtoe)



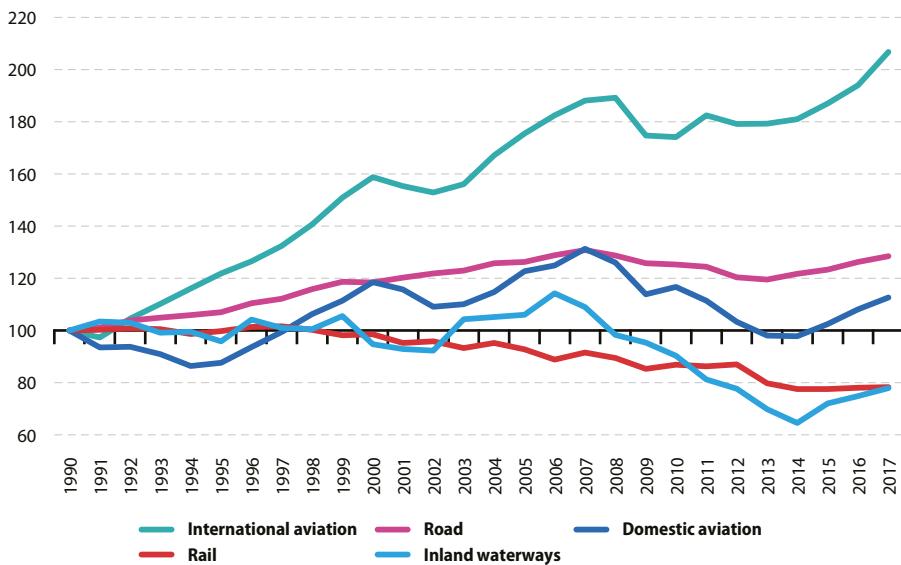
Source: Eurostat (online data code: [nrg_bal_c](#))

A similar analysis for all end uses (based again on the period from 2007 onwards) reveals that EU-28 final energy consumption for industry fell overall by 14.1 % during the period between 2007 and 2017. The overall decline in energy consumption for transport was 2.9 %, while the rate of change for households' energy use (-0.2 %) was less pronounced. By contrast, final energy consumption by services increased during the period under consideration, rising by 9.3 % overall.

There were significant differences in the development of energy consumption across

various transport modes, with rapid growth for international aviation (89.3 % between 1990 and 2008). However, a considerable reduction in energy consumption for international aviation followed in 2009 (down by 7.7 %.) For the next few years there was no clear pattern for energy consumption for international aviation. However, there were five consecutive years of growth since 2013, such that the level of consumption in 2017 stood well above its previous relative peak in 2008 (increasing by 9.3 %).

Figure 1.3.7: Energy consumption by transport mode, EU-28, 1990-2017
 (1990 = 100, based on tonnes of oil equivalent)



Source: Eurostat (online data code: nrg_bal_s)

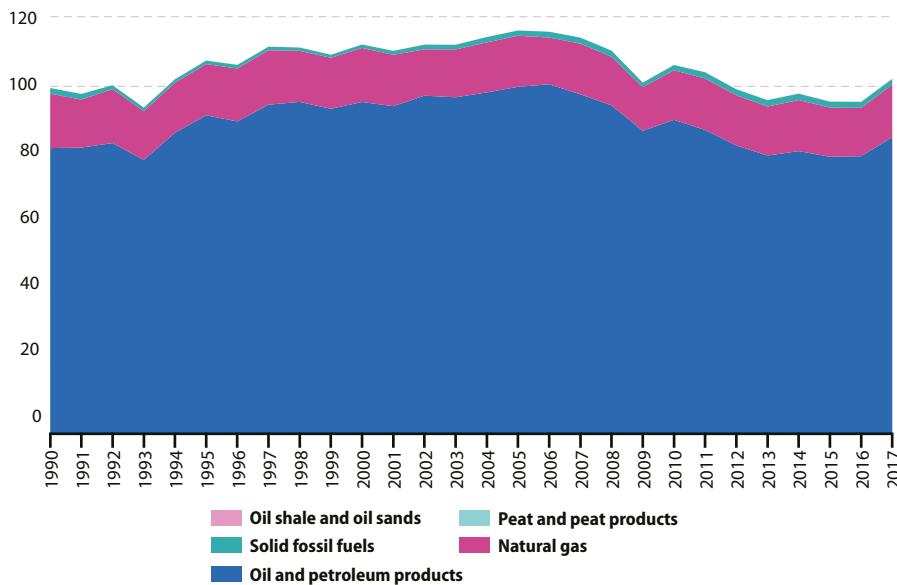
As shown in Figure 1.3.7, international aviation had the highest growth in EU-28 energy consumption among the principal modes of transport between 1990 and 2017 — rising by 106.8 % overall. Road transport — by far the most important transport mode — and domestic aviation were the only other transport modes to report increases over this period, as their consumption rose by 28.5 % and 12.7 %, respectively. By contrast, energy consumption for rail transport in 2017 was 21.7 % lower than in 1990 and 22.1 % lower for transport via inland waterways.

In absolute terms, the largest decreases in energy consumption among the different transport modes were recorded for transport

via inland waterways and for rail transport, where EU-28 consumption was between 1.4 and 1.8 Mtoe lower in 2017 than in 1990 (for both these modes). There was almost no change in the energy consumed by domestic aviation, even though the consumption of energy for international aviation rose by 26.4 Mtoe between 1990 and 2017. Road transport consumption increased by 67.9 Mtoe, which it is interesting to note that is more than 2.5 times as high as the increase for international aviation. These changes in energy consumption reflect the use of each transport mode, but can also be influenced by technological changes, especially when they relate to fuel-efficiency gains or losses.



Figure 1.3.8: Non-energy consumption by fuel, EU-28, 1990-2017
(Mtoe)



Source: Eurostat (online data code: [nrg_bal_c](#))

Final non-energy consumption includes fuels that are used as raw materials and are not consumed as fuel or transformed into another fuel (for example, chemical reactions or bitumen for road construction). Non-energy consumption in 2017 amounted to 102.2 Mtoe (Figure 1.3.8).

Oil and petroleum products accounted for 85.4 %, natural gas for 15.1 %, and solid fossil fuels for 1.7 %.

Figure 1.3.9: Energy consumption in households, EU-28, 2017 (Mtoe)



In the EU, the main use of energy by households is for heating their homes (64.1 % of final energy consumption in the residential sector), see Figure 1.3.9 and Table 1.3.1. Electricity used for lighting and most electrical appliances represents 14.4 % (this excludes the use of electricity for powering the main heating, cooling or cooking systems), while the proportion used for water heating

is slightly higher, representing 14.8 %. Main cooking devices require 5.6 % of the energy used by households, while space cooling and other end-uses cover 0.3 % and 0.9 % respectively. Heating of space and water consequently represents 78.9 % of the final energy consumed by households.

Table 1.3.1: Share of fuels in the final energy consumption in the residential sector by type of end-use, EU-28, 2017 (%)

EU-28	Total Residential / Households	Space heating	Space cooling	Water heating	Cooking	Lighting and appliances	Other end uses
Electricity	24.3	3.4	0.3	2.8	2.7	14.4	0.7
Derived Heat	7.8	6.1	0.0	1.7	0.0	0.0	0.0
Gas	36.5	27.6	0.0	7.1	1.9	0.0	0.0
Solid Fuels	3.3	3.0	0.0	0.3	0.0	0.0	0.0
Oil & Petroleum Products	11.3	9.0	0.0	1.6	0.7	0.0	0.1
Renewables and Wastes	16.8	15.0	0.0	1.5	0.3	0.0	0.1
Total	100.0	64.1	0.3	14.8	5.6	14.4	0.9

Source: Eurostat

Table 1.3.2: Primary energy consumption and distance to 2020 and 2030 targets, EU-28, in selected years, 2006-2017

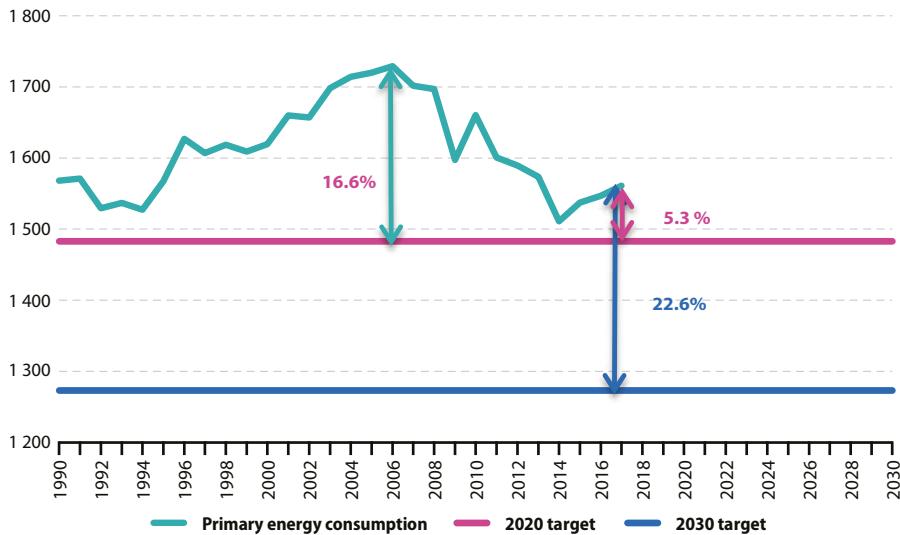
	2006	2014	2015	2016	2017
Energy consumption (Mtoe)	1 729.2	1 511.1	1 537.3	1 546.7	1 561.0
Index (2005=100)	100.5	87.9	89.4	89.9	90.8
2020 target for primary consumption (Mtoe)	1 483.0	1 483.0	1 483.0	1 483.0	1 483.0
Distance to 2020 target (Mtoe)	246.2	28.1	54.3	63.7	78.0
Distance to 2020 target (%)	16.6	1.9	3.7	4.3	5.3
2030 target for primary consumption (Mtoe)	1 273.0	1 273.0	1 273.0	1 273.0	1 273.0
Distance to 2030 target (Mtoe)	456.2	238.1	264.3	273.7	288.0
Distance to 2030 target (%)	35.8	18.7	20.8	21.5	22.6

Source: Eurostat (online data code: [nrg_ind_eff](#))

Primary energy consumption (shown in Table 1.3.2 and Figure 1.3.10) increased for the third consecutive year since 2014. In 2017 it was 0.9 % higher than in 2016 and 3.3 % higher than in 2014. The gap between the actual level of primary energy consumption and the target level in 2020 increased from 1.9 % in 2014 to 5.3 % in 2017. The distance to the 2030 target was 22.6 % in 2017. Since 1990, the first year for which

data are available, consumption has fallen by 0.4 %. However, over the years, primary energy consumption has fluctuated greatly. It peaked in 2006 (1 729 Mtoe representing a 16.6 % gap from the 2020 target), while a record low was reached in 2014 (1 511 Mtoe representing a 1.9 % gap from the 2020 target). Since its all time peak in 2006, primary energy consumption decreased by 9.7 %.

Figure 1.3.10: Distance to Europe 2020 and 2030 targets for primary energy consumption, EU-28, 1990-2017 (Mtoe)



Note: the y-axis is cut.

Source: Eurostat (online data code: [nrg_ind_eff](#))

Table 1.3.3: Final energy consumption and distance to 2020 and 2030 targets, EU-28, in selected years, 2006-2017

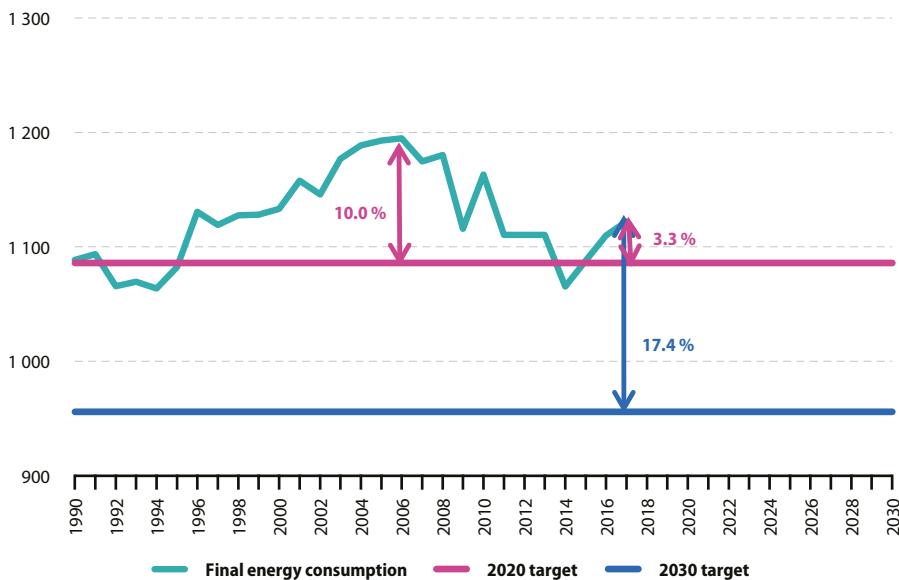
	2006	2014	2015	2016	2017
Energy consumption (Mtoe)	1 194.8	1 065.3	1 088.0	1 109.8	1 122.3
Index (2005=100)	100.2	89.3	91.2	93.0	94.1
2020 target for final consumption (Mtoe)	1 086.0	1 086.0	1 086.0	1 086.0	1 086.0
Distance to 2020 target (Mtoe)	108.8	-20.7	2.0	23.8	36.3
Distance to 2020 target (%)	10.0	-1.9	0.2	2.2	3.3
2030 target for final consumption (Mtoe)	956.0	956.0	956.0	956.0	956.0
Distance to 2030 target (Mtoe)	238.8	109.3	132.0	153.8	166.3
Distance to 2030 target (%)	25.0	11.4	13.8	16.1	17.4

Source: Eurostat (online data code: nrg_ind_eff)

Final energy consumption (shown in Table 1.3.3 and in Figure 1.3.11) increased for the third consecutive year since 2014. In 2017 it was 1.1 % higher than in 2016 and 5.3 % higher than in

2014. While in 2014 final energy consumption was 1.9 % below the 2020 target, in 2017 it was 3.3% above the 2020 target. The distance to the 2030 target was 17.4 % in 2017.

Figure 1.3.11: Distance to Europe 2020 and 2030 targets for final energy consumption, EU-28, 1990-2017
(Mtoe)

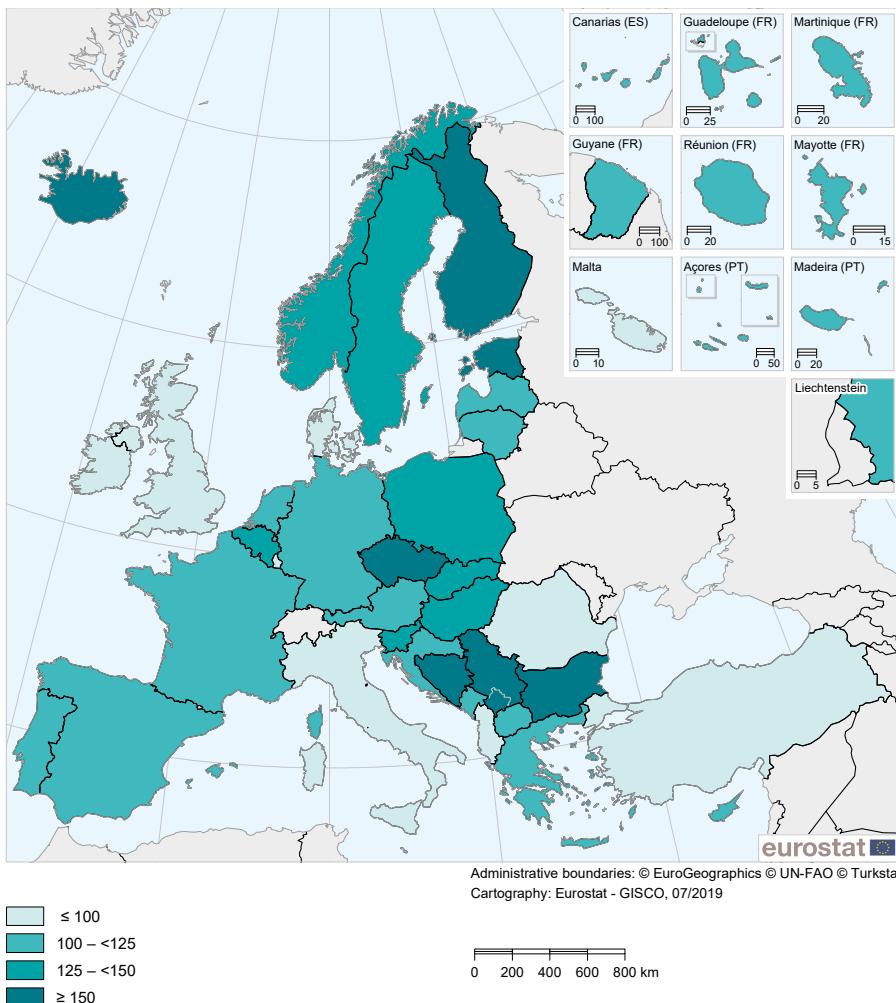


Note: the y-axis is cut.

Source: Eurostat (online data code: nrg_ind_eff)



Map 1.3.1: Energy intensity of the economy, 2017
 (kg of oil equivalent per 1 000 EUR PPS)



Source: Eurostat (online data codes: nrg_bal_s, nama_10_gdp)

Energy intensity can be considered as an approximation of the energy efficiency of a country's economy. There are various reasons for observing improvements in energy intensity: the general shift from industry towards a service based economy in Europe, a shift within industry

to less energy-intensive production methods and activities, the closure of inefficient units, or more energy-efficient appliances. In Map 1.3.1 the energy intensity is presented using GDP purchasing power standards (PPS).

Table 1.3.4: Energy intensity of the economy, 2007–2017

(kg of oil equivalent per 1 000 EUR of GDP-Chain linked volumes (2010))

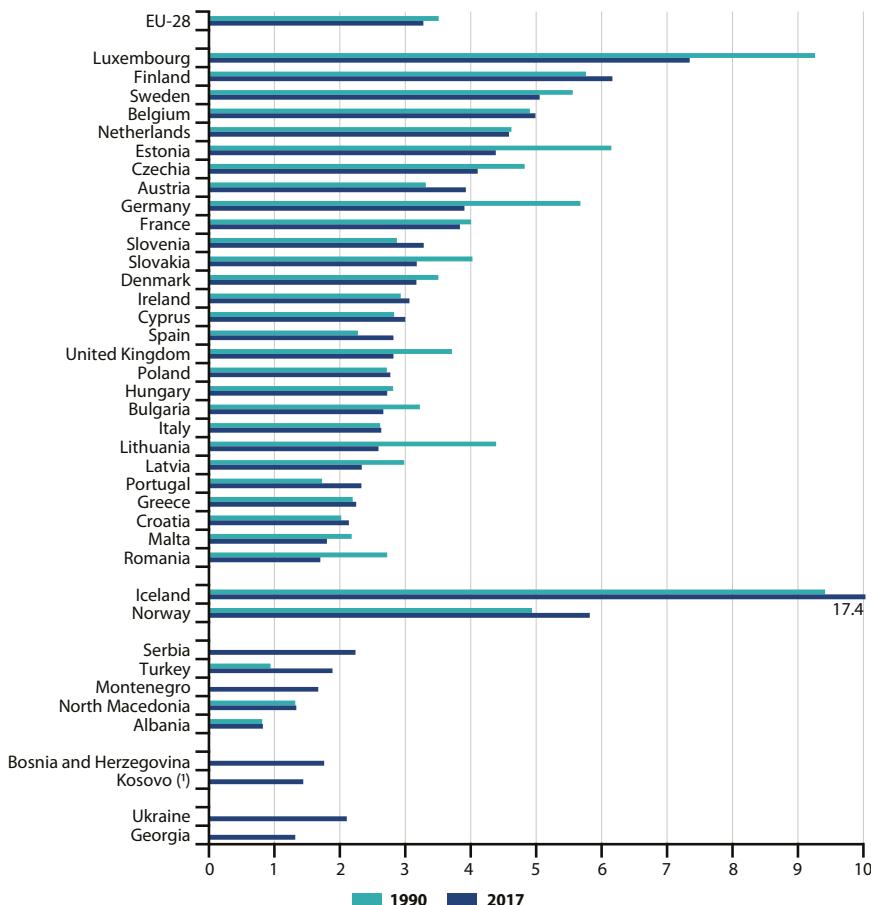
	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
EU-28	138.8	137.5	135.1	137.7	130.7	130.0	128.2	121.4	120.5	118.9	117.9
EA-19	131.3	130.3	128.9	130.6	124.1	123.9	123.2	117.2	116.6	115.0	114.2
Belgium	159.1	162.9	160.1	167.6	154.5	147.1	152.0	142.2	139.8	145.7	142.7
Bulgaria	551.4	512.1	464.7	467.5	491.1	471.3	434.9	447.4	451.8	425.7	424.4
Czechia	296.4	283.2	279.5	291.0	274.5	274.7	277.6	260.8	248.6	240.3	238.5
Denmark	82.4	80.8	80.7	83.9	77.0	73.9	73.4	68.6	67.0	67.2	67.1
Germany	129.6	129.3	128.5	129.7	118.8	118.8	120.9	114.0	112.7	111.2	109.9
Estonia	322.7	329.9	336.7	384.4	357.8	333.1	364.4	335.1	307.5	328.0	300.9
Ireland	88.9	91.9	92.1	90.0	79.6	80.4	75.8	70.0	58.8	59.0	54.1
Greece	123.6	125.1	126.2	124.6	133.3	142.1	129.6	128.2	129.2	127.1	129.4
Spain	133.0	126.9	120.8	120.7	121.3	124.6	118.6	114.6	115.0	112.7	115.0
France	134.7	135.0	133.6	135.2	129.7	129.4	129.3	123.2	123.9	120.5	117.9
Croatia	209.5	200.4	208.5	209.4	205.4	198.1	195.2	186.2	189.7	184.8	185.9
Italy	111.2	110.8	109.4	110.2	106.1	104.9	102.8	97.1	100.0	98.0	99.6
Cyprus	147.5	150.1	149.1	142.8	139.8	134.7	124.0	128.2	128.4	131.4	131.1
Latvia	217.8	217.0	243.5	260.2	231.3	230.5	221.5	216.8	207.1	203.4	201.5
Lithuania	296.5	290.0	311.2	243.7	237.5	231.5	211.4	204.4	204.8	205.2	205.0
Luxembourg	114.2	115.8	114.0	115.6	110.9	108.7	101.9	95.2	90.6	88.8	90.4
Hungary	265.0	258.5	263.2	269.1	259.4	250.7	237.1	226.5	231.5	229.8	230.1
Malta	151.6	149.4	140.3	142.2	140.0	142.9	122.2	113.9	87.8	78.8	85.3
Netherlands	129.1	125.5	127.7	134.8	124.1	125.5	123.3	115.3	114.8	114.7	112.2
Austria	113.3	112.5	111.0	116.1	109.6	108.2	110.7	106.5	107.3	106.0	105.4
Poland	298.2	289.3	269.9	280.7	267.4	253.9	251.7	234.2	228.0	232.1	231.6
Portugal	144.2	140.6	142.5	135.4	134.5	131.9	133.6	130.8	133.5	130.6	133.0
Romania	315.0	286.8	266.7	279.3	279.7	267.9	235.8	225.8	219.4	208.7	205.4
Slovenia	195.5	200.3	196.3	199.0	197.5	195.1	192.3	180.1	174.3	175.0	169.6
Slovakia	275.7	268.5	259.4	262.1	247.5	234.3	233.7	213.9	212.0	206.6	211.2
Finland	189.7	180.9	184.7	196.3	184.3	180.1	178.5	183.4	173.3	175.4	171.5
Sweden	135.5	135.6	129.3	137.2	134.2	134.5	130.4	126.0	117.7	120.2	117.3
United Kingdom	117.4	115.9	112.2	115.1	105.2	105.8	102.0	93.6	93.4	90.3	87.2
Iceland	436.8	493.2	545.6	536.6	564.0	544.4	546.3	535.1	490.4	442.7	443.5
Norway	86.0	99.8	99.5	103.0	88.3	93.8	98.5	84.4	84.6	78.9	83.9
Montenegro	379.8	381.8	317.1	361.3	351.6	341.1	306.4	294.7	301.2	280.6	281.5
North Macedonia	473.8	439.3	409.7	405.4	429.2	414.9	373.3	350.5	331.1	326.8	334.0
Albania	263.4	255.0	250.3	239.2	243.4	216.2	250.3	244.9	223.7	221.6	224.6
Serbia	544.8	524.1	486.3	494.8	507.2	456.9	454.2	412.7	449.5	453.3	453.3
Turkey	182.0	177.0	186.2	181.3	174.8	174.2	155.2	158.3	161.6	165.2	165.7
Bosnia and Herzegovina	:	:	:	:	:	:	:	446.5	446.2	473.4	458.0
Kosovo (1)	:	539.5	577.0	571.7	553.0	504.6	473.2	448.3	490.3	504.6	459.9

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_s, nama_10_gdp)



Figure 1.3.12: Gross inland energy consumption per capita, 1990 and 2017
(toe per capita)



(l) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: [nrg_bal_s](#), [demo_pjan](#))

In 2017, gross inland consumption in Luxembourg and Finland was over 6 toe per capita. In Romania and Malta, consumption was under 2 toe per capita (Figure 1.3.12). This indicator is influenced by the structure of industry in each country, the severity of the winter weather, as well as by other factors, such as fuel tourism in the case of Luxembourg. The EU-28 average in 2017 is 3.3 toe per capita.

Between 1990 and 2017, the EU-28 average decreased by 6.7 %. However, at national level, the evolution of the indicator varies. The biggest increase in gross inland consumption per capita between 1990 and 2017 was observed in Portugal (34.9 %), followed by Spain (23.8 %) and Austria (18.5 %), while the biggest decrease was observed in Lithuania (41.0 %), Romania (37.5 %) and Germany (31.2 %).

1.4 Energy Prices

Table 1.4.1: Electricity prices, registered in the second half of the year, 2016-2018
(EUR/kWh)

	Households (')			Non-households (')		
	2016	2017	2018	2016	2017	2018
EU-28	0.2038	0.2042	0.2113	0.1129	0.1118	0.1149
Belgium	0.2745	0.2877	0.2937	0.1158	0.1087	0.1142
Bulgaria	0.0938	0.0983	0.1005	0.0788	0.0790	0.0846
Czechia	0.1421	0.1488	0.1586	0.0732	0.0710	0.0721
Denmark	0.3084	0.3010	0.3123	0.0936	0.0846	0.0788
Germany	0.2977	0.3048	0.3000	0.1492	0.1514	0.1516
Estonia	0.1238	0.1319	0.1418	0.0896	0.0846	0.0924
Ireland	0.2338	0.2355	0.2539	0.1245	0.1241	0.1349
Greece	0.1723	0.1620	0.1646	0.1115	0.1190	0.1059
Spain	0.2284	0.2177	0.2477	0.1029	0.1032	0.1098
France	0.1711	0.1756	0.1799	0.0903	0.0920	0.0889
Croatia	0.1331	0.1236	0.1321	0.0877	0.0920	0.1013
Italy	0.2261	0.2080	0.2161	0.1556	0.1449	0.1434
Cyprus	0.1621	0.1826	0.2183	0.1295	0.1392	0.1811
Latvia	0.1624	0.1582	0.1511	0.1201	0.1159	0.1047
Lithuania	0.1171	0.1107	0.1097	0.0882	0.0825	0.0899
Luxembourg	0.1698	0.1618	0.1691	0.0858	0.0803	0.0846
Hungary	0.1125	0.1134	0.1118	0.0796	0.0779	0.0822
Malta	0.1274	0.1298	0.1306	0.1399	0.1364	0.1356
Netherlands	0.1592	0.1556	0.1707	0.0805	0.0764	0.0809
Austria	0.2010	0.1978	0.2012	0.1004	0.0997	0.1011
Poland	0.1352	0.1451	0.1396	0.0815	0.0862	0.0884
Portugal	0.2298	0.2230	0.2293	0.1132	0.1147	0.1170
Romania	0.1233	0.1289	0.1317	0.0771	0.0786	0.0866
Slovenia	0.1629	0.1613	0.1638	0.0832	0.0784	0.0866
Slovakia	0.1537	0.1442	0.1462	0.1112	0.1113	0.1201
Finland	0.1545	0.1599	0.1698	0.0694	0.0676	0.0707
Sweden	0.1962	0.1993	0.1990	0.0656	0.0647	0.0727
<u>United Kingdom</u>	0.1831	0.1856	0.2024	0.1278	0.1246	0.1423
Iceland	0.1478	0.1518	0.1457	0.0652	:	:
Liechtenstein	0.1747	0.1618	:	0.1479	0.0773	:
Norway	0.1631	0.1605	0.1907	0.0813	0.0703	0.0872
Montenegro	0.0970	0.1003	0.1030	0.0782	0.0770	0.0805
North Macedonia	0.0828	0.0811	0.0787	0.0521	0.0561	0.0675
Albania	0.0835	0.0856	0.0910	:	:	:
Serbia	0.0654	0.0695	0.0709	0.0470	0.0751	0.0719
Turkey	0.1205	0.0959	0.0857	0.0725	0.0601	0.0621
Bosnia and Herzegovina	0.0844	0.0864	:	0.0607	0.0614	:
Kosovo (')	0.0592	0.0654	0.0638	0.0771	0.0758	0.0733
Moldova	0.0923	0.1013	0.1029	0.0778	0.0852	0.0787
Ukraine	0.0320p	0.0383	0.0410	:	:	0.0618
Georgia	:	:	0.0741	:	:	0.0564

(') Annual consumption: 2 500 kWh < consumption < 5 000 kWh.

(") Annual consumption: 500 MWh < consumption < 2 000 MWh.

(¹) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: nrg_pc_204 and nrg_pc_205)



The price of energy in the EU depends on a range of different supply and demand conditions, including the geopolitical situation, the national energy mix, import diversification, network costs, environmental protection costs, severe weather conditions, or levels of excise and taxation. Note that these prices include taxes, levies and VAT for household consumers, but exclude refundable taxes and levies and VAT for non-household consumers.

An overview of average electricity prices in euro per kilowatt-hour (EUR per kWh) for the last three years (second half of each year in order to avoid seasonal effect) is presented in Table 1.4.1.

For household consumers (defined as medium-size consumers with an annual consumption within the range of 2 500 kWh < consumption

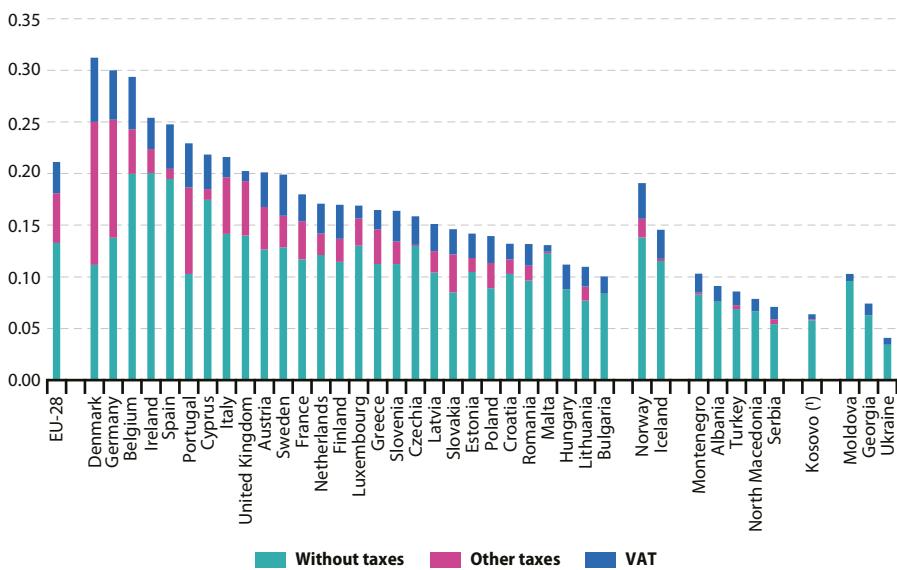
< 5 000 kWh), European Union electricity prices during the second half of 2018 were the highest in Denmark (EUR 0.3123 per kWh), Germany (EUR 0.3000 per kWh) and Belgium (EUR 0.2937 per kWh) (Figure 1.4.1).

The lowest electricity prices were in Bulgaria (EUR 0.1005 per kWh), Lithuania (EUR 0.1097 per kWh) and Hungary (EUR 0.1118 per kWh).

The price of electricity for household consumers in Denmark was more than three times as high as the price in Bulgaria.

The EU-28 average price in the second semester of 2018 — a weighted average calculated based on the most recent (2017) data on the electricity consumption of households — was EUR 0.2113 per kWh.

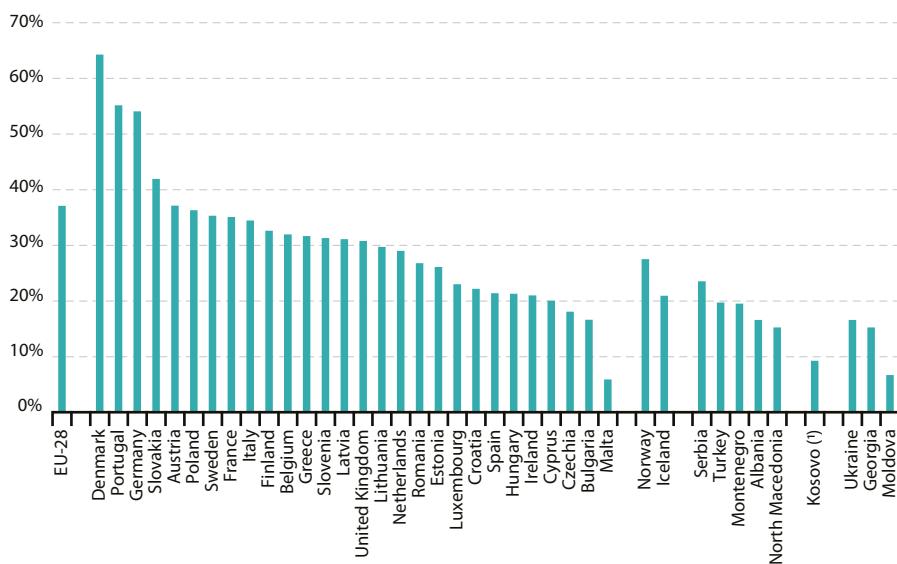
Figure 1.4.1: Electricity prices for household consumers, registered in the second half of 2018
(EUR/kWh)



(I) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: nrg_pc_204)

**Figure 1.4.2: Electricity — share of taxes and levies paid by household consumers, registered in the second half of 2018
(%)**



(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_pc_204)

The proportion of taxes and levies in the overall electricity retail price for household consumers is shown in Figure 1.4.2.

The relative amount of tax contribution in the second half of 2018 in the EU was smallest in Malta (5.9 %), where a low VAT rate is applied to the basic price and no other taxes are charged to household consumers. The highest taxes were charged in Denmark, where 64.3% of the final price was made up of taxes and levies.

For non-household consumers (defined as medium-size consumers with an annual consumption within the range of 500 MWh < consumption < 2 000 MWh), EU electricity prices during the second half of 2018 were the highest in Cyprus and Germany (Figure 1.4.3).

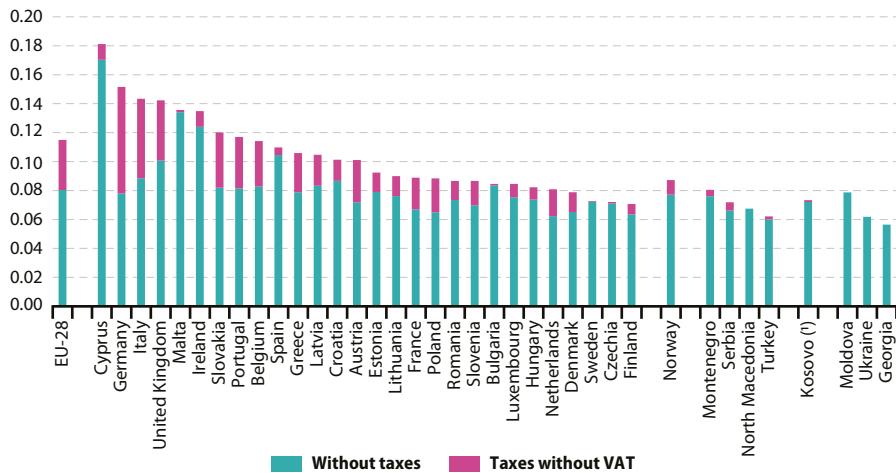
The EU-28 average price in the second semester of 2018 — a weighted average based on the most recent (2017) national data on consumption of non-household consumers — was EUR 0.1149 per kWh.

The proportion of non-recoverable taxes and levies in the overall electricity price for non-household consumers is presented in Figure 1.4.4. In the second half of 2018 the highest share of taxes was charged in Germany, where non-recoverable taxes and levies made up almost half (48.5 %) of the total price.

The price of electricity is, to some degree, influenced by the price of primary fuels and, lately, by the cost of carbon dioxide (CO₂) emission certificates.



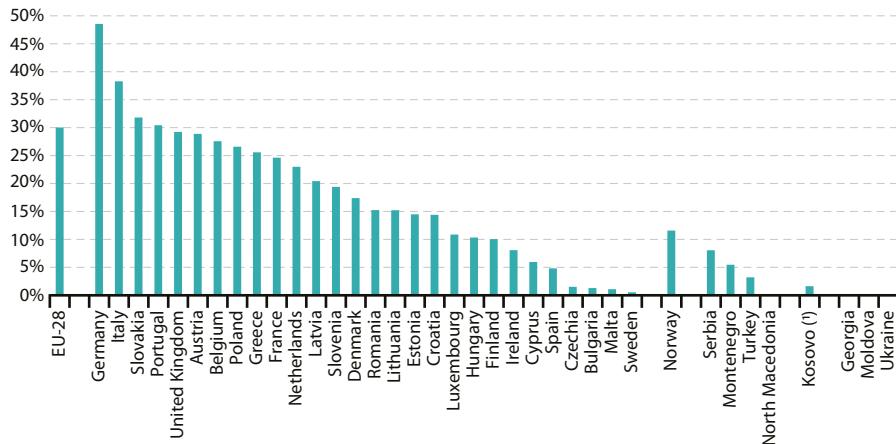
Figure 1.4.3: Electricity prices for non-household consumers, registered in the second half of 2018
(EUR/kWh)



(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: [nrg_pc_205](#))

Figure 1.4.4: Electricity — share of non-recoverable taxes and levies paid by non-household consumers, registered in the second half of 2018
(%)



(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: [nrg_pc_204](#))

Table 1.4.2: Natural gas prices, second half of year, 2016-2018
(EUR/kWh)

	Households (¹)			Non-households (²)		
	2016	2017	2018	2016	2017	2018
EU-28	0.0635	0.0634	0.0670	0.0299	0.0282	0.0313
Belgium	0.0534	0.0552	0.0625	0.0257	0.0229	0.0252
Bulgaria	0.0311	0.0375	0.0437	0.0192	0.0253	0.0289
Czechia	0.0563	0.0566	0.0569	0.0258	0.0245	0.0267
Denmark	0.0858	0.0875	0.0913	0.0324	0.0335	0.0384
Germany	0.0642	0.0609	0.0608	0.0332	0.0307	0.0315
Estonia	0.0328	0.0413	0.0425	0.0234	0.0277	0.0325
Ireland	0.0678	0.0649	0.0761	0.0339	0.0323	0.0388
Greece	0.0652	..c	0.0654	0.0283	0.0275	0.0335
Spain	0.0857	0.0865	0.0875	0.0260	0.0267	0.0299
France	0.0676	0.0695	0.0763	0.0378	0.0345	0.0390
Croatia	0.0370	0.0366	0.0360	0.0275	0.0247	0.0283
Italy	0.0838p	0.0874	0.0951	0.0273	0.0253	0.0293
Latvia	0.0406	0.0393	0.0450	0.0248	0.0285	0.0324
Lithuania	0.0387	0.0395	0.0405	0.0245	0.0331	0.0387
Luxembourg	0.0418	0.0398	0.0429	0.0330	0.0314	0.0332
Hungary	0.0360	0.0365	0.0347	0.0275	0.0246	0.0285
Netherlands	0.0808	0.0815	0.0861	0.0285	0.0269	0.0297
Austria	0.0674	0.0698	0.0701	0.0341	0.0332	0.0340
Poland	0.0441	0.0442	0.0450	0.0261	0.0276	0.0312
Portugal	0.0815	0.0799	0.0784	0.0276	0.0271	0.0295
Romania	0.0323	0.0308e	0.0354e	0.0262	0.0256e	0.0281e
Slovenia	0.0563	0.0532	0.0577	0.0326	0.0320	0.0343
Slovakia	0.0445	0.0445	0.0459	0.0312	0.0291	0.0308
Finland	:	:	:	0.0440	0.0532	0.0586
Sweden	0.1142	0.1125	0.1223	0.0384	0.0466	0.0481
United Kingdom	0.0501	0.0479	0.0518	0.0249	0.0224	0.0277
Liechtenstein	0.0823	:	:	0.0529	:	:
North Macedonia	:	0.0510	0.0606	0.0213	0.0261	0.0328
Serbia	0.0326	0.0339	0.0342	0.0300	0.0309	0.0376
Turkey	0.0301	0.0243	0.0209	0.0224	0.0173	0.0188
Bosnia and Herzegovina	0.0336	0.0327	:	0.0379	0.0358	:
Moldova	0.0295	0.0311	0.0289	0.0252	0.0265	0.0242
Ukraine	0.0238	0.0217	0.0216	0.0226	0.0239	0.0291
Georgia	:	:	0.0151	:	:	0.0221

(¹) Annual consumption: 5 555 kWh < consumption < 55 555 kWh (20 - 200 GJ).

(²) Annual consumption: 2 778 MWh < consumption < 27 778 MWh (10 000 - 100 000 GJ).

Source: Eurostat (online data codes: [nrg_pc_202](#) and [nrg_pc_203](#))

An overview of average prices in euro per kilowatt-hour (EUR per kWh) for natural gas over the last three years (focusing on the second half of each year in order to avoid any seasonal effect) is presented in Table 1.4.2.

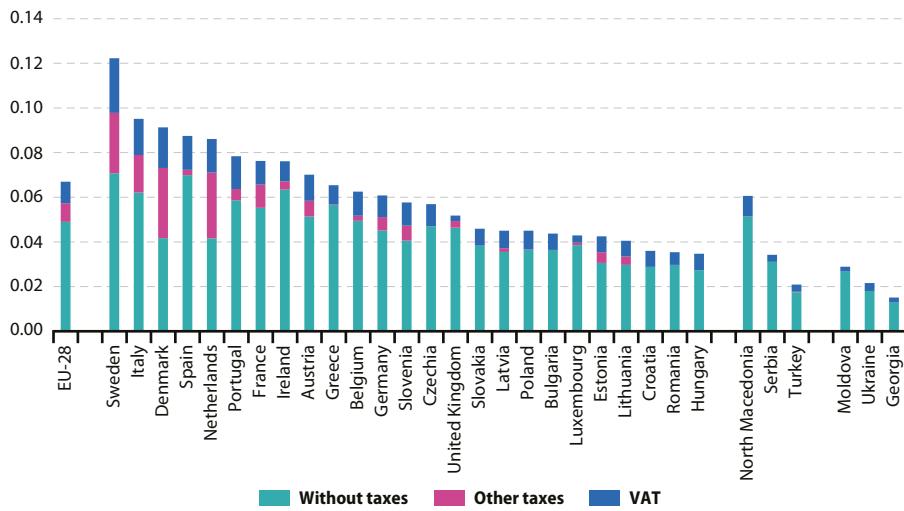
For household consumers (defined as medium-sized consumers with an annual consumption within the range of 20 Gigajoules (GJ) < consumption < 200 GJ), EU natural gas prices

during the second half of 2018 were the highest in Sweden, Italy and Denmark (Figure 1.4.5), and the lowest in Hungary, Romania and Croatia.

The price of natural gas for households in Sweden (EUR 0.1223 per kWh) was nearly four times the price that was charged in Hungary (EUR 0.0347 per kWh).

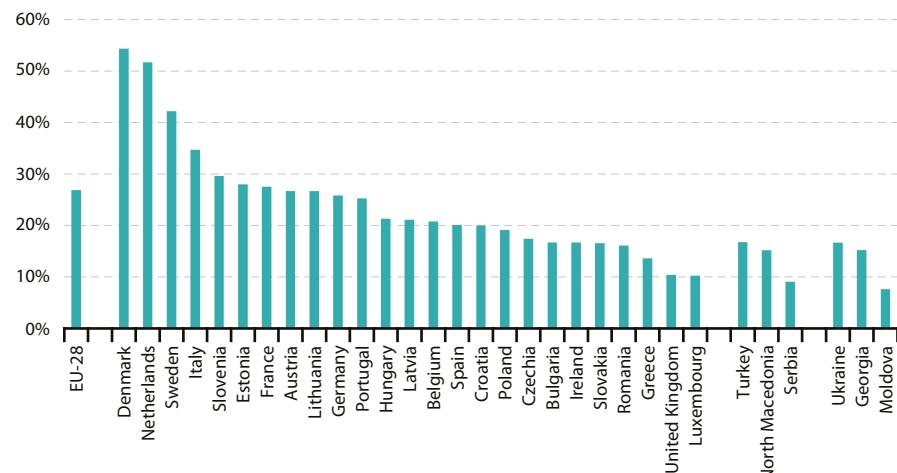


Figure 1.4.5: Natural gas prices for household consumers, registered in the second half of 2018
(EUR/kWh)



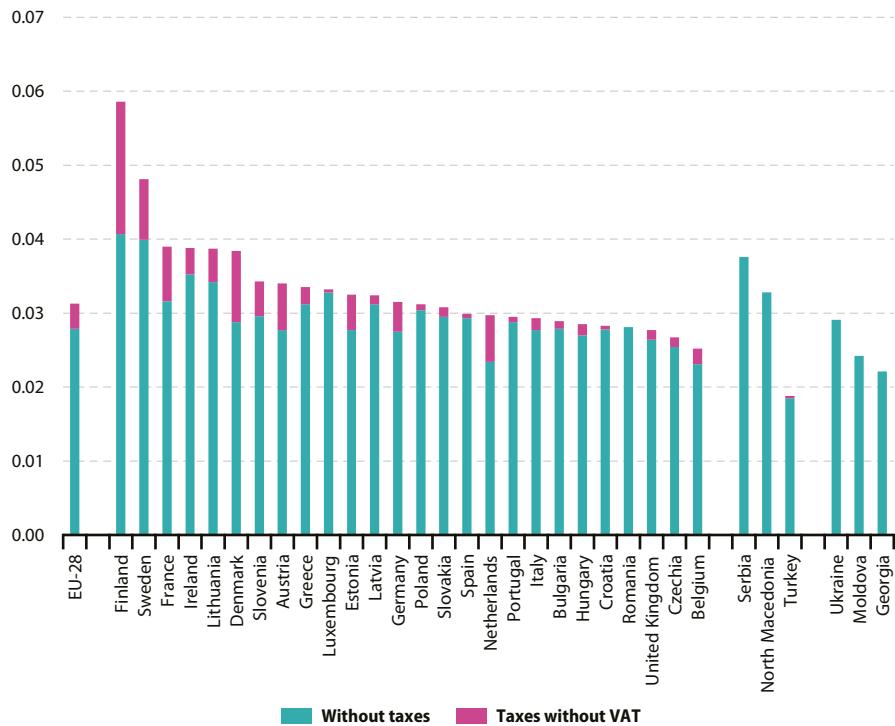
Source: Eurostat (online data code: nrg_pc_202)

Figure 1.4.6: Natural gas — share of taxes and levies paid by household consumers, registered in the second half of 2018 (%)



Source: Eurostat (online data code: nrg_pc_202)

Figure 1.4.7: Natural gas prices for non-household consumers, registered in the second half of 2018
(EUR/kWh)



Source: Eurostat (online data code: [nrg_pc_203](#))

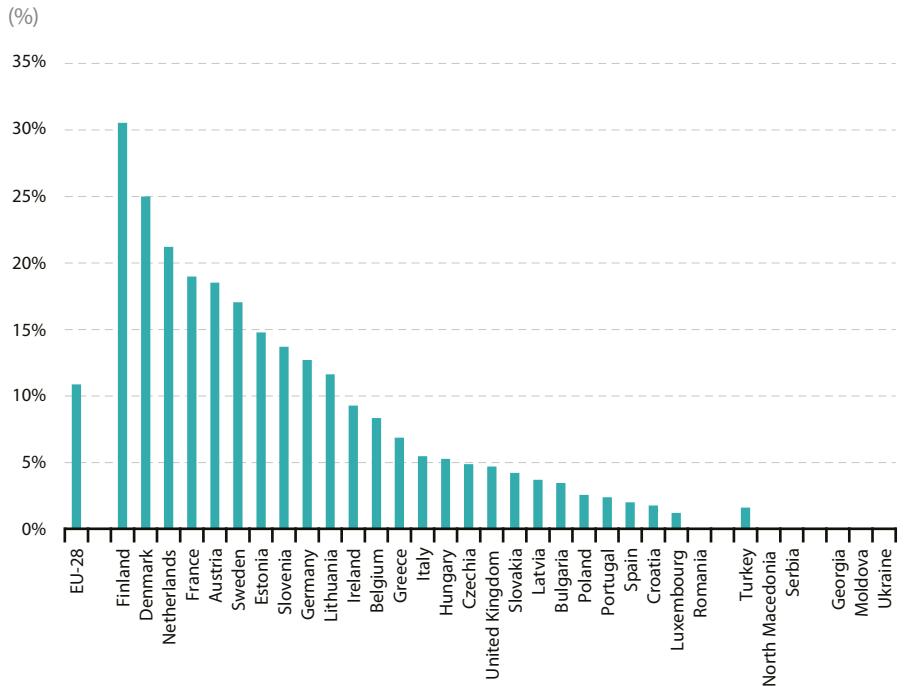
The proportion of taxes and levies in the overall natural gas retail price for household consumers is shown in Figure 1.4.6. The share of tax in natural gas prices during the second half of 2018 was the lowest in Luxembourg (10.3 %) where a low VAT rate is applied to the basic price. The highest taxes were charged in Denmark, where 54.3 % of the final price was made up of taxes and levies, followed by Netherlands, where tax also counts for half of the price (51.7 %).

For non-household consumers (defined as medium-sized consumers with an annual

consumption within the range of 10 000 GJ < consumption < 100 000 GJ), EU natural gas prices during the second half of 2018 were the highest in Finland (EUR 0.0586 per kWh), Sweden (EUR 0.0481 per kWh) and France (EUR 0.0390 per kWh), and the lowest in Belgium (EUR 0.0252 per kWh) (Figure 1.4.7).

The EU-28 average price — a weighted average based on most recent (2017) national data on the consumption of non-household consumers — was 0.0313 per kWh.

Figure 1.4.8: Natural gas — share of non-recoverable taxes and levies paid by non-household consumers, registered in the second half of 2018



Source: Eurostat (online data code: nrg_pc_203)

The proportion of taxes and levies that cannot be recovered by non-household consumers in the overall natural gas price is presented in Figure 1.4.8. For non-household consumers, tax share in the second half of 2018 was the lowest in Romania (0.0 %), Luxembourg (1.2 %) and Croatia (1.8 %). The highest shares of taxes were registered in Finland (30.5 %), Denmark (25.0 %) and the Netherlands (21.2 %).

In contrast to the price of other fossil fuels, which are usually traded on global markets with relatively uniform prices, there is a wider range of prices within the EU Member States for natural gas.

Electricity and gas markets were liberalised in EU since the second half of the 1990s.

Directives adopted in 2003 established common rules for internal markets for electricity and natural gas.

In July 2009, the European Parliament and Council adopted a third package of legislative proposals^(l) aimed at ensuring a real and effective choice of suppliers, as well as benefits for customers.

It is thought that increased transparency for gas and electricity prices should help promote fair competition, by encouraging consumers to choose between different energy sources (oil, coal, natural gas and renewable energy sources) and different suppliers.

(l) <https://ec.europa.eu/energy/node/50>

1.5 Electricity and natural gas markets

Table 1.5.1: Electricity generating companies, in selected years, 2003-2017
(number)

	Electricity generating companies			Main electricity generating companies		
	2003	2010	2017	2003	2010	2017
Belgium	2	4	>310	2	3	2
Bulgaria	13	22	113	5	5	5
Czechia	20	24	230	1	1	2
Denmark	>1 000	>1 000	~1 300	2	2	1
Germany	> 450	>450	:	4	4	5
Estonia	2	6	9	2	1	1
Ireland	5	8	9	3	6	4
Greece	1	4	3	1	1	3
Spain	:	:	>10	5	4	4
France	4	>5	>5	1	1	2
Croatia	2	2	12	2	2	1
Italy	79	185	688	4	5	3
Cyprus	1	1	1	1	1	1
Latvia	5	11	96	1	1	1
Lithuania	5	9	25	2	5	4
Luxembourg	9	3	>10	1	2	4
Hungary	30	68	30	6	3	4
Malta	1	1	3	1	1	3
Netherlands	≥87	700	350	4	5	4
Austria	34	126	240	7	4	4
Poland	31	68	211	7	5	3
Portugal	36	107	48	3	2	5
Romania	11	10	32	7	6	3
Slovenia	3	3	3	3	2	2
Slovakia	6	8	22	1	1	1
Finland	25	29	38	4	4	4
Sweden	7	24	33	3	5	3
United Kingdom	22	19	23	6	8	4
Norway	161	184	196	6	3	2
Montenegro	:	:	1	:	:	1
North Macedonia	:	1	3	:	1	2
Serbia			1	:	:	1
Turkey	148	60	246	3	2	3
Bosnia and Herzegovina	:	:	3	:	:	1
Kosovo (l)	:	:	1	:	:	1
Moldova	:	:	4	:	:	3

(l) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (This data is not yet available in the Eurostat dissemination database)

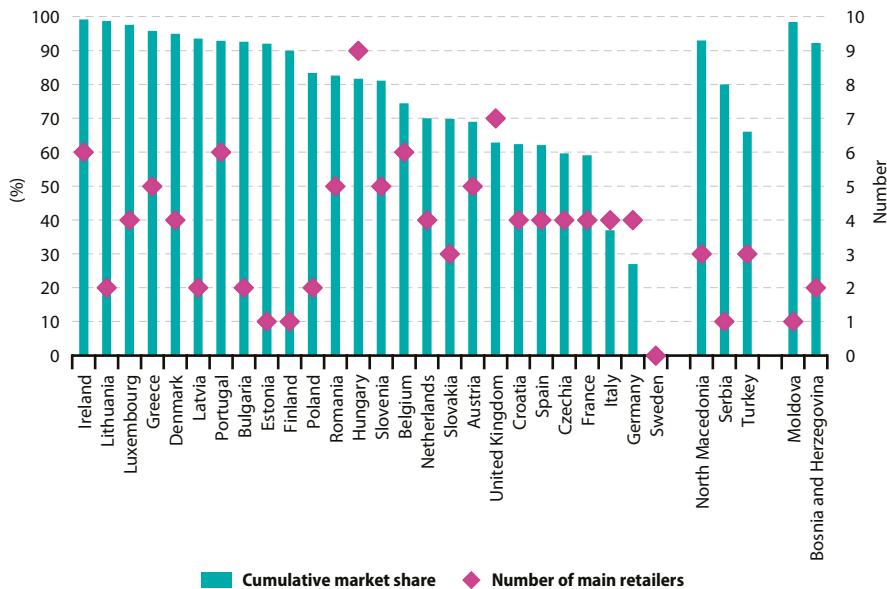
Analysing the structure of the electricity and gas markets permits us to explore how concentrated these markets are and understand their dynamics.

The first three columns of Table 1.5.1 refer to the number of companies that generate electricity, representing together at least 95 % of net electricity generation at national level.

In 2017, the number of electricity generating companies, representing at least 95 % of national net electricity generation, remained limited to five or less in four EU Member States. Germany did not report a number for this indicator.



Figure 1.5.1: Main natural gas retailers to final customers and their cumulative market share, 2017



Note: retailers are considered as 'main' if they sell at least 5% of the total natural gas consumed by final customers.

Source: Eurostat (This data is not yet available in the Eurostat dissemination database)

Between 2016 and 2017, the number of electricity generating companies representing at least 95 % of national net electricity generation remained stable in nine EU Member States while it increased in 11 Member States; the number went down most significantly in Italy.

The last three columns of Table 1.5.1 display the number of main companies that have a market coverage for at least 5 % of the total national net electricity generation, each.

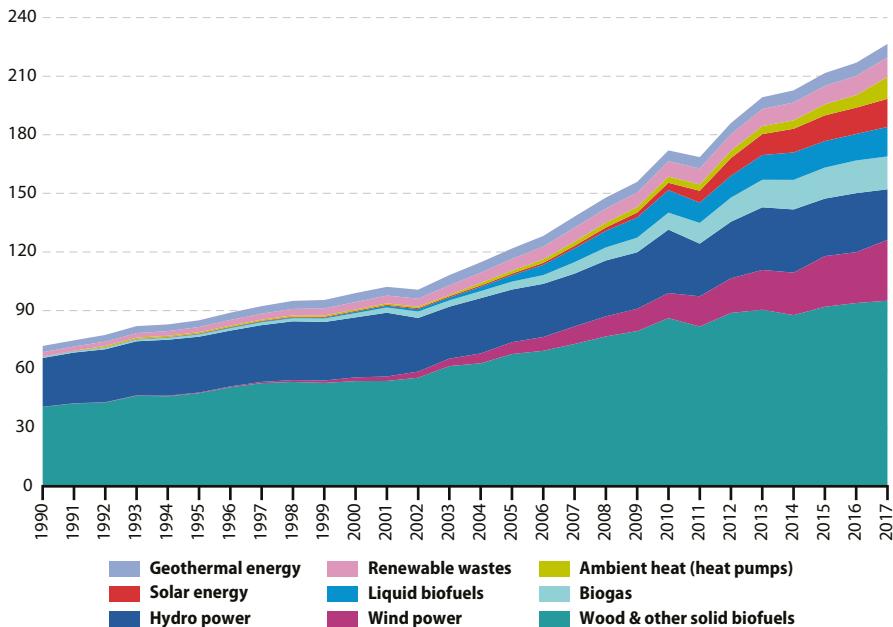
Six EU Member States declared that only one single enterprise has a significant share of electricity generation at national level in 2017. In 2016, the respective number was five EU Member States. In 2017, In Portugal, Germany and Bulgaria there are five electricity generating companies of considerable importance.

The number of main enterprises at EU-28 level fluctuated between 82 and 90 companies between 2003 and 2017.

Figure 1.5.1 illustrates the cumulative market shares of main natural gas retailers for the EU Member States available, as well as North Macedonia, Turkey, Serbia, Bosnia and Herzegovina and Moldova. It shows that the largest number of main natural gas retailers can be found in Ireland, Lithuania and Luxembourg. If one looks at the remaining retail-market, thus the retail companies with a market coverage of less than 5 %, this market is largest in Germany (73 %) and equal to or below 10 % in ten out of 25 EU Member States that reported this information.

1.6 Renewable energy sources

Figure 1.6.1: Primary production of energy from renewable sources, EU-28, 1990-2017 (Mtoe)



Source: Eurostat (online data code: [nrg_bal_c](#))

The primary production of renewable energy within the EU-28 in 2017 was 226.5 million tonnes of oil equivalent (toe). The total production of renewable energy within the EU-28 increased by 64.0 % from 2007 to 2017, equivalent to an average increase of 5.1 % per year.

Among renewable energies, the most important source in the EU-28 was wood and other solid biofuels, accounting for 42.0 % of primary renewables production in 2017 (see Figure 1.6.1). Wind power was, for the first time, the second most important contributor to the renewable energy mix (13.8 % of the total), followed by hydro power (11.4 %). Although their levels of

production remained relatively low, there was a particularly rapid expansion in the output of biogas, liquid biofuels and solar energy, which accounted respectively for a 7.4 %, 6.7 % and 6.4 % share of the EU-28 renewable energy produced in 2017. Ambient heat (captured by heat pumps) and geothermal energy accounted for 5.0 % and 3.0 % of the total, respectively, while renewable wastes increased to reach 4.4 %. There are currently very low levels of tide, wave and ocean energy production, with these technologies principally found in France and the United Kingdom.

Table 1.6.1: Primary production of renewable energy — solid biofuels and hydropower, in selected years, 2005–2017
 (thousand toe)

	Solid biofuels				Hydropower			
	2005	2010	2015	2017	2005	2010	2015	2017
EU-28	67 698.0	86 109.1	91 892.0	95 207.5	26 939.9	32 410.9	29 416.7	25 862.7
EA-19	44 780.9	56 109.1	59 219.5	61 981.5	17 128.3	22 954.9	19 599.7	17 404.6
Belgium	527.9	1 200.2	1 197.9	1 212.5	24.8	26.8	27.3	23.2
Bulgaria	717.7	942.5	1 160.3	1 123.4	372.9	434.8	486.7	243.2
Czechia	1 841.2	2 445.4	2 954.4	2 997.1	204.6	239.9	154.3	160.7
Denmark	1 260.1	1 703.2	1 694.2	1 726.6	2.0	1.8	1.6	1.5
Germany	7 975.5	11 010.2	12 061.6	12 011.0	1 688.5	1 801.6	1 631.7	1 732.6
Estonia	682.1	957.7	1 209.3	1 487.3	1.9	2.3	2.3	2.2
Ireland	180.4	190.3	201.3	245.9	54.3	51.5	69.3	59.5
Greece	956.9	724.9	952.5	808.6	431.4	641.4	524.4	340.7
Spain	4 176.0	4 665.6	5 260.2	5 472.7	1 581.5	3 637.5	2 419.6	1 615.0
France	9 078.9	10 338.0	10 014.7	10 794.2	4 426.5	5 392.4	4 767.5	4 297.0
Croatia	1 243.9	1 338.9	1 532.1	1 542.6	604.9	784.7	549.5	456.4
Italy	4 148.4	7 011.9	7 340.3	7 826.0	3 101.2	4 395.3	3 915.5	3 112.5
Cyprus	6.4	5.4	6.5	10.2	0.0	0.0	0.0	0.0
Latvia	1 553.7	1 596.0	2 009.2	2 039.5	285.9	302.7	160.0	376.7
Lithuania	845.3	1 002.2	1 204.7	1 306.0	38.8	46.4	30.0	51.8
Luxembourg	39.9	49.0	57.1	77.0	8.0	9.3	8.5	7.4
Hungary	1 540.2	2 346.6	2 513.2	2 360.1	17.4	16.2	20.1	18.9
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	938.5	1 208.7	1 336.1	1 433.7	7.6	9.0	8.0	5.2
Austria	3 281.8	4 191.5	4 384.3	4 593.2	3 189.6	3 298.7	3 189.2	3 299.2
Poland	4 166.2	5 866.2	6 596.9	6 161.1	189.2	251.1	157.5	220.1
Portugal	2 713.3	2 806.2	2 603.0	2 619.4	406.8	1 388.5	744.7	507.0
Romania	3 228.9	3 900.0	3 521.0	3 564.2	1 737.5	1 709.6	1 430.1	1 246.3
Slovenia	469.5	619.0	590.2	591.6	297.6	388.5	327.4	332.6
Slovakia	397.8	740.4	889.8	841.2	398.8	451.8	332.4	371.8
Finland	6 808.5	7 791.8	7 901.0	8 611.3	1 185.2	1 111.1	1 441.8	1 270.1
Sweden	7 936.6	9 499.6	9 081.5	9 498.3	6 259.9	5 709.2	6 475.7	5 601.3
United Kingdom	982.2	1 957.6	3 618.9	4 252.6	423.2	308.8	541.5	509.7
Iceland	0.0	0.0	10.9	16.2	603.6	1 082.7	1 184.9	1 208.8
Norway	1 119.1	1 196.8	854.7	930.9	11 667.1	10 037.7	11 805.8	12 195.7
Montenegro	145.6	162.9	198.1	209.5	160.4	236.5	128.2	88.0
North Macedonia	204.8	190.9	206.9	191.7	128.3	209.1	160.4	95.5
Albania	230.0	205.0	214.0	168.0	462.0	650.6	506.9	389.1
Serbia	902.8	1 036.4	1 104.4	1 086.2	981.1	1 022.4	866.7	787.0
Turkey	5 325.0	4 449.4	2 817.3	2 440.5	3 401.6	4 453.6	5 773.5	5 005.9
Bosnia and Herzegovina	:	:	725.0	683.0	:	:	477.3	325.9
Kosovo (l)	166.4	235.1	256.1	365.6	9.6	13.4	12.0	15.4
Ukraine	261.6	1 666.0	2 581.5	3 520.6	1 063.0	1 130.9	464.0	769.1
Georgia	:	:	398.8	364.9	:	:	726.9	792.0

(l) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_c)

Table 1.6.2: Primary production of renewable energy — geothermal, wind and solar energy, in selected years, 2005-2017
(thousand toe)

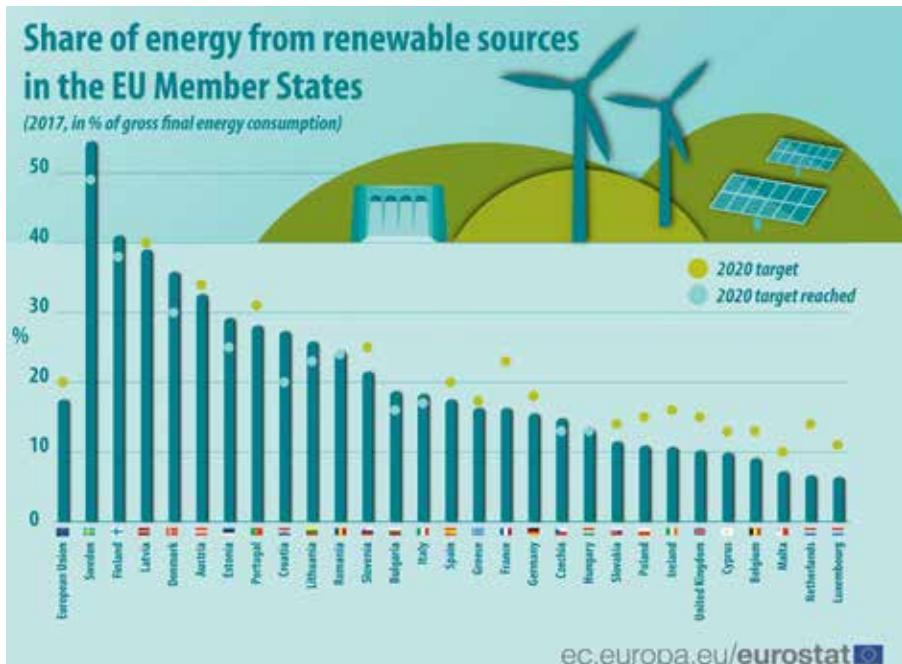
	Geothermal				Wind				Solar			
	2005	2010	2015	2017	2005	2010	2015	2017	2005	2010	2015	2017
EU-28	5 309.2	5 515.2	6 549.8	6 812.3	6 057.9	12 843.8	25 963.7	31 161.8	824.0	3 717.8	13 151.0	14 379.6
EA-19	5 155.8	5 334.8	6 346.8	6 567.3	5 143.5	10 673.4	18 039.0	21 809.7	770.8	3 555.1	11 732.3	12 542.6
Belgium	3.1	2.2	1.5	1.5	19.5	111.1	479.3	559.8	2.8	60.3	286.8	308.7
Bulgaria	32.7	32.7	33.4	34.6	0.4	58.6	124.8	129.3	0.0	11.5	140.7	144.1
Czechia	0.0	0.0	0.0	0.0	1.8	28.8	49.2	50.8	2.5	61.7	212.4	208.3
Denmark	4.1	5.1	3.3	3.6	568.7	671.5	1 215.2	1 270.9	10.2	16.2	88.7	120.3
Germany	46.1	86.2	213.6	255.5	2 341.3	3 249.6	6 810.5	9 088.0	370.8	1 492.6	4 001.0	4 063.1
Estonia	0.0	0.0	0.0	0.0	4.6	23.8	61.5	62.2	0.0	0.0	0.0	0.0
Ireland	0.0	0.0	0.0	0.0	95.6	242.0	565.2	640.1	0.5	7.5	11.7	13.6
Greece	12.3	16.0	9.9	8.8	108.9	233.4	397.3	476.1	101.0	196.9	531.7	614.7
Spain	7.3	16.0	18.8	18.8	1 820.7	3 806.6	4 241.2	4 224.2	65.5	1 034.8	3 184.1	3 351.3
France	189.5	174.6	303.4	414.5	82.8	855.1	1 833.1	2 124.7	25.6	117.7	826.8	995.3
Croatia	0.0	6.8	8.9	8.2	0.9	12.0	68.5	103.5	2.3	5.2	15.3	19.6
Italy	4 791.2	4 775.8	5 469.5	5 500.8	201.5	784.7	1 276.3	1 525.5	30.0	298.0	2 162.7	2 305.0
Cyprus	0.0	0.8	1.6	1.6	0.0	2.7	19.1	18.2	41.3	61.3	78.7	85.0
Latvia	0.0	0.0	0.0	0.0	4.0	4.2	12.7	12.9	0.0	0.0	0.0	0.0
Lithuania	2.9	4.5	1.6	0.7	0.2	19.3	69.7	117.3	0.0	0.0	6.3	5.8
Luxembourg	0.0	0.0	0.0	0.0	4.5	4.7	8.8	20.2	1.8	2.7	10.8	11.5
Hungary	86.6	98.6	105.7	133.2	0.9	45.9	59.6	65.2	1.9	5.4	22.8	41.8
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.6	13.0	18.3
Netherlands	0.0	7.6	58.5	72.8	177.7	343.3	649.2	908.8	20.2	28.5	122.5	216.7
Austria	29.8	34.5	34.9	35.9	114.5	177.5	415.9	565.3	87.3	168.5	261.6	289.4
Poland	11.4	13.4	21.7	22.6	11.6	143.1	933.7	1 281.9	0.1	10.0	49.9	68.7
Portugal	65.7	180.6	187.0	198.9	152.5	789.5	998.1	1 053.1	22.7	66.3	148.7	173.2
Romania	17.9	23.0	29.1	41.8	0.0	26.3	607.3	636.9	0.0	0.1	170.9	160.3
Slovenia	0.0	27.7	39.5	48.9	0.0	0.0	0.5	0.5	0.0	9.3	34.5	35.3
Slovakia	8.0	8.3	7.1	8.6	0.5	0.5	0.5	0.5	0.0	5.7	49.0	50.0
Finland	0.0	0.0	0.0	0.0	14.6	25.3	200.1	412.3	0.7	1.3	2.3	5.5
Sweden	0.0	0.0	0.0	0.0	80.4	299.8	1 403.4	1 514.1	6.1	11.1	19.6	30.9
United Kingdom	0.8	0.8	0.8	0.8	249.7	884.4	3 463.0	4 299.5	30.1	41.5	698.4	1 043.0
Iceland	1 778.2	3 706.8	3 729.6	3 579.9	0.0	0.0	0.9	0.7	0.0	0.0	0.0	0.0
Norway	0.0	0.0	0.0	0.0	42.9	75.6	216.3	245.2	0.0	0.0	0.0	0.0
Montenegro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.8.3	0.0	0.0	0.2	0.2
North Macedonia	10.1	11.4	6.0	5.6	0.0	0.0	10.4	9.5	0.0	0.0	1.9	2.0
Albania	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.3	6.7	12.4	13.3
Serbia	0.0	5.4	6.1	5.3	0.0	0.0	0.0	4.2	0.0	0.0	0.9	1.1
Turkey	1 007.0	1 966.1	4 846.6	7 128.0	5.1	250.8	1 001.9	1 539.5	384.8	432.0	844.2	1 091.4
Bosnia and Herzegovina	:	:	0.0	0.0	:	:	0.0	0.0	:	:	0.0	1.8
Kosovo (1)	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.2	0.2	0.3	0.4
Ukraine	0.0	0.0	0.0	0.0	3.2	4.4	93.2	84.6	0.0	0.0	41.0	64.0
Georgia	:	:	16.1	17.7	:	:	0.0	7.5	:	:	2.4	3.1

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_c)



Figure 1.6.2: Share of energy from renewable sources, 2017
(% of gross final energy consumption)



Source: Eurostat (online data code: nrg_ind_ren)

The EU seeks to have a 20 % share of its gross final energy consumption from renewable sources by 2020; this target is distributed among the EU Member States with national action plans designed to plot a pathway for the development of renewable energies in each of them.

Figure 1.6.2 shows the latest data available for the share of renewable energies in gross final energy consumption and the targets that have been set for 2020. The share of renewables in gross final energy consumption stood at 17.5 % in the EU-28 in 2017, compared with 8.5 % in 2004.

With more than half (54.5 %) of energy from renewable sources in its gross final consumption of energy, Sweden had by far the highest share among the EU Member States in 2017, ahead of Finland (41.0 %), Latvia (39.0 %), Denmark

(35.8 %) and Austria (32.6 %). At the opposite end of the scale, the lowest proportions of renewables were registered in Luxembourg (6.4 %), the Netherlands (6.6 %), Malta (7.2 %), Belgium (9.1 %), Cyprus (9.9 %) and the United Kingdom (10.2 %). Compared with the most recent data available for 2017, the targets for France, the Netherlands and Ireland require each of these Member States to increase their share of renewable energy in final energy consumption by at least 5.0 percentage points. By contrast, eleven Member States had already surpassed their targets for 2020; the extent to which the targets have been exceeded was particularly large in Croatia, Sweden, Denmark and Estonia.

Table 1.6.3: Energy from renewable sources, in selected years, 2005-2017
 (% share of gross final energy consumption)

	2005 2010 2015 2016 2017 2015-2016 average						Indicative trajectory			
	S2005 (1)	2015-2016	2017-2018	2020 target						
EU-28	9.1	13.1	16.7	17.0	17.5	16.9	:	:	:	20.0
Belgium	2.3	5.6	7.9	8.6	9.1	8.3	2.2	7.1	9.2	13.0
Bulgaria	9.4	14.1	18.2	18.8	18.7	18.5	9.4	12.4	13.7	16.0
Czechia	7.1	10.5	15.0	14.9	14.8	14.9	6.1	9.2	10.6	13.0
Denmark	16.0	22.1	31.4	32.6	35.8	32.0	17.0	22.9	25.5	30.0
Germany	7.1	11.7	14.9	14.9	15.5	14.9	5.8	11.3	13.7	18.0
Estonia	17.4	24.6	28.4	28.6	29.2	28.5	18.0	21.2	22.6	25.0
Ireland	2.8	5.8	9.1	9.3	10.7	9.2	3.1	8.9	11.5	16.0
Greece	7.0	9.8	15.4	15.1	16.3	15.2	6.9	11.9	14.1	18.0
Spain	8.4	13.8	16.2	17.4	17.5	16.8	8.7	13.8	16.0	20.0
France	9.6	12.7	15.2	15.9	16.3	15.6	10.3	16.0	18.6	23.0
Croatia	23.7	25.1	29.0	28.3	27.3	28.6	12.6	15.9	17.4	20.0
Italy	7.5	13.0	17.5	17.4	18.3	17.5	5.2	10.5	12.9	17.0
Cyprus	3.1	6.0	9.4	9.3	9.9	9.4	2.9	7.4	9.5	13.0
Latvia	32.3	30.4	37.5	37.1	39.0	37.3	32.6	35.9	37.4	40.0
Lithuania	16.8	19.6	25.8	25.6	25.8	25.7	15.0	18.6	20.2	23.0
Luxembourg	1.4	2.9	5.0	5.4	6.4	5.2	0.9	5.4	7.5	11.0
Hungary	6.9	12.7	14.4	14.3	13.3	14.3	4.3	8.2	10.0	13.0
Malta	0.1	0.8	5.1	6.2	7.2	5.7	0.0	4.5	6.5	10.0
Netherlands	2.5	3.9	5.7	5.9	6.6	5.8	2.4	7.6	9.9	14.0
Austria	23.7	29.9	32.8	33.0	32.6	32.9	23.3	28.1	30.3	34.0
Poland	6.9	9.3	11.7	11.3	10.9	11.5	7.2	10.7	12.3	15.0
Portugal	19.5	24.2	28.0	28.4	28.1	28.2	20.5	25.2	27.3	31.0
Romania	17.2	23.1	24.8	25.0	24.5	24.9	17.8	20.6	21.8	24.0
Slovenia	16.0	20.4	21.9	21.3	21.5	21.6	16.0	20.1	21.9	25.0
Slovakia	6.4	9.1	12.9	12.0	11.5	12.5	6.7	10.0	11.4	14.0
Finland	28.8	32.4	39.3	39.0	41.0	39.2	28.5	32.8	34.7	38.0
Sweden	40.5	47.2	53.6	53.8	54.5	53.7	39.8	43.9	45.8	49.0
United Kingdom	1.3	3.7	8.4	9.2	10.2	8.8	1.3	7.5	10.2	15.0
Montenegro	35.7	40.6	43.1	41.5	40.0	42.3	:	29.3	30.7	33.0
North Macedonia	16.5	16.5	19.5	18.0	19.7	18.8	:	24.6	25.9	28.0
Albania	31.4	31.9	34.4	37.1	34.6	35.7	:	34.3	35.6	38.0
Serbia	14.3	19.8	21.9	21.0	20.6	21.4	:	23.8	25.0	27.0
Turkey	15.5	14.0	13.6	13.7	13.2	13.7	:	:	:	:
Kosovo (2)	20.0	18.3	18.5	24.4	22.9	21.4	:	21.6	22.9	25.0

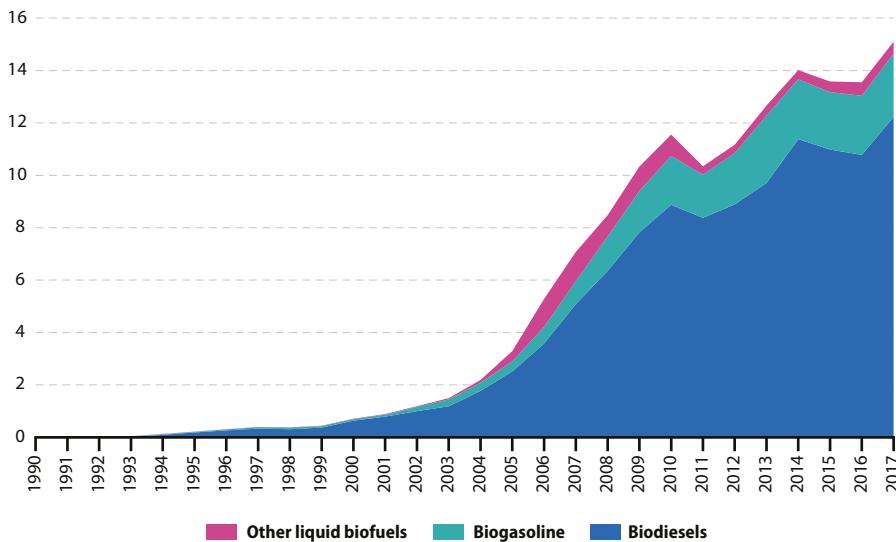
(1) S2005 is the share of energy from renewable sources in 2005, baseline used for the calculation of the indicative trajectory (in accordance with Directive 2009/28/EC on the promotion of the use of energy from renewable sources).

(2) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: SHARES_summary_results in <http://ec.europa.eu/eurostat/web/energy/data/shares>



Figure 1.6.3: Primary production of liquid biofuels, EU-28, 1990-2017
(Mtoe)



Source: Eurostat (online data code: [nrg_bal_c](#))

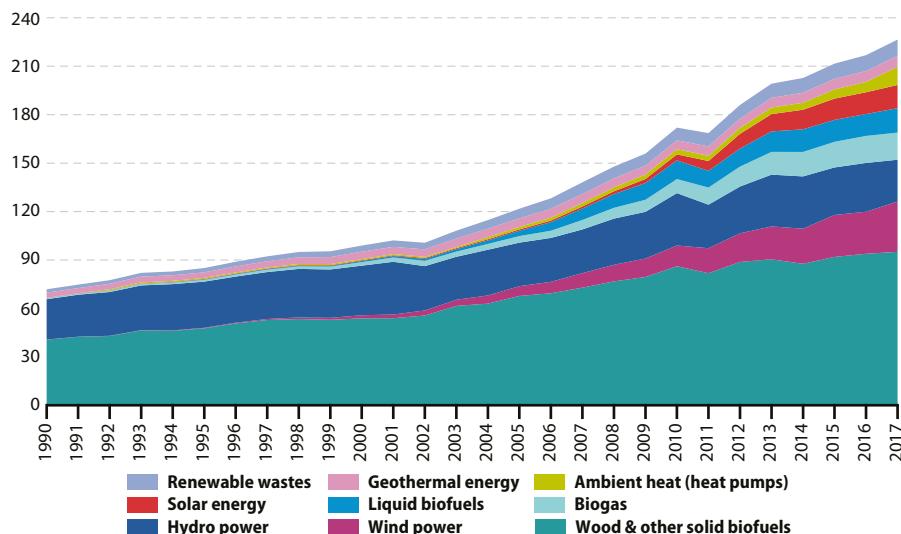
Due to the binding 2020 target, the production of liquid biofuels in the EU has increased significantly, with biodiesel being the liquid biofuel most widely produced, followed by biogasoline and other liquid biofuels (Figure 1.6.3).

Liquid biofuels, usually blended with fossil fuels, is the most widely used renewable energy source in transport.

Renewable energy sources accounted for a 13.9 % share of the EU-28 gross inland energy consumption in 2017. Wood and other solid biofuels continue to be the largest contributor

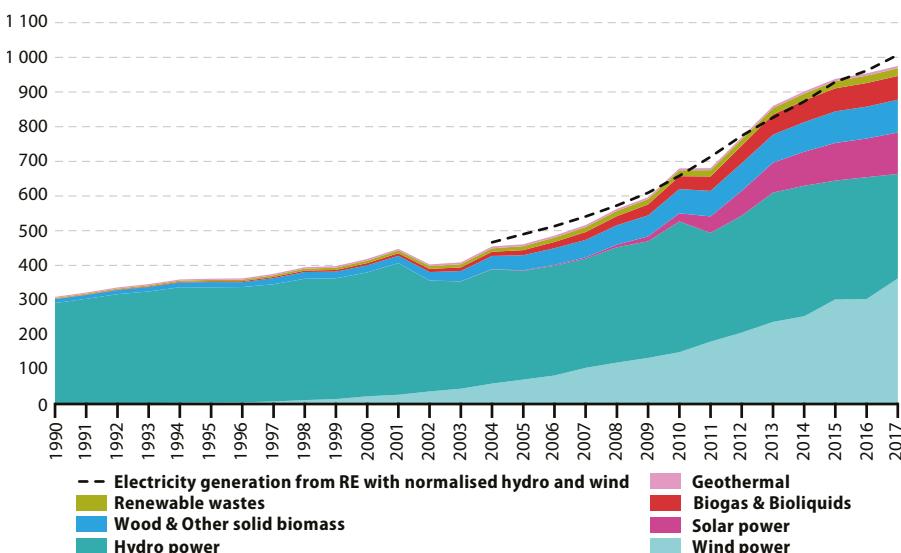
to the mix of renewable energy sources. Hydro power and wood accounted for 91.3 % in 1990. However, their combined relative rate of increase since then has been much smaller than that of the other sources. Consequently, their combined share decreased to 53.4 % in 2017. A graphic evolution of gross inland energy consumption of renewable energies is shown in Figure 1.6.4 (where electricity production is not normalised).

Figure 1.6.4: Gross inland consumption of renewables, EU-28, 1990-2017 (Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

Figure 1.6.5: Gross electricity generation from renewable sources, EU-28, 1990-2017 (GWh)



Source: Eurostat (online data code: nrg_bal_c)



In 2017, electricity generation from renewable sources contributed more than one quarter (30.7 %) to total EU-28 gross electricity consumption. Wind power is for the first time the most important source, followed closely by hydro power (Figure 1.6.5).

The accounting rules in Directive 2009/28/EC prescribe that electricity generated by hydro power and wind power have to be normalised to account for annual weather variations (hydro is normalised over the last 15 years and wind over the last 5 years).

The growth in electricity generated from renewable energy sources during the period 2007 to 2017 largely reflects an expansion in three renewable energy sources across the EU, principally wind power, but also solar power and solid biofuels (including renewable wastes).

In 2017 hydro power has been replaced for the first time by wind power as the single largest source for renewable electricity generation in the EU-28. Indeed, the amount of electricity generated from hydro was relatively similar to the level recorded a decade earlier. By contrast, the quantity of electricity generated from solar and from wind turbines in the EU-28 was 31.6 times and 3.5 times as high in 2017 as in 2007. As a

result, the shares of wind power and solar power in the total quantity of electricity generated from renewable energy sources rose to 37.2 % and 12.3 % in 2017, respectively.

The growth in electricity from solar power has been dramatic, rising from just 3.8 TWh in 2007 to overtake geothermal energy in 2008, reaching a level of 119.5 TWh in 2017. Over this 10-year period, the contribution of solar power to all electricity generated in the EU-28 from renewable energy sources rose from 0.7 % to 12.3 %.

The installed electrical capacity in the EU-28 is presented in Table 1.6.4. It increased by 46.2 % in the period from 2000 to 2017. Its structure changed significantly over this period. In 2000, the highest share of installed capacity was accounted for combustible fuels (58.0 %), followed by hydro (20.1 %) and nuclear (19.9 %), with all others at less than 2.0 %. In 2017, the share of installed capacity of combustible fuels decreased slightly to 45.0 %, the share of hydro to 15.3 % and the share of nuclear to 12.0 %. On the other hand, the share of wind increased to 16.7 % and the share of solar to 10.8 %, while geothermal and tide, wave and ocean remained negligible.

Table 1.6.4: Maximum electrical capacity, EU-28, in selected years, 2000-2017 (MW)

	2000	2005	2010	2011	2012	2013	2014	2015	2016	2017
Total capacity	691 626	757 865	883 710	923 724	950 730	959 952	976 934	985 785	992 890	1 010 998
Combustible fuels	401 342	435 069	487 685	492 678	497 387	484 901	483 096	470 506	457 231	455 115
Hydro	139 014	143 388	147 327	148 697	149 276	150 391	150 565	152 690	154 095	155 118
Pure hydro power	97 566	99 714	102 305	103 449	103 559	104 524	104 365	105 292	106 247	106 612
Mixed hydro power	18 484	19 521	20 673	20 892	21 230	21 362	21 550	21 911	22 424	23 260
Pumped hydro power	22 964	24 153	24 349	24 356	24 487	24 505	24 650	25 487	25 425	25 247
Geothermal	604	687	762	778	781	795	834	836	838	848
Wind	12 709	40 278	84 323	93 942	106 110	117 101	128 614	141 437	154 273	168 933
Solar	177	2 289	30 778	54 431	72 993	82 724	89 186	97 296	103 345	109 014
Solar thermal	0	0	734	1 151	2 002	2 306	2 306	2 306	2 306	2 306
Solar photovoltaic	177	2 289	30 044	53 280	70 991	80 418	86 880	94 990	101 039	106 708
Tide, wave, ocean	214	217	220	219	225	226	230	227	238	242
Nuclear	137 337	134 994	131 731	132 087	123 183	122 971	123 515	121 957	122 051	120 884
Other sources	229	943	883	892	774	841	894	836	819	843

Source: Eurostat (online data code: nrg_inf_epc)

Table 1.6.5: Electricity from renewable sources, in selected years, 2004-2017
 (% share of gross electricity consumption)

	2004	2006	2008	2010	2012	2014	2016	2017
EU-28	14.3	15.4	17.0	19.7	23.5	27.4	29.6	30.7
Belgium	1.7	3.1	4.6	7.1	11.3	13.4	15.8	17.2
Bulgaria	9.1	9.3	10.0	12.7	16.1	18.9	19.2	19.1
Czechia	3.7	4.1	5.2	7.5	11.7	13.9	13.6	13.7
Denmark	23.8	24.0	25.9	32.7	38.7	48.5	53.9	60.4
Germany	9.4	11.8	15.0	18.2	23.6	28.1	32.2	34.4
Estonia	0.5	1.3	1.9	10.2	15.4	13.8	15.2	17.0
Ireland	6.0	8.5	10.8	15.6	19.8	23.5	26.8	30.1
Greece	7.8	8.9	9.6	12.3	16.4	21.9	22.7	24.5
Spain	19.0	20.0	23.7	29.8	33.5	37.8	36.6	36.3
France	13.8	14.1	14.4	14.8	16.5	18.4	19.2	19.9
Croatia	35.0	35.0	33.8	37.5	38.7	45.2	46.6	46.4
Italy	16.1	15.9	16.6	20.1	27.4	33.4	34.0	34.1
Cyprus	0.0	0.0	0.3	1.4	4.9	7.4	8.6	8.9
Latvia	46.0	40.4	38.7	42.1	44.9	51.0	51.3	54.4
Lithuania	3.6	4.0	4.9	7.4	10.9	13.7	16.9	18.3
Luxembourg	2.8	3.2	3.6	3.8	4.7	6.0	6.7	8.1
Hungary	2.2	3.5	5.3	7.1	6.1	7.3	7.3	7.5
Malta	0.0	0.0	0.0	0.0	1.1	3.3	5.7	6.6
Netherlands	4.4	6.5	7.5	9.6	10.4	9.9	12.5	13.8
Austria	61.6	62.8	65.0	65.6	66.5	70.1	73.3	72.2
Poland	2.2	3.0	4.4	6.6	10.7	12.4	13.4	13.1
Portugal	27.4	29.3	34.1	40.6	47.5	52.1	54.0	54.2
Romania	25.0	28.1	28.1	30.4	33.6	41.7	42.7	41.6
Slovenia	29.3	28.2	30.0	32.2	31.6	33.9	32.1	32.4
Slovakia	15.4	16.6	17.0	17.8	20.1	22.9	22.5	21.3
Finland	26.7	26.4	27.3	27.7	29.5	31.4	32.9	35.2
Sweden	51.2	51.8	53.6	56.0	60.0	63.2	64.9	65.9
United Kingdom	3.5	4.5	5.5	7.5	10.8	17.8	24.6	28.1
Montenegro	:	37.7	38.3	45.7	42.8	51.4	51.0	50.1
North Macedonia	14.5	14.0	13.8	15.8	16.7	19.3	24.1	24.8
Albania	70.0	74.2	73.3	74.6	72.4	71.0	86.0	90.7
Serbia	18.5	23.6	25.9	28.2	28.5	30.3	29.2	28.7
Turkey	27.9	24.7	22.8	25.3	27.1	30.5	34.8	35.1
Kosovo (1)	1.2	1.6	1.4	1.7	1.6	1.9	3.7	3.2

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: SHARES_summary_results in <http://ec.europa.eu/eurostat/web/energy/data/shares>

There is a significant variation between EU Member States. In Austria (72.2 %), Sweden (65.9 %) and Denmark (60.4 %) at least three fifths of all the electricity consumed was generated from renewable energy sources — largely as a result of hydro power and solid biofuels —

while more than half of the electricity used in Portugal (54.2 %) and Latvia (54.4 %) came from renewable energy sources. On the other hand, in Cyprus, Hungary, Luxembourg and Malta the share of electricity generated from renewable sources was less than 10 % (Table 1.6.5).



Table 1.6.6: Renewable energy sources in heating and cooling, in selected years, 2004-2017

(%)

	2004	2006	2008	2010	2012	2014	2016	2017
EU-28	10.4	11.8	13.8	15.4	17.0	18.4	19.0	19.5
Belgium	2.8	3.7	5.0	6.1	7.3	7.7	8.1	8.0
Bulgaria	14.1	14.8	17.3	24.4	27.5	28.3	30.0	29.9
Czechia	9.9	11.2	12.9	14.1	16.3	19.5	19.8	19.7
Denmark	20.6	23.8	28.1	31.0	33.6	38.5	42.2	46.5
Germany	7.1	8.4	10.3	12.1	13.5	13.5	13.1	13.4
Estonia	33.2	30.7	35.5	43.3	43.1	45.2	51.2	51.6
Ireland	2.9	3.7	3.5	4.3	4.9	6.3	6.3	6.9
Greece	12.8	12.4	14.2	17.9	23.4	27.0	24.6	26.6
Spain	9.5	11.3	11.6	12.6	14.1	15.7	17.1	17.5
France	12.5	11.7	13.3	16.1	17.5	19.1	21.1	21.3
Croatia	29.4	29.1	28.6	32.8	36.5	36.1	37.6	36.5
Italy	5.7	10.1	15.3	15.6	17.0	18.9	18.9	20.1
Cyprus	9.3	10.4	14.5	18.2	20.7	21.6	23.0	24.5
Latvia	42.5	42.6	42.9	40.7	47.3	52.2	51.8	54.6
Lithuania	30.4	29.2	32.0	32.5	34.5	40.6	46.6	46.5
Luxembourg	1.8	3.6	4.6	4.7	5.0	7.2	7.3	8.1
Hungary	6.4	11.4	12.0	18.1	23.3	21.2	20.9	19.6
Malta	1.0	1.4	1.7	5.7	13.1	14.8	16.5	20.2
Netherlands	2.2	2.7	3.1	3.1	3.8	5.1	5.4	5.9
Austria	20.2	22.9	25.1	28.7	30.0	32.9	32.2	32.0
Poland	10.2	10.2	10.8	11.7	13.4	14.0	14.7	14.5
Portugal	32.5	34.2	37.5	33.9	33.2	34.0	35.1	34.4
Romania	17.3	17.6	23.2	27.2	25.7	26.7	26.9	26.6
Slovenia	18.4	18.5	19.2	28.1	31.5	32.4	34.0	33.2
Slovakia	5.1	4.5	6.1	7.9	8.8	8.9	9.9	9.8
Finland	39.5	41.4	43.3	44.2	48.4	52.0	53.7	54.8
Sweden	46.6	56.3	61.0	60.9	65.8	67.9	68.5	69.1
United Kingdom	0.7	0.9	1.9	2.6	3.2	4.7	7.0	7.5
Montenegro	:	51.4	46.0	76.5	79.8	67.6	69.2	67.5
North Macedonia	23.3	24.9	24.6	26.5	29.6	35.0	30.9	36.4
Albania	33.1	31.0	37.1	31.3	39.1	31.0	33.8	24.9
Serbia	14.0	15.8	16.7	23.2	23.2	28.8	24.7	24.4
Turkey	17.6	15.2	15.0	14.4	12.1	12.3	11.7	10.3
Kosovo (l)	51.9	48.9	47.8	45.5	49.3	51.8	51.8	50.5

(l) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: SHARES_summary_results in <http://ec.europa.eu/eurostat/web/energy/data/shares>

In 2017, renewable energy accounted for 19.5 % of the total energy use for heating and cooling in the EU-28. This is a significant increase compared to 2004 (10.4 %). Increases in industrial sectors, services and households (building sector) contributed to this growth. Aerothermal,

geothermal and hydrothermal heat energy captured by heat pumps is taken into account, to the extent reported by countries. The share of energy from renewable sources in heating and cooling is presented in Table 1.6.6.

Table 1.6.7: Renewable energy sources in transport, in selected years, 2004-2017
(%)

	2004	2006	2008	2010	2012	2014	2016	2017
EU-28	1.4	2.4	3.9	5.2	5.3	6.1	7.2	7.6
Belgium	0.5	0.6	0.6	4.7	4.8	5.8	6.0	6.6
Bulgaria	0.9	1.0	0.9	1.4	0.6	5.7	7.2	7.2
Czechia	1.6	1.2	2.7	5.1	6.1	6.9	6.4	6.6
Denmark	0.4	0.5	0.5	1.1	6.4	6.7	6.8	6.8
Germany	2.2	6.8	6.4	6.4	7.4	6.9	7.0	7.0
Estonia	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4
Ireland	0.0	0.1	1.3	2.5	4.9	5.3	5.2	7.4
Greece	0.1	0.7	1.1	1.9	0.9	1.3	1.6	1.8
Spain	1.0	0.8	2.2	5.0	0.9	1.1	5.3	5.9
France	1.5	2.3	6.2	6.5	7.4	8.2	8.7	9.1
Croatia	1.0	1.0	1.1	1.1	1.1	4.3	1.3	1.2
Italy	1.2	1.0	2.6	4.7	6.1	5.0	7.4	6.5
Cyprus	0.0	0.0	1.9	2.0	0.0	2.7	2.7	2.6
Latvia	2.1	2.2	1.7	4.0	4.0	4.1	2.8	2.5
Lithuania	0.4	1.9	4.3	3.8	4.9	4.3	3.6	3.7
Luxembourg	0.1	0.2	2.2	2.1	2.8	5.5	5.9	6.4
Hungary	0.9	1.1	5.1	6.1	5.9	6.9	7.6	6.8
Malta	0.0	0.0	0.0	0.0	3.2	4.6	5.5	6.9
Netherlands	0.5	0.8	2.9	3.3	5.2	6.5	4.9	5.9
Austria	4.5	7.5	9.5	10.7	10.0	11.0	10.6	9.7
Poland	1.4	1.6	3.5	6.6	6.5	6.2	3.9	4.2
Portugal	0.4	1.6	2.5	5.5	0.8	3.7	7.7	7.9
Romania	1.6	1.4	3.5	3.4	4.9	4.7	6.2	6.6
Slovenia	0.9	1.1	1.8	3.1	3.3	2.9	1.6	2.7
Slovakia	1.5	3.5	4.3	5.3	5.4	7.6	7.7	7.0
Finland	1.0	1.0	2.9	4.4	1.1	24.7	9.0	18.8
Sweden	6.3	7.1	8.3	9.2	15.2	21.9	33.8	38.6
United Kingdom	0.3	0.7	2.3	3.3	1.6	1.9	5.0	5.1
Montenegro	:	0.5	0.9	0.8	0.7	1.1	1.1	1.0
North Macedonia	0.2	0.3	0.3	0.2	0.2	0.2	0.1	0.1
Albania	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serbia	0.5	0.4	0.7	0.7	2.0	1.2	1.2	1.2
Turkey	0.3	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Kosovo (1)	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: SHARES_summary_results in <http://ec.europa.eu/eurostat/web/energy/data/shares>

The EU agreed to set a common target of 10 % for the share of renewable energy (including liquid biofuels, hydrogen, biomethane, 'green' electricity, etc.) in the transport sector by 2020.

The average share of energy from renewable sources in transport increased from 1.4 % in 2004 to 7.6 % in 2017 (Table 1.6.7). Among the EU Member States the relative share of renewable

energy in transport fuel consumption ranged from 38.6 % in Sweden, 18.8 % in Finland and 9.7 % in Austria down to less than 2.0 % in Croatia, Greece and Estonia.

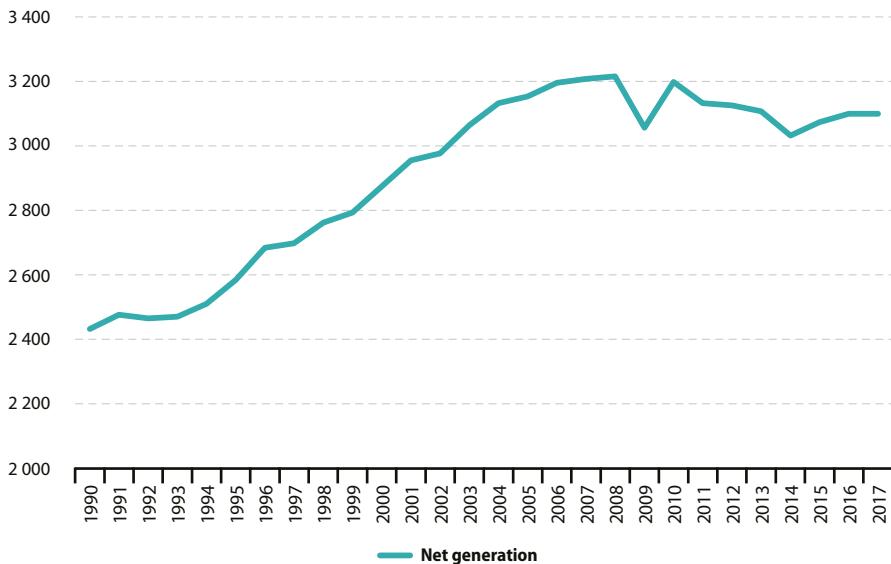
In some of the EU Member States there was a rapid take-up in the use of renewable energy as a transport fuel. This was particularly true in Ireland, Luxembourg, Malta, Finland and Sweden.



1.7 Electricity

Figure 1.7.1: Net electricity generation, EU-28, 1990-2017

(thousand GWh)



Note: the y-axis is cut.

Source: Eurostat (online data code: [nrg_ind_peh](#))

Total net electricity generation in the EU-28 was 3.10 million gigawatt hours (GWh) in 2017 (Figure 1.7.1). The level of net electricity generation in the EU-28 in 2017 was 3.6 % lower than its relative peak of 2008, when total output stood at 3.22 million GWh.

Almost half (49.0 %) of the net electricity generated in the EU-28 in 2017 came from combustible fuels (such as natural gas, coal and oil), while a quarter (25.0 %) came from nuclear power stations.

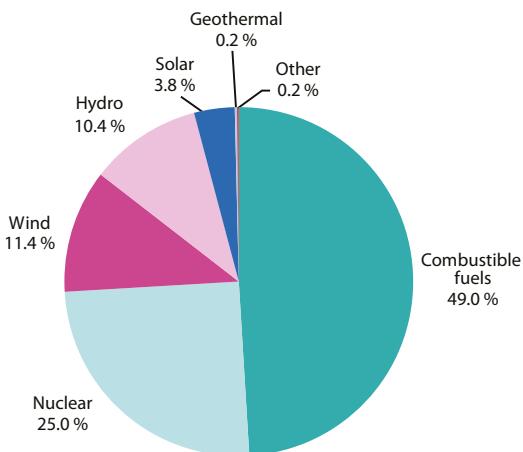
Among the renewable energy sources shown in Figure 1.7.2, the highest share of net electricity generation in 2017 was from wind turbines (11.4 %), followed by hydropower plants (10.4 %) and solar power (3.8 %). The relative importance of renewable energy sources in relation to EU-28

net electricity generation grew between 2007 and 2017 from 14.2 % to 25.8 %, while there was a relatively large decrease in the importance of combustible fuels from 58.1 % to 49.0 % and also a reduction in the share of electricity generated from nuclear power plants from 27.6 % to 25.0 %.

Among the renewable energy sources, the proportion of net electricity generated from solar and wind increased greatly: from 0.1 % in 2007 to 3.8 % in 2017 for solar power and from 3.2 % in 2007 to 11.4 % in 2017 for wind turbines.

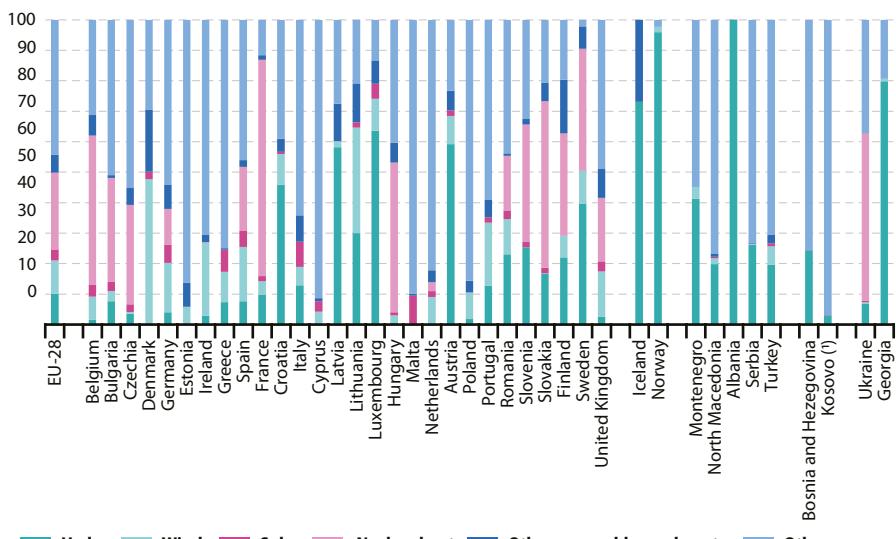
A more detailed breakdown of the contribution of renewable energies, nuclear energy and other fuels to the generation of electricity in member's states and other reporting countries is shown in Figure 1.7.3.

Figure 1.7.2: Net electricity generation, EU-28, 2017
(% of total, based on GWh)



Source: Eurostat (online data code: nrg_ind_peh)

Figure 1.7.3: Breakdown of electricity production by source, 2017
(%)



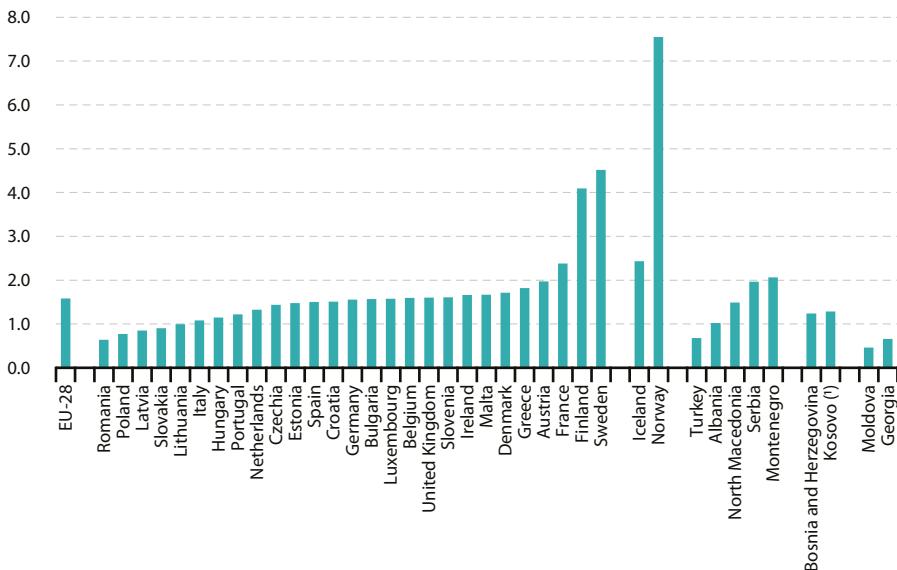
■ Hydro ■ Wind ■ Solar ■ Nuclear heat ■ Other renewables and waste ■ Other sources

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: nrg_bal_peh)



Figure 1.7.4: Households consumption of electricity per capita, 2017
(MWh per capita)



(I) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: nrg_cb_e_demo_pjan)

Electricity consumption per capita in the households sector in the EU-28 in 2017 was 1.6 MWh (1 579 kWh). The range of electricity consumption per capita in the households sector in the EU Member States in 2017 varied widely, from consumption below 1 MWh per capita in Romania, Poland, Latvia and Slovakia, to consumption of over 4 MWh per capita in Sweden and Finland (Figure 1.7.4).

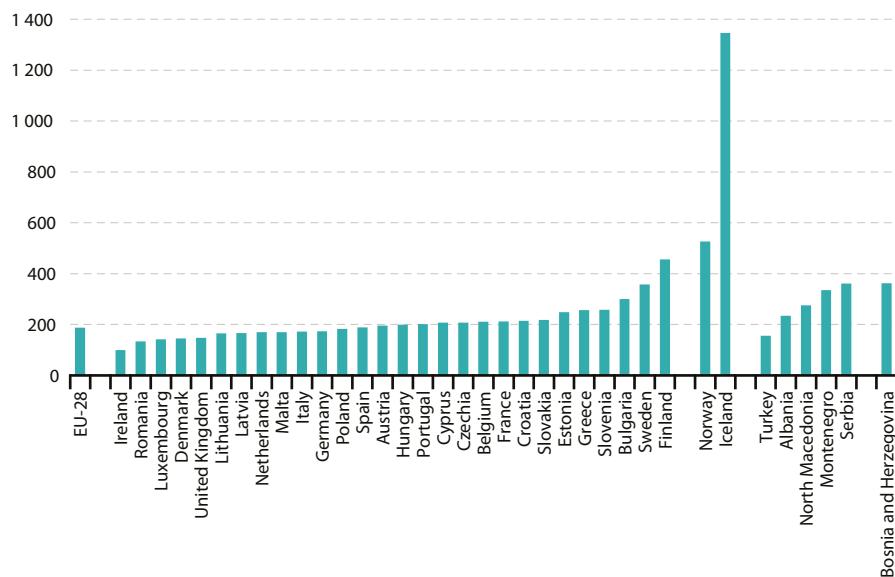
Focusing on electricity consumption per capita in the households sector in non-EU countries, an even wider range is observed: from 0.7 MWh in Turkey and Georgia to 7.5 MWh in Norway. The range is affected by the choice of energy used for space heating, the climate conditions as well as the level of economic development of each country.

Electricity consumption per unit of GDP (using Purchasing Power Standards) in the EU-28 in 2017 was 187.3 kWh per 1000 EUR (Figure 1.7.5). The amount of electricity consumed per unit of GDP depends on many factors, such as the general standard of living, the economy and weather conditions as well as the energy efficiency of buildings and appliances. Using GDP in Purchasing Power Standards when analysing energy consumption allows for better comparison across countries in one year.

The EU Member States with the lowest electricity consumption per unit of GDP in 2017 were Ireland, Romania, Luxembourg and Denmark. The highest rates of electricity consumption per unit of GDP were registered in Finland, Sweden

and Bulgaria. Figure 1.7.5 shows also data for non-EU countries with lowest consumption rates in Turkey and highest in Iceland (limited to countries where GDP in Purchasing Power Standards is available).

Figure 1.7.5: Final consumption of electricity, 2017
(kWh per thousand EUR (PPS))



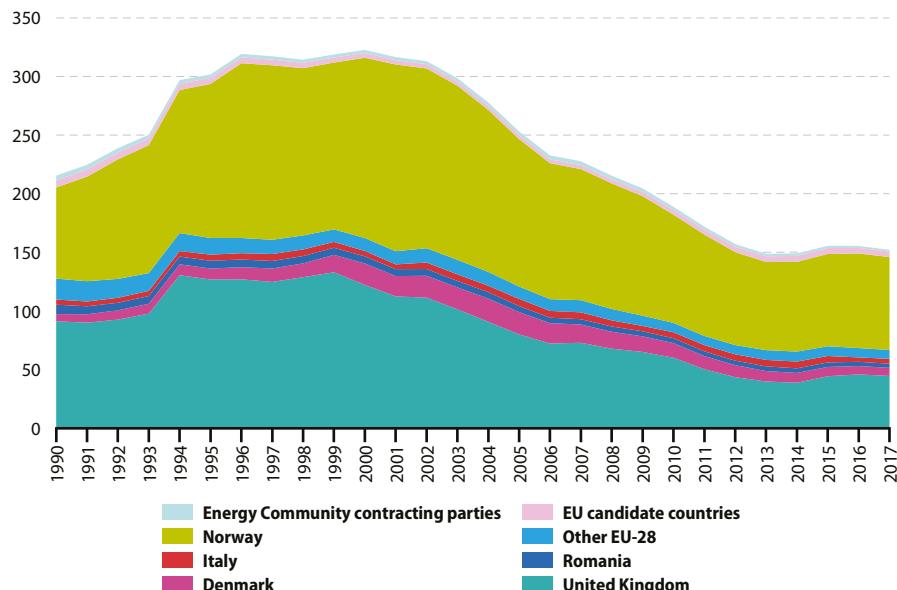
Source: Eurostat (online data codes: nrg_cb_e, nama_10_gdp)



1.8 Oil and petroleum products

Figure 1.8.1: Primary production of crude oil, 1990-2017

(Mtoe)



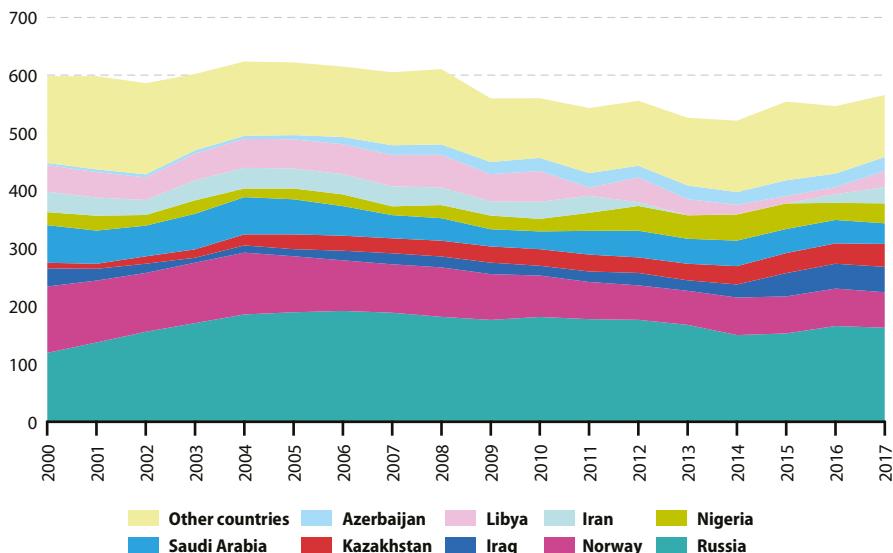
Source: Eurostat (online data code: [nrg_bal_c](#))

For decades, crude oil and petroleum products have had the largest share in gross inland energy consumption in the EU-28. Despite decreasing production and consumption in the EU in recent years, crude oil and its derived products remain the largest components of energy consumption.

The primary production of crude oil in 2017 in the European Union (EU-28) was 66.7 million tonnes of oil equivalent (Mtoe). This production peaked in 1999 at 169.5 Mtoe and reached a minimum of 64.5 Mtoe in 2014. The top oil producers in the EU-28 in 2017 were the United Kingdom (44.6 Mtoe) followed by Denmark (6.9 Mtoe), Italy (4.1 Mtoe) and Romania (3.5 Mtoe each).

In Norway, one of the key European non-EU crude oil producers, production peaked in 2001 (159.2 Mtoe) and by 2013 it had decreased to less than half (75.1 Mtoe). Since then, Norwegian production has been increasing, reaching 80.7 Mtoe in 2016, but fell slightly in 2017 (79.2 Mtoe). EU candidate countries (Albania, Serbia and Turkey) have some production of crude oil, however on a rather small scale (in total near 4.6 Mtoe in 2017). The Energy Community contracting parties (Ukraine and Georgia) produced in 2017 1.5 Mtoe crude oil. These data are presented in Figure 1.8.1.

Figure 1.8.2: Crude oil imports by country of origin, EU-28, 2000-2017 (Mt)



Source: Eurostat (online data code: nrg_ti_oil)

In 2017, total imports of crude oil to the EU-28 amounted to 565.7 million tonnes. The major imports in 2017 came from Russia (163.1 million tonnes), Norway (61.4 million tonnes), Iraq (44.0 million tonnes), Kazakhstan (39.7 million tonnes) and Saudi Arabia (35.6 million tonnes). The Russian imports have remained relatively stable over the past decade. The crude oil imports from Norway have almost halved over the period 2000-2017, from 114.9 million tonnes to 61.4 million tonnes. On the other hand, Iraq saw a substantial increase from 31.3 million tonnes to 44.0 million tonnes over the same period; the EU imports from Kazakhstan were four times higher in 2017 (39.7 million tonnes) compared to 2000 (9.7 million tonnes). See Figure 1.8.2 for the historic evolution since 2000.

The production of electricity from fossil fuels, especially from oil products, is slowly

diminishing. Many of the existing oil-fired plants are kept only as a part of the power reserve margin, using mainly fuel oil and gas/diesel oil.

In 2017 the input of oil into the transformation sector for electricity generation represented less than a quarter of the quantities used in 1990.

In the last 5 years the final energy consumption of petroleum products (excluding international shipping and aviation) has globally dropped below the 1990's level. The final energy consumption of individual petroleum products is shown in Figure 1.8.3. Gas/diesel oil and gasoline (listed in order of significance) are by far the two most important products throughout the whole 27-year-period, although demonstrating different evolution patterns.

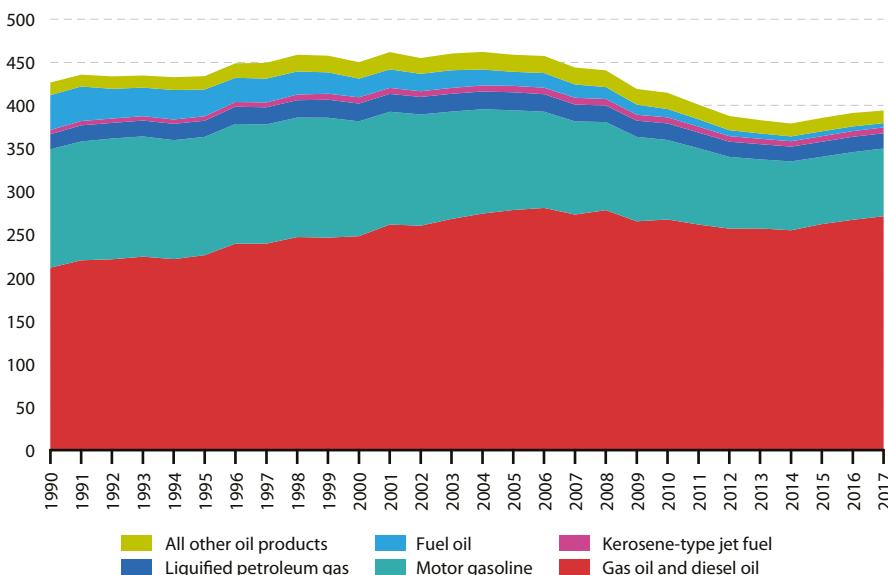


For international aviation the leading petroleum product is kerosene-type jet fuel, which more than doubled since 1990 reaching 51 Mtoe. For international shipping (maritime bunkers) the most consumed product is the fuel oil, which reached 34 Mtoe in 2017 demonstrating an increase of 25 % as compared to 1990 (27 Mtoe).

The EU is the world's second largest producer of petroleum products (after the United States).

Several policy initiatives are tackling the security of energy supplies as well as environmental and climate aspects of oil production and consumption.

Figure 1.8.3: Final energy consumption of petroleum products, EU-28, 1990-2017 (Mtoe)



Source: Eurostat (online data code: nrg_bal_c)

2

Transport



Introduction

Transport is an important sector of the European Union (EU) economy and plays a vital role in today's mobile society. Transportation and mobility are also central to sustainable development. Sustainable transportation can enhance economic growth and improve accessibility while respecting the environment and improving resilience of cities, urban-rural linkages and productivity of rural areas.

The transport policy of the EU aims to foster clean, safe and efficient, underpinning the internal market for goods and the right of citizens to travel freely throughout the EU.

The main aspects of the EU policy are laid down in the White Paper 'Roadmap to a Single European Transport Area'. Its objective is to establish a sustainable transport sector that continues to serve the needs of the economy and the citizens while meeting future constraints: oil scarcity, growing congestion and the need to cut CO₂ and pollutant emissions in order to improve air quality particularly in cities. By 2050, transport will have to cut greenhouse gas

emissions by 60% compared to 1990 and to reduce dependence on imported oil.

In order to monitor the developments and policies and to plan future strategies, the European Commission seeks to analyse a range of transport statistics. Eurostat's statistics in this field describe the most important features of transport, thus the quantities of freight and numbers of passengers that are moved each year, the number of vehicles and infrastructure that are used, but also the contribution of transport services to the economy as a whole. Data collection is supported by several legal acts obliging the EU Member States to report statistical data, as well as voluntary agreements to supply additional data. Eurostat transport statistics are used for policy making, to support legislative proposals and for modelling exercises.

The Transport chapter in this publication includes statistical data on freight and passenger transport as well as on equipment and safety for different modes of transport.

Transport in the EU: 2017 facts and figures...

Luxembourg ranked first with 670 passenger cars per 1000 inhabitants



Air passengers surpassed 1 billion for the first time

9.6 billion passengers on national railway networks



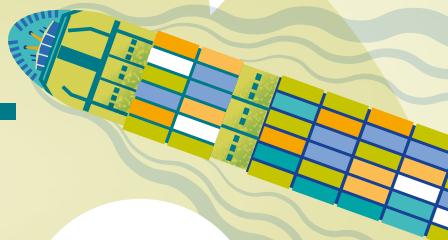
415 million passengers embarked and disembarked in sea ports



Road transport accounted for 76.7 % of the total inland freight transport



One fifth of road freight journeys were performed by empty vehicles



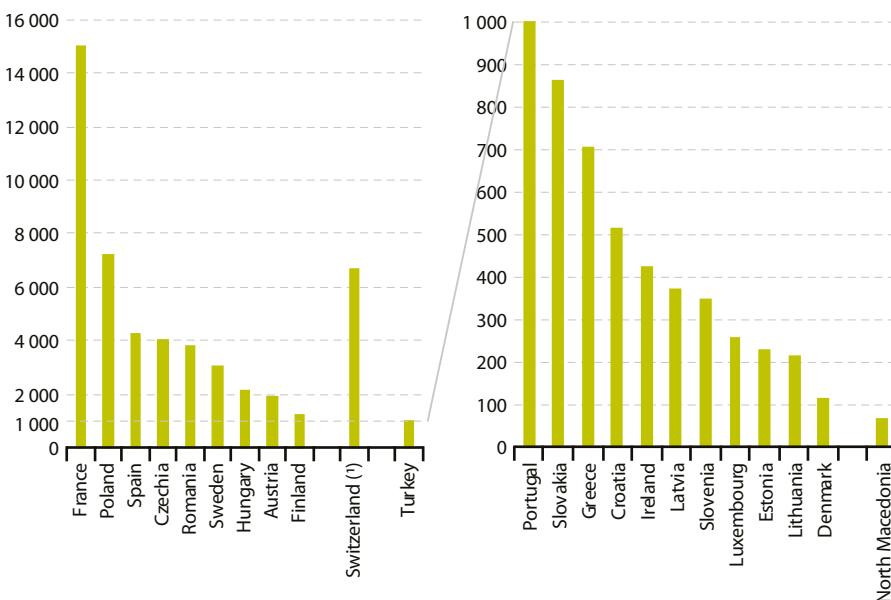
Metal ores were the most transported goods via inland waterways (24%)

2.1 Transport Equipment

Among the countries for which data are available, France has by far the highest number of railway vehicles for passengers (more than 15 thousand passenger railway vehicles) (Figure 2.1.1). In second position, Poland counted less than half of the railway vehicles registered in France. Among the EU Member States, only nine of them have registered more than a thousand passenger railway vehicles (left-scale of the graph). Since 2008, increases in the national capacity (number

of seats) of passenger railway vehicles have been reported only in a few EU Member States: Belgium and Spain (until 2009), Hungary (until 2011), Estonia, Greece, Croatia, Luxembourg, Finland and Sweden (Table 2.1.1). For most EU Member States for which data were available, decreases ranging from -1.2 % to -42.2 % were registered between 2008 and 2017.

**Figure 2.1.1: Passenger railway vehicles, 2017
(number)**



Note: Data for Belgium, Bulgaria, Germany, Italy, Netherlands, United Kingdom and the EFTA country Norway are not available.

(¹) 2016 data instead of 2017

Source: Eurostat (online data code: rail_eq_pa_ntry)



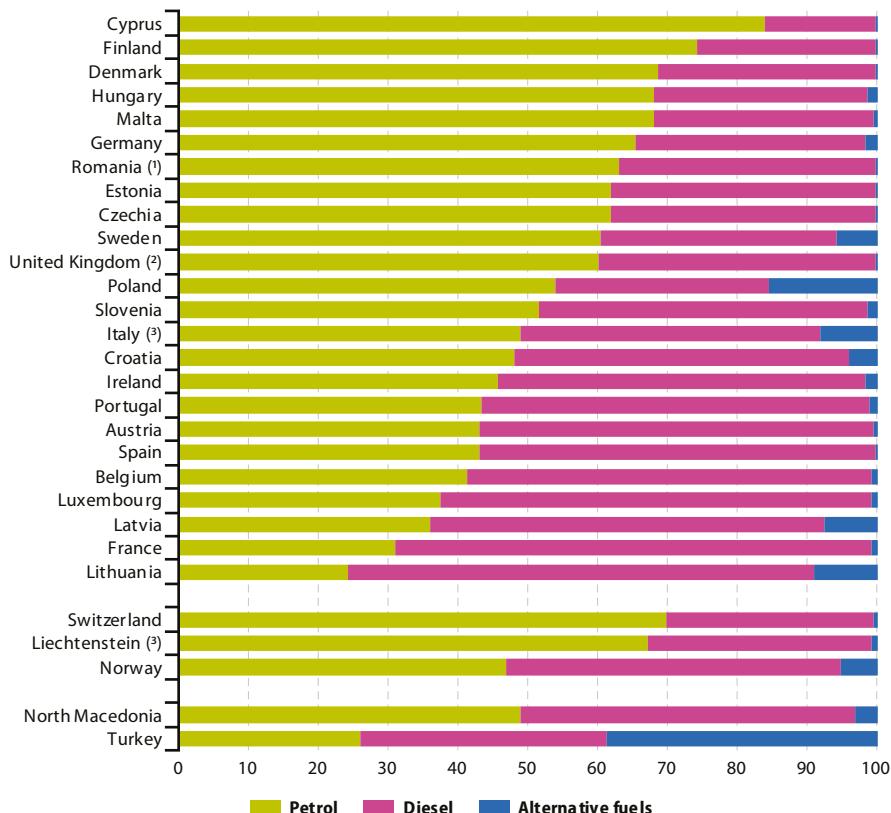
Table 2.1.1: Capacity of passenger railway vehicles, 2008-2017
(thousand seats)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belgium	294	305	:	:	:	:	:	:	:	:
Bulgaria	:	105	86	84	84	87	:	:	:	:
Czechia	305	307	309	301	293	288	287	283	266	270
Denmark	121	:	:	:	:	:	144	148	126	125
Germany	:	:	:	:	:	:	:	:	:	:
Estonia	17	16	15	15	18	24	25	25	25	25
Ireland	:	:	:	:	41	41	41	41	41	41
Greece	33	30	:	37	37	:	37	37	37	37
Spain	258	324	283	275	170	:	:	:	255	255
France	1 329	:	:	:	:	:	:	:	:	:
Croatia	34	33	32	32	33	33	33	36	36	36
Italy	860	845	845	772	:	:	:	:	:	:
Latvia	30	23	22	22	22	22	22	22	21	22
Lithuania	27	25	24	19	18	18	16	14	16	16
Luxembourg	19	19	22	21	24	24	24	26	26	27
Hungary	193	197	182	204	:	:	:	:	:	:
Netherlands	:	:	:	:	:	:	:	:	:	:
Austria	:	:	253	248	253	157	141	117	141	95
Poland	550	538	534	524	501	490	458	475	450	463
Portugal	:	:	:	:	:	:	:	:	:	163
Romania	338	:	:	:	:	:	:	:	262	262
Slovenia	22	22	22	22	22	22	22	22	22	22
Slovakia	75	73	63	57	69	64	61	62	65	64
Finland	69	69	71	73	76	78	77	73	79	80
Sweden	143	141	145	149	173	177	184	186	193	195
United Kingdom	:	:	:	:	:	:	:	:	:	:
Norway	:	:	:	:	:	:	:	:	:	:
Switzerland	:	:	:	:	:	:	:	:	:	:
North Macedonia	7	6	4	4	4	3	3	4	4	4
Turkey	107	107	102	114	134	159	166	168	170	168

Source: Eurostat (online data code: rail_eq_pa_csb)

Figure 2.1.2: Passenger cars by fuel type, 2017

(%)



Note: Data for Bulgaria, Greece, Netherlands and Slovakia are not available.

(?) 2015 data instead of 2017.

(?) Great Britain only.

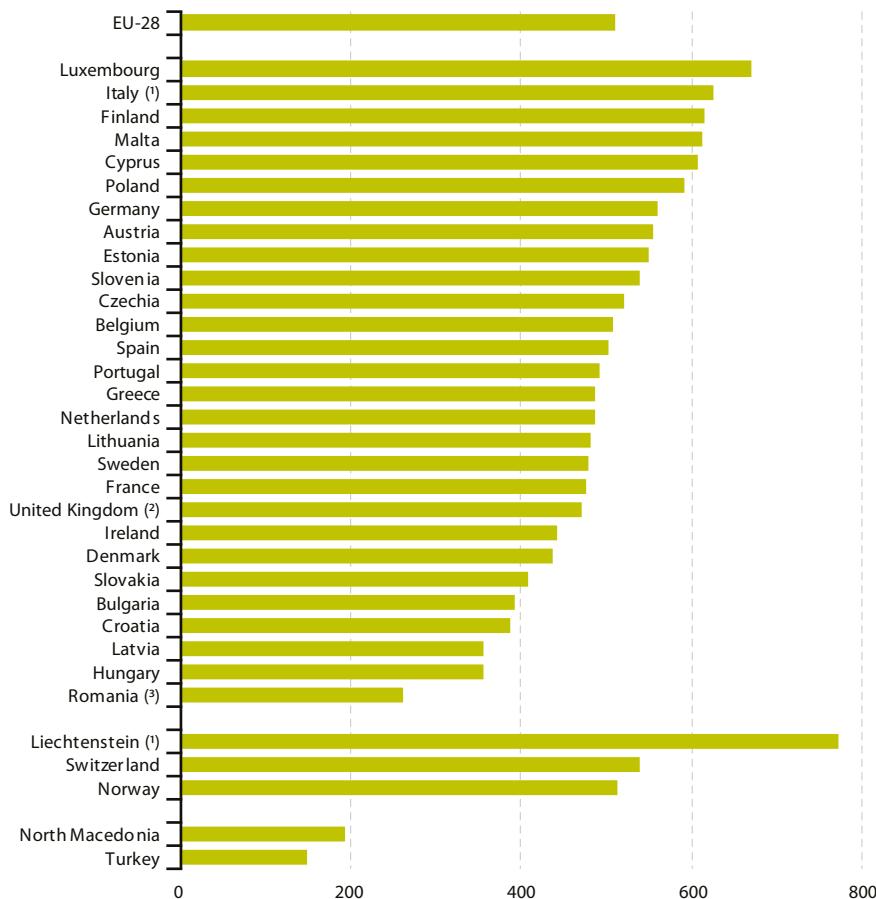
(?) 2016 data instead of 2017.

Source: Eurostat (online data code: road_eqs_carpda)

Regarding passenger cars, in 13 out of 24 EU Member States for which 2017 data are available, more than 50 % of the cars were petrol driven (Figure 2.1.2). The highest percentage of petrol-driven cars was reported in Cyprus (84.1 %), followed by Finland (74.2 %) and Denmark (68.7 %). Diesel-driven cars exceeded the 50 % threshold in France (68.0 %), Lithuania (66.9 %), Luxembourg (61.8 %), Belgium (57.8 %), Spain

(56.9 %), Austria (56.6 %), Latvia (56.3 %), Portugal (55.5 %) and Ireland (52.6 %). The contribution of alternative fuels was significant in Poland (15.4 %), Lithuania (9.0 %), Italy (8.3 %) and Latvia (7.6 %). However, the category 'alternative fuels' might be overestimated in some countries due to the lack of accurate data sources.

Figure 2.1.3: Passenger cars per thousand inhabitants, 2017
(number)



(?) 2016 data instead of 2017

(?) Great Britain only

(?) 2015 data instead of 2017

Source: Eurostat (online data code: [road_eqs_carhab](#))

Several smaller countries are amongst the EU Member States with the highest 'motorisation rates', i.e. passenger cars per 1 000 inhabitants (Figure 2.1.3). Luxembourg (670 passenger cars per 1 000 inhabitants) heads the list; however, this figure may be influenced by cross-border workers (i.e. not inhabitants) using company cars

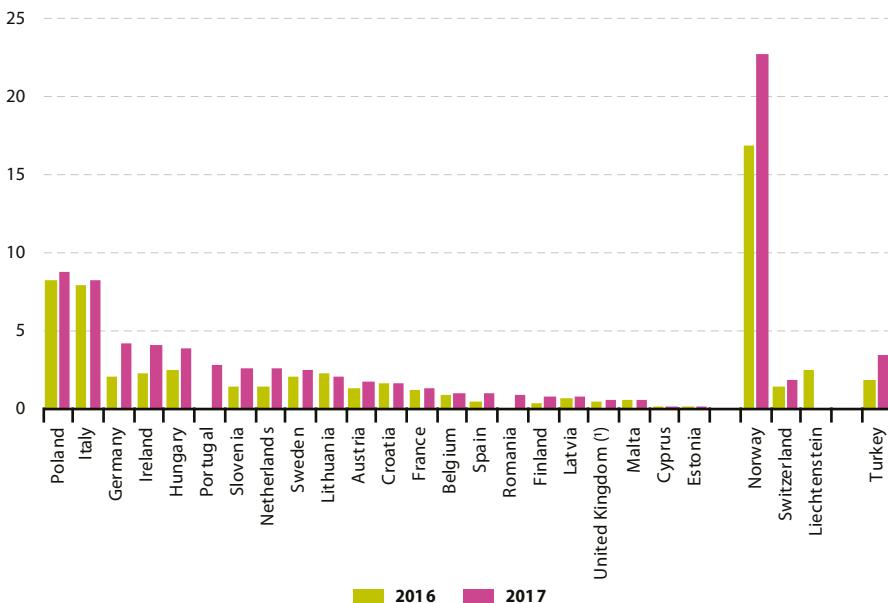
registered in the country. In second place follows Italy with 625 cars per 1 000 inhabitants. Other countries with a high motorisation rate include Finland (617 cars), Malta (613 cars) and Cyprus (609 cars).

At the other end of the scale, a particularly low motorisation rate is recorded in Romania (261 cars).

The motorisation rate in the two EU candidate countries for which data are available is substantially lower than in the Member States. The smallest value, 149 cars per thousand inhabitants, was recorded in Turkey.

In the EU Member States and EFTA countries for which recent data are available, an increase in the share of new registrations of passenger cars powered by alternative fuels (including hybrids) can generally be observed from 2016 to 2017, although at a low level in most countries (Figure 2.1.4).

**Figure 2.1.4: New passenger cars with alternative fuels engine, 2016 and 2017
(% of new passenger cars)**



Note: Data for Bulgaria, Czechia, Denmark, Greece, Luxembourg, Portugal, Slovakia, Iceland and North Macedonia are not available. 2017 data for Liechtenstein are not available.

(¹) Great Britain only.

Source: Eurostat (online data codes: [road_eqr_carmot](#) and [road_eqr_carpda](#))

In 2017, the highest share of alternative fuels in new registrations could be seen in Poland (8.7 %) and Italy (8.2 %) and, from the EFTA countries, in Norway (22.7 %). With considerable lower rates followed Germany (4.2 %), Ireland (4.1 %) and Hungary with a share of 3.8 % of passenger cars with alternative fuels amongst the

new registrations. However, for more than ten Member States, registrations of new passenger cars with alternative fuels were less than 2 % of the total registrations of new passenger cars in 2017.

Table 2.1.2: Renewal rate of passenger cars, 2008-2017
 (% share of first registrations in total number of registrations)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belgium	10.5	9.2	10.5	10.7	9.0	8.9	8.8	9.0	9.6	9.6
Bulgaria	14.9	8.0	7.2	7.1	7.0	6.9	7.0	7.1	7.6	8.7
Czechia	3.2	3.6	3.7	3.8	3.7	3.5	4.0	4.5	4.9	4.9
Denmark	7.1	:	:	:	:	7.9	8.1	8.6	9.0	8.8
Germany	7.5	9.1	6.9	7.4	7.1	6.7	6.8	7.1	7.2	7.4
Estonia	4.5	1.8	1.9	3.0	3.2	3.1	3.2	3.1	3.3	3.5
Ireland	7.9	3.0	5.4	5.3	4.0	3.8	4.2	6.3	7.1	6.2
Greece	5.9	4.8	2.9	2.1	1.2	1.3	1.7	1.9	2.1	2.5
Spain	5.4	4.4	4.5	3.7	3.2	3.4	4.0	4.9	5.4	5.7
France	:	7.2	7.0	6.8	5.8	5.3	5.4	5.8	6.2	6.5
Croatia	6.2	3.5	3.1	3.2	2.8	3.2	4.6	4.9	6.2	5.9
Italy	6.1	6.0	5.4	4.8	3.8	3.5	:	4.3	4.9	:
Cyprus	11.6	8.1	7.1	5.9	4.3	3.1	3.7	4.4	5.5	6.8
Latvia	5.9	1.9	4.2	7.1	8.1	8.8	2.0	2.1	2.5	2.5
Lithuania	11.5	8.1	9.5	7.7	8.7	8.6	11.3	10.6	10.8	11.9
Luxembourg	16.0	14.3	14.7	14.4	14.2	12.8	13.4	12.2	12.9	13.1
Hungary	5.8	:	2.1	2.6	3.6	4.2	5.3	6.3	7.2	7.8
Malta	4.2	6.7	5.6	6.4	5.2	5.1	5.8	6.1	5.9	6.4
Netherlands	6.6	5.1	6.2	7.1	6.3	5.3	4.9	5.5	4.7	4.9
Austria	6.9	7.3	7.4	7.9	7.3	6.9	6.5	6.5	6.8	7.2
Poland	8.0	5.2	5.1	5.1	4.8	5.1	5.2	5.5	6.3	5.9
Portugal	:	:	5.3	3.8	2.6	:	3.7	4.8	5.6	4.4
Romania	14.6	7.7	7.2	4.1	5.4	6.0	:	6.4	:	:
Slovenia	6.8	5.4	5.7	5.6	4.7	4.9	5.1	5.6	5.9	6.5
Slovakia	9.8	9.3	7.6	7.5	7.2	6.1	6.5	6.8	7.2	7.5
Finland	5.2	3.3	3.9	4.3	3.7	3.3	3.3	3.4	3.6	3.5
Sweden	6.0	5.3	7.1	7.4	6.8	6.5	7.1	7.8	8.1	8.1
United Kingdom (!)	7.4	7.0	7.0	6.7	:	:	:	8.6	8.6	8.0
Iceland	:	:	:	:	:	:	:	:	:	:
Liechtenstein	7.9	6.3	6.6	7.4	7.5	6.8	6.3	7.1	6.8	:
Norway	6.3	5.6	6.9	7.1	7.0	7.0	6.7	6.8	6.4	6.8
Switzerland	7.2	6.6	7.3	7.9	7.8	7.2	6.9	7.3	7.1	6.9
North Macedonia	6.8	4.6	15.9	12.8	10.9	9.2	8.0	7.6	7.7	6.6
Turkey	5.2	5.0	6.4	7.4	6.5	7.1	5.9	7.0	6.6	6.2

(!) Great Britain only.

Source: Eurostat (online data codes: road_eqr_carmot and road_eqs_carmot)

In 2017, the renewal rate of passenger cars (the ratio of first registered to total passenger cars) in the EU-28 ranged from 2.5 % in Greece and Latvia to 13.1 % in Luxembourg (Table 2.1.2). Renewal rates of passenger cars have had a

tendency to decrease in the majority of EU Member States since 2008, but from 2017 an increase can be noted in some countries.

Table 2.1.3: Lorries and road tractors per thousand inhabitants, 2008–2017
(number)

	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belgium	67	67	68	69	70	:	:	72	74	77
Bulgaria	40	43	45	47	50	54	57	62	64	60
Czechia	59	58	57	57	58	57	:	62	62	65
Denmark	:	:	:	:	:	79	78	77	76	76
Germany	31	31	32	33	34	35	:	:	:	:
Estonia	62	61	61	63	66	70	73	77	82	87
Ireland	:	:	:	:	70	:	68	70	72	72
Greece	:	:	:	:	:	:	:	:	:	:
Spain	118	116	114	113	110	:	108	109	109	110
France	87	87	88	89	90	103	103	102	101	101
Croatia	39	38	36	35	32	:	:	35	38	41
Italy	69	70	70	70	70	67	:	68	69	70
Cyprus	157	156	147	141	132	127	123	122	124	125
Latvia	59	56	34	35	37	47	42	44	43	45
Lithuania	47	46	43	45	46	49	34	36	38	41
Luxembourg	71	70	71	72	71	69	68	69	70	72
Hungary	45	47	46	47	47	47	49	50	53	55
Malta	106	104	103	103	102	101	100	98	98	99
Netherlands	63	62	61	59	58	57	56	57	58	60
Austria	46	47	48	49	50	50	51	51	52	54
Poland	71	73	78	82	83	85	88	90	93	96
Portugal	:	:	137	135	119	120	130	127	127	130
Romania	31	32	33	34	36	:	:	:	:	:
Slovenia	42	41	41	41	41	:	:	:	:	:
Slovakia	50	54	55	56	57	:	:	117	119	:
Finland	82	85	89	93	96	:	101	104	107	111
Sweden	56	55	56	58	58	58	59	60	61	62
United Kingdom (l)	61	59	59	59	:	:	:	63	65	66
Liechtenstein	76	76	78	80	83	83	83	84	87	:
Norway	110	109	108	108	109	:	:	:	106	106
Switzerland	43	43	43	44	45	46	46	47	48	49
North Macedonia	8	9	9	16	15	17	:	:	:	:
Turkey	40	41	10	10	10	48	49	52	53	55

(l) Great Britain only.

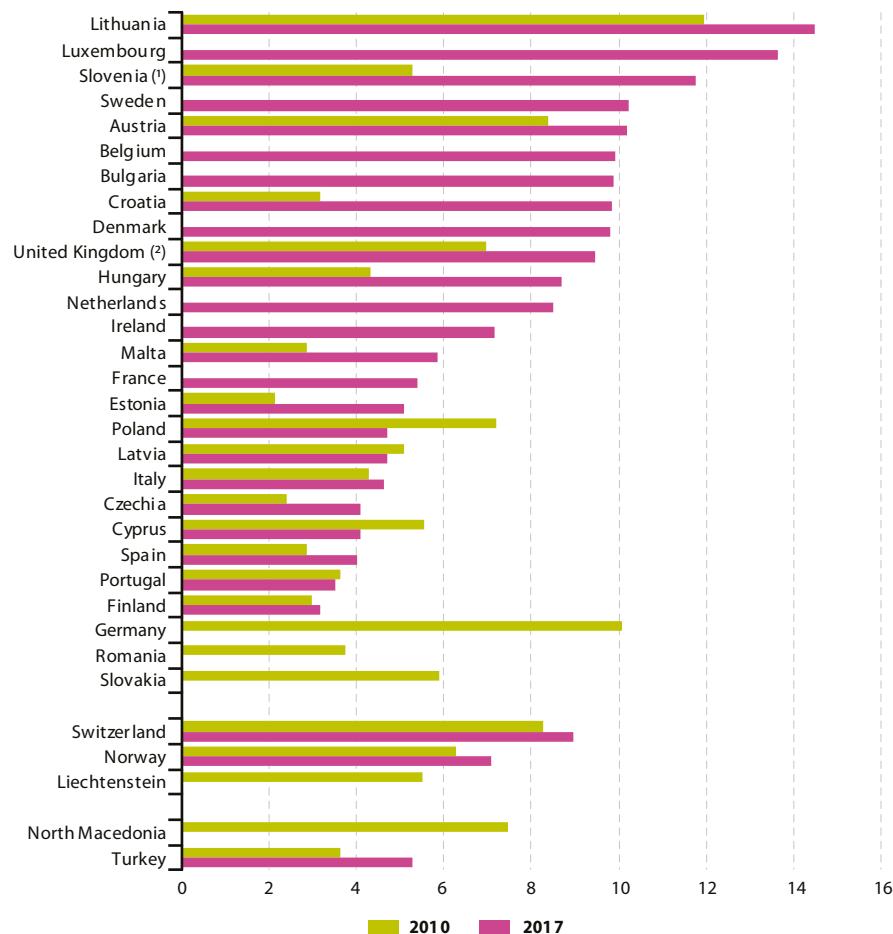
Source: Eurostat (online data codes: [road_eqs_lorroa_h](#), [road_eqs_lorroa](#) and [demo_pjan](#))

When it comes to lorries and road tractors, in 2017, their number per thousand inhabitants varied from 41 lorries and road tractors per 1 000 inhabitants in Croatia and Lithuania to 130 in Portugal (Table 2.1.3). Besides Portugal, rates above 100 were also recorded in Cyprus (125), Finland (111), Spain (110) and France (101). In addition to Croatia and Lithuania (both 41), low

rates were also recorded in Latvia (45). Between 2008 and 2017, the trend was not consistent among EU Member States. The highest increases were observed in Bulgaria (50.1 %), Estonia (40.3 %), Finland (35.7 %) and Poland (35.0 %). On the other hand, the highest decreases were recorded in Latvia (-23.6 %), Cyprus (-20.6 %) and Lithuania (-12.5 %).

Figure 2.1.5: Renewal rate of lorries and road tractors, 2010 and 2017

(% share of first registrations in total number of registrations)



Note: Data for Greece and the EFTA country Iceland are not available.

(1) Road tractors only.

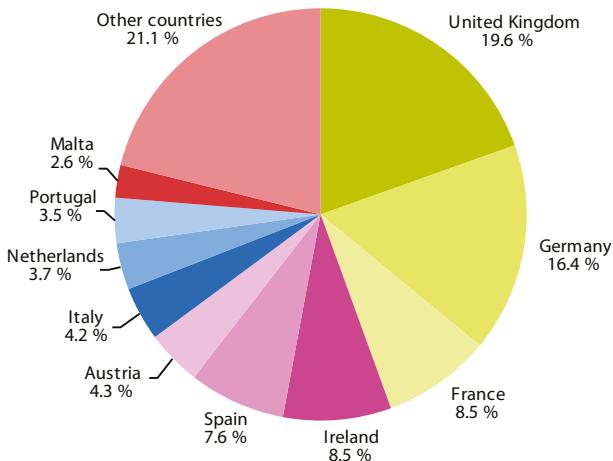
(2) Great Britain only.

Source: Eurostat (online data codes: road_eqr_tracmot, road_eqr_tracm, road_eqr_lormot, road_eqs_lorroa and road_eqs_lorroa_h)

Among those EU Member States for which data are available (Figure 2.1.5), for five countries, recorded renewal rates of lorries and road tractors are above 10 % in 2017: Lithuania (14.5 %), Luxembourg (13.6 %), Slovenia (11.8 %),

Sweden and Austria (both 10.2%). By contrast, the decreases in renewal rates between 2010 and 2017 were substantial in Poland (-34.7 %) and Cyprus (-26.4 %).

Figure 2.1.6: Top 10 operator countries in the EU-28 commercial air fleet, 2017 (%)



Source: Eurostat (online data code: [avia_eq_arc_typ](#))

As regards commercial air fleet (Figure 2.1.6), in 2017, the largest numbers of commercial aircraft were reported by United Kingdom (1 312 aircraft accounting for a 19.6 % share of the EU total), followed by Germany (1 100; 16.4 % share), France (571; 8.5 % share), Ireland (569; 8.5 %

share) and Spain (509; 7.6 % share). In terms of number of aircraft per million inhabitants, Malta (362) and Luxembourg (203) held the highest values, while the lowest were Poland (4) and Romania (3).

Table 2.1.4: Inland waterways vessels by type of vessel, 2017

	Self-propelled barge		Tug and pusher		Dumb and pushed vessel	
	Number	Change 2017/2003 (%)	Number	Change 2017/2003 (%)	Number	Change 2017/2003 (%)
Belgium	:	:	:	:	:	:
Bulgaria	34	1 600.0	30	-11.8	112	-32.9
Czechia	33	-56.6	71	-46.6	106	-52.7
Germany	1 157	-10.6	414	:	825	-29.4
France	752	-38.3	:	:	334	-51.0
Croatia	22	340.0	36	-23.4	116	-12.1
Italy	:	:	:	:	:	:
Lithuania	34	36.0	37	76.2	29	0.0
Luxembourg	:	:	:	:	:	:
Hungary	70	-69.6	56	-30.0	243	-37.9
Netherlands	3 265	:	728	:	1 065	:
Austria	:	:	:	:	:	:
Poland	89	-3.3	219	-15.4	509	3.9
Romania	164	:	295	-67.9	1 139	-42.5
Slovakia	10	-61.5	33	-25.0	100	-51.5
Finland	185	37.0	27	-12.9	50	61.3
Sweden	:	:	:	:	:	:
United Kingdom	158	4.6	:	:	287	-15.3
Switzerland	10	:	9	:	3	:

Note: Member States without significant inland waterways transport are not listed.

Source: Eurostat (online data code: [iww_eq_age](#) and [iww_eq_loadcap](#))

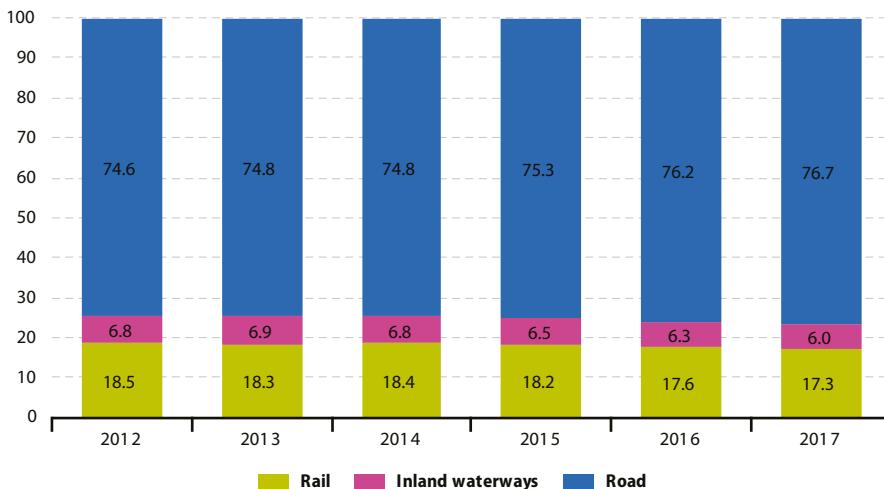
As for inland waterways vessels, Table 2.1.4 shows that over the last 15 years (2003–2017) significant increases in the number of self-propelled barges were recorded in Bulgaria (1 600 %), Croatia (340 %) and Lithuania (36 %), while in Hungary the number of vessels decreased by

70 %. However, these numbers must be put into perspective, as the EU Member States they relate to have only recently developed their previously small fleet. Bulgaria's self-propelled barge fleet only includes 34 vessels, Croatia's 22 and Lithuania's 34.

2.2 Freight transport

Figure 2.2.1: Modal split of inland freight transport, EU-28, 2012-2017

(% share in tonne-kilometres)



Note: EU-28 includes rail transport estimates for Belgium (2012-2017), Croatia (2016), road freight transport for Malta (2012-2017) and inland waterways for Finland (2017). Figures may not add up to 100% due to rounding.

Source: Eurostat (online data code: [tran_hv_frmmod](#))

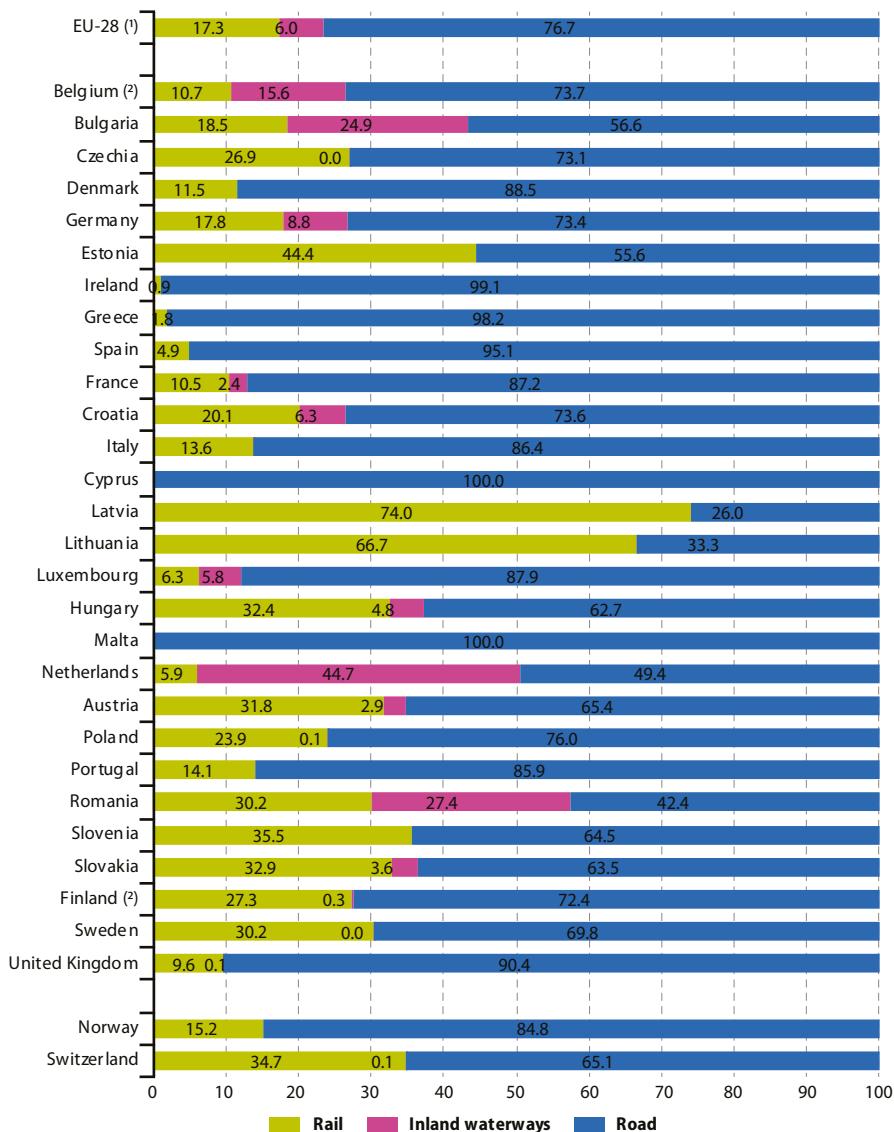
Road transport continues to have the largest share of EU freight transport performance among the three inland transport modes. Figure 2.2.1 shows that in 2017, road transport accounted for over three-quarters (76.7 %) of the total inland freight transport (based on tonne-kilometres performed). This share increased by 0.5 percentage points (pp) compared with the previous year. The share of road has remained stable at around 75 % in recent years, fluctuating between 74.6 % in 2012 and 75.3 % in 2015.

Between 2012 and 2016, the share of rail in the inland transport performance remained relatively stable (between 18.5 % and 17.6 %). In 2017, rail transport accounted for 17.3 % of the EU total, slightly lower than the previous year (-0.3 pp). Between 2012 and 2017, the share of inland waterways in EU freight transport fluctuated

between 6 % and 7 %, recording a share of 6 % of the total inland transport performance in 2017.

Even though the modal split between the different modes of transport does not tend to change radically from year to year at EU level, changes are sometimes more noticeable at country level. As can be seen in Figure 2.2.2, the modal split at country level varies considerably. In particular, the modal split obviously depends on the availability of a given mode. Only 18 of the Member States report freight data on inland waterways. In particular, Cyprus and Malta do not have either railways or navigable inland waterways; thus, for these two Member States the share of road freight transport is 100 % by default.

Figure 2.2.2: Modal split of inland freight transport, 2017
 (% share in tonne-kilometres)



(1) EU-28 includes rail transport estimates for Belgium, road freight transport for Malta and inland waterways transport for Finland. Figures may not add up to 100% due to rounding.

(2) Estimated values.

Source: Eurostat (online data code: [tran_hv_frmmod](#))

Table 2.2.1: Rail freight transport by type of transport for main undertakings, 2016 and 2017 (million tonne-kilometres)

	2016			2017			Change 2017/2016 (%)		
	National	International	Transit	National	International	Transit	National	International	Transit
EU-28	1 123	1 123	1 123	1 123	1 123	1 123	1 123	1 123	1 123
Belgium	-	-	-	-	-	-	-	-	-
Bulgaria	2 013	579	312	2 259	671	200	12.2	15.9	-35.7
Czechia	5 325	7 972	2 321	5 499	7 794	2 550	3.3	-2.2	9.9
Denmark	185	325	2 106	163	290	2 201	-12.0	-10.8	4.5
Germany	57 227	44 853	14 085	56 072	42 956	13 203	-2.0	-4.2	-6.3
Estonia	575	1 765	0	674	1 651	0	17.1	-6.4	-
Ireland	44	58	0	41	59	0	-5.7	2.5	-
Greece	50	204	0	58	299	0	16.9	46.8	-
Spain	7 921	1 887	0	8 337	1 912	0	5.2	1.3	-100.0
France	20 484	8 740	3 345	20 605	9 164	3 672	0.6	4.8	9.8
Croatia	-	-	-	934	894	681	-	-	-
Italy	11 102	11 291	0	10 272	11 792	0	-7.5	4.4	-
Cyprus	-	-	-	-	-	-	-	-	-
Latvia	391	14 942	540	406	13 466	1 142	3.7	-9.9	111.6
Lithuania	3 643	7 995	2 152	3 772	8 821	2 821	3.5	10.3	31.1
Luxembourg	22	160	20	19	171	23	-13.7	7.3	15.5
Hungary	1 578	5 297	3 652	1 989	5 867	5 499	26.1	10.8	50.6
Malta	-	-	-	-	-	-	-	-	-
Netherlands	421	5 865	356	423	5 475	569	0.6	-6.7	59.9
Austria	4 439	10 104	6 818	4 584	10 301	7 372	3.3	1.9	8.1
Poland	33 145	12 550	1 647	37 456	14 002	2 096	13.0	11.6	27.2
Portugal	2 218	546	9	2 185	557	9	-1.5	2.0	-6.8
Romania	9 242	2 752	291	10 045	3 140	598	8.7	14.1	105.3
Slovenia	577	2 720	665	629	2 947	871	9.0	8.3	31.0
Slovakia	1 082	4 056	3 232	982	4 355	3 140	-9.2	7.4	-2.8
Finland	6 091	3 355	0	6 464	3 854	0	6.1	14.9	-
Sweden	13 044	7 412	950	13 195	7 372	1 272	1.2	-0.5	33.9
United Kingdom	16 624	429	0	16 706	461	0	0.5	7.6	-
Norway	2 236	1 076	0	2 756	1 284	0	23.2	19.3	-
Switzerland	2 903	1 221	7 526	2 740	1 251	6 754	-5.6	2.4	-10.3
Montenegro	49	61	3	95	62	12	96.1	0.8	-
North Macedonia	3	96	124	2	103	172	-11.3	7.4	38.7
Turkey	10 971	445	8	12 259	406	11	11.7	-8.8	26.9

Note: Cyprus and Malta have no railways.

Source: Eurostat (online data code: rail_go_typepas)

Concerning freight transport by rail, in 2017, the total EU performance can be estimated at around 416 billion tonne-kilometres.

Compared to 2016, the largest increases in national transport performance among the EU member States were observed for Hungary (+26.1 %), Estonia (+17.1 %), Greece (+16.9 %), Poland (+13.0 %) and Bulgaria (+12.2 %). Substantial growth was also registered in Montenegro (+96.1 %), Norway (+23.2 %) and Turkey (+11.7 %) (Table 2.2.1).

On the contrary, substantial decreases were registered in Luxembourg (-13.7 %), Denmark (-12.0 %) and North Macedonia (-11.3%).

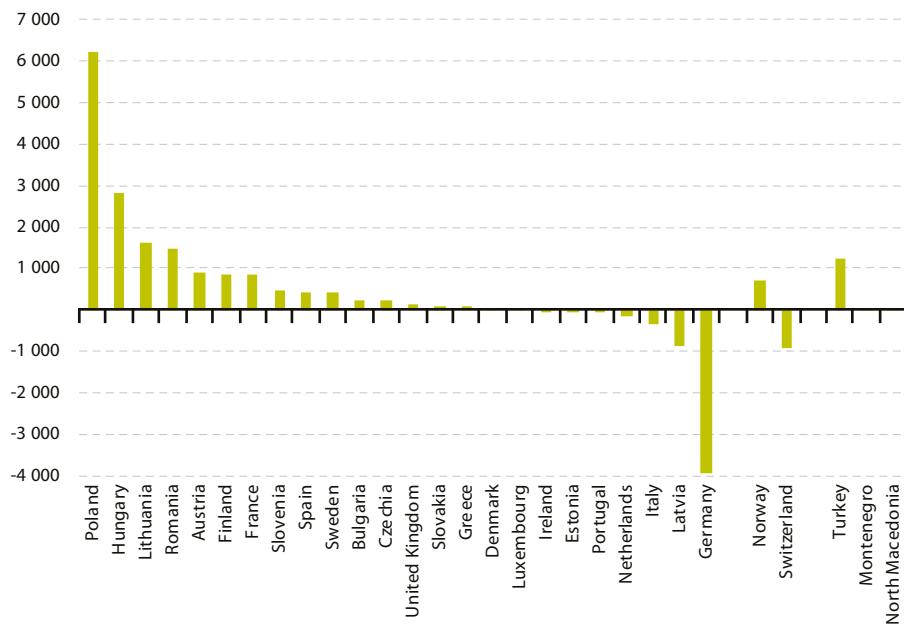
For total international transport performance the highest increase was for Greece (+46.8 %), followed by Norway (+19.3 %), Bulgaria (+15.9 %), Finland (+14.9 %) and Romania (+14.1 %). In contrast, Denmark registered the largest decrease (-10.8 %), followed by Latvia (-9.9 %) and Turkey (-8.8 %).

Regarding transit transport, the highest rise was observed for Latvia (+111.6 %) and Romania (+105.3 %) while the largest decrease was registered by Bulgaria (-35.7 %), followed by Spain with no transit.

The change in transport performance between 2016 and 2017 is presented for each reporting country in Figure 2.2.3. A growth in transport performance between 2016 and 2017 was registered for 17 EU Member States, the EFTA country Norway, and the candidate countries Montenegro, North Macedonia and Turkey.

In absolute terms, Germany recorded the largest decrease between 2016 and 2017 (-3.9 billion tonne-kilometres), followed by Latvia (-0.9 billion tonne-kilometres) and Italy (-0.3 billion tonne-kilometres). In contrast, four countries reported absolute increases of more than 1 billion tonne-kilometres over the same period, namely Poland (+6.2 billion tonne-kilometres), Hungary (+2.8 billion tonne-kilometres), Lithuania (+1.6 billion tonne-kilometres) and Romania (+1.5 billion tonne-kilometres).

Figure 2.2.3: Rail freight transport for main undertakings: change between 2016 and 2017 (million tonne-kilometres)



Note: Cyprus and Malta have no railways. Data are confidential for Belgium (2016 and 2017) and Croatia (2016). Quarterly data have been used for Montenegro in 2016.

Source: Eurostat (online data codes: [rail_go_typepas](#) and [rail_go_quartal](#))

Table 2.2.2: Road freight transport by type of transport, 2017
(million tonne-kilometres)

	2017					Change 2017/2016 (%)				
	National	International	Cross-trade	Cabotage	Total	National	International	Cross-trade	Cabotage	Total
EU-28	1 218 631	469 759	186 782	45 442	1 920 613	3.6	4.8	8.6	17.1	4.7
Belgium	20 632	11 035	1 226	1 326	34 220	-3.7	2.1	-7.5	-18.6	-2.8
Bulgaria	8 328	10 182	:c	:c	35 150	13.7	-9.9	:c	:c	-0.7
Czechia	21 899	18 223	:c	614	:c	-1.8	-17.2	:c	-37.7	-12.0
Denmark	12 577	1 577	314	:c	:c	-3.5	2.0	-24.5	:c	-3.7
Germany	271 666	36 558	3 265	1 660	313 149	-0.0	-6.2	-6.7	2.9	-0.8
Estonia	1 631	2 711	:c	344	:c	-9.0	-3.7	:c	-31.1	-7.8
Ireland	9 326	1 702	:c	304	:c	0.5	-2.4	:c	24.6	1.9
Greece	15 471	6 094	:c	:c	28 377	1.8	:c	:c	:c	15.5
Spain	154 666	69 501	4 160	:c	231 109	6.7	6.0	:c	:c	6.5
France	155 876	11 259	:c	:c	:c	8.1	1.2	:c	:c	7.6
Croatia	4 199	4 978	2 496	161	11 834	5.3	0.8	5.8	209.6	4.4
Italy	106 711	11 899	:c	465	119 687	6.4	3.0	:c	:c	6.3
Cyprus	802	24	-	-	826	17.3	26.3	-	-	17.5
Latvia	3 240	6 235	:c	:c	14 972	15.4	3.5	:c	:c	5.2
Lithuania	3 184	12 422	:c	2 567	:c	7.2	16.8	:c	:c	26.2
Luxembourg	1 211	3 001	3 580	1 622	9 414	1.6	2.7	3.2	-6.8	1.0
Hungary	11 940	16 337	10 180	1 227	39 684	1.9	5.9	-13.1	7.1	-0.8
Malta	:	:	:	:	:	:	:	:	:	:
Netherlands	33 162	28 074	4 339	1 958	67 533	-2.6	0.9	9.8	-0.2	-0.4
Austria	16 803	7 314	1 383	479	25 978	1.8	-2.2	-17.2	-1.8	-0.6
Poland	120 036	135 567	61 720	17 897	335 220	12.6	14.8	16.4	38.0	15.3
Portugal	10 854	15 579	6 412	1 341	34 186	4.5	-6.7	-1.2	2.5	-2.0
Romania	13 548	17 565	19 669	3 921	54 704	3.1	8.9	24.0	29.1	13.6
Slovenia	2 310	9 031	8 413	1 059	20 814	8.2	8.3	15.3	13.1	11.3
Slovakia	6 326	15 001	12 698	1 386	35 411	11.0	-0.8	-8.5	-4.2	-2.0
Finland	26 330	530	155	201	27 966	7.1	:c	-58.0	:c	4.2
Sweden	38 556	2 967	198	:c	:c	-1.8	-6.2	:c	:c	-1.9
United Kingdom	147 349	6 056	:c	309	:c	-0.9	2.2	:c	26.6	-0.7
Norway	18 741	2 640	:c	4	:c	1.2	10.5	:c	:c	2.3
Switzerland	10 238	1 424	133	152	11 947	1.0	-4.0	:c	-30.0	-1.5

Source: Eurostat (online data code: road_go_ta_tott)

European road freight transport increased by 4.7 % from 2016 to 2017, in terms of tonne-kilometres (Table 2.2.2).

National transport in the EU, representing 63.5 % of total transport, recorded a 3.6 % increase from 2016 to 2017, while cross-trade and cabotage transport, representing 12.1 % of total transport, recorded an increase of 10.1 % over this period.

EU national and international road freight transport, covering goods loaded and unloaded, increased from 2016 to 2017 by 3.6 % and 4.8 % respectively. Cross-trade and cabotage both recorded substantial growths, of 8.6 % and 17.1 % respectively.

In 2017, Poland (17.5 % of EU total tonne-kilometres) reconfirmed its position as one of

the most significant countries for road transport in Europe. Lithuania (26.2 %), Cyprus (17.5 %), Greece (15.5 %) and Poland (15.3 %) were the Member States recording the highest rise in tonne-kilometres performed from 2016 to 2017, while at the other end of the scale, Czechia registered a substantial decline (-12.0 %), followed by Estonia (-7.8 %).

Four EU Member States (Croatia, Poland, Romania and Slovenia) registered increases in all transport types, with rises ranging between 4.4 % and 15.3 % in total transport. Croatia, Poland and Romania recorded substantial growth for cabotage. In cross-trade transport, Romania, Slovenia and Poland experienced considerable increases.

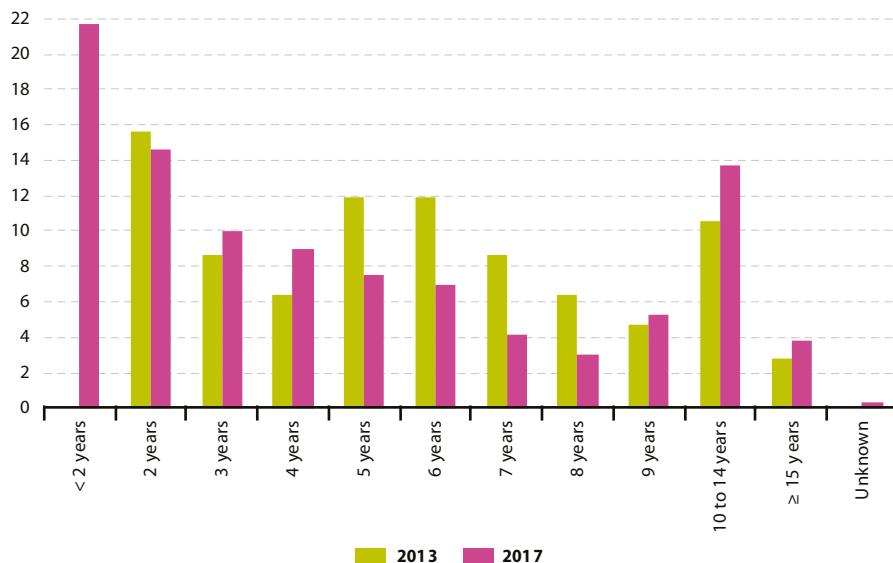
Among other countries with a large road transport industry, France, Spain and Italy saw rises ranging from 6.3 % to 7.6 %, driven by important increases in national transport, while Germany and the United Kingdom reported decreases of 0.8 % and 0.7 % respectively, due to decreases in national or international transport.

Road freight vehicles of less than 2 years old dominated the EU market in the last years, and 2017 was not an exception with around 417 billion tonne-kilometres (21.7 % of the total tonne-kilometres). In 2017, vehicles 5 years old or less accounted for 62.9 % of the total tonne-kilometres, while those over 10 years

old performed only 17.5 % of tonne-kilometres (Figure 2.2.4).

Between 2013 and 2017 there was a strong decline in road freight transport performed (in tonne-kilometres) by vehicles between 5 years and 8 years old; in contrast, transport performed by vehicles 3 and 4 years old, and vehicles aged 9 years or more, increased over the same period. Transport performed by very old road freight vehicles (over 15 years) has continuously increased between 2013 and 2017 (60.9 %); however, it represented only 3.8 % of the total tonne-kilometres.

**Figure 2.2.4: Road freight transport by age of vehicle, EU-28, 2013 and 2017
(% share in tonne-kilometres)**



Note: 2013 data for vehicles of less than 2 years and of unknown age are not available.

Source: Eurostat (online data code: [road_go_ta_agev](#))

Table 2.2.3: Road freight transport by axle configuration, 2017
(million tonne-kilometres)

	Lorry	Lorry with trailer	Road tractor with semi-trailer	Total
EU-28	144 693	214 409	1 300 373	1 659 475
Belgium	:	:	:	:
Bulgaria	2 049	:c	:c	35 150
Czechia	6 528	36 272	1 475	44 274
Denmark	1 423	3 233	10 846	15 502
Germany	23 093	65 383	224 673	313 149
Estonia	248	:c	:c	6 189
Ireland	2 442	:c	9 282	:c
Greece	4 797	3 875	:c	:c
Spain	11 371	4 121	215 616	231 109
France	14 761	:c	146 453	:c
Croatia	:c	1 517	:c	11 834
Italy	:	:	:	:
Cyprus	300	:	526	826
Latvia	489	:c	:c	14 956
Lithuania	2 061	:c	33 141	:c
Luxembourg	899	860	:c	:c
Hungary	:	:	:	:
Malta	:	:	:	:
Netherlands	:	:	:	:
Austria	3 951	4 717	17 310	25 978
Poland	23 194	8 618	:c	:c
Portugal	1 802	405	31 979	34 186
Romania	:c	11 320	32 748	:c
Slovenia	918	2 128	17 769	20 814
Slovakia	:c	1 590	:c	35 411
Finland	2 146	21 133	4 687	27 966
Sweden	2 987	:c	:c	41 851
United Kingdom	25 327	4 646	123 967	153 939
Norway	4 022	:c	:c	21 385
Switzerland	:	:	:	:

Source: Eurostat (online data code: road_go_ta_axle)

Road tractors and semi-trailers accounted for 78.4 % of total EU tonne-kilometres in 2017, while lorries and lorries with trailers made up 21.6 % (Table 2.2.3). At Member State level, most of the countries had more than 60 % of their transport performed by road tractors with semi-trailers. Czechia (96.7 %) and Finland (83.2 %) had a large majority of tonne-kilometres performed by lorries with trailers.

In 2017, Poland continued to have the highest share (30.7 %) in EU international transport (Figure 2.2.5), followed by Spain with a share of 10.9 % and Germany and Romania with a share of 5.9 % each.

The EU share of cross-trade transport was 26.6 % while cabotage transport represented 6.5 %

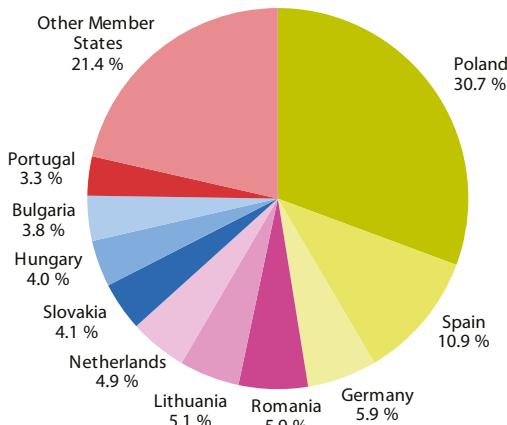
(Figure 2.2.6). For four Member States (Romania, Slovenia, Slovakia and Luxembourg), the share of cross-trade in international transport represented more than 40 % of international transport. For Luxembourg, the share of cabotage is also very high (19.8 %); this can be explained by the location of the country.

The ‘average load’ was calculated by dividing annual freight transport performance (tonne-kilometres) by the corresponding laden distance travelled (vehicle-kilometres, equivalent to kilometres). This indicator provides information on the average weight in tonnes carried per road vehicle in each country and at EU level.

EU average vehicle loads were 13.7 tonnes in 2017, with national loads of 12.7 tonnes and international loads of 15.9 tonnes. Cyprus had the highest international load at 24.0 tonnes, while Finland and Luxembourg had the highest national loads at 17.1 tonnes (Figure 2.2.7).

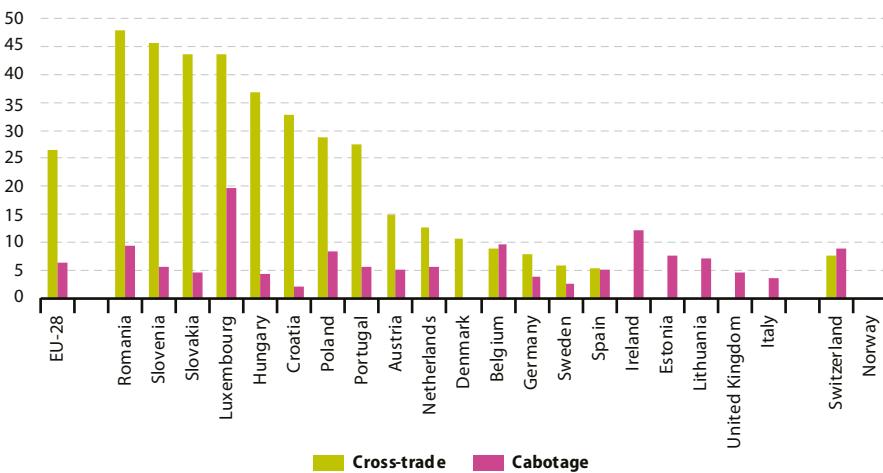
Vehicle loads were higher for longer distance journeys. The average load in national transport in Slovakia was 57.2 % below the EU average, with only 5.4 tonnes.

Figure 2.2.5: International road freight transport, 2017
(% share in tonne-kilometres)



Source: Eurostat (online data code: [road_go_ta_tott](#))

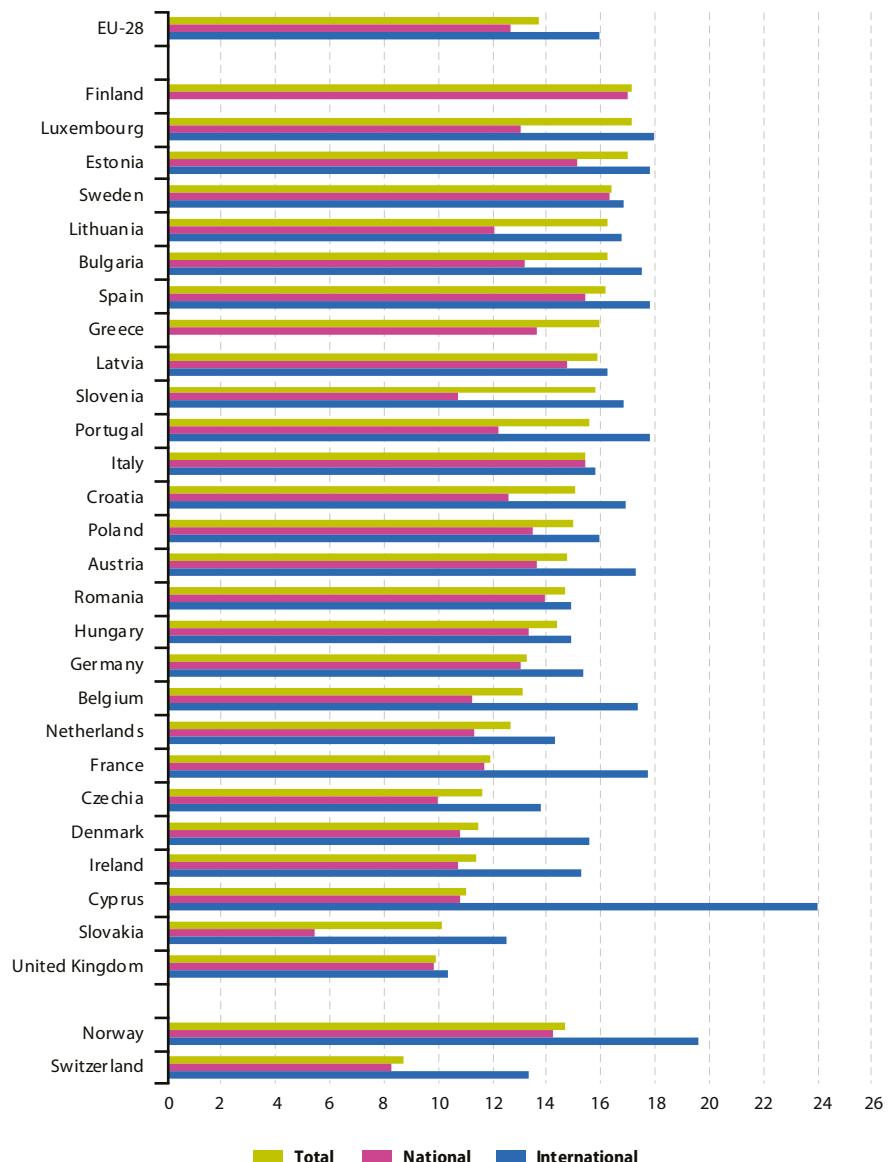
Figure 2.2.6: Cross-trade and cabotage in international road freight transport, 2017
(% share in tonne-kilometres)



Note: Only countries for which data are available are presented.

Source: Eurostat (online data code: [road_go_ta_tott](#))

Figure 2.2.7: Average loads for total road freight transport, 2017 (tonnes)



Note: International transport is not available for Finland and Greece.

Source: Eurostat (online data code: road_go_ta_tott)

Table 2.2.4: Road freight transport by distance class, 2017
(million tonne-kilometres)

	Less than 150 km		From 150 to 299 km		From 300 to 999 km		Over 1 000 km	
	2017	Change 2017/2013 (%)	2017	Change 2017/2013 (%)	2017	Change 2017/2013 (%)	2017	Change 2017/2013 (%)
EU-28	426 626	8.2	:C	:C	:C	:C	:C	:C
Belgium	11 339	2.7	12 201	38.1	15 854	-4.2	:C	:C
Bulgaria	3 337	-5.2	4 230	44.8	11 686	28.6	:C	:C
Czechia	13 337	56.4	8 375	15.5	15 390	-33.8	:C	:C
Denmark	4 915	-6.2	4 410	5.9	5 127	-7.7	:C	:C
Germany	95 781	13.0	76 985	10.1	121 784	-5.4	:C	:C
Estonia	870	-5.5	837	6.2	1 913	38.3	:C	:C
Ireland	5 088	40.4	3 939	18.0	1 891	34.1	:C	:C
Greece	5 842	12.5	3 394	18.4	7 826	59.5	11 319	:C
Spain	37 642	26.8	30 558	31.6	102 882	17.0	:C	:C
France	45 096	-15.2	39 818	-0.2	79 285	8.2	3 495	:C
Croatia	1 918	2.7	1 905	17.4	5 275	48.9	:C	:C
Italy	28 854	-9.9	31 643	-5.0	50 575	-1.9	:C	:C
Cyprus	784	30.7	:C	:C	1	0.0	20	100.0
Latvia	2 272	28.7	1 615	21.4	:C	:C	:C	:C
Lithuania	1 529	22.7	2 277	64.5	11 912	134.1	:C	:C
Luxembourg	1 535	5.5	1 821	3.8	3 564	-26.2	:C	:C
Hungary	6 223	31.5	6 563	32.4	17 188	35.5	9 572	-28.1
Malta	:	:	:	:	:	:	:	:
Netherlands	25 996	7.2	18 977	1.1	18 565	-19.9	:C	:C
Austria	9 969	21.8	6 002	14.7	7 643	-5.0	:C	:C
Poland	40 907	19.6	41 971	23.4	142 921	46.0	109 416	34.3
Portugal	4 979	16.1	4 304	11.6	9 274	1.0	:C	:C
Romania	5 242	14.6	4 879	41.2	20 550	91.7	24 034	57.2
Slovenia	1 992	31.3	1 873	30.9	9 343	46.4	:C	:C
Slovakia	4 105	45.0	3 444	32.7	13 680	35.6	:C	:C
Finland	7 834	4.0	6 727	8.3	:C	:C	:C	:C
Sweden	13 544	58.9	10 683	43.7	14 857	15.0	:C	:C
United Kingdom	45 694	-7.0	63 501	23.3	50 508	42.1	:C	:C
Norway	6 536	-11.6	4 019	-10.1	8 965	17.1	:C	:C
Switzerland	7 899	0.8	2 468	-13.3	1 369	-25.5	:C	:C

Source: Eurostat (online data code: [road_go_ta_dc](#))

In 2017, most of the goods were carried over distances between 300 and 999 km (Table 2.2.4). In specific cases, some countries had different patterns.

For some countries with an important domestic market, the share of road freight transport over short distances (less than 150 km) was higher: Ireland, Austria and the Netherlands.

It has to be noted that there were important variations since 2013 in each distance class, however the global trend of a country's road freight transport was often observed in most of the distance classes.

Table 2.2.5: Road freight transport by group of goods (NST 2007), EU-28, 2015-2017

NST2007	Million tonnes					Billion tonne-kilometres				
	2015	2016	2017	Share in 2017 (%)	Change 2017/2016 (%)	2015	2016	2017	Share in 2017 (%)	Change 2017/2016 (%)
Agriculture, forestry and fishery products	1 290	1 279	1 318	9.2	3.0	196	199	208	11.2	4.4
Coal and lignite; crude petroleum and natural gas	150	105	:c	:c	:c	10	10	:c	:c	:c
Metal ores and peat	3 543	3 488	3 645	25.4	4.5	133	136	147	7.9	7.9
Food products, beverages and tobacco	1 704	1 783	1 828	12.7	2.5	301	319	331	17.8	3.7
Textiles and textile products; leather and leather products	64	69	77	0.5	10.6	16	18	19	1.0	4.1
Wood and wood products (except furniture); pulp, paper and paper products; printed and recorded media	580	:c	597	4.2	:c	120	:c	120	6.4	:c
Coke and refined petroleum products	:c	:c	488	3.4	:c	:c	:c	53	2.8	:c
Chemicals and chemical products; rubber and plastic products; nuclear fuel	:c	585	612	4.3	4.6	:c	127	134	7.2	5.5
Other non metallic mineral products	1 716	1 702	1 734	12.1	1.9	138	136	148	7.9	8.7
Basic metals and fabricated metal products (except machinery and equipment)	525	550	578	4.0	5.1	119	124	130	7.0	5.1
Machinery and equipment	:c	282	270	1.9	-4.4	:c	54	53	2.8	-1.6
Transport equipment	263	:c	321	2.2	:c	68	:c	79	4.3	:c
Furniture and other manufactured goods	109	118	127	0.9	7.8	32	36	38	2.1	5.1
Secondary raw materials, wastes	1 076	1 083	1 053	7.3	-2.8	67	73	74	4.0	1.3
Mail, parcels	187	:c	:c	:c	:c	39	:c	:c	:c	:c
Equipment and material for transport of goods	299	:c	320	2.2	:c	41	:c	44	2.4	:c
Goods moved in removals; baggage accompanying travellers	152	157	162	1.1	3.6	14	14	15	0.8	3.3
Mixture of different types of goods which are transported together	:c	:c	846	5.9	:c	:c	:c	197	10.6	:c
Unidentifiable goods	205	166	163	1.1	-2.1	28	28	24	1.3	-12.3
Other goods	159	220	219	1.5	-0.4	34	45	49	2.7	10.5

Source: Eurostat (online data code: road_go_ta_tg)

In 2017, 'metal ores and other mining and quarrying products' was the largest product group in terms of tonnage, accounting for 3 645 million tonnes and a share of 25.4 % (Table 2.2.5). Other important product groups were 'food, beverages and tobacco' (12.7 %), 'other non-metallic mineral products' (12.1 %) and 'agricultural products' (9.2 %).

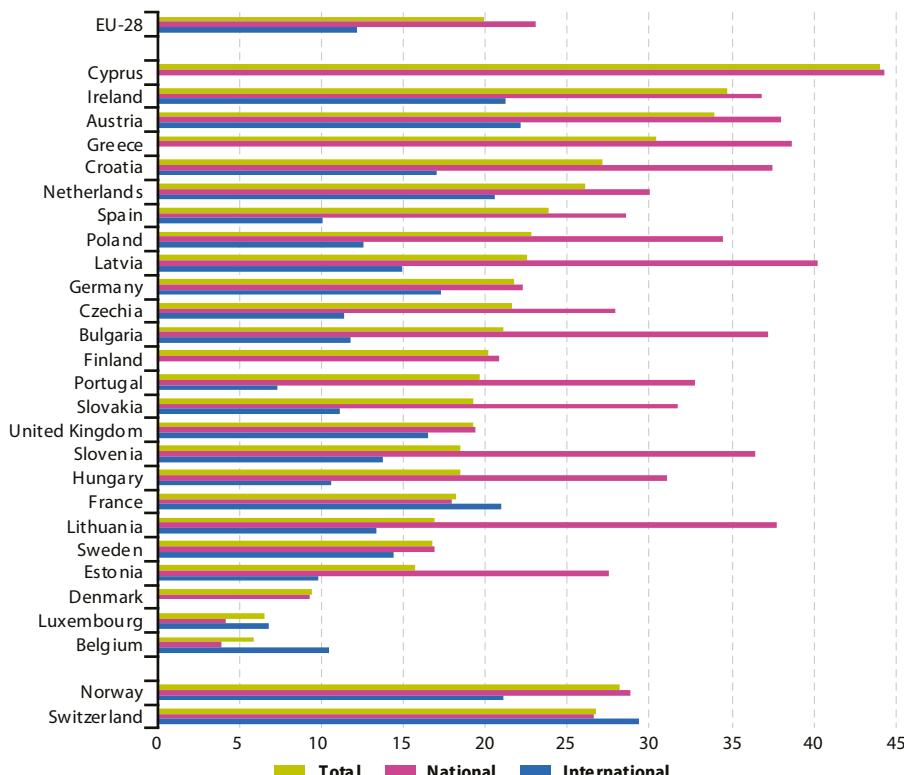
The highest rises from 2016 to 2017 were recorded for 'textiles, textile products, leather and leather products' (+10.6 %) and 'furniture and other manufactured goods' (+7.8 %). 'Machinery and equipment' (-4.4 %) saw the highest decrease over the same period.

In 2017, 'food products, beverages and tobacco' dominated the transport when measured in tonne-kilometres, accounting for 331 billion tonne-kilometres. The share of 'food products, beverages and tobacco' in the total road freight transport was 17.8 %, followed by 'agricultural products' (11.2 %), 'grouped goods' (10.6 %) and 'other non-metallic mineral products' and 'metal ores and peat' (7.9 % each).

The highest rises from 2016 to 2017 were for 'other non-metallic mineral products' (+8.7 %) and 'metal ores and peat' (+7.9 %), while a decrease was registered for 'machinery and equipment' (-1.6 %).

Figure 2.2.8: Empty road journeys by type of operation, 2017

(% share in vehicle-kilometres)



Note: Data for Italy and Romania are not available. International transport is not available for Denmark, Greece and Finland.

Source: Eurostat (online data code: [road_go_ta_tott](#))

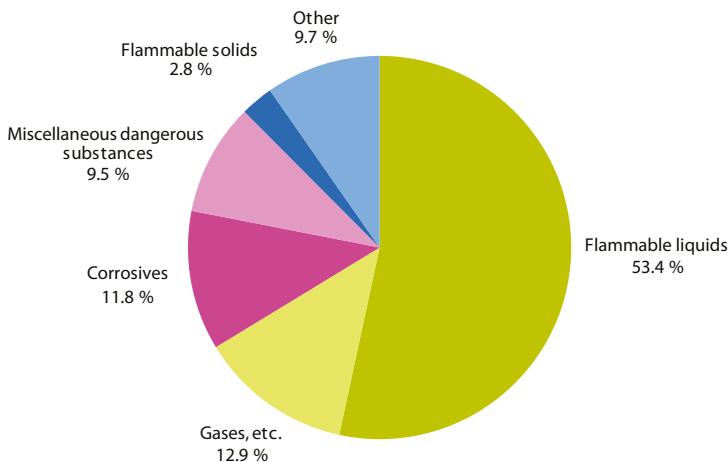
Figure 2.2.8 shows that one fifth of road freight journeys were performed by empty vehicles at EU level. The share of empty journeys increased to 23.1 % for national transport, but was only 12.2 % for international transport in 2017.

At total transport level, most Member States fell in the range between 15 % and 30 % empty journeys. However, the figure for Cyprus was 44.0 %, probably a reflection of the journeys carrying goods imported through ports and construction traffic, which is largely one way. Empty journeys for Ireland and Austria were slightly higher than the average, recording 34.8 % and 33.9 % empty vehicle-kilometres

respectively. At the other extreme were Belgium with 5.9 % empty vehicle-kilometres, Luxembourg with 6.5 % and Denmark with 9.4 %.

The total figures largely reflected performance in national transport. In contrast, for international transport, all Member States reported substantially lower levels of empty runnings, only four countries being over 20 % (Austria with 22.1 %, Ireland with 21.2 %, France with 21.0 % and the Netherlands with 20.5 %). This shows the economic importance of finding loads for international return journeys, while empty journeys can be more present in domestic transport.

Figure 2.2.9: Road transport of dangerous goods by type of goods, EU-28, 2017
(% share in tonne-kilometres)



Source: Eurostat (online data code: [road_go_ta_dg](#))

Figure 2.2.9 shows the types of dangerous goods in EU-28 road freight transport in 2017. The largest specific product group was flammable liquids, taking over more than half of the total (53.4 %). Two other groups, gases (compressed, liquefied or dissolved under pressure) and corrosives, accounted for 12.9 % and 11.8 % respectively. There were very small changes

compared to previous years, the distribution between product groups remained quite similar over time.

As dangerous goods represent a small share of all the goods transported by road, there are considerable uncertainties in the surveys' results on this type of goods.

Table 2.2.6: Main country-to-country flows in intra EU-28 road freight transport, 2017

Rank	Pair of countries		Total tonnes (million)	Hauliers of first country (%)	Hauliers second country (%)	All other hauliers (%)	Main other haulier
1	Germany	Netherlands	92.5	26.3	54.3	19.4	Poland
2	Germany	Poland	65.7	3.1	96.3	0.6	Lithuania
3	Belgium	France	57.1	42.0	25.8	32.2	Luxembourg
4	Belgium	Netherlands	56.2	22.9	66.8	10.3	Poland
5	Germany	France	48.7	34.0	15.4	50.6	Poland
6	Belgium	Germany	45.2	16.9	30.3	52.8	Poland
7	Spain	France	42.8	81.6	5.3	13.1	Romania
8	Austria	Germany	38.4	33.7	34.5	31.8	Hungary
9	Czechia	Germany	25.3	63.9	16.4	19.7	Poland
10	Germany	Italy	23.3	22.4	19.4	58.2	Poland
11	Spain	Portugal	20.7	46.5	52.4	1.1	Lithuania
12	France	Italy	19.5	22.3	33.3	44.5	Poland
13	France	Netherlands	16.8	9.2	49.8	41.0	Poland
14	Czechia	Poland	15.9	9.9	89.3	0.9	Lithuania
15	Germany	Denmark	13.4	57.5	7.9	34.7	Poland
16	Germany	Spain	12.4	5.1	58.1	36.8	Portugal
17	Czechia	Slovakia	11.7	45.8	51.4	2.9	Poland
18	Ireland	United Kingdom	10.8	47.0	51.7	1.3	Poland
19	Austria	Italy	10.6	35.6	8.7	55.7	Slovenia
20	Germany	Luxembourg	9.9	53.8	35.6	10.6	Poland

Source: Eurostat (online data codes: [road_go_ta_tott](#), [road_go_ia_ugett](#), [road_go_ia_lgett](#) and [road_go_cta_gtt](#))

Table 2.2.6 shows share of transport performed for the main intra-EU country-to-country flows, by the countries the hauliers come from. Germany is one of the two origin/destination countries in half of the top 20 country-to-country flows, illustrating the central role of Germany in intra-EU trade flows. However, German hauliers' share of the total volumes transported was less than half in most bilateral flows, with as little as 3.1 % in the bilateral traffic between Germany and Poland. German hauliers recorded the highest share in transport between Germany and Denmark (57.5 %) and between Germany and Luxembourg (53.9 %).

The share of hauliers from other countries than the origin and destination countries varied substantially in these country-to-country flows. Hauliers from such third countries carried 58.2 % of the total volume transported between Germany and Italy, 55.7 % for Austria/Italy and 55.0 % for Belgium/Germany. At the other end of the scale, only 1.1 % of the road

freight transported between Spain and Portugal was carried by hauliers from third countries, with even lower shares of hauliers from other countries in the bilateral flows between Czechia and Poland (0.9 %) and between Germany and Poland (0.6 %).

Polish hauliers were the main hauliers from other countries than the origin and destination countries in these intra-EU road freight flows.

Switzerland, Norway, Russia and Turkey are important trading partners for the EU. Table 2.2.7 highlights the main country-to-country road transport flows between these four countries and EU Member States in 2017. Switzerland's traffic was with Germany (23.4 % of the total extra-EU transport), France, Italy, Austria, Belgium, Poland and the Netherlands, while Norway had links with Sweden, Denmark and Germany. Russia transported goods mainly with Poland and Turkey with Bulgaria.

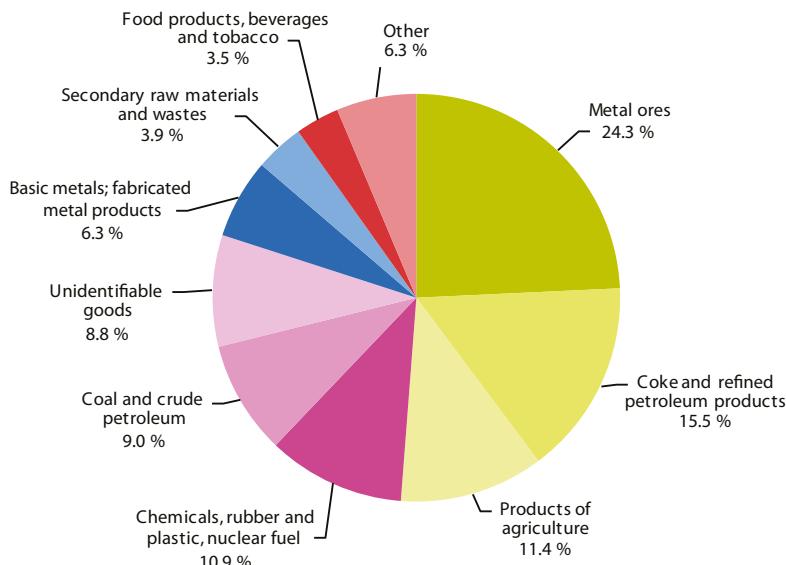
Table 2.2.7: Main country-to-country flows in extra EU-28 road freight transport, 2017

Rank	Pair of countries	Total tonnes (million)	Share in total extra EU-28 (%)
1	Germany Switzerland	19.2	23.4
2	France Switzerland	11.7	14.2
3	Sweden Norway	11.3	13.7
4	Italy Switzerland	5.4	6.6
5	Austria Switzerland	2.9	3.5
6	Poland Russia	2.5	3.1
7	Bulgaria Turkey	1.7	2.1
8	Belgium Switzerland	1.5	1.8
9	Denmark Norway	1.4	1.7
10	Poland Switzerland	1.4	1.7
11	Germany Norway	1.2	1.5
12	Netherlands Switzerland	1.2	1.5

Source: Eurostat (online data codes: [road_go_ta_tott](#), [road_go_ia_ugtt](#), [road_go_ia_lgtt](#) and [road_go_cta_gtt](#))

When it comes to freight transport by inland waterways, the main types of goods transported at EU level in 2017 were 'metal ores', 'coke and refined petroleum products' and 'products of agriculture'. These top-three categories accounted for more than half of all goods transport on EU inland waterways (Figure 2.2.10).

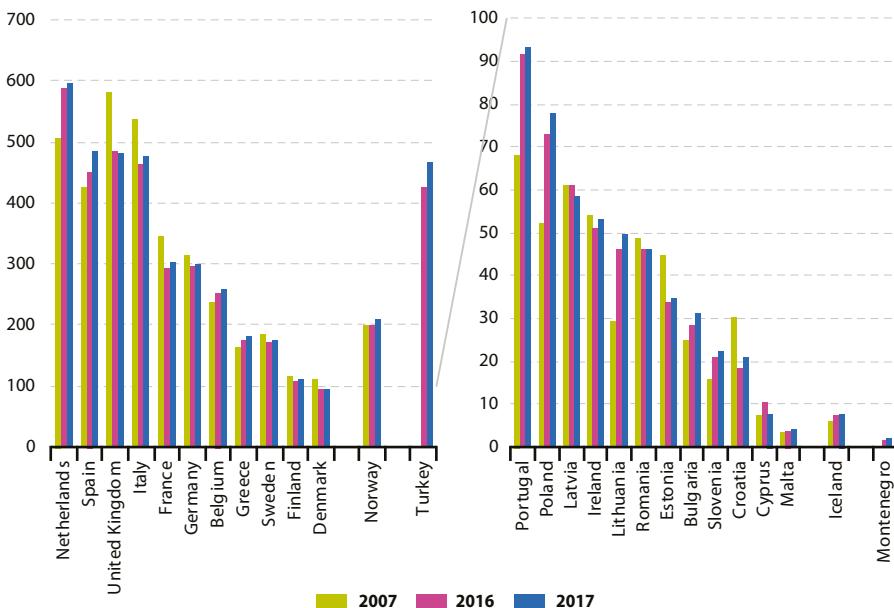
Compared with 2016, the share of 'metal ores' in total transport performance increased by +1.3 percentage points, while the shares of 'coke and refined petroleum products' and 'products of agriculture' fell by -0.4 and -1.1 percentage points, respectively.

Figure 2.2.10: Inland waterways freight transport by main type of goods, EU-28, 2017 (%)
(%, based on tonne-kilometres)

Note: Data for Finland are not available.

Source: Eurostat (online data code: [iww_go_atygo](#))

Figure 2.2.11: Gross weight of seaborne freight handled in all ports, 2007, 2016 and 2017 (million tonnes)



Note: Data for Montenegro and Turkey are not available in 2007.

Source: Eurostat (online data code: mar_mg_aa_cwh)

As regards seaborne freight transport, the total gross weight of goods handled in EU ports was estimated at close to 4.0 billion tonnes in 2017, an increase of 2.6 % from 2016.

The Netherlands reported the largest volumes of seaborne freight handling in Europe in this period (Figure 2.2.11). At 596 million tonnes, the volume of seaborne goods handled in Dutch ports represented 15.0 % of the EU total in 2017. The Netherlands was followed by Spain, which surpassed the United Kingdom and Italy for the first time in 2017. Their respective shares were 12.3 %, 12.2 % and 12.0 % of the EU total.

Behind these four countries, France regained its fifth place among the EU countries overtaking Germany in 2017. Among other countries reporting maritime freight data to Eurostat, the

candidate country Turkey handled 466 million tonnes of goods in 2017, placing Turkey between Italy and France in terms of total tonnage of seaborne goods handled.

Compared with 2016, the largest relative increases in port freight activity among the EU Member States were recorded by Croatia (+12.1 %), Malta (+8.6 % from a low base), Bulgaria (+7.9 %), Lithuania (+7.8 %) and Spain (+7.7 %) and the candidate countries Montenegro and Turkey (+29.6 % from a low base and +9.4 %, respectively). Only five countries registered a decrease in port freight activity: Cyprus (-23.4 %), Latvia (-3.7 %), Denmark (-1.2 %), the United Kingdom (-0.5 %) and Romania (-0.2 %).

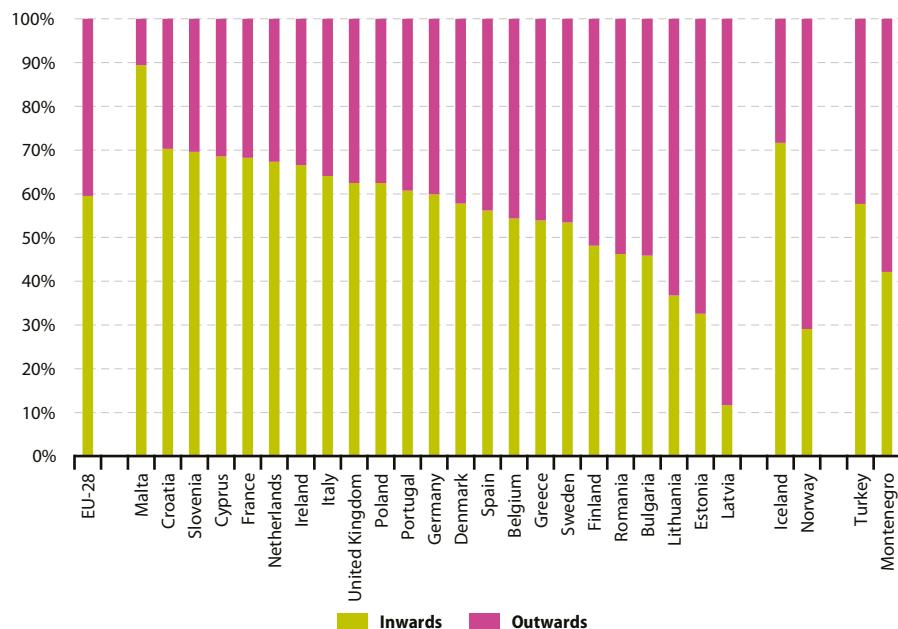
Twelve Member States recorded decreases in port freight activity in the 10-year period between 2007 and 2017. The highest relative falls were observed for Croatia (-30.9 %), Estonia (-22.6 %), the United Kingdom (-17.1 %), Denmark (-13.7 %), France (-12.7 %) and Italy (-11.6 %). In contrast, Lithuania registered the largest relative increase (+70.4 %), followed by Poland (+48.9 %), Slovenia (+40.7 %), Portugal (+36.8 %), Malta (+27.4 % from low base) and Bulgaria (+24.3 %). Iceland also reported an increase (+24.8 %).

Inward movements of goods to the EU countries increased by 2.9 % to almost 2.4 billion tonnes in 2017 compared with 2016, while outwards movements increased by 2.1 % to 1.6 billion tonnes (Figure 2.2.12). Nonetheless, inward movements still accounted for more than 59 %

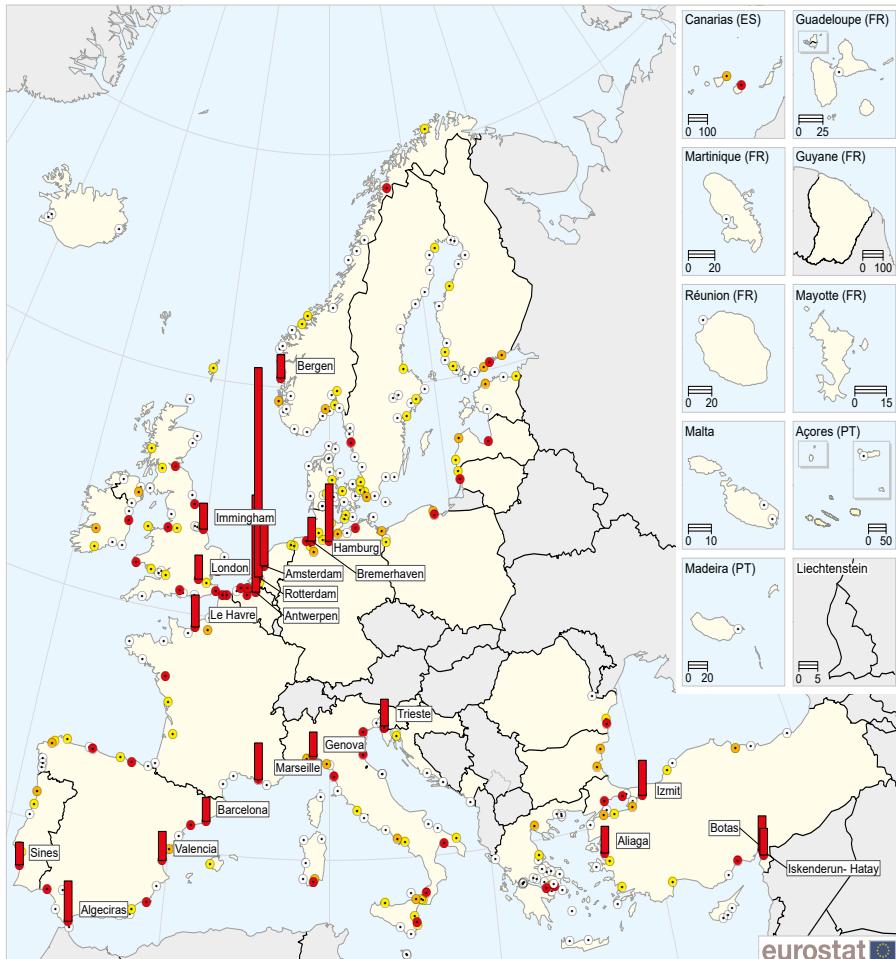
of the total tonnes of goods handled in the EU ports. Liquid bulk goods, such as crude oil and oil products, made up a substantial proportion of the inward tonnage.

More seaborne goods are unloaded from than loaded onto vessels in the majority of EU countries. Malta and Croatia had the highest shares of unloaded goods in 2017, with respective shares of 89 % and 70 % of the total tonnes of seaborne goods recorded as inward movements to their ports. Iceland also had a high share of 72 %. In contrast, the three Baltic countries, Bulgaria, Romania and Finland, as well as Norway and Montenegro, all had high shares of outward movements of goods.

Figure 2.2.12: Gross weight of seaborne freight handled in all ports by direction, 2017 (%) share in tonnes)



Source: Eurostat (online data code: mar_mg_aa_cwhd)

Map 2.2.1: Main cargo ports by gross weight of freight handled, 2017

Top 20 ports are named and their handling activity shown as bars.

Administrative boundaries: © EuroGeographics © UN-FAO © Turkstat
Cartography: Eurostat — GISCO, 02/2019



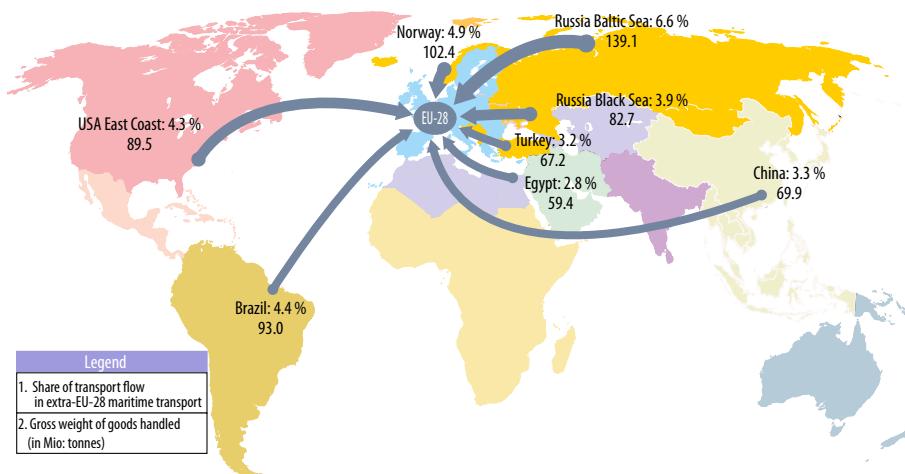
Source: Eurostat (online data code: mar_mg_aa_pwhd)

Rotterdam, Antwerpen and Hamburg, all located on the North Sea coast, maintained their positions as Europe's top three ports in 2017, both in terms of the gross weight of goods handled and in terms of the volume of containers handled in the ports (Map 2.2.1). The 20 largest cargo ports accounted for close to 39 % of the total tonnage of goods handled in the main ports of the reporting countries in 2017. The largest port in Europe, Rotterdam in the Netherlands, on its own accounted for just above 9 % of the total tonnage handled in the countries reporting maritime freight data.

In terms of tonnage, maritime transport is the most important mode for long distance transport

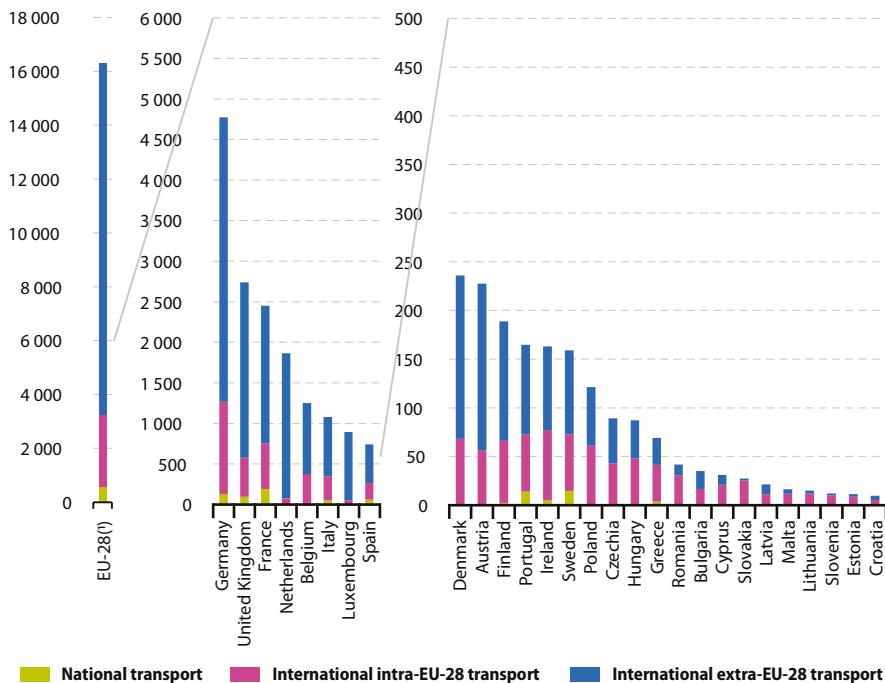
of goods to or from the EU, with almost two thirds going to or from ports outside the EU (international extra EU-28 transport). Map 2.2.2 shows that all of the top eight maritime flows of goods between EU and extra-EU regions were inward flows in 2017. In declining order, these were the inward flows of goods from the Baltic Sea area of Russia (6.6 % of the total EU seaborne transport), Norway (4.9 %), Brazil (4.4 %), the East Coast of the USA (4.3 %), the Black Sea area of Russia (3.9 %), China (3.3 %), Turkey (3.2 %) and Egypt (2.8 %).

Map 2.2.2: Main extra-EU-28 maritime transport flows by gross weight of freight handled, 2017



Source: Eurostat (online data code: mar_qg_qm_ewhp)

Figure 2.2.13: Air freight and mail by type of transport, 2017
(thousand tonnes)



(I) Double counting is excluded in the intra-EU-28 and total EU-28 aggregates by taking into consideration only departure declarations.

Source: Eurostat (online data code: [avia_gooe](#))

The growing importance of the international transport segment is reflected in air freight and mail transport figures at EU level. In 2017 more than 16 million tons of freight and mail was transported by air in the EU-28. Compared with 2016, it increased by 7.8 %.

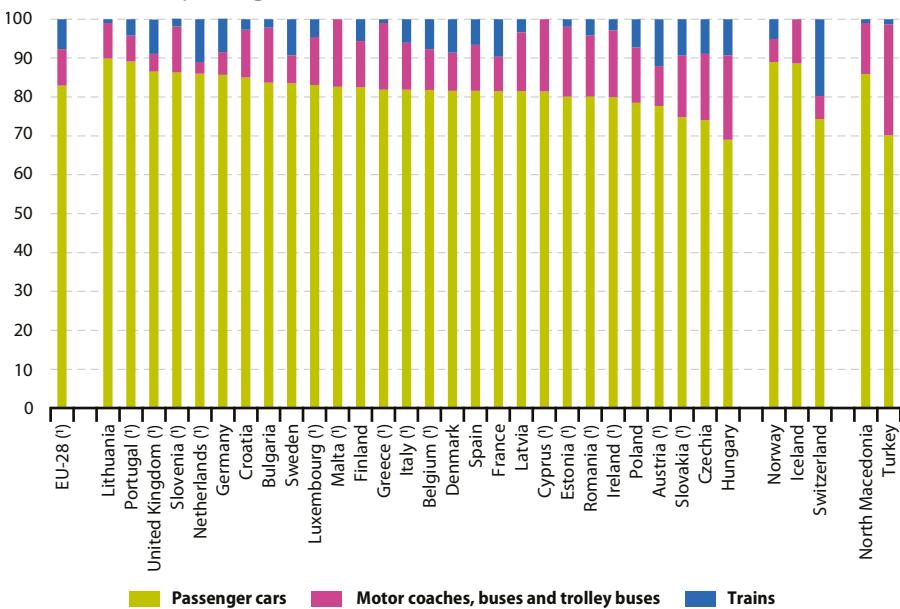
Growth of 1.7 % and 9.6 % respectively were recorded for international intra-EU and extra-EU from 2016 to 2017. Compared with previous year a decrease of 2.0 % was recorded for

domestic freight and mail transport. Figure 2.2.13 shows that extra-EU freight and mail transport dominates in air transport – it accounted for 80 % of the total EU-28 in 2017. Germany, the United Kingdom, the Netherlands and France had very high shares in the extra-EU transport of 21.5 %, 13.3 %, 11.0 % and 10.4 % respectively. In 2017, Germany also had the highest share in the intra-EU transport (7.0 %), followed by France (3.5 %), the United Kingdom (2.3 %) and Belgium (2.3 %).

2.3 Passenger transport

Figure 2.3.1: Modal split of inland passenger transport, 2016

(% of total inland passenger-kilometres)



Note: excluding powered two-wheelers. Cyprus, Malta and Iceland: railways not applicable.

(l) Includes estimates or provisional data.

Source: Eurostat (online data code: tran_hv_psmod)

Figure 2.3.1 shows that passenger cars accounted for 82.9 % of inland passenger transport in the EU in 2016, with motor coaches, buses and trolley buses (9.4 %) and passenger trains (7.7 %) both accounting for less than a tenth of all traffic (measured in passenger-kilometres).

The passenger car was by far the most important mode for passenger transport in all EU Member States. In Lithuania and Portugal passenger cars accounted for close to 90 % of all passenger transport in 2016. Slovakia, Czechia and Hungary were the only EU Member States where the shares of passenger cars were below three quarters. For Hungary, this was reflected in the highest share of motor coaches and buses (21.7 %) among

the EU Member States. An even higher share was reported for the candidate country Turkey (28.5 %). The lowest share for motor coaches, buses and trolley buses was in the Netherlands (3.0 %). The EU Member States with the highest share of passenger transport by train were Austria (12.1 %) and the Netherlands (11.0 %). However, this was well below the EFTA country Switzerland, where trains carried out 19.8 % of all passenger transport in 2016. At the same time, their share was 2.0 % in Estonia and Slovenia and less in Greece and Lithuania, as well as in North Macedonia and Turkey.

Table 2.3.1: Rail passenger transport by type of transport, 2016–2017
(thousand passengers)

	National			International			Total		
	2016	2017	Change 2017/2016 (%)	2016	2017	Change 2017/2016 (%)	2016	2017	Change 2017/2016 (%)
EU-28	9 490 149	9 634 875	1.5	:	:	:	:	:	:
Belgium	:c	:c	:c	:c	:c	:c	:c	:c	:c
Bulgaria	20 911	20 411	-2.4	515	784	52.3	21 425	21 195	-1.1
Czechia	173 701	176 932	1.9	5 066	5 791	14.3	178 766	182 724	2.2
Denmark	198 682	193 928	-2.4	12 717	12 638	-0.6	211 399	206 566	-2.3
Germany	2 799 851	2 815 592	0.6	13 931	15 851	13.8	2 813 782	2 831 443	0.6
Estonia	6 823	7 326	7.4	103	107	4.4	6 926	7 433	7.3
Ireland	42 478	45 130	6.2	342	375	9.5	42 820	45 505	6.3
Greece	15 561	15 337	-1.4	21	22	4.4	15 582	15 359	-1.4
Spain	568 756	592 284	4.1	1 065	1 321	24.0	569 822	593 605	4.2
France	1 197 557	1 237 353	3.3	38 966	40 126	3.0	1 236 523	1 277 479	3.3
Croatia	20 412	19 513	-4.4	298	290	-2.5	20 709	19 803	-4.4
Italy	849 248	846 081	-0.4	2 972	2 676	-10.0	852 220	848 757	-0.4
Cyprus	-	-	-	-	-	-	-	-	-
Latvia	17 071	17 327	1.5	157	167	6.5	17 228	17 494	1.5
Lithuania	3 580	3 855	7.7	336	322	-4.2	3 916	4 176	6.7
Luxembourg	16 081	16 523	2.8	6 378	6 407	0.5	22 459	22 930	2.1
Hungary	:c	:c	:c	:c	:c	:c	:c	:c	:c
Malta	-	-	-	-	-	-	-	-	-
Netherlands	:c	:c	:c	:c	:c	:c	:c	:c	:c
Austria	243 898	245 224	0.5	9 298	9 269	-0.3	253 196	254 493	0.5
Poland	274 302	291 500	6.3	1 143	1 548	35.5	275 445	293 048	6.4
Portugal	133 238	141 876	6.5	234	251	7.4	133 472	142 127	6.5
Romania	58 656	67 142	14.5	203	188	-7.6	58 859	67 330	14.4
Slovenia	13 231	12 592	-4.8	419	410	-1.9	13 650	13 002	-4.7
Slovakia	65 807	71 474	8.6	3 343	3 442	3.0	69 150	74 916	8.3
Finland	81 662	85 155	4.3	452	548	21.0	82 114	85 703	4.4
Sweden	208 944	216 800	3.8	12 001	12 100	0.8	220 945	228 900	3.6
United Kingdom	1 753 135	1 737 710	-0.9	19 428	19 649	1.1	1 772 563	1 757 359	-0.9
Norway	73 756	72 968	-1.1	537	593	10.4	74 293	73 561	-1.0
Switzerland	483 705	485 694	0.4	13 584	14 427	6.2	497 289	500 121	0.6
Montenegro (1)	:	:	:	:	:	:	1 285	927	-27.9
North Macedonia	660	495	-24.9	3	5	64.8	663	500	-24.5
Turkey	88 870	85 206	-4.1	168	132	-21.5	89 038	85 338	-4.2

Note: Cyprus and Malta have no railways.

(1) Totals are the sum of quarterly data.

Source: Eurostat (online data codes: rail_pa_typepas and rail_pa_quartal)

Concerning rail transport, more than 9.6 billion passengers travelled on national railway networks in the EU, in 2017 (Table 2.3.1). It has to be noted that international transport represented less than 8 % of the total transport for all countries except Luxembourg where it represented 28 %. All in all, 16 of the EU Member States reported increases in the total number of passenger transported between 2016 and 2017. The largest increases were recorded in Romania (+14.4 %), Slovakia (+8.3 %) and Estonia

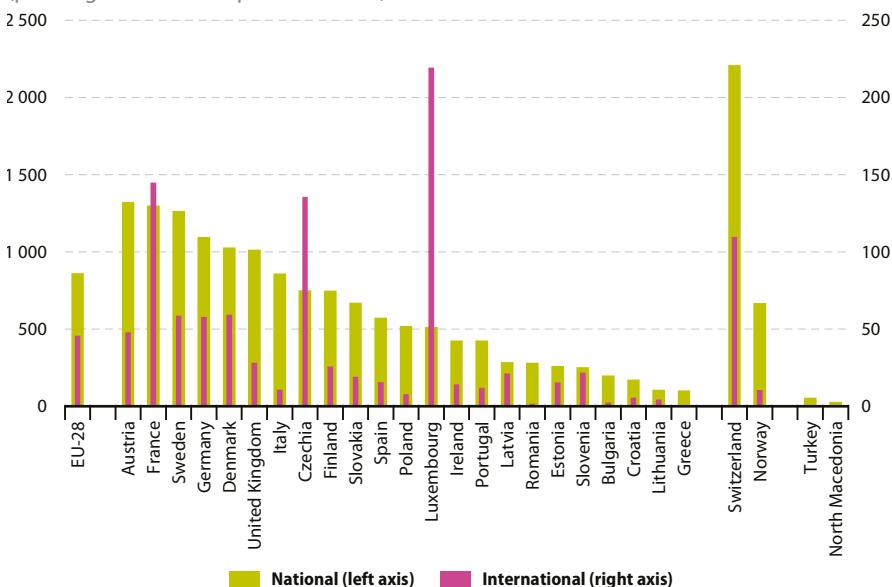
(+7.3 %). In contrast, the transport of passengers decreased by 4.7 % in Slovenia. Outside the EU, Montenegro and North Macedonia registered a large drop in rail passenger transport (-27.9 % and -24.5 %).

When looking at the evolution of national transport between 2016 and 2017, the largest increase was reported by Romania (+14.5 %), followed by Slovakia (+8.6 %) and Lithuania (+7.7 %), while Slovenia reported the largest decrease with -4.8 %.

In order to compare between countries the relative importance of rail transport, the data can be normalised by expressing passenger traffic in relation to population (Figure 2.3.2). Travel on the national rail network in Austria, France, Sweden, Germany, Denmark and the United Kingdom averaged more than 1 000 passenger-kilometres per inhabitant in 2017; this was well below the level recorded in Switzerland (2 211 passenger-kilometres per inhabitant). By contrast, among the EU Member States the lowest average distances travelled on national railway networks in 2017 were recorded in Greece (103 passenger-kilometres per inhabitant) and Lithuania (107 passenger-kilometres per inhabitant), while the levels in the candidate countries Turkey (56 passenger-kilometres per inhabitant) and in North Macedonia (28 passenger-kilometres per inhabitant) were even lower.

In terms of international rail travel, the only EU Member States to report levels of more than 100 passenger-kilometres per inhabitant in 2017 were Luxembourg (219 passenger-kilometres per inhabitant), France (145 passenger-kilometres per inhabitant) and Czechia (136 passenger-kilometres per inhabitant); this level was also surpassed in the EFTA country Switzerland (110 passenger-kilometres per inhabitant). These figures may reflect, among others, the proximity of international borders, the importance of cross-border commuters within the workforce, access to high-speed rail links, and whether or not international transport corridors run through a particular country.

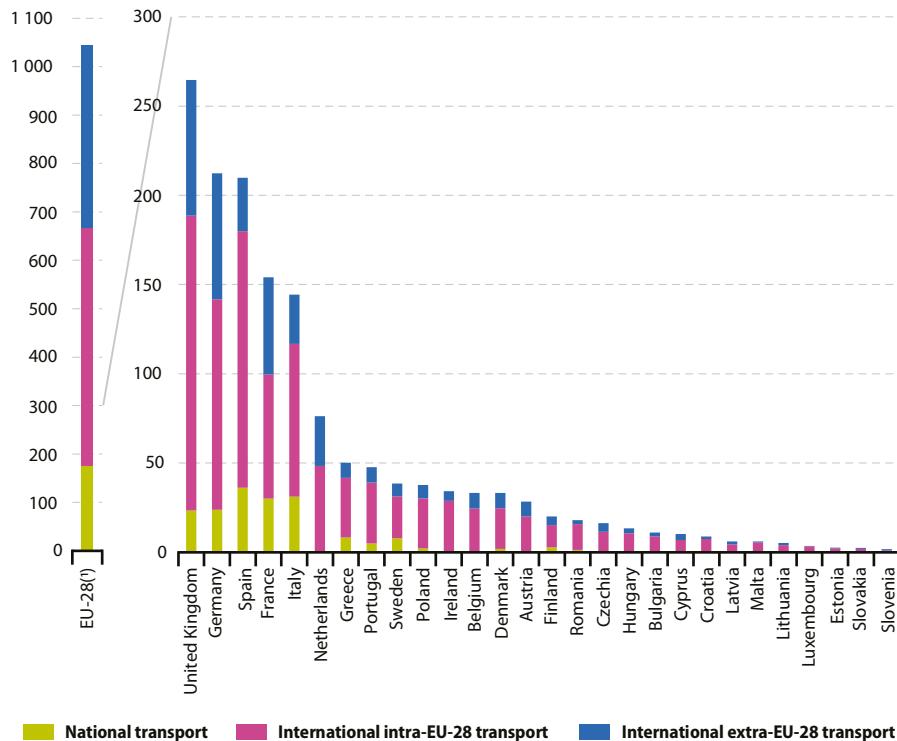
Figure 2.3.2: Rail passenger transport by type of transport, 2017
(passenger-kilometres per inhabitant)



Note: Cyprus and Malta have no railways. Data for Belgium, Hungary and the Netherlands are not available.

Source: Eurostat (online data codes: rail_pa_typepas and demo_gind)

Figure 2.3.3 Air passenger transport by type of transport, 2017
(million passengers carried)



(1) Double counting is excluded in the intra-EU-28 and total EU-28 aggregates by taking into consideration only departure declarations.
Source: Eurostat (online data code: [avia_paoc](#))

As for air passengers, the total number of passengers transported surpassed 1 billion for the first time in 2017, at EU level (Figure 2.3.3). The United Kingdom was the EU Member State carrying the highest number of passengers in 2017 (265 million passengers), followed by Germany (212 million passengers) and Spain (210 million passengers). These three countries together with France and Italy represented two thirds of the total EU air transport. On the other side, Slovenia recorded 1.7 million passengers.

Almost half of the air passenger transport concerned intra-EU flights (47 %) while national

transport and extra-EU transport accounted for 17 % and 36 % of air passenger transport, respectively. For all countries intra-EU transport is dominant, with shares between 45 % for France and 92 % for Malta. When looking at extra-EU transport, the highest share was registered by the Slovenia (40 %) while the lowest by Malta (8%). The share of national transport was higher than the share of extra-EU transport only for Italy (22 %), Sweden (20 %) and Spain (17 %).

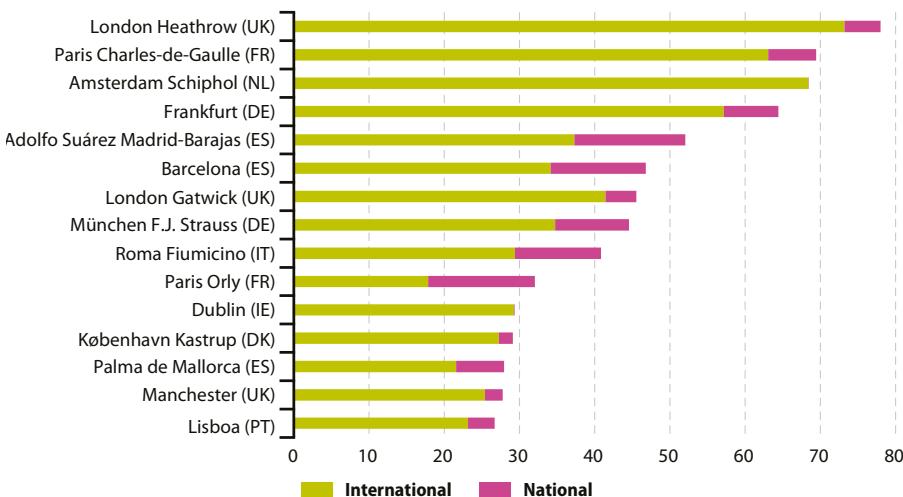
London Heathrow was the busiest airport in the EU in terms of passenger carried in 2017, with 78 million passengers arriving or departing (Figure 2.3.4). Heathrow has constantly remained the busiest airport in the EU since the beginning of the time series in 1993. It was followed — at some distance — by Paris Charles de Gaulle airport (69 million), Amsterdam Schiphol airport (68 million) and Frankfurt airport (64 million).

The overwhelming majority of passengers travelling through these four busiest airports were travelling on international flights; the lowest share among them was recorded for Frankfurt airport (89 %), rising to almost 100 % for Amsterdam Schiphol. In contrast, national flights accounted for 28 % of the 52 million passengers carried through the EU's fifth busiest passenger airport in 2017, Adolfo Suárez Madrid-Barajas. There were also relatively high proportions of passengers on national flights to and from Paris Orly (44 %), Roma Fiumicino (28 %) and Barcelona airport (27 %).

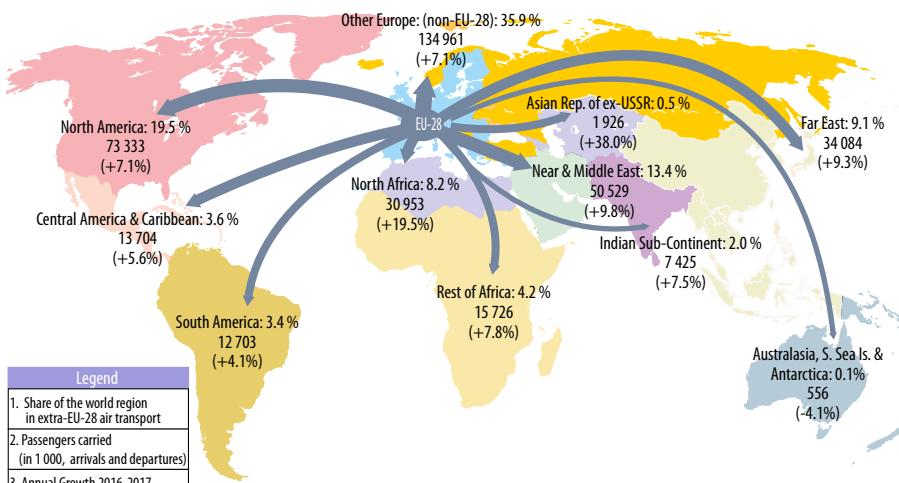
Map 2.3.1 presents some elements of the extra-EU air transport of passengers. With a 38 % increase between 2016 and 2017, 'Asian Republics of the Ex-USSR' is the partner world region with the highest increase for EU passenger transport. The highest and continued decrease of Australia -4.1 % could be partially linked to the increase in Near and Middle East (+9.8 %) – more passengers taking indirect flight to Australia changing in Near and Middle East airports. North Africa also recorded an important increase after several years of decrease (+19.5 %).

When it comes to maritime transport, the total number of passengers embarking and disembarking in EU ports is estimated at almost 415 million in 2017, a rise of 4.6 % from the previous year (Figure 2.3.5). Unlike goods movements, where broadly 60 % of goods are unloaded and 40 % loaded in the EU ports, the difference between the number of passengers disembarking ('inwards') and embarking ('outwards') in EU ports is generally small.

Figure 2.3.4: Top 15 airports in the EU-28, 2017
(million passengers carried)



Source: Eurostat (online data code: avia_paoa)

Map 2.3.1: Air transport of passengers, extra-EU-28, 2017

Source: Eurostat (online data code: [avia_paexcc](#)).

This reflects the fact that seaborne passenger transport in Europe is mainly carried by national or intra-EU ferry services, with the same passengers being counted twice in the port

throughput statistics (once when they embark the ferry in one EU port and once when they disembark the same ferry in another EU port).

Figure 2.3.5: Seaborne passengers embarked and disembarked in all ports, EU-28, 2002-2017
(million passengers)

Note: the y-axis is cut.

Source: Eurostat (online data code: [mar_mp_aa_cph](#))

Table 2.3.2: Seaborne passengers embarked and disembarked in all ports, 2014-2017 (thousand passengers)

	2014	2015	2016	2017					Change 2017/2016 (%)
	Total	Total	Total	Inwards	Outwards	Cruise	Non cruise	Total	
EU-28	393 127	395 432	396 523	207 978	206 829	14 020	400 788	414 808	4.6
Belgium	821	844	1 118	634	636	950	321	1 270	13.7
Bulgaria	1	2	3	0	2	0	2	2	-28.0
Denmark	41 353	41 647	41 583	21 507	21 379	425	42 461	42 886	3.1
Germany	30 780	30 087	30 849	15 321	15 453	2 248	28 527	30 774	-0.2
Estonia	13 654	14 164	14 333	7 402	7 449	14	14 836	14 850	3.6
Ireland	2 755	2 751	2 717	1 394	1 380	5	2 769	2 774	2.1
Greece	66 533	65 680	65 248	35 021	35 002	439	69 584	70 023	7.3
Spain	23 486	24 522	26 323	13 976	13 923	3 004	24 896	27 899	6.0
France	26 638	26 133	24 514	12 641	12 453	717	24 377	25 093	2.4
Croatia	23 523	27 271	29 661	15 976	15 351	76	31 251	31 327	5.6
Italy	72 225	70 268	67 273	36 935	36 941	3 747	70 129	73 876	9.8
Cyprus	76	68	59	46	26	21	51	72	22.8
Latvia	862	661	723	487	507	0	994	994	37.5
Lithuania	280	286	303	141	156	0	297	297	-1.8
Malta	9 669	9 910	10 690	5 643	5 642	211	11 075	11 286	5.6
Netherlands (1)	1 819	1 910	1 906	963	965	0	1 928	1 928	1.2
Poland	2 224	2 421	2 602	1 292	1 293	0	2 585	2 585	-0.7
Portugal	551	583	679	369	371	63	677	740	9.0
Romania	1	1	0	0	0	0	0	0	25.0
Slovenia	27	34	28	19	19	0	38	38	33.0
Finland	18 471	18 884	19 222	9 800	9 689	7	19 481	19 489	1.4
Sweden	29 244	29 500	29 800	15 384	14 881	175	30 091	30 265	1.6
United Kingdom	28 135	27 805	26 887	13 027	13 311	1 919	24 419	26 338	-2.0
Iceland	723	737	544	459	458	0	917	917	68.4
Norway (2)	6 103	6 714	6 266	3 079	3 273	109	6 243	6 352	1.4
Montenegro	108	99	110	62	57	0	119	119	7.6
Turkey	2 150	2 233	1 250	683	694	118	1 259	1 377	10.2

(1) Data exclude cruise passengers.

(2) Data on international maritime passenger transport only.

Source: Eurostat (online data code: [mar_mp_aa_cph](#) and [mar_mp_aa_cphd](#))

At close to 74 million and 70 million seaborne passengers, respectively, Italian and Greek ports handled a combined share of 35 % of the total number of passengers embarking and disembarking in EU ports in 2017 (Table 2.3.2). As a consequence, Italy and Greece remained the main countries in terms of EU seaborne passenger transport. Both countries recording substantial increases in passengers embarking and disembarking compared with 2016 (+9.8 % and +7.3 %, respectively). The two leading countries were followed by Denmark with close to 43 million passengers embarking and disembarking in 2017, an increase by 3.1 % from 2016.

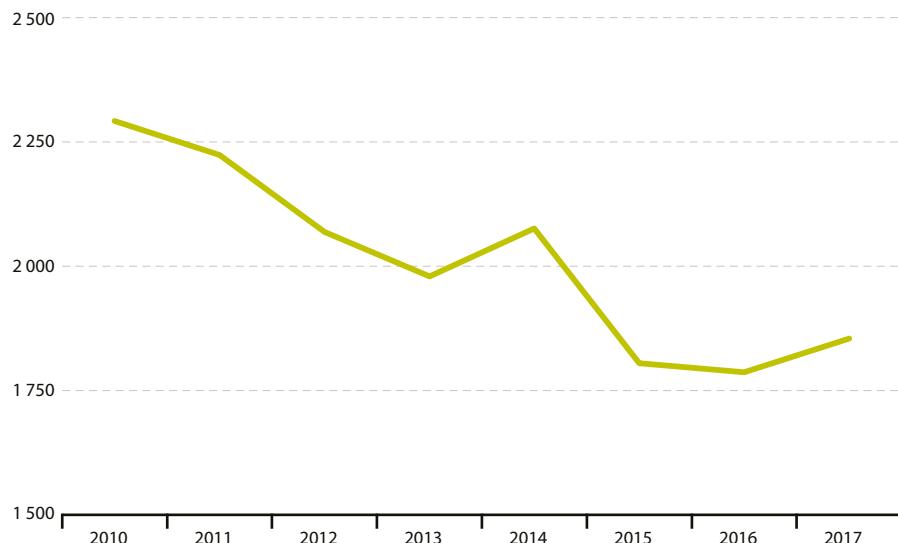
In 2017, compared with the previous year, the largest relative increases in seaborne passengers transport were recorded by Latvia (+37.5 %), Slovenia (+33.0 %), Romania (+25.0 % from a low

base), Cyprus (+22.8 %) and Belgium (+13.7 %) as well as Iceland (+68.4 %). In contrast, only five countries reported a fall in 2017 compared with the previous year. The largest relative decreases were recorded in Bulgaria (-28.0 %, from low base).

Although cruise passengers made up only 3.4 % of the total number of passengers embarking and disembarking in EU ports in 2017, these passengers play an important role in the ports and countries where the cruise traffic is concentrated. Close to 80 % of the total number of cruise passengers embarking and disembarking in European ports in 2017 did so in the ports of one of the four countries Italy, Spain, Germany and the United Kingdom. Cruise passengers on day excursions in EU ports are not included in these figures.

2.4 Transport safety

Figure 2.4.1: Rail accidents, EU-28, 2010-2017
(number)



Note: the y-axis is cut.

Source: Eurostat (online data code: [tran_sf_railac](#))

Railway safety data are collected by the European Union Agency for Railways (ERA) through the Common Safety Indicators (CSIs). The number of railway accidents fell between 2010 and 2016, with the exception of an increase in 2014. In 2017, the number of accidents increased by 68 accidents compared to 2016, to a total of 1 855 accidents (+3.8 %) (Figure 2.4.1). Nevertheless, railway safety has generally improved in the EU, with 437 fewer accidents in 2017 compared to 2010, a reduction of 19.1 %. In 2015, the decrease compared with the previous year was particularly marked (-13.1 %). In 2017, however, the number of accidents was slightly above the level of 2015 (+2.8 %).

Looking at the detailed 2017 figures on railway accidents (Table 2.4.1), the largest category at EU level was accidents to persons caused by rolling stock in motion, with 1 080 accidents representing 58 % of the total. Typically, these accidents involve persons on railway tracks (unauthorised persons or trespassers) that are hit by a running train. Accidents at level crossings, including pedestrians, is the other main category, with a total number of 467 accidents in 2017 (25 % of the total). Together, these two categories represented 83 % of the total number of railway accidents in the EU.

Table 2.4.1: Rail accidents by type of accident, 2017
(number)

	Collisions	Derailments	Level crossing accidents (incl. pedestrians)	Accidents to persons by rolling stock in motion (excl. suicides)	Fires in rolling stock	Other accidents	TOTAL
EU-28	114	97	467	1 080	21	76	1 855
Belgium	1	2	12	17	0	1	33
Bulgaria	1	5	11	29	1	0	47
Czechia	11	2	36	39	2	7	97
Denmark	2	0	2	8	0	0	12
Germany	38	8	73	198	0	29	346
Estonia	4	0	13	2	0	0	19
Ireland	0	1	0	3	0	0	4
Greece	1	3	6	18	0	1	29
Spain	5	10	12	21	1	3	52
France	7	8	41	87	0	8	151
Croatia	1	2	10	18	0	2	33
Italy	2	5	12	75	3	7	104
Latvia	0	1	7	15	1	0	24
Lithuania	0	0	2	25	0	0	27
Luxembourg	1	0	0	0	0	0	1
Hungary	5	10	33	99	8	5	160
Netherlands	2	1	11	7	3	2	26
Austria	7	5	26	22	0	0	60
Poland	10	12	57	172	0	1	252
Portugal	0	3	7	19	0	0	29
Romania	0	1	43	101	0	0	145
Slovenia	1	3	6	1	0	0	11
Slovakia	1	1	14	48	1	0	65
Finland	0	0	7	6	0	4	17
Sweden	2	4	16	11	1	6	40
United Kingdom	12	10	10	39	0	0	71
<i>Channel Tunnel</i>	0	0	0	0	0	0	0
Norway	10	3	2	1	0	0	16
Switzerland	3	3	1	30	0	7	44
Montenegro	:	:	:	:	:	:	:
North Macedonia	0	23	1	4	0	17	45
Turkey	:	:	:	:	:	:	:

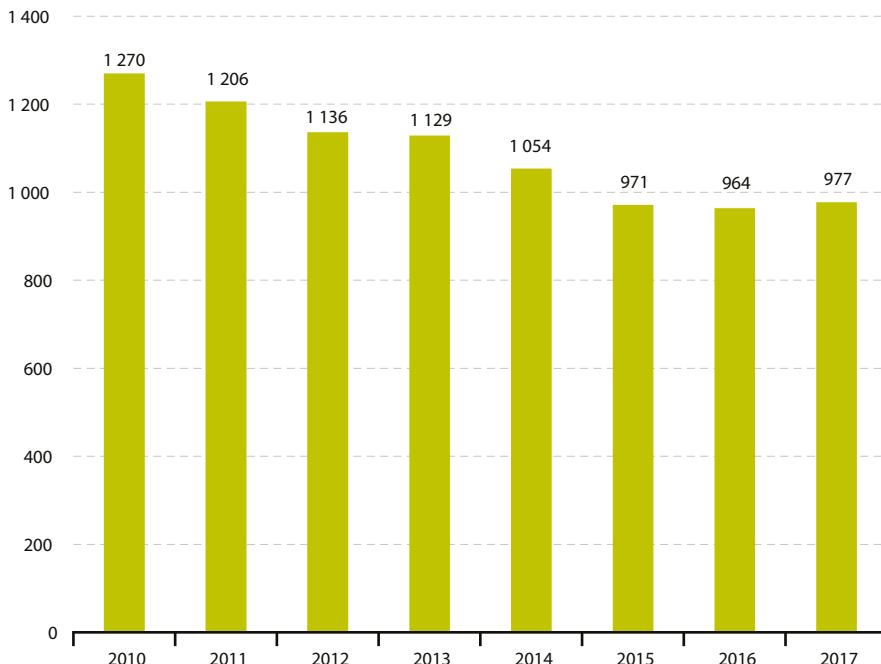
Source: Eurostat (online data code: tran_sf_railac)

Germany and Poland registered the highest number of railway accidents among the Member States in 2017; together these two countries recorded close to one third of all railway accidents in the EU (Table 2.4.1). With 160 accidents, Hungary accounted for 9 % of the railway accidents in the EU. In contrast, Luxembourg reported only one railway accident

in 2017 (a collision) and Ireland four accidents (one derailment and three accidents to persons caused by rolling stock in motion).

The Channel Tunnel is listed as a separate entity as a distribution between France and the United Kingdom cannot be made.

Figure 2.4.2: Persons killed in railway accidents, EU-28, 2010-2017
(number)



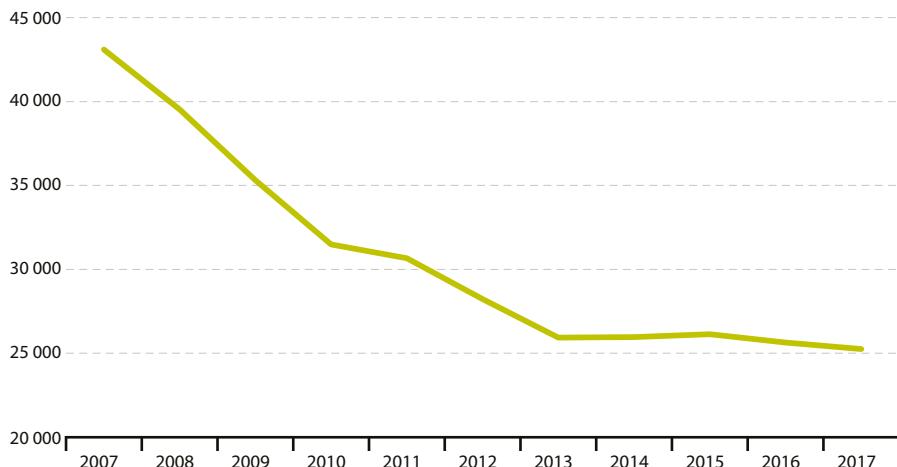
Source: Eurostat (online data code: [tran_sf_railvi](#))

Figure 2.4.2 shows the number of persons killed in railway accidents in the EU. The total number of fatalities has gradually declined from 1 270 persons killed in railway accidents in 2010 to 971 persons in 2015. In the years 2016 and 2017, the fatalities remained roughly at the same level as in 2015, falling slightly to 964 persons killed in 2016 but increasing to 977 persons killed in 2017. Over the period from 2010 to 2017, this corresponds to a reduction in the number of persons killed in railway accidents by almost one quarter (-23.1 %).

Focusing on 2017, fatalities in the category 'Unauthorised persons' remained the largest category of victims, with 610 cases in 2017 (62 % of the total number of persons killed in railway accidents).

The second largest category was 'Level crossing users' with 297 deaths (30 %). Only a fraction of the registered fatalities were railway passengers. In 2017, the share of railway passengers in the total number of fatalities was 1.5 % (15 railway passengers killed).

Figure 2.4.3: Persons killed in road accidents, EU-28, 2007-2017
(number)



Note: the y-axis is cut.

Source: Eurostat (online data codes: [tran_sf_roadvde](#))

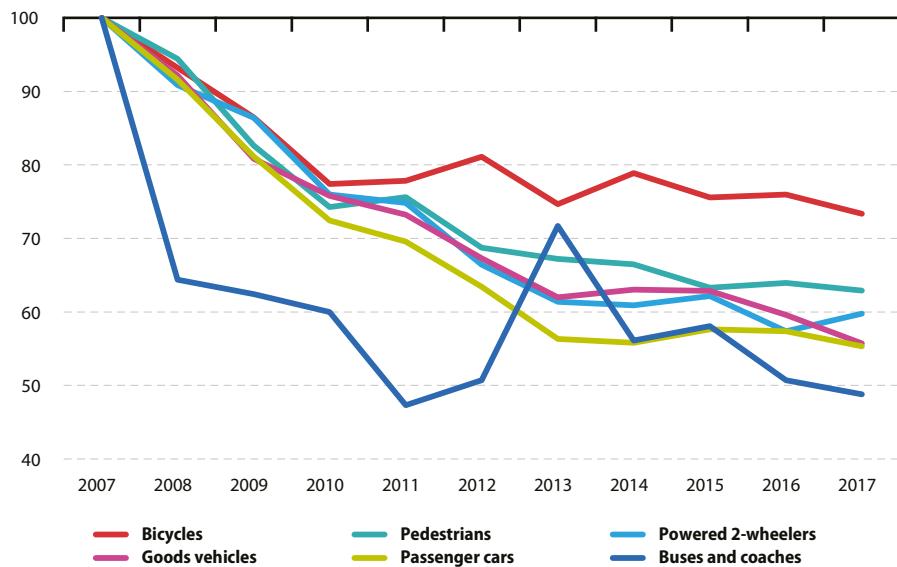
The road accidents data come from the CARE database (the Community database on road accidents resulting in death or injury). CARE has detailed data on individual accidents collected by the Member States from police and hospital sources. The number of persons killed, counted in road traffic accidents, has fallen considerably over the last 20 years: EU fatalities fell by 41 % between 2007 and 2017 (Figure 2.4.3). In 2017, 25 257 persons were killed, a figure that is roughly unchanged compared to 2016 (25 643 persons killed).

In 2017, 49.7 persons per million inhabitants were killed in road traffic accidents in the

EU. Differences between Member States are considerable: the values range from well under 30 deaths per million inhabitants (the United Kingdom and Sweden) to over 90 in Bulgaria and Romania.

Figure 2.4.4 shows that over the last decade the largest drop in the number of persons killed in road accidents in the EU was among buses and coaches (-51.2 %), followed by car drivers and their passengers (-44.7 %), and occupants of goods vehicles (-44.3 %). The fall in the number of persons killed among cyclists (-26.6 %) and pedestrians (-37.1 %), though, was smaller.

Figure 2.4.4: Persons killed in road accidents by category of vehicles, EU-28, 2007-2017
(2007=100)



Note: Data for Bulgaria, Ireland, Cyprus, Malta, Lithuania and Slovakia are not included because they are not available for all years and/or vehicle categories. Goods vehicles category includes road tractors.

Source: Eurostat (online data code: [tran_sf_roadve](#))

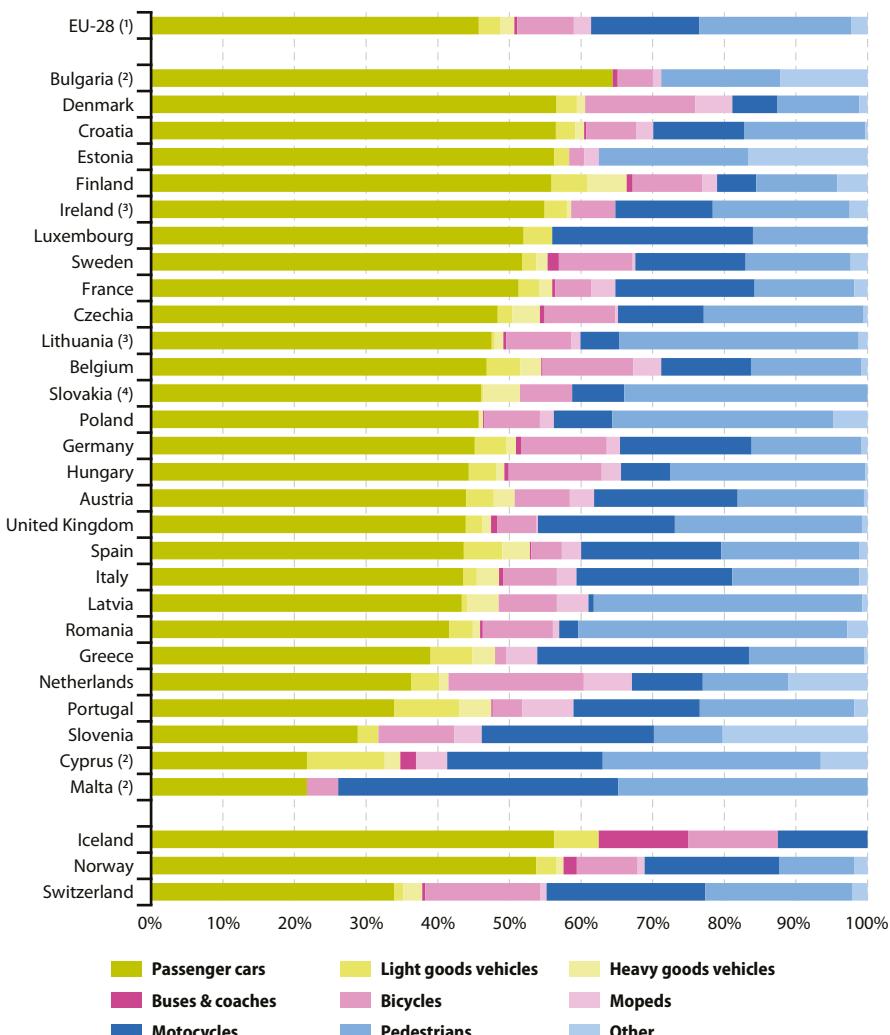
The pattern for buses and coaches in Figure 2.4.4 stands out from the rest as even a single severe accident can significantly change the trend. There were 108 deaths in the EU in this category in 2011, 107 in 2012, but the number increased to 149 in 2013 before falling to 119 deaths in 2014 and to 112 in 2017.

In countries where cycling is widespread, such as the Netherlands or Denmark, it comes as no surprise that cyclists account for a larger share of persons killed than in countries where this is less the case. Indeed, Figure 2.4.5 shows that cyclists accounted for 18.9 % of all road accident deaths in the Netherlands; the figure for Denmark was 15.4 %. At the other end of the spectrum, in Greece cyclists accounted for 1.5 % of deaths and in Luxembourg and Cyprus, no cyclists

were killed. Greece, however, had the second highest share concerning motorcycle fatalities (among countries for which detailed data are available): 29.5 % of deaths in all road accidents in Greece were among motorcyclists; Malta had the highest share (39.1 %). In Portugal and the Netherlands, the remaining ‘two-wheeled’ category —mopeds — accounted for 7.1 % and 6.7 % respectively of all deaths in road accidents, a much larger share than in other countries.

A high number of pedestrians were killed in road accidents: in 2017, accounting for nearly 21.2 % of all road accident deaths in the EU. This share varies considerably between countries, from under 9.6 % in Slovenia to around 37 % in Latvia and Romania.

Figure 2.4.5: Persons killed in road accidents by category of vehicles, 2017 (%)



Note: Heavy goods vehicles category includes road tractors.

(1) Estimated.

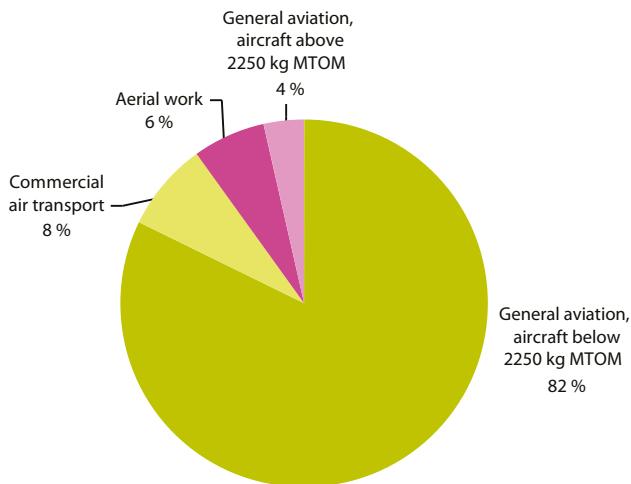
(2) 2016 data instead of 2017.

(3) 2015 data instead of 2017.

(4) 2010 data instead of 2017.

Source: Eurostat (online data code: tran_sf_roadve)

Figure 2.4.6: Persons killed in air accidents in the EU-28, involving aircraft registered in the EU-28 Member States, by aviation category, 2017 (%)



Note: Provisional data

Source: Eurostat (online data code: [tran_sf_aviaca](#), [tran_sf_aviaaw](#), [tran_sf_aviagah](#), [tran_sf_aviagal](#))

Air accidents data are collected by the European Aviation Safety Agency (EASA). In 2017, a total of 141 persons died in accidents occurring on EU territory involving aircraft registered in the countries of the European Union.

Most of the air accident fatalities (82 %) were registered in the category 'General aviation' (Figure 2.4.6), under the sub-category of aircraft with a maximum take-off mass (MTOM) of less than 2250 kg.

This sub-category comprises small aeroplanes, gliders, 'microlights', as well as hot air balloons. 8 % of the fatalities fell into the category 'Commercial air transport' (11 fatalities) in 2017. A further 6 % (corresponding to 9 fatalities) were registered in the category 'Aerial work', while 5 persons (4 %) were killed in 'General aviation' accidents involving large aircrafts over 2250 kg MTOM.

3

Environment



Introduction

Eurostat provides environmental statistics, accounts and indicators supporting the development, implementation, monitoring and evaluation of the European Union's environmental policies, strategies and initiatives. Eurostat produces statistics and accounts on environmental pressures, and on the measures to avoid or mitigate impacts on the environment.

Environmental accounts analyse the links between the environment and the economy by organising the environmental information in a way that is consistent with the accounting principles of national accounts. Indicators derived from the environmental accounts are used to monitor EU progress towards a more resource efficient and circular economy, to assess progress towards sustainable development as defined by the Sustainable Development Goals (SDGs), and to follow the implementation of the 7th Environment Action Programme (7th EAP).

The 2030 agenda for sustainable development, adopted by the UN General Assembly in 2015, provides an opportunity for the EU's own strategic orientation to build a sustainable future. Eurostat is regularly monitoring progress towards the SDGs in an EU context. Eurostat also maintains a dedicated website on sustainable development (<https://ec.europa.eu/eurostat/web/sdi/overview>).

The 7th EAP 'Living well, within the limits of our planet' draws on a number of strategic initiatives, including the resource efficiency roadmap, the biodiversity strategy and the low carbon economy roadmap. Eurostat's statistics and accounts contribute to the implementation of the 7th EAP.

With its Roadmap for moving to a competitive low-carbon economy in 2050, the European Commission has looked beyond short-term objectives and set out a pathway for achieving much deeper emission cuts by the middle of the century: the EU could be using around 30 % less energy in 2050 than it did in 2005. Eurostat

works on improving the visibility and relevance of existing official statistics to support climate change analysis and reporting on greenhouse gas emissions.

In 2015, the European Commission adopted an ambitious Circular Economy Action Plan to stimulate Europe's transition towards a circular economy, boost global competitiveness, foster sustainable economic growth and generate new jobs. In 2018, the European Commission adopted a circular economy package including an EU strategy for plastics, an interface between chemical, product and waste legislation, a monitoring framework on progress towards a circular economy and a report on critical raw materials. Eurostat maintains the monitoring framework. It shows the progress in four areas of the circular economy: production and consumption, waste management, secondary raw materials and competitiveness and innovation.

The Europe 2020 strategy for smart, sustainable and inclusive growth includes targets specifically related to the environment and climate change. Eurostat's environment statistics and accounts help monitor its success through a set of statistics and indicators.

Eurostat's water statistics help measure the success of the 2012 'Blueprint to Safeguard Europe's Water Resources'. Statistics related to wastewater help highlight the impact of the EU wastewater legislation on pollutant discharges to the environment.

Eurostat produces statistics and indicators for the EU's waste policies. The statistics on waste provides information about the sources and the treatment of waste. Particular waste streams such as waste electrical and electronic equipment or plastic packaging waste are also monitored. Eurostat's dedicated website on waste (<https://ec.europa.eu/eurostat/web/waste/overview>) is the main source of data on waste generation and waste management in the EU.

Environment in the EU: 2017 facts and figures...



487 kg of municipal waste per capita generated, of which 46.3 % were recycled

All EU Member States met in 2016 the plastic packaging recycling target of 22.5%, and EU-wide recycling rate is at 42.4%



18% of the total terrestrial area protected under Natura 2000



Environmental taxes at only 6.1% of government tax revenue

Resource productivity in the EU economy increased by about 40 % since 2000, amounting to 2.20 euro/kg in 2017

Environmental economy grew three times faster than the whole economy between 2000 and 2016



Greenhouse gas emissions in the EU down by 22 % between 1990 and 2017

National environmental protection expenditure at 1.9% of GDP – less than households' spending on alcoholic beverages, tobacco and narcotics



3.1 Emissions of greenhouse gases and air pollutants

In 2017, greenhouse gas (GHG) emissions in the EU-28 as reported in GHG inventories were down by 22 % compared with 1990 levels, representing an absolute reduction of 1 240 million tonnes of CO₂-equivalents. This puts the EU on track to surpass its 2020 target, which is to reduce GHG emissions by 20 % by 2020 and by 40 % by 2030 compared with 1990.

Across EU Member States in 2017, GHG emissions were the highest in Germany (21 % of the EU-28 total or 936 million tonnes of CO₂-equivalents), followed by the United Kingdom and France. The biggest decreases compared to 1990 were reported for Lithuania, Latvia, Romania and Estonia (– 57 %, – 56 %, – 54 % and – 48 % respectively). On the other side of the spectrum, the biggest increases compared to 1990 were reported for Cyprus (+ 56 %), Portugal (+ 23 %) and Spain (+ 22 %) (see Figure 3.1.1).

The ratio of GHG emissions (in tonnes of CO₂ equivalents, as reported in air emissions accounts) to gross value added (in million euro) measures the GHG intensity in economic activities (see Figure 3.1.2). Gross value added is valued at basic prices, and the time series are compiled using chain-linked volumes to eliminate the effects of inflation: the gross value added data are presented with 2008 as the reference year. With 5 kg of CO₂ equivalents per euro, the supply of electricity, gas, steam and air conditioning had by far the highest GHG intensity

in the EU-28 in 2017. Agriculture, forestry and fishing had the second highest GHG intensity, 2.6 kg of CO₂ equivalents per euro. Between 2008 and 2017, the largest fall in GHG intensity in relative terms was observed in manufacturing (29 %), while the biggest reduction in absolute terms was observed for the supply of electricity, gas, steam and air conditioning (1.5 kg of CO₂ equivalents per euro). There were also reductions in intensity for the other activities shown in Figure 3.1.2 except for mining and quarrying where the greenhouse gas intensity increased by 3.2 %.

Note that in the reporting of GHG emissions, two approaches are internationally established; air emissions accounts (AEA) and GHG inventories, see Table 3.1.1.

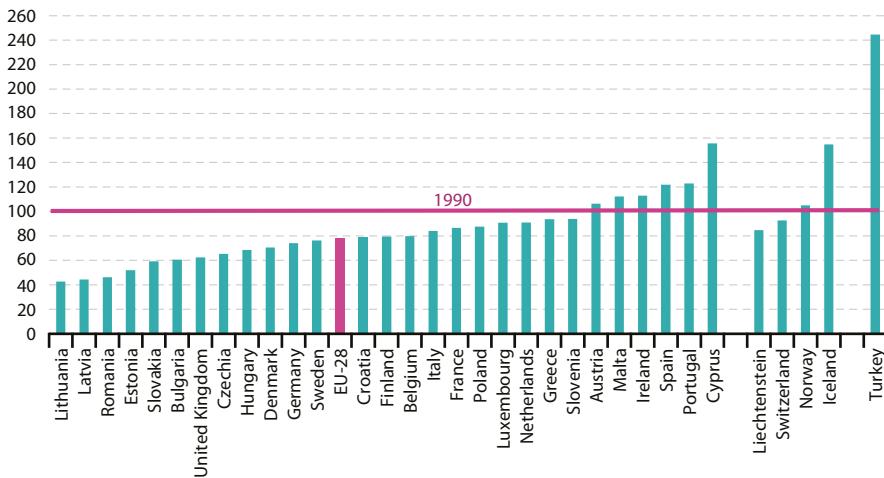
National and EU totals differ between the two approaches. GHG inventories include international aviation and maritime transport (international bunker fuels) as memorandum items, which mean that they are excluded from national totals reported. However, they are included in air emissions accounts totals. Therefore total emissions reported in GHG inventory databases can differ significantly from the total reported in air emissions accounts for countries with a large international aircraft and/or shipping fleet. AEA reconciles totals with emission inventories through so-called 'bridging items'.

Table 3.1.1: Emissions accounts versus emission inventories

Air emissions accounts – greenhouse gases (residence principle)	Greenhouse gas emission inventories (territory principle)
Emissions are assigned to the country where the economic operator causing the emission is resident.	Emissions are assigned to the country where the emission takes place.
Emissions are classified by economic activity, following the NACE classification of the system of national accounts.	Emissions are assigned to processes classified according to their technical nature (e.g. combustion in power plants, solvent use).
Emissions from international navigation and aviation are assigned to the countries where the operator of the ship/aircraft is resident, regardless of where the emission takes place.	Emissions from international navigation and aviation are assigned to the countries where the associated fuel is bunkered, irrespective of the operator's place of residence.

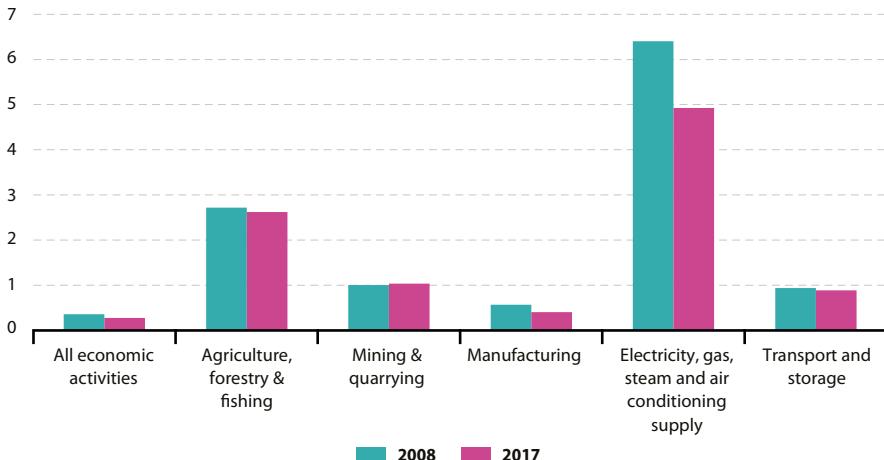
Source: Eurostat

Figure 3.1.1: Total greenhouse gas emissions (including international aviation and indirect CO₂, excluding LULUCF), by country, 2017
(Index 1990 = 100)



Source: European Environmental Agency (online data code: [env_air_gge](#))

Figure 3.1.2: Greenhouse gas intensity by economic activity, EU-28, 2008 and 2017
(kg of CO₂ equivalents per euro)



Source: Eurostat (online data code: [env_ac_aeint_r2](#))

Among the EU Member States, the GHGs emitted by the various producers and households varied considerably (see Table 3.1.2). These differences are, in part, due to different economic structures and different mixes of renewable and non-renewable energy sources.

In eleven EU Member States businesses supplying electricity, gas, steam and air conditioning were the main producers of GHGs in 2016, while in six more Member States manufacturing was the main producer. In Ireland and Latvia the activities of agriculture, forestry and fishing

were the main emitters while in Denmark, Lithuania, Luxembourg and Malta transportation and storage activities were the main source of greenhouse gas emissions. Households were the main source of GHGs in France, Croatia, Italy, Hungary and United Kingdom.

Eurostat's carbon footprint of the EU-28 measures how much CO₂ would have been emitted in the EU-28 due to EU-28's demand for products, if all imported products were produced within the EU-28 using an EU-28 average production technology.

Table 3.1.2: Greenhouse gas emissions by economic activity, 2016
(thousand tonnes of CO₂ equivalents)

	Agriculture, forestry and fishing	Mining and quarrying	Manufacturing	Electricity, gas, steam and air conditioning supply	Transportation and storage	Other services, water supply and construction	Total production activities	Hous-eholds	Production activities plus households
EU-28	521 418	79 449	831 884	1 083 723	525 315	477 940	3 519 730	903 699	4 423 429
Belgium	12 428	466	34 356	15 638	10 045	13 302	86 233	28 778	115 011
Bulgaria	4 271	372	6 839	28 555	6 227	1 496	47 760	9 881	57 641
Czechia	8 807	7 935	18 089	49 515	6 323	10 540	101 208	15 990	117 198
Denmark	12 312	1 785	5 821	11 085	43 428	6 517	80 950	8 305	89 254
Germany	72 612	6 089	171 685	337 909	87 566	89 637	765 498	193 082	958 579
Estonia	1 394	91	2 467	11 892	1 936	1 285	19 065	1 142	20 207
Ireland	20 004	331	6 526	12 000	13 734	4 430	57 026	12 420	69 446
Greece	8 330	404	13 373	31 415	6 973	9 597	70 092	15 308	85 400
Spain	46 777	1 634	77 570	58 039	46 986	28 470	259 476	68 677	328 154
France	90 694	1 187	87 532	29 889	42 721	68 289	320 313	127 890	448 202
Croatia	3 723	641	4 137	4 113	1 138	4 519	18 273	5 605	23 878
Italy	39 109	2 986	89 565	94 432	47 145	43 662	316 897	103 010	419 907
Cyprus	572	15	1 565	3 313	263	958	6 686	1 862	8 548
Latvia	3 228	49	1 184	1 967	2 575	1 498	10 501	2 079	12 581
Lithuania	4 953	11	5 255	1 813	9 369	1 457	22 859	4 541	27 399
Luxembourg	804	7	1 496	319	4 702	1 028	8 356	1 718	10 074
Hungary	9 040	753	10 588	12 419	4 285	10 301	47 386	15 640	63 025
Malta	63	3	24	307	2 397	238	3 031	197	3 228
Netherlands	29 272	2 507	44 970	52 155	25 911	22 516	177 331	36 406	213 737
Austria	8 835	891	26 597	7 684	5 106	5 980	55 093	14 743	69 835
Poland	45 813	21 456	61 649	152 175	27 194	36 291	344 578	53 319	397 897
Portugal	8 890	249	16 099	14 676	6 452	11 116	57 482	8 232	65 714
Romania	19 730	5 230	23 455	28 941	7 296	13 589	98 240	16 521	114 761
Slovenia	2 019	315	2 209	5 034	4 151	1 124	14 851	3 315	18 166
Slovakia	2 290	557	16 691	6 158	3 724	5 428	34 848	5 503	40 351
Finland	8 131	423	12 466	17 246	10 237	5 972	54 474	6 810	61 284
Sweden	9 047	1 517	14 149	6 963	13 286	7 056	52 017	9 252	61 269
United Kingdom	48 269	21 546	75 528	88 072	84 148	71 644	389 208	133 474	522 681
Iceland	871	1	1 944	5	2 408	501	5 731	584	6 315
Norway	6 127	15 314	11 776	1 733	15 079	3 098	53 126	4 883	58 010
Switzerland	6 861	74	7 210	793	7 922	10 306	33 165	19 135	52 301
Turkey	66 896	6 241	123 544	139 692	28 014	45 880	410 267	79 232	489 499

Source: Eurostat (online data code: env_ac_ainah_r2)

The EU-28's total carbon footprint was equal to 7.2 tonnes CO₂ per person in 2017. It consists of about 1.7 tonnes of CO₂ per person (tonnes/person) directly emitted by private households from burning fossil fuels (for example for heating dwellings and fuelling private vehicles) and 5.5 tonnes/person emitted indirectly along the production chains of final products which were either consumed or invested in within the EU-28. A majority of the latter — 4.4 tonnes/person — stemmed from domestic production activities actually located in the EU-28. A smaller part, equal to 1.2 tonnes/person, is estimated to have been avoided by importing intermediate and

final products into the EU-28, eventually for EU-28 final use.

Table 3.1.3 shows which products have the largest carbon footprints (CO₂ emissions due to EU-28 demand for final products). With 0.77 tonnes/person or 771 kilogrammes per person (kg/person) the final use of the product group electricity, gas, steam and air-conditioning has the biggest carbon footprint. Next ranks the final use of constructions and construction works with 644 kg/person while the final use of food products, beverages and tobacco products ranks third with a carbon footprint of 393 kg/person.

Table 3.1.3: CO₂ emissions due to final use of products, by type of final use and origin, EU-28, 2017

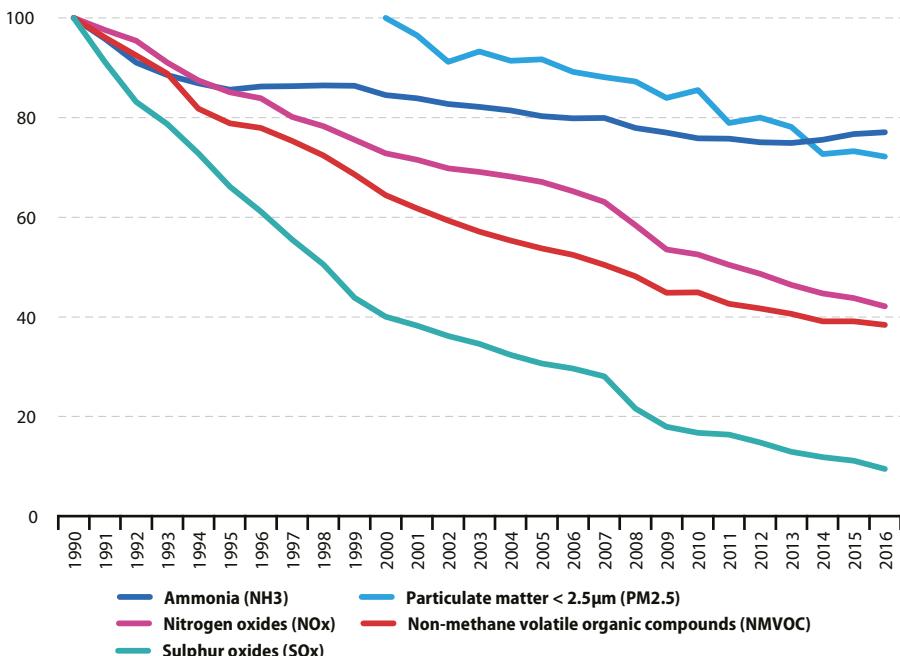
CPA product	Final consumption expenditure		Gross capital formation		Domestic final use, total	
	domestic emissions	imported emissions ^(l)	domestic emissions	imported emissions ^(l)	Global emissions	
	kg of CO ₂ per inhabitant				% ^(l)	
Electricity, gas, steam and air-conditioning	764	43	-34	-2	771	10.7
Constructions and construction works	24	5	513	102	644	8.9
Food products, beverages and tobacco products	301	87	4	1	393	5.4
Coke and refined petroleum products	135	150	0	4	290	4.0
Accommodation and food services	171	34	-0	-0	205	2.8
Public administration and defence services; compulsory social security services	172	29	1	0	202	2.8
Land transport services and transport services via pipelines	178	22	0	0	200	2.8
Retail trade services, except of motor vehicles and motorcycles	151	24	11	2	187	2.6
Air transport services	140	41	0	0	181	2.5
Real estate services (excl imputed rents)	146	26	3	1	176	2.4
Human health services	142	30	0	0	172	2.4
Wholesale trade services, except of motor vehicles and motorcycles	113	23	27	6	169	2.3
Motor vehicles, trailers and semi-trailers	63	31	37	19	151	2.1
Products of agriculture, hunting and related services	71	23	11	3	109	1.5
Machinery and equipment n.e.c.	2	1	65	38	107	1.5
Scientific research and development services	9	3	67	23	101	1.4
Education services	89	11	0	0	100	1.4
Chemicals and chemical products	51	24	5	3	84	1.2
Textiles, wearing apparel and leather products	33	45	1	3	82	1.1
Other products	686	208	193	115	1 202	17
Total	3 443	860	905	319	5 526	76.3
Direct emissions by private households	1 713	0	0	0	1 713	23.7
All CPA products (CPA = Statistical Classification of Products by Activity) plus direct emissions by private households	5 156	860	905	319	7 239	100.0

Note: Estimates.

(l) Imported emissions are estimated as 'avoided emissions due to imports'; the amount of CO₂ that would have been emitted in case the imported product would have been produced in the EU-28.

Source: Eurostat (online data code: env_ac_io10)

Figure 3.1.3: Emissions of air pollutants, EU-28, 1990-2016
(Index 1990 = 100)



Source: European Environment Agency (online data code: [env_air_emis](#))

Air pollution harms human health and the environment. Nitrogen dioxide and particulate matter pollution pose serious health risks while Europe's sensitive ecosystem areas are affected by acid deposition of excess sulphur and nitrogen compounds (SO_x, NO_x, NH₃).

Air pollutants are emitted from human activities, mainly the combustion of fuels. For the last 27 years (1990 to 2016) the EU-28 recorded reductions in emissions of all air pollutants considered in this chapter (see Figure 3.1.3).

The biggest fall was reported for sulphur oxides (SO_x) which decreased by almost 90 %, followed by non-methane volatile organic compounds (NMVOC) which declined by nearly 60 %. Emissions of nitrous oxides (NO_x) more than halved; while the smallest decrease was reported for ammonia (NH₃), emissions of which fell by roughly one quarter.

Emissions of fine particulate matter (PM2.5) decreased by roughly one third since the year 2000.

Tropospheric ozone occurs when so-called ozone precursor substances (i.e. non-methane volatile organic compounds (NMVOC), nitrogen oxides (NOx), carbon monoxide (CO) and methane (CH_4)) react in the lower atmosphere in the presence of sunlight. High ozone levels occur during the warmer summer months as the sun makes, for example, exhaust fumes from vehicles react in the lower atmosphere. High ozone levels are known to damage human tissue and are a health risk, especially for people with respiratory problems.

With 25 %, private households were the biggest contributor to total emissions of ozone precursors in 2016; closely followed by the transport industry with 24 %. The manufacturing industry was the third largest emitter with 18 % (see Figure 3.1.4). Between 2008 and 2016, the biggest absolute drop occurred in transportation and storage (1.8 million tonnes of NMVOC equivalents (NMVOC-eq.) or 25 %).

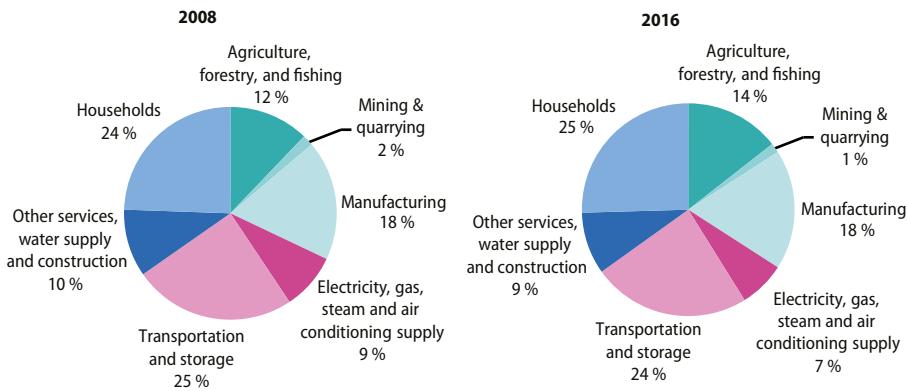
Several air pollutants contribute to the acidification of the environment. The most important ones are discussed in this chapter and

comprise sulphur dioxide (SO_2), nitrogen oxides (NOx) and ammonia (NH_3). The impact of SO_2 , NOx and NH_3 can be observed in the progressive degradation of soils, water and forests. They also contribute to the formation of fine particles in the air that cause respiratory diseases. The acidifying potential of SO_2 , NOx and NH_3 is commonly measured in SO_2 equivalents ($\text{SO}_2\text{-eq.}$).

Agriculture, forestry and fishing account for the largest share of all industries: in 2016, these activities contributed 43 % of total acidifying potential emitted by industries and households, compared with 33 % in 2008 (see Figure 3.1.5).

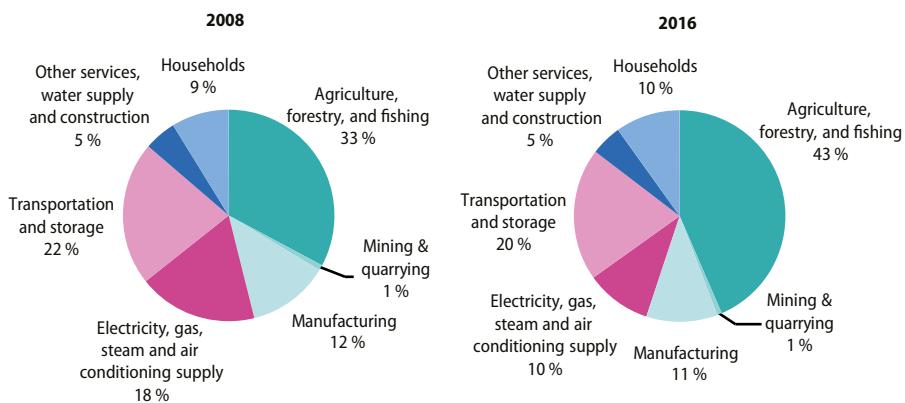
The second largest production activity in 2016 was transportation and storage with a share of 20 % or 3.6 million tonnes of $\text{SO}_2\text{-eq.}$, followed by manufacturing (11 % or 1.9 million tonnes of $\text{SO}_2\text{-eq.}$). While the largest share of emissions in transport came from NOx, in manufacturing SO_2 emissions were predominant (see Figure 3.1.5). The biggest decrease was observed in electricity, gas, steam and air conditioning supply industry, which dropped from 4.4 to 1.8 million tonnes of $\text{SO}_2\text{-eq.}$ (59 %) between 2008 and 2016.

Figure 3.1.4: Emissions of ozone precursors by economic activity, EU-28, 2008 and 2016
 (% of total emissions in NMVOC equivalents)



Source: Eurostat (online data code: env_ac_ainah_r2)

Figure 3.1.5: Emissions of acidifying gases by economic activity, EU-28, 2008 and 2016
 (% of total emissions in SO₂ equivalents)



Source: Eurostat (online data code: env_ac_ainah_r2)

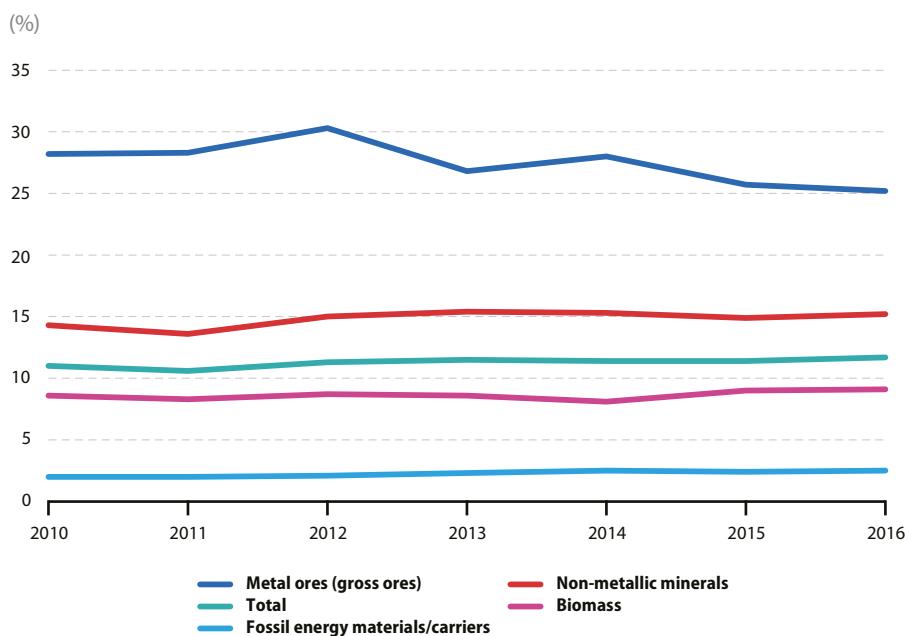
3.2 Circular economy

The circular economy aims to maintain the value of products, materials and resources for as long as possible by returning them into the product cycle at the end of their use, while minimising the generation of waste. Materials such as biomass, metals, minerals and fossil fuels, are extracted from the environment and fed into our societies to make products or produce energy. At the end of their life cycle, products may be recycled, transformed into energy or discharged as residual waste. The fewer products we discard, the less materials we extract, the better for our environment.

The rate of circularity of the EU in 2016 was, on average, only 12 % (see Figure 3.2.1). The

circularity rate, also known by the technical name of Circular material use rate (CMU rate), is the share of material resources used in the EU which came from recycled products and recovered materials - thus saving extraction of primary raw materials. A higher circularity rate means that more secondary materials substitute for primary raw materials thus reducing the environmental impacts of extracting primary material. The 12 % circularity rate in 2016 is a steady improvement from circa 8 % in 2004. However, progress is slow: with the current trend, it would take the EU a century to reach a circularity of 40 %.

Figure 3.2.1: Circular material use rate by material categories, EU-28, 2010-2016



Source: Eurostat (online data code: [env_ac_curm](#))

The circularity rate is much lower than other metrics of the circular economy, such as recycling rates, which are around 55 % in the EU. This is because the circularity rate takes account of all the materials which enter in our society, whereas the recycling rates only take account of waste. Examples of materials which count into the circularity rate are food and fodder, fossil fuels for energy production or for material use (e.g. plastics), materials which accumulate in our societies as stocks of buildings, infrastructure, vehicles, etc. Only some of these materials, at the end of their life cycle, end up as waste and thus count in recycling rates.

There are important differences of the circularity rate by material category. In 2016, the circularity rate of metal ores was 25 %; it was 15 % for

non-metallic minerals (including glass), 9 % for biomass (including paper, wood, tissue, etc.) and only 2.5 % for fossil energy materials (including plastics and fossil fuels). Fossil fuel materials are less suitable for recycling because they are mainly used up to produce energy; however, more recycling of plastics is possible. Biomass is also partly unsuitable for recycling e.g. food and fodder or wood for energy, but progress is possible by reducing food waste, recycling of natural tissues in cloths, etc. By countries, circularity rate is highest in 2016 in the Netherlands (29.0 %), followed by France (19.5 %) and Belgium (18.9 %). It is lowest in Greece (1.3 %), Romania (1.5 %) and Ireland (1.7 %) (see Table 3.2.1).

Table 3.2.1: Circular material use rate, 2010-2016

(%)

	2010	2011	2012	2013	2014	2015	2016
EU-28	11.0	10.6	11.3	11.5	11.4	11.4	11.7
Belgium	12.6	13.5	16.7	17.2	18.2	18.3	18.9
Bulgaria	2.1	1.8	1.9	2.5	2.7	3.1	4.3
Czechia	5.3	5.4	6.3	6.7	6.9	6.9	7.6
Denmark	8.0	7.1	6.5	7.8	9.1	8.4	8.2
Germany	11.0	10.3	10.7	10.9	10.7	11.2	11.4
Estonia	8.8	14.3	19.2	14.6	11.0	11.2	11.8
Ireland	1.7	1.9	1.7	1.6	1.9	1.8	1.7
Greece	2.7	2.2	1.9	1.9	1.4	1.5	1.3
Spain	10.4	9.8	9.8	8.9	7.7	7.6	8.2
France	17.5	16.8	16.9	17.3	17.8	18.7	19.5
Croatia	1.6	2.4	3.6	3.7	4.6	4.3	4.4
Italy	11.6	12.1	14.5	16.2	16.8	16.6	17.1
Cyprus	2.0	1.9	2.0	2.4	2.2	2.4	2.3
Latvia	0.7	1.6	0.7	2.3	3.1	3.3	3.9
Lithuania	3.9	3.6	3.8	3.2	3.8	4.1	4.5
Luxembourg	24.1	20.7	18.5	15.3	11.2	9.7	6.5
Hungary	5.2	5.4	6.1	6.2	5.4	5.8	6.4
Malta	5.4	4.7	4.0	8.8	10.2	6.8	5.2
Netherlands	25.4	25.3	26.6	27.2	26.6	25.9	29.0
Austria	6.3	6.4	7.1	8.3	9.1	10.0	10.6
Poland	10.8	9.2	10.6	11.8	12.5	11.6	10.2
Portugal	1.8	1.7	2.0	2.5	2.5	2.1	2.1
Romania	2.4	2.2	2.2	2.0	1.8	1.4	1.5
Slovenia	5.9	7.6	9.4	9.2	8.4	8.5	8.5
Slovakia	5.1	4.8	4.1	4.6	4.8	5.0	4.9
Finland	13.5	14.0	15.3	10.1	7.3	6.5	5.3
Sweden	7.4	7.8	8.4	7.5	6.7	6.9	7.1
United Kingdom	15.6	15.4	15.7	15.7	15.6	16.2	17.2

Source: Eurostat (online data code: env_ac_cur)

3.3 Material flow accounts

Eurostat's material flow accounts are a comprehensive data framework that systematically records the inputs of materials to European economies. Resource productivity quantifies the relation between economic activity and the consumption of natural resources, and sheds light on whether they go hand-in-hand or the extent to which they are decoupled. Natural resources include biomass, metal ores, non-metallic minerals and fossil energy materials. Domestic material consumption (DMC) measures the total amount, in tonnes, of material directly used in an economy, either by businesses, government and other institutions for economic production or by households.

The total DMC of the EU economy is estimated at 13.8 tonnes per capita in 2018.

The level of DMC differs significantly across the EU-28, ranging from around 9 tonnes per capita (Italy, the United Kingdom and Spain) to around 30 tonnes per capita (Finland, Estonia and the EFTA country Norway). Furthermore, the structure of DMC — by main material category — varies across countries, as can be seen from Figure 3.3.1. The composition of DMC in each country is influenced by natural endowments with material resources, and the latter may form an important structural element of each economy.

The consumption of non-metallic minerals varies most across countries from around 3 tonnes per capita to more than 15 tonnes per capita. The

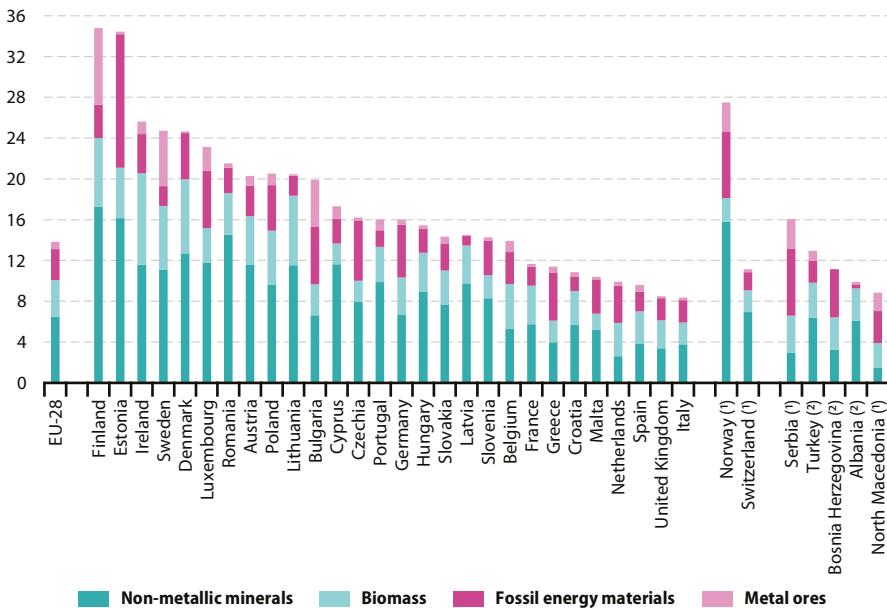
differences between countries are influenced amongst others by levels of construction activities (investments), population densities, and size of infrastructures, such as road networks. Biomass consumption also varies greatly across countries ranging between 2 and more than 8 tonnes per capita. Economies with high biomass consumption are specialised in timber production (Latvia, Finland) or certain livestock production (Ireland, Denmark).

Consumption of fossil energy material is around 3 tonnes per capita for the EU and more even across countries. Countries below average rely on non-fossil energy carriers such as nuclear and biomass (e.g. France, Sweden, Latvia). Countries well above average are those with extraordinary fossil fuel extraction activities (e.g. Estonia, Norway).

Consumption of metal ores is highest in extracting countries (Finland, Sweden and Bulgaria).

Besides the structure of the economy and climatic conditions, population density may explain — at least in part — differences between European countries in relation to consumption patterns. More densely populated Member States such as the Netherlands, Belgium, the United Kingdom, Italy and Malta tend to consume somewhat lower amounts per capita than the EU average whereas higher per capita consumption may be observed for low population density Member States like Finland, Estonia and Sweden.

Figure 3.3.1: Domestic material consumption by main material category, 2018
(tonnes per capita)

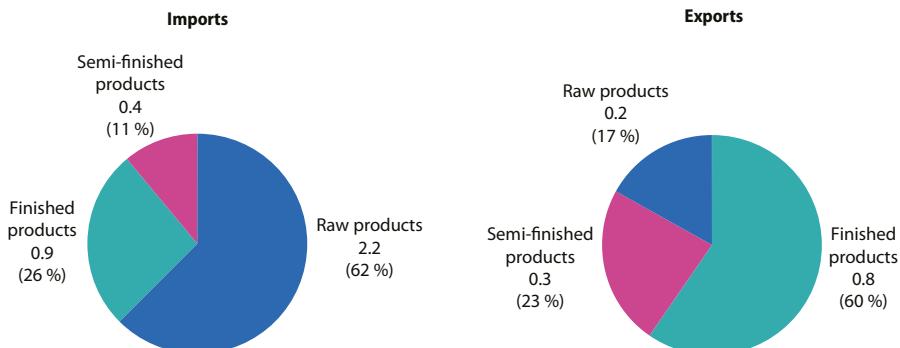


(¹) 2017 data instead of 2018.

(²) 2016 data instead of 2018.

Source: Eurostat (online data code: env_ac_mfa; demo_gind)

Figure 3.3.2: Physical imports and exports by stage of manufacturing, EU-28, 2018
(tonnes per capita)



Source: Eurostat (online data codes: env_ac_mfa, demo_gind)

Eurostat also provides data on physical imports and exports of goods in a breakdown by stage of manufacturing (see Figure 3.3.2). A distinction is made between three stages: finished products, semi-finished products and raw products.

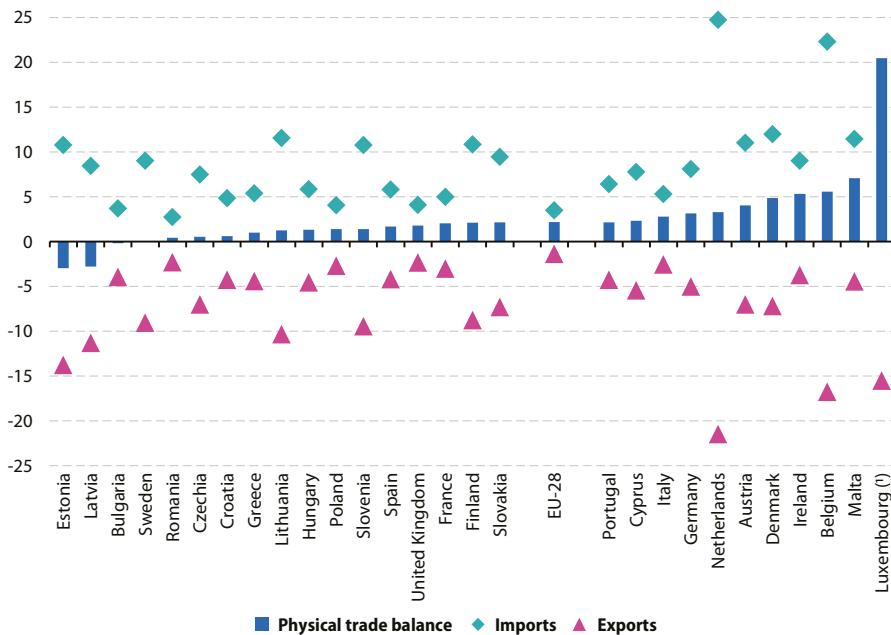
The EU's physical exports are dominated by finished products (about 60 %) whereas the physical imports are dominated by raw products more than 60 %). The EU economy is specialised in the transformation of low-value raw products into high-value finished and semi-finished products.

Figure 3.3.3 shows the physical trade balance (weight of imported goods minus exported goods) for all EU Member States. In physical terms, most EU Member States import more than

they export (i.e. net importers). There are only a few net exporting countries, namely Estonia (wood, fossil energy materials) and Latvia (wood).

Resource productivity is measured as gross domestic product (GDP) over DMC. Two different versions of GDP are used in this article: GDP at market prices expressed in chain-linked volume is used for comparisons over time as it shows the development of the economic aggregate excluding inflation; GDP at market prices expressed in current prices converted into purchasing power standards (PPS), is used for cross-country comparisons in a specific year as PPS remove differences in price levels between countries.

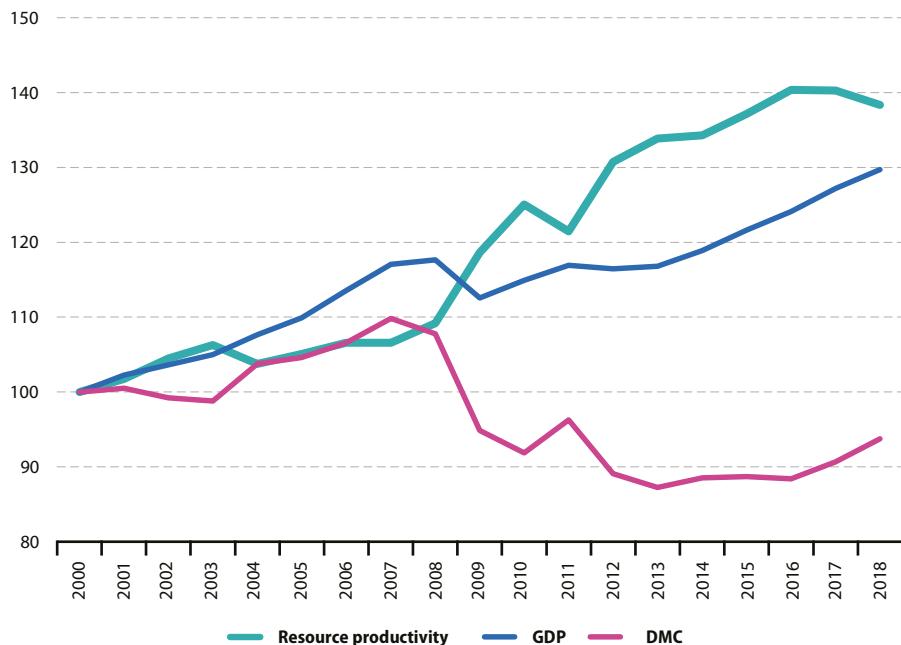
**Figure 3.3.3: Physical trade balance (imports minus exports) by country, 2018
(tonnes per capita)**



⁽¹⁾ Physical imports of Luxembourg account for 36 tonnes per capita

Source: Eurostat (online data code: env_ac_mfa_demo_gind)

Figure 3.3.4: Resource productivity in comparison to GDP and DMC, EU-28, 2000-2018
(Index 2000=100)



Note: GDP in chain-linked volumes, reference year 2010

Source: Eurostat (online data code: [nama_10_gdp](#), [env_ac_mfa](#); [env_ac_rp](#))

Since 2000, the resource productivity in the EU-28 economy increased by around 40 % (see Figure 3.3.4 and Table 3.3.1), although growth has been stagnating for the latest years. The financial and economic crises (2008-2009) had a clear influence on the development path of the EU's resource productivity. After a moderate growth in the pre-crisis era, resource productivity had a marked increase during the crisis due to a very sharp decrease of DMC. The DMC fall was more pronounced than the decrease of GDP: the crisis affected the material-intensive industries of manufacturing and construction more than the rest of the economy, such as services industries.

At Member State level, resource productivity developed quite differently (see Table 3.3.1), although it increased in nearly all countries between the year 2000 and today.

Physical imports and exports can be complemented with supplementary estimates of the amounts of raw materials needed to produce traded goods. This can be done by converting the traded goods into their raw material equivalents (RME), i.e. the amount of raw materials that need to be extracted to produce the traded goods.

Table 3.3.1: Resource productivity, GDP and DMC, by country, 2017

	GDPPPS per capita	DMC per capita	Resource productivity (GDPPPS/DMC)	
	(PPS per capita)	(tonnes per capita)	(PPS per kilogram)	(Index EU-28 = 100)
EU-28	30 064	13.4	2.2	100.0
Belgium	34 888	13.8	2.5	112.7
Bulgaria	14 791	19.7	0.8	33.6
Czechia	26 846	15.7	1.7	76.4
Denmark	38 382	24.2	1.6	70.7
Germany	37 121	15.8	2.3	104.6
Estonia	23 617	31.0	0.8	34.0
Ireland	54 235	23.5	2.3	103.1
Greece	20 179	11.3	1.8	79.7
Spain	27 565	8.9	3.1	138.2
France	31 248	11.7	2.7	119.2
Croatia	18 543	10.0	1.9	83.0
Italy	28 936	8.2	3.5	158.1
Cyprus	25 528	17.9	1.4	63.5
Latvia	20 027	13.0	1.5	68.5
Lithuania	23 479	17.8	1.3	58.7
Luxembourg	76 006	23.4	3.2	144.7
Hungary	20 334	13.1	1.6	69.4
Malta	29 315	11.8	2.5	110.7
Netherlands	38 485	9.3	4.1	184.4
Austria	38 043	20.0	1.9	84.6
Poland	21 133	18.8	1.1	50.2
Portugal	22 987	15.9	1.4	64.5
Romania	18 778	21.2	0.9	39.5
Slovenia	25 527	13.1	1.9	86.8
Slovakia	22 856	13.1	1.7	78.0
Finland	32 728	33.0	1.0	44.2
Sweden	36 296	24.0	1.5	67.3
United Kingdom	31 702	8.5	3.7	166.3
Norway	43 906	27.1	1.6	72.3
Switzerland	46 812	11.5	4.1	182.1
North Macedonia	10 842	8.8	1.2	54.6
Albania(‘)	8 634	9.9	0.9	38.7
Serbia	11 603	16.0	0.7	32.3
Turkey (‘)	19 155	12.9	1.5	66.2
Bosnia and Herzegovina(‘)	8 994	:	:	-

Note: GDP in current prices, Purchasing Power Standards (PPS)

(‘) 2016 data instead of 2017.

Source: Eurostat (online data codes: env_ac_mfa, nama_10_gdp, demo_gind)

Eurostat has developed a model to estimate the raw material equivalents of imports and exports for the aggregated EU economy.

Figure 3.3.5 shows that imports in RME and exports in RME are both substantially higher than the same flows measured in the actual weight of the traded goods as they cross the border. Imports in RME for the EU are estimated at 8.3 tonnes per capita, 2.5 times higher than actual physical imports. At 5.4 tonnes per capita, exports in RME are 4.1 times higher than actual physical exports.

The physical trade balance (imports minus exports) in RME is 2.8 tonnes per capita whereas

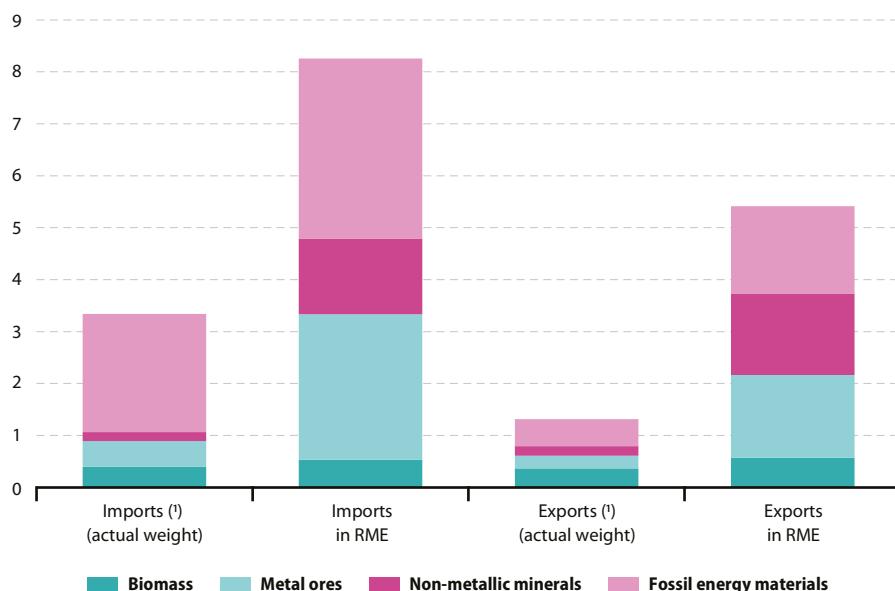
the actual physical trade balance itself is 2.0 tonnes per capita in 2016. As for imports and exports, the difference is mostly due to the material category of metal ores.

The adjustment of the trade flows from actual weight when crossing the border to RME also impacts the material flow indicators. The main RME-based indicator is raw material consumption (RMC), which mirrors DMC from the EW-MFA.

It is also referred to as the EU's material footprint. RMC represents the total amount of extracted raw materials needed to produce the goods and services consumed by residents of the EU.

Figure 3.3.5: Comparison of the actual weight of traded goods with trade in raw material equivalents (RME), EU-28, 2016

(tonnes per capita)



(!) The material categories 'other products' and 'waste' from EW-MFA are proportionally assigned to the four main material categories represented

Source: Eurostat (online data codes: [env_ac_mfa](#), [env_ac_rme](#), [demo_gind](#))

Figure 3.3.6 shows the development of the EU's material footprint or raw material consumption (RMC) over time. The change in total RMC is captured by combining the four areas reflecting the different material categories. For comparison, the development of DMC is included in the graph as a dotted line. Both indicators show almost the same development.

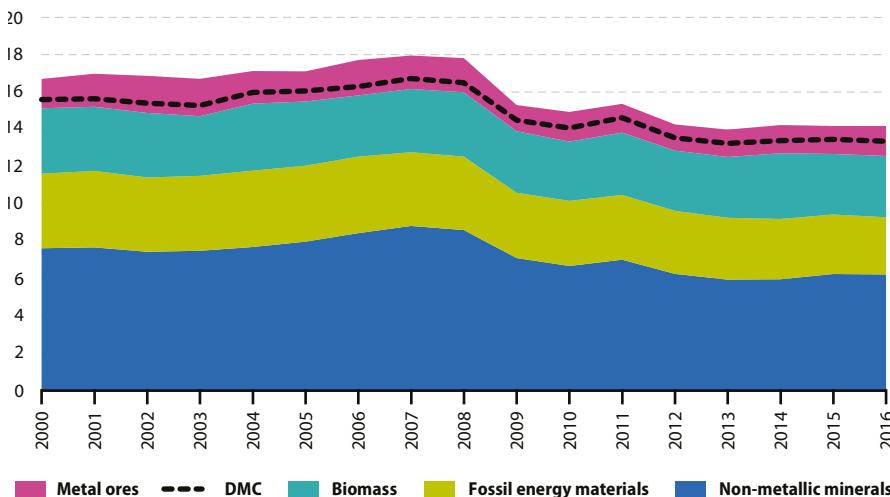
For 2016, the absolute difference between RMC and DMC is 0.82 tonnes per capita. The minimum difference over the time period shown is 0.72 tonnes per capita, in 2015, and the maximum difference is 1.47 tonnes per capita in 2002.

The RMC of non-metallic minerals is the major driver of the observed trend given that its development over time has the largest impact on the overall development. As the physical trade of non-metallic minerals is small and the trade balance in RME is close to zero, the total amount of RMC of this material category is close to the domestic extraction. This means that the development of total RMC is mainly determined by domestic extraction of non-metallic minerals.

Non-metallic minerals are mostly composed of construction minerals such as sand and gravel. Gross value added in construction increased by 12 % in the EU-28 from 2000 to 2007. Domestic extraction of non-metallic minerals increased by 19 % in the same period. Gross value added in construction decreased by 11 % during the economic crisis (2010 compared to 2007) and decreased further by 5 % in 2016 (compared to 2010).

Domestic extraction of non-metallic minerals decreased by 22 % (2010 compared to 2007) and by 5 % in 2016 (compared to 2010). It therefore seems that domestic extraction of non-metallic minerals tends to increase or decrease more than gross value added in construction. It also suggests that gross value added in construction is not only the main factor affecting the development of domestic extraction of construction minerals, but that it also drives the development of RMC.

Figure 3.3.6: Raw material consumption (RMC) by main material categories, EU-28, 2000–2016
(tonnes per capita)



Source: Eurostat (online data codes: env_ac_mfa, env_ac_rme, demo_gind)

3.4 Waste

Waste, defined by Directive 2008/98/EC Article 3(1) as 'any substance or object which the holder discards or intends or is required to discard', potentially represents an enormous loss of resources in the form of both materials and energy. In addition, the management and disposal of waste can have serious environmental impacts. Landfill, for example, takes up land space and may cause air, water and soil pollution, while incineration may result in emissions of air pollutants.

EU waste management policies therefore aim to reduce the environmental and health impacts of waste and to improve the EU's resource efficiency. The long-term aim of these policies is to reduce the amount of waste generated and when waste generation is unavoidable to promote it as a resource and achieve higher levels of recycling and the safe disposal of waste.

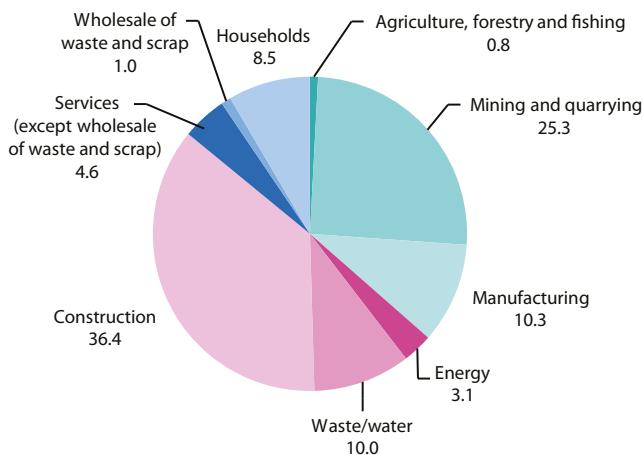
In 2016, the total waste generated in the EU-28 by all economic activities and households amounted to 2 538 million tonnes; this was the

highest amount recorded for the EU-28 during the period 2004–2016 (a time series only exists for even years).

As might be expected, the overall amount of waste generated is related to some extent to the population and economic size of a country. In Table 3.4.1, the smallest EU Member States generally reported the lowest levels of waste generation and the larger ones the highest. Nevertheless, relatively high quantities of waste were generated in Bulgaria and Romania and a relatively low quantity in Italy.

The share of different economic activities and of households in total waste generation in 2016 is presented in Figure 3.4.1. In the EU-28, construction contributed 36.4 % of the total in 2016 and was followed by mining and quarrying (25.3 %), manufacturing (10.3 %), waste and water services (10.0 %) and households (8.5 %); the remaining 9.5 % was waste generated from other economic activities, mainly services (4.6 %) and energy (3.1 %).

Figure 3.4.1: Waste generation by economic activities and households, EU-28, 2016 (%)



Source: Eurostat (online data code: env_wasgen)

Table 3.4.1: Waste generation by economic activities and households, 2016
(%)

	Mining and quarrying	Manufacturing	Energy	Construction and demolition	Other economic activities	Households
EU-28	25	10	3	36	16	8
Belgium	0	23	1	31	36	8
Bulgaria	82	3	8	2	3	2
Czechia	1	18	4	40	23	14
Denmark	0	5	4	58	16	17
Germany	2	14	3	55	17	9
Estonia	26	37	25	5	6	2
Ireland	16	35	2	10	28	10
Greece	78	6	4	1	4	7
Spain	16	11	3	28	26	17
France	1	7	0	69	14	9
Croatia	12	8	2	24	31	22
Italy	0	17	2	33	29	18
Cyprus	5	33	0	36	10	16
Latvia	0	19	11	4	30	34
Lithuania	1	41	2	8	32	17
Luxembourg	0	7	0	75	11	6
Hungary	1	17	16	23	25	18
Malta	8	1	0	69	13	8
Netherlands	0	10	1	70	13	6
Austria	0	9	1	73	10	7
Poland	39	17	11	10	18	5
Portugal	3	17	1	12	35	33
Romania	87	4	4	0	3	2
Slovenia	0	26	14	10	38	12
Slovakia	3	32	9	9	29	18
Finland	76	8	1	11	3	1
Sweden	77	4	1	7	7	3
United Kingdom	6	4	0	49	30	10
Iceland	0	25	0	4	31	40
Liechtenstein	3	2	0	88	1	5
Norway	3	14	2	27	32	22
Montenegro	19	2	18	37	10	13
North Macedonia	49	51	0	0	0	0
Serbia	79	3	12	1	2	3
Turkey	11	:	26	:	:	37
Bosnia and Herzegovina (?)	2	27	71	0	0	0
Kosovo (?)	14	20	40	6	10	11

(1) 2012.

(2) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: env_wasgen)

In 2016, some 2 312 million tonnes of waste were treated in the EU-28. This doesn't include exported waste but includes the treatment of waste imported into the EU. The reported amounts are therefore not directly comparable with those on waste generation.

In the EU-28 in 2016, slightly more than half (53.3 %) of the waste was treated in recovery operations: recycling (37.8 % of the total treated waste) backfilling (9.9 %) or energy

recovery (5.6 %). The remaining 46.7 % was either incinerated without energy recovery (1.0 %) or disposed of otherwise, mainly by landfilling (45.7 %). Significant differences could be observed among the EU Member States concerning the use they made of these various treatment methods. For instance, some Member States had very high recycling rates (Italy and Belgium), while others favoured landfill (Greece, Bulgaria, Romania, Finland and Sweden) (see Table 3.4.2).

**Table 3.4.2: Waste treatment, 2016
(% of total)**

	Recovery			Disposal	
	Recycling	Backfilling	Energy recovery	Landfill and other	Incineration without energy recovery
EU-28	37.8	9.9	5.6	45.7	1.0
Belgium	76.9	0.0	12.6	6.4	4.1
Bulgaria	5.2	0.0	0.4	94.4	0.0
Czechia	49.5	29.0	4.5	16.6	0.4
Denmark	51.4	0.0	19.5	29.1	0.0
Germany	42.7	26.6	11.3	18.1	1.2
Estonia	21.6	11.2	2.5	64.7	0.0
Ireland	10.6	46.0	4.8	38.4	0.3
Greece	4.8	0.0	0.3	94.8	0.0
Spain	37.1	5.7	3.6	53.6	0.0
France	55.0	10.3	5.4	27.6	1.6
Croatia	47.2	4.0	1.0	47.8	0.0
Italy	78.9	0.1	4.0	14.2	2.7
Cyprus	10.4	28.0	3.8	57.8	0.0
Latvia	71.7	1.1	6.8	20.3	0.0
Lithuania	33.4	4.1	5.8	56.6	0.0
Luxembourg	34.8	24.2	2.1	39.0	0.0
Hungary	54.1	3.7	7.4	34.2	0.6
Malta	19.1	63.4	0.0	17.2	0.4
Netherlands	45.6	0.0	7.6	46.0	0.9
Austria	37.0	11.0	:	45.9	:
Poland	46.2	22.2	3.3	28.0	0.4
Portugal	43.5	9.5	12.1	34.7	0.2
Romania	4.0	0.4	1.4	94.1	0.1
Slovenia	60.2	27.2	4.8	6.9	0.8
Slovakia	40.0	4.7	7.0	47.8	0.5
Finland	7.4	0.0	4.5	88.0	0.0
Sweden	12.0	4.9	6.6	76.3	0.2
United Kingdom	48.5	7.8	3.4	37.5	2.7
Iceland	25.0	51.0	0.4	22.3	1.3
Norway	43.5	2.6	34.0	19.5	0.5
Montenegro	0.8	0.0	0.2	98.9	0.0
Serbia	2.8	0.8	0.2	96.3	0.0
Turkey	33.0	0.0	0.8	:	0.2
Kosovo (1)	0.0	0.0	0.0	100.0	0.0

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: env_wastr)

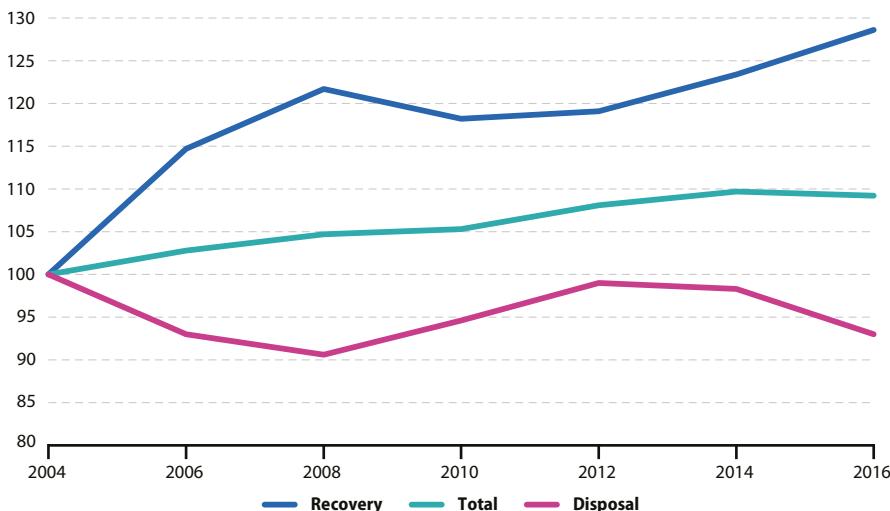
Figure 3.4.2 shows the development of waste treatment in the EU-28 for the two main treatment categories – recovery and disposal – during the period 2004-2016. The quantity of waste recovered, in other words recycled, used for backfilling (the use of waste in excavated areas for the purpose of slope reclamation or safety or for engineering purposes in landscaping) or incinerated with energy recovery grew by 24.7 % from 960 million tonnes in 2004 to 1 198 million tonnes in 2016; as a result, the share of such recovery in total waste treatment rose from 45.4 % in 2004 to 53.6 % by 2016. The quantity of waste subject to disposal decreased from 1 154 million tonnes in 2004

to 1 038 million tonnes in 2016, which was a decrease of 10.1 %. The share of disposal in total waste treatment decreased from 54.6 % in 2004 to 46.7 % in 2016.

Municipal waste accounts for only about 10 % of total waste generated when compared with the data reported according to the Waste Statistics Regulation. However, it has a very high political profile because of its complex character, due to its composition, its distribution among many sources of waste, and its link to consumption patterns.

Eurostat has collected and published data on municipal waste since 1995.

Figure 3.4.2: Development of waste treatment, EU-28, 2004-2016
(Index 2004 = 100)



Source: Eurostat (online data code: [env_wastrt](#))

Table 3.4.3 shows waste for selected years, covering the period 1995 to 2017. For 2017, municipal waste generation totals vary considerably, ranging from 272 kg per capita in Romania to 781 kg per capita in Denmark. The variations reflect differences in consumption patterns and economic wealth, but also depend on how municipal waste is collected and managed. There are differences between countries regarding the degree to which waste from commerce, trade and administration is collected and managed together with waste from households.

Figure 3.4.3 shows the amount of waste generated at EU-28 level and the amount of waste by treatment category (landfill, incineration, material recycling, composting and other). The 'other treatment' category was calculated as the difference between the sum of the amounts treated and the amounts of waste generated. This difference arises in countries that

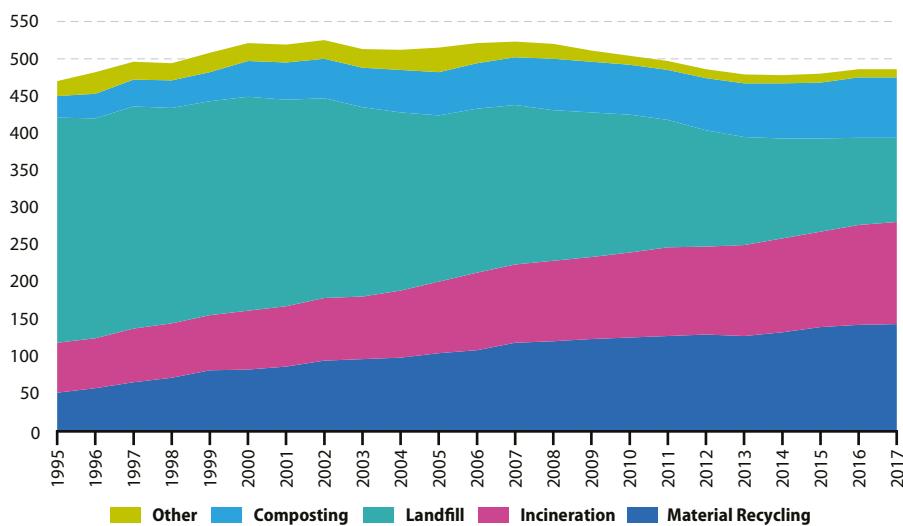
have to estimate waste generation in areas not covered by a municipal waste collection scheme and thus report more waste generated than treated.

In the reference period, the total municipal waste landfilled in the EU-28 fell by 88 million tonnes, or 60 % - from 145 million tonnes (302 kg per capita) in 1995 to 58 million tonnes (113 kg per capita) in 2017. This corresponds to an average annual decline of 4.1 %.

For the shorter period 2005–2017 landfilling has fallen by as much as 5.6 % per year on average. As a result, the landfilling rate (landfilled waste as share of generated waste) in the EU-28 dropped from 64 % in 1995 to 23 % in 2017.

The amount of waste recycled (material recycling and composting) rose from 39 million tonnes (81 kg per capita) in 1995 to 116 million tonnes (215 kg per capita) in 2017 at an average annual rate of 5.0 %.

**Figure 3.4.3: Municipal waste treatment, EU-28, 1995–2017
(kg per capita)**



Source: Eurostat (online data code: env_wasmun)

Table 3.4.3: Municipal waste generated, in selected years, 1995-2017
(kg per capita)

	1995	2000	2005	2011	2017	Change 2017/1995 (%)
EU-28	470	521	515	497	486	3.4
Belgium	455	471	482	453	410	-9.9
Bulgaria	694	612	588	508	435	-37.3
Czechia	302	335	289	320	344	13.9
Denmark	521	664	736	781	781	49.9
Germany	623	642	565	626	633	1.6
Estonia	371	453	433	301	390	5.1
Ireland	512	599	731	616	:	:
Greece	303	412	442	503	504	66.3
Spain	505	653	588	485	462	-8.5
France	475	514	529	534	514	8.2
Croatia	:	262	336	384	416	:
Italy	454	509	546	529	489	7.7
Cyprus	595	628	688	672	637	7.1
Latvia	264	271	320	350	438	65.9
Lithuania	426	365	387	442	455	6.8
Luxembourg	587	654	672	666	607	3.4
Hungary	460	446	461	382	385	-16.3
Malta	387	533	623	589	604	56.1
Netherlands	539	598	599	568	513	-4.8
Austria	437	580	575	573	570	30.4
Poland	285	320	319	319	315	10.5
Portugal	352	457	452	490	487	38.4
Romania	342	355	383	259	272	-20.5
Slovenia	596	513	494	415	471	-21.0
Slovakia	295	254	273	311	378	28.1
Finland	413	502	478	505	510	23.5
Sweden	386	428	477	449	452	17.1
United Kingdom	498	577	581	491	468	-6.0
Iceland	426	462	516	495	656	54.0
Norway	624	613	426	485	748	19.9
Switzerland	600	656	661	689	706	17.7
Montenegro	:	:	:	524	:	:
North Macedonia	:	:	:	357	344	:
Albania	:	:	:	:	436	:
Serbia	:	:	:	375	306	:
Turkey	441	465	458	416	425	-3.6
Bosnia and Herzegovina	:	:	:	340	352	:
Kosovo (l)	:	:	:	:	228	:

(l) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data code: env_wasmun)

Since 1995, the amount of municipal waste incinerated in the EU-28 has risen by 38 million tonnes or 118 % and accounted for 70 million tonnes in 2017. Municipal waste incinerated has thus risen from 67 kg per capita to 137 kg per capita.

Figure 3.4.4 shows the recycling rate for all packaging waste for the EU Member States and EEA/EFTA countries in 2016. The recycling covers material recycling and other forms of recycling (e.g. organic recycling). The target of 55 % recycled packaging waste was met by all EU Member States, except Hungary (49.7 %) and Malta (39.7 %).

Figure 3.4.5 shows the recycling rate for plastic packaging waste for the EU Member States and

EEA/EFTA countries in 2016. The recycling rate covers only material recycling and not other forms of recycling, i.e. exclusively material that is recycled back into plastics.

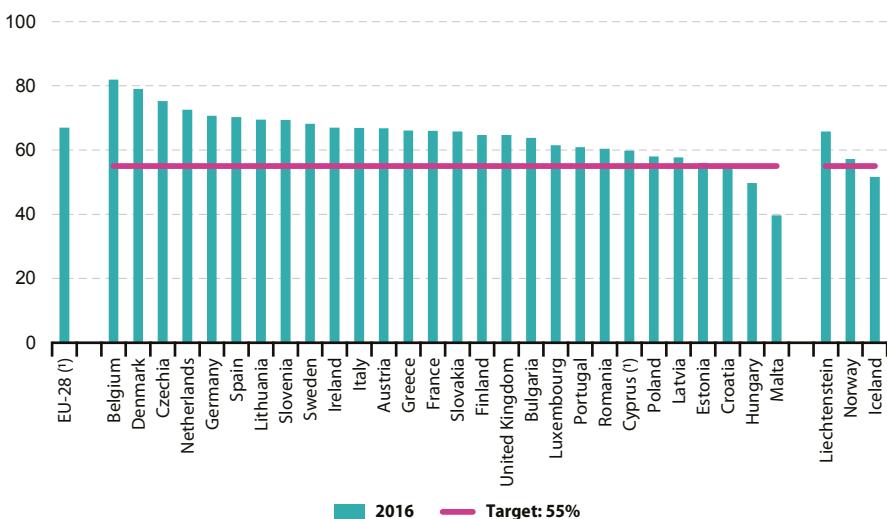
The target of 22.5 % recycled plastic packaging waste was met by all EU Member States, only Lichtenstein, with 20.9 %, did not reach the target.

Figure 3.4.6 shows that in 2016 'paper and cardboard' (41 %), 'plastic' (19 %), 'glass' (19 %), 'wood' (16 %) and 'metal' (5 %) are the most common types of packaging waste in the EU-28.

Other materials represent less than 0.3 % of the total volume of packaging waste generated in 2016.

Figure 3.4.4: Recycling rate for all packaging, 2016

(%)



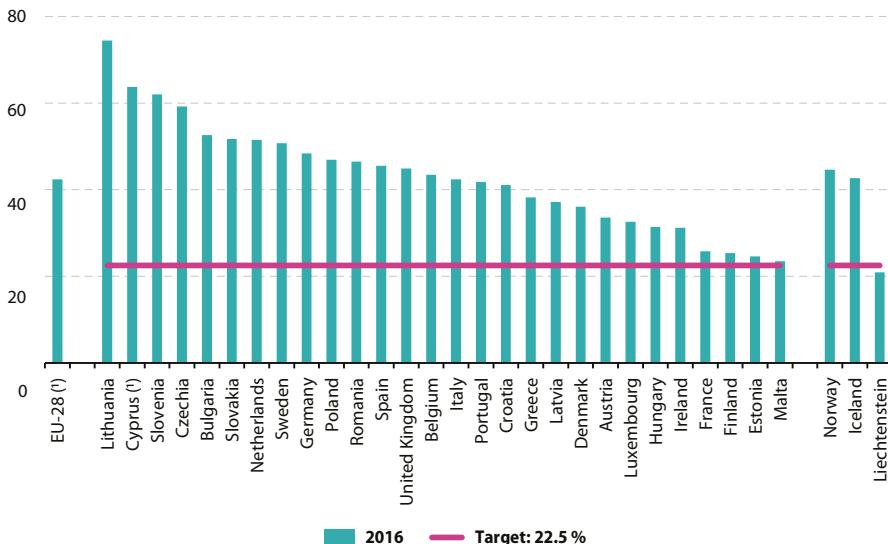
Note: ranked in descending order of recycling rate.

(?) Estimate: Cyprus (2015 data)

Source: Eurostat (online data code: env_waspac)

Figure 3.4.5: Recycling rate for plastic packaging waste, 2016

(%)

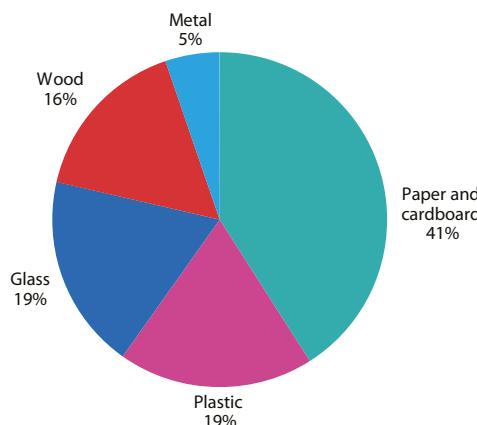


Note: ranked in descending order of recycling rate.

(I) Estimate: Cyprus (2015 data)

Source: Eurostat (online data code: [env_waspac](#))**Figure 3.4.6:** Packaging waste generated by packaging material, EU, 2016

(%)



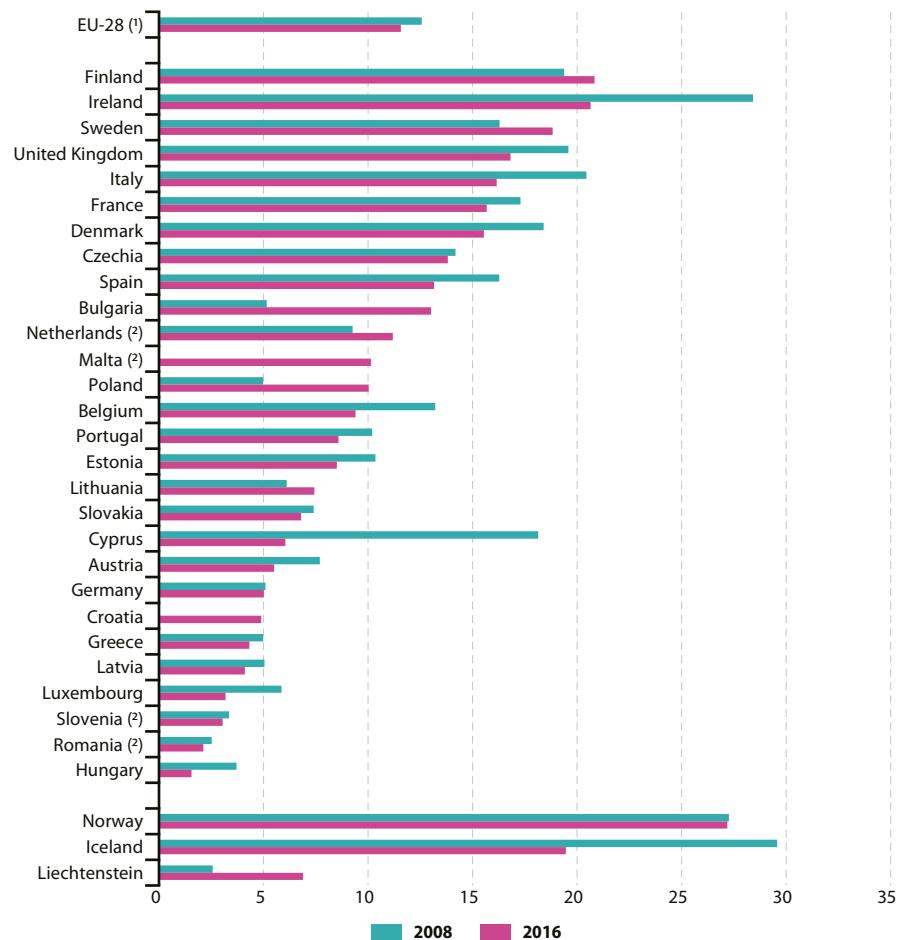
Notes: Data from the EU aggregate have been estimated by Eurostat.

Source: Eurostat ([env_waspac](#))

Figure 3.4.7 shows the number of end-of-life vehicles per 1 000 inhabitants in the European Union and EFTA countries for 2008 and 2016. The calculation of the number of dismantled cars per 1000 inhabitants is based on the total average population. In 2016, 21 end-of-life cars

per 1 000 inhabitants were accounted for Ireland and Finland, and 27 in Norway, while the EU-28 average stood at 12 demolished cars per 1 000 inhabitants. The number of end-of-life vehicles per 1 000 inhabitants in the EU-28 decreased by 7.9 % in 2016 compared with 2008.

Figure 3.4.7: End-of-life vehicles, 2008 and 2016
(number of dismantled cars per 1000 inhabitants)



⁽¹⁾ Eurostat estimates for 2008 and 2016.

⁽²⁾ Eurostat estimates for 2016.

Source: Eurostat (online data code: env_waselvt)

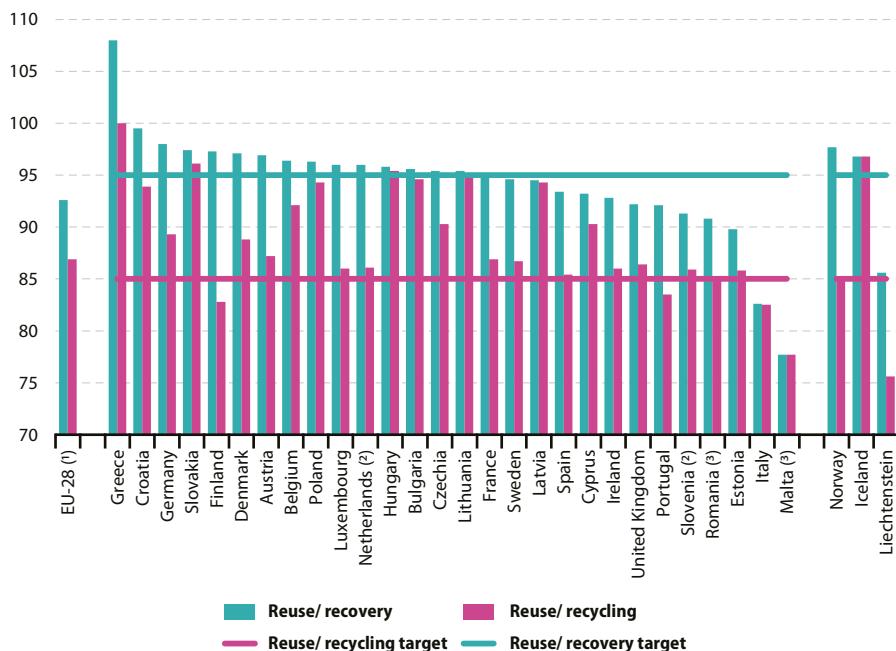
As displayed in Figure 3.4.8, the rates calculated for the EU-28 for reuse and recycling stood at 86.9 % and for reuse and recovery at 92.6 % in 2016. However, 4 EU Member States, namely Finland, Portugal, Italy and Malta (estimated) did not meet the minimum rate of 85 % for reuse and recycling in order to comply with the Directive 2000/53/EC in 2016. As regards the reuse and recovery target, while 15 Member States were in compliance with the Directive 2000/53/EC in 2016, 13 EU Member States (France, Sweden, Latvia, Spain, Cyprus, Ireland, the United Kingdom, Portugal, Slovenia, Romania, Estonia,

Italy and Malta) failed to meet the minimum reuse and recovery rate of 95 %. While 25 Member States complied with at least one of the two targets, 3 Member States, namely Portugal, Italy and Malta (estimated) failed to meet any of them.

When remaining stocks from previous years were treated in the following years due to capacity limitations or low metal prices (e.g. in Greece) or any other reason, it may happen that values higher than 100 % for reuse and recovery rate appear.

Figure 3.4.8: Recovery and recycling rate for end-of-life vehicles, 2016

(%)



Notes: ranked on 'Reuse/recovery'. The y-axis is cut.

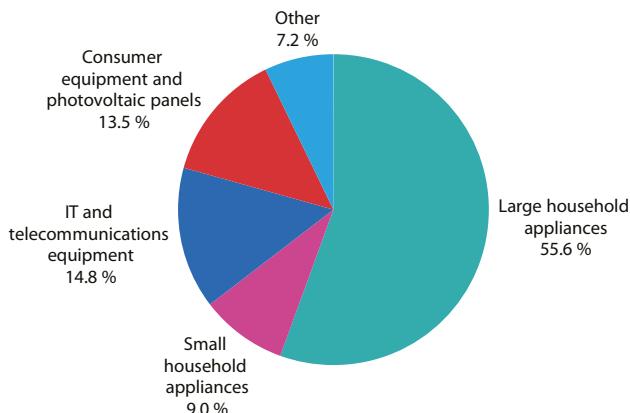
(I) Eurostat estimate for 2016.

(?) 2014 data.

(?) 2015 data.

Source: Eurostat (online data code: env_waselvt)

Figure 3.4.9: Waste electrical and electronic equipment, total collected, by EEE category, 2016
(%)

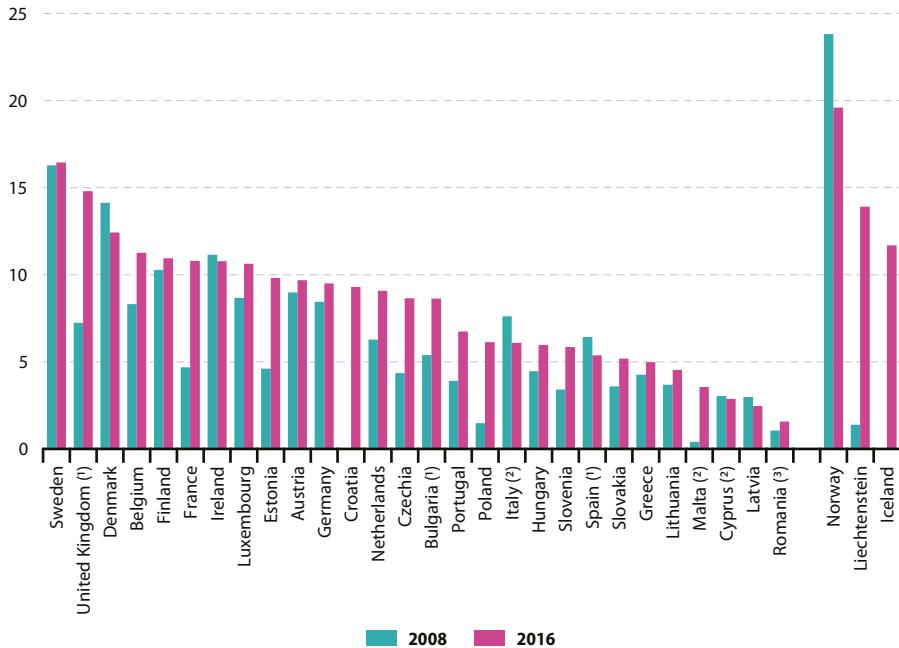


Source: Eurostat (online data code: [env_waselee](#))

Figure 3.4.9 shows the amount of WEEE collected by equipment category. Large household appliances account for approximately 2.5 million tonnes, i.e. 55.6 % of the total WEEE collected in 2016. IT and telecommunications equipment (14.8 %) and consumer equipment and photovoltaic panels (13.5 %) are the second and third largest categories for WEEE collection in the EU, accounting for 669 thousand tonnes and 610 thousand tonnes respectively. Small household appliances contributed with 408 thousand tonnes, accounting for 9.0 % to WEEE collection. The remaining seven categories together (see 'Other') totaled about 325 thousand tonnes, or 7.2 % of WEEE collected in the EU in 2016.

Figure 3.4.10 shows the amount of WEEE collected by country in kg per inhabitant for the years 2008 and 2016. The figure illustrates both the level of collection in the countries and the progress made between 2008 and 2016. In 2016, the total amount of collected WEEE varied considerably across EU Member States, ranging from 1.6 kg per inhabitant in Romania to 16.5 kg per inhabitant in Sweden. The considerable variation in the collected amounts reflects differences in EEE consumption levels as well as the different performance levels of existing waste collection schemes.

Figure 3.4.10: Waste electrical and electronic equipment, total collected, 2008 and 2016 (kg per inhabitant)



Note: Ranked by 2016 data.

(1) 2008: Eurostat estimate.

(2) 2016: 2015 data instead.

(3) 2016: 2014 data instead.

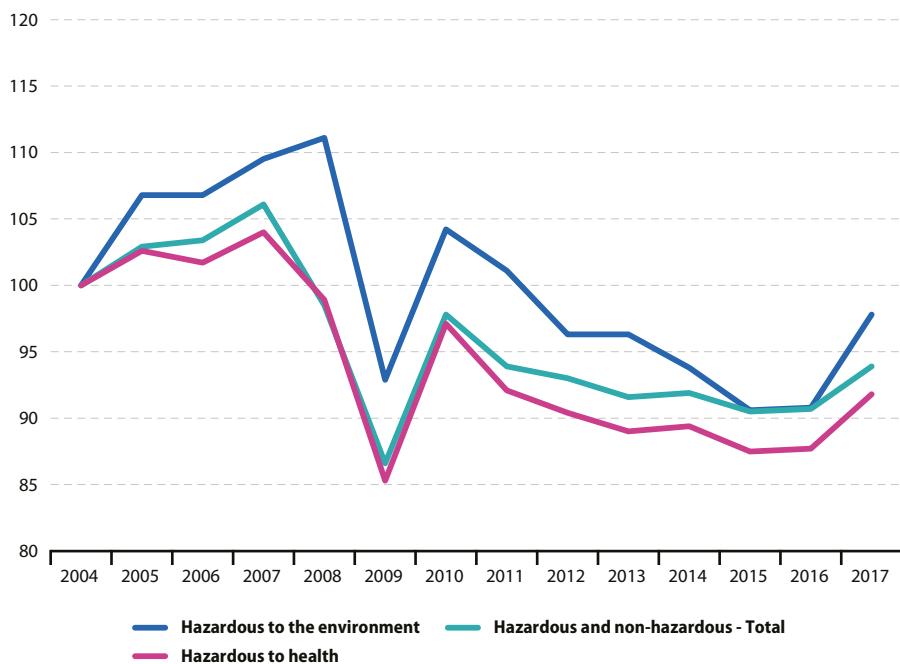
Source: Eurostat (online data code: [env_waselee](#))

3.5 Chemicals

The total production of industrial chemicals in the EU-28 increased each year between 2004 and 2007, rising overall by 6.1 % to peak at 330 million tonnes in 2007 (see Figure 3.5.1). During the financial and economic crisis, production fell by 24 million tonnes in 2008 and by a further 37 million tonnes in 2009 (or about 18 % in total). The rebound in activity in 2010 made up for the losses reported in 2009. In

2011, the production of chemicals in the EU-28 decreased again and then decreased only slightly during the period 2011–2016, which was still 40–50 million tonnes below the precrisis peak in 2007. In 2017, for the first time since 2010, there was a noticeable increase of 10 million tonnes. The production of industrial chemicals was largely concentrated in Western Europe.

Figure 3.5.1: Production of chemicals, EU-28, 2004–2017
(index 2004 = 100)



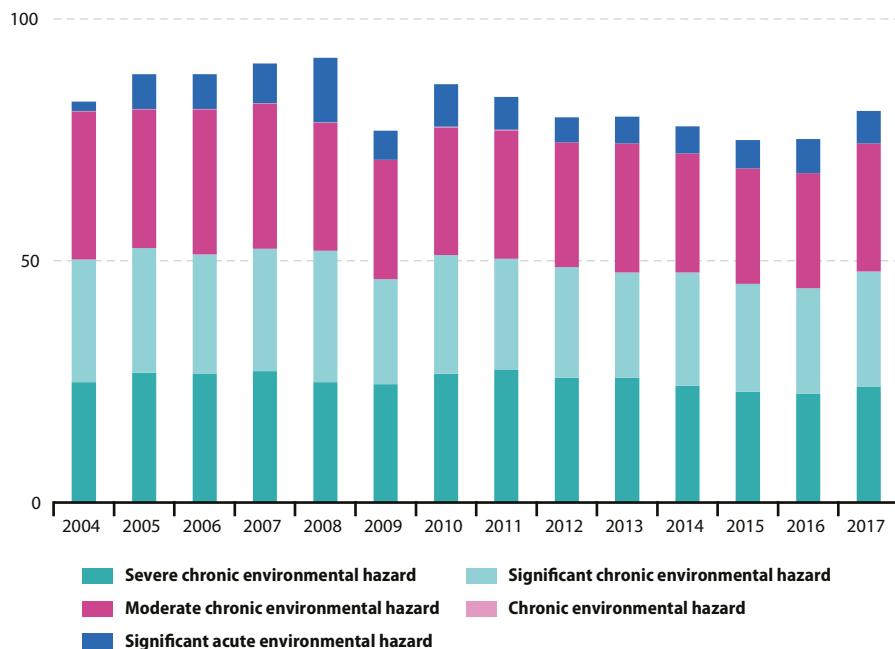
Note: the y-axis is cut.

Source: Eurostat (online data codes: env_chmhaz)

Figure 3.5.2 presents the development of the production of chemicals that are hazardous to the environment, analysed in more detail according to five classes of environmental hazard. The aggregated production of these five classes in the EU-28 slightly grew between 2004 and 2007 to reach a peak of 92 million tonnes. The production of chemicals hazardous to the environment fell by 15 million tonnes during the next two years to a low of 77 million tonnes in

2009. As was the case for the overall production of chemicals, there was a strong re-bound in the production of chemicals hazardous to the environment in 2010. During the period 2011–2015 the production of these five classes fell from 86 to 75 million tonnes which is an absolute minimum for the entire reporting period. Starting in 2016, production began to rise again and reached a level of 81 million tonnes in 2017.

Figure 3.5.2: Production of chemicals hazardous to the environment, EU-28, 2004–2017 (million tonnes)



Note: The different classes of chemicals are ranked according to their environmental effect from the most harmful (bottom class) up to the least harmful (top class).

Source: Eurostat (online data code: [env_chmhaz](#))

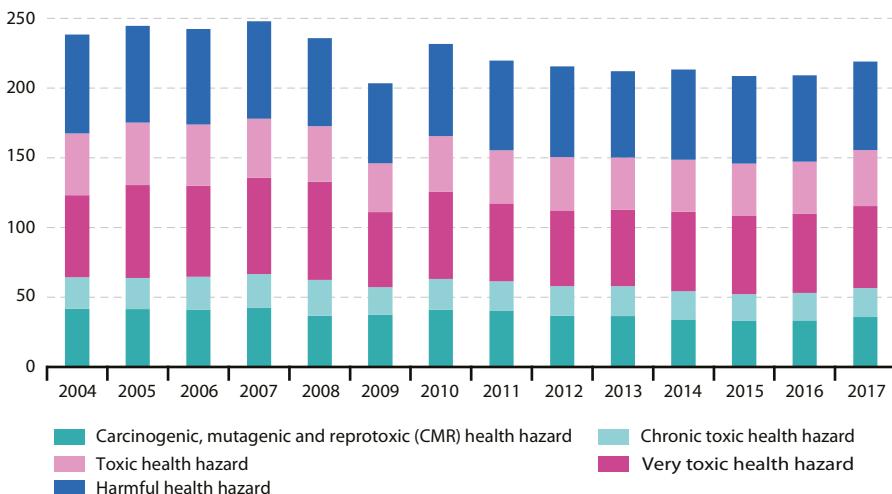
Figure 3.5.3 presents the development of EU-28 production of chemicals hazardous to human health, analysed according to five hazard classes. The pattern of production for chemicals hazardous to health followed a trend similar to the one observed for chemicals hazardous to the environment. Production reached a peak in 2007, after which there was a significant decline in production (that coincided with the financial and economic crisis), followed by a strong rebound in 2010. In 2011, the production of chemicals hazardous to health decreased again, and continued to decrease to a low in 2015. In 2017 an increase was observed.

The EU-28 production of chemicals hazardous to health (all five hazard classes together) reached a peak of 248 million tonnes in 2007. Production fell in 2008 and further in 2009 to a level of 204 million tonnes. The rebound in activity in 2010 made up for most of the losses recorded in 2009 but was followed by further reductions in 2011. Since then production of chemicals

hazardous to health slightly decreased. As a result, the EU-28 level of production of chemicals hazardous to health in 2015 and 2016 was about 209 million tonnes. The increase in 2017 resulted in a level of 219 million tonnes, about 20 million tonnes less than in 2004.

The share of all chemicals hazardous to health in total EU-28 chemicals production remained on a roughly constant level over the period 2004–2017. From about 77 % in 2004, the share of all chemicals hazardous to health fell to 75 % in 2007. While there was an absolute spike in the share of chemicals hazardous to health in 2008 (which may be attributed to a rapid decline in the overall production of chemicals during the financial and economic crisis, rather than an increase in the production of all chemicals hazardous to health), the share subsequently continued to fall, reaching the lowest value in 2015 and 2016 (74 %) and rose again to 75 % in 2017.

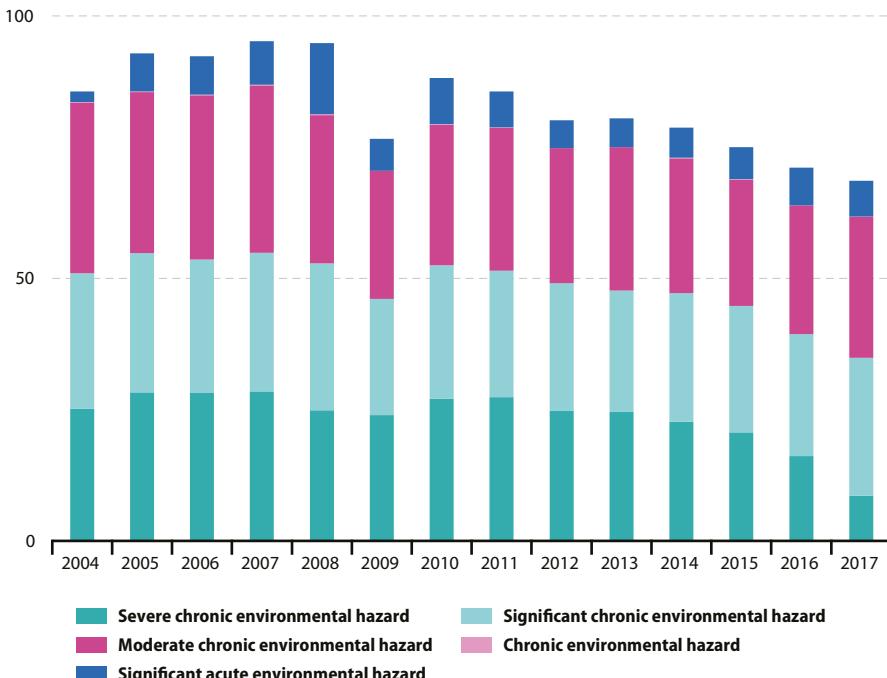
Figure 3.5.3: Production of chemicals hazardous to health, EU-28, 2004–2017 (million tonnes)



Note: The different classes of chemicals are ranked according to their toxicity from the most dangerous (bottom class) up to the least dangerous (top class).

Source: Eurostat (online data code: env_chmhaz)

Figure 3.5.4: Consumption of chemicals hazardous to the environment, EU-28, 2004–2017
(million tonnes)



Note: The different classes of chemicals are ranked according to their environmental impact from the most harmful (bottom class) up to the least harmful (top class).

Source: Eurostat (online data code: [env_chmhaz](#))

Figure 3.5.4 shows the timeline for the apparent consumption of chemicals hazardous to the environment from 2004 to 2017. Over the period from 2004 to 2015, differences between the consumption and the production of chemicals are between 0 % and 5 % (about 4 million tonnes) and the consumption is almost always higher than the production thus a net import surplus occurs for each year. The apparent consumption indicator shows very similar values

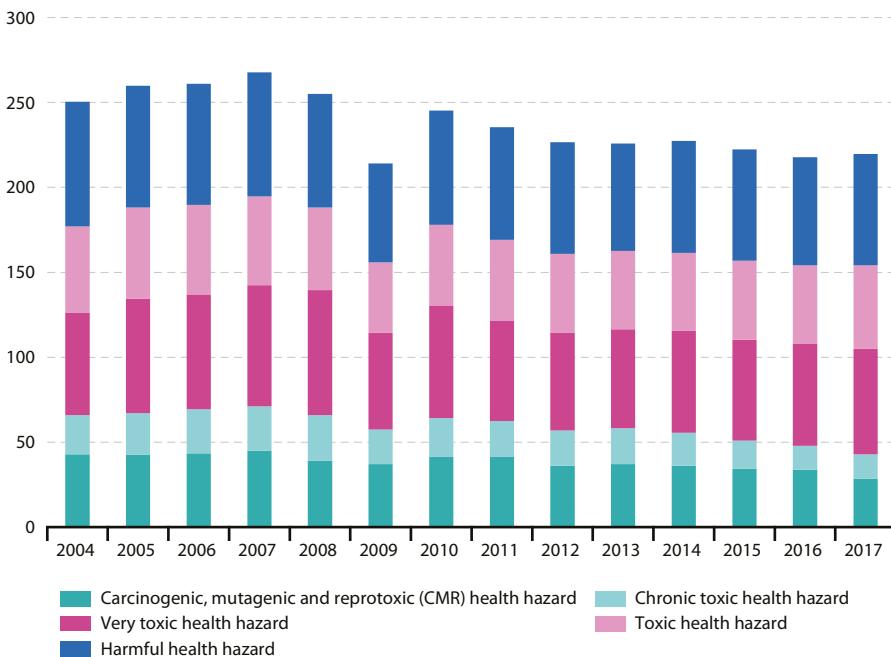
as the indicator on the production of chemicals hazardous to the environment. Differences between consumption and production, however, occur in 2016 and 2017. In 2016 and more particularly in 2017, a considerable net export of chemicals hazardous to the environment occurs. Net export in 2017 subtracts about 12 million tonnes or 15 % from the sum of the production of the five classes of chemicals hazardous to the environment.

Figure 3.5.5 shows the time lines for the apparent consumption of chemicals hazardous to health from 2004 – 2017. Differences between the consumption and production are relatively small. Net trade adds between about 8 % (20 million tonnes) to the sum of the production of the five classes of chemicals hazardous to health. In difference to chemicals hazardous to the environment, the consumption is always higher than the production. Thus a net import

surplus occurs for each year. In 2016 and 2017, net imports indeed decline sharply, but net trade does still result in a small import surplus of about 1 million tonnes.

The apparent consumption indicator shows similar figures as the indicator on the production of chemicals hazardous to health. In general, the apparent consumption is dominated by the production of chemicals.

Figure 3.5.5: Consumption of chemicals hazardous to health, EU-28, 2004–2017 (million tonnes)



Note: The different classes of chemicals are ranked according to their toxicity from the most dangerous (bottom class) up to the least dangerous (top class).

Source: Eurostat (online data code: [env_chmhaz](#))

3.6 Biodiversity

Biodiversity — a contraction of biological diversity — encompasses the number, variety and variability of organisms, including humans. Given that we depend on the natural richness of our planet for the food, energy, raw materials, clean air and water that make life possible and drive our economies, most commentators agree it is imperative to seek to prevent a loss of biodiversity, since any loss may not only undermine the natural environment, but also our economic and social goals.

The challenges associated with preserving biodiversity have made this topic an international issue. A report of the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) from May 2019 reported an accelerated extinction of species and decline in ecosystem health at the global level. A survey carried out in the 28 EU Member States in December 2018 (>27 000 respondents) as part of Eurobarometer showed an increasing awareness of the meaning and importance of biodiversity among EU citizens.

This chapter examines two indicators for biodiversity in the EU — information on

protected areas (for terrestrial and marine biodiversity) and bird populations.

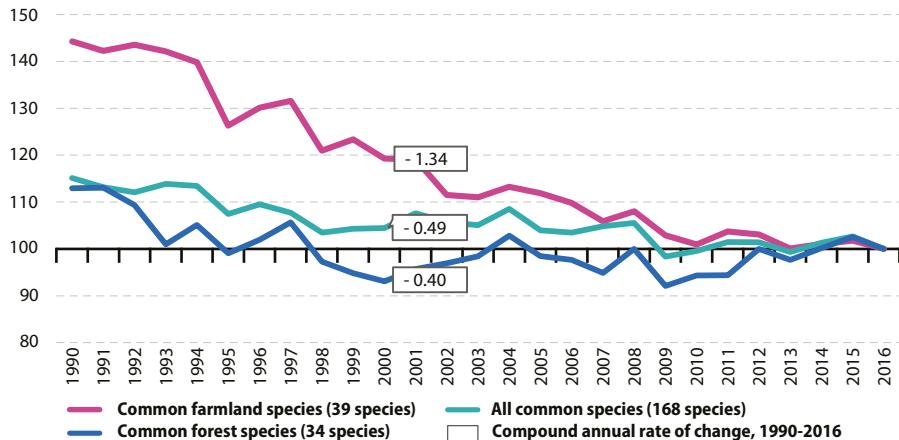
Being relatively easy to monitor, compared with many other groups of organisms, and sensitive to changes in the environment, including pollution and habitat modification, birds have been used as an important indicator of the state of the environment.

Figure 3.6.1 shows the overall change in the three bird indices for the EU (common farmland bird index, common forest bird index and index of all common birds), expressed numerically through the compound annual rate of change (values in the boxes). This variable indicates the overall development of each of the three bird indices without taking the annual fluctuations into account. Bird indices show that populations of all three groups of common birds declined over the period 1990 – 2016, with the steepest decline observed for common farmland birds (-1.34%).

These annual rates of change translate into a 36.2 % decline for common farmland birds, 10.8 % decline for common forest birds and 13.2 % decline for all common birds in the EU between 1990 and 2016.

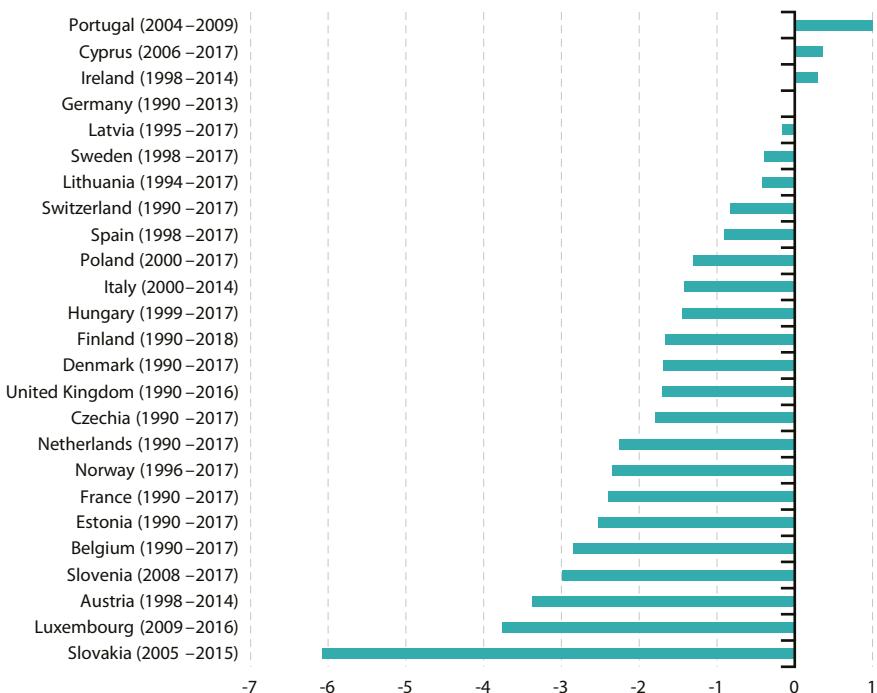
Figure 3.6.1: Common bird indices, EU, 1990–2016

(aggregated index of population estimates of selected groups of breeding bird species, 2016=100)



Source: EBCC / RSPB / BirdLife / Czech Ornithological Society; Eurostat (online data code: env_bio3)

Figure 3.6.2: Compound annual rate of change of national common farmland bird indices (%)



Note: this variable is independent of the base year chosen and gives the same result for any of them, using the formula $RCH_A_C = (Y_t / Y_{t0})^{1/(t-t0)} - 1$, where: t_0 = the earliest year; t = the most recent year; Y_{t0} = indicator value in the earliest year; and Y_t = indicator value in the most recent year. This variable makes it possible to compare the average annual rates of change between countries with different starting and end years of their time series. In economics, this variable is known as the compound annual growth rate and measures e.g. return on an investment over a defined period of time. Years in brackets indicate the time period for which data for the country are available.

Source: OECD, Eurostat (online data code: [env_bio2](#))

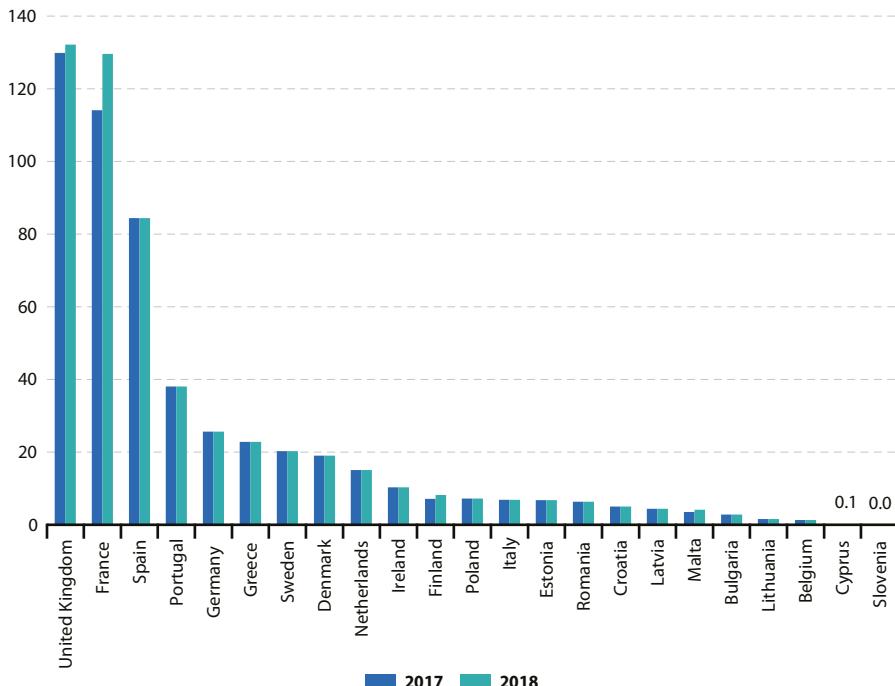
In addition to the EU bird indices which are calculated using data for a suite of species common for all EU countries participating in the pan-European common bird monitoring scheme, countries also calculate national, country-specific indices for common farmland birds. For these, countries select their suite of common farmland species, which may differ from the suite of other European countries. Figure 3.6.2 shows the compound annual rates of change of common farmland species at national levels. The different time coverage of the data reflects each country's

participation in the monitoring scheme. The compound annual rate of change makes it possible to compare the average annual rates of change in countries with different starting and end years of their time series. Of the 20 countries that compiled data up to the most recent years (i.e. 2015 – 2018), only data for Cyprus suggest an improvement in the national farmland bird index. The largest decrease in the population of common farmland birds was recorded in Slovakia (6.1 %).

Areas protected for the preservation of biodiversity are proposed by the EU Member States under the Habitats Directive and under the Birds Directive. Some 784 thousand km² of the EU-28's terrestrial area were protected or proposed for protection as of 2018, i.e. 18 % of the total land area of the EU. Known as Natura 2000, it is the largest network of protected areas in the world. Natura 2000 areas do not necessarily overlap with protected areas designated under national legislation. Economic activities are allowed under Natura 2000 as long as they do not affect the conservation status of species or habitats in a negative way.

In addition to protected terrestrial areas, there were more than 550 thousand km² of protected marine areas in EU-28 waters in 2018. This represents an inter-annual increase of almost 3.7 % in 2017 - 2018 for the EU as a whole. Nearly two thirds — 346 thousand km² or 62.7 % — of them were located in coastal waters around the United Kingdom, France and Spain (see Figure 3.6.3). Between 2017 and 2018, some Member States achieved a large increase in the extent of designated marine protected areas: Malta (18.7 %), Finland (14 %) and France (13.6 %), whereas Slovenia reported a decrease of 9 %.

Figure 3.6.3: Natura 2000 protected marine area, 2017 and 2018
(thousand km²)



Note: not relevant for the Czechia, Luxembourg, Hungary, Austria and Slovakia.

Source: EEA / European topic centre on biodiversity; Eurostat (online data code: env_bio1)

3.7 Water

Water is essential for life, it is an indispensable resource for the economy, and also plays a fundamental role in the climate regulation cycle. The management and protection of water resources, of fresh and salt water ecosystems, and of the water we drink and bathe in is therefore one of the cornerstones of environmental protection.

Water resources refer to the freshwater available for use in a territory and include surface waters (lakes, rivers and streams) and groundwater. Freshwater availability in a country is primarily determined by climate conditions and inflows from other countries.

There are considerable differences in the amounts of freshwater abstracted within each of the EU Member States, in part reflecting the size of each country and the resources available, but also abstraction practices, climate and the industrial and agricultural structure of each country.

Total abstraction of freshwater in the EU ranged between 43 million m³ in Malta (2017 data) and 31.3 billion m³ in Spain (2016 data). Turkey recorded an even higher total amount, namely 60.0 billion m³.

Between 2007 and 2017, the volume of freshwater abstracted rose at its fastest pace in Turkey (51 %) and Greece (19 %), while the largest decreases were recorded in Lithuania (87 %) and Belgium (36 %).

Table 3.7.1 also shows the considerable differences between EU Member States as regards abstraction from groundwater and surface water resources. In Finland (2006 data), surface water abstraction accounted for around 24 times the volume of water abstracted from groundwater resources, while the ratio of surface to groundwater resources was around 9:1 in

Romania and Bulgaria (2017 data) and 7:1 in the Netherlands (2016 data). At the other end of the range, the volume of water abstracted from groundwater resources was around 15 times as high as the volume of surface water abstraction in Malta (2017 data) and 10 times in Denmark (2016 data). Greece, Spain, Germany and France (all 2016 data) recorded the highest amounts of groundwater abstracted, with 6.9 billion m³, 6.4 billion m³, 6.0 billion m³ and 5.5 billion m³, respectively. Looking at the development of groundwater abstraction in EU Member States during the 10-year period between 2007 and 2017, the volume of groundwater extracted remained quite stable over time in many countries, while Greece and Denmark (with increases of 88 % and 18 %) as well as Portugal (with a decrease of 57 %) were notable exceptions.

Similar to groundwater, the largest volumes of surface water abstraction among the EU Member States were recorded in Spain, France (both 2016 data) and Germany (2017 data), with 24.9 billion m³, 21.0 billion m³ and 18.4 billion m³ respectively. Between 2007 and 2017, there was a considerable increase in surface water abstraction in Denmark (from 3 to 70 million m³) and Turkey (from 27.6 to 44.6 billion m³). The largest relative decreases in the volume of surface water abstraction were recorded in Lithuania (94 % - mainly due to the closure of Ignalina nuclear power plant in 2009), Belgium (40 %) and Germany (31 %), while there were also reductions of at least 20 % recorded in Czechia, Greece, Hungary, the Netherlands and Slovakia.

In 2017, freshwater abstraction by public water supply ranged across the EU Member States from a high of 179.2 m³ of water per inhabitant in Greece (2016 data) down to a low of 31.2 m³ per inhabitant in Malta — see Figure 3.7.1.

Table 3.7.1: Total surface and groundwater abstraction, in selected years, 2007-2017
(million m³)

	Surface water abstraction			Groundwater abstraction		
	2007	2012	2017	2007	2012	2017
Belgium (1)	5 570	4 664	3 362	648	636	632
Bulgaria	5 560	5 149	5 076	642	566	582
Czechia	1 589	1 461	1 261	381	379	369
Denmark (2)	3	107	70	567	622	672
Germany (3) (4)	26 476	22 448	18 362	5 825	5 916	5 963
Estonia	1 586	1 357	1 541	248	274	247
Ireland	517	:	:	213	:	:
Greece (2) (5)	5 821	4 320	4 386	3 651	5 615	6 854
Spain (2)	29 077	27 813	24 866	6 496	6 496	6 394
France (2) (6)	25 748	24 400	21 028	5 662	5 608	5 509
Croatia (7)	214	211	248	464	450	425
Italy	:	:	:	:	:	:
Cyprus	71	100	61	145	155	155
Latvia	111	102	97	107	158	111
Lithuania	2 094	518	136	175	151	156
Luxembourg (2) (8)	20	24	22	27	21	23
Hungary (9)	4 758	4 516	3 473	521	535	583
Malta	:	3	3	37	37	40
Netherlands (2)	9 955	9 798	7 005	993	941	983
Austria	:	:	:	:	:	:
Poland	9 356	8 834	8 094	2 671	2 645	2 558
Portugal (10) (11)	:	:	2 772	4 794	:	2 065
Romania	6 240	5 884	6 116	644	598	646
Slovenia	745	602	741	191	180	189
Slovakia	330	326	244	358	339	335
Finland (12)	6 298	:	:	264	:	:
Sweden (13)	2 285	2 466	2 010	346	345	365
United Kingdom	6 379	6 168	:	2 197	2 046	:
Switzerland (14)	:	1 000	:	:	1 005	:
North Macedonia (15)	435	306	:	116	207	:
Albania (14)	:	:	1 081	:	:	107
Serbia	4 097	3 896	4 917	532	507	461
Turkey (14)	27 582	36 950	44 553	12 096	13 560	15 460
Kosovo (16)	166	219	241	138	13	15

(1) Data for 2015 instead of 2017.

(2) Data for 2016 instead of 2017.

(3) Surface water - data for 2012 and 2017: estimated

(4) Groundwater: data for 2013 instead of 2012 and for 2016 instead of 2017.

(5) Surface water, 2016: break in series.

(6) Data for 2007: definition differs, see metadata.

(7) Surface water: data for 2008 instead of 2007.

(8) Data for 2009 instead of 2007.

(9) Surface water: data for 2016 instead of 2017.

(10) Groundwater - data for 2007 estimated.

(11) Data for 2017: break in series.

(12) Data for 2006 instead of 2007.

(13) Data for 2010 instead of 2012 and for 2015 instead of 2017.

(14) Data estimated.

(15) Data for 2014 instead of 2012.

(16) Groundwater: Data for 2006 instead of 2007 and data for 2013 instead of 2012. This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the (C) Opinion on the Kosovo Declaration of Independence.

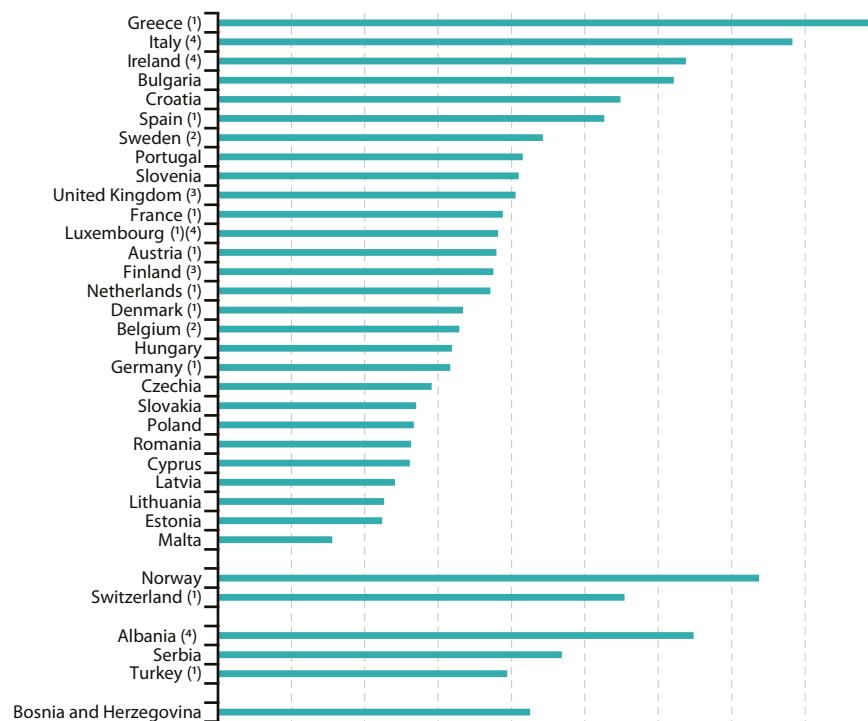
Source: Eurostat (online datacode: env_wat_abs)

Some of the patterns of freshwater abstraction from public supply reflect specific conditions in the EU Member States: for example, in Ireland (127.5 m^3 per inhabitant) the use of water from the public supply was still free of charge for many households, while in Bulgaria (124.2 m^3 per inhabitant) there were particularly high losses from the public network. Abstraction rates were also high in some non-EU Member States, notably in Norway (147.2 m^3 per inhabitant).

A majority of the EU Member States for which data are available (see Table 3.7.2) reported values

for water use by households to be more or less stable over time (2007 – 2017). Among the EU Member States, a marked increase could however be observed in Greece, which is also heading the list in terms of the level of water use from public supply, followed by Cyprus (136.8 and 103.8 m^3 per inhabitant, respectively; both 2016 data). On the other hand, Lithuania and Romania manage to get along with less than a fifth of the value in Greece, with 24.7 and 26.3 m^3 per inhabitant, respectively.

**Figure 3.7.1: Total freshwater abstraction for public water supply, 2017
(m^3 per inhabitant)**



(*) Data for 2016 instead of 2017.

(?) Data for 2015 instead of 2017.

(^{*}) Data for 2014 instead of 2017.

(*) Estimated.

Source: Eurostat (online datacode: env_wat_abs)

Table 3.7.2: Household water use from public water supply, 2007-2017(m³ per inhabitant)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belgium	13.9	13.7	13.6	:	:	31.7	32.4	33.6	:	:	:
Bulgaria	36.6	36.1	36.3	35.6	36.1	37.0	35.8	34.6	35.9	36.0	36.2
Czechia	34.1	32.4	31.9	30.9	31.0	30.8	30.2	30.1	30.2	30.5	30.7
Denmark	:	:	:	:	:	:	:	:	:	:	:
Germany (l)	:	:	:	43.7	44.4	44.2	44.0	44.4	44.7	44.7	44.3
Estonia	:	:	:	:	:	:	:	:	:	:	:
Ireland	:	:	:	:	:	:	:	:	:	:	:
Greece (?)	35.8	:	:	:	91.8	92.1	92.8	93.4	94.0	136.8	:
Spain	64.3	61.8	61.7	58.9	54.7	53.6	51.8	52.2	52.8	53.5	:
France	:	:	:	:	:	:	:	:	:	:	:
Croatia	:	42.6	42.6	44.0	42.6	43.1	45.5	40.5	42.5	41.6	42.9
Italy	:	:	:	:	:	:	:	:	:	:	:
Cyprus	94.1	76.8	85.0	96.8	93.1	88.7	90.3	90.5	94.3	103.8	:
Latvia	:	:	:	34.5	58.6	55.7	37.1	36.0	35.7	40.0	47.1
Lithuania	:	20.3	20.4	18.7	19.0	19.3	21.9	23.1	23.5	24.3	24.7
Luxembourg	:	:	:	:	:	:	:	74.9	:	:	:
Hungary	:	:	:	34.1	34.0	34.4	33.4	33.0	34.0	34.1	34.8
Malta (?)	44.6	44.4	39.9	41.3	42.0	44.1	44.0	43.6	42.7	43.3	42.7
Netherlands	48.3	48.1	47.8	47.4	46.9	46.8	46.8	46.5	47.0	47.4	:
Austria	:	:	:	45.6	:	:	:	:	43.6	:	:
Poland	31.5	31.8	31.3	31.5	31.6	31.5	31.3	31.5	32.5	32.6	32.2
Portugal	52.1	55.7	58.6	:	:	:	:	:	:	:	:
Romania	:	:	:	:	:	30.0	29.3	24.8	25.1	25.4	26.3
Slovenia	:	:	:	:	:	41.3	38.2	38.1	38.1	38.0	38.2
Slovakia	:	:	:	:	:	:	:	:	:	:	:
Finland	:	:	:	:	:	:	:	:	:	:	:
Sweden	52.5	:	:	:	:	:	:	50.1	:	:	:
United Kingdom	:	:	:	46.0	:	:	:	:	:	:	:
Norway (?)	77.6	77.7	77.6	:	:	:	:	66.1	64.5	64.5	:
Switzerland	81.9	79.3	74.4	71.9	70.3	68.4	65.9	63.4	63.9	62.1	:
North Macedonia	:	:	:	35.4	38.2	40.0	40.9	118.4	:	:	:
Albania	:	:	:	:	:	:	:	:	:	98.4	:
Serbia	47.9	47.2	46.4	45.2	44.1	44.8	45.1	43.2	44.6	43.4	45.0
Turkey	:	:	:	32.8	:	34.9	:	32.6	:	39.1	:
Bosnia and Herzegovina	28.6	29.8	30.3	30.6	29.9	30.2	28.5	28.1	28.8	29.6	30.3
Kosovo (?)	:	:	:	19.0	23.7	24.4	24.3	26.0	28.1	29.5	27.6

(l) Data for 2011 and 2017: estimated.

(?) 2016: break in series.

(?) Data estimated.

(?) Data for 2007 to 2009: estimated.

(?) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online data codes: env_wat_cat and demo_pjan)

Table 3.7.3: Share of the population connected to at least secondary urban wastewater treatment, 2007–2017 (%)

	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017
Belgium	68.7	71.0	72.8	75.0	77.2	74.9	76.4	78.2	80.5	81.9	83.0
Bulgaria	39.6	41.3	42.7	45.1	53.7	53.9	54.6	54.8	60.7	61.8	63.2
Czechia	73.0	75.4	75.7	76.9	78.0	78.0	79.8	79.8	80.7	81.2	82.3
Denmark	:	:	89.4	88.0	88.4	88.4	90.1	91.0	90.8	91.5	91.8
Germany	91.9	:	:	95.6	95.5	95.4	95.4	95.6	95.8	96.0	:
Estonia	83.5	84.5	84.5	83.3	86.1	86.2	87.1	88.0	87.6	87.8	87.9
Ireland	59.0	:	71.0	:	63.0	58.8	59.4	60.0	60.6	61.2	61.2
Greece	85.0	:	87.4	87.4	88.2	92.0	92.9	92.9	93.4	93.4	:
Spain	:	88.0	:	93.0	:	94.8	:	92.9	:	:	:
France	:	:	:	77.7	79.8	80.1	80.0	79.0	80.0	80.0	80.0
Croatia	22.0	:	:	:	36.9	36.9	36.9	36.9	36.9	36.9	36.9
Italy	:	57.5	83.0	:	:	57.6	:	:	59.6	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:
Latvia	66.7	56.9	63.2	60.3	71.5	81.4	83.4	85.1	90.3	91.6	95.0
Lithuania	:	:	:	:	:	63.1	64.3	69.4	72.3	73.5	73.8
Luxembourg	:	:	:	91.3	90.9	96.1	96.3	96.6	96.6	96.9	97.0
Hungary	49.8	50.0	52.1	69.5	70.9	72.8	72.7	73.5	76.5	78.1	79.2
Malta	8.4	14.8	15.2	6.6	92.3	91.9	91.8	91.6	:	14.5	14.9
Netherlands	:	99.3	:	99.3	99.4	99.5	99.4	99.4	99.4	99.5	99.5
Austria	:	92.6	:	93.9	:	94.5	:	95.0	:	99.8	:
Poland	61.8	62.9	64.1	64.5	65.5	68.5	70.2	71.4	72.6	73.4	73.5
Portugal	51.0	52.0	55.8	:	:	:	:	:	:	:	84.6
Romania	20.4	18.2	20.7	22.7	31.7	35.3	36.1	38.2	39.7	43.8	46.5
Slovenia	48.8	51.1	52.9	51.6	54.4	53.7	55.2	55.6	57.4	63.3	67.4
Slovakia	:	:	:	:	:	:	:	:	:	63.6	65.0
Finland	:	:	:	83.0	83.0	83.0	83.0	85.0	:	:	:
Sweden	94.0	94.0	94.0	94.0	94.0	95.0	95.0	95.0	95.0	95.0	95.0
United Kingdom	:	96.9	97.0	99.5	:	:	:	100.0	:	:	:
Iceland	:	2.0	:	1.0	:	:	:	:	:	:	:
Norway	66.0	66.0	66.2	65.8	67.8	68.9	68.8	68.9	71.8	68.4	68.6
Switzerland	:	:	:	98.0	:	:	98.0	:	:	:	:
Albania	:	:	:	:	:	:	:	9.9	8.0	7.0	7.3
Serbia	6.9	7.5	8.9	8.6	8.9	9.0	9.4	10.0	10.8	12.5	12.6
Turkey	31.1	31.4	35.2	37.6	:	42.0	42.7	43.2	55.4	56.3	:
Bosnia and Herzegovina	10.0	10.7	10.7	10.9	11.1	11.4	11.7	11.8	11.8	29.6	29.6
Kosovo (1)	:	:	:	:	0.6	0.6	0.6	0.6	0.6	0.6	0.6

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/1999 and the ICJ Opinion on the Kosovo Declaration of Independence.

Source: Eurostat (online datacodes: [env_wv_con](#))

Table 3.7.3 presents information on the proportion of the population connected to at least secondary wastewater treatment plants. This share has been generally increasing and was above 80% in 16 of the EU Member States for which data are available (mixed reference years). The share of the population connected to at least secondary wastewater treatment plant rose to above 95% in 7 Member States (Germany, Latvia, Luxembourg, the Netherlands, Austria, Sweden and the United Kingdom (mixed reference years)), as well as Switzerland. At the other end

of the range, less than one in two households were connected to at least secondary urban wastewater treatment plants in Malta, Romania and Croatia, while the same was also true in Iceland (2010 data), Albania, Serbia and Bosnia and Herzegovina, and Kosovo (1) (all 2017).

(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo Declaration of Independence.

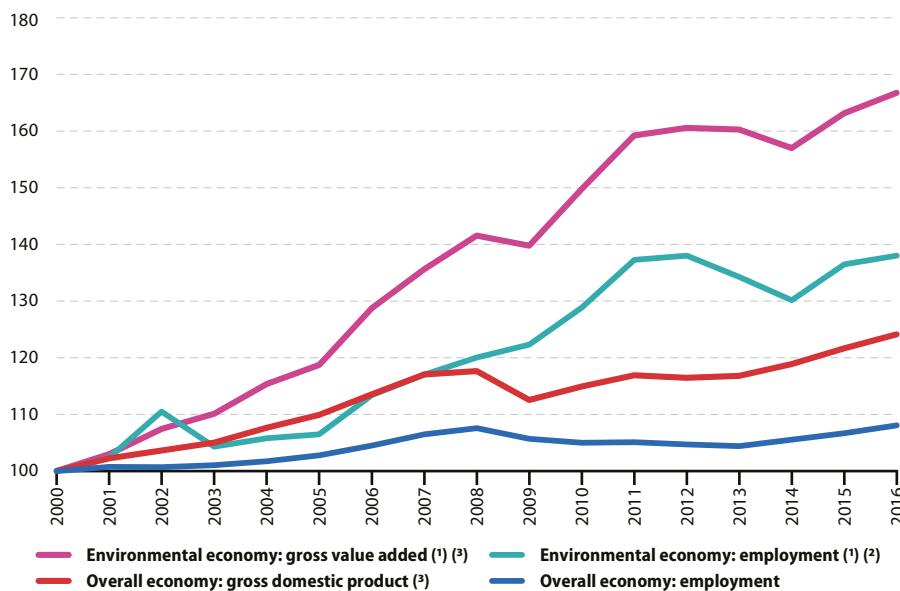
3.8 Environmental goods and services

Environmental goods and services encompass products that serve either of two purposes: 'environmental protection' — that is, preventing, reducing and eliminating pollution or any other degradation of the environment or 'resource management' — that is, preserving the stock of natural resources, hence safeguarding it against depletion.

The Environmental goods and services sector (EGSS) accounts provide information on production (output) and exports of environmental products and the employment and gross value added linked to their production.

According to Eurostat estimates, employment in the EU-28's environmental economy rose from 3.2 million full-time equivalents (FTEs) in 2000 to 4.5 million full-time equivalents in 2016. The environmental economy generated EUR 746 billion output and EUR 303 billion gross value added in 2016. Between 2000 and 2016, employment and value added grew considerably faster than employment and gross domestic product (GDP) in the overall economy (see Figure 3.8.1).

Figure 3.8.1: Key indicators for the environmental economy and the overall economy, EU-28, 2000–2016
(index 2000 = 100)



(1) Eurostat estimates.

(2) In full-time equivalents.

(3) Index compiled for chain-linked volumes data in EUR million (reference year 2010; at 2010 exchange rates)

Source: Eurostat (online data codes: nama_10_a10_e, nama_10_gdp, env_ac_egss1, env_ac_egss2)

The decade after the year 2000 marked a period of almost steady net job creation in the environmental economy with annual employment increasing by 2 % – 8 % in most years. The declining employment in 2003 marks an exception in a period of growth, which came to an end in 2013 and 2014 when job numbers fell in two consecutive years. Since then, employment has grown again, reaching in 2016 similar levels as in 2012.

Over the past one and a half decades, the environmental economy has outperformed the overall economy in terms of employment and value added. Even in 2009, when the financial crisis led to a 4 % contraction in GDP, gross value added from the production of environmental goods and services remained relatively stable (-1 %). In the aftermath of the crisis, the environmental economy grew between 2009 and 2011 but stagnated in the two following years and declined between 2013 and 2014. Since then, the gross value added of the environmental sector has been growing faster again than the GDP.

The environmental economy can also be analysed with a view on production units, using the statistical classification of economic activities (NACE). Because the units producing environmental goods and services can engage in a range of activities, an analysis by economic activity provides a complementary picture to the analysis by environmental domain. Table 3.8.1 follows this alternative approach and shows that most employment within the environmental economy of the EU was related in 2016 to energy and water supply, sewerage, waste management and remediation activities (NACE Sections D and E) with 1.5 million full-time equivalents followed by construction (NACE Section F) with 1.3 million full-time equivalents. The environmental economy also provides 0.8 million full-time equivalent jobs related to other services activities, 0.5 million full-time equivalent jobs in mining, quarrying and manufacturing, and 0.4 million full-time equivalents in agriculture, forestry and fishing. Table 3.8.1 also shows the value of total output and gross value added.

Table 3.8.1 : Employment, production and value added in the environmental economy, by activity, EU-28, 2016

	Employment (thousand full-time equivalents)	Output (EUR billion)	Gross value added (EUR billion)
Total	4 451	746	303
Agriculture, forestry and fishing	422	36	19
Mining, quarrying and manufacturing	475	110	37
Energy and water supply, sewerage and waste services	1 490	335	126
Construction	1 275	177	69
Services	788	89	53

Note: Data for EU-28 are estimated by Eurostat.

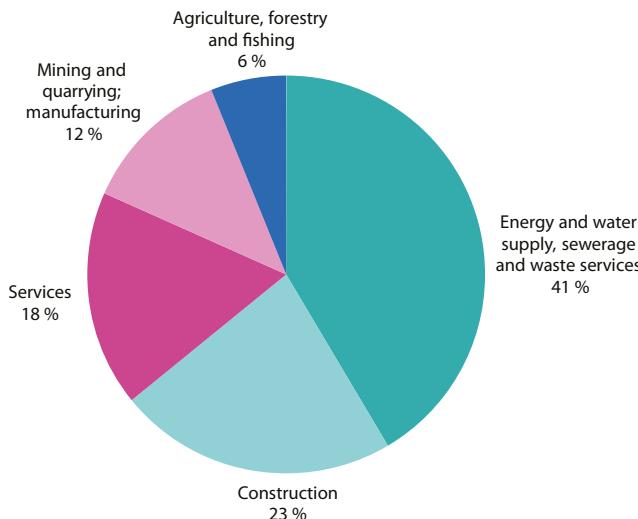
Source: Eurostat (online data code: [env_ac_egss3](#))

Energy and water supply, sewerage, waste management and remediation activities contributed in 2016 some EUR 126 billion, or 41 % to the value added of the environmental economy (see Figure 3.8.2). This group of activities mainly includes the production of energy from renewable sources as well as sewerage and waste treatment services. The activity with the second highest contribution to the gross value added of the environmental economy was construction, reporting EUR 69 billion of value added or 23 % of the total. This activity includes energetic refurbishment of existing buildings and the construction of new energy-efficient buildings as well as noise insulation work, maintenance and repair of water networks, construction work for wastewater and waste treatment plants and sewerage systems. The third largest activity comprises miscellaneous services that generated together

EUR 53 billion of value added (18 % of the total) for the environmental economy. The remaining activities contributed 12 % (mining, quarrying and manufacturing) and 6 % (agriculture, forestry and fishing) to the value added of the environmental economy.

Labour productivity expressed as value added per full-time equivalent is highest for energy and water supply, sewerage, waste management and remediation activities that generated on average EUR 84 400 per full-time equivalent job (generating 41 % of the value added of the environmental economy with only 33 % of the labour input). Labour productivity is lowest for agriculture, forestry and fishing that generated on average EUR 44 100 (generating 6 % of the value added of the environmental economy with 9 % of the labour input).

Figure 3.8.2: Gross value added of the environmental economy, by activity, EU-28, 2016 (%)



Note: Data for EU-28 are estimated by Eurostat.

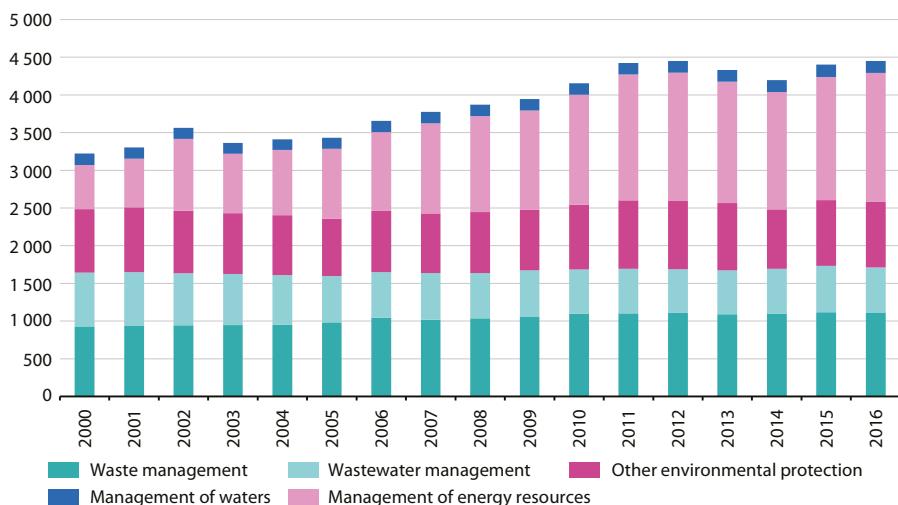
Source: Eurostat (online data code: [env_ac_egss3](#))

Employment in the environmental economy can be broken down by environmental protection and resource management activities. Figure 3.8.3 presents a breakdown into three environmental protection activities (wastewater management, waste management and other environmental protection activity) and two resource management activities (management of waters and management of energy resources) following the classification of environmental protection activities (CEPA) and the classification of resource management activities (CReMA). Employment related to the management of energy resources increased considerably since 2000. Also employment in waste management increased while the number of full-time jobs in the other domains remained relatively stable.

Job creation in the management of energy resources is mainly related to the production of energy from renewables (such as wind and solar power), the manufacturing of related equipment, and measures for heat and energy

saving. Employment in this domain more than tripled from 0.6 million full-time equivalents in 2000 to 1.7 million full-time equivalents in 2016. In other words: more than one million new full-time equivalent jobs have been created through the management of energy resources between 2000 and 2016. The second largest contribution to environmental employment came from waste management, with the number of jobs rising from 0.9 million full-time equivalents in 2000 to 1.1 million full-time equivalents in 2016 (overall increase of 20 %). By contrast, employment decreased in the domain of wastewater management by 16 % from 714 thousand full-time equivalents in 2000 to 598 full-time equivalents in 2016. Whereas environmental protection accounted for more than three quarters (77 %) of the employment in the environmental economy in 2000, the share decreased to 58 % in 2016 following the creation of new jobs in the renewable energy sector.

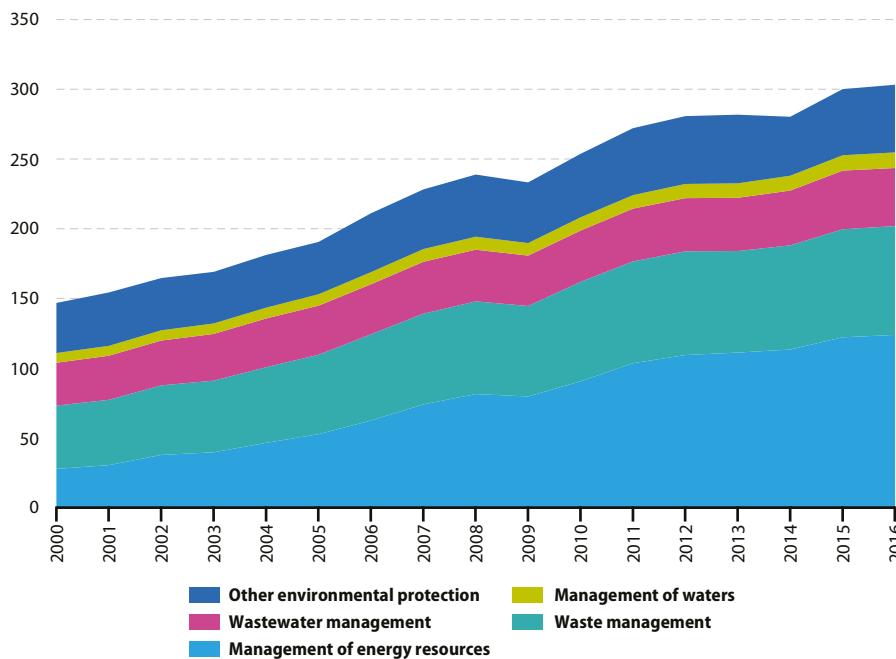
Figure 3.8.3: Employment in the environmental economy, by domain, EU-28, 2000–2016
(thousand full-time equivalents)



Note: Data for EU-28 are estimated by Eurostat.

Source: Eurostat (online data code: env_ac_egss1)

Figure 3.8.4: Gross value added of the environmental economy, by domain, EU-28, 2000–2016
(billion EUR)



Note: Data for EU-28 are estimated by Eurostat.

Source: Eurostat (online data code: [env_ac_egss2](#))

Gross value added of the environmental economy increased from EUR 147 billion in 2000 to EUR 303 billion in 2016 (see Figure 3.8.4; note that the trend is based on current prices). Alongside, also the environmental economy's contribution to GDP increased from 1.5 % in 2000 to 2.0 % in 2016. Gross value added of the environmental economy rose steadily between 2000 and 2008, reaching EUR 239 billion. It declined in 2009 as a result of the financial crisis, but has been growing afterwards in all years but 2014.

Gross value added of environmental protection activities increased from EUR 112 billion in 2000

to EUR 168 billion in 2016. The contribution of environmental protection to GDP remained stable over this period at 1.1-1.2 %. Gross value added of resource management activities had a lower baseline value in 2000, namely EUR 35 billion (or 0.4 % of GDP) but reported faster growth to reach EUR 135 billion (or 0.9 % of GDP) in 2016, largely due to increasing energy production from renewables (for example, wind, solar power and biofuels) and products for energy and heat saving.

3.9 Environmental Taxes

An environmental tax is a tax whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment and which is defined in the European system of accounts (ESA 2010) as a tax. European statistics distinguish four different categories of environmental taxes relating to energy, transport, pollution and resources; value added taxes (VAT) are excluded from the scope of environmental taxes.

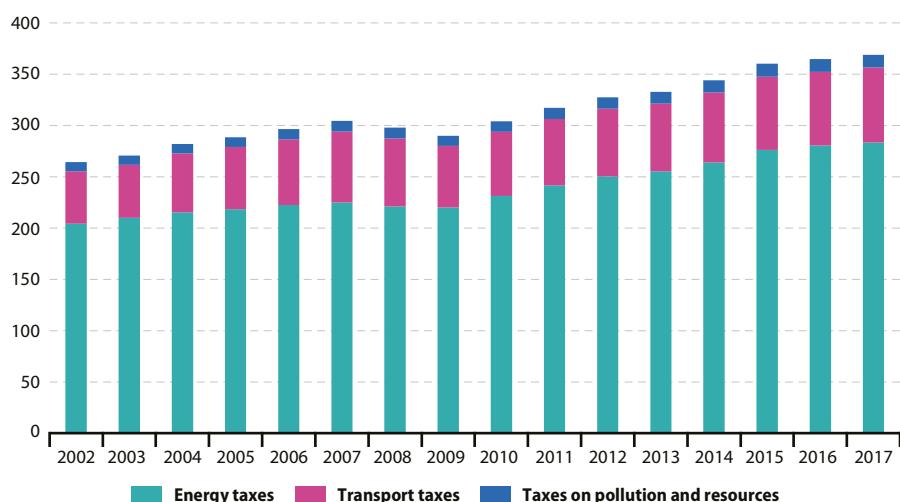
Environmental taxes have been increasingly used to influence the behaviour of economic operators, whether producers or consumers. These taxes also generate revenue that can potentially be used by government to increase its expenditure on environmental protection or efficient management of natural resources.

In 2017, the total environmental tax revenue in the EU (i.e., revenue from environmental taxes

collected by governments in all EU Member States) amounted to EUR 368.8 billion; this figure represents 2.4 % of the EU-28 gross domestic product (GDP) and 6.1 % of the total government revenue from taxes and social contributions in the EU. From 2002 to 2017, the total environmental tax revenue in the EU increased by 2.2 % per year (at current prices) on average whereas GDP at market prices rose at an annual average of 2.6 %. In 2017, the level of the total environmental tax revenue in the EU was around EUR 104 billion higher than in 2002 (see Figure 3.9.1).

Taxes on energy accounted for more than three-quarters of the total revenues from environmental taxes (76.9 % of the total) in 2017, well ahead of taxes on transport (19.8 %) and those on pollution and resources (3.3 %) (see Figure 3.9.2).

Figure 3.9.1: Total environmental tax revenue by type of tax, EU-28, 2002–2017 (billion EUR)



Source: Eurostat (online data code: env_ac_tax)

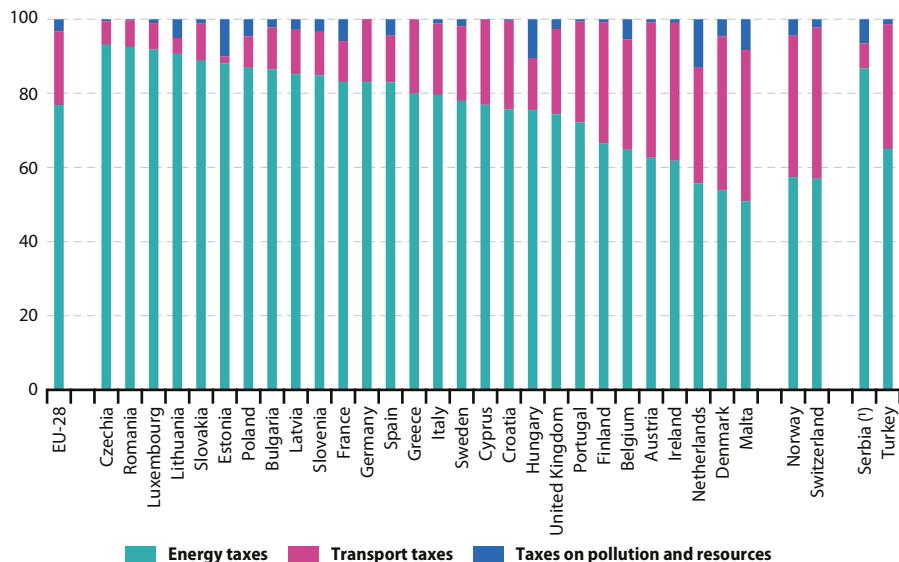
Energy taxes are the most significant category of environmental taxes in Czechia, Romania, Luxembourg and Lithuania, where energy taxes accounted in 2017 for more than nine tenths of total environmental tax revenue. By contrast, energy taxes only slightly exceeded 50 % of the revenue from environmental taxes in Malta (50.8 %), and accounted only for 54–56 % of the total in Denmark (53.8 %) and in the Netherlands (55.7 %).

Transport taxes represented the second-largest contribution to total environmental tax revenue. Their relative significance was considerably higher in Denmark (41.6 %), Malta (40.8 %), Ireland (37.2 %) and Austria (36.4 %). On the other hand, in some EU Member States the share of transport taxes in total revenue from environmental taxes was well below the EU average, with the lowest shares recorded in

Estonia (1.9 %), Lithuania (4.3 %), Czechia (6.4 %), Luxembourg (7.1 %) and Romania (7.2 %).

Pollution and resource taxes represented a relatively small share of total environmental tax revenue. This category of environmental taxes groups a variety of taxes levied e.g. on waste, water pollution and abstraction. In many European countries such taxes were introduced more recently than energy or transport taxes. As yet, no taxes of this category have been levied in Greece and in Germany, whilst in Cyprus, Romania, Croatia, Czechia and Portugal only marginal amounts of the pollution and resource taxes were recorded. However, in three EU Member States, the Netherlands (13.1 %), Hungary (10.7 %) and Estonia (10.1 %), pollution and resource taxes are a relatively important source of environmental tax revenue.

Figure 3.9.2: Environmental taxes by tax category, 2017
(% of total environmental taxes)



Note: Imputed social contributions are excluded from total revenues from taxes and social contributions.

(1) 2016 data.

Source: Eurostat (online data code: env_ac_tax)

The environmental tax revenue by category is also available for two EFTA countries as well as for Serbia and Turkey. For both Norway and Switzerland, the share of energy tax revenue amounted in 2017 to 57.0 %, while for Turkey energy taxes were an even more significant category of environmental tax revenue, with the equivalent share at 65.0 %. For Serbia, energy taxes accounted for 86.7 % of the total environmental tax revenue. Serbia collects only 6.8 % of its environmental tax revenue from transport taxes, while this category of taxes accounts for 40.8 % of total environmental taxes in Switzerland and 38.2 % in Norway.

In the EU, businesses paid a little more than half (51 %) of all energy tax revenue collected by governments in 2016 (see Figure 3.9.3). The contribution of households, albeit lower, was also significant (at 47 % in 2016). The remainder (2 %) relates to the amounts payable by non-residents or

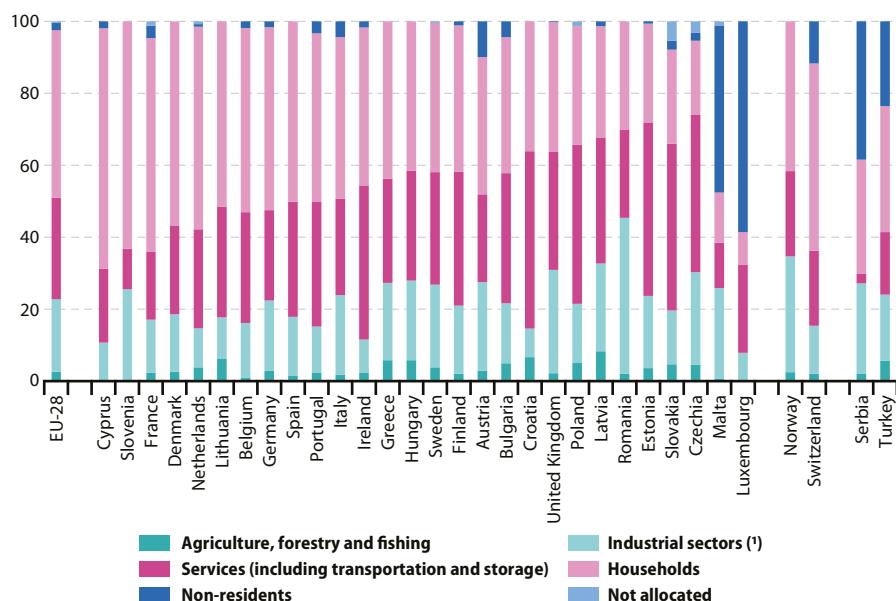
that could not be allocated to a specific group of payers.

Among the EU Member States, Luxembourg stands out with the largest share of the energy tax revenue (at 59 %) collected from non-residents, largely due to non-resident purchases of petrol and diesel. In Malta this share is also substantial (at 46 %).

In 2016, the share of energy taxes payable by households in Cyprus (67 %) and Slovenia (63 %), France (59 %), Denmark (57 %) and the Netherlands (56 %) was considerably higher than the EU-28 average of 46 %. A relatively low contribution of households is observable in Luxembourg (9 %) and Malta (14 %). The share of energy tax revenue levied on the services sector (including transportation and storage activities) amounted to 28 % for the EU-28 as a whole, ranging from 11 % in Slovenia to 48 % in Estonia and 49 % in Croatia.

Figure 3.9.3: Energy taxes by economic activity, 2016

(% of energy tax revenue)



(¹) Mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply sewerage, waste management and remediation activities, construction

Source: Eurostat (online data code: env_ac_taxind2)

The third most significant contribution to the EU-28 energy tax revenue (20 %) originated from the industrial sector (Mining and quarrying, manufacturing, electricity, gas, steam and air conditioning supply, water supply sewerage, waste management and remediation activities). The share of energy taxes payable by this sector is particularly large in Romania (at 43 %). Relatively high shares for this industry sector, compared to the EU average, were also recorded by United Kingdom (29 %), Czechia (26 %) and Slovenia and Malta (both 25 %).

The contribution of agriculture, forestry and fishing to the total energy taxes accounted for less than 3 % for the EU-28, ranging from below 1 % in Luxembourg, Slovenia, Belgium, Cyprus and Malta to above 5 % in Croatia, Lithuania, Hungary, Greece and Poland and even to more than 8 % in Latvia.

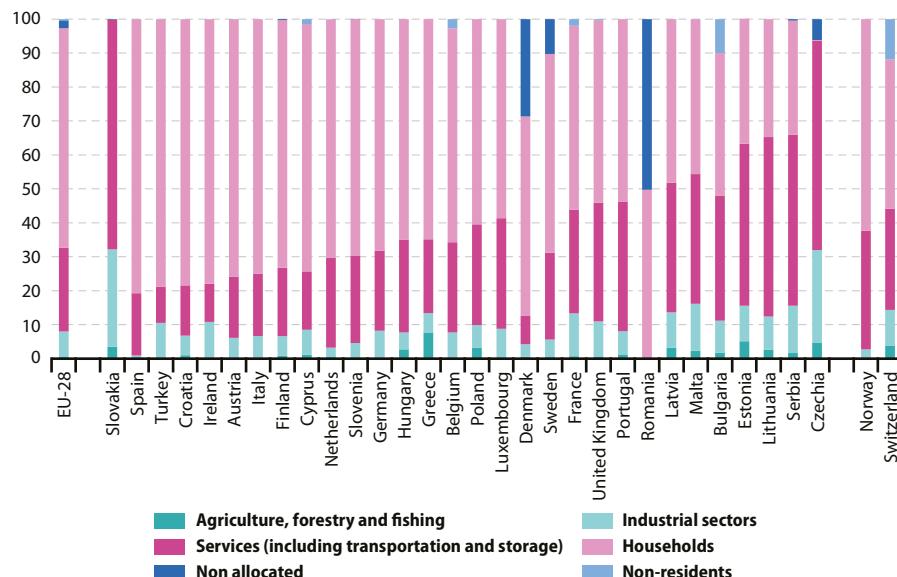
The energy taxes payable by businesses were also relatively high in 2016 in Norway (above 58 % of all energy tax revenue). In Switzerland,

non-residents contributed to 12 % of the total energy tax revenue.

On average, among the EU Member States, the share of transport taxes payable by households was much higher (65 %) than the share payable by businesses (33 %) (see Figure 3.9.4). This is because in most EU Member States households pay a larger share of the motor vehicle tax revenue (an important component of transport tax revenue) than businesses. However, in some Member States the structure of transport tax revenue by payer differs considerably, with households contributing only marginally to transport tax revenue, as in Slovakia and in Czechia.

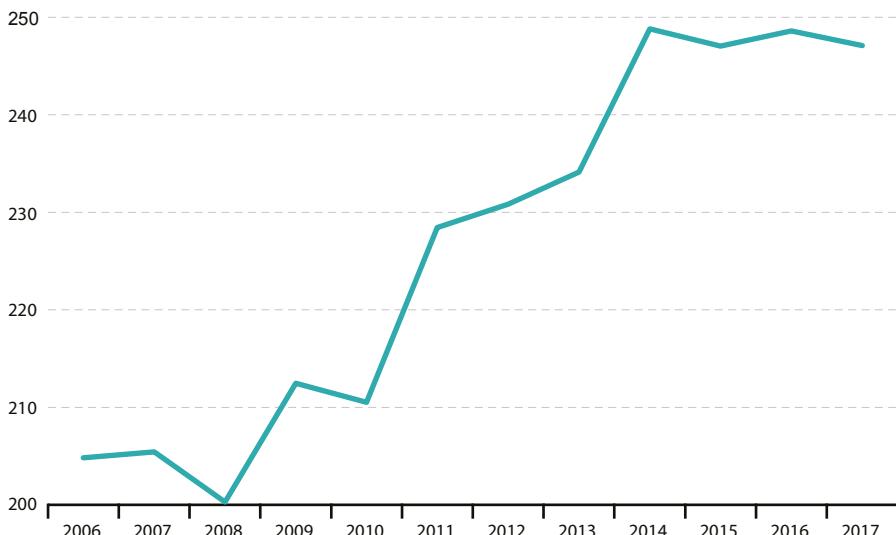
At 66 %, businesses contributed a much higher share to the total transport tax revenue than households in Serbia in 2016. Switzerland stands out in 2016 with the largest share of transport taxes payable by non-residents, 11.9 %.

Figure 3.9.4: Transport taxes by economic activity, 2016
(% of transport tax revenue)



Source: Eurostat (online data code: env_ac_taxind2)

Figure 3.9.5: Implicit tax rate on energy (deflated), EU-28, 2006–2017
 (EUR per tonne of oil equivalent)



Note: the y-axis is cut.

Source: Eurostat (online data code: [ten00120](#))

The implicit tax rate on energy is defined as the ratio of energy tax revenue to final energy consumption calculated for a calendar year. Energy tax revenues are measured in constant price euro (deflated with the implicit GDP deflator, prices of year 2010) and final energy consumption is measured in tonnes of oil equivalent (toe); as such the implicit tax rate on energy is expressed in terms of euro per tonne of oil equivalent (EUR per toe). The implicit tax rate on energy is not influenced by the size of the tax base and provides a measure of the

effective level of energy taxation. From 2006 to 2017, the implicit tax rate on energy grew by 17 % in real terms (in other words, after deflating the energy tax revenue), changing from EUR 204.8 per toe to EUR 247.1 per toe (see Figure 3.9.5). Between 2006 and 2008, the implicit tax rate on energy decreased. From 2008 to 2014, strong annual increases have been observed, except in 2010. Since 2014 it remained rather stable. This movement reflects the fact that energy use is more and more costly in terms of the amount of tax that is levied for each unit consumed.

3.10 Environmental protection expenditure

The increased awareness of the need to combat environmental pollution and preserve natural resources has led to an increase in the supply and demand of environmental goods and services, in other words, products to prevent, measure, control, limit, minimise or correct environmental damage and resource depletion.

Statistics on environmental protection expenditure enable to identify and measure society's response to environmental concerns and how it is financed. Environmental protection expenditure accounts (EPEA) quantify the resources devoted to environmental protection by resident economic units.

This chapter is based on the results of the 2018 data collection on environmental protection expenditure accounts (EPEA) provided by European Union (EU) Member States with reporting obligation (Cyprus was granted a derogation) and selected non-EU countries. It provides information on the EU's expenditure on prevention, reduction and elimination of pollution or any other degradation of the environment and covers the total spending by a country (i.e. by its households, businesses and government) on environmental protection services, e.g. waste and wastewater management, protection of biodiversity, as well as protection of soil, research and development, education and training.

The environmental services are produced both by private corporations and by government. The share of each sector in the total output of environmental services depends on national

arrangements and varies across EU Member States.

National expenditure on environmental protection ('NEEP') measures the resources used by resident units in a given period for protecting the natural environment. It is calculated as a sum of current expenditure on environmental protection (EP) activities and investments for EP activities, including net transfers to the rest of the world.

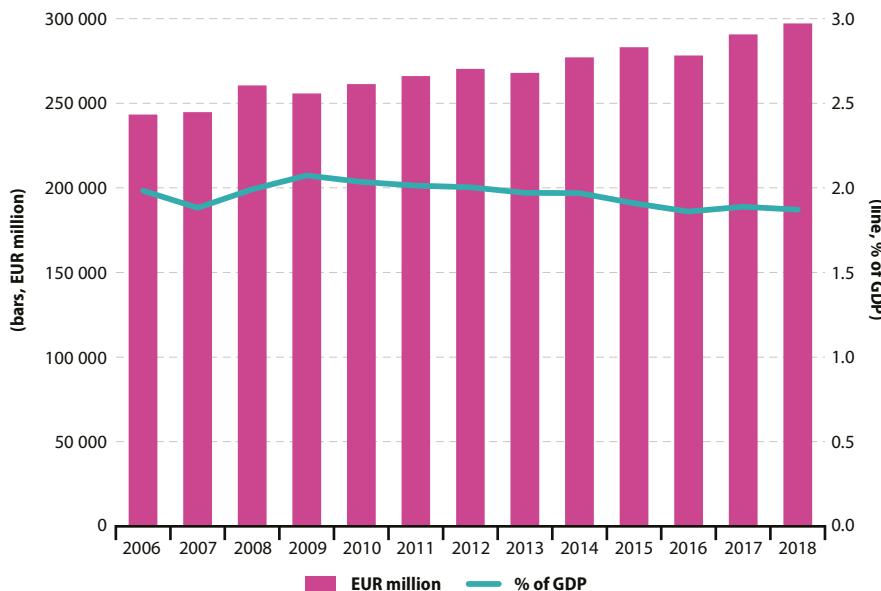
In 2018, EU-28 national expenditure on environmental protection of all EU Member States amounted to EUR 297 billion, according to Eurostat's estimates.

From 2006 to 2018, NEEP at current prices increased overall by 22.1 %, rising on average by nearly 2 % each year (see Figure 3.10.1).

As percentage of gross domestic product (GDP), EU-28 NEEP remained relatively stable between 2006 and 2018. In 2006 the share amounted to 2.0 %, a small increase to 2.1 % of GDP is observed in 2009, mainly as a result of a large GDP contraction during the financial crisis and economic recession, stabilizing at around 1.9 % from 2015 onwards.

Estimates by institutional sectors highlight that corporations made the largest contribution to NEEP, and accounted for 54 % of total NEEP in 2018. The expenditure of general government and non-profit institutions serving households (NPISH) as a whole, and of households accounted respectively for 24 % and 22 % of total NEEP in 2018.

Figure 3.10.1: National expenditure on environmental protection, EU-28, 2006–2018
(EUR million and % of GDP)



Note: Data for EU-28 are estimated by Eurostat.

Source: Eurostat (online data codes: [env_ac_pepsgg](#), [env_ac_pepssp](#), [env_ac_pepsnsp](#), [env_ac_eptrf](#), [env_ac_epneec](#) and [nama_10_gdp](#))

In 2018, households and general governments' purchases of environmental protection services for final use (final consumption expenditure) amounted to EUR 116 billion, accounting for nearly two fifths of total NEEP.

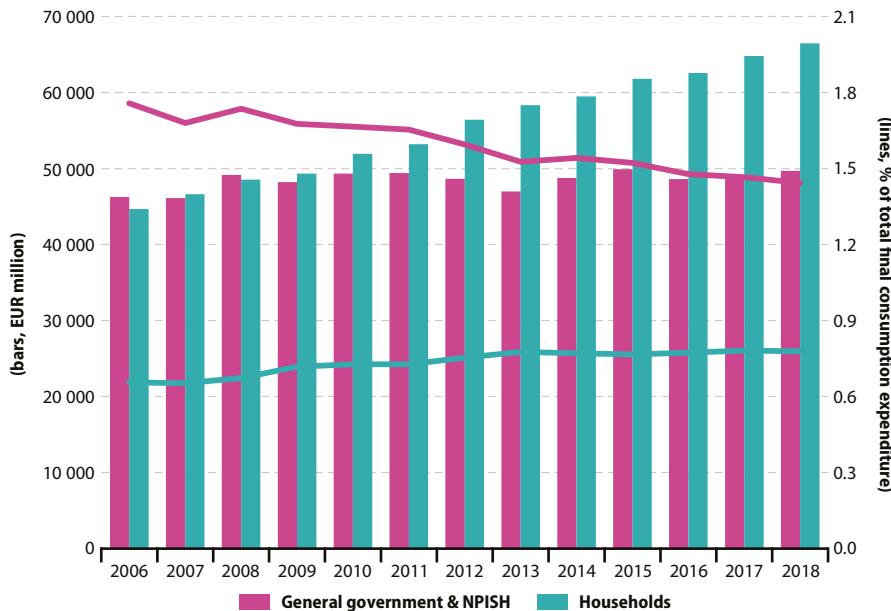
Over the half (57 %) of the EU-28 final consumption expenditure on environmental protection services, around EUR 66 billion, was covered directly by households. The remaining 43 %, around EUR 50 billion, was spent by general government and non-profit institutions serving households (NPISH) to produce environmental protection services which were then provided to all citizens for free or at a price that is not economically significant.

Between 2006 and 2018, households' expenditure on environmental protection

expenditure services increased by nearly 50 % over the entire period, which is equivalent to an average annual growth rate of 3.4 % (see Figure 3.10.2, left scale). Still, environmental protection accounted for a very small proportion of households' spending (less than 1 %), and this share remained stable over the recent decade (see Figure 3.10.2, right scale).

General government and NPISH expenditure on environmental protection services increased by 7.5 % from 2006 to 2018, i.e. on average 0.6 % per year. In 2018 final expenditure of environmental protection services accounted for 1.4 % of the total final consumption of these sectors.

Figure 3.10.2: Final consumption expenditure on environmental protection services, EU-28, 2006–2018
(EUR million and % of sectoral total final consumption expenditure)



Note: Data for EU-28 are estimated by Eurostat.

Source: Eurostat (online data codes: [env_ac_cepsgh](#), [nama_10_gdp](#))

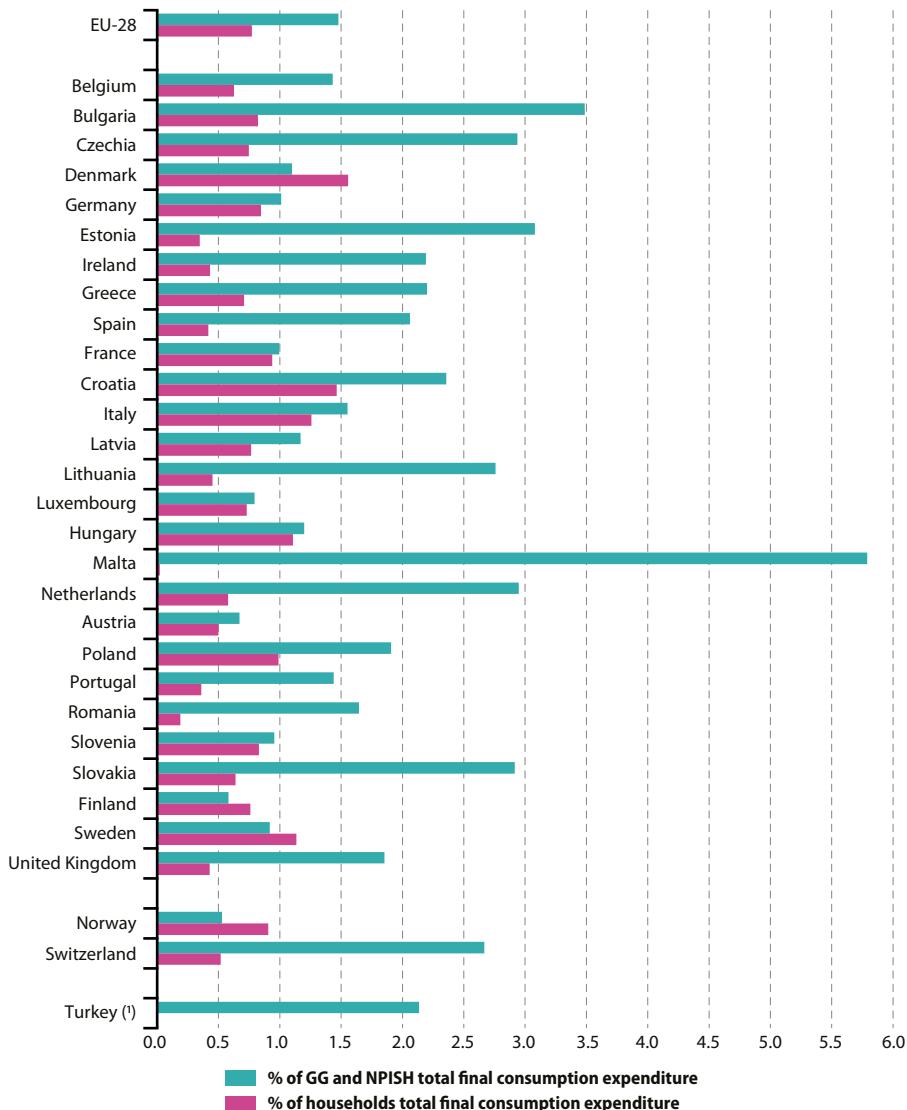
Figure 3.10.3 presents the share of the environmental protection expenditure of general government and NPISH, and of households in the total final consumption of each of these two sectors. In 2016, the last mandatory year for data reporting, the EU-28 share for general government and NPISH amounted to 1.5 %, and for the large majority of Member States the share ranged between 1 % and 3 %.

For households, the EU-28 share of final consumption expenditure on environmental

protection services in their total final consumption amounted to 0.8 % in 2016.

In 2018 EU-28 invested EUR 64 billion (21 % of NEEP) into assets essential to provide environmental protection services (e.g. wastewater treatment plants, vehicles to transport waste, and acquisitions of land to create a natural reserve or cleaner equipment for producing with less polluting emissions).

Figure 3.10.3: Final consumption expenditure on environmental protection services by general government and NPISH, and by household, 2016
(% of total final consumption by sector)



Note: Data for EU-28 are estimated by Eurostat; NPISH: non-profit organisations serving households.

(*) Only GG total final consumption are included in the calculation of indicator; no data available for NPISH.

Source: Eurostat (online data code: env_ac_cepsgh and nasa_10_gdp)

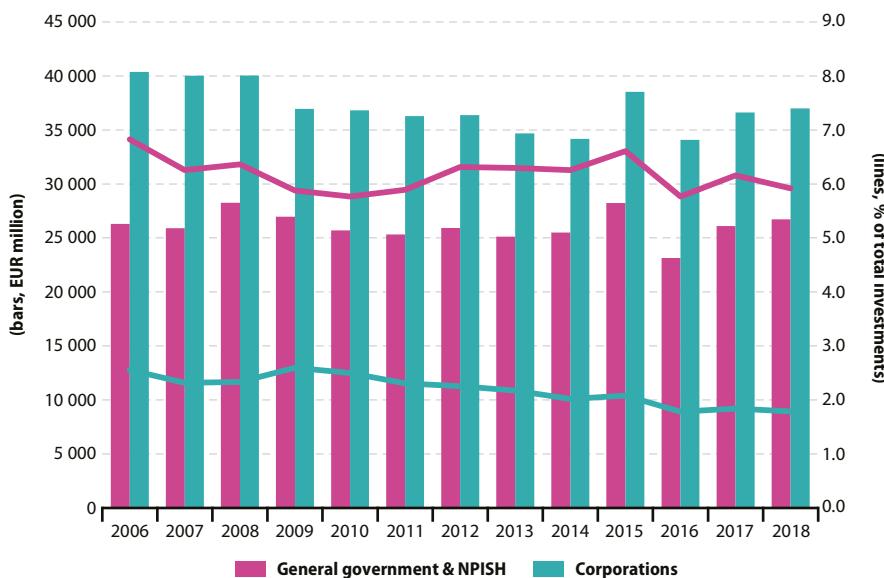
About EUR 37 billion (58 % of total environmental protection investments) was spent by corporations, both the specialist providers of environmental protection services (e.g. private companies dealing with waste collection and processing and with sewerage) and other corporations, to develop and purchase technologies and equipment reducing the environmental pressures arising from their production process (e.g. equipment reducing the air emissions). General government and NPISH accounted, with EUR 27 billion spent in 2018, for the remaining share (42 %) of environmental protection investments.

Still, between 2006 and 2018, investments of the corporations decreased by 8.4 %, whilst they remained relatively stable for general government and NPISH (see Figure 3.10.4).

The share of environmental protection investments in total investments of corporations is relatively low. In 2018, it amounted to 1.8 %, having decreased by 0.8 percentage points since 2006. The equivalent share for general government and NPISH sector was larger: it amounted to 5.9 % in 2018, having decreased by 0.9 percentage points since 2006 (see Figure 3.10.4).

More detailed data by EU Member State highlight that for 2016 the share investments for environmental protection in total investments by business sector varied across countries, ranging from 0.1 % to 4.7 % of total investments (see Figure 3.10.5). Even larger variations were observed for the general government and NPISH sectors, the shares ranging from 0.2 % to 11.2 % across the EU (see Figure 3.10.5).

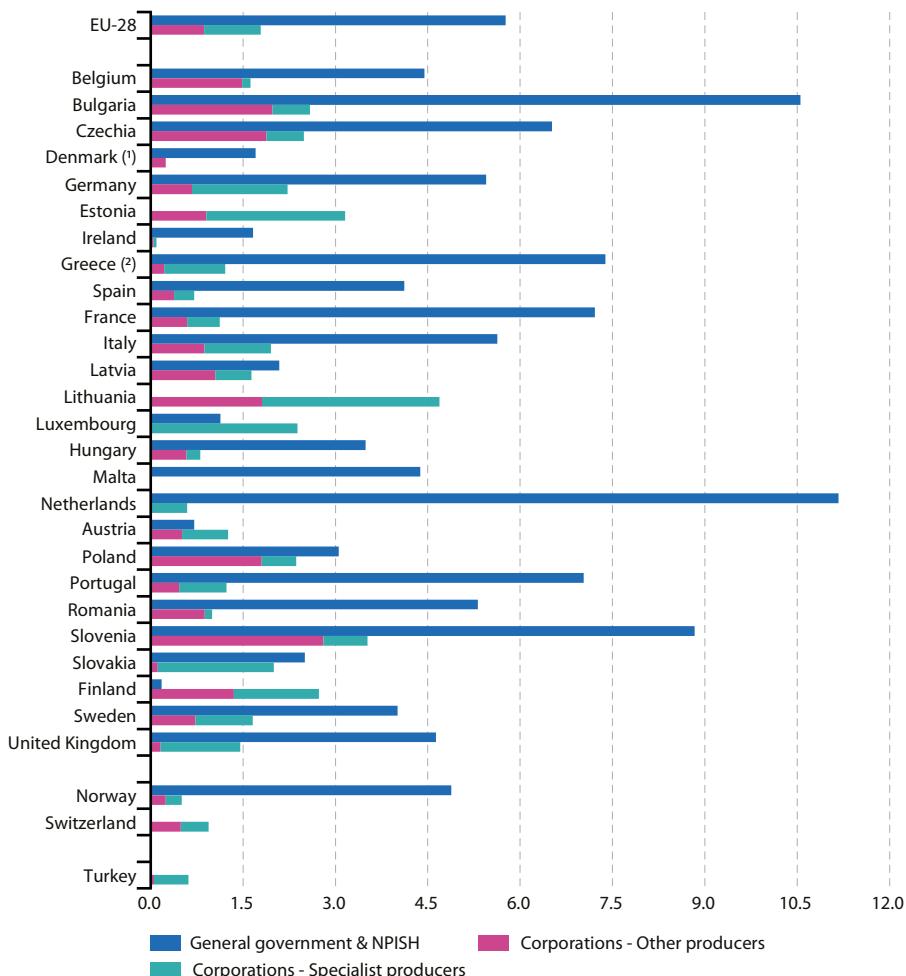
Figure 3.10.4: Investment for environmental protection, EU-28, 2006–2018
(EUR million and % of total investment)



Notes: Data for EU-28 are estimated by Eurostat; Investment comprises gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets; NPISH: Non-profit institutions serving households.

Source: Eurostat (online data codes: env_ac_pepsg, env_ac_pepss, env_ac_pepsnp and nasa_10_nf_tr)

Figure 3.10.5: Investment for environmental protection by corporations and by general government and non-profit institutions serving households (NPISH), 2016 (% of total investment by sector)



Notes: Data for EU-28 are estimated by Eurostat; Investment comprises gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets.

For Croatia no data available on total investment by sector and for Malta no data available on corporations total investments for calculation of the share by sector.

For Estonia and Lithuania the share of general government investments is not presented in this graph; for these countries the value of disposals of non-financial non-produced assets is higher than investments in fixed assets in 2016.

(?) Corporations - Specialist producers: not available.

(?) Corporations - Other producers: Eurostat estimates.

(?) Corporations - Other producers: not available.

Source: Eurostat (online data code: env_ac_pepssp, env_ac_pepsnsp, env_ac_pepsgg and nasa_10_nf_tr)

4

Indicators for EU-28 countries



EU-28



Key information

Gross Domestic Product	2017	15 393.4	EUR billion
Population	2017	511.5	million

Main indicators

Energy			
Share of energy from renewable sources in gross final consumption of energy	2017	2.5	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	71.3	million tonnes of oil equivalent
Electricity prices for household consumers (¹)	2018S2	0.21	EUR/kWh
Natural gas prices for household consumers (²)	2018S2	0.07	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	86.7	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	30.7	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	74.3	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	7.6	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	226.6	million tonnes of oil equivalent

Transport			
Passenger cars	2017	512	number per thousand inhabitants
National railway passengers transport	2017	9 635	million
Air passenger transport	2017	1 043	million
Road freight transport	2017	76.7	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	3 961	million tonnes
Persons killed in railway accidents	2017	977	number
Persons killed in passenger cars accidents	2017	11 631	number

Environment			
Greenhouse gas emissions (³)	2017	8.8	tonnes of CO ₂ equivalent per capita
Resource productivity (⁴)	2018	138.4	index 2000 = 100
Plastic packaging waste generated	2016	31.9	kilograms per capita
Plastic packaging waste recycled	2016	42.4	recycling rate (%)
Environmental tax revenue	2017	6.1	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	486	kilograms per capita
Municipal waste recycled	2017	46.4	recycling rate (%)
National expenditure on environmental protection	2016	1.9	share of gross domestic product (%)
Terrestrial protected area under Natura 2000	2018	18.0	share of total area (%)

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Belgium



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	439.2 EUR billion	2.9
Population	2017	11.4 million	2.2

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	3.9	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	3.6	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.29	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.06	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	97.1	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	17.2	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	98.4	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.6	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	3.2	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	508	number per thousand inhabitants	-
National railway passengers transport	2017	:c	million	:c
Air passenger transport	2017	33	million	3.2
Road freight transport	2017	73.7	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	258	million tonnes	6.5
Persons killed in railway accidents	2017	20	number	2.0
Persons killed in passenger cars accidents	2017	288	number	2.5
Environment				EU-28
Greenhouse gas emissions (³)	2017	10.5	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	124.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	30.3	kilograms per capita	31.9
Plastic packaging waste recycled	2016	43.4	recycling rate (%)	42.4
Environmental tax revenue	2017	5.0	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	410	kilograms per capita	486
Municipal waste recycled	2017	53.7	recycling rate (%)	46.4
National expenditure on environmental protection	2016	3.2	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	12.7	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Bulgaria

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	51.7 EUR billion	0.3
Population	2017	7.1 million	1.4	

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-2.7	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	1.3	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.10	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	101.5	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	19.1	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	97.6	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	7.2	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.9	million tonnes of oil equivalent	226.6
	Transport			Share of EU-28 total (%)
Passenger cars	2017	393	number per thousand inhabitants	-
National railway passengers transport	2017	20	million	0.2
Air passenger transport	2017	11	million	1.1
Road freight transport	2017	56.6	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	31	million tonnes	0.8
Persons killed in railway accidents	2017	16	number	1.6
Persons killed in passenger cars accidents	2016	456	number	3.9
	Environment			EU-28
Greenhouse gas emissions (³)	2017	8.8	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	137.3	index 2000 = 100	138.4
Plastic packaging waste generated	2016	15.2	kilograms per capita	31.9
Plastic packaging waste recycled	2016	52.6	recycling rate (%)	42.4
Environmental tax revenue	2017	9.1	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	435	kilograms per capita	486
Municipal waste recycled	2017	34.6	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.4	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	34.5	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Czechia



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	191.7 EUR billion	1.2
Population	2017	10.6 million	2.1

Main indicators

Energy

EU-28

Share of energy from renewable sources in gross final consumption of energy	2017	-1.8	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	2.4	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.16	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.06	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	97.1	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	13.7	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	101.9	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.6	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	4.4	million tonnes of oil equivalent	226.6

Transport

Share of EU-28 total (%)

Passenger cars	2017	522	number per thousand inhabitants	-
National railway passengers transport	2017	177	million	1.8
Air passenger transport	2017	16	million	1.5
Road freight transport	2017	73.1	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	-	million tonnes	-
Persons killed in railway accidents	2017	35	number	3.6
Persons killed in passenger cars accidents	2017	279	number	2.4

Environment

EU-28

Greenhouse gas emissions (³)	2017	12.3	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	170.3	index 2000 = 100	138.4
Plastic packaging waste generated	2016	22.4	kilograms per capita	31.9
Plastic packaging waste recycled	2016	59.2	recycling rate (%)	42.4
Environmental tax revenue	2017	5.9	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	344	kilograms per capita	486
Municipal waste recycled	2017	34.1	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.7	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	14.1	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Denmark



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	292.8 EUR billion	1.9
Population	2017	5.7 million	1.1

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-5.8	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.31	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.09	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	-3.9	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	60.4	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	-56.2	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.8	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	4.2	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	438	number per thousand inhabitants	-
National railway passengers transport	2017	194	million	2.0
Air passenger transport	2017	33	million	3.2
Road freight transport	2017	88.5	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	95	million tonnes	2.4
Persons killed in railway accidents	2017	6	number	0.6
Persons killed in passenger cars accidents	2017	99	number	0.9
Environment				EU-28
Greenhouse gas emissions (³)	2017	8.8	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	117.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	37.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	36.1	recycling rate (%)	42.4
Environmental tax revenue	2017	8.1	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	781	kilograms per capita	486
Municipal waste recycled	2017	46.3	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.2	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	8.4	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Germany



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	3 277.3	EUR billion
Population	2017	82.5	million

Main indicators

Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	2.5	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	6.6	million tonnes of oil equivalent
Electricity prices for household consumers (¹)	2018S2	0.30	EUR/kWh
Natural gas prices for household consumers (²)	2018S2	0.06	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	95.8	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	34.4	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	91.4	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	7.0	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	42.6	million tonnes of oil equivalent
Transport			Share of EU-28 total (%)
Passenger cars	2017	561	number per thousand inhabitants
National railway passengers transport	2017	2 816	million
Air passenger transport	2017	212	million
Road freight transport	2017	73.4	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	299	million tonnes
Persons killed in railway accidents	2017	157	number
Persons killed in passenger cars accidents	2017	1 437	number
Environment			EU-28
Greenhouse gas emissions (³)	2017	11.3	tonnes of CO ₂ equivalent per capita
Resource productivity (⁴)	2018	140.2	index 2000 = 100
Plastic packaging waste generated	2016	37.6	kilograms per capita
Plastic packaging waste recycled	2016	48.4	recycling rate (%)
Environmental tax revenue	2017	4.6	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	633	kilograms per capita
Municipal waste recycled	2017	67.6	recycling rate (%)
National expenditure on environmental protection	2016	2.1	share of gross domestic product (%)
Terrestrial area protected under Natura 2000	2018	15.5	share of total area (%)

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Estonia

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	23.6 EUR billion	0.2
Population	2017	1.3 million	0.3	

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-4.2	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.14	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	115.2	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	17.0	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	100.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	0.4	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.6	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2017	550	number per thousand inhabitants	-
National railway passengers transport	2017	7	million	0.1
Air passenger transport	2017	3	million	0.3
Road freight transport	2017	55.6	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	35	million tonnes	0.9
Persons killed in railway accidents	2017	7	number	0.7
Persons killed in passenger cars accidents	2017	27	number	0.2

	Environment			EU-28
Greenhouse gas emissions (³)	2017	16.0	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	94.2	index 2000 = 100	138.4
Plastic packaging waste generated	2016	49.1	kilograms per capita	31.9
Plastic packaging waste recycled	2016	24.6	recycling rate (%)	42.4
Environmental tax revenue	2017	8.8	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	390	kilograms per capita	486
Municipal waste recycled	2017	28.4	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.0	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	17.9	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Ireland

		Key information		Share of EU-28 total (%)
		Gross Domestic Product	2017	297.1 EUR billion 1.9
		Population	2017	4.8 million 0.9

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	5.3	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.25	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.08	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	98.3	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	30.1	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	32.7	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	7.4	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.1	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	444	number per thousand inhabitants	-
National railway passengers transport	2017	45	million	0.5
Air passenger transport	2017	34	million	3.3
Road freight transport	2017	99.1	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	53	million tonnes	1.3
Persons killed in railway accidents	2017	2	number	0.2
Persons killed in passenger cars accidents	2015	89	number	0.8
Environment				EU-28
Greenhouse gas emissions (³)	2017	13.3	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	234.0	index 2000 = 100	138.4
Plastic packaging waste generated	2016	57.9	kilograms per capita	31.9
Plastic packaging waste recycled	2016	31.2	recycling rate (%)	42.4
Environmental tax revenue	2017	7.6	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2016	581	kilograms per capita	486
Municipal waste recycled	2016	40.7	recycling rate (%)	46.4
National expenditure on environmental protection	2016	0.5	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	13.1	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Greece



Key information

			Share of EU-28 total (%)
Gross Domestic Product	2017	180.2 EUR billion	1.2
Population	2017	10.8 million	2.1

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	1.7	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.16	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.07	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	98.0	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	24.5	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	100.5	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	1.8	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	2.8	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2017	487	number per thousand inhabitants	-
National railway passengers transport	2017	15	million	0.2
Air passenger transport	2017	50	million	4.8
Road freight transport	2017	98.2	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	181	million tonnes	4.6
Persons killed in railway accidents	2017	21	number	2.1
Persons killed in passenger cars accidents	2017	285	number	2.5

	Environment			EU-28
Greenhouse gas emissions (³)	2017	9.2	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	125.8	index 2000 = 100	138.4
Plastic packaging waste generated	2016	17.3	kilograms per capita	31.9
Plastic packaging waste recycled	2016	38.2	recycling rate (%)	42.4
Environmental tax revenue	2017	10.2	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	504	kilograms per capita	486
Municipal waste recycled	2017	18.9	recycling rate (%)	46.4
National expenditure on environmental protection	2016	:	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	27.3	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Spain



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	1 166.3 EUR billion	7.6
Population	2017	46.5 million	9.1

Main indicators

Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	2.5	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	5.0	million tonnes of oil equivalent
Electricity prices for household consumers (¹)	2018S2	0.25	EUR/kWh
Natural gas prices for household consumers (²)	2018S2	0.09	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	97.9	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	36.3	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	101.3	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	5.9	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	17.6	million tonnes of oil equivalent
Transport			Share of EU-28 total (%)
Passenger cars	2017	504	number per thousand inhabitants
National railway passengers transport	2017	592	million
Air passenger transport	2017	210	million
Road freight transport	2017	95.1	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	486	million tonnes
Persons killed in railway accidents	2017	29	number
Persons killed in passenger cars accidents	2017	799	number
Environment			EU-28
Greenhouse gas emissions (³)	2017	7.7	tonnes of CO ₂ equivalent per capita
Resource productivity (⁴)	2018	208.9	index 2000 = 100
Plastic packaging waste generated	2016	32.8	kilograms per capita
Plastic packaging waste recycled	2016	45.5	recycling rate (%)
Environmental tax revenue	2017	5.4	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	462	kilograms per capita
Municipal waste recycled	2017	33.5	recycling rate (%)
National expenditure on environmental protection	2016	1.6	share of gross domestic product (%)
Terrestrial area protected under Natura 2000	2018	27.3	share of total area (%)

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

France



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	2 295.1 EUR billion	14.9
Population	2017	66.8 million	13.1

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	6.7	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	34.3	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.18	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.08	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	99.2	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	19.9	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	98.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	9.1	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	25.9	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2017	478	number per thousand inhabitants	-
National railway passengers transport	2017	1 237	million	12.8
Air passenger transport	2017	154	million	14.8
Road freight transport	2017	87.2	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	303	million tonnes	7.6
Persons killed in railway accidents	2017	94	number	9.6
Persons killed in passenger cars accidents	2017	1 767	number	15.2

	Environment			EU-28
Greenhouse gas emissions (³)	2017	7.2	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	140.8	index 2000 = 100	138.4
Plastic packaging waste generated	2016	32.6	kilograms per capita	31.9
Plastic packaging waste recycled	2016	25.8	recycling rate (%)	42.4
Environmental tax revenue	2017	5.0	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	514	kilograms per capita	486
Municipal waste recycled	2017	42.9	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.9	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	12.9	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Croatia



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	49.0 EUR billion	0.3
Population	2017	4.2 million	0.8

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-7.3	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.13	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	77.1	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	46.4	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	53.8	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	1.2	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	2.2	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	389	number per thousand inhabitants	-
National railway passengers transport	2017	20	million	0.2
Air passenger transport	2017	9	million	0.9
Road freight transport	2017	73.6	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	21	million tonnes	0.5
Persons killed in railway accidents	2017	20	number	2.0
Persons killed in passenger cars accidents	2017	187	number	1.6
Environment				EU-28
Greenhouse gas emissions (³)	2017	6.2	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	103.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	13.1	kilograms per capita	31.9
Plastic packaging waste recycled	2016	41.1	recycling rate (%)	42.4
Environmental tax revenue	2017	9.1	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	416	kilograms per capita	486
Municipal waste recycled	2017	23.6	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.0	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	36.6	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Italy

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	1 727.4 EUR billion	11.2
Population	2017	60.6 million	11.8	

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-1.3	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.22	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.10	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	91.5	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	34.1	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	92.3	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.5	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	26.5	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2016	625	number per thousand inhabitants	-
National railway passengers transport	2017	846	million	8.8
Air passenger transport	2017	144	million	13.8
Road freight transport	2017	86.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	475	million tonnes	12.0
Persons killed in railway accidents	2017	55	number	5.6
Persons killed in passenger cars accidents	2017	1 472	number	12.7

	Environment			EU-28
Greenhouse gas emissions (³)	2017	7.3	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	195.5	index 2000 = 100	138.4
Plastic packaging waste generated	2016	36.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	42.4	recycling rate (%)	42.4
Environmental tax revenue	2017	7.9	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	489	kilograms per capita	486
Municipal waste recycled	2017	47.7	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.9	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	19.0	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Cyprus



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	19.6 EUR billion	0.1
Population	2017	0.9 million	0.2

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	3.1	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.22	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	-	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	100.9	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	8.9	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	-	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	2.6	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	0.1	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	609	number per thousand inhabitants	-
National railway passengers transport	2017	-	million	-
Air passenger transport	2017	10	million	1.0
Road freight transport	2017	100.0	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	8	million tonnes	0.2
Persons killed in railway accidents	2017	-	number	-
Persons killed in passenger cars accidents	2016	10	number	0.1
Environment				EU-28
Greenhouse gas emissions (³)	2017	11.6	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	159.7	index 2000 = 100	138.4
Plastic packaging waste generated	2016	18.9	kilograms per capita	31.9
Plastic packaging waste recycled	2016	63.7	recycling rate (%)	42.4
Environmental tax revenue	2017	8.6	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	637	kilograms per capita	486
Municipal waste recycled	2017	16.1	recycling rate (%)	46.4
National expenditure on environmental protection	2016	:	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	28.8	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Latvia

		Key information		Share of EU-28 total (%)	
Gross Domestic Product	2017	27.0	EUR billion	0.2	
Population	2017	2.0	million	0.4	

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	1.0	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.15	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.05	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	100.1	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	54.4	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	102.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	2.5	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	2.6	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	356	number per thousand inhabitants	-
National railway passengers transport	2017	17	million	0.2
Air passenger transport	2017	6	million	0.6
Road freight transport	2017	26.0	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	59	million tonnes	1.5
Persons killed in railway accidents	2017	16	number	1.6
Persons killed in passenger cars accidents	2017	59	number	0.5
Environment				EU-28
Greenhouse gas emissions (³)	2017	6.1	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	104.6	index 2000 = 100	138.4
Plastic packaging waste generated	2016	20.6	kilograms per capita	31.9
Plastic packaging waste recycled	2016	37.2	recycling rate (%)	42.4
Environmental tax revenue	2017	11.2	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	438	kilograms per capita	486
Municipal waste recycled	2017	23.3	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.7	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	11.5	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Lithuania

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	42.2 EUR billion	0.3
	Population	2017	2.8 million	0.6

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-2.8	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.11	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	96.3	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	18.3	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	99.3	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	3.7	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.7	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2016	483	number per thousand inhabitants	-
National railway passengers transport	2017	4	million	0.0
Air passenger transport	2017	5	million	0.5
Road freight transport	2017	33.3	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	50	million tonnes	1.3
Persons killed in railway accidents	2017	17	number	1.7
Persons killed in passenger cars accidents	2015	115	number	1.0

	Environment			EU-28
Greenhouse gas emissions (³)	2017	7.3	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	105.2	index 2000 = 100	138.4
Plastic packaging waste generated	2016	22.9	kilograms per capita	31.9
Plastic packaging waste recycled	2016	74.4	recycling rate (%)	42.4
Environmental tax revenue	2017	6.5	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	455	kilograms per capita	486
Municipal waste recycled	2017	48.1	recycling rate (%)	46.4
National expenditure on environmental protection	2016	:	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	12.4	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Luxembourg

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	55.3 EUR billion	0.4
	Population	2017	0.6 million	0.1

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	4.6	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.17	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	99.7	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	8.1	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	100.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.4	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	0.2	million tonnes of oil equivalent	226.6

	Transport			Share of EU-28 total (%)
Passenger cars	2017	670	number per thousand inhabitants	-
National railway passengers transport	2017	17	million	0.2
Air passenger transport	2017	4	million	0.4
Road freight transport	2017	87.9	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	-	million tonnes	-
Persons killed in railway accidents	2017	1	number	0.1
Persons killed in passenger cars accidents	2017	13	number	0.1

	Environment			EU-28
Greenhouse gas emissions (³)	2017	20.0	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	123.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	53.1	kilograms per capita	31.9
Plastic packaging waste recycled	2016	32.6	recycling rate (%)	42.4
Environmental tax revenue	2017	4.4	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	607	kilograms per capita	486
Municipal waste recycled	2017	48.3	recycling rate (%)	46.4
National expenditure on environmental protection	2016	0.9	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	27.0	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Hungary

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	124.1 EUR billion	0.8
	Population	2017	9.8 million	1.9

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-0.3	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	1.4	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.11	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.03	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	86.6	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	7.5	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	96.3	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.8	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	3.2	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	355	number per thousand inhabitants	-
National railway passengers transport	2017	:c	million	:c
Air passenger transport	2017	13	million	1.2
Road freight transport	2017	62.7	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	-	million tonnes	-
Persons killed in railway accidents	2017	101	number	10.3
Persons killed in passenger cars accidents	2017	277	number	2.4
Environment				EU-28
Greenhouse gas emissions (³)	2017	6.6	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	120.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	31.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	31.4	recycling rate (%)	42.4
Environmental tax revenue	2017	6.6	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	385	kilograms per capita	486
Municipal waste recycled	2017	35.0	recycling rate (%)	46.4
National expenditure on environmental protection	2016	:	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	21.4	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Malta



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	11.3 EUR billion	0.1
Population	2017	0.5 million	0.1

Main indicators

Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	2.8	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent
Electricity prices for household consumers (¹)	2018S2	0.13	EUR/kWh
Natural gas prices for household consumers (²)	2018S2	-	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	104.2	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	6.6	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	105.2	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	6.9	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	0.0	million tonnes of oil equivalent

Transport			Share of EU-28 total (%)
Passenger cars	2017	613	number per thousand inhabitants
National railway passengers transport	2017	-	million
Air passenger transport	2017	6	million
Road freight transport	2017	100.0	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	4	million tonnes
Persons killed in railway accidents	2017	-	number
Persons killed in passenger cars accidents	2016	5	number

Environment			EU-28
Greenhouse gas emissions (³)	2017	5.5	tonnes of CO ₂ equivalent per capita
Resource productivity (⁴)	2018	139.4	index 2000 = 100
Plastic packaging waste generated	2016	31.9	kilograms per capita
Plastic packaging waste recycled	2016	23.5	recycling rate (%)
Environmental tax revenue	2017	8.4	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	604	kilograms per capita
Municipal waste recycled	2017	6.4	recycling rate (%)
National expenditure on environmental protection	2016	1.5	share of gross domestic product (%)
Terrestrial area protected under Natura 2000	2018	13.3	share of total area (%)

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Netherlands

	Key information		Share of EU-28 total (%)	
	Gross Domestic Product	2017	738.1 EUR billion	4.8
	Population	2017	17.1 million	3.3

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	7.4	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.3	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.17	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.09	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	90.5	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	13.8	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	-4.4	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	5.9	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	5.6	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	487	number per thousand inhabitants	-
National railway passengers transport	2017	:c	million	:c
Air passenger transport	2017	76	million	7.3
Road freight transport	2017	49.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	596	million tonnes	15.0
Persons killed in railway accidents	2017	12	number	1.2
Persons killed in passenger cars accidents	2017	194	number	1.7
Environment				EU-28
Greenhouse gas emissions (³)	2017	12.0	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	149.1	index 2000 = 100	138.4
Plastic packaging waste generated	2016	29.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	51.5	recycling rate (%)	42.4
Environmental tax revenue	2017	8.6	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	513	kilograms per capita	486
Municipal waste recycled	2017	54.2	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.4	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	13.3	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Austria

		Key information		Share of EU-28 total (%)	
Gross Domestic Product	2017	369.9	EUR billion	2.4	
Population	2017	8.8	million	1.7	

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	1.4	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.20	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.07	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	92.2	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	72.2	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	90.2	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	9.7	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	9.8	million tonnes of oil equivalent	226.6

Transport				Share of EU-28 total (%)
Passenger cars	2017	555	number per thousand inhabitants	-
National railway passengers transport	2017	245	million	2.5
Air passenger transport	2017	28	million	2.7
Road freight transport	2017	65.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	-	million tonnes	-
Persons killed in railway accidents	2017	18	number	1.8
Persons killed in passenger cars accidents	2017	182	number	1.6

Environment				EU-28
Greenhouse gas emissions (³)	2017	9.6	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	118.9	index 2000 = 100	138.4
Plastic packaging waste generated	2016	34.1	kilograms per capita	31.9
Plastic packaging waste recycled	2016	33.6	recycling rate (%)	42.4
Environmental tax revenue	2017	5.7	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	570	kilograms per capita	486
Municipal waste recycled	2017	57.7	recycling rate (%)	46.4
National expenditure on environmental protection	2016	3.2	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	15.4	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Poland

Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	467.3 EUR billion	3.0
Population	2017	38.0 million	7.4

Main indicators

Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	4.1	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent
Electricity prices for household consumers (¹)	2018S2	0.14	EUR/kWh
Natural gas prices for household consumers (²)	2018S2	0.05	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	98.6	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	13.1	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	77.8	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	4.2	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	9.1	million tonnes of oil equivalent
Transport			Share of EU-28 total (%)
Passenger cars	2017	593	number per thousand inhabitants
National railway passengers transport	2017	291	million
Air passenger transport	2017	38	million
Road freight transport	2017	76.0	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	78	million tonnes
Persons killed in railway accidents	2017	171	number
Persons killed in passenger cars accidents	2017	1 295	number
Environment			EU-28
Greenhouse gas emissions (³)	2017	11.0	tonnes of CO ₂ equivalent per capita
Resource productivity (⁴)	2018	135.1	index 2000 = 100
Plastic packaging waste generated	2016	26.5	kilograms per capita
Plastic packaging waste recycled	2016	46.9	recycling rate (%)
Environmental tax revenue	2017	7.9	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	315	kilograms per capita
Municipal waste recycled	2017	33.8	recycling rate (%)
National expenditure on environmental protection	2016	2.0	share of gross domestic product (%)
Terrestrial area protected under Natura 2000	2018	19.6	share of total area (%)

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Portugal



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	194.6 EUR billion	1.3
Population	2017	10.3 million	2.0

Main indicators

Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	2.9	difference to 2020 target (%)
Electricity generation from nuclear plants	2017	0.0	million tonnes of oil equivalent
Electricity prices for household consumers (⁽¹⁾)	2018S2	0.23	EUR/kWh
Natural gas prices for household consumers (⁽²⁾)	2018S2	0.08	EUR/kWh
Energy dependency on oil and petroleum products (excluding biofuels)	2017	100.2	net imports/gross available energy (%)
Gross electricity generation from renewable sources	2017	54.2	share of gross electricity consumption (%)
Energy dependency on natural gas	2017	100.4	net imports/gross available energy (%)
Energy from renewable sources used in transport	2017	7.9	share of total renewable sources (%)
Primary production of renewables and biofuels	2017	5.1	million tonnes of oil equivalent
			226.6

Transport			Share of EU-28 total (%)
Passenger cars	2017	492	number per thousand inhabitants
National railway passengers transport	2017	142	million
Air passenger transport	2017	48	million
Road freight transport	2017	85.9	share of total inland freight transport in tonne-kilometres (%)
Gross weight of seaborne freight handled in all ports	2017	93	million tonnes
Persons killed in railway accidents	2017	20	number
Persons killed in passenger cars accidents	2017	204	number

Environment			EU-28
Greenhouse gas emissions (⁽³⁾)	2017	7.2	tonnes of CO ₂ equivalent per capita
Resource productivity (⁽⁴⁾)	2018	132.9	index 2000 = 100
Plastic packaging waste generated	2016	36.7	kilograms per capita
Plastic packaging waste recycled	2016	41.8	recycling rate (%)
Environmental tax revenue	2017	7.5	share of total revenue from taxes and social contributions (%)
Municipal waste generated	2017	487	kilograms per capita
Municipal waste recycled	2017	28.4	recycling rate (%)
National expenditure on environmental protection	2016	1.2	share of gross domestic product (%)
Terrestrial area protected under Natura 2000	2018	20.7	share of total area (%)
			18.0

(⁽¹⁾) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(⁽²⁾) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(⁽³⁾) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁽⁴⁾) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Romania



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	187.5 EUR billion	1.2
Population	2017	19.6 million	3.8

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-0.5	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	1.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.13	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.04	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	60.6	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	41.6	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	9.7	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	6.6	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	5.8	million tonnes of oil equivalent	226.6
	Transport			Share of EU-28 total (%)
Passenger cars	2015	261	number per thousand inhabitants	-
National railway passengers transport	2017	67	million	0.7
Air passenger transport	2017	18	million	1.7
Road freight transport	2017	42.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	46	million tonnes	1.2
Persons killed in railway accidents	2017	59	number	6.0
Persons killed in passenger cars accidents	2017	812	number	7.0
	Environment			EU-28
Greenhouse gas emissions (³)	2017	5.9	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	83.9	index 2000 = 100	138.4
Plastic packaging waste generated	2016	17.7	kilograms per capita	31.9
Plastic packaging waste recycled	2016	46.5	recycling rate (%)	42.4
Environmental tax revenue	2017	7.7	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	272	kilograms per capita	486
Municipal waste recycled	2017	13.9	recycling rate (%)	46.4
National expenditure on environmental protection	2016	:	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	22.7	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Slovenia



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	43.0	EUR billion	0.3
Population	2017	2.1	million	0.4

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	3.5	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	0.5	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.16	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.06	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	103.3	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	32.4	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	99.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	2.7	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.0	million tonnes of oil equivalent	226.6

Transport				Share of EU-28 total (%)
Passenger cars	2017	541	number per thousand inhabitants	-
National railway passengers transport	2017	13	million	0.1
Air passenger transport	2017	2	million	0.2
Road freight transport	2017	64.5	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	22	million tonnes	0.6
Persons killed in railway accidents	2017	5	number	0.5
Persons killed in passenger cars accidents	2017	30	number	0.3

Environment				EU-28
Greenhouse gas emissions (³)	2017	8.5	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	174.7	index 2000 = 100	138.4
Plastic packaging waste generated	2016	22.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	62.0	recycling rate (%)	42.4
Environmental tax revenue	2017	10.2	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	471	kilograms per capita	486
Municipal waste recycled	2017	57.8	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.1	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	37.8	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Slovakia



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	84.9 EUR billion	0.6
Population	2017	5.4 million	1.1

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	2.5	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	1.3	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.15	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.05	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	97.5	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	21.3	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	105.6	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	7.0	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	1.6	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	408	number per thousand inhabitants	-
National railway passengers transport	2017	71	million	0.7
Air passenger transport	2017	2	million	0.2
Road freight transport	2017	63.5	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	-	million tonnes	-
Persons killed in railway accidents	2017	30	number	3.1
Persons killed in passenger cars accidents	2010	171	number	1.5
Environment				EU-28
Greenhouse gas emissions (³)	2017	8.0	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	138.9	index 2000 = 100	138.4
Plastic packaging waste generated	2016	22.0	kilograms per capita	31.9
Plastic packaging waste recycled	2016	51.7	recycling rate (%)	42.4
Environmental tax revenue	2017	5.4	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	378	kilograms per capita	486
Municipal waste recycled	2017	29.8	recycling rate (%)	46.4
National expenditure on environmental protection	2016	2.0	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	30.0	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Finland



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	223.9 EUR billion	1.5
Population	2017	5.5 million	1.1

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-3.0	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	1.9	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.17	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	:	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	96.4	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	35.2	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	98.9	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	18.8	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	11.7	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	617	number per thousand inhabitants	-
National railway passengers transport	2017	85	million	0.9
Air passenger transport	2017	20	million	1.9
Road freight transport	2017	72.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	110	million tonnes	2.8
Persons killed in railway accidents	2017	10	number	1.0
Persons killed in passenger cars accidents	2017	133	number	1.1
Environment				EU-28
Greenhouse gas emissions (³)	2017	10.4	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	115.4	index 2000 = 100	138.4
Plastic packaging waste generated	2016	22.4	kilograms per capita	31.9
Plastic packaging waste recycled	2016	25.4	recycling rate (%)	42.4
Environmental tax revenue	2017	6.9	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	510	kilograms per capita	486
Municipal waste recycled	2017	40.5	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.8	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	12.6	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Sweden



Key information

		Share of EU-28 total (%)	
Gross Domestic Product	2017	475.2 EUR billion	3.1
Population	2017	10.0 million	2.0

Main indicators

	Energy			EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	-5.5	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	5.6	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.20	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.12	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	84.5	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	65.9	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	100.0	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	38.6	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	19.4	million tonnes of oil equivalent	226.6
	Transport			Share of EU-28 total (%)
Passenger cars	2017	479	number per thousand inhabitants	-
National railway passengers transport	2017	217	million	2.3
Air passenger transport	2017	38	million	3.6
Road freight transport	2017	69.8	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	176	million tonnes	4.4
Persons killed in railway accidents	2017	14	number	1.4
Persons killed in passenger cars accidents	2017	131	number	1.1
	Environment			EU-28
Greenhouse gas emissions (³)	2017	5.5	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	103.6	index 2000 = 100	138.4
Plastic packaging waste generated	2016	24.0	kilograms per capita	31.9
Plastic packaging waste recycled	2016	50.7	recycling rate (%)	42.4
Environmental tax revenue	2017	4.9	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	452	kilograms per capita	486
Municipal waste recycled	2017	46.8	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.9	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	13.4	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

United Kingdom



Key information

Share of EU-28 total (%)

Gross Domestic Product	2017	2 338.0 EUR billion	15.2
Population	2017	65.8 million	12.9

Main indicators

Energy				EU-28
Share of energy from renewable sources in gross final consumption of energy	2017	4.8	difference to 2020 target (%)	2.5
Electricity generation from nuclear plants	2017	6.0	million tonnes of oil equivalent	71.3
Electricity prices for household consumers (¹)	2018S2	0.20	EUR/kWh	0.21
Natural gas prices for household consumers (²)	2018S2	0.05	EUR/kWh	0.07
Energy dependency on oil and petroleum products (excluding biofuels)	2017	34.7	net imports/gross available energy (%)	86.7
Gross electricity generation from renewable sources	2017	28.1	share of gross electricity consumption (%)	30.7
Energy dependency on natural gas	2017	45.5	net imports/gross available energy (%)	74.3
Energy from renewable sources used in transport	2017	5.1	share of total renewable sources (%)	7.6
Primary production of renewables and biofuels	2017	15.6	million tonnes of oil equivalent	226.6
Transport				Share of EU-28 total (%)
Passenger cars	2017	471	number per thousand inhabitants	-
National railway passengers transport	2017	1 738	million	18.0
Air passenger transport	2017	265	million	25.4
Road freight transport	2017	90.4	share of total inland freight transport in tonne-kilometres (%)	-
Gross weight of seaborne freight handled in all ports	2017	482	million tonnes	12.2
Persons killed in railway accidents	2017	41	number	4.2
Persons killed in passenger cars accidents	2017	815	number	7.0
Environment				EU-28
Greenhouse gas emissions (³)	2017	7.7	tonnes of CO ₂ equivalent per capita	8.8
Resource productivity (⁴)	2018	177.2	index 2000 = 100	138.4
Plastic packaging waste generated	2016	34.5	kilograms per capita	31.9
Plastic packaging waste recycled	2016	44.9	recycling rate (%)	42.4
Environmental tax revenue	2017	7.0	share of total revenue from taxes and social contributions (%)	6.1
Municipal waste generated	2017	468	kilograms per capita	486
Municipal waste recycled	2017	43.8	recycling rate (%)	46.4
National expenditure on environmental protection	2016	1.2	share of gross domestic product (%)	1.9
Terrestrial area protected under Natura 2000	2018	8.6	share of total area (%)	18.0

(¹) For households with annual consumption between 2 500 kWh and 5 000 kWh; prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

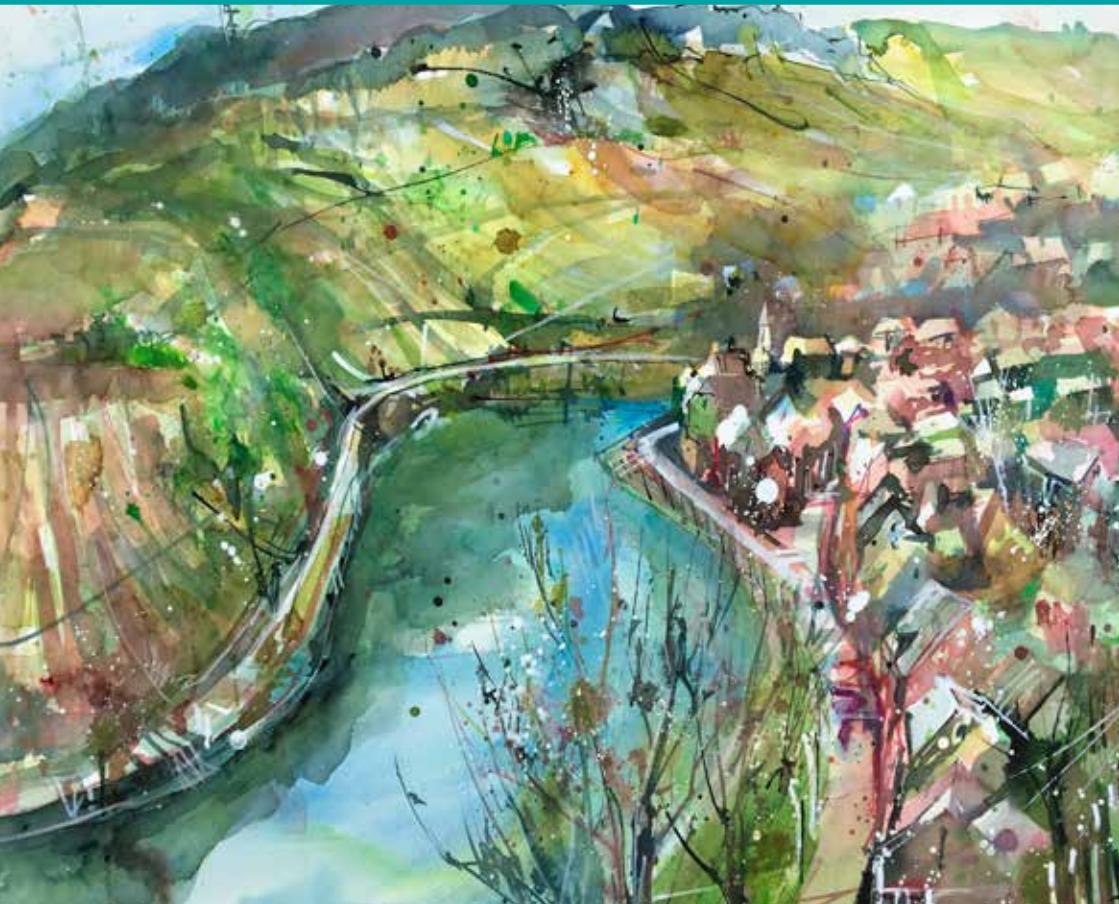
(²) For households with annual consumption between 5 555 kWh and 55 555 kWh (20 - 200 GJ); prices include VAT and other taxes and levies; data for the 2nd semester of 2018.

(³) The indicator does not include emissions and removals related to land use, land-use change and forestry (LULUCF) but does include emissions from international aviation.

(⁴) Gross Domestic Product (GDP)/ Domestic Material Consumption (DMC), indexed to reference year 2000. Note: GDP in chain-linked volumes.

Source: Eurostat

Annexes



Annex 1A: Legislation and methodology used in the energy section

Eurostat collects data on energy quantities on an annual and monthly basis. The main legislation covering these data collections is Regulation (EC) No 1099/2008 of the European Parliament and of the Council of 22 October 2008 on energy statistics. Since its adoption, this Regulation was amended four times:

- Commission Regulation (EU) No 844/2010 of 20 September 2010 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the establishment of a set of annual nuclear statistics and the adaptation of the methodological references according to NACE Rev. 2
- Commission Regulation (EU) No 147/2013 of 13 February 2013 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the implementation of updates for the monthly and annual energy statistics
- Commission Regulation (EU) No 431/2014 of 24 April 2014 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the implementation of annual statistics on energy consumption in households
- Commission Regulation (EU) 2017/2010 of 9 November 2017 amending Regulation (EC) No 1099/2008 of the European Parliament and of the Council on energy statistics, as regards the updates for the annual and monthly energy statistics

The next amendment of the Regulation (EC) No 1099/2008 is expected to come into force in 2020.

Given the special focus on renewables, the data collection on renewable energies is also

regulated by the Directive 2009/28/EC on the promotion of the use of energy from renewable sources as amended by Council Directive 2013/18/EU and Directive (EU) 2015/1513.

Eurostat also collects annual data on district cooling and district heating, as well as on combined heat and power generation, according to 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.

In parallel, Eurostat collects data on prices of both electricity and natural gas, as described in the Regulation (EU) 2016/1952.

Eurostat collects also data on emergency oil stocks according to the Council Directive 2009/119/EC of 14 September 2009, imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products.

The energy sector is constantly evolving and its importance for Europe is increasing, a fact that is reflected in the Commission policies. Eurostat is in constant collaboration with the other directorates, in order to be able to understand the developing policy needs and provide additional data to support the definition, implementation and evaluation of Community decisions and projects.

The ‘Clean energy for all Europeans’ package, put into force in May 2019, is expected to increase the need for additional statistical evidence for policy making. This package includes the governance of the energy union and climate action (Regulation (EU) 2018/1999), which entered into force on 24 December 2018; one of the main goals of the new regulation is to implement strategies and



measures which ensure that the objectives of the energy union, in particular the EU's 2030 energy and climate targets, and the long-term EU greenhouse gas emissions commitments are consistent with the Paris agreement.

In parallel, the 'Clean energy for all Europeans' package also includes the new amending Directive on energy efficiency (2018/2002) updating the policy framework in view of 2030 and beyond; the key element of the amended

Directive is a headline energy efficiency target for 2030 of at least 32.5%.

Eurostat has developed a coherent and harmonised system of energy statistics, meeting the requirements of policymakers for Energy Union and energy efficiency monitoring; nevertheless it keeps collaborating with its counterparts in order to be able to amend the existing reporting according to the current and future needs.

Annex 1B: Glossary of terms used in the energy section

These are the main definitions. More can be found in the glossary of Statistics Explained http://ec.europa.eu/eurostat/statistics-explained/index.php/Category:Energy_glossary.

AMBIENT HEAT

Heat energy at a useful temperature level, extracted (captured) by means of heat pumps that need electricity or other auxiliary energy to function. This heat energy can be stored in the ambient air, beneath the surface of solid earth or in surface water.

BIOFUELS

Liquid or gaseous fuels used primarily for transport produced from biomass. Biofuels comprise biogasoline, biodiesel and other liquid biofuels. Second-generation biofuels refer to biofuels produced from wastes, residues, non-food cellulosic material and lingo-cellulosic material.

BROWN COAL AND DERIVED PRODUCTS

Brown coal and derived products include brown coal (sub-bituminous coal and lignite) and brown coal/lignite briquettes.

CHP

See 'Combined heat and power'.

COGENERATION

See 'Combined heat and power'.

COMBINED HEAT AND POWER

A combined heat and power (also referred to as a cogeneration or a CHP) unit is an installation in which heat energy released from fuel is transmitted to electrical generator sets which are designed and operated in such a way that energy is partly used for generating electrical energy and partly for supplying heat for various purposes.

The thermal efficiency of a combined heat and power unit is significantly higher than that of a unit producing electricity only.

ENERGY BALANCE SHEETS

The energy balance sheets expressed in specific units and in tonnes of oil equivalent, for the European Union as a whole, as well as for each EU Member State, Iceland, Norway, and all candidate countries can be found on the Eurostat website <http://ec.europa.eu/eurostat/web/energy/data/energy-balances>.

ENERGY DEPENDENCY

Energy dependency shows the extent to which a country relies upon imports in order to meet its energy needs. It is calculated using the following formula: net energy imports/ (gross inland energy consumption + international maritime bunkers).

ENERGY INTENSITY

Energy intensity gives an indication of the effectiveness with which energy is being used to produce added value. It is defined as the ratio of Gross Inland Energy Consumption to Gross Domestic Product.

FINAL ENERGY CONSUMPTION

Final energy consumption is the energy consumed in the following sectors: industry, transport, commercial and public services, agriculture/forestry, fishing, residential and other. It excludes the non-energy consumption, deliveries to the energy transformation sector and for the own use of the energy sector.

GCV

See 'Gross calorific value'.

GROSS CALORIFIC VALUE

The gross calorific value (GCV) is the total amount of heat released by a unit quantity of fuel, when it is burned completely with oxygen, and when the products of combustion are returned to ambient temperature. This quantity includes the heat of condensation of any water vapour contained in the fuel and of the water vapour formed by the combustion of any hydrogen contained in the fuel.

GROSS INLAND CONSUMPTION

Gross inland consumption (also referred to as Gross Inland Energy Consumption) is the quantity of energy consumed within the borders of a country. It is calculated using the following formula: primary production + recovered

products + imports + stock changes - exports
- bunkers (i.e. quantities supplied to seagoing ships).

HARD COAL AND DERIVED PRODUCTS

Hard coal and derived products include hard coal (anthracite, coking coal, other bituminous coal), patent fuels, coke oven coke and coal tar.

INSTALLED CAPACITY

Installed capacity represents the maximum active power that can be supplied, continuously, with all plants running.

NATURAL GAS

Natural gas comprises gases, occurring in underground deposits, whether liquefied or gaseous, consisting mainly of methane. It includes both 'non-associated' gas originating from fields producing hydrocarbons only in gaseous form, and 'associated' gas produced in association with crude oil as well as methane recovered from coal mines.

NCV

See 'Net calorific value'.

NET CALORIFIC VALUE

The net calorific value (NCV) is the amount of heat released by a unit quantity of fuel, when it is burned completely with oxygen, and when the products of combustion are returned to ambient temperature. This quantity does not include the heat of condensation of the water vapour formed by the combustion of hydrogen contained in the fuel.

NET IMPORTS

Net imports is calculated as the difference between imports and exports.



POWER STATION EFFICIENCY

The efficiency of a thermal or nuclear power station is defined as the ratio between the output, i.e. the gross electricity generated, and the fuel input. In the case of a combined heat and power installation the output is the gross electricity generated plus the heat produced.

PRIMARY ENERGY PRODUCTION

Primary energy production is the extraction of energy from a natural source. The precise definition depends on the fuel involved:

- Hard coal, brown coal: Quantities of fuels extracted or produced, calculated after any operation for removal of inert matter. In general, production includes the quantities consumed by the producer during the production process (e.g. for heating or operation of equipment and auxiliaries) as well as any quantities supplied to other on-site producers of energy for transformation or other uses.
- Peat, oil shale and oil sands: Quantities of fuels extracted or produced within national boundaries.
- Crude oil: Quantities of fuels extracted or produced within national boundaries, including off-shore production. Production includes only marketable production, and excludes any quantities returned to formation.
- Natural gas: Quantities of dry gas within national boundaries, measured after purification and extraction of natural gas liquids and sulphur. The production includes only marketable production, and excludes any quantities re-injected, vented and flared, and any extraction losses. The production includes all quantities used within the natural gas industry, in gas extraction, pipeline systems and processing plants.
- Nuclear heat: Quantities of heat produced in a reactor. Production is the actual heat produced or the heat calculated on the basis of the gross electricity generated and the thermal efficiency of the nuclear plant.
- Ambient heat – See 'Ambient heat'.

• Hydropower, wind, solar photovoltaic: Quantities of electricity generated. Production is calculated on the basis of the gross electricity generated and a conversion factor of 3 600 kJ/kWh.

• Geothermal energy: Quantities of heat extracted from geothermal fluids. Production is calculated on the basis of the difference between the enthalpy of the fluid produced in the production borehole and that of the fluid disposed of via the re-injection borehole.

• Biomass/wastes: In the case of municipal solid wastes (MSW), wood, wood wastes and other solid wastes, production is the heat produced after combustion and corresponds to the heat content (NCV) of the fuel. In the case of anaerobic digestion of wet wastes, production is the heat content (NCV) of the biogases produced. The production includes all quantities of gas consumed in the installation for the fermentation processes, and excludes all quantities of flared gases.

In the case of biofuels, the production is the heat content (NCV) of the fuel.

RES

See 'Renewable energy'.

Renewable energy

Renewable energy sources include wind power, solar power (thermal, photovoltaic and concentrated), hydro power, tidal power, geothermal energy, biofuels, ambient heat, and the renewable part of waste.

TOE

See 'Tonne of oil equivalent'

TONNE OF OIL EQUIVALENT

The tonne of oil equivalent (toe) is a conventional standardised unit defined on the basis of a tonne of oil with a net calorific value of 41 868 kilojoules/kilogramme.

Annex 2A: Legislation and methodology used in the transport section

The main terms used in the field of transport statistics are defined in the 'Eurostat concepts and definitions database' (RAMON) accessible on the Eurostat website under <https://ec.europa.eu/eurostat/ramon/>

Further clarification of the terms used in transport statistics can be found in the Eurostat/ITF/UNECE 'Glossary for Transport Statistics' publication, available at <https://ec.europa.eu/eurostat/web/transport/publications> and in the glossary of Statistics Explained under https://ec.europa.eu/eurostat/statistics-explained/index.php/Category:Transport_glossary

All online publications on transport can be found on the Eurostat website: <http://europa.eu/lUk78nB>.

The indicators presented in the transport section of this statistical book represent a small part of the very detailed data collected by Eurostat in the framework of legal acts and voluntary data agreements. According to a commonly agreed breakdown, the indicators are presented on the one hand by domains of interest (equipment, vehicle-kilometres, quantity and performance for the transport of freight and passengers, safety) and on the other hand, by modes of transport (rail, road, inland waterways, maritime and aviation). To facilitate the comparisons between smaller and bigger countries, most of the indicators combine basic transport figures with population or Gross Domestic Product (GDP). Eurostat's online database has been used as the main source for the indicators, while figures from the DG for Mobility and Transport have been used as an additional source.

Two main channels are used by Eurostat to collect statistical data:

1. Legal acts on transport statistics which cover detailed data collections for all the main modes of transport:

- Rail: Regulation (EU) No 2018/643 of the European Parliament and of the Council of 18 April 2018 on rail transport statistics (OJ L 112 of 2.5.2018)
 - Road: Regulation (EU) No 70/2012 of the European Parliament and of the Council on statistical returns in respect of the carriage of goods by road (recast) (O.J. L 32 of 3.2.2012)
 - Inland waterways: Regulation (EU) 2018/974 of the European Parliament and of the Council on statistics of goods transport by inland waterways (codification) (O.J. L 179 of 16.7.2018)
 - Maritime: Directive 2009/42/EC of the European Parliament and of the Council of 6 May 2009 on statistical returns in respect of carriage of goods and passengers by sea (recast) (O.J. L 141 of 6.6.2009)
 - Aviation: Regulation (EC) No 437/2003 of the European Parliament and of the Council of 27 February 2003 on statistical returns in respect of the carriage of passengers, freight and mail by air (O.J. L 66 of 11.3.2003) and the subsequent implementing Commission Regulation 1358/2003 (O.J. L 194/9 of 1.8.2003).
 - Road accidents: Council Decision 93/704/ EC of 30 November 1993 (O.J. L 329 of 30.12.1993)
2. The 'Common Questionnaire' of Eurostat, UNECE and ITF, which is used to collect, on a voluntary basis, annual aggregated data covering many aspects of inland modes of transport (rail, road, inland waterways and pipelines). Other voluntary agreements cover the data collection for regional transport, passenger mobility and road traffic.



Annex 2B: Glossary of terms used in the transport section

RAILWAY VEHICLE

Mobile equipment running exclusively on rails, moving either under its own power (tractive vehicles) or hauled by another vehicle (coaches, railcar trailers, vans and wagons).

PASSENGER RAILWAY VEHICLE

Railway vehicle for the conveyance of passengers, even if it comprises one or more compartments with spaces specially reserved for luggage, parcels, mail, etc.

These vehicles include special vehicles such as sleeping cars, saloon cars, dining cars, ambulance cars and vans carrying accompanied road passenger vehicles. Each separate vehicle of an indivisible set for the conveyance of passengers is counted as a passenger railway vehicle. Included are railcars if they are designed for passenger transport.

PASSENGER CAR

Road motor vehicle, other than a moped or a motor cycle intended for the carriage of passengers and designed to seat no more than nine persons (including the driver). Refers to category M1 of the UN Consolidated Resolution on the Construction of Vehicles (R.E.3).

LORRY/TRUCK

Rigid road motor vehicle designed, exclusively or primarily, to carry goods.

ROAD TRACTOR (SEMI-TRAILER TRACTOR)

Road motor vehicle designed, exclusively or primarily, to haul other road vehicles which are not power-driven (mainly semi-trailers).

TRAILER

Goods road vehicle designed to be hauled by a road motor vehicle. With semi-trailers, refers to category O of the UN Consolidated Resolution on the Construction of Vehicles (R.E.3).

This category excludes agricultural trailers and caravans.

SEMI-TRAILER

Goods road vehicle with no front axle designed in such way that part of the vehicle and a substantial part of its loaded weight rests on a road tractor. With trailers, refers to category O of the UN Consolidated Resolution on the Construction of Vehicles (R.E.3).

ALTERNATIVE FUELS

A type of motor energy other than the conventional fuels, petrol and diesel.

Alternative fuels include electricity, LPG, natural gas (LNG or CNG), alcohols, mixtures of alcohols with other fuels, hydrogen, biofuels (such as biodiesel), etc. (This list is not exhaustive.) Alternative fuels do not include unleaded petrol, reformulated petrol or city (low-sulphur) diesel.

INLAND WATERWAYS VESSEL

A floating craft designed for the carriage of goods, public transport of passengers or specially fitted out for a specific commercial duty which navigates predominantly in navigable inland waterways or in waters within, or closely adjacent to sheltered waters or areas where port regulations apply.

Vessels under repair are included.

RAILWAY TRANSPORT OPERATOR/ RAILWAY UNDERTAKING

A licensed public or private transport operator which provides services for the transport of goods and/or passengers by rail.

NATIONAL ROAD TRANSPORT

Road transport between two places (a place of loading/embarkation and a place of unloading/disembarkation) located in the same country irrespective of the country in which the road motor vehicle is registered. It may involve transit through a second country.

ROAD CABOTAGE TRANSPORT

Road transport within a country other than the registration country, performed by a road motor vehicle registered in the reporting country.

INTERNATIONAL ROAD TRANSPORT

Road transport between a place of loading/embarkation or unloading/disembarkation in the declaring country and a place of loading/embarkation or unloading/disembarkation in another country.

Such transport may involve transit through one or more additional countries.

CROSS-TRADE ROAD TRANSPORT

Road transport performed by a road motor vehicle registered in one country between a place of loading/embarkation in a second country and a place of unloading/disembarkation in a third country.

Such transport may involve transit through one or more additional countries.

TONNE-KILOMETRE

Unit of measurement of goods transport which represents the transport of one tonne of goods over a distance of one kilometre.

PASSENGER-KILOMETRE

Unit of measurement representing the transport of one passenger over a distance of one kilometre.

VEHICLE-KILOMETRE

Unit of measurement representing the movement of a road vehicle over one kilometre.

NAVIGABLE INLAND WATERWAY

A stretch of water, not part of the sea, which by natural or man-made features is suitable for navigation, primarily by inland waterway vessels. This term covers navigable rivers, lakes, canals and estuaries.

GROSS WEIGHT OF GOODS

The total weight of goods carried, including packaging but excluding the tare weight of transport units (e.g. containers, swap bodies and pallets for containing goods).

(This concept is used for maritime transport; the definition of 'weight of goods' for each mode is provided in the related legal act.)

INJURY ACCIDENT (FOR RAIL MODE)

Any accident involving at least one rail vehicle in motion, resulting in at least one killed or injured person. Accidents in workshops, warehouses and depots are excluded.

PERSON KILLED

Any person dying immediately or within 30 days as a result of an injury accident, excluding suicides.



Annex 3: Legislation, methodology and glossary of terms used in the environment section

The Environment chapter includes indicators on greenhouse gas emissions, material flow accounts (MFA), circular economy, waste generation and treatment, waste resources, abstraction and use, wastewater treatment, biodiversity, chemicals, and economic indicators on environmental protection expenditure (EPEA), the environmental goods and services sector (EGSS) and environmental taxes. Greenhouse gas inventories data are taken from the European Environment Agency (EEA). Data on waste are reported under Regulation (EC) No 2150/2002 of the European Parliament and of the Council on waste statistics. Data on European environmental economic accounts, including MFA, EPEA, EGSS and environmental taxes, are reported under Regulation (EU) No 691/2011. Data on water are collected in cooperation with the Organisation for Economic Co-operation and Development (OECD) by means of a Joint Questionnaire. Data on chemicals are compiled from other data collections within Eurostat (COMEXT and PRODCOM). Data on bird indicators are provided by the European Bird Census Council /The Royal Society for Protection of Birds/Bird Life International /Czech Society for Ornithology.

For more detailed data and the most recent updates, please consult Eurostat's website at <https://ec.europa.eu/eurostat>

MAIN DEFINITIONS:

These are the main definitions. More can be found in the glossary of Statistics Explained https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Category:Environment_glossary

CO₂ EQUIVALENT

CO₂ equivalent is a metric measure used to compare the emissions from various greenhouse gases on the basis of their global-warming

potential (GWP), by converting amounts of other gases to the equivalent amount of carbon dioxide with the same global warming potential.

DOMESTIC EXTRACTION

Domestic extraction is one indicator from Eurostat's economy-wide Material Flow Accounts. Domestic extraction is the amount of raw materials (without water and air) extracted from the domestic natural environment and further processed in the economy.

DOMESTIC MATERIAL INPUT (DMI)

Domestic material input (DMI) is one indicator from Eurostat's economy-wide Material Flow Accounts. DMI measures the amount of materials (without water and air) which is actually being made available in an economy to produce goods and services (output). It is composed of the domestic extractions plus the simple mass weight of imported goods.

DOMESTIC MATERIAL CONSUMPTION (DMC)

Domestic material consumption (DMC) is one indicator from Eurostat's economy-wide Material Flow Accounts. DMC measures the amount of materials (without water and air) which is actually used by the categories of domestic final demand (consumption by households and government, and gross fixed capital formation). DMC is defined and calculated as domestic material input minus the simple mass weight of exports.

ENVIRONMENTAL DOMAINS

The scope of environmental protection is defined according to the System of Environmental-Economic Accounts (SEEA CF). Environment protection is classified according to the Classification of Environmental Protection Activities (CEPA 2000), and resource management is classified according to Classification of Resource Management Activities (CReMA). For details, see annexes 4 and 5 of [Environmental Goods and Services Handbook](#).

ENVIRONMENTAL GOODS AND SERVICES SECTOR

The environmental goods and services sector (EGSS) is also referred to as 'environmental economy', 'environment industry' or 'eco-industries'. It encompasses diverse activities and provides a range of products such as organic vegetables, renewable energy, or waste treatment services that help protecting the environment and preserving the stock of natural resources. For further information, see [Environmental Goods and Services Handbook](#).

ENVIRONMENTAL TAXES BY ECONOMIC ACTIVITIES

Environmental taxes are taxes whose tax base is a physical unit (or a proxy of it) of something that has a proven, specific negative impact on the environment, and which is identified in ESA as a tax. Environmental taxes comprise four types: energy, transport, pollution and resource taxes. Carbon dioxide taxes are included under energy as they are often an integral part of general energy taxes. General value added tax (VAT) is excluded.

For further information, see [Environmental taxes - a statistical guide](#).

NATIONAL EXPENDITURE ON ENVIRONMENTAL PROTECTION (NEEP)

NEEP measures the resources devoted by resident units to protecting the natural environment.

It is calculated in environmental protection expenditure accounts (EPEA) as a sum of uses of environmental protection (EP) services by resident units, gross fixed capital formation (GFCF) for EP activities, and net transfers to the rest of the world for EP.

For further information, see [Environmental protection expenditure accounts handbook](#).

EPEA SECTORS

EPEA are compiled by institutional sector (based on National Accounts' definitions): general government and NPISH (S.13 and S.15), corporations (S.11 and S.12), households (S.14) and the rest of the world (S.2).

The corporations sector covers specialist and secondary market producers of EP services as well as entities incurring costs to make their production process less environmentally damaging (ancillary producers).

Specialist producers provide EP services as their main activity and are classified to NACE divisions 37, 38.1, 38.2 and 39 (within NACE section E).

For further information, see [Environmental protection expenditure accounts handbook](#).

GLOBAL WARMING POTENTIAL (GWP)

The global warming potential is the estimated potential of a greenhouse gas contributing to global warming in the atmosphere. It is based on its effect over a 100-year time horizon. These substances have individual GWP ranging from 1 (carbon dioxide), 25 (methane),

298 (nitrous oxide) to 22 800 (sulphur hexafluoride). Hydrofluorocarbons and perfluorocarbons comprise a large number of different gases that have different GWPs (Intergovernmental Panel on Climate Change — IPCC, 1996).



GREENHOUSE GASES (GHG)

These emissions are reported under the 1992 United Nations Framework Convention on Climate Change and, for the EU Member States, under the Regulation (EU) 525/2013. According to the Kyoto Protocol anthropogenic emissions of the seven greenhouse gases (the 'Kyoto basket') are aggregated using the global warming potential: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), nitrogen trifluoride (NF_3) and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF_6).

IMPLICIT TAX RATE ON ENERGY

The indicator expresses energy tax revenue in relation to final energy consumption calculated for a calendar year. Energy tax revenues are measured in euro (deflated) and the final energy consumption in tonnes of oil equivalent (TOE). The indicator measures the taxes levied on the use of energy which contributes to foster energy efficiency.

Energy tax revenue is the sum of taxes on energy products used for both mobile and stationary purposes.

Final energy consumption includes energy consumed in the transport, industrial, commercial, agricultural, public and households sectors but excludes deliveries to the energy transformation sector and to the energy industries themselves. The different energy products are aggregated on the basis of their net calorific value, and expressed in tonnes of oil equivalent.

NACE

Nomenclature statistique des activités économiques dans la Communauté Européenne; in English: Statistical classification of economic activities in the European Community. NACE is organised in sections and sub-sections.

SECTIONS OF NACE REV.2

- A. Agriculture, forestry and fishing
- B. Mining and quarrying
- C. Manufacturing
- D. Electricity, gas, steam and air conditioning supply
- E. Water supply; sewerage, waste management and remediation activities
- F. Construction
- G. Wholesale and retail trade; repair of motor vehicles and motorcycles
- H. Transportation and storage
- I. Accommodation and food service activities
- J. Information and communication
- K. Financial and insurance activities
- L. Real estate activities
- M. Professional, scientific and technical activities
- N. Administrative and support service activities
- O. Public administration and defence; compulsory social security
- P. Education
- Q. Human health and social work activities
- R. Arts, entertainment and recreation
- S. Other service activities
- T. Activities of households as employers
- U. Activities of extraterritorial organisations and bodies

RAW MATERIAL CONSUMPTION (RMC)

Raw material consumption (RMC) is an indicator based on Eurostat's economy-wide Material Flow Accounts in combination with economic data and modelling. RMC is the amount of raw materials (without water and air) which is extracted domestically and abroad to produce the goods and services used by the categories of domestic final demand (consumption by households and government, and gross fixed capital formation). RMC is defined and calculated as raw material input minus the exported goods expressed in tonnes raw material equivalents.

RAW MATERIAL EQUIVALENTS (RME)

Raw material equivalents are a measurement concept in Eurostat's economy-wide Material Flow Accounts related to traded goods. Traded goods (imports and exports) are usually reported in simple mass weight as they pass the border. Raw material equivalents is the amount of extracted raw materials (without water and air) which was necessary to produce the traded good. Imports and exports expressed in raw material equivalents are components of the RMI and RMC indicators.

RAW MATERIAL INPUT (RMI)

Raw material input (RMI) is an indicator based on Eurostat's economy-wide Material Flow Accounts in combination with economic data and modelling. RMI is the amount of raw materials (without water and air) which is extracted domestically and abroad, to be used in the economy to produce goods and services (output). It is composed of the raw materials domestically extracted and the imported goods expressed in tonnes raw material equivalents.

STAGE OF MANUFACTURING

Goods trade internationally are classified according to their stage of manufacturing. The following three stages of manufacturing are defined:

- raw products: raw materials like products produced by primary industries such as agriculture, forestry, fishing, and mining;
- semi-manufactured products: products which are further processed raw products but do not yet constitute finished products; they obviously need to be further processed;
- finished products: products which are finalised, i.e. are not processed or transformed anymore; note that finished products are potentially used for final consumption by households, governments etc. but also as intermediate input to industries.

In operational terms the stage of manufacturing is defined by a correspondence list between CN (combined nomenclature) and the three groupings above — developed by Eurostat and the European Statistical System.

WASTE

Waste means any substance or object which the holder discards or intends or is required to discard. Municipal waste generated consists of waste collected by or on behalf of municipal authorities and disposed of through the waste management system. The bulk of this waste stream is from households, though similar wastes from sources such as commerce, offices and public institutions are included.



WASTE RECOVERY

Any operation whose principal result is either waste that serves a useful purpose by replacing other materials which would otherwise have been used to fulfil a particular function, or waste being prepared to fulfil that function, in a plant or in the wider economy. Some examples of recovery operations are: solvent reclamation/regeneration, recycling/reclamation of organic substances which are not used as solvents (including composting and other biological transformation processes), recycling/reclamation of metals and metal compounds, regeneration of acids or bases, oil re-refining or other reuses of oil.

WASTE RECYCLING

Waste recycling is any recovery operation by which waste materials are reprocessed into products, materials or substances whether for the original or other purposes. It includes the reprocessing of organic material but does not include energy recovery and the reprocessing into materials that are to be used as fuels or for backfilling operations.

WATER NET ABSTRACTION (= WATER WITHDRAWAL)

Water gross abstraction minus returned water.

COOLING WATER

This is water which is used to absorb and remove heat. Data on cooling water used in the generation of electricity in power stations,

and cooling water used in the manufacturing industry are collected separately. Cooling water used in other economic sectors is not addressed.

PUBLIC WATER SUPPLY

Water supplied by economic units engaged in collection, purification and distribution of water (including desalting of sea water to produce water as the principal product of interest, and excluding system operation for agricultural purposes and treatment of waste water solely in order to prevent pollution). It corresponds to division 36 (NACE Rev.2) independently of the sector involved. Deliveries of water from one public supply undertaking to another are excluded.

WASTEWATER TREATMENT

The major aim of wastewater treatment is to remove as much of the pollution (dissolved substances and suspended solids) as possible before the remaining water, called effluent, is discharged back to the environment. Primary treatment typically removes about 60 % of suspended solids from wastewater by means of settling. Secondary treatment (biological) removes more than 90 % of suspended solids and a considerable part of the nutrients. Tertiary treatment includes targeted removal of nutrients such as phosphorus and nitrogen and practically all suspended and organic matter from wastewater.

Annex 4: Calorific values and conversion factors

CALORIFIC VALUES

Eurostat collects and uses the net calorific values of the various energy products from the reporting countries.

If no calorific values are provided by a reporting country, Eurostat uses the net calorific values enacted in [Commission Regulation \(EU\) No 601/2012](#) on the monitoring and reporting of greenhouse gas emissions pursuant to [Directive 2003/87/EC](#) of the European Parliament and of the Council.

For products not covered by the Commission Regulation (EU) No 601/2012, Eurostat uses estimates. These estimates take into account the [Commission Decision 2007/589/EC](#) establishing guidelines for the monitoring and reporting of greenhouse gas emissions pursuant to [Directive 2003/87/EC](#) of the European Parliament and of the Council

The tonne of oil equivalent (toe) is a conventional standardised unit defined on

the basis of a tonne of oil with a net calorific value of 41 868 kilojoules/kilogramme. The conversion coefficients from the specific units to kg_{oe} (kilogramme of oil equivalent) are thus computed by dividing the conversion coefficients to the kilojoules by 41 868.

Conversion between units

From	To	TJ	Mtoe	GWh GWh
TJ		1	/ 41 868	/ 3.6
Mtoe		× 41 868	1	× 11 630
GWh		× 3.6	/ 11 630	1

The following prefixes are used for multiples of tonnes of oil equivalent (toe), joules (J), watts (W) and watt hours (Wh):

kilo (k)	= 1 000	or	10^3
mega (M)	= 1 000 000	or	10^6
giga (G)	= 1 000 000 000	or	10^9
tera (T)	= 1 000 000 000 000	or	10^{12}

Default calorific values

Values with light shading are estimates.

Product	Net calorific value (TJ/kt)
Anthracite	26.7
Coking coal	28.2
Other bituminous coal	25.8
Sub-bituminous coal	18.9
Lignite	11.9
Patent fuels	20.7
Coke oven coke	28.2
Gas coke	28.2
Coal tar	28
Brown coal briquettes	19
Peat	9.8
Peat products	16
Oil shale and oil sands	8.9
Crude oil	42.3
Natural gas liquids	44.2
Refinery feedstocks	43
Additives and oxygenates	42.5
Other hydrocarbons (w/o bio)	42.5
Refinery gas	49.5
Ethane	46.4
Liquefied petroleum gases	47.3
Motor gasoline (w/o bio)	44.3

Product	Net calorific value (TJ/kt)
Aviation gasoline	44.3
Gasoline-type jet fuel	44.3
Kerosene-type jet fuel	44.1
Other kerosene	43.8
Naphtha	44.5
Gas oil and diesel oil (w/o bio)	43
(Residual) Fuel oil	40.4
White spirit and SPB	40.2
Lubricants	40.2
Bitumen	40.2
Petroleum coke	32.5
Paraffin waxes	40.2
Other oil products	40.2
Charcoal	29.5
Pure biogasoline	27
Blended biogasoline	27
Pure biodiesels	27
Blended biodiesels	27
Pure bio jet kerosene	44
Blended bio jet kerosene	44
Other liquid biofuels	27.4

Annex 5: A practical guide to accessing European statistics

The simplest way to access Eurostat's broad range of statistical information is through the Eurostat website (<https://ec.europa.eu/eurostat>). Eurostat provides users with free access to its databases and all of its publications in PDF format via the Internet. The website is updated daily and gives access to the latest and most comprehensive statistical information available on the EU, its Member States, EFTA countries, candidate countries and potential candidates.

EUROSTAT ONLINE DATA CODE(S) — EASY ACCESS TO THE FRESHEST DATA

Eurostat online data codes, such as tps00001 and nama_gdp_c⁽¹⁾, allow the reader to easily access the most recent data on Eurostat's website. In this pocketbook these online data codes are given as part of the source below each table and figure.

In the PDF version of this publication, the reader is led directly to the freshest data when clicking on the hyperlinks that form part of each online data code. Readers of the paper version can access the freshest data by typing a standardised hyperlink into a web browser, https://ec.europa.eu/eurostat/product?code=<data_code>&mode=view, where <data_code> is to be replaced by the online data code printed under the table or figure in question. The data is presented either in the TGM or the Data Explorer interface.

Navigating Eurostat's database (<https://ec.europa.eu/eurostat/data/database>) is another way to view tables and datasets. There, tables and datasets are arranged in a tree

⁽¹⁾ There are two types of online data codes:

- Tables (accessed using the TGM interface) have 8-character codes, which consist of 3 or 5 letters the first of which is 't' — followed by 5 or 3 digits, e.g. tps00001 and tsdph220.
- Databases (accessed using the Data Explorer interface) have codes that use an underscore '_' within the syntax of the code, e.g. nama_gdp_c and proj_08c2150p

structure and grouped according to their theme or the EU policy they serve.

Datasets can be found under the heading Database by themes and Tables on EU policy.

Online data codes can also be inserted into the Search function on Eurostat's website, which is found in the upper-right corner of the Eurostat homepage, at <https://ec.europa.eu/eurostat>. Such a search retrieves links to the relevant table or dataset, their metadata and related publications.

Data on the Eurostat's website is constantly updated.

Note also that the description above presents the situation as of the end of September 2019.

STATISTICS EXPLAINED

Statistics Explained provide easy access to Eurostat's statistical information. The service can be accessed from the Eurostat homepage, or directly at <https://ec.europa.eu/eurostat/statistics-explained>.

Statistics Explained is a wiki-based system that presents statistical topics. Together, the articles make up an encyclopaedia of European statistics, which is completed by a statistical glossary that clarifies the terms used. In addition, numerous links are provided to the latest data and metadata and to further information, making Statistics Explained a portal for regular and occasional users alike.

In September 2019 Statistics Explained contained almost 900 statistical and background articles and some 1 900 glossary pages in English. Out of the 900 articles, 23 have been translated and are available in 22 EU languages.

Symbols and abbreviations

SYMBOLS

Eurostat online databases contain a large amount of metadata that provides information on the status of particular values or data series. In order to improve readability, only the most significant information has been included in the tables and figures. The following symbols are used, where necessary:

:	Data not available
0	Real zero or figure less than half of the unit used
-	Not applicable
%	Percentage
1234	Estimates are printed in italic
c	Confidential
p	Provisional value

Breaks in series are indicated in the footnotes provided under each table.

UNITS OF MEASUREMENT

CO₂-eq	carbon dioxide equivalent
EUR	euro, data from 1.1.1999 onwards
FTEs	full-time equivalents
GJ	gigajoule
GW	gigawatt
GWh	gigawatt hour
ha	hectare
kg	kilogram
kgoe	kilograms of oil equivalent
kJ	kilojoule
km	kilometre
km²	square kilometre
kt	kilotonne
ktoe	thousand tonnes of oil equivalent
kWh	kilowatt hour
m³	cubic metre
mio	million (106)

Mt	million tonnes
Mtoe	million tonnes of oil equivalent
MW	megawatt
MWh	megawatt hour
NMVOC-eq	non-methane volatile organic compounds equivalent
PJ	petajoule
pkm	passenger-kilometre
tkm	tonne-kilometre
t	tonne
toe	tonne of oil equivalent
TWh	terawatt hour
USD	United States dollar
vkm	vehicle-kilometre

ABBREVIATIONS

AWU	annual work units
CARE	Community Road Accident Database
CEPA	Classification of Environmental Protection Activities
CH₄	methane
CHP	combined heat and power
CMR	carcinogenic, mutagenic and reprotoxic
CO	carbon monoxide
CO₂	carbon dioxide
DEU	domestic extraction used
DMC	domestic material consumption
DMI	direct material input
EASA	European Aviation Safety Agency
EBCC	European Bird Census Council
ECE	United Nations Economic Commission for Europe
EEA	European Environment Agency
EGSS	Environmental goods and services
ELV	end-of-life vehicles

EUROPEAN FREE TRADE ASSOCIATION (EFTA) COUNTRIES

Iceland
Liechtenstein
Norway
Switzerland

EUROPEAN ECONOMIC AREA COUNTRIES

Iceland
Liechtenstein
Norway

EU CANDIDATE COUNTRIES

Albania
North Macedonia
Montenegro
Serbia
Turkey

EU POTENTIAL CANDIDATES

Bosnia and Herzegovina
Kosovo (⁴)

ENERGY COMMUNITY CONTRACTING PARTIES

Albania
Bosnia and Herzegovina
Kosovo (⁴)
North Macedonia
Georgia
Moldova
Montenegro
Serbia
Ukraine

(⁴) This designation is without prejudice to positions on status,
and is in line with UNSCR 1244/99 and the ICJ Opinion on the
Kosovo Declaration of Independence

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