Energy, transport and environment indicators

2017 edition

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Energy, transport and environment indicators

2017 edition

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Foreword

The Energy, transport and environment indicators book presents statistics produced primarily by the European Statistical System. It provides information on where the European Union stands and where current trends may lead us in the areas of transport, energy and environment policies. It therefore contributes to making better informed decisions in these closely related areas.

In his State of the Union Address 2017 before the European Parliament, Jean Claude Juncker, President of the European Commission, referred to the Energy Union as a priority project. The Energy Union includes concrete legislative and non-legislative initiatives, such as the Clean Energy for all Europeans package. Mr Juncker also stated that Europe should lead the fight against climate change. The draft Commission Work Programme for 2018 discusses initiatives such as the Mobility and Climate Change package and the reflection paper Towards a Sustainable Europe by 2030 on the follow-up to the UN Sustainable Development Goals, including on the Paris Agreement on climate change.

Implementation of the EU action plan for the Circular Economy remains high on the agenda of the European Commission. The Circular Economy package proposes amending the European Union's waste legislation. It also puts forward concrete measures that will contribute to lower carbon dioxide emission levels and energy savings as well as decreased air, soil and water pollution.

The mobility sector is an indispensable driver for the global competitiveness of the economy, and a major employer. At the end of May 2017, the European Commission launched the Europe on the Move strategy, a wide-ranging set of initiatives for a fundamental modernisation of European mobility and transport. The first series of eight legislative initiatives target road transport. These initiatives will improve competitiveness, reduce CO_2 emissions, improve air quality and public health, and increase the safety of transport.

The indicators presented in this statistical book are by no means exhaustive. The most recent data for energy, transport and environment can be freely downloaded from the Eurostat database. The content of this publication is extracted from more comprehensive Statistics Explained articles, the section of the Eurostat website that presents statistical topics in an easily understandable form.

I wish you enjoyable reading!

Marcel Jortay
Director, Sectoral and Regional Statistics

Introduction

The 2017 edition of this publication presents a compilation of data on energy, transport and the environment. Climate change, energy security and sustainable transport have become increasingly interconnected over the years. This greater correlation creates the need for a comprehensive approach that includes reliable and comparable statistical data, necessary to better understand the complexity of these issues, for sound policy-making and for defining effective measures.

The indicators presented in this publication provides national data for the 28 EU Member States, the EFTA countries and the candidate countries. When available, the EU-28 aggregate is also provided. Data availability varies between indicators, but for most of them time series are available for at least 10 years. The data presented include the most recent reference years available at the time of preparing this publication (August and September 2017), for most of the indicators either 2016 or 2015.

In the Energy chapter, the main data sources are reported under Regulation (EC) No 1099/2008 on Energy Statistics and Directive 2008/92/EC concerning transparency of gas and electricity prices. In addition, the legal background for the share of renewable energy sources in gross final energy consumption is the Directive 2009/28/EC. It is in the context of Directive 2012/27/EU that the energy savings indicator is provided.

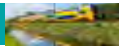
The transport indicators cover infrastructure, transport equipment, freight and passenger transport, transport safety and transport-related emissions for the different modes of transport. In the Transport chapter, the most important data sources are being reported under the EU legal acts on transport statistics and the Eurostat/United Nations Economic Commission for Europe (UNECE)/International Transport Forum (ITF) common questionnaire on inland transport. The EU legal acts for the different modes of transport include Regulation (EU) 2016/2032 amending Regulation (EC) No 91/2003 on rail transport statistics, Directive 2009/42/EC (recast) on maritime transport statistics, Regulation (EU) 2016/1954 amending Regulation (EC) No 1365/2006 on statistics on freight transport by inland waterways, Regulation (EU) No 70/2012 (recast) on statistics on freight transport by road and Regulation (EC) No 437/2003 on air transport statistics.

The Environment chapter includes indicators on greenhouse gas emissions, waste generation and treatment, water resources, abstraction and use, wastewater treatment, forestry and biodiversity, chemicals, material flow accounts and economic indicators on environmental protection expenditure, the environmental goods and services sector and environmental taxes. Data on waste derive from reporting under Regulation 2150/2002 of the European Parliament and of the Council on waste statistics. Data on European environmental economic accounts are derived from Regulation 691/2011 and other related voluntary data collections. Data on water are collected in cooperation with the Organisation for Economic Co-operation and Development (OECD) by means of a Joint Questionnaire. Environmental accounts are collected by Eurostat and emissions data are taken from the European Environment Agency (EEA). The Food and Agriculture Organization (FAO) is the source of data on forest area and wood harvest by ownership whereas imports of wood and wood products come from Eurostat.

Data on bird indicators are provided by the European Bird Census Council/The Royal Society for Protection of Birds/Bird Life International/Statistics Netherlands.

For more detailed data and the most recent updates, please consult:

- Eurostat's website at http://ec.europa.eu/eurostat
- the European Environment Agency's (EEA) website at http://eea.europa.eu



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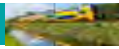
DATA EXTRACTION PERIOD

The statistical data presented in this book are the ones analysed in the continuously updated Statistics Explained articles on energy, transport and the environment at the time of drafting this publication (August and September 2017).

Contents



Symbols and abbreviations

SYMBOLS

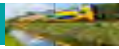
Eurostat online databases contain a large amount of metadata that provides information on the status of particular values or data series. In order to improve readability, only the most significant information has been included in the tables and figures. The following symbols are used, where necessary:

:	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

ECU	European currency unit, data up to 31.12.1998
EUR	Euro, data from 1.1.1999 on
GJ	giga joule
GW	gigawatt
GWh	gigawatt hour
ha	hectare
kg	kilogram
kgoe	kilograms of oil equivalent
kJ	kilojoule
km	kilometre
km^2	square kilometre
ktoe	thousand tonnes of oil equivalent
kWh	kilowatt hour
m^3	cubic metre
mio	million (106)
Mt	million tonnes
Mtoe	million tonnes of oil equivalent

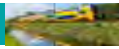


MW	megawatt
MWh	megawatt hour
PJ	petajoule
pkm	passenger-kilometre
tkm	tonne-kilometre
t	tonne
toe	tonne of oil equivalent
TWh	terawatt hour
USD	United States dollar
vkm	vehicle-kilometre

ABBREVIATIONS

AWU	annual work units
CARE	Community Road Accident Database
CEPA	Classification of Environmental Protection Activities
CH_4	methane
CHP	combined heat and power
CMR	carcinogenic, mutagenic and reprotoxic
CO_2	carbon dioxide
DEU	domestic extraction used
DMC	domestic material consumption
DMI	direct material input
EBCC	European Bird Census Council
ECE	United Nations Economic Commission for Europe
EEA	European Environment Agency
EPE	environmental protection expenditure
ERA	European Union Agency for Railways
FAWS	forests available for wood supply
FEC	final energy consumption
FLEGT	Forest Law Enforcement, Governance and Trade
GDP	gross domestic product
GHG	greenhouse gases
GIC	gross inland consumption

GNI	gross national income
GVA	gross value added
GWP	global warming potential
IEA	International Energy Agency
IPCC	Intergovernmental Panel on Climate Change
IT	information technology
ITF	International Transport Forum
LULUCF	land use, land use change and forestry
NACE	statistical classification of economic activities in the European Community
NMVOC	non-methane volatile organic compounds
NO_x	nitrogen oxides
NPISH	non-profit institutions serving households
N_2O	nitrous oxide
OECD	Organisation for Economic Co-operation and Development
OJ	Official Journal of the European Union
OPEC	Organisation of the Petroleum Exporting Countries
OWL	other wooded land
PPP	purchasing power parity
PPS	purchasing power standard
RES	renewable energy sources
RMC	raw material consumption
RME	raw material equivalents
RMI	raw material input
RSPB	The Royal Society for the Protection of Birds
UIC	Union Internationale des Chemins de fer
UN	United Nations
UNECE	United Nations Economic Commission for Europe
UNFCCC	United Nations Framework Convention on Climate Change
VPA	voluntary partnership agreements
WEEE	waste electrical and electronic equipment



COUNTRIES

EU-28 The 28 Member States of the European Union from 1 July 2013 (Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Croatia, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom)

EU-27 The 27 Member States of the European Union from 1 January 2007 (Belgium, Bulgaria, Czech Republic, Denmark, Germany, Estonia, Ireland, Greece, Spain, France, Italy, Cyprus, Latvia, Lithuania, Luxembourg, Hungary, Malta, Netherlands, Austria, Poland, Portugal, Romania, Slovenia, Slovakia, Finland, Sweden, United Kingdom)

EU-15 The 15 Member States of the European Union from 1 January 1995 to 30 April 2004 (Belgium, Denmark, Germany, Ireland, Greece, Spain, France, Italy, Luxembourg, Netherlands, Austria, Portugal, Finland, Sweden, United Kingdom)

European Free Trade Association (EFTA) countries

Iceland

Liechtenstein

Norway

Switzerland

EU candidate countries

Albania

The former Yugoslav Republic of Macedonia

Montenegro

Serbia

Turkey

EU potential candidates

Bosnia and Herzegovina

Kosovo ([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

1 General Data

The world's population reached 7 422 million inhabitants in 2016 (Table 1.1.1). China was the most populous country with 1 379 million inhabitants, accounting for 18.5 % of the world's population. The population of the EU-28 broke through the threshold of 500 million in 2008 and stood at 510 million inhabitants in 2016. In the same year, the population of the United States was 323 million, Russia's was 144 million and Japan's 127 million. The upward trend in world population has been continuous since 2000. The overall increase between 2000 and 2016 was 21.6 %. Among the group of countries presented in Figure 1.1.1, the fastest population growth was recorded in the United States (14.5 %), followed by China (9.2 %). During the same period, the EU-28 experienced a 4.7 % increase in its population, while the population of Japan remained stable (+0.1 %). In contrast, Russia recorded a 1.5 % decrease between 2000 and 2016.

Population density is the ratio of the population to the land area of the territory (Table 1.1.1). In 2016, world population density was estimated at 55 inhabitants/km^2. One of the most densely populated countries in the world was Japan (336 inhabitants/km^2), while China's density was 144 inhabitants/km^2 and the EU-28's 117. The United States and Russia both had population densities below the world average (33 and 8 inhabitants/km^2 respectively).

Table 1.1.1: Area and population worldwide, 2016

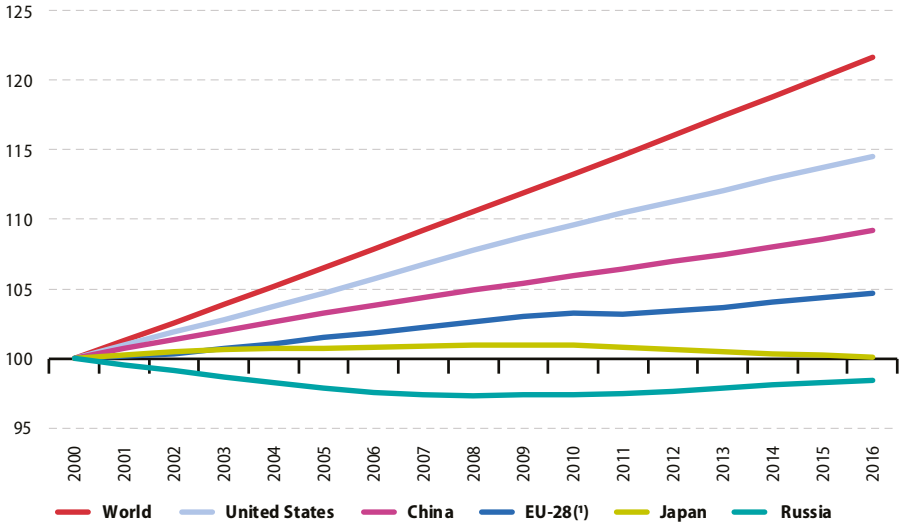
	Land area (1) (thousand km^2)	Population (thousand)	Pupulation density (inhabitants/km^2)
EU-28	4 369	510 279	117
China	9 600	1 378 665	144
Japan	378	126 995	336
Russia	17 098	144 342	8
United States	9 834	323 128	33
World	136 162	7 442 136	55

(1) 2015 data for land area.

Source: Land area: United Nations Demographic Yearbook 2015; Population: United Nations Population Division - World Population Prospects, 2017 revision; EU-28 data: Eurostat (online data code: demo_pjan and lan_lcv_ovw)

Figure 1.1.1: Population index worldwide, 2000-2016

(index 2000=100)



(1) Break in time series in 2001, 2010, 2011, 2012, 2014 and 2015. Provisional data for 2014-2016.

Source: United Nations Population Division, World Population Prospects, 2017 revision; EU-28: Eurostat (online data code: demo_pjan)

In 2016, the world's gross domestic product (GDP) at current prices was valued at USD 75 544 billion (Table 1.1.2). The EU-28 accounted for USD 16 398 billion, a 21.7 % share of the world's GDP, while the United States accounted for a 24.6 % share. The share of China in the world's GDP was 14.8% in 2016, Japan's 6.5 % and Russia's 1.7 %. Compared to year 2000, most major economies had increased their GDP by 2016; Japan was an exception, with its GDP in 2016 only 1.1 % higher than in 2000 (Figure 1.1.2). The fall recorded in Russia's GDP since 2013 continued at a slightly slower pace in 2016, with a fall of 6.1 % compared to 2015. Among the group of countries presented, China stood out with a GDP growth of 924.5 % over the period 2000-2016.

Gross national income (GNI) is the sum of incomes of residents of an economy in a given period. It is equal to GDP minus primary income payable by resident units to non-resident units, plus primary income receivable from the rest of the world (from non-resident units to resident units). With the use of GNI per capita measured in purchasing power parities (PPP), the income levels of different countries can be compared to the income level of the world as a whole (value=100) (Table 1.1.2). In 2016, the highest GNI per capita among the major world economies was recorded by the United States (360.4 compared with the world average), followed by Japan (266.3), the EU-28 (245.2) and Russia (140.0); in contrast, the GNI per capita for China (96.3) was slightly lower than for the world as a whole.

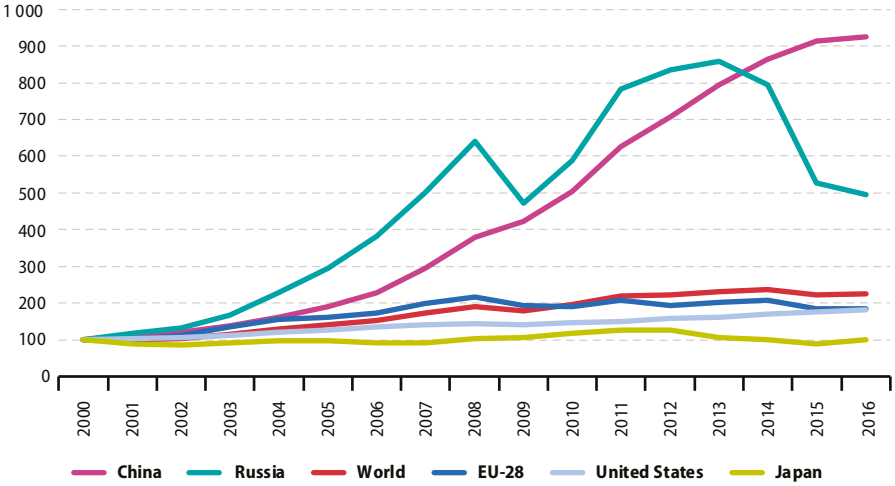
Table 1.1.2: GDP, GDP as share of world total and GNI per capita in PPP, 2016

	GDP at current prices (million USD)	Share of world GDP (%)	GNI per capita in PPP (world =100)
EU-28	16 397 980	21.7	245.2
China	11 199 145	14.8	96.3
Japan	4 939 384	6.5	266.3
Russia	1 283 162	1.7	140.0
United States	18 569 100	24.6	360.4
World	75 543 543	100.0	100.0

Source: GDP: World Bank and OECD national accounts data; GNI per capita: International Comparison Program database.

Figure 1.1.2: GDP in the world in current USD, 2000-2016

(index 2000=100)



Source: World Bank and OECD national accounts data.

In 2016, China recorded the highest exports of goods (EUR 1 895 billion) among the five major economies presented, closely followed by the EU-28 (EUR 1 744 billion) (Table 1.1.3). The United States recorded the highest imports (EUR 2 032 billion), again followed by the EU-28 (1 711 billion EUR). As far as net exports (exports minus imports) are concerned, in 2016 China (EUR 460 billion, except Hong Kong), Russia (EUR 93 billion), Japan (EUR 34 billion) and the EU-28 (EUR 33 billion) were all net exporters (Figure 1.1.3). In contrast, the United States was a net importer in 2016, with the value of imports of goods exceeding exports by EUR 720 billion.

During the period 2000 to 2016, all countries recorded increases in both exports and imports (Table 1.1.3). The highest increase in exports was recorded by China (sevenfold) while for Russia and the EU-28, the exports more than doubled over this period. Regarding imports of goods, the imports to China were almost 6 times higher in 2016 than in 2000, while the imports to Russia increased by a factor of 4.5.

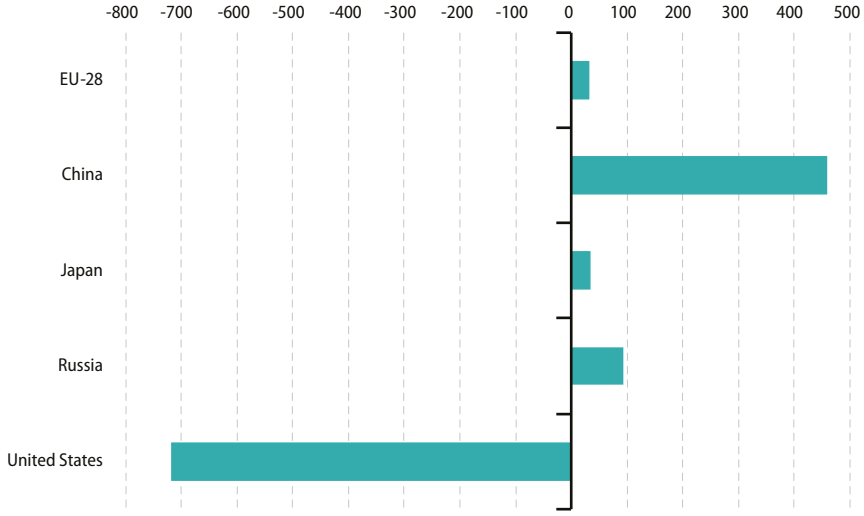
Table 1.1.3: Trade in goods worldwide, 2000-2016
(million EUR)

	2000	2005	2010	2016
			Exports	
EU-28 (1)	849 739	1 049 477	1 354 055	1 743 722
China	269 813	612 454	1 190 460	1 895 056
Japan	518 914	478 210	580 655	582 647
Russia	111 619	194 077	299 515	257 920
United States	844 869	726 903	964 094	1 312 826
			Imports	
EU-28 (1)	992 698	1 183 909	1 531 518	1 710 906
China	243 710	530 466	1 051 670	1 434 566
Japan	411 112	414 650	523 542	548 310
Russia	36 682	79 340	172 672	164 656
United States	1 362 129	1 392 429	1 484 695	2 032 398
			Net exports	
EU-28 (1)	-142 959	-134 432	-177 463	32 816
China	26 103	81 988	138 790	460 490
Japan	107 802	63 560	57 113	34 338
Russia	74 937	114 737	126 843	93 264
United States	-517 260	-665 526	-520 601	-719 572

(1) EU-27 data for 2000.

Source: Eurostat (online data code: ext_lt_introle)

Figure 1.1.3: Net exports, 2016
(billion EUR)



Source: Eurostat (online data code: ext_lt_introle)

2 Energy indicators

2.1 Energy prices

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.

An overview of average electricity prices in euro per kilowatt-hour (EUR per kWh) for the last three years (second half of each year) is presented in Table 2.1.1.

For household medium-size consumers([1]) electricity prices during the second half of 2016 were highest among the EU Member States in Denmark (EUR 0.308 per kWh), Germany (EUR 0.298 per kWh) and Belgium (EUR 0.275 per kWh); see Figure 2.1.1.

The EU-28 average price([2]) was EUR 0.205 per kWh.

The lowest electricity prices were in Bulgaria (EUR 0.094 per kWh), Hungary (EUR 0.113 per kWh) and Lithuania (EUR 0.117 per kWh).

The price of electricity for households in Denmark and in Germany was more than three times as high as the price in Bulgaria.

The electricity prices for household consumers in the EU-28 increased in 2008, decreased in the first half of 2009 but were stable in the second half, and then increased continuously from the first half of 2010 to the second half of 2016, apart from a fall of 2.4 % in the first half of 2016.

([1]) Medium-size consumers with an annual consumption within the range of 500 MWh < consumption < 2 000 MWh.

([2]) Average price - a weighted average using the most recent (2015) national data for the quantity of consumption by industrial consumers.

Table 2.1.1: Electricity prices, second half of year, 2014-2016

(EUR/kWh)

	Households (1)			Industry (2)		
	2014	2015	2016	2014	2015	2016
EU-28	0.208	0.210	0.205	0.121	0.119	0.114
Belgium	0.204	0.235	0.275	0.109	0.108	0.116
Bulgaria	0.090	0.096	0.094	0.076	0.078	0.079
Czech Republic	0.138	0.141	0.142	0.082	0.078	0.073
Denmark	0.304	0.304	0.308	0.097	0.091	0.094
Germany	0.297	0.295	0.298	0.152	0.149	0.149
Estonia	0.133	0.129	0.124	0.093	0.096	0.090
Ireland	0.254	0.245	0.234	0.136	0.136	0.125
Greece	0.179	0.177	0.172	0.130	0.115	0.112
Spain	0.237	0.237	0.228	0.117	0.113	0.103
France	0.170	0.168	0.171	0.094	0.095	0.089
Croatia	0.132	0.131	0.133	0.092	0.093	0.088
Italy	0.234	0.243	0.234	0.174	0.160	0.156
Cyprus	0.236	0.184	0.162	0.190	0.141	0.130
Latvia	0.130	0.165	0.162	0.118	0.118	0.120
Lithuania	0.132	0.124	0.117	0.117	0.100	0.088
Luxembourg	0.174	0.177	0.170	0.099	0.089	0.086
Hungary	0.115	0.115	0.113	0.090	0.087	0.080
Malta	0.125	0.127	0.127	0.178	0.141	0.140
Netherlands	0.180	0.185	0.159	0.089	0.085	0.081
Austria	0.199	0.198	0.201	0.106	0.105	0.100
Poland	0.141	0.142	0.135	0.083	0.086	0.082
Portugal	0.223	0.229	0.230	0.119	0.115	0.113
Romania	0.125	0.132	0.123	0.081	0.080	0.077
Slovenia	0.163	0.163	0.163	0.085	0.087	0.083
Slovakia	0.152	0.152	0.154	0.117	0.112	0.111
Finland	0.154	0.153	0.155	0.072	0.071	0.069
Sweden	0.187	0.187	0.196	0.067	0.059	0.066
United Kingdom	0.201	0.218	0.183	0.134	0.152	0.128
Iceland	0.116	0.127	0.148	:	:	0.065
Liechtenstein	0.155	0.180	0.168	0.140	0.161	0.148
Norway	0.166	0.143	0.163	0.081	0.069	0.081
Montenegro	0.099	0.099	0.097	0.075	0.076	0.078
Form. Yug. Rep. of Macedonia	0.082	0.084	0.083	0.078	0.081	0.052
Albania	0.116	0.082	0.084	:	:	:
Serbia	0.060	0.065	0.065	0.067	0.068	0.047
Turkey	0.131	0.122	0.121	0.081	0.070	0.073
Bosnia and Herzegovina	0.081	0.083	0.084	0.062	0.061	0.061
Kosovo (3)	0.059	0.061	0.059	0.079	0.081	0.077
Moldova	:	0.088	0.092	:	0.077	0.078
Ukraine	:	:	0.032	:	:	:

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

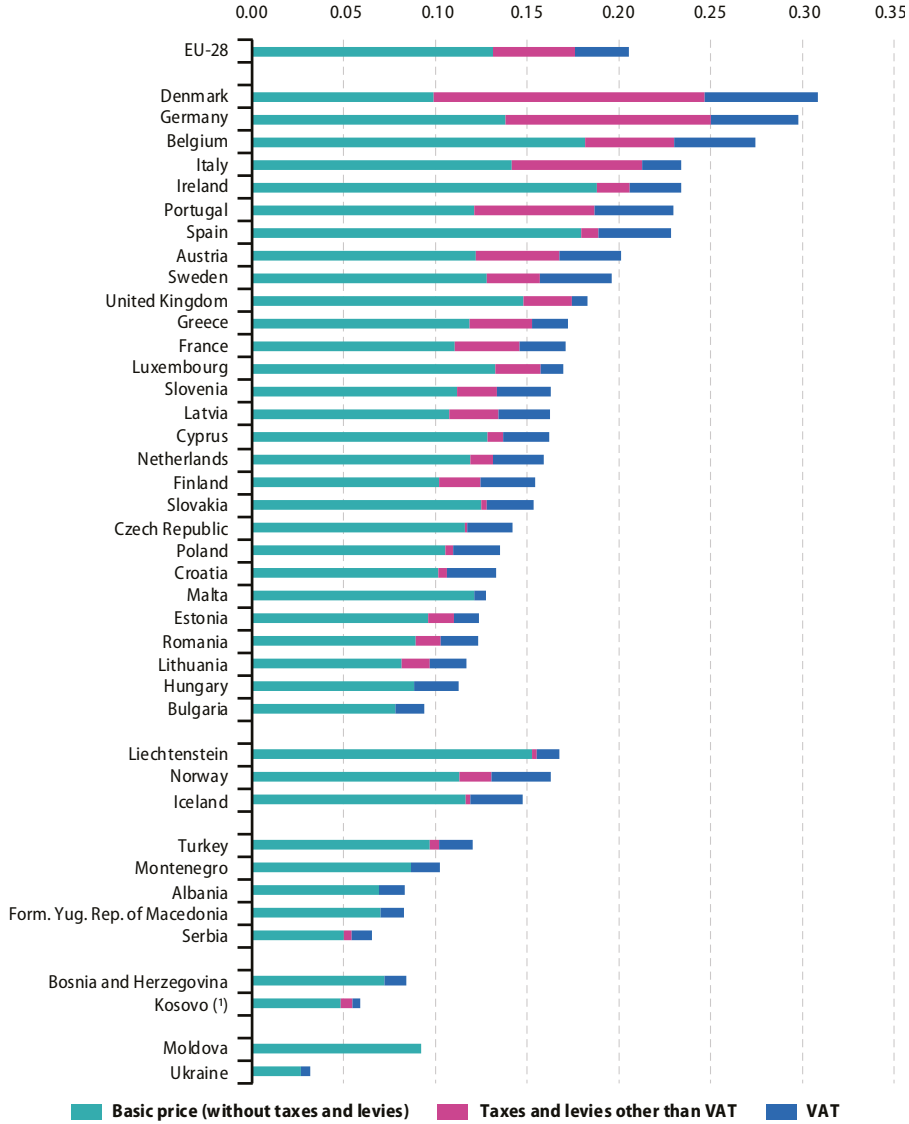
(2) Annual consumption: 500 MWh < consumption < 2 000 MWh; excluding VAT.

(3) 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)

Figure 2.1.1: Electricity prices for household consumers, second half 2016

(EUR/kWh)



Note: annual consumption: 2 500 kWh < consumption < 5 000 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 (nrg_pc_204)

The proportion of taxes and levies in the overall electricity retail price for household consumers is shown in Figure 2.1.2.

The relative amount of tax contribution in the second half of 2016 was smallest in Malta (4.8 %) 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 67.8 % of the final price was made up of taxes and levies.

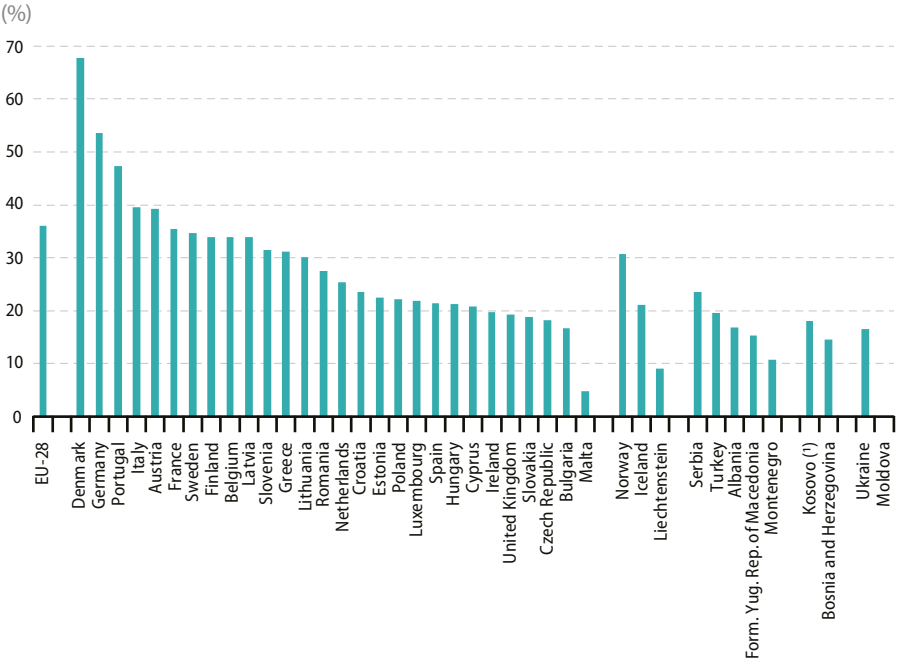
For industrial medium-sized consumers electricity prices during the second half of 2016 were highest among the EU Member States in Italy and Germany (see Figure 2.1.3).

The EU-28 average price was EUR 0.114 per kWh.

The proportion of non-recoverable taxes and levies in the overall electricity price for industrial consumers is presented in Figure 2.1.4. In the second half of 2016 the highest share of taxes was charged in Germany, where non-recoverable taxes and levies made up 46.8 % of the total price.

There is a wider range of prices within the EU Member States for electricity. The price of electricity is influenced by the price of primary fuels and, more recently, by the cost of carbon dioxide (CO_2) emission certificates.

Figure 2.1.2: Figure 2.1.2: Electricity — share of taxes and levies paid by household consumers, second half 2016



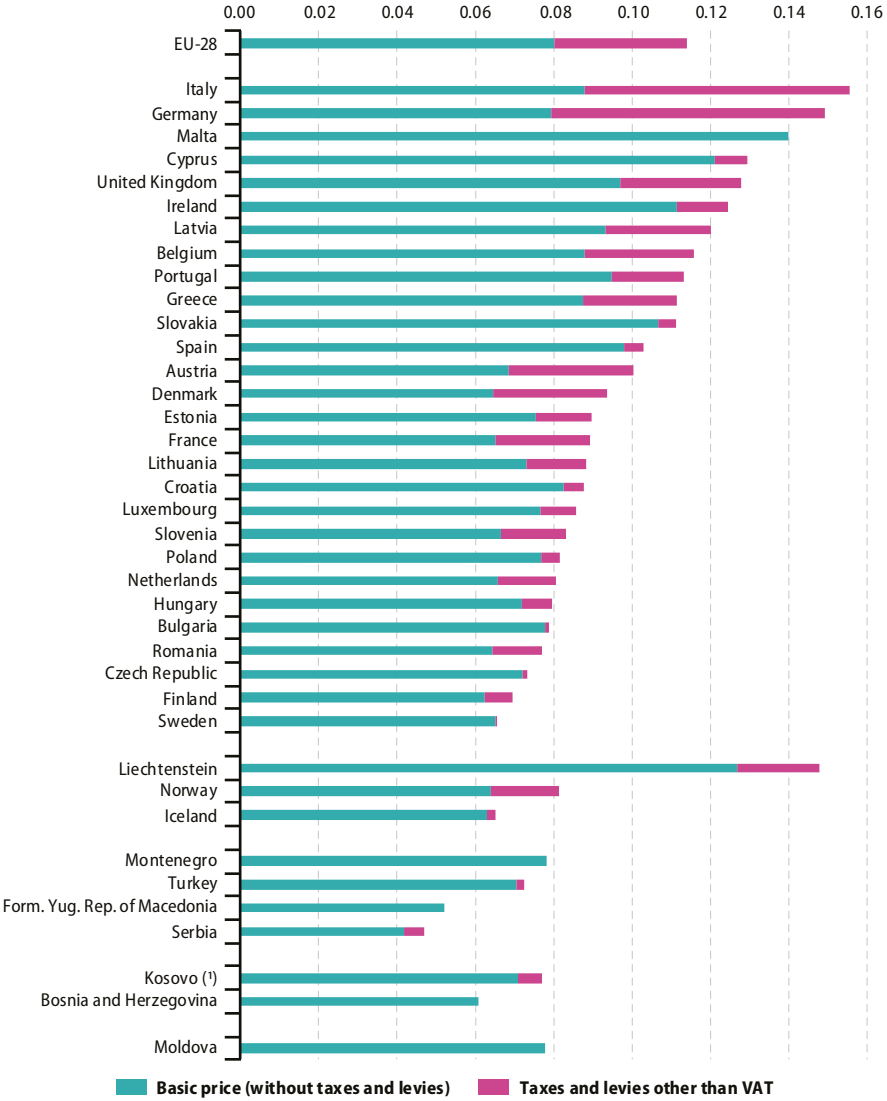
Note: annual consumption: 2 500 kWh < consumption < 5 000 kWh.

(!) 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)

Figure 2.1.3: Electricity prices for industrial consumers, second half 2016

(EUR/kWh)

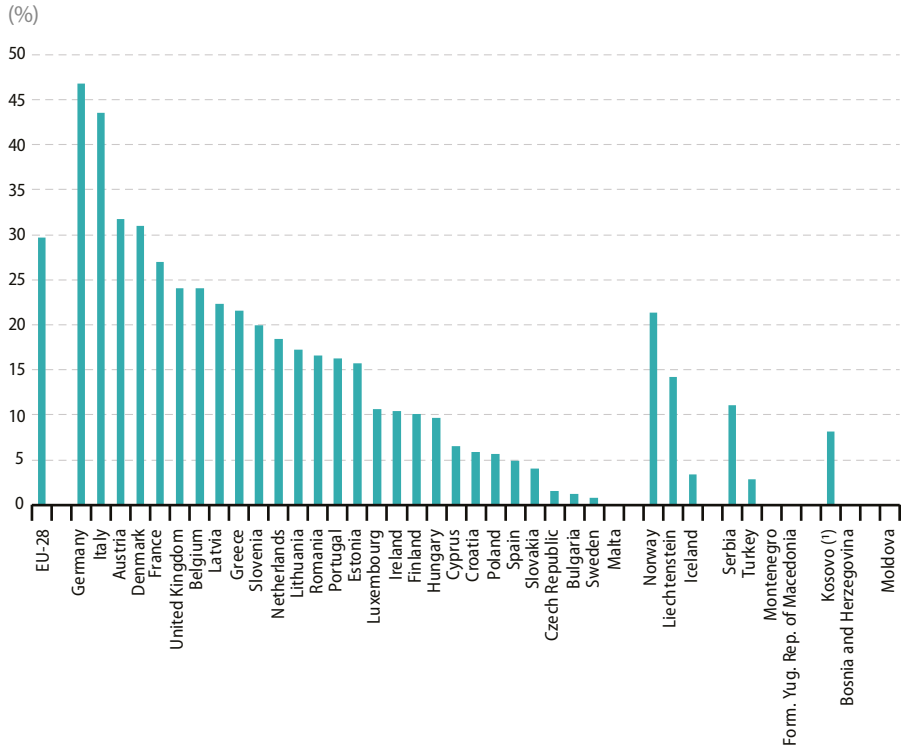


Note: annual consumption: 500 MWh < consumption < 2 000 MWh. Excluding VAT.

(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 2.1.4: Electricity — share of non-recoverable taxes and levies paid by industrial consumers, second half 2016



Note: annual consumption: 500 MWh < consumption < 2 000 MWh. Excluding VAT.

(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)

An overview of average prices in euro per kilowatt-hour (EUR per kWh) for natural gas over the last three years (second half of each year) is presented in Table 2.1.2.

For household medium-sized consumers(3) natural gas prices during the second half of 2016 were highest among the EU Member States in Sweden, Spain, Italy, Portugal and the Netherlands (see Figure 2.1.5).

(3) Medium-sized consumers with an annual consumption within the range of 20 Gigajoules (GJ) < consumption < 200 GJ

The lowest natural gas prices were in Bulgaria, Romania and Estonia.

The price of natural gas for households in Sweden (EUR 0.114 per kWh) was more than three times the price that was charged in Bulgaria (EUR 0.031 per kWh).

Table 2.1.2: Natural gas prices, second half of year, 2014-2016

(EUR/kWh)

	Households (1)			Industry (2)		
	2014	2015	2016	2014	2015	2016
EU-28	0.072	0.071	0.064	0.037	0.035	0.030
Belgium	0.065	0.062	0.053	0.029	0.029	0.026
Bulgaria	0.048	0.039	0.031	0.034	0.027	0.019
Czech Republic	0.056	0.058	0.056	0.030	0.029	0.026
Denmark	0.088	0.076	0.074	0.037	0.034	0.030
Germany	0.068	0.068	0.064	0.040	0.038	0.033
Estonia	0.049	0.038	0.033	0.037	0.027	0.023
Ireland	0.075	0.072	0.068	0.042	0.037	0.034
Greece	0.080	0.075	0.065	0.047	0.036	0.028
Spain	0.096	0.096	0.086	0.037	0.032	0.026
France	0.076	0.073	0.068	0.038	0.037	0.038
Croatia	0.048	0.046	0.037	0.040	0.035	0.028
Italy	0.095	0.091	0.084	0.035	0.032	0.027
Cyprus	–	–	–	–	–	–
Latvia	0.049	0.049	0.041	0.036	0.029	0.025
Lithuania	0.050	0.044	0.039	0.037	0.022	0.025
Luxembourg	0.051	0.048	0.042	0.039	0.037	0.033
Hungary	0.035	0.035	0.036	0.039	0.034	0.028
Malta	–	–	–	–	–	–
Netherlands	0.082	0.080	0.081	0.034	0.032	0.029
Austria	0.073	0.071	0.067	0.040	0.038	0.034
Poland	0.050	0.050	0.044	0.036	0.034	0.026
Portugal	0.104	0.098	0.082	0.044	0.038	0.028
Romania	0.032	0.034	0.032	0.031	0.029	0.026
Slovenia	0.063	0.061	0.056	0.044	0.038	0.033
Slovakia	0.052	0.050	0.045	0.038	0.035	0.031
Finland	:	:	:	0.047	0.042	0.044
Sweden	0.114	0.117	0.114	0.044	0.042	0.038
United Kingdom	0.065	0.067	0.050	0.035	0.035	0.025
Liechtenstein	0.086	0.093	0.082	0.056	0.060	0.053
Former Yugoslav Republic of Macedonia	:	:	:	0.042	0.027	0.021
Serbia	0.045	0.040	0.033	0.038	0.036	0.030
Turkey	0.037	0.035	0.030	0.027	0.025	0.022
Bosnia and Herzegovina	0.051	0.051	0.034	0.053	0.053	0.038
Moldova	:	0.032	0.030	:	0.027	0.025
Ukraine	:	:	0.024	:	:	0.023

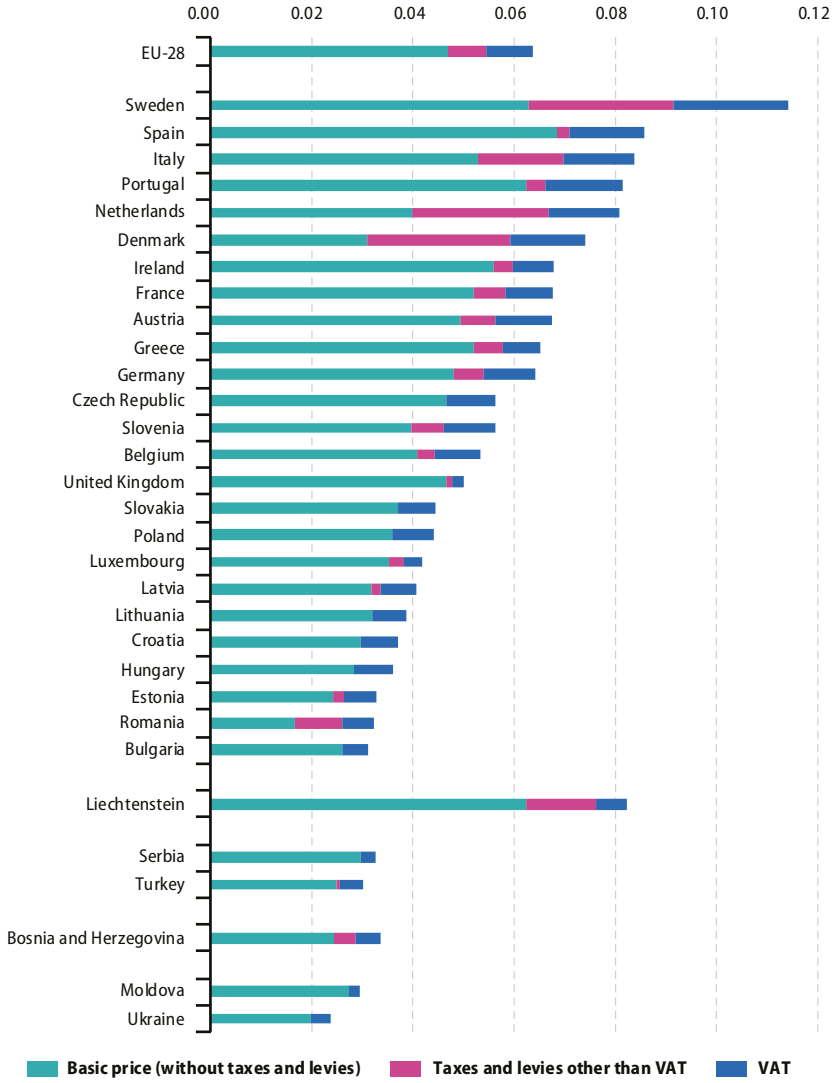
(1) Annual consumption: 20 GJ < consumption < 200 GJ.

(2) Annual consumption: 10 000 GJ < consumption < 100 000 GJ. Excluding VAT.

Source: Eurostat (online data codes: nrg_pc_202 and nrg_pc_203)

Figure 2.1.5: Natural gas prices for household consumers, second half 2016

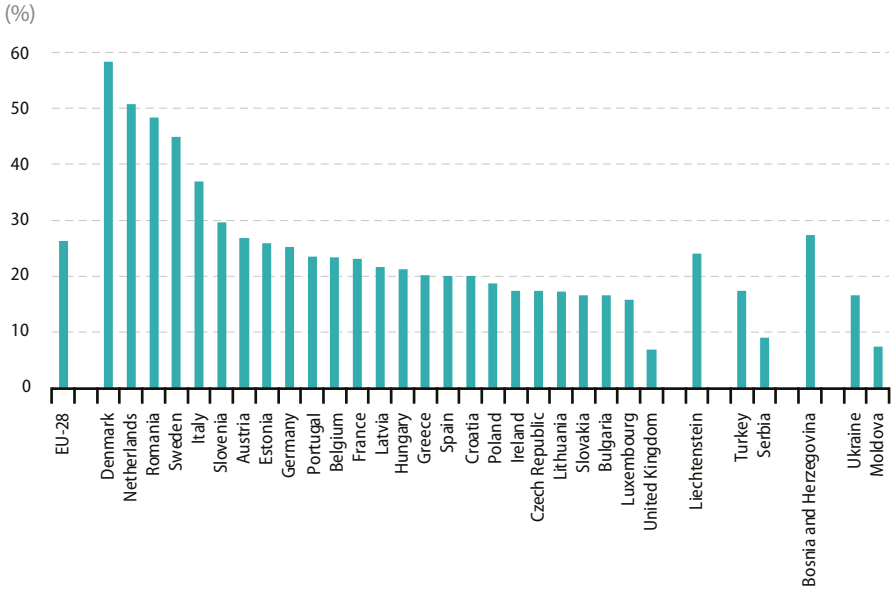
(EUR/kWh)



Note: annual consumption: 20 GJ < consumption < 200 GJ. Cyprus and Malta: not relevant. Finland: not available.

Source: Eurostat (online data code: nrg_pc_202)

Figure 2.1.6: Natural gas — share of taxes and levies paid by household consumers, second half 2016



Note: annual consumption: 20 GJ < consumption < 200 GJ. Cyprus and Malta: not relevant. Finland: not available.

Source: Eurostat (online data code: nrg_pc_202)

The proportion of taxes and levies in the overall natural gas retail price for household consumers is shown in Figure 2.1.6. The relative amount of tax contribution in the second half of 2016 was smallest in the United Kingdom (7.0 %) where a relatively low VAT rate was applied to the basic price. The highest taxes were charged in Denmark where 58.3 % of the final price was made up of taxes and levies, with this share also exceeding half in the Netherlands (50.7 %).

For industrial medium-size consumers ([4]) natural gas prices during the second half of 2016 were highest among the EU Member States in Finland (EUR 0.044 per kWh), Sweden and France (both EUR 0.038 per kWh); they were lowest in Bulgaria (EUR 0.019 per kWh) - see Figure 2.1.7.

([4]) Medium-size consumers with an annual consumption within the range of 10 000 GJ < consumption < 100 000 GJ.

The EU-28 average price ([5]) was EUR 0.030 per kWh.

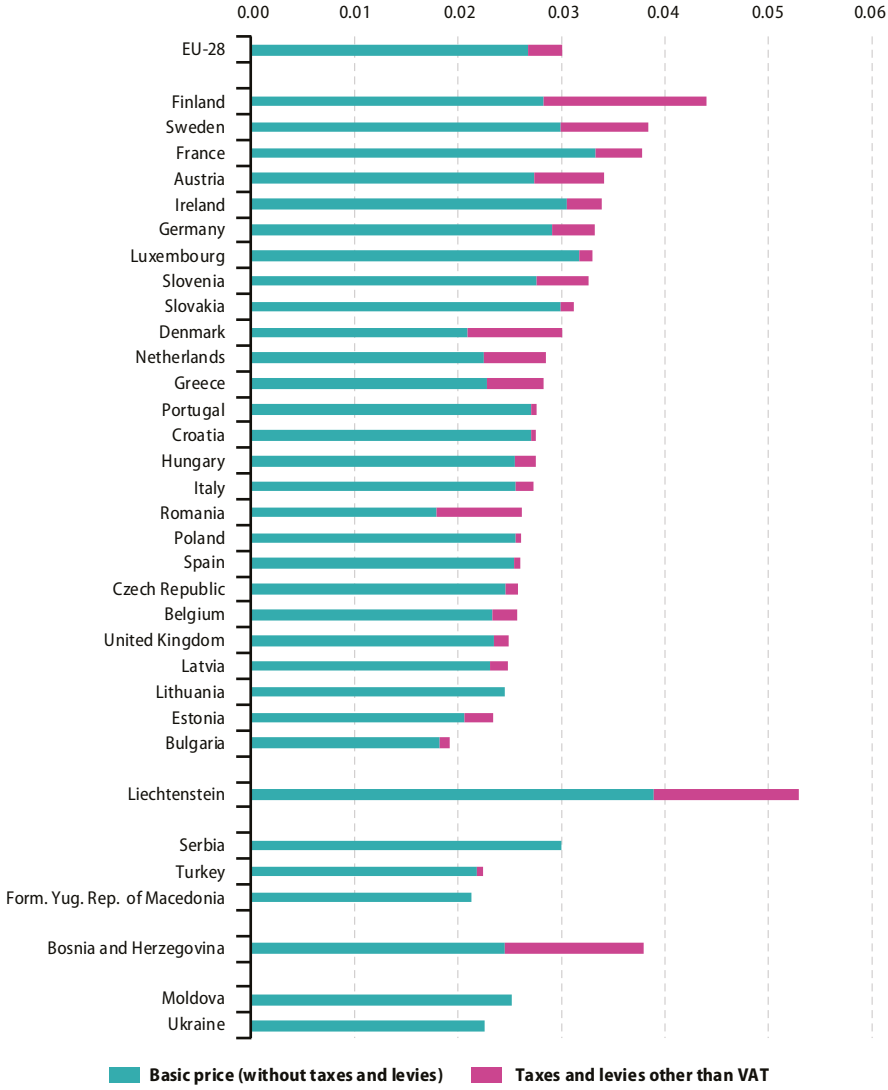
The proportion of taxes and levies that cannot be recovered by industrial consumers in the overall natural gas price is presented in Figure 2.1.8. For industrial consumers, the relative amount of tax contribution in the second half of 2016 was lowest in Lithuania where no energy or other taxes were applied. The highest shares of taxes were registered in Finland (35.7%), Romania (31.7%) and Denmark (30.6 %).

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.

([5]) Average price - a weighted average using the most recent (2015) national data for the quantity of consumption by industrial consumers

Figure 2.1.7: Natural gas prices for industrial consumers, second half 2016

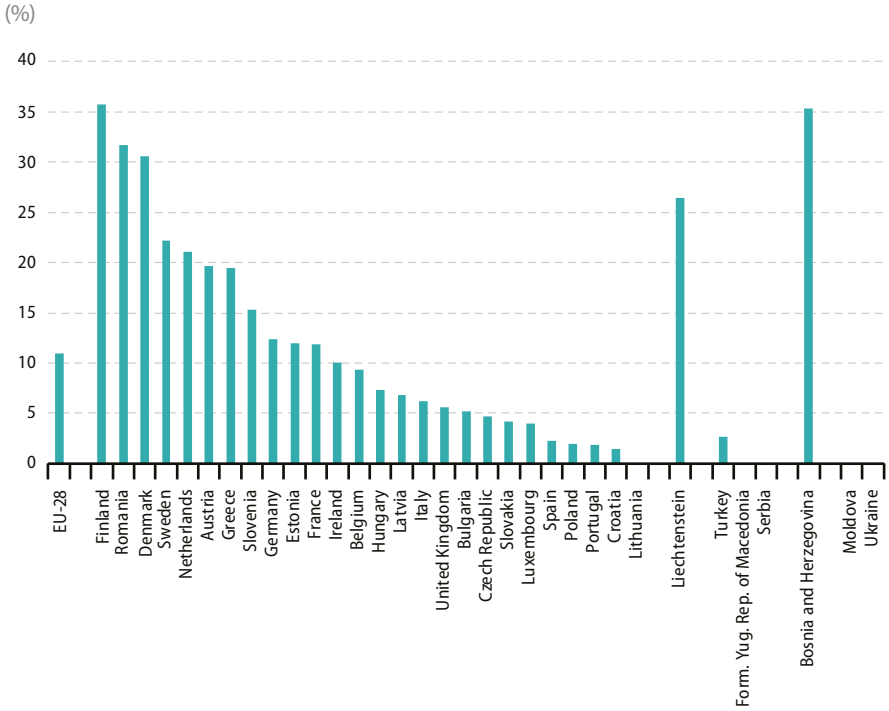
(EUR/kWh)



Note: annual consumption: 10 000 GJ < consumption < 100 000 GJ. Excluding VAT. Cyprus and Malta: not relevant.

Source: Eurostat (online data code: nrg_pc_203)

Figure 2.1.8: Natural gas — share of non-recoverable taxes and levies paid by industrial consumers, second half 2016



Note: annual consumption: 10 000 GJ < consumption < 100 000 GJ. Excluding VAT. Cyprus and Malta: not relevant.

Source: Eurostat (online data code: nrg_pc_203)

The EU has acted to liberalise electricity and gas markets 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 ([6]) aimed at ensuring a real and effective choice of suppliers, as well as benefits for customers.

The 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.

([6]) http://ec.europa.eu/energy/node/50

2.2 Electricity markets

Table 2.2.1: Number of electricity generating companies and of main electricity generating companies (2005-2015)

	Number of electricity generating companies (1)				Number of main electricity generating companies (2)			
	2005	2010	2014	2015	2005	2010	2014	2015
Belgium	3	4	>100	>350	2	3	2	3
Bulgaria	14	22	55	75	5	5	5	5
Czech Republic	18	24	21	33	1	1	2	2
Denmark	>1 000	>1 000	~1550	~1300	3	2	3	3
Germany	> 450	>450	:	:	4	4	4	4
Estonia	2	6	10	11	1	1	1	1
Ireland	4	8	8	9	4	6	6	5
Greece	1	4	3	2	1	1	3	2
Spain (3)	:	:	>10	>10	4	4	4	4
France	4	>5	>5	>5	1	1	2	2
Croatia	2	2	2	6	2	2	2	2
Italy	88	185	652	654	4	5	3	3
Cyprus	1	1	1	1	1	1	1	1
Latvia	6	11	76	80	1	1	1	1
Lithuania	6	9	20	23	3	5	6	6
Luxembourg	>12	3	>10	>10	2	2	2	4
Hungary	40	68	39	39	3	3	2	2
Malta	1	1	1	1	1	1	1	1
Netherlands	100	700	350	650	5	5	4	4
Austria	53	126	201	192	4	4	4	4
Poland	70	68	128	162	5	5	4	2
Portugal	59	107	66	69	3	2	4	4
Romania	12	10	27	29	7	6	3	3
Slovenia	3	3	3	3	2	2	2	2
Slovakia	6	8	17	21	1	1	1	1
Finland	27	29	30	36	4	4	4	4
Sweden	14	24	32	33	3	5	3	3
United Kingdom	17	19	19	22	7	8	7	6
Norway	175	184	183	182	4	3	3	2
Montenegro	:	:	1	1	:	:	1	1
Former Yugoslav Republic of Macedonia	1	1	3	3	1	1	1	1
Serbia			4	1	:	:	4	1
Turkey	29	60	150	209	3	2	2	2
Bosnia and Herzegovina	:	:	2	2	:	:	1	1

(1) Representing at least 95 % of the national net electricity generations.

(2) Companies are considered as 'main' if they produce at least 5 % of the national net electricity generation.

(3) This figure takes into account the shares of both traditional generating companies and operators that represent renewable and CHP generation units in the market (although they are not the owners of the majority of these facilities). As renewables and CHP generation units represent a high percentage of the total capacity installed in Spain, and those units are participated by a great amount of small companies, it is not possible to determine the exact number of generating companies (owning the generation units) representing at least 95 % of the national net electricity generation.

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

During the period 2003-2015, the number of main electricity generating companies in the European Union fluctuated between 82 and 93 companies, without a clear up- or downward trend.

The information in Table 2.2.1 refers to the number of companies that generate electricity representing at least 95 % of net electricity generation at national level and the companies that they are considered as 'main' if they produce at least 5 % of the national net electricity generation.

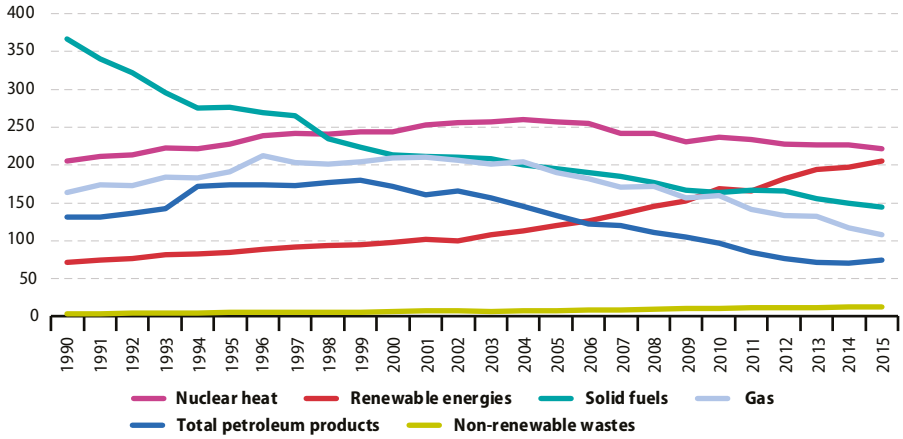
Apart from Malta and Cyprus, where only one electricity company dominates the national production, figures around or above 80 % for the largest electricity generators are observed in France (86 %), Estonia (80 %) and Croatia (78 %).

A size of the largest generation company on national level below 25 % can be observed in Poland (18 %), Lithuania (23 %) and Spain (25 %). The market share of the largest generator for Bulgaria, Austria, United Kingdom and the Netherlands were not reported.

2.3 Primary energy production

Figure 2.3.1: Primary energy production, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Primary production of energy within the EU-28 in 2015 was nearly 767 000 ktoe, 0.8 % lower than in 2014. The biggest decrease was in gas (8.2 %), followed by solid fuels (3.0 %) which continue to decrease year by year and nuclear heat (2.2 %). An increase was registered for renewable energies with 3.8 % and non-renewable waste with 3.9 % (Figure 2.3.1).

Nuclear heat accounted for the highest share in primary energy production in EU-28 in 2015 (28.9 %), followed by renewable energies (26.7 %), solid fuels (18.9 %), gas (14.0 %), petroleum products (9.8 %) and non-renewable wastes (1.7 %).

Over the past decade (2005-2015), the trend in primary energy production was negative for fossil fuels and nuclear energy. Production of petroleum products accounted for the biggest decrease (43.9 %) while gas production fell by 43.5 %. However, there was a positive trend in production of renewable energies over the same period, with a 71.0 % increase.

Production of primary energy in the EU-28 totalled 767 million tonnes of oil equivalent (Mtoe) in 2015 — see Table 2.3.1. This was 0.8 % lower than a year before and continued the generally downward development observed in recent years, with 2010 the main exception as production rebounded following a relatively strong fall in energy production in 2009 that coincided with the global financial and economic crisis.

Table 2.3.1: Total production of primary energy, 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2013	2014	2015
EU-28	943.2	959.1	942.6	904.2	837.7	792.0	772.9	766.6
EA-19	485.9	465.3	453.2	470.3	479.8	477.3	465.1	448.6
Belgium	12.4	11.5	13.4	13.7	15.4	14.7	12.3	10.4
Bulgaria	9.3	10.2	9.8	10.6	10.5	10.5	11.3	12.0
Czech Republic	41.1	32.3	30.8	33.2	31.9	30.4	29.6	28.8
Denmark	10.0	15.5	27.6	30.8	22.9	16.4	15.7	15.7
Germany	186.4	144.9	135.2	136.8	128.7	120.6	119.9	119.8
Estonia	5.4	3.4	3.2	3.9	4.9	5.7	5.8	5.6
Ireland	3.5	4.1	2.2	1.6	1.8	2.3	2.0	1.9
Greece	9.2	9.3	10.0	10.3	9.4	9.3	8.8	8.5
Spain	34.4	31.3	31.4	30.0	34.3	34.6	34.9	33.4
France	110.7	126.0	129.3	135.6	134.2	134.5	135.9	136.7
Croatia	5.7	5.0	4.3	4.8	5.1	4.4	4.4	4.4
Italy	25.6	29.4	28.2	30.3	33.0	36.9	36.8	36.1
Cyprus	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
Latvia	1.1	1.4	1.4	1.9	2.0	2.1	2.4	2.3
Lithuania	4.8	3.8	3.2	3.9	1.3	1.4	1.5	1.6
Luxembourg	0.0	0.0	0.1	0.1	0.1	0.1	0.2	0.1
Hungary	14.6	13.9	11.6	10.3	11.8	11.4	11.0	11.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	60.5	66.8	57.9	62.5	69.9	69.3	58.5	47.6
Austria	8.1	8.8	9.8	9.8	11.8	12.2	12.0	11.9
Poland	103.7	98.8	78.6	77.9	66.7	70.6	66.9	67.3
Portugal	3.4	3.3	3.8	3.6	5.8	5.8	6.0	5.3
Romania	38.3	32.3	28.5	28.2	27.8	26.1	26.6	26.7
Slovenia	3.1	3.0	3.1	3.5	3.8	3.6	3.7	3.4
Slovakia	5.3	5.0	6.3	6.3	6.0	6.4	6.3	6.3
Finland	12.0	13.1	14.8	16.6	17.3	18.0	18.1	17.5
Sweden	29.5	31.3	30.0	34.2	32.7	34.7	34.2	33.6
United Kingdom	205.1	254.4	268.2	204.0	148.5	110.1	108.2	118.3
Iceland	1.6	1.6	2.4	2.4	4.8	5.3	5.2	4.9
Norway	119.3	184.6	227.5	224.2	207.9	193.9	196.7	207.8
Montenegro	0.0	0.0	0.0	0.6	0.8	0.8	0.7	0.7
Former Yugoslav Republic of Macedonia	1.3	1.6	1.5	1.6	1.6	1.4	1.3	1.3
Albania	2.4	1.2	1.0	1.1	1.6	2.0	1.9	2.1
Serbia	13.7	12.2	11.8	10.2	10.5	11.3	9.4	10.7
Turkey	25.9	26.5	25.9	24.0	32.3	31.3	31.2	31.4
Bosnia and Herzegovina	4.6	0.8	3.1	3.6	4.4	4.6	6.0	0.5
Kosovo (1)	0.0	0.0	1.1	1.4	1.9	1.8	1.6	1.8
Moldova	0.1	0.1	0.1	0.1	0.2	0.3	0.3	0.3
Ukraine	135.8	81.3	76.2	78.9	77.3	82.7	71.0	60.0

(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_109a)

Table 2.3.2: Primary production of hard coal and lignite and of crude oil (without NGL), 2005-2015

(Mtoe)

	Coal and lignite				Crude oil (without NGL)			
	2005	2010	2014	2015	2005	2010	2014	2015
EU-28	195.0	164.1	149.4	144.9	119.4	88.3	64.7	69.1
EA-19	79.3	65.1	60.7	57.2	13.6	10.8	12.0	11.4
Belgium	0.0	0.0	0.0	0.0	:	:	:	:
Bulgaria	4.2	4.9	5.1	5.8	0.0	0.0	0.0	0.0
Czech Republic	23.6	20.7	16.8	16.8	0.3	0.2	0.2	0.1
Denmark	0.0	0.0	0.0	0.0	18.5	12.0	8.1	7.7
Germany	56.5	45.9	44.1	43.0	3.5	2.5	2.4	2.4
Estonia	3.2	3.9	4.5	4.2	0.0	0.0	0.0	0.0
Ireland	0.8	1.0	1.0	0.8	0.0	0.0	0.0	0.0
Greece	8.5	7.3	6.4	5.7	0.1	0.1	0.1	0.1
Spain	6.3	3.3	1.6	1.2	0.2	0.1	0.3	0.2
France	0.0	0.0	0.0	0.0	1.1	0.9	0.8	0.8
Croatia	0.0	0.0	0.0	0.0	0.8	0.6	0.5	0.6
Italy	0.1	0.1	0.1	0.1	6.2	5.1	5.9	5.5
Cyprus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Latvia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	0.0	0.0	0.0	0.0	0.2	0.1	0.1	0.1
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	1.7	1.6	1.6	1.5	0.9	0.7	0.6	0.6
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	0.0	0.0	0.0	0.0	1.5	1.0	1.5	1.4
Austria	0.0	0.0	0.0	0.0	0.9	0.9	0.9	0.8
Poland	68.4	55.1	53.6	53.6	0.8	0.7	0.9	0.9
Portugal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Romania	5.8	5.9	4.4	4.7	5.3	4.4	4.1	4.0
Slovenia	1.2	1.2	0.8	0.9	0.0	0.0	0.0	0.0
Slovakia	0.6	0.6	0.6	0.5	0.0	0.0	0.0	0.0
Finland	2.1	1.8	1.6	0.8	0.0	0.0	0.0	0.0
Sweden	0.2	0.2	0.1	0.1	0.0	0.0	0.0	0.0
United Kingdom	11.8	10.5	6.9	5.1	79.2	58.9	38.2	43.8
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	1.0	1.3	1.1	0.7	126.1	91.1	78.4	81.0
Montenegro	0.3	0.4	0.4	0.4	:	:	:	:
Former Yugoslav Republic of Macedonia	1.3	1.2	1.0	0.9	:	:	:	:
Albania	0.0	0.0	0.0	0.0	0.4	0.7	1.2	:
Serbia	7.5	7.2	5.7	7.2	0.6	0.9	1.1	1.0
Turkey	10.8	17.5	16.2	12.8	2.3	2.5	2.5	2.6
Bosnia and Herzegovina	2.9	3.5	3.8	:	:	:	:	:
Kosovo ([1])	1.2	1.6	1.3	1.5	:	:	:	:
Moldova	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ukraine	34.7	32.2	26.9	16.9	3.1	2.6	2.1	1.6

Note: NGL = Natural gas liquids

([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: ten00076)

Table 2.3.3: Primary production of natural gas and of nuclear heat, 2005-2015

(Mtoe)

	Natural gas				Nuclear heat			
	2005	2010	2014	2015	2005	2010	2014	2015
EU-28	190.6	159.7	117.2	107.6	257.5	236.6	226.1	221.2
EA-19	83.5	83.8	64.2	52.2	201.5	187.3	173.9	170.5
Belgium	0.0	0.0	0.0	0.0	12.3	12.4	8.7	6.7
Bulgaria	0.4	0.1	0.2	0.1	4.8	4.0	4.1	4.0
Czech Republic	0.2	0.2	0.2	0.2	6.4	7.2	7.8	6.9
Denmark	9.4	7.3	4.1	4.1	0.0	0.0	0.0	0.0
Germany	14.3	11.1	6.9	6.3	42.1	36.3	25.1	23.7
Estonia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ireland	0.5	0.2	0.1	0.1	0.0	0.0	0.0	0.0
Greece	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Spain	0.1	0.0	0.0	0.1	14.8	16.0	14.8	14.8
France	0.9	0.6	0.0	0.0	116.5	110.5	112.6	112.8
Croatia	1.9	2.2	1.4	1.5	0.0	0.0	0.0	0.0
Italy	9.9	6.9	5.9	5.5	0.0	0.0	0.0	0.0
Cyprus	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Latvia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Lithuania	0.0	0.0	0.0	0.0	2.7	0.0	0.0	0.0
Luxembourg	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Hungary	2.3	2.2	1.4	1.4	3.6	4.1	4.1	4.1
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	56.3	63.4	50.1	39.0	1.0	1.0	1.1	1.1
Austria	1.3	1.4	1.1	1.0	0.0	0.0	0.0	0.0
Poland	3.9	3.7	3.7	3.7	0.0	0.0	0.0	0.0
Portugal	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Romania	9.7	8.6	8.8	8.8	1.4	3.0	3.0	3.0
Slovenia	0.0	0.0	0.0	0.0	1.5	1.5	1.6	1.5
Slovakia	0.1	0.1	0.1	0.1	4.6	3.8	4.0	4.0
Finland	0.0	0.0	0.0	0.0	6.0	5.9	6.1	6.0
Sweden	0.0	0.0	0.0	0.0	18.7	14.9	16.7	14.5
United Kingdom	79.4	51.5	33.1	35.7	21.1	16.0	16.4	18.1
Iceland	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Norway	75.0	95.2	95.0	102.1	0.0	0.0	0.0	0.0
Montenegro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Former Yugoslav Republic of Macedonia	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Albania	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Serbia	0.2	0.3	0.4	0.5	0.0	0.0	0.0	0.0
Turkey	0.7	0.6	0.4	0.3	0.0	0.0	0.0	0.0
Bosnia and Herzegovina	0.0	0.0	0.0	:	0.0	0.0	0.0	0.0
Kosovo (1)	:	:	:	0.0	0.0	0.0	0.0	0.0
Moldova	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Ukraine	15.6	15.4	15.0	14.8	22.9	23.2	23.0	22.8

(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: ten00076)

Table 2.3.4: Primary production of renewable energy, 1990 and 2015

	Primary production		Share of total, 2015				
	1990	2015	Solar (1)	Biomass & waste	Geo-thermal	Hydro	Wind
	(1 000 toe)				(%)		
EU-28	71 802.4	205 043.2	6.4	63.5	3.2	14.3	12.7
EA-19	51 564.3	144 956.0	8.0	61.7	4.3	13.5	12.4
Belgium	481.2	2 958.6	9.7	73.1	0.1	0.9	16.2
Bulgaria	335.8	2 032.6	6.9	61.3	1.6	23.9	6.1
Czech Republic	1 140.7	4 279.3	5.0	90.3	0.0	3.6	1.2
Denmark	1 031.6	3 528.4	2.4	63.0	0.1	0.0	34.4
Germany	5 313.4	38 886.1	10.3	67.5	0.5	4.2	17.5
Estonia	187.9	1 286.3	0.0	95.0	0.0	0.2	4.8
Ireland	167.7	980.7	1.3	34.0	0.0	7.1	57.6
Greece	1 104.7	2 640.7	20.1	44.6	0.4	19.9	15.0
Spain	6 202.0	16 873.5	18.9	41.5	0.1	14.3	25.1
France	15 224.3	21 416.9	3.4	65.0	1.0	21.9	8.5
Croatia	1 218.0	2 227.6	0.7	71.1	0.5	24.7	3.1
Italy	6 380.6	23 563.9	9.2	45.6	23.2	16.6	5.4
Cyprus	6.1	118.0	66.8	15.8	1.4	0.0	16.1
Latvia	1 061.8	2 330.1	0.0	92.6	0.0	6.9	0.5
Lithuania	320.5	1 466.1	0.4	92.7	0.1	2.0	4.7
Luxembourg	18.2	113.0	9.6	75.2	0.0	7.5	7.8
Hungary	789.8	3 239.9	0.7	93.6	3.3	0.6	1.8
Malta	0.0	14.8	83.1	16.9	0.0	0.0	0.0
Netherlands	754.9	4 810.4	2.6	82.6	1.2	0.2	13.5
Austria	4 990.1	9 303.3	2.9	58.1	0.4	34.2	4.5
Poland	1 579.7	8 635.2	0.6	86.5	0.3	1.8	10.8
Portugal	3 277.4	5 182.1	2.9	59.9	3.6	14.4	19.3
Romania	1 583.3	5 935.0	2.9	62.3	0.5	24.1	10.2
Slovenia	490.5	1 025.6	3.4	60.4	4.2	31.9	0.0
Slovakia	328.0	1 591.6	3.1	75.6	0.4	20.9	0.0
Finland	5 255.0	10 394.4	0.0	84.2	0.0	13.9	1.9
Sweden	11 530.3	18 374.5	0.1	57.0	0.0	35.2	7.6
United Kingdom	1 028.9	11 834.7	5.9	60.2	0.0	4.6	29.3
Iceland	1 620.0	4 917.2	0.0	0.0	75.8	24.1	0.0
Norway	11 394.1	13 266.5	0.0	9.0	0.0	89.4	1.6
Montenegro	0.0	326.4	0.1	60.7	0.0	39.3	0.0
Former Yugoslav Republic of Macedonia	42.2	399.4	0.5	54.7	2.0	40.2	2.6
Albania	607.9	733.3	1.7	29.2	0.0	69.1	0.0
Serbia	1 983.4	1 984.0	0.0	56.0	0.3	43.7	0.0
Turkey	9 658.1	15 673.9	5.4	20.5	30.8	36.8	6.4
Bosnia and Herzegovina	426.3	477.3	:	:	:	100.0	0.0
Kosovo (2)	0.0	268.4	0.1	95.4	0.0	4.5	0.0
Moldova	84.2	319.2	0.0	98.6	0.0	1.3	0.1
Ukraine	1 263.7	3 204.3	1.3	81.3	0.0	14.5	2.9

(1) Thermal and photovoltaic.

(2) 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_107a)

Table 2.3.5: Primary energy production, by fuel, 2015

	Total production (Mtoe)	Share of each fuel to total production (%)				
		Coal	Crude oil	Natural gas	Nuclear	Renewable
EU-28	766.6	18.9	9.0	14.0	28.9	26.7
EA-19	448.6	12.7	2.5	11.6	38.0	32.3
Belgium	10.4	0.0	:	0.0	65.0	28.5
Bulgaria	12.0	48.7	0.2	0.7	33.2	17.0
Czech Republic	28.8	58.6	0.5	0.7	24.2	14.9
Denmark	15.7	0.0	48.7	26.4	0.0	22.5
Germany	119.8	35.9	2.0	5.3	19.8	32.5
Estonia	5.6	75.6	0.0	0.0	0.0	23.2
Ireland	1.9	39.8	0.0	5.6	0.0	51.3
Greece	8.5	67.0	0.7	0.1	0.0	31.2
Spain	33.4	3.7	0.7	0.2	44.2	50.5
France	136.7	0.0	0.6	0.0	82.5	15.7
Croatia	4.4	0.0	14.2	33.5	0.0	50.7
Italy	36.1	0.1	15.2	15.3	0.0	65.2
Cyprus	0.1	0.0	0.0	0.0	0.0	97.4
Latvia	2.3	0.0	0.0	0.0	0.0	99.6
Lithuania	1.6	1.3	4.8	0.0	0.0	92.5
Luxembourg	0.1	0.0	0.0	0.0	0.0	76.9
Hungary	11.2	13.6	5.4	12.2	36.7	29.0
Malta	0.0	0.0	0.0	0.0	0.0	100.0
Netherlands	47.6	0.0	3.0	82.0	2.2	10.1
Austria	11.9	0.0	7.1	8.7	0.0	78.0
Poland	67.3	79.6	1.4	5.5	0.0	12.8
Portugal	5.3	0.0	0.0	0.0	0.0	97.7
Romania	26.7	17.7	15.0	33.0	11.3	22.3
Slovenia	3.4	25.4	0.0	0.1	43.0	30.2
Slovakia	6.3	7.8	0.2	1.2	62.6	25.2
Finland	17.5	4.8	0.0	0.0	34.2	59.3
Sweden	33.6	0.3	0.0	0.0	43.2	54.6
United Kingdom	118.3	4.3	37.0	30.1	15.3	10.0
Iceland	4.9	0.0	0	0.0	0.0	100.0
Norway	207.8	0.4	39.0	49.1	0.0	6.4
Montenegro	0.7	54.4	:	0.0	0.0	45.6
Former Yugoslav Republic of Macedonia	1.3	68.7	:	0.0	0.0	31.3
Albania	2.1	1.6	61.6	1.3	0.0	35.4
Serbia	10.7	67.2	9.6	4.3	0.0	18.5
Turkey	31.4	40.7	8.2	1.0	0.0	49.9
Bosnia and Herzegovina	0.5	:	:	:	0.0	100.0
Kosovo (1)	1.8	85.1	:	0.0	0.0	14.9

(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_110a)

When viewed over a longer period, the production of primary energy in the EU-28 was 15.2 % lower in 2015 than it had been a decade earlier. The general downward development of EU-28 primary energy production may, at least in part, be attributed to supplies of raw materials becoming exhausted and/or producers considering the exploitation of limited resources uneconomical.

In 2015, the highest level of primary energy production among the EU Member States was in France, with a 17.8 % share of the EU-28 total, followed by Germany (15.6 %) and the United Kingdom (15.4 %).

Half of the EU Member States recorded an expansion in their level of primary energy production during the 10 years to 2015. The largest expansion in the production was registered in Italy (an increase of 5.9 Mtoe), followed by Spain (3.4 Mtoe), Austria (2.2 Mtoe), Portugal and Estonia (both 1.7 Mtoe). By contrast, the production of primary energy in the United Kingdom fell by as much as 85.7 Mtoe, while Germany (-17.0 Mtoe), Denmark (-15.1 Mtoe), the Netherlands (-14.9 Mtoe) and Poland (-10.5 Mtoe) also reported contractions in excess of 10.0 Mtoe.

Primary energy production in the EU-28 in 2015 was spread across a range of different energy sources, the most important of which in terms of the size of its contribution was nuclear energy (28.9 % of the total). The significance of nuclear energy was particularly high in France where it accounted for more than four fifths (82.5 %) of the national production of primary energy, while in Belgium this share was just less than two thirds (65.0 %) and in Slovakia it was over three fifths (62.6 %); elsewhere, the share of nuclear energy in primary production was less than half of the total, with no contribution from nuclear energy in 14 of the EU Member States; the German government has announced plans to close all of its nuclear reactors by 2022.

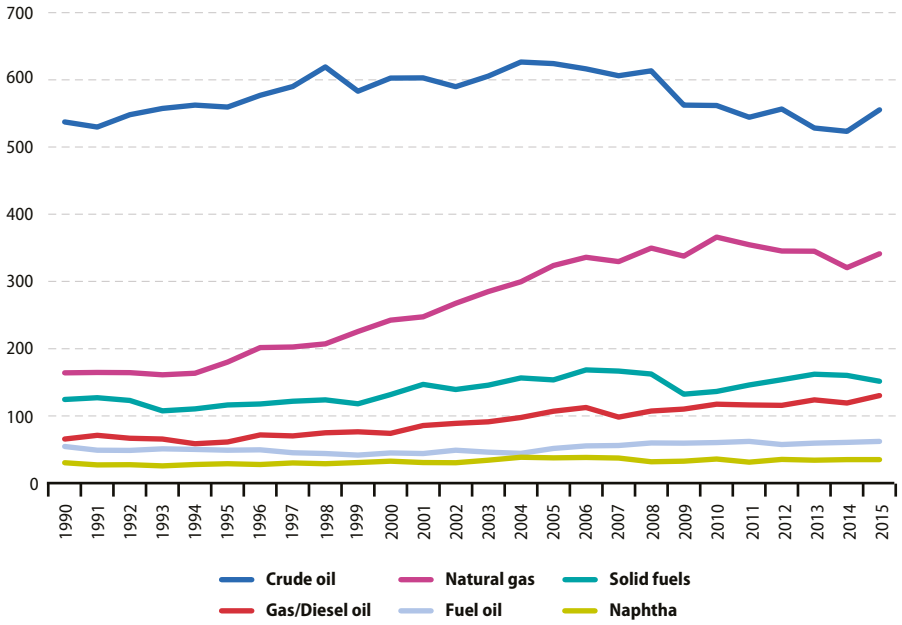
In 2014, more than one quarter (26.7 %) of the EU-28's total production of primary energy was accounted for by renewable energy sources, while the share for solid fuels (18.9 %, largely coal) was just below one fifth and the share for natural gas was somewhat lower (14.0 %). Crude oil (9.0 %) was the only other major source of primary energy production.

Over this 10-year period the production from renewables increased by 71.0 %, replacing, to some degree, the production of other sources of energy. By contrast, the production levels for the other sources fell, the largest reductions being recorded for crude oil (-43.9 %), natural gas (-43.5 %) and solid fuels (-25.7 %), with a more modest fall of 14.1 % for nuclear energy.

2.4 Energy trade & dependency

Figure 2.4.1: Imports of selected energy products, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

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

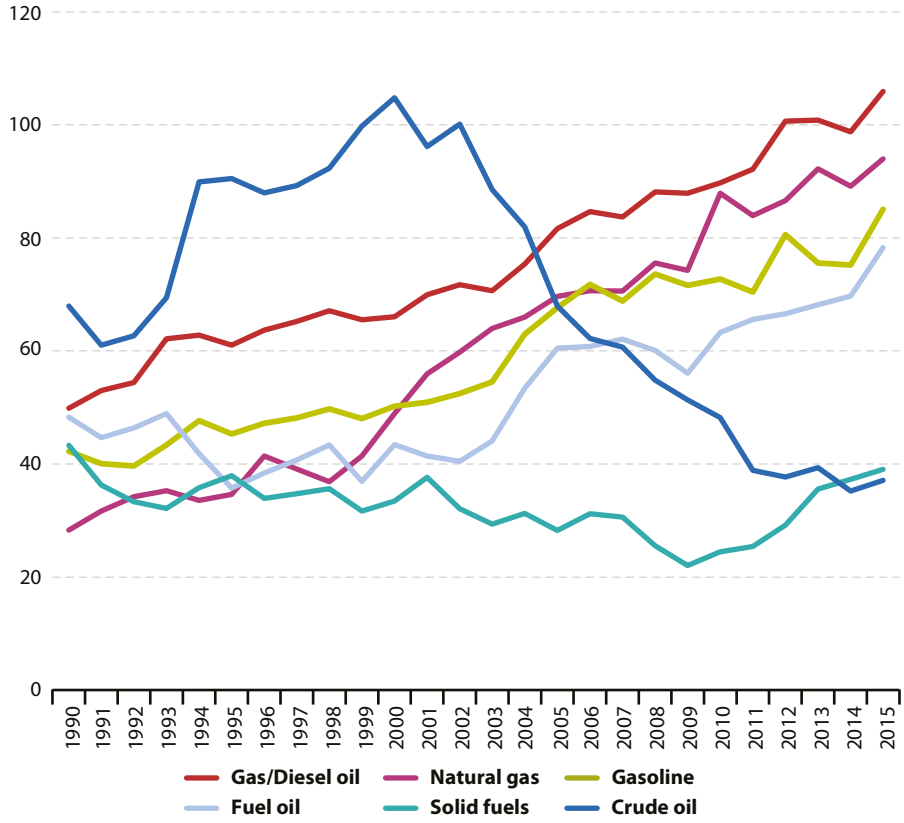
The quantity of imported natural gas doubled over the period 1990–2015 to 341 Mtoe (Figure 2.4.1), although there is a slight decrease since 2010 but increased again a bit in 2015.

Crude oil ranked first in terms of quantities imported, though for 2015, the figure was 555 Mtoe, 11.0 % lower than 10 years ago.

Exports are much lower than imports (Figure 2.4.3). In 2015, gas/diesel oil (nearly 106 Mtoe) ranked highest, followed by natural gas (94 Mtoe) and gasoline (85 Mtoe).

Figure 2.4.2: Exports of selected energy products, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Table 2.4.1: Main origin of primary energy imports, EU-28, 2005-2015

(% of extra EU-28 imports)

	Solid fuels										
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Russia	20.2	21.4	21.5	22.7	26.2	22.8	22.9	23.0	25.9	25.9	25.8
Colombia	10.0	9.7	11.0	10.7	15.2	16.9	20.7	21.7	19.6	18.8	21.3
United States	6.5	6.7	7.9	12.2	11.8	14.2	15.7	20.6	19.5	18.3	14.0
Australia	11.2	10.3	11.3	10.2	6.5	8.9	7.7	6.6	6.7	5.6	8.1
South Africa	21.4	19.8	17.4	14.4	13.7	8.2	6.9	5.7	6.0	8.7	6.9
Indonesia	6.2	7.9	6.8	6.3	6.1	4.7	4.4	4.0	2.8	3.0	3.1
Canada	2.7	2.4	2.6	2.3	1.2	1.7	1.9	1.5	1.6	2.2	1.4
Mozambique	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.3	0.4
Ukraine	1.9	1.4	1.5	2.0	1.5	1.6	2.1	1.5	1.4	1.3	0.4
Others	19.9	20.4	20.0	19.2	17.8	20.9	17.6	15.5	16.2	15.8	18.6
	Crude oil										
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Russia	30.5	31.2	31.2	29.8	31.5	32.4	32.8	31.8	31.9	28.9	27.7
Norway	15.6	14.2	13.8	14.0	14.2	12.8	11.7	10.6	11.1	12.4	11.4
Nigeria	3.0	3.3	2.5	3.7	4.2	3.9	5.7	7.7	7.7	8.7	8.0
Saudi Arabia	9.8	8.3	6.6	6.4	5.3	5.5	7.6	8.3	8.2	8.5	7.5
Iraq	2.0	2.7	3.2	3.1	3.5	3.0	3.4	3.9	3.5	4.3	7.2
Kazakhstan	4.1	4.2	4.3	4.5	5.0	5.1	5.4	4.8	5.4	6.1	6.2
Azerbaijan	1.2	2.1	2.7	3.0	3.8	4.1	4.6	3.6	4.5	4.2	4.9
Algeria	3.2	2.3	1.7	2.4	1.5	1.2	2.4	2.7	3.7	4.0	4.0
Angola	1.1	0.7	1.9	2.4	2.5	1.5	2.0	1.9	2.8	3.2	4.0
Others	29.5	30.9	32.0	30.8	28.4	30.5	24.4	24.5	21.1	19.8	18.9
	Natural gas										
	2005	**2006**	**2007**	**2008**	**2009**	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**
Russia	34.6	33.0	32.1	31.2	27.6	26.8	28.3	27.8	32.4	29.7	29.4
Norway	20.2	21.7	23.3	23.7	24.5	22.9	22.1	24.9	23.6	25.0	25.9
Algeria	15.0	13.6	12.7	12.3	11.9	11.7	10.7	10.8	10.1	9.7	8.8
Qatar	1.3	1.5	1.8	1.9	4.6	8.1	9.6	6.8	5.2	5.5	6.1
Libya	1.4	2.1	2.5	2.4	2.4	2.2	0.6	1.5	1.4	1.7	1.7
Nigeria	2.9	3.6	3.8	3.3	2.0	3.4	3.6	2.8	1.4	1.2	1.6
Trinidad and Tobago	0.2	1.0	0.7	1.4	1.9	1.2	0.9	0.7	0.6	0.7	0.5
Peru	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.6	0.4	0.3	0.2
Turkey	0.0	0.0	0.0	0.1	0.2	0.1	0.2	0.1	0.2	0.2	0.2
Others	24.5	23.5	23.1	23.5	24.8	23.5	24.2	23.9	24.8	26.0	25.5

Source: Eurostat (online data codes: nrg_122a, nrg_123a and nrg_124a)

Table 2.4.2: Net imports of primary energy, 2005-2015

	(thousand tonnes of oil equivalent)						(tonnes of oil equivalent per inhabitant)					
	2005	2007	2009	2011	2013	2015	2005	2007	2009	2011	2013	2015
EU-28 (1)	980 186	983 658	936 433	943 563	908 012	902 124	2.0	2.0	1.9	1.9	1.8	1.8
Belgium (2)	53 428	50 935	48 125	48 077	48 571	50 625	5.1	4.8	4.5	4.4	4.3	4.5
Bulgaria	9 276	10 180	7 981	6 911	6 357	6 585	1.2	1.3	1.1	0.9	0.9	0.9
Czech Republic	12 638	11 617	11 558	12 605	12 050	13 544	1.2	1.1	1.1	1.2	1.1	1.3
Denmark	-10 126	-5 199	-3 835	-1 072	2 249	2 301	-1.9	-1.0	-0.7	-0.2	0.4	0.4
Germany (2)	208 193	196 730	195 394	197 139	204 888	196 015	2.5	2.4	2.4	2.5	2.5	2.4
Estonia (3)	1 496	1 576	1 227	761	848	483	1.1	1.2	0.9	0.6	0.6	0.4
Ireland (3)	13 765	14 048	13 296	12 566	12 357	12 716	3.3	3.2	2.9	2.7	2.7	2.7
Greece	23 498	24 715	22 353	19 874	16 390	18 812	2.1	2.2	2.0	1.8	1.5	1.7
Spain	123 832	123 159	110 057	104 579	89 047	94 428	2.8	2.7	2.4	2.2	1.9	2.0
France (2)	143 957	137 223	133 211	126 898	125 317	116 843	2.3	2.1	2.1	1.9	1.9	1.8
Croatia	5 147	5 237	4 381	4 604	4 039	4 116	1.2	1.2	1.0	1.1	0.9	1.0
Italy	160 365	158 158	142 354	142 439	124 235	121 831	2.8	2.7	2.4	2.4	2.1	2.0
Cyprus	2 843	2 899	2 920	2 665	2 333	2 452	3.8	3.8	3.6	3.1	2.7	2.9
Latvia	3 097	3 162	2 886	2 747	2 628	2 370	1.4	1.4	1.3	1.3	1.3	1.2
Lithuania	5 026	5 766	4 291	5 839	5 304	5 482	1.5	1.8	1.4	1.9	1.8	1.9
Luxembourg (4)	4 675	4 478	4 255	4 442	4 210	4 007	10.1	9.3	8.5	8.6	7.7	7.0
Hungary (4)	17 421	16 417	14 722	12 974	11 879	13 454	1.7	1.6	1.5	1.3	1.2	1.4
Malta	1 630	1 811	2 001	2 300	2 138	2 230	4.0	4.5	4.9	5.5	5.0	5.2
Netherlands	37 577	37 689	34 491	28 432	24 248	46 785	2.3	2.3	2.1	1.7	1.4	2.8
Austria	24 520	23 408	21 079	23 417	20 781	20 214	3.0	2.8	2.5	2.8	2.5	2.3
Poland	15 938	24 755	29 943	33 695	25 166	28 021	0.4	0.6	0.8	0.9	0.7	0.7
Portugal	24 845	21 718	20 779	18 783	16 662	18 300	2.4	2.1	2.0	1.8	1.6	1.8
Romania	10 840	12 835	7 224	7 896	6 019	5 541	0.5	0.6	0.4	0.4	0.3	0.3
Slovenia (5)	3 855	3 874	3 460	3 512	3 250	3 233	1.9	1.9	1.7	1.7	1.6	1.6
Slovakia	12 428	12 200	11 149	11 176	10 066	9 642	2.3	2.3	2.1	2.1	1.9	1.8
Finland	18 953	19 951	18 326	19 026	16 646	15 660	3.6	3.8	3.4	3.5	3.1	2.9
Sweden	19 460	18 281	17 469	18 596	16 020	14 240	2.2	2.0	1.9	2.0	1.7	1.5
United Kingdom	31 610	46 035	55 336	72 683	94 316	72 194	0.5	0.8	0.9	1.1	1.5	1.1
Iceland	1 070	1 132	1 177	1 135	810	961	3.6	3.6	3.7	3.6	2.5	2.9
Norway	-195 956	-188 179	-186 599	-170 173	-160 473	-177 067	-42.4	-40.0	-38.6	-34.4	-31.6	-34.1
Montenegro	436	614	413	411	233	306	0.7	1.0	0.7	0.7	0.4	0.5
Form. Yugo. Rep. of Macedonia	1 199	1 401	1 211	1 376	1 300	1 420	0.6	0.7	0.6	0.7	0.6	0.7
Albania	1 119	1 026	1 025	834	670	282	0.4	0.3	:	:	:	0.1
Serbia (4)	5 536	5 933	4 901	4 930	3 536	4 009	0.7	0.8	0.7	0.7	0.5	0.6
Turkey	62 035	75 967	70 633	80 543	87 415	102 791	0.9	1.1	1.0	1.1	1.1	1.3
Kosovo (6)	550	595	636	700	506	697	0.3	0.3	0.3	:	:	:

(1) Tonnes of oil equivalent per inhabitant, 2009, 2011, 2013 and 2015: break in series.

(2) Tonnes of oil equivalent per inhabitant, 2011 and 2015: break in series.

(3) Tonnes of oil equivalent per inhabitant, 2015: break in series.

(4) Tonnes of oil equivalent per inhabitant, 2011: break in series.

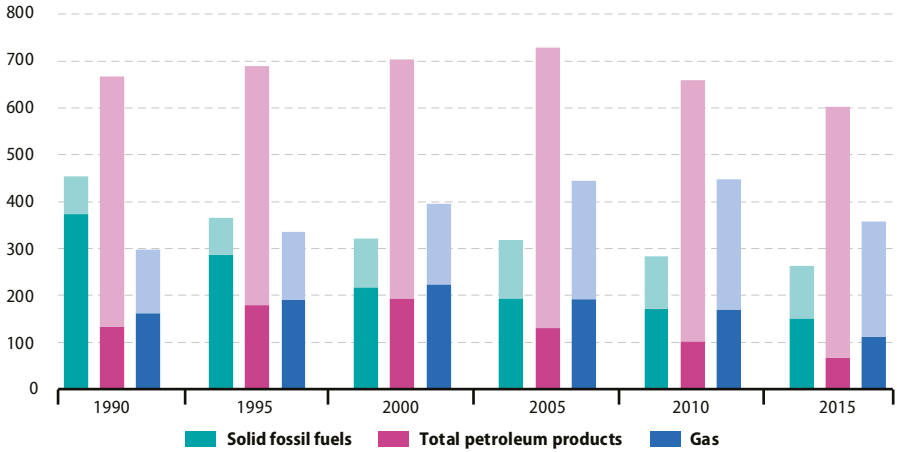
(5) Tonnes of oil equivalent per inhabitant, 2007: break in series.

(6) 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_100a and demo_pjan)

Figure 2.4.3: Energy dependency by fuel, EU-28, 1990-2015

(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_100a)

Gross inland consumption represents the quantity of energy necessary to satisfy the energy needs of a country or a region. The ratio between net imports and gross inland consumption 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 2.4.3 where 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.

In 2015 in EU-28, the highest need (gross inland consumption + international maritime bunkers) was for petroleum products, 602 Mtoe, of which 88.8 % were imported. For natural gas the needs in 2015 was 358 Mtoe, 69.1 % of it covered by imports.

The origin of EU-28 energy imports has changed somewhat in recent years, although Russia has maintained its position as the main supplier of crude oil and natural gas (despite seeing its share reduced somewhat) and also emerged as the leading supplier of solid fuels. In 2015, some 25.8 % of the EU-28's imports of solid fuels were from Russia: it became the principal supplier of solid fuels in 2006, overtaking South Africa.

The security of the EU's primary energy supplies may be threatened if a high proportion of imports are concentrated among relatively few partners. Almost two thirds (64.1 %) of the EU-28's imports of natural gas in 2015 came from Russia, Norway or Algeria. A similar analysis shows that 61.0 % of EU-28 solid fuel 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 Nigeria accounted for 47.1 % of the EU-28's imports.

Table 2.4.3: Energy dependence – all energy products, 2005-2015

(%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	52.1	53.6	52.8	54.5	53.5	52.6	54.0	53.4	53.1	53.4	54.0
EA-19	65.0	65.4	63.7	64.6	63.5	62.1	62.5	61.2	60.1	60.3	62.4
Belgium	80.1	79.6	76.9	81.1	75.6	78.2	75.4	76.1	77.4	80.0	84.3
Bulgaria	46.7	45.6	50.7	51.7	45.1	39.6	36.0	36.1	37.7	34.5	35.4
Czech Republic	27.8	27.6	25.0	27.8	26.9	25.5	28.8	25.4	27.7	30.3	31.9
Denmark	-49.8	-35.5	-24.1	-20.5	-19.7	-15.7	-5.6	-2.3	12.2	12.2	13.1
Germany	60.5	60.9	58.4	60.9	61.2	60.3	61.9	61.5	62.7	61.7	61.9
Estonia	26.1	29.2	24.7	24.7	22.0	13.6	12.0	17.0	11.9	8.9	7.4
Ireland	89.6	90.9	87.5	90.7	88.9	86.6	90.0	85.1	89.3	85.3	88.7
Greece	68.6	71.9	71.2	73.3	67.6	69.1	65.1	66.4	62.2	66.2	71.7
Spain	81.4	81.2	79.6	81.3	79.1	76.7	76.3	73.1	70.4	72.9	73.3
France	51.6	51.5	50.4	50.8	51.0	49.0	48.8	48.2	48.0	46.1	46.0
Croatia	52.5	49.0	51.6	54.6	46.0	46.6	49.4	48.9	47.0	43.8	48.3
Italy	83.4	85.9	83.0	82.9	80.8	82.6	81.4	79.2	76.8	75.9	77.1
Cyprus	100.7	102.5	95.9	97.5	96.3	100.8	92.4	97.0	96.3	93.2	97.7
Latvia	63.9	66.7	62.5	58.8	60.4	45.5	59.9	56.4	55.9	40.6	51.2
Lithuania	56.8	62.0	61.2	57.8	49.9	81.8	81.7	80.3	78.3	78.0	78.4
Luxembourg	97.4	98.2	96.7	97.5	97.5	97.1	97.3	97.5	97.1	96.5	95.9
Hungary	63.1	62.7	61.2	63.2	58.6	56.4	49.8	49.7	49.6	59.3	53.4
Malta	100.0	100.0	100.0	100.0	99.9	99.0	101.3	101.0	104.1	97.7	97.3
Netherlands	37.8	38.1	37.7	34.2	36.3	30.1	30.0	30.4	26.0	33.3	52.1
Austria	71.8	72.7	69.2	69.2	65.5	62.9	70.3	64.5	61.6	66.1	60.8
Poland	17.2	19.6	25.5	30.2	31.6	31.3	33.4	30.6	25.6	28.6	29.3
Portugal	88.6	84.0	81.4	83.4	81.4	75.1	77.7	79.2	72.4	71.2	77.4
Romania	27.6	29.4	31.7	28.0	20.3	21.9	21.6	22.7	18.5	17.1	17.1
Slovenia	52.5	52.0	52.5	55.1	48.2	48.7	47.7	51.2	46.9	44.5	48.7
Slovakia	65.3	63.8	68.3	64.4	66.5	63.1	64.3	60.2	59.2	60.9	58.7
Finland	54.1	53.6	52.9	54.1	53.6	47.8	52.8	46.3	48.6	48.9	46.8
Sweden	36.8	36.8	35.4	37.1	36.7	36.6	36.3	28.7	31.6	32.0	30.1
United Kingdom	13.4	21.2	20.5	26.2	26.4	28.2	36.0	42.2	46.3	45.5	37.4
Iceland	31.1	25.9	22.8	21.1	20.0	18.5	17.9	13.7	13.3	14.0	16.4
Norway	-703.2	-667.4	-657.1	-570.5	-580.2	-499.0	-590.9	-566.9	-479.4	-590.5	-585.9
Montenegro	42.1	44.8	54.0	45.9	42.9	26.3	36.2	34.2	23.4	29.9	29.8
Former Yugoslav Republic of Macedonia	41.8	43.3	46.4	44.8	43.9	43.0	44.5	47.9	46.7	51.8	52.6
Albania	50.5	41.8	50.9	52.0	47.7	30.5	37.4	22.0	28.1	34.2	12.7
Serbia	35.3	37.2	35.9	37.2	32.2	33.2	30.4	27.8	23.7	27.5	27.2
Turkey	71.6	72.6	74.3	72.2	70.4	69.3	70.7	75.3	73.9	74.8	77.5
Bosnia and Herzegovina	6.0	3.8	7.7	4.8	4.4	6.0	12.1	12.7	7.6	21.4	:
Kosovo ([1])	28.2	29.5	29.0	27.1	25.9	24.6	27.5	27.3	21.9	27.2	27.6

([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: tsdcc310)

Table 2.4.4: Energy dependence - solid fuels, total petroleum products and natural gas, 2005-2015

(%)

	Solid fuels				Total petroleum products				Natural gas			
	2005	2010	2014	2015	2005	2010	2014	2015	2005	2010	2014	2015
EU-28	39.4	39.4	45.7	42.8	82.1	84.5	87.5	88.8	57.1	62.2	67.3	69.1
EA-19	56.2	58.8	60.9	62.2	97.4	96.6	95.9	98.1	72.3	70.9	74.8	78.6
Belgium	101.3	98.3	101.6	97.2	100.8	101.4	101.1	103.8	100.5	100.3	101.2	99.3
Bulgaria	37.0	24.7	14.6	11.2	102.2	101.1	97.9	99.2	87.7	92.6	94.1	97.0
Czech Republic	-16.1	-15.1	-4.2	-1.8	97.5	96.5	97.6	97.8	97.8	84.8	96.3	95.1
Denmark	94.4	69.4	104.9	85.0	-102.7	-43.4	-9.5	5.8	-113.5	-68.1	-46.6	-48.0
Germany	31.7	40.1	44.8	45.5	97.1	96.5	95.7	96.4	79.6	81.2	89.4	90.1
Estonia	0.7	-0.6	0.3	-0.3	70.8	57.5	51.5	39.4	100.0	100.0	100.0	100.0
Ireland	70.8	49.0	60.0	66.8	100.0	97.3	97.6	103.9	86.7	95.5	96.5	96.5
Greece	4.1	5.1	2.9	2.8	97.7	98.7	99.9	105.4	99.1	99.9	99.3	99.9
Spain	70.1	85.5	77.1	78.3	101.2	99.9	101.7	102.1	101.2	99.3	103.5	96.9
France	94.5	101.0	98.6	98.4	99.3	97.7	98.5	98.5	99.3	93.0	103.6	98.7
Croatia	91.3	102.5	92.3	103.0	79.4	80.4	74.0	79.6	23.7	18.1	28.6	27.1
Italy	99.4	101.0	98.7	100.2	91.8	93.5	88.6	89.5	84.7	90.5	89.7	90.4
Cyprus	121.0	65.5	127.3	100.0	102.3	104.2	97.9	102.8	:	:	:	:
Latvia	94.3	102.8	76.5	84.7	102.2	94.4	92.4	102.9	105.6	61.8	72.1	98.6
Lithuania	94.2	91.9	89.4	87.1	91.9	98.7	92.9	100.7	100.7	99.7	104.1	99.7
Luxembourg	100.0	100.0	100.0	100.0	99.4	99.4	100.3	99.3	100.0	100.0	99.5	99.4
Hungary	42.8	41.9	28.3	34.0	81.2	84.7	87.7	93.2	81.1	78.7	97.7	69.7
Malta	:	:	:	:	100.0	99.2	98.3	97.8	:	:	:	:
Netherlands	101.5	121.7	108.9	112.4	96.2	94.2	91.9	101.5	-59.3	-61.6	-73.1	-32.1
Austria	99.3	99.4	100.9	85.2	91.6	89.9	91.6	94.0	88.5	75.3	96.8	72.5
Poland	-23.9	-5.2	-8.7	-11.6	97.5	97.0	93.1	96.8	69.7	69.3	72.0	72.2
Portugal	96.3	98.3	96.9	100.0	102.3	97.5	95.5	99.7	103.8	100.4	100.0	99.8
Romania	33.4	17.6	17.4	17.4	38.5	51.9	54.0	53.5	30.1	16.8	5.0	1.8
Slovenia	21.0	19.2	21.5	18.9	101.3	99.2	97.7	99.6	99.6	99.3	99.6	99.6
Slovakia	88.4	75.7	83.2	84.6	88.2	89.6	91.0	89.4	97.5	99.9	104.8	95.1
Finland	67.4	57.5	80.3	61.2	98.4	89.4	94.8	104.5	100.0	100.0	99.9	99.7
Sweden	97.2	102.2	94.7	92.3	104.0	93.6	101.7	105.4	95.1	98.8	99.1	99.1
United Kingdom	71.9	51.9	87.5	65.4	-3.2	14.1	42.1	36.4	7.0	37.9	44.9	41.8
Iceland	100.0	96.3	100.0	100.0	102.0	97.0	99.0	102.6	:	:	:	:
Norway	-53.1	-50.2	-30.4	0.2	-1 126.0	-627.4	-712.4	-682.1	-1 743.1	-1 128.4	-1 823.1	-1 795.4
Montenegro	-2.1	-2.8	-1.5	-3.1	100.0	100.0	103.0	97.7	:	:	:	:
Form. Yug. Rep. of Macedonia	7.9	9.4	11.1	8.7	102.5	97.8	100.7	100.0	99.5	100.0	99.8	100.0
Albania	16.5	97.8	100.0	64.5	73.9	50.6	31.4	6.6	0.0	0.0	0.0	0.0
Serbia	8.5	9.2	7.4	8.0	:	75.0	60.6	62.8	88.3	84.5	69.0	79.2
Turkey	51.7	43.1	53.7	63.3	90.8	92.5	92.7	96.8	97.1	98.1	99.6	99.9
Bosnia and Herzegovina	1.7	10.4	14.3	:	:	:	:	:	100.0	100.0	100.0	:
Kosovo (1)	1.5	1.6	0.2	-0.1	:	:	:	:	:	:	:	:

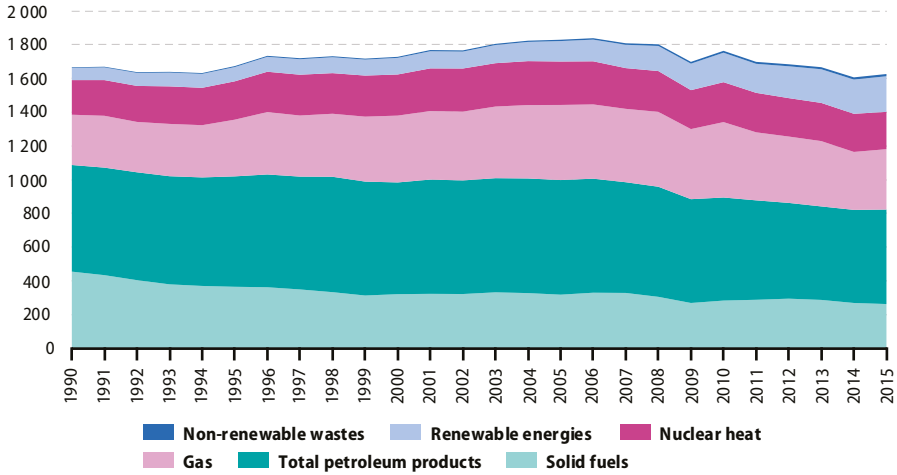
(1) This designation is without prejudice to positions on status, and is in line with UNSCR 1244/99 and the ICJ Opinion on the Kosovo declaration of independence.

Source: Eurostat (online data code: tsdcc310)

2.5 Energy consumption

Figure 2.5.1: Gross inland energy consumption, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Oil (crude oil and petroleum products) continues to be the most important energy source for the European economy, despite the long-term downward trend, while natural gas remains the second most important energy source.

Gross inland energy consumption in the EU-28 in 2015 was 1 627 Mtoe (Figure 2.5.1). It was relatively stable during the period 1990-2010, with a strong decrease in 2009 as a result of the financial and economic crises. In 2009, gross inland energy consumption decreased by 5.8 % compared to 2008. The sharpest decrease was in solid fuels by 11.9 %, followed by gas (6.4 %) and petroleum products by 5.7 % each (Figure 2.5.2).

There was a recovery in 2010, when gross inland energy consumption increased by 3.8 %, afterwards followed by consecutive decreases until 2015. The gross inland consumption in 2013 was just below the level recorded in 1990 and in 2015 it was 2.5 % below the 1990 levels.

A 42.2 % drop in solid fuels and oil products with 11.4 % contributed the most to the 2015 decrease, while renewable energies increased considerably (over 192 %) compared to 1990. In fact, the gross inland energy consumption in the EU-28 in 2014 was the lowest since the historic time series allows for comparison (since 1990).

As for the structure of gross inland energy consumption in 2015, petroleum products held the biggest share (34.4 %), followed by gas (22.0 %) and solid fossil fuels (16.1 %). The share of nuclear heat was 13.6 % and renewables accounted for 13.0 % (Figure 2.5.3). Since 1990, the amount and share of solid fuels has fallen significantly (from 27.2 % in 1990, to 18.6 % in 2000, to 16.1 % in 2015). On the other hand, renewable energy sources have increased their share of the total, from 4.3 % in 1990, to 5.7 % in 2000, to 13.0 % in 2015, while gas has risen from 17.9 % in 1990, to 22.9 % in 2000 and to 22.0 % in 2015.

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. In 2015, 72.5 % of all energy in the EU-28 was produced from fossil sources (coal, crude oil, natural gas), decreased by 5.8 % compared to 2008. The sharpest decrease was in solid fuels by 11.9 %, followed by gas (6.4 %) and petroleum products by 5.7 % each (Figure 2.5.2).

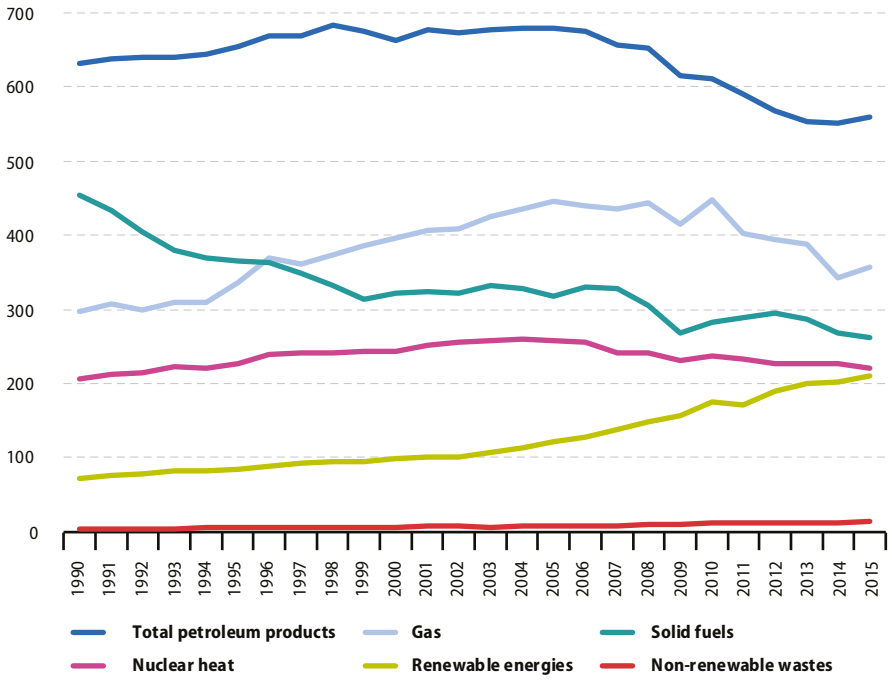
Only in three EU countries the share of fossil fuels in gross inland energy consumption (Figure 2.5.3) is below 50 % (Sweden 27.6 %, France 47.3 % and Finland 45.3 %).

It should be noted that France and Sweden are the countries with the highest contribution of nuclear heat to the gross inland energy consumption (43.7 % and 30.7 % respectively).

In 2015, over half of gross inland consumption was covered by solid fossil fuels (Figure 2.5.3) in Estonia (60.8 %) and Poland (50.5 %). The average in EU-28 was 16.1 %. The smallest shares of solid fossil fuels in gross inland energy consumption (under 2 %) in 2015 were observed in Latvia, Luxembourg, Cyprus and Malta. The biggest shares of total petroleum products in gross inland energy consumption were observed in: Cyprus 92.8 %, Malta 85.4 % and Luxembourg 63.1 %.

Figure 2.5.2: Gross inland energy consumption, EU-28, 1990-2015

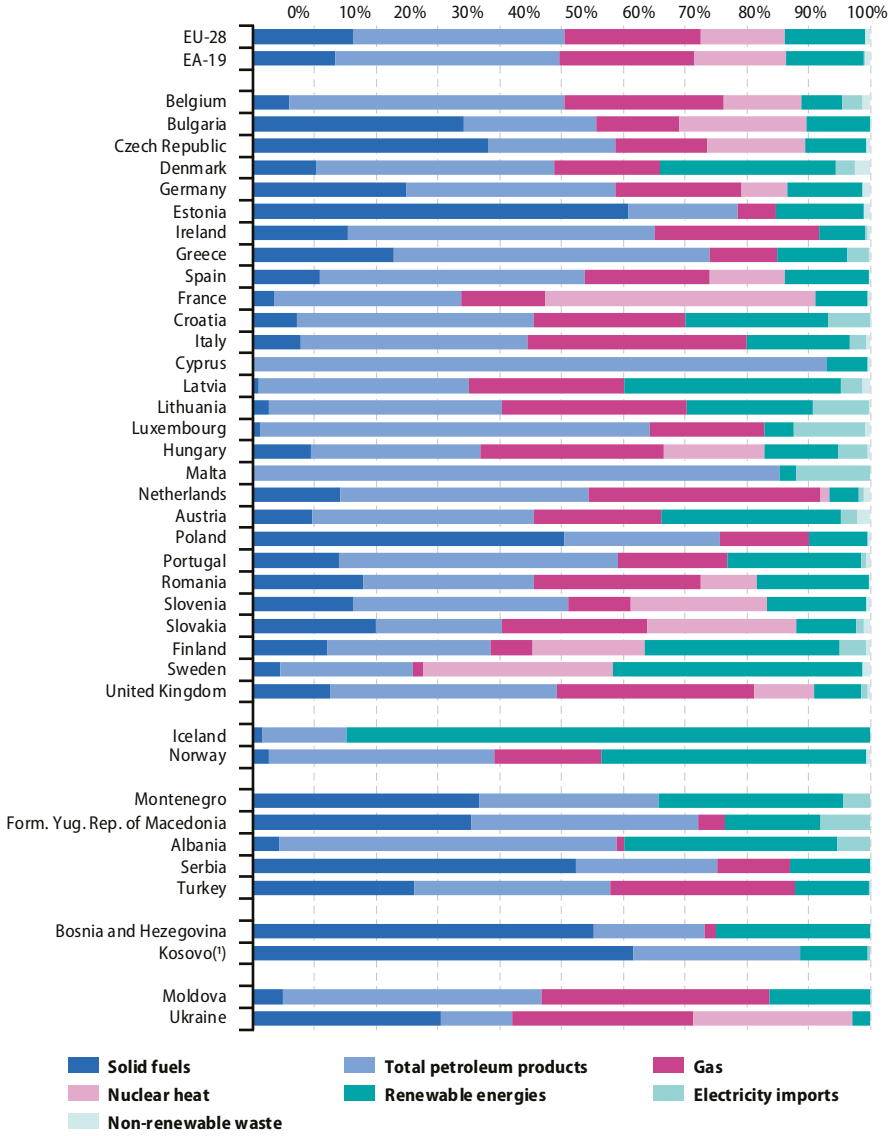
(Mtoe)



Source: Eurostat (data online code: nrg_110a)

Figure 2.5.3: National shares of fuels in gross inland energy consumption, 2015

(%)



(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_110a)

Table 2.5.1: Total gross inland consumption of energy, 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	1 670.0	1 675.0	1 730.1	1 830.9	1 764.4	1 698.9	1 685.6	1 667.8	1 607.8	1 627.5
Belgium	48.6	53.8	59.3	59.1	60.9	57.0	54.6	56.6	53.5	54.2
Bulgaria	27.6	22.7	18.5	19.8	17.8	19.1	18.2	16.8	17.7	18.5
Czech Republic	50.1	41.9	41.4	45.4	45.4	43.8	43.5	43.5	42.2	42.4
Denmark	17.9	20.2	19.7	19.6	20.0	18.6	17.9	17.8	16.8	16.8
Germany	356.3	341.6	342.3	341.9	332.5	315.8	317.9	324.5	313.2	314.2
Estonia	9.9	5.5	5.0	5.6	6.2	6.2	6.1	6.7	6.7	6.3
Ireland	10.3	11.1	14.4	15.3	15.2	13.9	13.8	13.7	13.6	14.2
Greece	22.3	23.9	28.3	31.4	28.7	27.8	27.6	24.2	24.4	24.4
Spain	90.1	102.1	123.6	144.2	130.3	128.5	128.1	119.3	116.7	121.4
France	227.8	241.8	257.5	276.4	266.9	257.8	258.1	258.9	248.5	252.6
Croatia	9.5	7.9	8.4	9.8	9.4	9.3	8.9	8.6	8.2	8.5
Italy	153.5	161.8	174.2	190.1	177.9	172.5	165.7	159.5	151.0	156.2
Cyprus	1.6	2.0	2.4	2.5	2.7	2.7	2.5	2.2	2.2	2.3
Latvia	7.9	4.6	3.9	4.6	4.6	4.4	4.5	4.5	4.5	4.4
Lithuania	15.9	8.6	7.1	8.7	6.8	7.0	7.1	6.7	6.7	6.9
Luxembourg	3.5	3.3	3.7	4.8	4.6	4.6	4.5	4.3	4.2	4.2
Hungary	28.8	26.2	25.3	27.6	26.6	26.0	24.7	23.9	23.8	25.2
Malta	0.6	0.8	0.8	1.0	0.9	0.9	1.0	0.9	0.9	0.8
Netherlands	68.6	75.5	78.0	84.1	85.8	80.2	80.5	80.3	76.4	77.6
Austria	25.0	27.1	29.0	34.1	34.3	33.3	33.2	33.7	32.5	33.2
Poland	103.3	98.8	88.6	92.2	100.7	100.8	97.6	98.0	94.3	95.4
Portugal	18.2	20.6	25.3	27.5	24.3	23.6	22.2	22.4	22.1	23.0
Romania	58.1	46.3	36.6	39.2	35.8	36.6	35.4	32.4	32.2	32.4
Slovenia	5.7	6.1	6.5	7.3	7.3	7.3	7.0	6.9	6.7	6.6
Slovakia	21.8	17.7	18.3	19.0	17.9	17.4	16.7	17.0	16.2	16.4
Finland	28.8	29.4	32.4	34.5	37.1	35.8	34.7	34.1	34.8	33.2
Sweden	47.4	51.5	48.9	51.0	50.8	49.5	49.8	49.1	48.2	45.5
United Kingdom	210.6	222.3	230.6	234.2	212.9	198.6	203.9	201.2	189.7	190.7
Iceland	2.4	2.3	3.3	3.4	5.9	6.3	5.8	6.1	6.1	5.8
Norway	21.4	23.8	26.4	27.2	34.3	28.4	30.1	33.1	28.4	30.0
Montenegro	0.0	0.0	0.0	1.0	1.1	1.1	1.1	1.0	1.0	1.0
Former Yugoslav Republic of Macedonia	2.4	2.5	2.7	2.9	2.8	3.1	3.0	2.8	2.7	2.7
Albania	2.6	1.3	1.8	2.2	2.1	2.2	2.1	2.4	2.3	2.2
Serbia	19.6	13.6	13.7	15.7	15.6	16.2	14.5	14.9	13.3	14.7
Turkey	52.3	62.1	76.6	85.6	106.9	113.8	119.7	117.5	124.0	131.7
Bosnia and Herzegovina	5.0	0.9	3.2	3.9	4.7	5.4	5.1	5.0	7.8	1.8
Kosovo (1)	0.0	0.0	1.5	1.9	2.5	2.5	2.4	2.3	2.2	2.5

(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_100a)

Table 2.5.2: Final energy consumption, 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2012	2013	2014	2015
EU-28	1 085.0	1 082.8	1 132.9	1 192.3	1 164.5	1 108.0	1 107.6	1 061.7	1 084.0
Belgium	31.5	34.3	37.5	36.6	37.6	35.1	36.4	34.2	35.8
Bulgaria	16.4	11.4	9.1	10.2	8.8	9.2	8.8	9.0	9.5
Czech Republic	32.7	26.3	25.1	26.3	25.4	24.5	24.3	23.6	24.2
Denmark	13.5	14.8	14.7	15.5	15.5	14.2	14.1	13.5	13.9
Germany	228.9	221.6	220.0	218.5	219.7	212.1	217.7	208.9	212.1
Estonia	5.7	2.6	2.4	2.9	2.9	2.9	2.9	2.8	2.8
Ireland	7.3	8.0	10.8	12.6	12.0	10.6	10.7	10.8	11.2
Greece	14.7	15.8	18.7	21.0	19.0	17.0	15.3	15.5	16.5
Spain	57.1	64.0	79.9	97.8	89.1	83.2	80.8	79.2	80.5
France	136.2	143.5	155.3	160.8	155.3	148.5	151.2	140.3	144.1
Croatia	6.5	5.3	6.0	7.2	7.2	6.7	6.6	6.2	6.6
Italy	107.7	114.6	124.7	137.2	128.5	121.8	118.5	113.3	116.4
Cyprus	1.1	1.4	1.6	1.8	1.9	1.8	1.6	1.6	1.7
Latvia	6.4	3.8	3.3	4.0	4.1	4.0	3.9	3.9	3.8
Lithuania	9.7	4.6	3.8	4.7	4.8	4.9	4.8	4.9	4.9
Luxembourg	3.3	3.1	3.5	4.5	4.3	4.2	4.1	4.0	4.0
Hungary	19.9	16.2	16.1	18.2	17.4	16.5	16.6	16.2	17.3
Malta	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.6
Netherlands	45.5	51.0	52.3	54.2	55.1	51.5	51.6	47.3	48.5
Austria	19.3	21.4	23.7	27.8	28.2	27.1	28.0	26.7	27.4
Poland	59.9	62.9	55.2	58.5	66.3	64.4	63.3	61.6	62.3
Portugal	11.9	13.9	17.9	19.0	18.1	16.0	15.9	15.8	16.0
Romania	40.8	27.0	22.8	24.7	22.6	22.8	21.8	21.7	21.9
Slovenia	3.7	4.1	4.5	4.9	5.0	4.9	4.8	4.6	4.7
Slovakia	15.2	11.0	11.0	11.6	11.5	10.3	10.6	10.0	10.1
Finland	21.7	22.0	24.3	25.2	26.2	25.2	24.7	24.5	24.2
Sweden	31.2	35.1	35.0	33.7	34.1	32.4	31.6	31.2	31.8
United Kingdom	136.9	142.7	153.2	152.8	143.2	135.9	136.7	129.6	131.4
Iceland	1.4	1.5	1.9	2.0	2.6	2.7	2.9	2.9	3.1
Norway	16.1	16.9	18.1	18.6	19.6	18.8	19.0	18.5	18.7
Montenegro	0.0	0.0	0.0	0.8	0.7	0.7	0.7	0.6	0.7
Former Yugoslav Republic of Macedonia	1.4	1.5	1.6	1.7	1.8	1.9	1.8	1.8	1.9
Albania	1.9	0.9	1.5	1.9	1.9	1.9	2.0	2.1	2.0
Serbia	11.8	6.1	6.9	9.6	9.0	8.5	8.3	7.8	8.2
Turkey	38.7	45.2	56.2	63.5	74.1	84.2	82.0	85.9	93.2
Bosnia and Herzegovina	3.3	0.8	1.2	1.5	1.9	2.0	1.9	4.5	2.3
Kosovo (1)	0.0	0.0	0.8	1.0	1.2	1.2	1.2	1.2	1.3

(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: ten00095)

Table 2.5.3: Final energy consumption of industry, 1990-2015

(Mtoe)

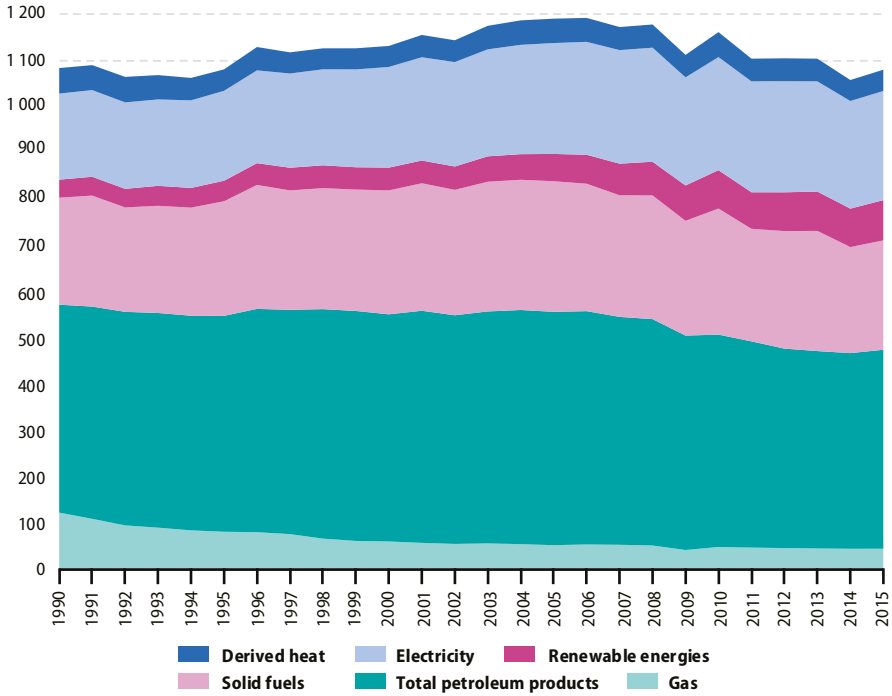
	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	370.8	331.6	333.4	328.1	287.0	283.2	277.9	277.6	274.0	274.7
EA-19	235.5	218.1	232.5	235.3	209.8	207.0	203.1	202.5	198.9	199.3
Belgium	12.1	11.9	14.1	11.7	12.1	11.6	11.5	12.0	11.9	11.9
Bulgaria	9.0	6.0	4.0	4.0	2.6	2.7	2.6	2.6	2.6	2.7
Czech Republic	17.3	12.5	10.1	9.7	8.0	7.9	7.8	7.5	7.4	7.5
Denmark	2.7	3.0	2.9	2.8	2.4	2.4	2.3	2.1	2.1	2.1
Germany	72.2	60.1	57.6	59.1	60.6	60.8	60.6	60.7	60.7	61.0
Estonia	2.5	0.8	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.5
Ireland	1.7	2.0	2.5	2.6	2.1	2.2	2.2	2.2	2.2	2.4
Greece	4.0	4.0	4.5	4.2	3.5	3.3	3.0	2.8	3.1	3.1
Spain	20.2	20.5	25.4	31.0	21.4	21.4	20.8	20.8	20.0	18.9
France	35.6	36.2	37.3	33.5	28.5	27.8	27.7	29.1	27.3	28.6
Croatia	2.2	1.3	1.4	1.6	1.4	1.3	1.1	1.1	1.1	1.1
Italy	35.8	36.0	39.7	39.9	31.3	30.1	29.1	26.8	26.2	26.0
Cyprus	0.3	0.4	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2
Latvia	2.0	0.7	0.6	0.7	0.8	0.7	0.8	0.8	0.8	0.8
Lithuania	3.3	1.0	0.8	1.1	0.9	1.0	1.1	1.0	1.0	1.0
Luxembourg	1.7	1.2	0.7	0.8	0.8	0.7	0.7	0.6	0.7	0.7
Hungary	6.5	3.8	3.5	3.4	2.9	3.3	3.5	3.9	4.0	4.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	15.0	16.1	16.5	17.0	15.4	15.2	14.8	14.5	14.3	14.3
Austria	6.2	6.4	7.3	8.7	9.2	9.3	9.1	9.3	9.1	9.1
Poland	25.4	23.0	18.5	15.3	14.1	14.6	14.4	14.9	15.0	15.0
Portugal	4.7	4.9	6.3	5.8	5.5	5.3	4.6	4.6	4.4	4.5
Romania	25.3	15.1	9.3	10.0	6.9	7.1	6.8	6.3	6.5	6.5
Slovenia	1.5	1.2	1.4	1.6	1.3	1.2	1.2	1.2	1.2	1.2
Slovakia	7.2	4.7	4.5	4.7	4.4	4.3	4.3	4.3	4.4	4.4
Finland	9.5	9.9	12.2	11.9	11.3	11.1	10.8	10.7	10.7	10.7
Sweden	12.3	13.8	14.3	12.6	12.2	11.9	11.7	11.4	11.2	11.5
United Kingdom	34.6	34.9	36.9	33.3	26.8	25.0	24.7	25.2	25.1	24.7
Iceland	0.4	0.4	0.7	0.7	1.3	1.3	1.4	1.4	1.4	1.5
Norway	6.1	6.1	6.9	6.8	6.1	6.1	5.9	5.9	5.8	5.9
Montenegro	0.0	0.0	0.0	0.3	0.2	0.2	0.2	0.2	0.1	0.1
Former Yugoslav Republic of Macedonia	0.7	0.5	0.5	0.6	0.5	0.6	0.6	0.6	0.5	0.5
Albania	0.7	0.2	0.3	0.2	0.4	0.4	0.4	0.3	0.4	0.3
Serbia	4.6	1.6	2.2	3.5	2.6	2.8	2.5	2.5	2.1	2.3
Turkey	12.1	13.3	21.0	22.6	24.9	27.1	28.1	26.8	27.9	28.8
Bosnia and Herzegovina	1.6	0.2	0.5	0.6	0.8	0.8	0.9	0.9	0.9	0.4
Kosovo ([1])	0.0	0.0	0.1	0.2	0.3	0.3	0.3	0.3	0.2	0.3
Moldova	1.2	0.7	0.5	0.7	0.7	0.6	0.6	0.5	0.3	0.2
Ukraine	91.5	48.9	39.0	38.9	30.7	32.0	29.8	27.7	25.3	21.1

([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_110a)

Figure 2.5.4: Final energy consumption, by fuel, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Final energy consumption in EU-28 in 2015 was 1 084 Mtoe, 2.1 % higher than in 2014 (Figure 2.5.4). Final energy consumption has increased slowly since 1994, reaching its highest value, 1 194 Mtoe, in 2006. By 2015, the final energy consumption decreased from its peak levels by 9.2 %.

Since 2006, decreases were recorded in the use of solid fuels (16.7 %), petroleum products (14.7 %), gas (14.1 %), derived heat (11.2 %) and electricity (3.3 %).

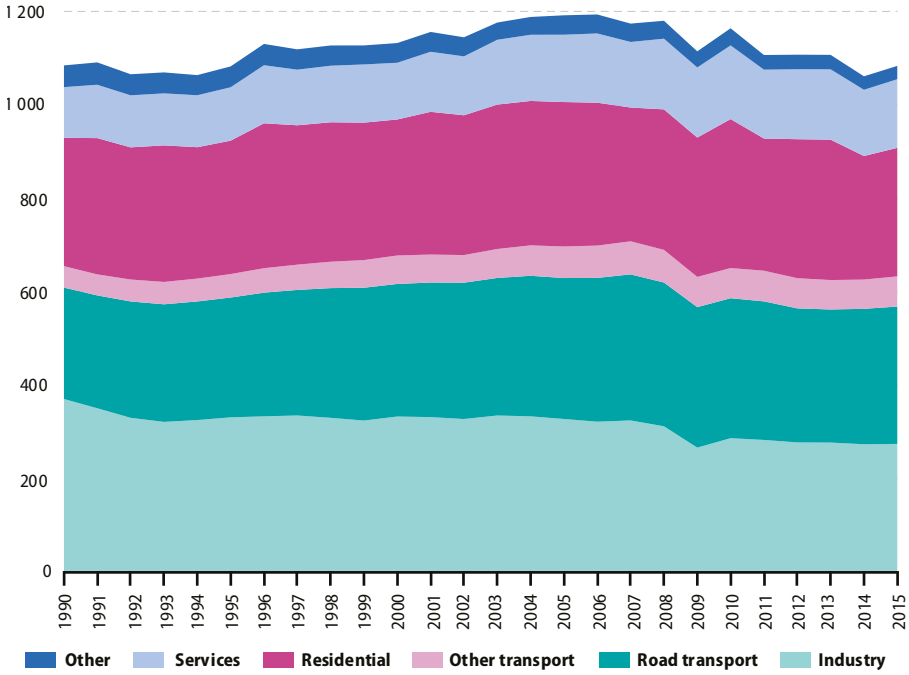
The biggest share in the structure of final energy consumption in 2015 was for petroleum products (39.6 %), followed by gas (21.8 %) and electricity (21.7 %). Solid fossil fuels contributed only 4.3 % to the final energy consumption at the end-use level.

The structure of final energy consumption in 2015 by sector shows that residential (25.4 %), transport (33.1 %) and industry (25.3 %) accounted for the biggest shares (Figure 2.5.5). The service sector accounted for 13.6 %, other transport 6.0 % and the remaining other sectors 2.6 %.

EU-28 final energy consumption was equivalent to two thirds (66.6 %) of gross inland consumption, at 1 084 Mtoe in 2015.

Figure 2.5.5: Final energy consumption by sector, EU-28, 1990-2015

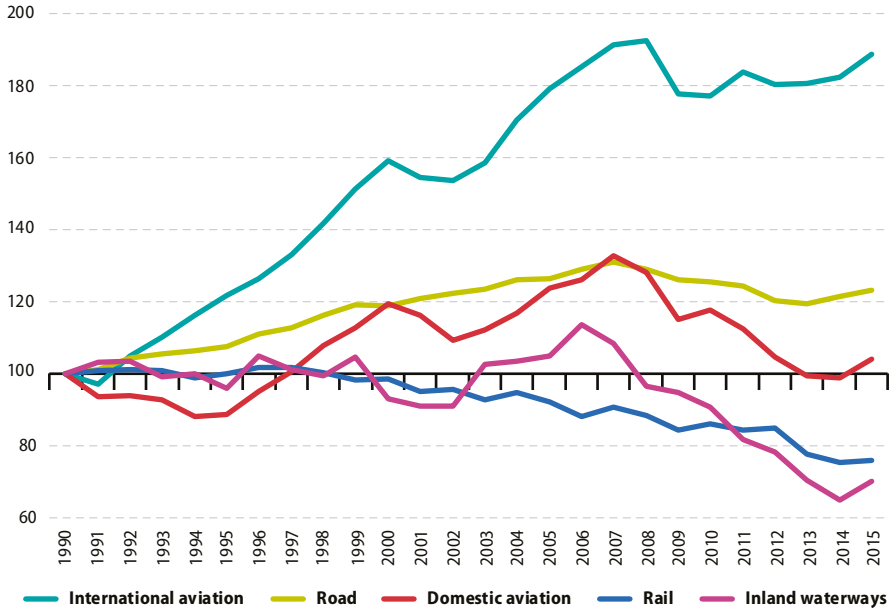
(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Figure 2.5.6: Energy consumption by transport mode, EU-28, 1990-2015

(1990 = 100, based on tonnes of oil equivalent)



Source: Eurostat (online data code: nrg_100a)

As shown in Figure 2.5.6, international aviation had the highest growth in EU-28 energy consumption among the principal modes of transport between 1990 and 2015 — rising 88.8 % overall. Road transport — by far the largest transport mode — and domestic aviation were the only other transport modes to report increases over this period, as their consumption rose by 23.3 % and 4.0 % respectively. By contrast, energy consumption in 2015 was 24.2 % lower than in 1990 for rail transport and 29.9 % 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 1.9 and 2.0 Mtoe lower in 2015 than in 1990 (for both these modes). There was almost no change in the energy consumed by domestic aviation, while the consumption of energy for international aviation rose by 21.5 Mtoe between 1990 and 2015; for comparison the 55.5 Mtoe increase recorded for road transport was more than 2.5 times as high. 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.

Table 2.5.4: Final energy consumption of transport, 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	284.4	306.8	344.7	369.3	364.2	362.3	351.6	347.9	352.6	358.6
EA-19	206.5	226.8	254.2	267.8	260.6	258.6	249.8	248.1	250.8	254.1
Belgium	7.8	8.6	9.7	9.9	10.3	10.3	9.9	9.7	9.9	10.4
Bulgaria	2.6	1.8	2.0	2.9	2.9	2.9	3.1	2.8	3.1	3.4
Czech Republic	2.8	2.8	4.4	6.1	6.2	6.2	6.1	6.0	6.2	6.5
Denmark	4.0	4.5	4.8	5.3	5.2	5.2	4.9	4.8	4.9	4.9
Germany	59.7	63.7	66.8	62.3	61.1	61.3	61.4	62.6	63.5	63.2
Estonia	0.9	0.5	0.6	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Ireland	2.0	2.4	4.1	5.1	4.7	4.3	4.1	4.2	4.5	4.6
Greece	5.9	6.5	7.3	8.2	8.2	7.4	6.3	6.3	6.4	6.6
Spain	22.7	26.4	33.2	39.9	37.2	36.0	33.3	31.8	32.0	33.6
France	42.1	45.7	50.4	50.3	49.5	49.6	49.3	49.0	49.3	50.1
Croatia	1.4	1.2	1.5	1.9	2.1	2.0	2.0	2.0	2.0	2.1
Italy	34.2	38.6	42.5	44.8	41.7	41.8	39.4	38.7	40.1	39.5
Cyprus	0.6	0.8	0.9	1.0	1.0	1.1	1.0	0.9	0.8	0.9
Latvia	1.1	0.7	0.7	1.1	1.2	1.1	1.1	1.1	1.1	1.1
Lithuania	2.0	1.0	1.1	1.4	1.5	1.5	1.6	1.6	1.7	1.8
Luxembourg	1.0	1.3	1.9	2.8	2.6	2.7	2.6	2.5	2.5	2.4
Hungary	3.1	2.7	3.3	4.3	4.3	4.0	3.9	3.6	4.0	4.4
Malta	0.2	0.3	0.3	0.2	0.3	0.3	0.3	0.3	0.3	0.3
Netherlands	10.7	12.6	14.2	15.2	15.1	15.4	14.7	14.5	13.9	14.3
Austria	5.0	5.8	7.0	9.0	8.8	8.6	8.5	8.8	8.7	9.0
Poland	7.4	8.3	9.9	12.5	17.7	17.9	17.2	16.3	16.4	17.2
Portugal	3.8	4.9	6.6	7.2	7.3	6.9	6.5	6.4	6.4	6.6
Romania	3.1	3.1	3.5	4.3	5.1	5.3	5.4	5.4	5.5	5.6
Slovenia	0.9	1.3	1.3	1.5	1.8	1.9	1.9	1.8	1.8	1.8
Slovakia	1.4	1.4	1.5	2.4	2.6	2.6	2.3	2.4	2.2	2.2
Finland	4.3	4.2	4.3	4.6	4.8	4.9	4.8	4.9	4.8	4.8
Sweden	7.4	7.8	8.2	8.6	8.6	8.5	8.3	8.3	8.5	8.7
United Kingdom	46.2	47.7	52.9	55.5	51.5	51.4	50.9	50.5	51.1	51.8
Iceland	0.3	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.5	0.5
Norway	3.8	4.3	4.4	4.7	5.3	5.1	5.0	5.3	5.4	5.5
Montenegro	0.0	0.0	0.0	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Former Yugoslav Republic of Macedonia	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6
Albania	0.2	0.2	0.5	0.8	0.8	0.8	0.8	0.8	0.8	0.8
Serbia	1.7	1.0	0.8	2.3	2.3	2.1	1.8	2.0	2.1	2.1
Turkey	9.5	12.1	12.4	13.6	16.0	16.1	18.8	20.7	23.7	28.2
Bosnia and Herzegovina	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.0	1.0
Kosovo ([1])	0.0	0.0	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.4
Moldova	0.9	0.5	0.3	0.4	0.6	0.6	0.6	0.6	0.6	0.7
Ukraine	21.5	12.9	10.7	12.1	13.2	13.1	12.1	12.0	10.4	8.8

([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_110a)

Table 2.5.5: Final energy consumption of households, services, etc., 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	429.7	444.5	454.8	494.9	513.3	461.8	478.5	482.1	435.1	450.6
EA-19	285.3	296.3	309.0	342.1	353.4	316.7	328.5	333.3	299.2	311.7
Belgium	11.6	13.9	13.8	14.9	15.2	13.1	13.6	14.7	12.4	13.4
Bulgaria	4.8	3.6	3.1	3.2	3.4	3.6	3.6	3.4	3.3	3.4
Czech Republic	12.6	11.0	10.6	10.6	11.2	10.5	10.7	10.8	10.0	10.2
Denmark	6.8	7.3	7.0	7.3	7.9	7.2	7.1	7.1	6.5	6.9
Germany	97.1	97.8	95.7	97.0	98.0	86.6	90.0	94.3	84.7	88.0
Estonia	2.3	1.2	1.3	1.4	1.5	1.4	1.5	1.5	1.5	1.5
Ireland	3.6	3.6	4.2	4.9	5.1	4.4	4.3	4.3	4.1	4.2
Greece	4.8	5.3	6.9	8.6	7.4	8.1	7.7	6.2	6.0	6.8
Spain	14.3	17.0	21.3	26.8	30.4	29.3	29.0	28.2	27.2	28.0
France	58.4	61.6	67.6	77.0	77.4	66.5	71.4	73.1	63.7	65.4
Croatia	2.8	2.8	3.1	3.8	3.8	3.6	3.5	3.4	3.1	3.4
Italy	37.7	40.0	42.5	52.5	55.5	51.2	53.3	53.0	47.1	50.9
Cyprus	0.2	0.3	0.3	0.5	0.6	0.7	0.6	0.6	0.6	0.6
Latvia	3.3	2.4	1.9	2.3	2.1	2.0	2.1	2.0	2.0	1.9
Lithuania	4.4	2.5	1.9	2.2	2.3	2.2	2.3	2.2	2.1	2.1
Luxembourg	0.6	0.6	0.9	0.9	1.0	0.9	0.9	0.9	0.9	0.9
Hungary	10.3	9.7	9.3	10.5	10.2	10.1	9.1	9.1	8.2	8.7
Malta	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Netherlands	19.8	22.3	21.7	21.9	24.6	21.1	21.9	22.6	19.1	20.0
Austria	8.1	9.1	9.4	10.1	10.2	9.4	9.5	9.8	9.0	9.3
Poland	27.1	31.6	26.8	30.6	34.5	32.2	32.8	32.1	30.2	30.0
Portugal	3.4	4.0	5.0	6.0	5.3	5.1	5.0	4.9	4.9	5.0
Romania	12.4	8.7	10.0	10.4	10.6	10.3	10.6	10.2	9.8	9.8
Slovenia	1.3	1.6	1.8	1.8	2.0	1.9	1.8	1.8	1.5	1.7
Slovakia	6.6	4.9	5.0	4.5	4.6	3.9	3.7	4.0	3.3	3.4
Finland	7.8	7.9	7.8	8.7	10.1	8.9	9.5	9.1	9.0	8.7
Sweden	11.4	13.4	12.5	12.4	13.3	12.0	12.4	11.8	11.4	11.6
United Kingdom	56.1	60.1	63.4	63.9	65.0	55.5	60.3	60.9	53.4	54.9
Iceland	0.7	0.8	0.8	0.9	0.9	0.9	1.0	1.0	1.0	1.1
Norway	6.2	6.6	6.7	7.1	8.1	7.5	7.9	7.8	7.2	7.3
Montenegro	0.0	0.0	0.0	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Former Yugoslav Republic of Macedonia	0.4	0.7	0.7	0.8	0.8	0.8	0.8	0.7	0.7	0.8
Albania	1.0	0.5	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.8
Serbia	5.6	3.5	3.9	3.8	4.1	4.3	4.2	3.8	3.7	3.8
Turkey	17.2	19.8	22.8	27.4	33.2	35.5	37.4	34.5	34.3	36.2
Bosnia and Herzegovina	1.7	0.5	0.7	1.0	1.1	1.1	1.1	1.1	2.6	0.8
Kosovo ([1])	0.0	0.0	0.4	0.5	0.6	0.6	0.6	0.6	0.6	0.7
Moldova	4.9	2.0	0.9	1.2	1.1	1.2	1.1	1.2	1.1	1.2
Ukraine	45.1	35.6	27.9	29.3	30.6	31.1	30.8	31.5	27.1	22.4

([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_100a)

Table 2.5.6: Electricity consumption of households, 1990-2015

(Mtoe)

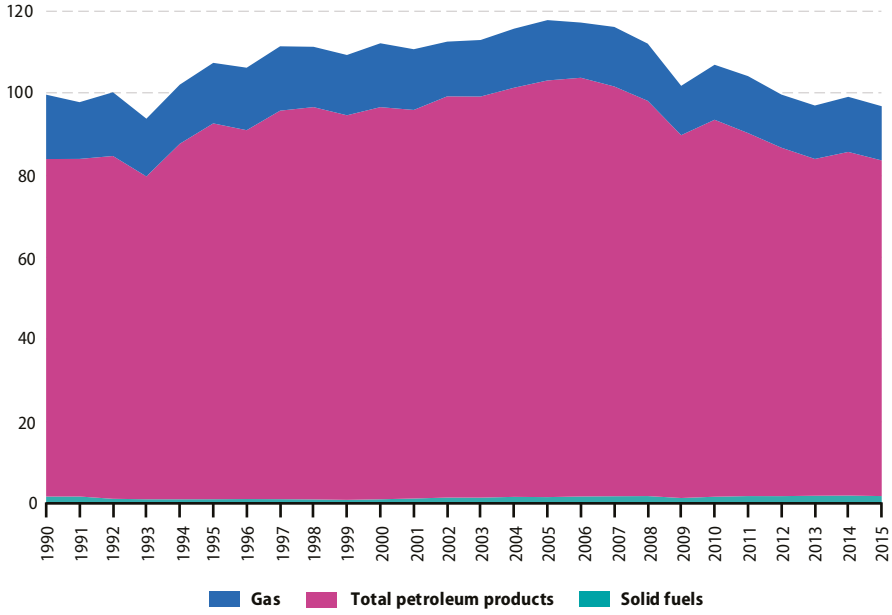
	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	52.3	56.5	61.7	69.0	73.1	69.5	71.6	71.3	67.6	68.4
EA-19	35.1	37.6	41.8	47.1	50.9	48.3	50.0	49.8	46.9	47.4
Belgium	1.6	1.9	2.0	2.2	1.7	1.7	1.7	1.7	1.6	1.6
Bulgaria	0.9	0.9	0.8	0.8	0.9	0.9	0.9	0.9	0.9	0.9
Czech Republic	0.8	1.3	1.2	1.3	1.3	1.2	1.3	1.3	1.2	1.2
Denmark	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9	0.9
Germany	11.8	10.9	11.2	12.1	12.2	11.7	11.8	11.7	11.1	11.1
Estonia	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.1	0.1
Ireland	0.4	0.4	0.5	0.6	0.7	0.7	0.7	0.7	0.7	0.7
Greece	0.8	1.0	1.2	1.5	1.6	1.5	1.6	1.5	1.5	1.5
Spain	2.6	3.1	3.8	5.4	6.5	6.5	6.5	6.1	6.1	6.0
France	8.3	9.4	11.1	11.9	13.9	12.1	13.6	14.4	12.5	13.1
Croatia	0.4	0.4	0.5	0.5	0.6	0.6	0.6	0.5	0.5	0.5
Italy	4.5	4.9	5.3	5.8	6.0	6.0	6.0	5.8	5.5	5.7
Cyprus	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Latvia	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Lithuania	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Luxembourg	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Hungary	0.8	0.8	0.8	1.0	1.0	1.0	0.9	0.9	0.9	0.9
Malta	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Netherlands	1.3	1.6	1.7	1.9	2.0	2.0	2.0	2.0	2.0	2.0
Austria	1.0	1.2	1.3	1.5	1.6	1.5	1.6	1.5	1.5	1.5
Poland	1.7	1.6	1.8	2.2	2.5	2.4	2.4	2.4	2.4	2.4
Portugal	0.5	0.7	0.9	1.1	1.2	1.2	1.1	1.1	1.0	1.0
Romania	0.5	0.6	0.7	0.8	1.0	1.0	1.0	1.0	1.0	1.0
Slovenia	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Slovakia	0.3	0.4	0.5	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Finland	1.3	1.4	1.5	1.7	2.0	1.8	1.9	1.8	1.8	1.8
Sweden	3.3	3.6	3.6	3.7	4.0	3.6	3.8	3.7	3.6	3.7
United Kingdom	8.1	8.8	9.6	10.8	10.2	9.6	9.9	9.8	9.3	9.3
Iceland	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Norway	2.6	3.0	3.0	2.9	3.4	3.1	3.3	3.3	3.2	3.2
Montenegro	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
Former Yugoslav Republic of Macedonia	0.1	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Albania	0.1	0.1	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3
Serbia	0.9	1.4	1.4	1.2	1.3	1.3	1.2	1.2	1.2	1.2
Turkey	0.8	1.2	2.1	2.7	3.6	3.8	3.9	3.9	4.0	4.1
Bosnia and Herzegovina	0.3	0.2	0.3	0.3	0.4	0.4	0.4	0.4	0.4	0.4
Kosovo ([1])	0.0	0.0	0.1	0.2	0.2	0.2	0.2	0.2	0.2	0.2

([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: tsdpc310)

Figure 2.5.7: Non-energy consumption by fuel, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

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).

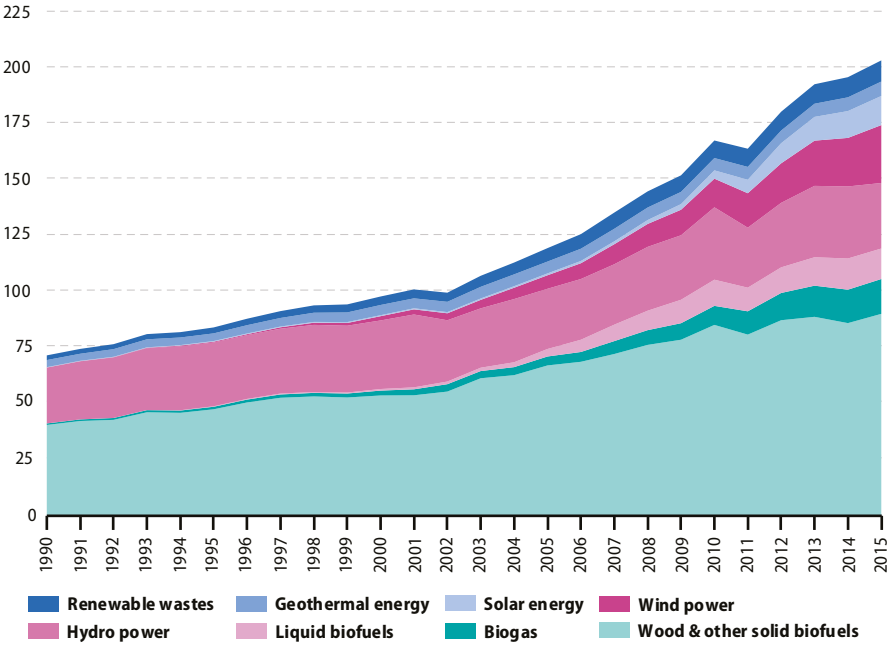
Non-energy consumption in 2015 amounted to almost 97 Mtoe (Figure 2.5.7).

Petroleum products accounted for 84.5 %, gas 13.6 %, and 1.9 % of all non-energy consumption was of solid fuels.

2.6 Renewable energy sources

Figure 2.6.1: Primary production of energy from renewable sources, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_109a)

Primary production of renewable energies is on a long-term increasing trend. Between 1990 and 2015 it increased by 184 % (an average annual growth rate of 4.3 %). However, in 2011, the primary production of renewables declined by 2.2 %; this was mainly due to the annual variation in hydropower production and decrease in the combustion of solid biomass. This was only the second decrease recorded since 1990 — the first in 2002 (-1.4 %) was also a consequence of hydropower variation. The Renewable Energy Directive requires that — for accounting purposes — hydropower and wind power production is normalised ([7]) for annual variations. Primary production of renewable energies is shown in Figure 2.6.1.

In 2015, the primary production of renewables increased by 3.8 % compared with 2014. In fact, this is among the 5 lowest annual increases in the last 15 years (including 2002 and 2011, where the primary production decreased). When compared to the primary production 5 years ago, it is now 21 % higher.

([7]) In calculating the contribution of hydropower and wind power the effects of weather variation is smoothed through the use of data for several years. See Annex II of Directive 2009/28/EC for the applied rules.

In 2015, gross electricity generation from renewables increased by 4.0 % compared with 2014. However, the picture varies depending on the energy source: from a decrease of 9.0 % for electricity generation from hydro to a 19.3 % increase for wind power. Between 1990 and 2015, total electricity generation from renewables increased by 203 %. In 2015, renewable electricity generation accounted for 29 % of total gross electricity generation.

Hydropower plants generate the largest share of electricity from renewable energy sources. Electricity generation from hydropower increased by 17 % between 1990 and 2015, even if its share of total renewable electricity generation shrank from 94 % to 37 % over the same period. This is due to the more rapid expansion of electricity generation from other renewable sources.

Wind power generation more than quadrupled over the period 2005-2015: since 2000, it has been the second largest contributor to renewable electricity, replacing wood and other solid biomass, which had held that position since 1990. Solar power electricity generation has increased rapidly in recent years and in 2015 accounted for 12 % of all renewable electricity. In 2013 the electricity generated from solar energy surpassed wood and other solid biomass and is now the third most important contributor to the electricity production from renewable sources. Solid renewables (wood and other solid biomass, excluding renewable wastes) are also used in conventional thermal generation power plants: their share in electricity from renewable sources grew from 3.5 % in 1990 to 10 % in 2015. Bioliquids and biogas, which were negligible in 1990, reached 7 % in 2015. Electricity generation from renewable sources is shown in Figure 2.6.2.

The available capacity of renewable electricity generation has increased significantly over the last 20 years. Wind power capacity had already begun to increase rapidly in the late 1990s and from 2005 there was a boom in solar generation capacity. Additional capacity increases for other renewables were much more modest than for these two. Solar and wind generation are intermittent energy sources: their utilisation rate is much lower than for those renewables used in conventional thermal power stations (as well as compared with fossil fuels and nuclear power). Pumped-storage hydropower plants can be reliably used to deal with surplus electricity generation from intermittent sources. The capacity of pumped-storage hydropower plants did not increase at the same rate as solar and wind. Installed capacity for renewable sources, nuclear power and pumped-storage hydropower is shown in Figure 2.6.3. To put into perspective electricity generation capacities from renewable sources, in 2015 it was in total around 430 GW, approximately the same as the existing electricity generation capacity of fossil fuel plants in the EU.

Production of liquid biofuels has increased significantly from almost nothing in 1990. There were rapid increases — especially after 2002 — producing an average annual growth rate between 2000 and 2010 of 32 %. However, production decreased in 2011 by 10 % compared with 2010. Since then it is increasing at around 10 % each year to fall again by 2 % in 2015. Production of liquid biofuels is shown in Figure 2.6.4.

Gross inland consumption of renewables is closely related to primary production of renewables. The only noticeable variation is due to imports and exports: primarily because of net imports of liquid biofuels, gross inland consumption of all renewables is 3 % higher than primary production. Gross inland consumption of renewables increased by 3.9 % in 2015 compared with 2014. Wood and other solid biomass continues to be the largest contributor to the mix of renewable energy sources. Hydropower and wood accounted for 91.5 % in 1990. However, the rate of increase since then has been much slower than for other sources notwithstanding that wood more than doubled by 2010. Consequently, their combined share decreased to 59 % in 2015. Gross inland consumption of renewable energies is shown in Figure 2.6.5.

Table 2.6.1: Primary production of renewable energy - solid biofuels and hydropower, 2005-2015

(thousand toe)

	Solid biofuels				Hydropower			
	2005	2010	2014	2015	2005	2010	2014	2015
EU-28	67 303.0	86 288.9	87 228.5	91 443.2	26 940.2	32 408.4	32 244.9	29 326.7
EA-19	44 886.4	56 287.1	56 341.4	58 954.0	17 128.5	22 954.7	23 089.0	19 510.3
Belgium	527.9	1 200.2	1 104.1	1 171.2	24.8	26.8	25.1	27.3
Bulgaria	717.7	942.5	1 086.5	1 160.3	372.9	434.8	396.0	486.8
Czech Republic	1 841.2	2 445.4	2 841.8	2 954.4	204.6	239.8	164.1	154.3
Denmark	1 260.1	1 703.2	1 308.0	1 590.3	2.0	1.8	1.3	1.5
Germany	7 975.5	11 010.2	11 424.7	12 061.6	1 688.6	1 801.6	1 684.2	1 631.7
Estonia	682.1	957.7	1 122.1	1 209.3	1.9	2.3	2.3	2.3
Ireland	180.4	190.3	210.4	201.5	54.3	51.5	61.0	69.4
Greece	956.9	724.9	869.2	952.4	431.4	641.4	384.9	524.3
Spain	4 176.0	4 665.6	5 160.6	5 260.2	1 581.5	3 637.5	3 367.9	2 419.6
France	9 078.9	10 287.5	9 078.2	9 661.1	4 426.5	5 392.3	5 402.4	4 681.0
Croatia	1 243.9	1 338.9	1 374.7	1 532.1	605.0	784.7	774.5	549.5
Italy	4 148.4	7 011.9	6 539.4	7 340.3	3 101.2	4 395.2	5 034.0	3 915.6
Cyprus	6.4	5.4	7.2	6.5	0.0	0.0	0.0	0.0
Latvia	1 553.7	1 596.0	2 046.1	2 009.2	286.0	302.7	171.5	159.9
Lithuania	845.3	1 002.2	1 116.6	1 204.7	38.8	46.4	34.3	30.0
Luxembourg	40.0	49.0	66.1	55.0	8.1	9.3	9.3	8.5
Hungary	1 039.8	2 346.6	2 362.9	2 510.9	17.4	16.2	25.9	20.1
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Netherlands	938.5	1 208.7	1 290.1	1 363.6	7.6	9.0	9.6	8.0
Austria	3 387.3	4 420.0	4 226.9	4 473.5	3 189.6	3 298.6	3 526.2	3 186.2
Poland	4 166.2	5 866.2	6 179.5	6 268.1	189.3	251.1	187.7	157.5
Portugal	2 713.3	2 806.2	2 670.6	2 603.0	406.8	1 388.5	1 338.7	744.6
Romania	3 228.9	3 900.0	3 645.7	3 521.0	1 737.5	1 709.6	1 617.0	1 430.2
Slovenia	469.5	619.0	532.6	590.2	297.6	388.5	523.8	327.4
Slovakia	397.8	740.4	759.5	889.8	398.8	451.8	361.9	332.4
Finland	6 808.5	7 791.8	8 116.9	7 901.0	1 185.2	1 111.1	1 151.9	1 441.9
Sweden	7 936.6	9 499.6	8 923.1	9 128.6	6 259.9	5 709.2	5 482.7	6 475.7
United Kingdom	982.2	1 959.4	3 165.0	3 823.6	423.2	306.5	506.7	540.8
Iceland	0.0	0.0	0.0	0.0	603.5	1 082.7	1 106.9	1 185.0
Norway	1 119.1	1 233.5	843.7	914.9	11 667.1	10 038.7	11 645.7	11 858.5
Montenegro	145.6	162.9	176.9	198.1	160.4	236.5	150.6	128.2
Form. Yug. Rep. of Macedonia	204.8	190.9	223.5	215.0	128.3	209.0	103.8	160.4
Albania	230.0	205.0	202.0	214.0	462.0	650.6	406.2	506.9
Serbia	902.8	1 036.4	1 111.1	1 104.4	1 034.6	1 022.4	946.1	866.7
Turkey	5 325.0	4 449.4	3 152.2	2 840.9	3 401.6	4 453.7	3 494.8	5 773.5
Bosnia and Herzegovina	181.7	180.1	1 767.4	:	515.7	690.1	510.3	477.3
Kosovo (1)	166.4	235.1	249.3	256.1	9.6	13.4	13.0	12.0
Moldova	70.5	171.0	293.2	305.1	32.4	35.0	27.3	4.3

(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_107a)

Table 2.6.2: Primary production of renewable energy — geothermal, wind and solar energy, 2005-2015

(thousand toe)

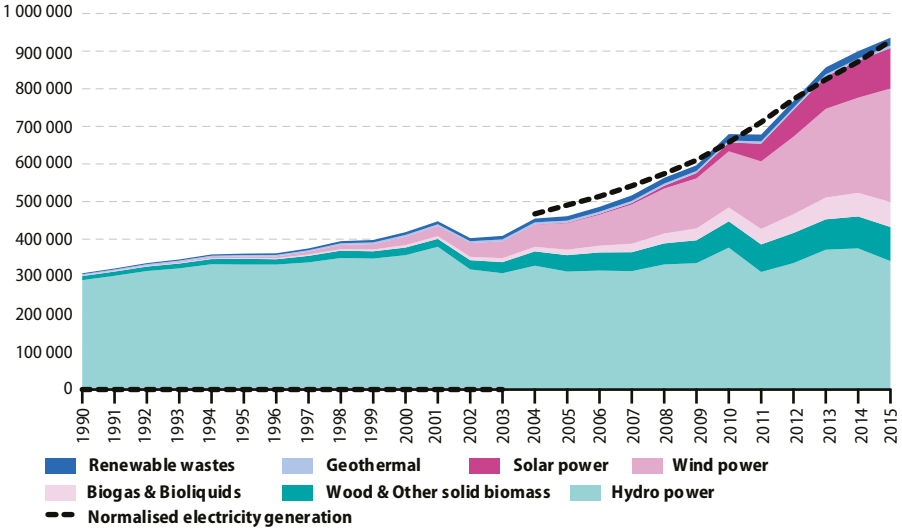
	Geothermal			Wind			Solar		
	2005	2010	2015	2005	2010	2015	2005	2010	2015
EU-28	5 309.2	5 517.4	6 466.4	6 057.9	12 842.4	25 956.1	828.6	3 723.3	13 050.9
EA-19	5 155.8	5 337.0	6 262.0	5 143.4	10 673.4	18 033.0	775.4	3 559.4	11 633.9
Belgium	3.1	4.3	3.2	19.5	111.1	479.3	2.8	60.3	285.6
Bulgaria	32.7	32.7	33.4	0.4	58.6	124.8	0.0	11.5	140.7
Czech Republic	0.0	0.0	0.0	1.8	28.8	49.3	2.5	61.6	212.4
Denmark	4.1	5.1	3.3	568.7	671.5	1 215.2	10.2	16.2	86.1
Germany	46.1	86.2	213.6	2 341.3	3 249.6	6 810.5	370.8	1 492.6	4 001.1
Estonia	0.0	0.0	0.0	4.6	23.8	61.5	0.0	0.0	0.0
Ireland	0.0	0.0	0.0	95.6	242.0	565.2	0.5	7.5	13.1
Greece	12.3	16.0	9.8	108.9	233.4	397.3	101.0	196.9	531.7
Spain	7.3	16.0	18.8	1 820.8	3 806.6	4 241.2	64.9	1 034.8	3 184.6
France	189.5	174.6	213.2	82.7	855.1	1 827.1	25.6	117.6	723.2
Croatia	0.0	6.8	10.7	0.9	12.0	68.4	2.3	5.2	15.3
Italy	4 791.2	4 775.8	5 469.5	201.5	784.7	1 276.4	30.0	298.0	2 162.7
Cyprus	:	0.8	1.6	0.0	2.7	19.0	41.3	61.3	78.8
Latvia	0.0	0.0	0.0	4.0	4.2	12.6	0.0	0.0	0.0
Lithuania	2.9	4.5	1.6	0.2	19.3	69.6	0.0	0.0	6.3
Luxembourg	0.0	0.0	0.0	4.5	4.7	8.8	1.7	2.7	10.8
Hungary	86.6	98.6	105.3	0.9	45.9	59.6	1.9	5.5	21.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.5	3.8	12.3
Netherlands	0.0	7.6	58.5	177.7	343.4	649.2	20.2	28.5	123.6
Austria	29.8	34.5	34.8	114.4	177.5	416.2	92.5	172.5	265.5
Poland	11.4	13.4	21.7	11.6	143.1	933.6	0.1	10.0	49.9
Portugal	65.7	180.6	187.0	152.5	789.5	998.1	22.7	66.3	148.8
Romania	17.9	23.0	29.1	0.0	26.3	607.3	0.0	0.1	170.9
Slovenia	0.0	27.7	43.3	0.0	0.0	0.5	0.0	9.2	34.5
Slovakia	8.0	8.3	7.1	0.5	0.5	0.5	0.0	5.8	49.0
Finland	0.0	0.0	0.0	14.6	25.3	200.1	0.7	1.3	2.3
Sweden	0.0	0.0	0.0	80.5	301.1	1 398.8	6.1	11.0	19.6
United Kingdom	0.8	0.8	0.8	249.7	881.8	3 466.0	30.1	42.7	700.8
Iceland	1 778.2	3 706.8	3 729.6	0.0	0.0	0.9	0.0	0.0	0.0
Norway	0.0	0.0	0.0	42.9	75.6	216.3	0.0	0.0	0.0
Montenegro	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Former Yugoslav Republic of Macedonia	10.1	11.4	8.1	0.0	0.0	10.4	0.0	0.0	1.9
Albania	0.0	0.0	0.0	0.0	0.0	0.0	2.3	6.7	12.4
Serbia	0.0	5.4	6.1	0.0	0.0	0.0	0.0	0.0	0.9
Turkey	1 007.0	1 966.1	4 834.6	5.1	250.7	1 001.9	384.8	432.0	844.2
Bosnia and Herzegovina	0.0	0.0	:	0.0	0.0	0.0	0.0	0.0	:
Kosovo (1)	0.0	0.0	0.0	0.0	0.1	0.0	0.2	0.2	0.3
Moldova	0.0	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.0
Ukraine	0.0	0.0	0.0	3.3	4.3	93.2	0.0	0.0	41.0

(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_107a)

Figure 2.6.2: Gross electricity generation from renewable sources, EU-28, 1990-2015

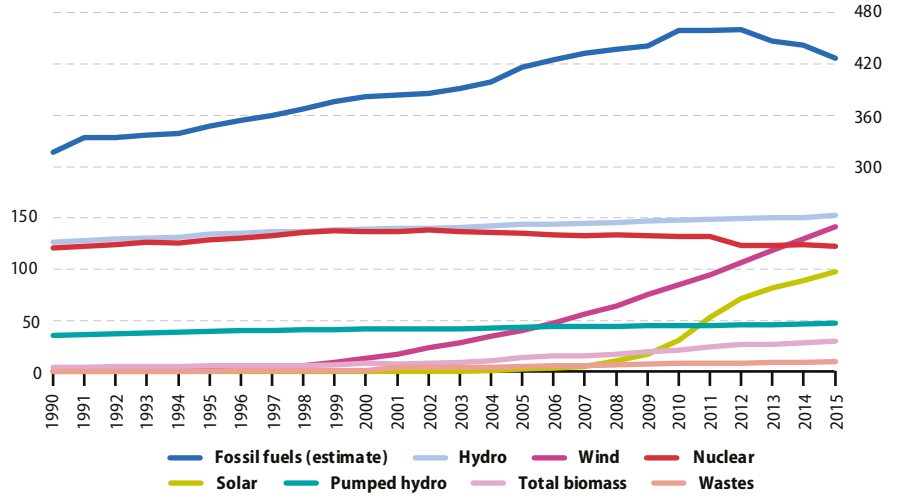
(GWh)



Source: Eurostat (online data code: nrg_105a)

Figure 2.6.3: Electricity generation capacity, EU-28, 1990-2015

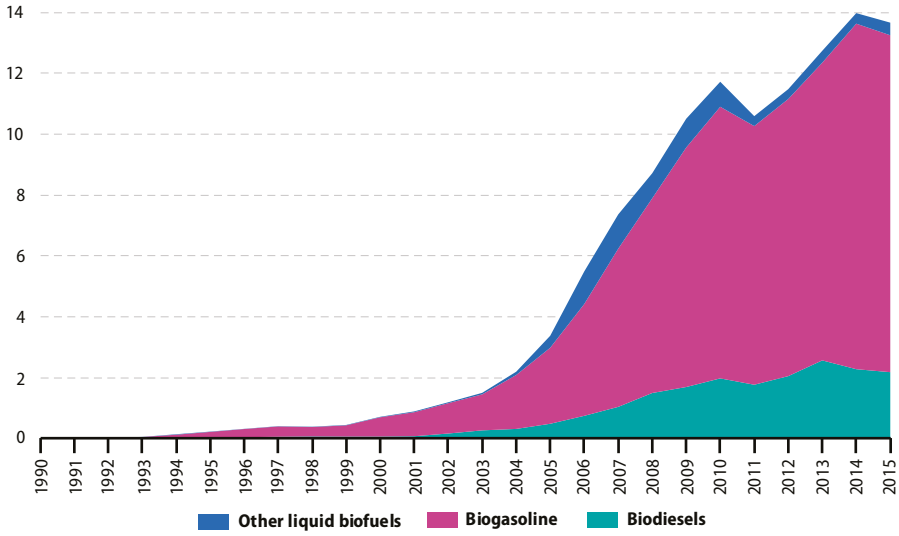
(GW)



Source: Eurostat (online data code: nrg_113a)

Figure 2.6.4: Primary production of liquid biofuels, EU-28, 1990-2015

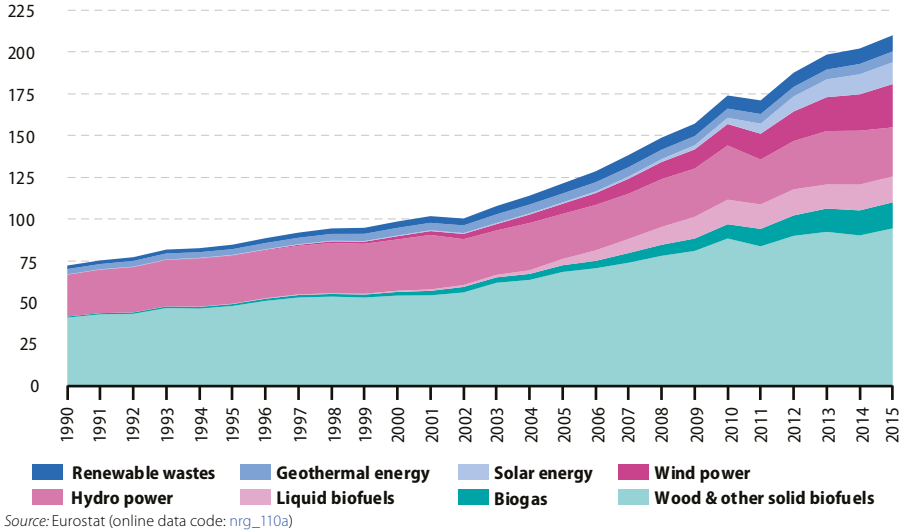
(Mtoe)



Source: Eurostat (online data code: nrg_109a)

Figure 2.6.5: Gross inland consumption of renewables, EU-28, 1990-2015

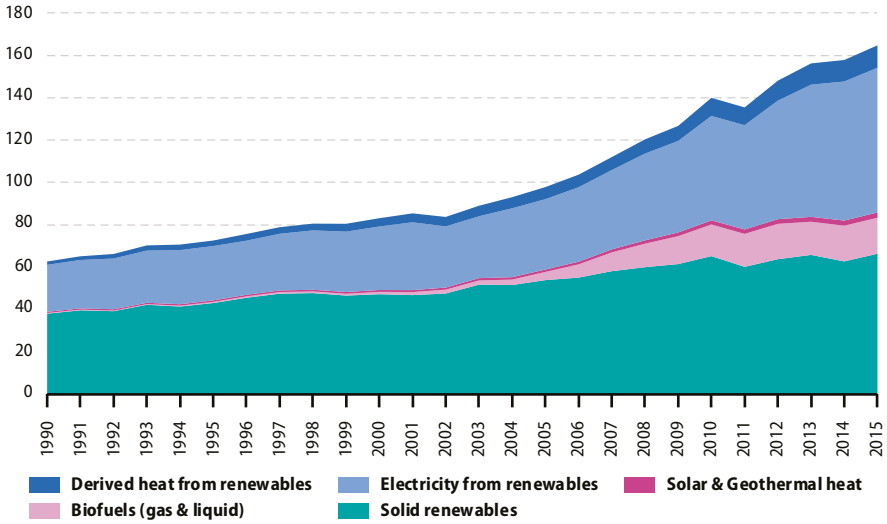
(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Figure 2.6.6: Renewable energy available for final consumption, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

Renewable energy available for final consumption (Figure 2.6.6) tends to rise and fall in line with changes in gross inland energy consumption from renewable sources. Rapid expansion of certain technologies caused the share of energy from solid renewables (including wood and renewable waste) to decrease from 61 % in 1990 to 40 % in 2015. However, in absolute terms it increased by 74 % over the same period. Renewable energy available for final consumption increased by 68 % between 2005 and 2015. In 2015 the renewable energy available for final consumption increased by 4.4 % compared to 2014.

In the EU-28, the share of energy from renewable sources in gross final consumption of energy increased from 8.5 % in 2004 to 16.7 % in 2015 (see Table 2.6.3). This is evidence of a progress towards the Europe 2020 target of 20 %.

As some countries have not yet fully implemented all provisions of the Renewable Energy Directive, some biofuels and bioliquids are not counted as compliant (sustainable) in the period 2011-2015. Some countries have not yet improved their national statistical system to fully account for all renewable energy sources (for example for the renewable energy with respect to heat pumps).

The increased share between 2010 and 2011 is not due to increased use of renewables but rather to a decline in the use of fossil energies (oil products and natural gas). Because of the 2020 targets of the Energy Efficiency Directive (2012/27/EU), further decreases in the EU's energy consumption could be expected up to 2020.

Comparing the average of 2011-12 to the indicative trajectory set out in the Renewable Energy Directive, it can be seen that France, the Netherlands and the Former Yugoslav Republic of Macedonia were below the first indicative trajectory values, while all other countries were above. Comparing the average of 2013-14 to the indicative trajectory set out in the Renewable Energy Directive, it can be seen that the

Netherlands, Albania and the Former Yugoslav Republic of Macedonia were below the second indicative trajectory values, while all other countries were above.

In 2015, electricity generation from renewable sources, with necessary adjustments for wind power and hydro power, contributed 28.8 % to total EU-28 electricity consumption but there is a huge variation between EU Member States (see Table 2.6.4).

In 2015, renewable energy accounted for 18.6 % of total energy use for heating and cooling in the EU-28. This is a significant increase from 10.2 % in 2004. Increases in industrial sectors, services and residential use (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 Member States. The share of energy from renewable sources in heating and cooling is presented in Table 2.6.5.

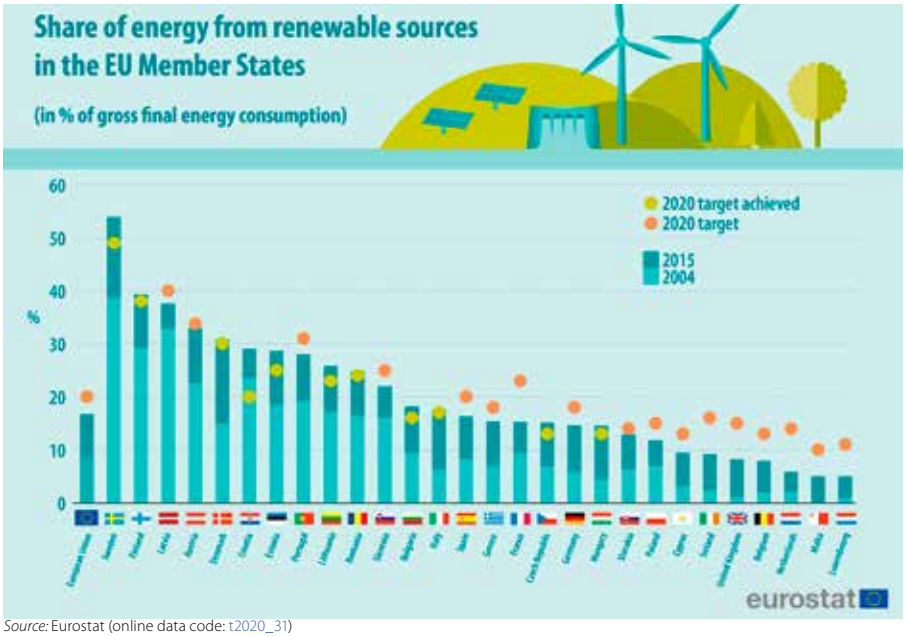
For all countries, there is a common 2020 target of 10 % for the share of renewable energy in the transport sector. The Renewable Energy Directive 2009/28/EC stipulates that only biofuels and bioliquids that fulfil sustainability criteria should be included.

In some countries consumption of biofuels and bioliquids in the period 2011-2015 were not certified as compliant (sustainable) due to late implementation of Directive 2009/28/ EC. While the share of renewable energy as a whole is increasing since 2004, between 2010 and 2011 its share in transport decreased. This can be attributed in part to the total absence of compliant biofuels reported by several EU countries (countries did report some biofuel use, but none or very little of it compliant in 2011).

Respecting accounting rules of Directive 2009/28/EC, the share of energy from renewable sources in transport increased from 1.4 % in 2004 to 6.7 % in 2015 (see Table 2.6.6).

Figure 2.6.7: Share of energy from renewable sources, 2004 and 2015

(%)



Source: Eurostat (online data code: t2020_31)

Table 2.6.3: Share of energy from renewable sources in gross final consumption of energy, 2005-15 (part 1)

(%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2013-2014 average	S_{2005}	Indicative trajectory				2020 target
														2011-2012	2013-2014	2015-2016	2017-2018	
EU-28	9	9.5	10.4	11	12.4	12.9	13.2	14.4	15.2	16.1	16.7	15.6	:	:	:	:	:	20
Belgium	2.3	2.6	3.1	3.6	4.7	5.7	6.3	7.2	7.5	8	7.9	7.8	2.2	4.4	5.4	7.1	9.2	13
Bulgaria	9.4	9.6	9.2	10.5	12.1	14.1	14.3	16	19	18	18.2	18.5	9.4	10.7	11.4	12.4	13.7	16
Czech Republic	7.1	7.4	8	8.6	9.9	10.5	11	12.8	13.8	15.1	15.1	14.5	6.1	7.5	8.2	9.2	10.6	13
Denmark	16	16.3	17.8	18.6	20	22.1	23.5	25.7	27.4	29.3	30.8	28.4	17	19.6	20.9	22.9	25.5	30
Germany	6.7	7.7	9.1	8.6	9.9	10.5	11.4	12.1	12.4	13.8	14.6	13.1	5.8	8.2	9.5	11.3	13.7	18
Estonia	17.5	16.1	17.1	18.9	23	24.6	25.5	25.8	25.6	26.3	28.6	26	18	19.4	20.1	21.2	22.6	25
Ireland	2.9	3.1	3.6	4.1	5.1	5.6	6.6	7.2	7.7	8.7	9.2	8.2	3.1	5.7	7	8.9	11.5	16
Greece	7	7.2	8.2	8	8.5	9.8	10.9	13.5	15	15.3	15.4	15.2	6.9	9.1	10.2	11.9	14.1	18
Spain	8.4	9.2	9.7	10.8	13	13.8	13.2	14.3	15.3	16.1	16.2	15.7	8.7	11	12.1	13.8	16	20
France	9.5	9.3	10.1	11.1	12.1	12.5	11.1	13.4	14.1	14.7	15.2	14.4	10.3	12.8	14.1	16	18.6	23
Croatia	23.8	22.7	22.2	22	23.6	25.1	25.4	26.8	28	27.9	29	28	12.6	14.1	14.8	15.9	17.4	20
Italy	7.5	8.3	9.8	11.5	12.8	13	12.9	15.4	16.7	17.1	17.5	16.9	5.2	7.6	8.7	10.5	12.9	17
Cyprus	3.1	3.3	4	5.1	5.6	6	6	6.8	8.1	8.9	9.4	8.5	2.9	4.9	5.9	7.4	9.5	13
Latvia	32.3	31.1	29.6	29.8	34.3	30.4	33.5	35.7	37.1	38.7	37.6	37.9	32.6	34.1	34.8	35.9	37.4	40
Lithuania	16.8	16.9	16.5	17.8	19.8	19.6	19.9	21.4	22.7	23.6	25.8	23.1	15	16.6	17.4	18.6	20.2	23
Luxembourg	1.4	1.5	2.7	2.8	2.9	2.9	2.9	3.1	3.5	4.5	5	4	0.9	2.9	3.9	5.4	7.5	11

Source: Eurostat (online data code: nrg_ind_335a)

Table 2.6.3: Share of energy from renewable sources in gross final consumption of energy, 2005-15 (part 2)

(%)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2013-2014 average	S_{2005}	Indicative trajectory				2020 target
														2011-2012	2013-2014	2015-2016	2017-2018	
Hungary	4.5	5.1	5.9	6.5	8.0	12.8	14.0	15.5	16.2	14.6	14.5	15.4	4.3	6.0	6.9	8.2	10.0	13
Malta	0.2	0.2	0.2	0.2	0.2	1.0	1.9	2.8	3.7	4.7	5.0	4.2	0.0	2.0	3.0	4.5	6.5	10
Netherlands	2.5	2.8	3.3	3.6	4.3	3.9	4.5	4.7	4.8	5.5	5.8	5.2	2.4	4.7	5.9	7.6	9.9	14
Austria	23.9	25.4	27.2	28.1	29.9	30.4	30.6	31.4	32.3	32.8	33.0	32.5	23.3	25.4	26.5	28.1	30.3	34
Poland	6.9	6.9	6.9	7.7	8.7	9.3	10.3	10.9	11.4	11.5	11.8	11.4	7.2	8.8	9.5	10.7	12.3	15
Portugal	19.5	20.8	21.9	23.0	24.4	24.2	24.6	24.6	25.7	27.0	28.0	26.4	20.5	22.6	23.7	25.2	27.3	31
Romania	17.3	17.1	18.3	20.5	22.7	23.4	21.4	22.8	23.9	24.8	24.8	24.4	17.8	19.0	19.7	20.6	21.8	24
Slovenia	16.0	15.6	15.6	15.0	20.1	20.4	20.3	20.8	22.4	21.5	22.0	22.0	16.0	17.8	18.7	20.1	21.9	25
Slovakia	6.4	6.6	7.8	7.7	9.4	9.1	10.3	10.4	10.1	11.7	12.9	10.9	6.7	8.2	8.9	10.0	11.4	14
Finland	28.8	30.0	29.6	31.3	31.3	32.4	32.8	34.4	36.7	38.7	39.3	37.7	28.5	30.4	31.4	32.8	34.7	38
Sweden	40.6	42.7	44.2	45.3	48.2	47.2	48.7	51.1	52.0	52.5	53.9	52.2	39.8	41.6	42.6	43.9	45.8	49
United Kingdom	1.3	1.5	1.8	2.7	3.3	3.7	4.2	4.6	5.7	7.1	8.2	6.4	1.3	4.0	5.4	7.5	10.2	15
Iceland	60.1	60.8	71.5	67.5	69.7	70.4	71.6	72.5	71.7	70.5	70.2	71.1	55.0	56.8	57.7	59.1	60.9	64
Norway	59.8	60.2	60.1	61.7	64.8	61.2	64.6	65.6	66.7	69.4	69.4	68.0	58.2	60.1	61.0	62.4	64.2	67.5
Montenegro	35.7	34.8	32.9	32.3	39.4	40.6	40.7	41.6	43.7	44.1	43.1	43.9	:	27.6	28.3	29.3	30.7	33
Form. Yug. Rep. of Macedonia	16.5	16.5	15.0	15.6	17.2	16.5	16.4	18.1	18.5	19.6	19.9	19.0	:	23.1	23.7	24.6	25.9	28
Albania	30.7	32.1	32.8	32.9	31.4	32.0	31.4	35.2	33.2	32.0	34.9	32.6	:	32.6	33.2	34.3	35.6	38
Turkey	15.6	14.1	13.3	13.5	14.3	14.2	13.0	13.1	14.0	13.7	13.6	13.8	:	:	:	:	:	:

Source: Eurostat (online data code: nrg_ind_335a)

Table 2.6.4: Share of electricity from renewable sources in gross electricity consumption, 2004-2015

(%)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	14.3	14.8	15.4	16.1	17.0	19.0	19.7	21.7	23.5	25.4	27.5	28.8
Belgium	1.7	2.4	3.1	3.6	4.6	6.2	7.1	9.1	11.3	12.5	13.4	15.4
Bulgaria	9.1	9.3	9.3	9.4	10.0	11.3	12.7	12.9	16.1	18.9	18.9	19.1
Czech Republic	3.6	3.7	4.0	4.6	5.2	6.4	7.5	10.6	11.7	12.8	13.9	14.1
Denmark	23.8	24.6	24.0	25.0	25.9	28.3	32.7	35.9	38.7	43.1	48.5	51.3
Germany	9.4	10.5	11.8	13.6	15.1	17.4	18.1	20.9	23.6	25.3	28.2	30.7
Estonia	0.6	1.1	1.5	1.5	2.1	6.1	10.4	12.3	15.8	13.0	14.1	15.1
Ireland	6.0	7.2	8.7	10.4	11.2	13.4	14.6	17.4	19.7	21.0	22.9	25.2
Greece	7.8	8.2	8.9	9.3	9.6	11.0	12.3	13.8	16.4	21.2	21.9	22.1
Spain	19.0	19.1	20.0	21.7	23.7	27.8	29.8	31.6	33.5	36.7	37.8	36.9
France	13.8	13.7	14.1	14.3	14.4	15.1	14.8	16.3	16.4	16.9	18.3	18.8
Croatia	35.5	35.6	35.0	34.0	33.9	35.9	37.6	37.6	38.8	42.1	45.3	45.4
Italy	16.1	16.3	15.9	16.0	16.6	18.8	20.1	23.5	27.4	31.3	33.4	33.5
Cyprus	0.0	0.0	0.0	0.1	0.3	0.6	1.4	3.4	4.9	6.6	7.4	8.4
Latvia	46.0	43.0	40.4	38.6	38.7	41.9	42.1	44.7	44.9	48.8	51.1	52.2
Lithuania	3.6	3.8	4.0	4.7	4.9	5.9	7.4	9.0	10.9	13.1	13.7	15.5
Luxembourg	2.8	3.2	3.2	3.3	3.6	4.1	3.8	4.1	4.6	5.3	5.9	6.2
Hungary	2.2	4.4	3.5	4.2	5.3	7.0	7.1	6.4	6.1	6.6	7.3	7.3
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.5	1.1	1.6	3.3	4.2
Netherlands	4.4	6.3	6.5	6.0	7.5	9.1	9.6	9.8	10.4	10.0	10.0	11.1
Austria	61.8	62.0	62.2	64.3	65.3	67.9	65.7	66.0	66.5	68.0	70.1	70.3
Poland	2.2	2.7	3.0	3.5	4.4	5.8	6.6	8.2	10.7	10.7	12.4	13.4
Portugal	27.5	27.7	29.3	32.3	34.1	37.6	40.7	45.9	47.6	49.1	52.1	52.6
Romania	25.0	26.9	28.1	28.1	28.1	30.9	30.4	31.1	33.6	37.5	41.7	43.2
Slovenia	29.3	28.7	28.2	27.7	30.0	33.8	32.2	31.0	31.6	33.1	33.9	32.7
Slovakia	15.4	15.7	16.6	16.5	17.0	17.8	17.8	19.3	20.1	20.8	22.9	22.7
Finland	26.7	26.9	26.4	25.5	27.3	27.3	27.7	29.4	29.5	30.9	31.4	32.5
Sweden	51.2	50.9	51.8	53.2	53.6	58.3	56.0	59.9	60.0	61.8	63.2	65.8
United Kingdom	3.5	4.1	4.5	4.8	5.5	6.7	7.4	8.8	10.7	13.8	17.9	22.4
Iceland	93.1	94.9	93.5	113.7	90.8	92.9	92.4	93.9	95.4	96.7	97.1	93.1
Norway	97.3	96.8	100.2	98.5	99.6	104.7	97.9	105.5	104.4	106.9	110.3	106.4

Source: Eurostat (online data code: nrg_ind_335a)

Table 2.6.5: Share of renewable energy sources in heating and cooling, 2004-2015

(%)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	10.2	10.9	11.4	12.8	13.1	14.7	14.9	15.6	16.4	16.9	18.1	18.6
Belgium	2.9	3.4	3.7	4.5	5.0	6.0	6.1	6.6	7.3	7.4	7.7	7.6
Bulgaria	14.1	14.3	14.8	13.9	17.3	21.7	24.4	24.9	27.5	29.2	28.3	28.6
Czech Republic	9.9	10.9	11.2	12.4	12.9	14.3	14.1	15.4	16.3	17.6	19.6	19.8
Denmark	20.6	22.8	23.8	26.9	28.1	29.5	31.0	32.3	33.6	34.9	37.9	39.6
Germany	6.3	6.8	7.0	8.4	7.4	9.2	9.8	10.5	10.4	10.6	12.2	12.9
Estonia	33.2	32.2	30.7	32.7	35.5	41.8	43.3	44.1	43.1	43.2	45.2	49.6
Ireland	2.9	3.5	3.6	3.9	3.6	4.3	4.5	5.0	5.1	5.4	6.6	6.4
Greece	12.8	12.8	12.5	14.4	14.3	16.5	17.9	19.4	23.4	26.5	26.9	25.9
Spain	9.5	9.4	11.4	11.3	11.7	13.3	12.6	13.6	14.1	14.1	15.7	16.8
France	12.3	12.2	11.5	12.5	13.0	14.9	15.8	16.0	16.9	17.9	18.8	19.8
Croatia	29.4	30.0	29.1	29.2	28.6	31.2	32.8	33.7	36.5	37.2	36.2	38.6
Italy	5.7	8.2	10.1	13.3	15.3	16.4	15.6	13.8	17.0	18.1	18.9	19.2
Cyprus	9.3	10.0	10.4	13.1	14.5	16.3	18.2	19.2	20.7	21.6	21.6	22.5
Latvia	42.5	42.7	42.6	42.4	42.9	47.9	40.7	44.7	47.3	49.7	52.2	51.8
Lithuania	30.4	29.3	29.2	29.1	32.0	33.7	32.5	32.8	34.5	36.9	40.6	46.1
Luxembourg	1.8	3.6	3.6	4.4	4.6	4.7	4.7	4.8	5.0	5.5	7.2	6.9
Hungary	6.5	6.0	7.5	8.9	8.3	10.5	18.1	20.1	23.3	23.7	21.2	21.3
Malta	1.1	2.2	2.6	3.2	3.6	1.8	7.8	12.2	13.2	15.7	14.5	14.1
Netherlands	2.2	2.4	2.8	3.0	3.1	3.4	3.1	3.7	3.9	4.1	5.2	5.5
Austria	20.1	22.3	23.0	25.6	25.9	27.6	29.5	30.0	30.9	32.7	32.0	32.0
Poland	10.2	10.2	10.2	10.5	10.9	11.5	11.7	13.1	13.4	14.1	14.0	14.3
Portugal	32.5	32.1	34.2	35.0	37.5	38.0	33.9	35.2	33.2	34.6	34.0	33.4
Romania	17.6	18.0	17.6	19.4	23.2	26.4	27.2	24.3	25.8	26.2	26.7	25.9
Slovenia	18.4	18.9	18.6	20.4	19.2	27.6	28.1	30.3	31.5	33.4	32.4	34.1
Slovakia	5.1	5.0	4.5	6.2	6.1	8.2	7.9	9.3	8.8	7.9	8.9	10.8
Finland	39.5	39.1	41.4	41.4	43.3	43.1	44.2	45.9	48.3	50.7	51.9	52.8
Sweden	46.7	51.9	56.4	58.7	61.1	63.6	60.9	62.2	65.8	67.1	68.0	68.6
United Kingdom	0.7	0.8	0.9	1.0	1.9	2.3	2.7	3.0	3.2	4.0	4.7	5.5
Iceland	52.3	53.4	56.9	58.6	62.0	62.1	63.9	65.2	64.6	59.0	58.2	63.4
Norway	25.5	28.8	28.4	29.3	30.8	31.8	32.6	33.8	33.2	32.7	31.7	33.8

Source: Eurostat (online data code: nrg_ind_335a)

Table 2.6.6: Share of renewable energy sources in transport, 2004-2015

(%)

	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	1.4	1.8	2.5	3.1	3.9	4.6	5.2	4.0	5.6	5.9	6.5	6.7
Belgium	0.5	0.6	0.6	0.6	0.6	2.1	4.7	4.7	4.8	5.0	5.7	3.8
Bulgaria	0.9	0.8	1.0	0.9	0.9	1.0	1.4	0.8	0.6	6.0	5.8	6.5
Czech Republic	1.6	0.9	1.2	1.4	2.7	4.1	5.1	1.2	6.1	6.3	6.9	6.5
Denmark	0.4	0.4	0.5	0.5	0.5	0.7	1.1	3.6	6.4	6.6	6.7	6.7
Germany	2.2	4.0	6.8	7.5	6.4	5.9	6.4	6.6	7.5	6.9	7.3	6.8
Estonia	0.2	0.2	0.2	0.2	0.2	0.4	0.4	0.4	0.4	0.4	0.4	0.4
Ireland	0.0	0.1	0.1	0.5	1.3	2.0	2.4	5.4	4.8	5.7	5.8	6.5
Greece	0.1	0.1	0.7	1.3	1.1	1.1	1.9	0.6	0.9	1.0	1.3	1.4
Spain	1.0	1.3	0.8	1.4	2.2	3.7	5.0	0.7	0.7	0.8	0.8	1.7
France	1.5	2.1	2.3	4.0	6.2	6.6	6.5	1.0	7.5	7.7	8.4	8.5
Croatia	1.0	1.0	1.0	1.1	1.2	1.3	1.1	1.0	1.0	4.3	4.1	3.5
Italy	1.2	1.0	1.0	1.0	2.6	3.9	4.8	5.0	6.0	5.4	5.0	6.4
Cyprus	0.0	0.0	0.0	0.0	1.9	2.0	2.0	0.0	0.0	1.1	2.7	2.5
Latvia	2.1	2.4	2.2	1.7	1.7	1.9	4.0	4.1	4.0	4.0	4.1	3.9
Lithuania	0.4	0.6	1.9	3.8	4.3	4.5	3.8	3.8	4.9	4.8	4.3	4.6
Luxembourg	0.1	0.1	0.2	2.2	2.2	2.2	2.1	2.3	2.8	4.0	5.4	6.5
Hungary	0.9	0.9	1.1	1.5	5.1	5.7	6.0	6.0	5.9	6.2	6.9	6.2
Malta	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	3.2	3.4	4.6	4.7
Netherlands	0.5	0.5	0.8	3.1	2.9	3.8	2.6	4.8	4.9	5.1	6.2	5.3
Austria	4.5	4.8	7.6	8.2	9.6	11.1	10.9	9.9	9.9	9.5	10.9	11.4
Poland	1.4	1.6	1.7	1.7	4.0	5.3	6.6	6.8	6.5	6.6	6.2	6.4
Portugal	0.4	0.5	1.6	2.5	2.6	3.9	5.6	0.7	0.8	0.9	3.7	7.4
Romania	1.6	1.6	1.4	2.4	3.4	4.5	3.8	3.1	4.9	5.4	4.7	5.5
Slovenia	0.9	0.8	1.1	1.5	1.8	2.3	3.1	2.5	3.3	3.8	2.9	2.2
Slovakia	1.4	1.6	3.4	4.0	4.3	5.3	5.3	5.5	5.4	6.0	7.6	8.5
Finland	1.0	0.9	1.0	1.0	2.9	4.6	4.4	1.0	1.1	10.2	22.0	22.0
Sweden	6.3	6.2	7.1	8.0	8.3	8.9	9.2	11.5	14.8	19.2	21.1	24.0
United Kingdom	0.3	0.5	0.7	1.1	2.3	2.9	3.3	3.2	3.9	4.7	5.3	4.4
Iceland	0.0	0.0	0.0	0.1	0.1	0.1	0.2	0.9	1.4	2.0	3.3	5.7
Norway	3.1	3.1	3.3	3.7	5.3	5.6	5.9	3.5	3.9	3.8	7.1	8.9

Source: Eurostat (online data code: nrg_ind_335a)

2.7 Energy savings, efficiency & intensity

Primary energy consumption (shown in Figure 2.7.1) decreased between 1990 and 2015 by 2.5 %. While consumption of solid fossil fuels (coal and coal products) decreased by 42 % and consumption of oil (including petroleum products) decreased by 13 %, consumption of renewables increased by 191 %, consumption of gaseous fuels (natural gas and manufactured gases) increased by 22 % and consumption of nuclear heat increased by 8 %. Primary energy consumption peaked in 2006 and then decreased by 11 % by 2015.

In 2014, primary energy consumption of oil and petroleum products reached a record low since 1990; however oil and petroleum products are still the most important source of primary energy consumption with a 31 % share. Renewables reached record high levels in 2015 and their share in primary energy consumption was 14 %. Fossil fuels together (solid, gaseous and liquid) account for 71 % of total primary energy consumption.

Table 2.7.1: Energy consumption, EU-28, 1990-2015

(Mtoe)

	1990	1995	2000	2005	2010	2014	2015	2020 target
Primary Energy	1 569.5	1 567.5	1 617.9	1 713.2	1 656.7	1 508.3	1 529.6	1 483
Solid Fossil Fuels	453.0	363.9	320.2	316.7	281.6	267.3	261.0	
Oil & Petroleum Products	548.9	562.8	566.6	578.0	519.1	468.5	478.1	
Gas (Natural & Derived)	282.6	321.4	380.7	430.5	433.7	330.1	344.7	
Nuclear Heat	205.2	227.3	243.8	257.5	236.6	226.1	221.2	
Renewables	72.1	84.6	98.5	121.3	174.0	202.1	210.0	
Other	7.7	7.4	8.0	9.2	11.7	14.1	14.5	
Final Energy	1 082.5	1 082.8	1 132.9	1 191.5	1 162.8	1 059.6	1 082.2	1 086
Solid Fossil Fuels	124.3	83.0	61.9	53.2	49.3	45.2	45.3	
Oil & Petroleum Products	446.5	466.1	490.5	503.8	458.4	422.4	429.6	
Gas (Natural & Derived)	230.9	247.5	267.6	282.0	272.3	229.1	236.3	
Electricity	185.8	194.1	217.4	239.4	244.1	232.4	235.9	
Derived Heat	55.1	46.3	45.3	52.7	54.0	45.3	45.9	
Renewables	38.9	44.3	49.1	58.9	82.0	82.0	85.8	
Non-renewable wastes	0.9	1.6	1.0	1.5	2.7	3.4	3.4	

Source: Eurostat (online data code: nrg_100a)

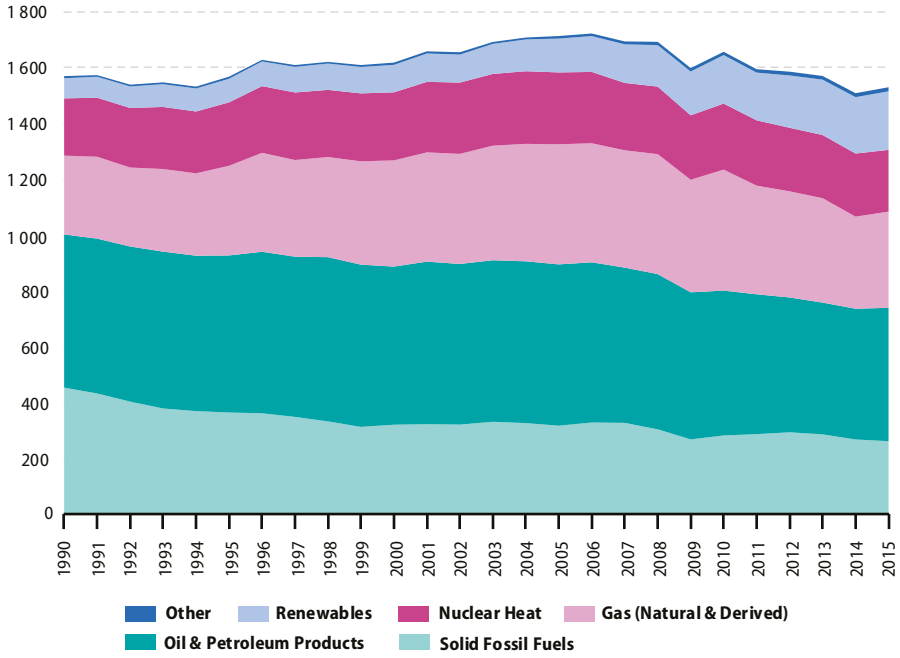
Table 2.7.2: Distance to 2020 targets, EU-28, 1990-2015

		1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
Primary Energy											
	Mtoe	86.5	84.5	134.9	230.2	173.7	111.2	102.4	86.9	25.3	46.6
	Percentage	5.8	5.7	9.1	15.5	11.7	7.5	6.9	5.9	1.7	3.1
Final Energy											
	Mtoe	-3.5	-3.2	46.9	105.5	76.8	19.6	20.2	19.5	-26.4	-3.8
	Percentage	-0.3	-0.3	4.3	9.7	7.1	1.8	1.9	1.8	-2.4	-0.4

Source: Eurostat (online data code: nrg_100a)

Figure 2.7.1: Primary energy consumption, EU-28, 1990-2015

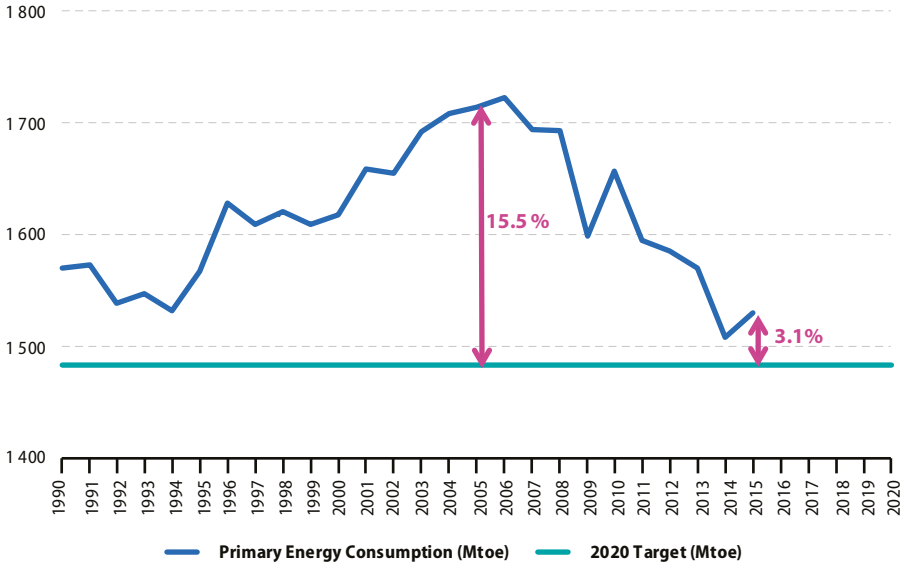
(Mtoe)



Source: Eurostat (online data code: nrg_100a)

Figure 2.7.2: Distance to Europe 2020 target for primary energy consumption, EU-28, 1990-2015

(Mtoe)



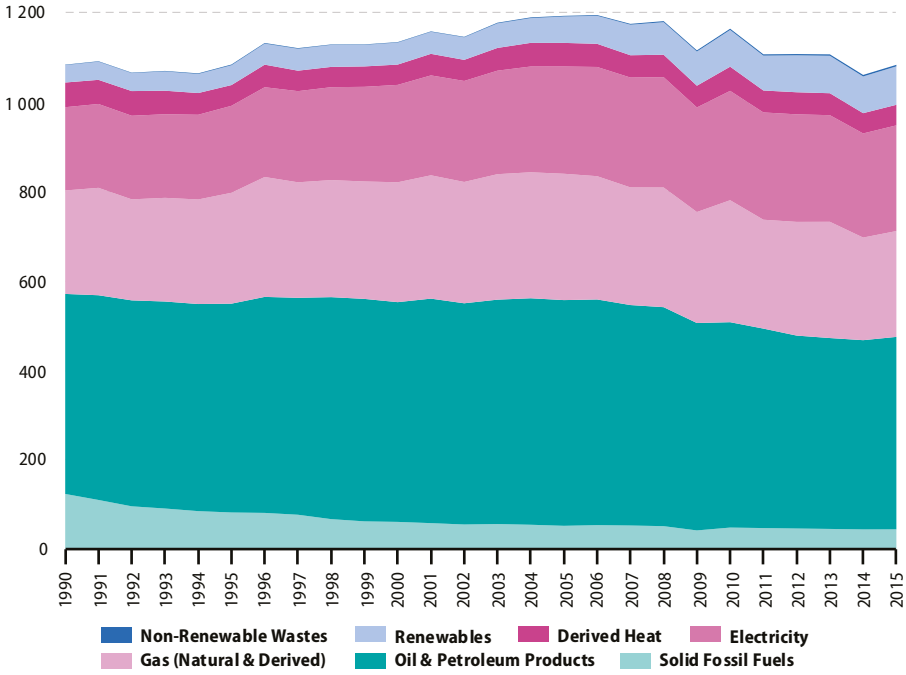
Source: Eurostat (online data code: nrg_100a)

The distance to the 20 % target for the primary energy consumption reached record low in 2014 (25.3 Mtoe or 1.7 %). In 2015, due to increase in primary energy consumption, the consumption was 46.6 Mtoe or 3.1 % higher than the 2020 primary energy efficiency target of 1 483 Mtoe (Figure 2.7.2).

The target values for 2020 are fixed in Article 3 of Directive 2012/27/EU: the Union's 2020 energy consumption has to be no more than 1 483 Mtoe for primary energy consumption and 1 086 Mtoe for final energy consumption for EU-28 as laid down in Directive 2013/12/EU.

Figure 2.7.3: Final energy consumption, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (data online code: nrg_100a)

Final energy consumption (Figure 2.7.3) in 2015 was approximately at the same level as in 1990. While consumption of solid fossil fuels (coal and coal products) decreased by 64 % and consumption of derived heat (heat sold) decreased by 17 %, final energy consumption of renewables increased by 120 % and final consumption of electricity increased by 27 %. Final energy consumption peaked in 2006 and then decreased by 9.3 % by 2015.

In 2014, final energy consumption of oil and petroleum products reached a record low since 1990, however, oil and petroleum products are still the most important source of final energy consumption with a 40 % share.

Solid fossil fuels are undergoing a long term decreasing trend and contribute only 4 % to final energy consumption. Fossil fuels together (solid, gaseous and liquid) account for 66 % of total final energy consumption. Electricity and natural gas have 22 % share each.

Table 2.7.3: Final energy consumption, 1990-2015

(Mtoe)

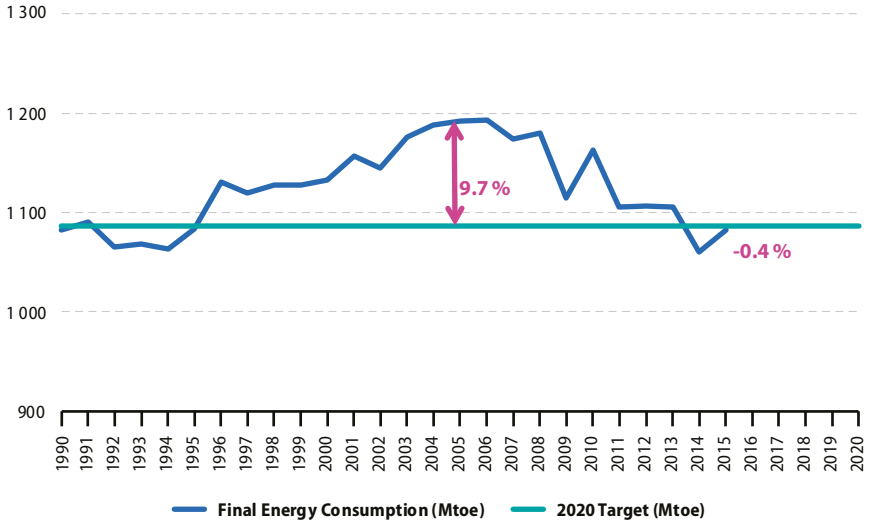
	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015	TARGET
EU-28	1082.5	1082.8	1132.9	1191.5	1162.8	1105.6	1106.2	1105.5	1059.6	1082.2	1086.0
EA-19	724.8	741.1	795.7	845.2	823.9	782.5	781.7	784.2	749.1	765.5	:
Belgium	31.5	34.3	37.5	36.6	37.6	35.0	35.1	36.4	34.2	35.8	32.5
Bulgaria	16.4	11.4	9.1	10.2	8.8	9.3	9.2	8.8	9.0	9.5	8.6
Czech Republic	32.7	26.3	25.1	26.3	25.3	24.5	24.4	24.3	23.5	24.1	25.3
Denmark	13.5	14.8	14.7	15.5	15.5	14.8	14.2	14.1	13.5	13.9	14.4
Germany	228.9	221.6	220.0	218.5	219.7	208.8	212.1	217.7	208.9	212.1	194.3
Estonia	5.7	2.6	2.4	2.9	2.9	2.8	2.9	2.9	2.8	2.8	2.8
Ireland	7.3	8.0	10.8	12.6	12.0	10.9	10.6	10.7	10.8	11.2	11.7
Greece	14.7	15.8	18.7	21.0	19.0	18.9	17.0	15.3	15.5	16.4	18.4
Spain	57.1	64.0	79.9	97.8	89.1	86.7	83.2	80.8	79.2	80.5	80.1
France	136.2	143.5	155.3	160.8	155.3	144.0	148.7	151.5	140.5	144.3	131.4
Croatia	6.5	5.3	6.0	7.2	7.2	7.0	6.7	6.6	6.2	6.6	7.0
Italy	107.7	114.6	124.7	137.2	128.5	123.1	121.8	118.5	113.3	116.4	124.0
Cyprus	1.1	1.4	1.6	1.8	1.9	1.9	1.8	1.6	1.6	1.7	1.8
Latvia	6.4	3.8	3.3	4.0	4.1	3.9	4.0	3.9	3.9	3.8	4.5
Lithuania	9.7	4.6	3.8	4.7	4.8	4.8	4.9	4.8	4.9	4.9	4.3
Luxembourg	3.3	3.1	3.5	4.5	4.3	4.3	4.2	4.1	4.0	4.0	4.2
Hungary	19.9	16.2	16.1	18.2	16.5	16.5	15.3	15.3	15.2	16.3	14.4
Malta	0.3	0.5	0.4	0.4	0.5	0.5	0.5	0.5	0.5	0.6	0.5
Netherlands	43.0	51.0	52.3	54.2	55.1	51.6	51.5	51.6	47.3	48.5	52.2
Austria	19.3	21.4	23.7	27.8	28.2	27.2	27.1	28.0	26.7	27.4	25.1
Poland	59.9	62.9	55.2	58.5	66.3	64.7	64.4	63.3	61.6	62.3	71.6
Portugal	11.9	13.9	17.9	19.0	18.1	17.3	16.0	15.9	15.8	16.0	17.4
Romania	40.8	27.0	22.8	24.7	22.6	22.8	22.8	21.8	21.7	21.9	30.3
Slovenia	3.7	4.1	4.5	4.9	5.0	5.0	4.9	4.8	4.6	4.7	5.1
Slovakia	15.2	11.0	11.0	11.6	11.5	10.8	10.3	10.6	10.0	10.3	9.0
Finland	21.7	22.0	24.3	25.2	26.2	25.0	25.2	24.7	24.5	24.2	26.7
Sweden	31.2	35.1	35.0	33.7	34.1	32.4	32.4	31.6	31.2	31.8	30.3
United Kingdom	136.9	142.7	153.2	152.0	142.5	131.2	135.2	135.7	128.5	130.3	129.2
Iceland	1.4	1.5	1.9	2.0	2.6	2.7	2.7	2.9	2.9	3.1	:
Norway	16.1	16.9	18.1	18.6	19.6	18.7	18.8	19.0	18.5	18.6	:
Montenegro	:	:	:	0.8	0.7	0.7	0.7	0.7	0.6	0.7	:
Form. Yug. Rep. of Macedonia	1.4	1.5	1.6	1.7	1.8	1.9	1.9	1.8	1.8	1.9	:
Albania	1.9	0.9	1.5	1.9	1.9	2.0	1.9	2.0	2.1	2.0	:
Serbia	11.8	6.1	6.9	9.6	9.0	9.2	8.5	8.3	7.8	8.2	:
Turkey	38.6	45.1	56.2	63.4	74.0	78.7	84.2	82.0	85.9	74.6	:
Bosnia and Herzegovina	3.3	0.8	1.2	1.5	1.9	2.0	2.0	1.9	:	:	:
Kosovo (1)	:	:	0.8	1.0	1.2	1.3	1.2	1.2	1.2	1.3	:

(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: t2020_34)

Figure 2.7.4: Distance to Europe 2020 target for final energy consumption, EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_100a)

The actual final energy consumption in years 2014 and 2015 was lower than the 2020 energy efficiency target level of 1 086 Mtoe. Final energy consumption in 2014 was 26.4 Mtoe or 2.4 % below the 2020 target. In 2015, while final energy consumption remained under the 2020 target, due to an increase compared to 2014, final energy consumption was only 3.8 Mtoe or 0.4 % below the target (Figure 2.7.4).

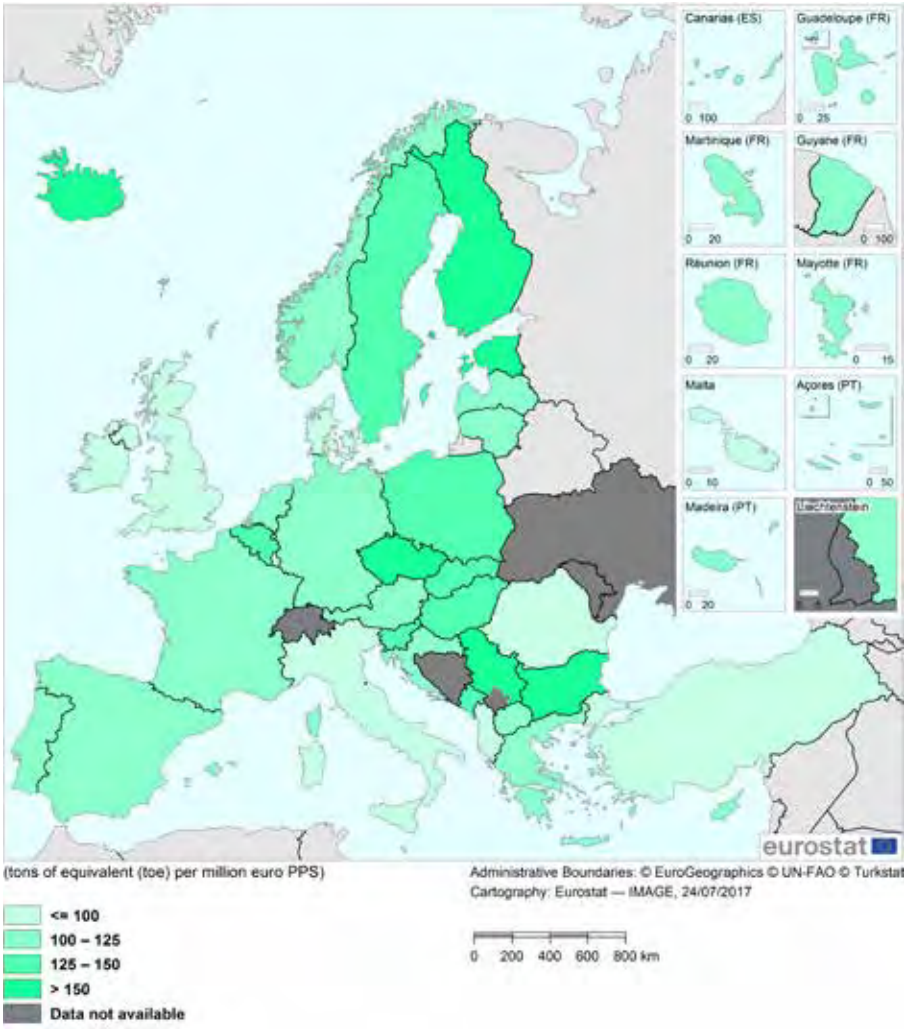
In 2015, Luxembourg and Finland had their gross inland consumption over 6 toe per capita. In Malta and Romania, consumption was under 2 toe per capita (Figure 2.7.5). This indicator is influenced by the structure of industry in each country, the severity of the winter weather, as well as by other factors, such as fuel tourism in the case of Luxembourg. The EU-28 average in 2015 is 3.2 toe per capita.

Energy intensity can be considered as an approximation of the energy efficiency of a nation's economy and shows how much energy is needed to produce a unit of GDP. 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 activities and production methods, the closure of inefficient units, or more energy-efficient appliances.

In Map 2.7.1 the energy intensity is presented using GDP PPS values that are more suited for comparison across countries in one specific year. Table 2.7.4 shows that the energy intensity improved in all EU countries between 2005 and 2015.

Map 2.7.1: Energy consumption per GDP, 2015

(toe/million euro PPS)

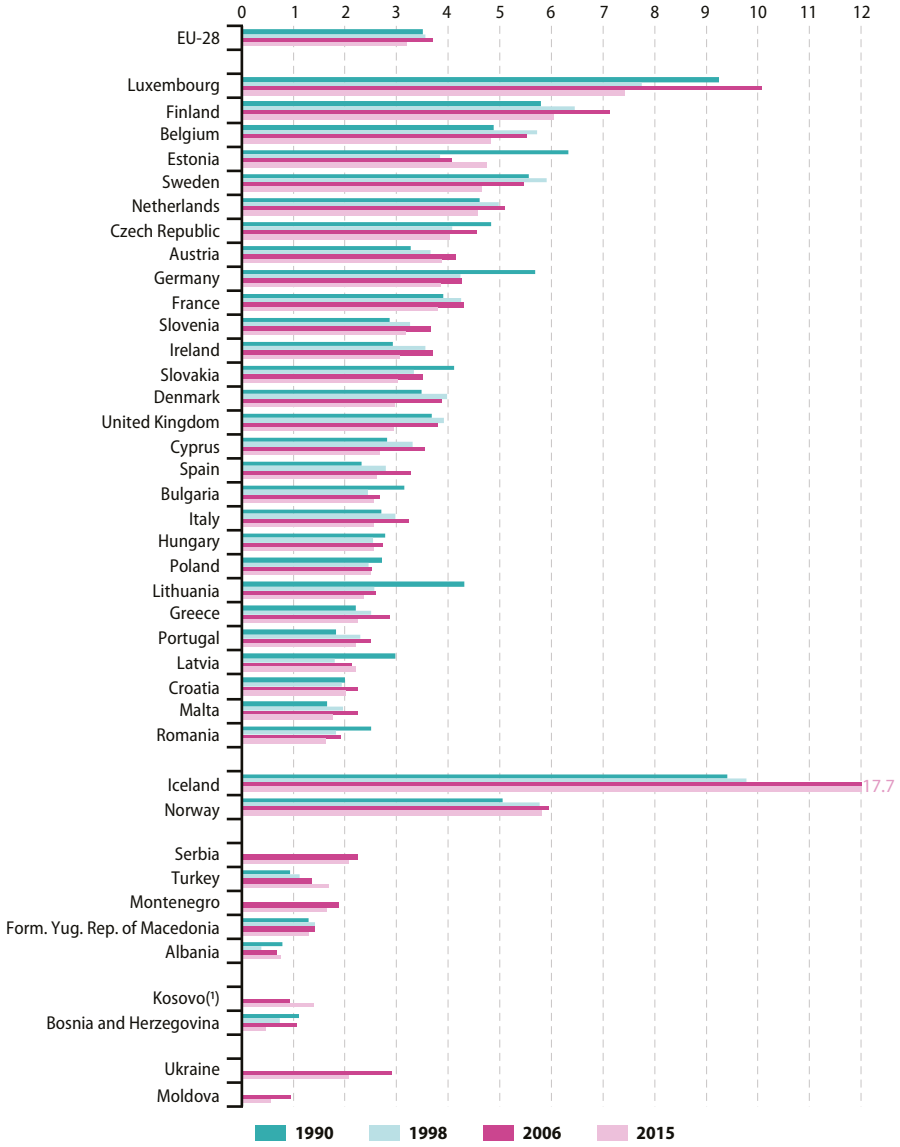


Gross inland energy consumption of all energy products per Gross Domestic Product at current market prices, using purchasing power standards.

Source: Eurostat (online data codes: nrg_100a and nama_10_gdp)

Figure 2.7.5: Gross inland energy consumption per capita, 1990, 1998, 2006 and 2015

(toe per capita)



(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_100a)

Table 2.7.4 Energy intensity of the economy, 2005-2015

(kg of oil equivalent per 1 000 EUR of GDP)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	149.2	145.1	138.5	137.5	135.5	137.6	130.3	129.9	128.2	121.5	120.3
EA-19	140.9	137.0	130.9	130.3	128.7	130.4	123.4	123.3	122.7	116.8	116.2
Belgium	173.3	166.2	157.8	162.8	159.3	166.8	153.3	146.8	152.1	141.6	141.3
Bulgaria	614.0	593.2	542.8	509.2	463.9	464.9	490.1	467.8	426.3	445.5	448.5
Czech Republic	327.0	313.9	296.7	283.3	279.9	289.9	274.5	274.9	276.4	261.2	249.2
Denmark	81.3	84.1	81.3	78.4	79.2	82.4	75.5	72.6	71.5	66.3	65.1
Germany	140.9	139.7	128.5	128.4	127.7	128.9	118.1	118.3	120.2	113.8	112.2
Estonia	373.9	331.1	344.4	352.2	372.0	417.9	390.4	370.3	398.1	385.4	355.1
Ireland	94.3	91.4	88.7	91.0	90.1	90.5	80.3	79.7	78.1	71.3	59.4
Greece	136.7	130.1	125.7	127.4	127.4	127.1	135.3	144.7	131.6	131.8	132.5
Spain	140.7	135.2	132.0	126.5	120.8	120.5	120.1	123.3	116.9	112.7	113.4
France	143.7	138.4	133.8	134.2	132.2	133.5	126.4	126.3	126.0	119.7	120.5
Croatia	222.5	210.9	209.2	199.4	208.1	209.5	207.3	201.9	197.7	189.6	192.9
Italy	116.6	113.2	111.5	111.6	110.1	110.9	106.9	105.7	103.5	97.9	100.4
Cyprus	148.9	148.0	147.4	149.4	147.9	142.0	138.9	134.2	124.1	128.4	128.7
Latvia	252.3	234.0	218.2	217.5	243.9	260.2	231.3	230.5	221.1	215.8	206.7
Lithuania	329.5	300.8	294.9	286.6	307.3	242.2	235.8	229.9	209.3	202.5	205.4
Luxembourg	134.8	126.1	114.1	115.6	113.9	115.5	110.8	108.7	101.6	93.6	89.1
Hungary	278.0	266.2	258.9	254.8	257.4	270.5	260.4	251.4	238.2	227.7	233.6
Malta	162.8	150.1	153.4	148.1	136.6	142.2	139.9	142.8	121.9	114.0	90.8
Netherlands	141.9	135.8	130.7	128.2	129.5	135.8	124.9	126.7	126.6	118.7	117.9
Austria	123.5	120.0	114.2	113.4	111.2	116.4	109.9	108.7	110.3	105.6	107.1
Poland	321.7	318.2	297.1	288.2	270.6	278.3	265.3	252.8	250.3	233.3	227.3
Portugal	157.4	147.8	144.1	139.6	142.0	135.0	133.8	131.2	133.5	130.6	133.9
Romania	357.2	342.1	318.8	293.0	278.3	282.5	285.4	274.4	243.0	233.8	226.7
Slovenia	220.2	208.4	195.1	199.7	199.7	202.4	201.0	198.3	195.5	184.0	177.9
Slovakia	355.1	324.7	277.3	269.0	260.7	264.2	250.3	236.3	237.1	220.1	215.1
Finland	192.1	200.6	189.7	181.7	186.7	198.3	186.6	183.3	181.9	186.4	177.7
Sweden	149.5	138.8	134.2	134.3	130.5	137.6	130.6	131.8	128.4	122.8	110.9
United Kingdom	130.1	125.0	117.6	116.6	114.9	116.2	106.7	108.2	104.7	95.8	94.3
Iceland	352.2	417.2	447.0	507.0	562.0	585.6	614.2	561.7	563.5	550.9	507.5
Norway	87.9	87.3	85.9	99.5	98.4	105.9	86.9	89.5	97.5	82.0	85.0
Montenegro	:	:	:	:	:	:	351.6	341.1	306.2	294.7	301.1
Form. Yug. Rep. of Macedonia	490.8	471.3	461.7	429.4	401.3	397.4	425.1	411.5	373.4	350.5	336.3
Albania	318.5	288.7	258.1	249.7	247.7	238.1	241.6	224.6	250.1	243.8	223.6
Serbia	601.7	610.4	569.5	546.7	514.1	523.8	536.6	486.9	487.4	441.9	486.1
Turkey	172.7	177.7	181.9	178.3	186.8	183.9	176.3	176.9	160.0	160.6	160.9
Kosovo ([1])	:	:	:	539.6	577.0	571.7	553.2	504.7	473.5	448.3	490.4

([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: tsdec360)

2.8 Energy industry

Table 2.8.1: Net electricity generation, 1990-2015

(thousand GWh)

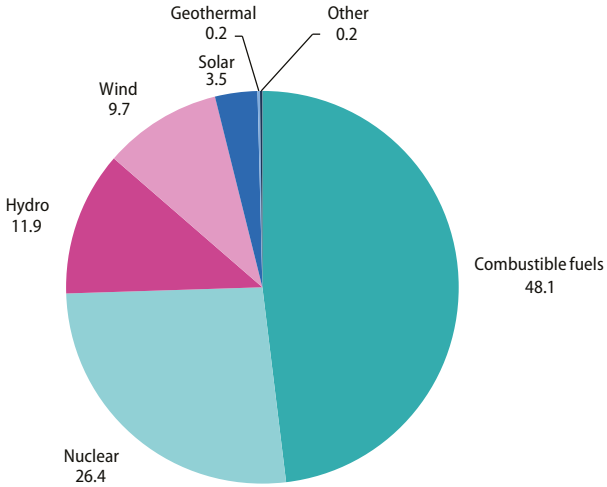
	1990	1995	2000	2005	2010	2013	2014	2015
EU-28	2 432.7	2 584.7	2 873.4	3 153.4	3 198.3	3 104.3	3 031.6	3 072.4
EA-19	1 655.5	1 774.4	2 007.7	2 222.3	2 281.6	2 215.6	2 160.6	2 190.3
Belgium	67.3	70.6	80.3	83.4	91.5	80.3	69.9	68.2
Bulgaria	37.5	37.4	36.9	40.3	42.2	39.8	43.2	44.7
Czech Republic	58.1	56.9	68.0	76.2	78.3	79.8	79.1	76.9
Denmark	24.3	34.7	34.4	34.4	36.9	33.1	30.8	27.9
Germany	508.6	498.9	538.5	582.7	594.8	601.8	592.0	610.1
Estonia	15.4	7.6	7.6	9.1	11.7	11.8	11.0	9.1
Ireland	13.7	16.8	22.7	24.8	27.4	25.1	25.3	27.6
Greece	32.1	38.4	49.9	55.7	53.4	52.6	46.7	47.8
Spain	144.6	159.1	214.4	282.1	291.0	275.4	268.4	269.8
France	401.2	472.6	516.1	550.0	544.1	547.6	540.3	544.7
Croatia	8.6	8.9	10.9	12.7	14.4	13.7	13.2	11.0
Italy	205.1	229.2	263.3	290.6	290.7	278.8	269.1	272.4
Cyprus	1.9	2.4	3.2	4.1	5.1	4.1	4.1	4.3
Latvia	5.9	3.5	3.7	4.4	6.1	5.8	4.7	5.1
Lithuania	26.3	12.4	10.0	13.6	5.3	4.5	4.1	4.7
Luxembourg	1.3	1.2	1.1	4.1	4.6	2.9	2.9	x2.7
Hungary	25.9	31.3	32.3	33.2	34.6	28.0	27.1	28.1
Malta	1.0	1.4	1.8	2.1	2.0	2.1	2.1	1.2
Netherlands	69.5	77.8	86.0	95.6	114.8	96.9	98.8	105.1
Austria	48.4	54.9	59.1	63.5	68.1	64.9	62.5	61.5
Poland	123.4	127.4	132.2	143.6	143.5	150.1	145.2	150.7
Portugal	27.4	31.9	42.2	45.0	52.8	50.4	51.5	50.9
Romania	56.7	52.9	48.6	55.5	55.9	54.1	60.7	61.3
Slovenia	11.2	11.8	12.8	14.1	15.4	15.1	16.5	14.2
Slovakia	23.0	23.4	27.7	29.3	25.4	27.2	25.0	24.8
Finland	51.6	60.5	67.3	67.8	77.2	68.4	65.5	66.2
Sweden	142.5	144.2	141.6	154.6	145.3	149.5	150.0	159.0
United Kingdom	300.1	316.6	360.8	380.5	365.7	340.5	321.7	322.4
Iceland	4.5	4.9	7.6	8.5	16.7	18.0	17.8	18.6
Norway	120.8	122.6	142.3	137.4	123.1	133.4	141.3	144.4
Montenegro	0	0	0	2.8	3.9	3.8	3.0	2.9
Form. Yug. Rep. of Macedonia	5.4	5.8	6.3	6.5	6.8	5.7	5.0	5.3
Albania	3.3	4.4	4.7	5.4	7.6	7.0	4.7	5.9
Serbia	38.2	32.5	31.3	34.6	35.7	37.2	31.9	35.6
Turkey	54.2	81.9	118.7	155.5	203.0	229.0	239.4	249.9
Bosnia and Herzegovina	11.7	4.3	8.7	11.2	16.2	16.5	15.2	14.6
Kosovo (1)	0.0	0.0	2.6	4.0	4.6	5.9	5.0	5.5

(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_105a)

Figure 2.8.1: Net electricity generation, EU-28, 2015

(% of total, based on GWh)



Source: Eurostat (online data code: nrg_105a)

Total net electricity generation in the EU-28 was 3.07 million gigawatt hours (GWh) in 2015 — which was 1.3 % higher than a year before, ending a period of four consecutive reductions in output. The level of net electricity generation in the EU-28 in 2015 was 4.5 % lower than its relative peak of 2008, when total output stood at 3.22 million GWh.

Germany had the highest level of net electricity generation in 2015 among the EU Member States, accounting for 19.9 % of the EU-28 total, just ahead of France (17.7 %); the United Kingdom (10.5 %) was the only other Member State with a double-digit share (see Table 2.8.1).

Almost half (48.1 %) of the net electricity generated in the EU-28 in 2015 came from combustible fuels (such as natural gas, coal and oil), while more than one quarter (26.4 %) came from nuclear power stations.

Among the renewable energy sources shown in Figure 2.8.1, the highest share of net electricity generation in 2015 was from hydropower plants (11.9 %), followed by wind turbines (9.7 %) and solar power (3.5 %).

The relative importance of renewable energy sources in relation to EU-28 net electricity generation grew between 2005 and 2015 from 13.3 % to 25.3 %, while there was a relatively large decrease in the importance of combustible fuels from 56.4 % to 48.1 % and also a reduction in the share of electricity generated from nuclear power plants from 30.0 % to 26.4 %.

Among the renewable energy sources, the proportion of net electricity generated from solar and wind increased greatly: from less than 0.1 % in 2005 to 3.5 % in 2015 for solar power and from 2.2 % in 2005 to 9.7 % in 2015 for wind turbines.

Table 2.8.2: Total gross electricity generation, 1990-2015

(thousand GWh)

	1990	1995	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	2 595.2	2 743.6	3 035.8	3 325.8	3 366.1	3 297.3	3 296.3	3 268.5	3 190.8	3 234.3
EA-19	1 760.1	1 880.3	2 119.4	2 340.6	2 393.4	2 332.9	2 334.1	2 323.7	2 265.4	2 298.1
Belgium	70.9	74.4	84.0	87.0	95.2	90.2	82.9	83.5	72.7	70.6
Bulgaria	42.1	41.8	40.9	44.4	46.7	50.8	47.3	43.8	47.5	49.2
Czech Republic	62.6	60.8	73.5	82.6	85.9	87.5	87.4	86.9	86.1	83.9
Denmark	26.0	36.8	36.1	36.2	38.9	35.2	30.7	34.7	32.2	28.9
Germany	550.0	537.3	576.5	622.6	633.0	613.1	629.8	638.7	627.8	646.9
Estonia	17.2	8.7	8.5	10.2	13.0	12.9	12.0	13.3	12.4	10.4
Ireland	14.5	17.9	24.0	26.0	28.4	27.2	27.4	25.9	26.1	28.4
Greece	35.0	41.6	53.8	60.0	57.4	59.4	61.0	57.2	50.5	51.9
Spain	151.9	167.1	224.5	294.1	301.5	293.8	297.6	285.6	278.7	281.0
France	420.8	494.3	540.0	576.1	569.1	561.4	564.9	571.4	563.7	568.5
Croatia	9.1	9.3	11.3	13.2	14.9	11.4	10.8	14.1	13.6	11.4
Italy	216.6	241.5	276.6	303.7	302.1	302.6	299.3	289.8	279.8	283.0
Cyprus	2.0	2.5	3.4	4.4	5.3	4.9	4.7	4.3	4.4	4.5
Latvia	6.6	4.0	4.1	4.9	6.6	6.1	6.2	6.2	5.1	5.5
Lithuania	28.4	13.9	11.4	14.8	5.7	4.8	5.0	4.8	4.4	4.9
Luxembourg	1.4	1.2	1.2	4.1	4.6	3.7	3.8	2.9	3.0	2.8
Hungary	28.4	34.0	35.2	35.8	37.4	36.0	34.6	30.3	29.4	30.3
Malta	1.1	1.6	1.9	2.2	2.1	2.2	2.3	2.3	2.2	1.3
Netherlands	72.0	81.2	89.6	99.9	119.3	114.0	103.3	101.7	103.4	110.1
Austria	50.3	56.2	61.3	66.8	71.1	65.8	72.6	68.3	65.4	65.3
Poland	136.3	139.0	145.2	156.9	157.7	163.5	162.1	164.6	159.1	164.9
Portugal	28.5	33.3	43.8	46.6	54.1	52.5	46.6	51.7	52.8	52.4
Romania	64.3	59.3	51.9	59.4	61.0	62.2	59.0	58.9	65.7	66.3
Slovenia	12.4	12.9	13.6	15.1	16.4	16.1	15.7	16.1	17.4	15.1
Slovakia	26.1	26.8	31.2	31.5	27.9	28.7	28.7	28.8	27.4	26.9
Finland	54.4	64.0	70.0	70.6	80.7	73.5	70.4	71.3	68.1	68.6
Sweden	146.5	148.4	145.3	158.4	148.6	150.4	166.6	153.2	153.7	162.1
United Kingdom	319.7	334.0	377.1	398.4	381.8	367.4	363.6	358.4	338.2	339.1
Iceland	4.5	5.0	7.7	8.7	17.1	17.2	17.5	18.1	18.1	18.8
Norway	121.8	123.2	143.0	138.0	123.6	127.6	147.7	134.0	142.0	145.0
Montenegro	0.0	0.0	0.0	2.9	4.0	2.7	2.8	3.9	3.2	3.0
Form. Yug. Rep. of Macedonia	5.8	6.1	6.8	6.9	7.3	6.8	6.3	6.1	5.4	5.6
Albania	3.3	4.5	4.8	5.4	7.6	4.2	4.7	7.0	4.7	5.9
Serbia	40.9	34.5	34.1	36.5	38.1	38.6	36.8	39.9	34.1	38.3
Turkey	57.5	86.2	124.9	162.0	211.2	229.4	239.5	240.2	252.0	261.8
Bosnia and Herzegovina	14.6	4.4	10.4	12.6	17.1	15.3	14.1	17.5	16.2	15.6
Kosovo (1)	0.0	0.0	3.0	4.5	5.2	5.8	5.9	6.5	5.4	6.1
Moldova	16.2	7.6	5.6	6.0	6.1	5.8	5.8	4.5	5.4	0.9
Ukraine	298.8	194.0	171.4	186.1	188.8	194.9	198.9	194.4	182.8	163.7

(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_105a)

Table 2.8.3: Gross electricity generation by fuel, EU-28, 1990-2015

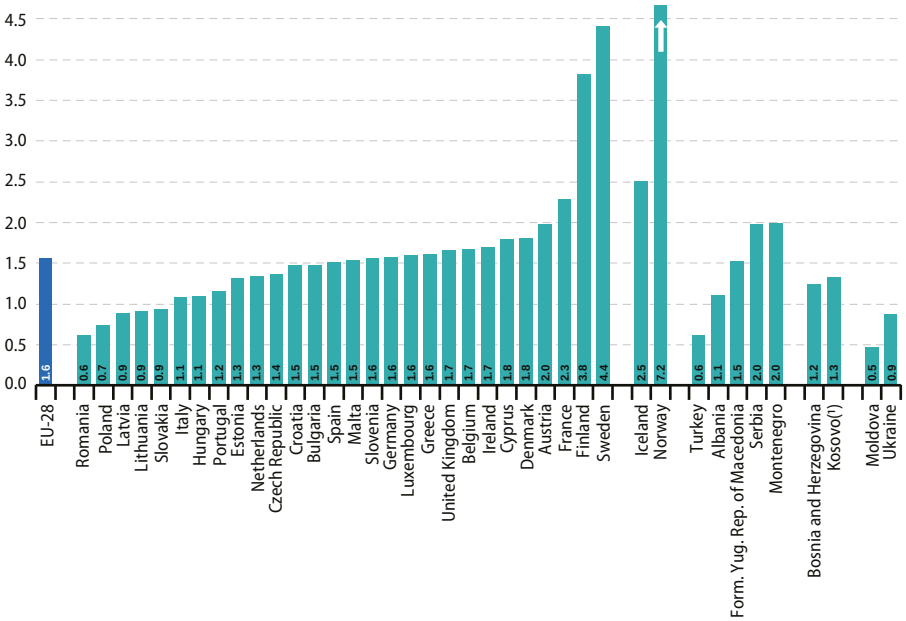
(GWh)

	1990	1995	2000	2005	2010	2015
Total gross electricity production	2 595 179	2 743 612	3 035 750	3 325 804	3 366 093	3 234 341
Solid fossil fuels	1 019 429	945 866	933 855	960 291	829 300	791 457
Anthracite	0	0	0	18 184	10 494	12 238
Coking Coal	52 696	59 159	37 874	37 230	16 232	1 073
Other Bituminous Coal	599 054	538 704	530 968	538 355	462 894	443 298
Sub-Bituminous Coal	7 679	10 640	6 380	5 771	3 378	4 722
Lignite/Brown Coal	337 807	320 479	344 081	341 162	313 437	313 662
Peat	5 137	7 843	5 902	7 486	9 332	5 835
Patent Fuel	0	0	0	0	0	0
Coke Oven Coke	837	0	0	0	2	1
Gas Coke	0	0	0	0	0	0
Coal Tar	0	0	64	100	23	14
BKB	1 510	765	923	2 715	2 463	2 616
Oil shale and oil sands	14 709	8 276	7 663	9 288	11 045	7 992
Peat products	0	0	0	0	0	6
Crude oil and petroleum products	224 199	230 303	181 296	142 772	87 039	61 092
Crude Oil and NGL	0	0	0	15	0	0
Refinery Gas	2 083	2 941	3 798	7 707	9 114	7 690
LPG (Liquefied Petroleum Gases)	23	186	22	490	460	414
Naphtha	0	0	0	0	99	0
Kerosene Type Jet Fuel	0	0	0	1	1	0
Other Kerosene	1	10	0	2	23	9
Gas / Diesel Oil	2 427	3 586	4 109	5 633	11 182	8 897
Residual Fuel Oil	149 056	172 760	140 496	103 923	47 065	28 684
Bitumen	0	2 231	3 776	223	0	0
Petroleum Coke	7	93	336	4 754	2 671	4 258
Other Oil Products	70 602	48 496	28 759	20 024	16 424	11 140
Natural gas and derived gases	223 431	294 383	513 148	704 048	799 066	529 915
Natural Gas	192 561	268 361	479 559	668 288	764 705	496 638
Gas Works Gas	81	37	1 615	2 115	2 499	2 552
Coke Oven Gas	9 308	5 932	7 908	6 615	7 119	7 014
Blast Furnace Gas	20 971	19 398	23 447	25 494	23 400	21 821
Other Recovered Gases	510	655	619	1 536	1 343	1 890
Nuclear	794 863	880 821	944 993	997 699	916 610	857 129
Renewables energies	327 753	382 568	448 585	496 099	710 442	965 817
Hydro	308 897	353 037	386 881	348 400	407 979	371 156
of which Pumped hydro	18 470	21 039	29 988	35 085	31 069	30 086
Wind	778	4 068	22 225	70 453	149 357	301 870
Solar Photovoltaic	12	41	119	1 460	22 503	102 330
Solar Thermal	0	0	0	0	761	5 593
Tide, Wive and Ocean	503	507	507	481	478	489
Solid biofuels excluding charcoal	10 925	15 150	20 309	43 613	70 002	90 728
Biogases	915	2 472	6 427	12 818	31 818	60 922
Municipal Waste (Renewable)	2 497	3 815	7 332	11 709	16 970	20 723
Liquid Biofuels	0	0	0	1 768	4 972	5 483
Geothermal	3 226	3 478	4 785	5 397	5 602	6 523
Waste (non-renewable)	5 292	8 746	12 128	14 240	19 168	23 161
Industrial Waste	2 911	5 012	5 205	2 816	3 436	3 552
Municipal Waste (Non-Renewable)	2 381	3 734	6 923	11 424	15 732	19 609
Other	212	717	1 338	10 622	4 387	5 671
Heat from Chemical Sources	38	29	266	741	798	1 021
Other Sources	174	688	1 072	9 881	3 589	4 650

Source: Eurostat (online data code: nrg_105a)

Figure 2.8.2: Households consumption of electricity per capita, 2015

(MWh/capita)



(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.

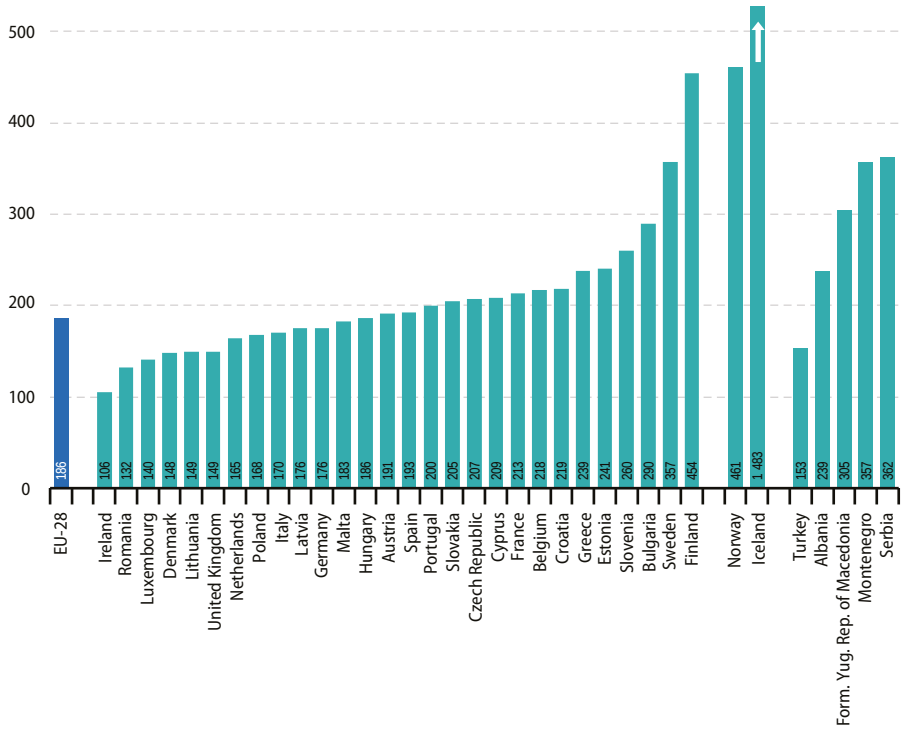
Source: Eurostat (online data code: nrg_105a)

Electricity consumption per capita in the residential sector in the EU-28 in 2015 was 1.6 MWh per capita (1 564 kWh). The range of electricity consumption per capita in the residential sector in the EU Member States in 2015 varied widely, from consumptions below 1 MWh per capita in Romania, Poland, Latvia, Lithuania and Slovakia, to consumptions of over 3 MWh per capita in Finland and Sweden (Figure 2.8.2).

Looking on electricity consumption per capita in the residential sector in non-EU countries, an even wider range is observed: from 0.5 MWh in Moldova to 7.2 MWh in Norway. The range is affected by the choice of energy used for space heating, the climate conditions in the countries as well as the level of economic development of the countries.

Figure 2.8.3: Final consumption of electricity per GDP (PPS), 2015

(kWh per 1000 EUR (PPS))



Source: Eurostat (online data code: nrg_105a)

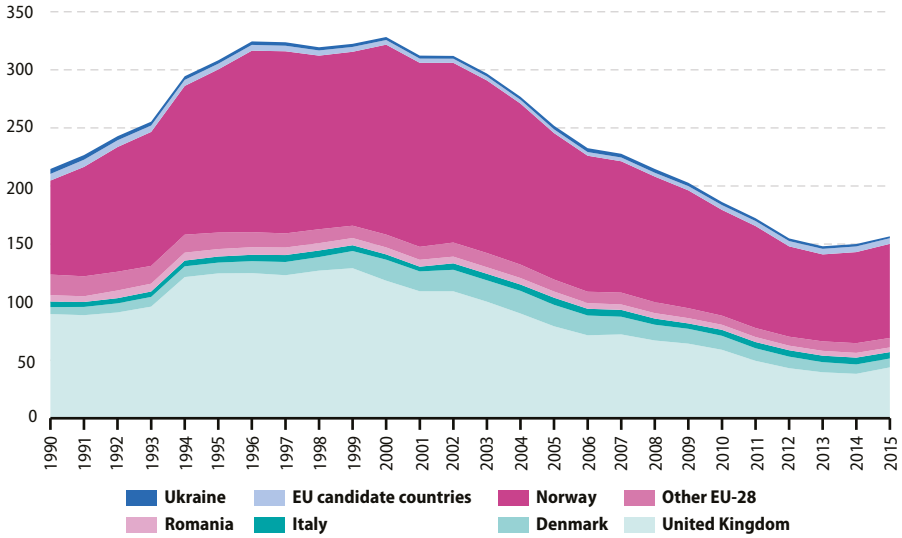
Electricity consumption per unit of GDP (using Purchasing Power Standards) in the EU-28 in 2015 was 186 kWh per 1000 EUR (Figure 2.8.3). The amount of electricity consumed per unit of GDP depends on many factors, starting from the general standard of living, the economy and weather conditions as well as energy efficiency of buildings and appliances. Using GDP in Purchasing Power Standards allows for better comparison across countries in one year.

The EU Member States with the lowest electricity consumption per unit of GDP in 2015 were Ireland, Romania, Luxembourg and Denmark. The highest rates of electricity consumption per unit of GDP were registered in Finland, Sweden and Bulgaria. Figure 2.8.4 shows also data for non-EU countries with lowest in Turkey and highest in Iceland (limited to countries where GDP in Purchasing Power Standards is available).

2.9 Oil and petroleum products

Figure 2.9.1: Primary production of crude oil, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

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 contributors to energy consumption.

The primary production of crude oil in 2015 in the European Union (EU-28) was 69.1 Mtoe. This production peaked in 2002 at 151 Mtoe and since then the production of crude oil decreased by 54 %. The top oil producers in the EU-28 in 2015 were the United Kingdom (43.8 Mtoe) followed by Denmark (7.6 Mtoe), Italy (5.5 Mtoe) and Romania (4.0 Mtoe).

In Norway, one of the key European non-EU crude oil producers, production peaked in 2000 (163.6 Mtoe) and by 2015 it had decreased to less than half (81.0 Mtoe). EU candidate countries (Albania, Serbia and Turkey) have some production of crude oil however on a very small scale (in total near 4.9 Mtoe in 2015). These data are presented in Figure 2.9.1.

In 2015, total imports of crude oil to the EU-28 amounted to 553.4 million tonnes (Mt). The major imports came from Russia (153.2 Mt in 2015), Norway (63.3 Mt), Nigeria (44.3 Mt) and Saudi Arabia (41.7 Mt). In relative terms, these four countries provided 55 % of EU imports of crude oil. Russia alone stood for 28 % of the crude oil imports to the EU. This share has remained relatively stable over the past decade, with a peak share of EU crude oil imports at 33 % in 2011. The crude oil imports from Norway have been almost halved over the period 2000-2015, from 114.9 Mt to 63.3 Mt.

On the other hand, Nigeria saw a substantial increase from 22.5 Mt to 44.3 Mt over the same period. See Figure 2.9.2 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 2015 the input of oil into the transformation sector for electricity generation represented less than a quarter of the quantities used in 1990.

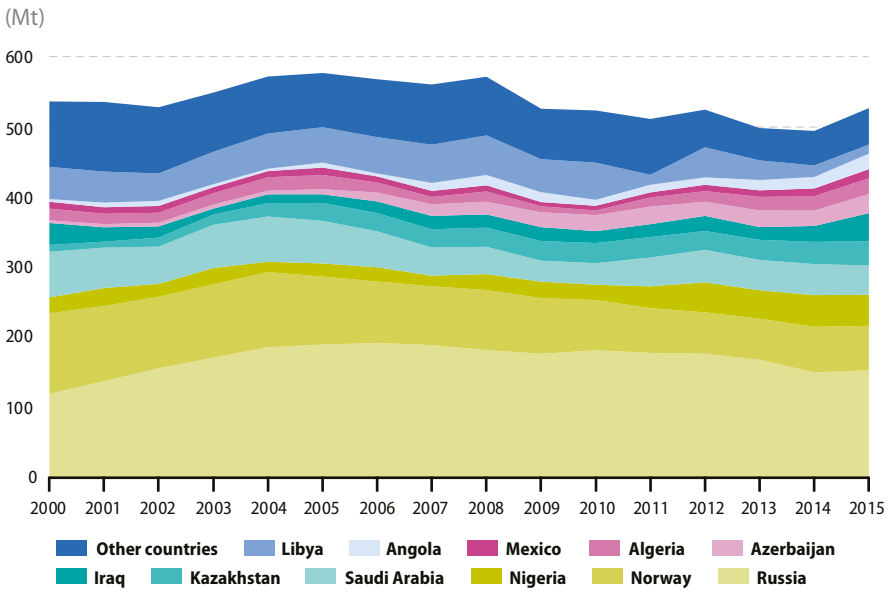
In the last five years the final energy consumption of petroleum products has globally dropped below the 1990s level. The final energy consumption of individual petroleum products is shown in Figure 2.9.3.

Gas/diesel oil, gasoline and kerosene type jet fuel (listed in order of significance) are by far the three most important products throughout the whole 25-year-period, although demonstrating different evolution patterns.

Crude oil and petroleum products have the highest share of energy consumption in the EU. 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.

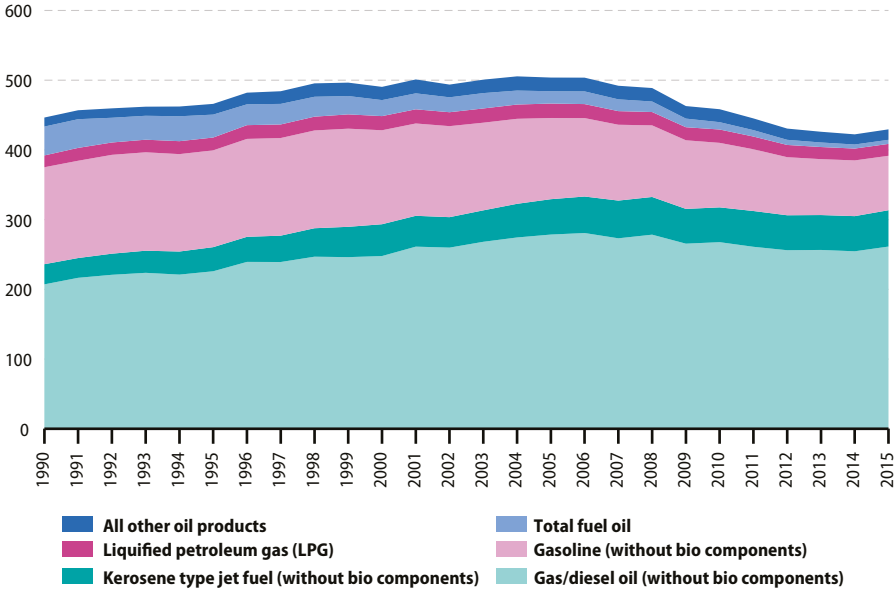
Figure 2.9.2: Crude oil imports into EU-28, 2000-2015



Source: Eurostat (online data code: nrg_123a)

Figure 2.9.3: Consumption of oil EU-28, 1990-2015

(Mtoe)



Source: Eurostat (online data code: nrg_110a)

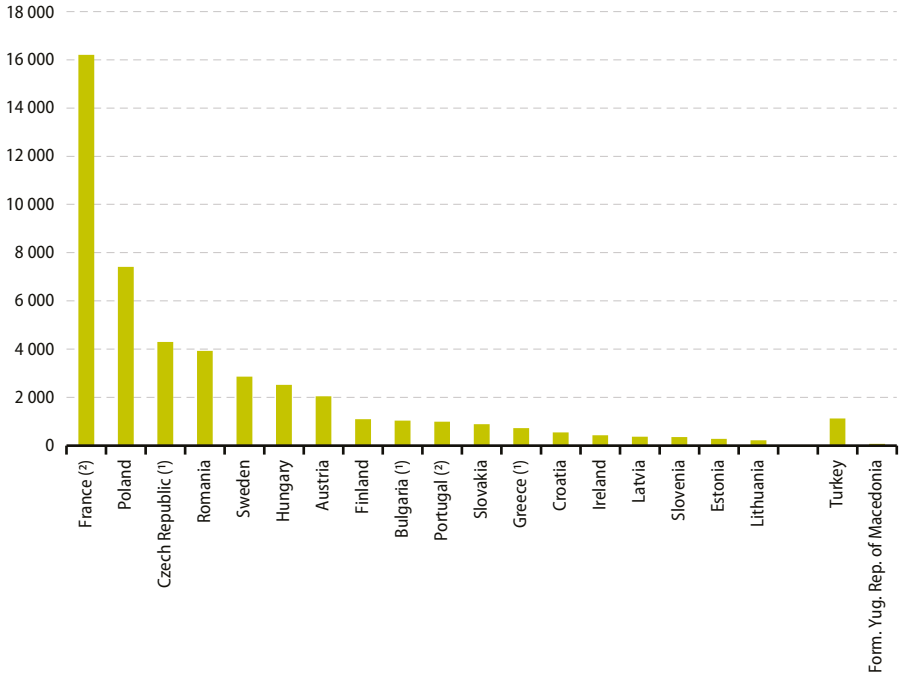
3 Transport indicators

3.1 Transport equipment

Since 2006, increases in the national capacity (number of seats) of passenger railway vehicles have only been reported in a few EU Member States: Belgium and Spain (until 2009), Hungary (until 2011), Estonia, and Sweden. For most EU Member States for which data were available, however, decreases ranging from 9.5 % to 59.8 % were registered (Table 3.1.1).

Among the countries for which data is available, France has by far the highest number of railway vehicles for passengers (Figure 3.1.1).

Figure 3.1.1: Number of passenger railway vehicles, 2015



Note: Data not available for Belgium, Denmark, Germany, Spain, Italy, Luxembourg, Netherlands and United Kingdom. Cyprus and Malta have no railways.

(1) 2013 data instead of 2015.
(2) 2014 data instead of 2015.

Source: Eurostat (online data code: rail_eq_pa_nty)

Table 3.1.1: Capacity of passenger railway vehicles, 2006-2015

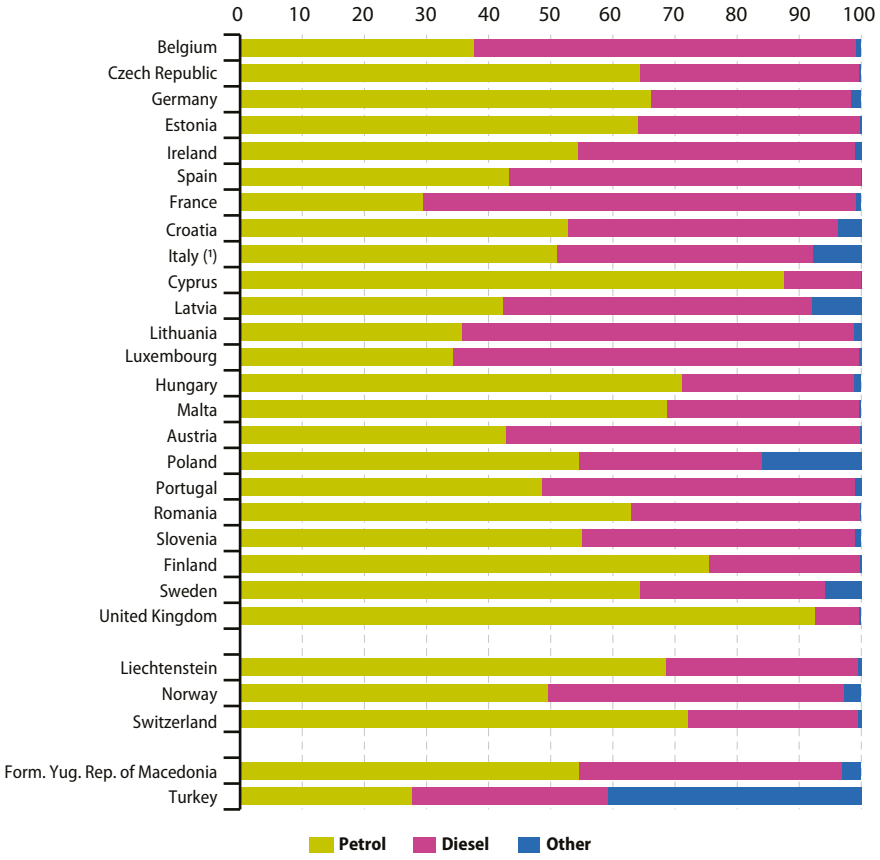
(thousand seats)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	282	288	294	305	:	:	:	:	:	:
Bulgaria	:	:	:	105	86	84	84	87	:	:
Czech Republic	323	313	305	307	309	301	293	288	:	:
Denmark	120	121	121	:	:	:	:	:	:	:
Germany	:	:	:	:	:	:	:	:	:	:
Estonia	16	16	17	16	15	15	18	24	25	25
Ireland	:	:	:	:	:	:	41	41	41	41
Greece	36	32	33	30	:	:	:	:	:	:
Spain	270	263	258	324	283	275	170	:	:	:
France	:	:	1 329	:	:	:	:	:	:	:
Croatia	35	34	34	33	32	32	33	33	33	36
Italy	798	865	860	845	845	772	:	:	:	:
Latvia	38	37	30	23	22	22	22	22	22	22
Lithuania	36	34	27	25	24	19	18	18	16	14
Luxembourg	19	20	19	19	22	21	:	:	:	:
Hungary	:	:	193	197	182	204	:	:	:	:
Netherlands	:	:	:	:	:	:	:	:	:	:
Austria	:	342	:	:	253	248	253	269	253	228
Poland	588	587	550	538	534	524	501	490	458	475
Portugal	:	:	:	:	:	:	:	:	:	:
Romania	411	365	338	:	:	:	:	:	:	:
Slovenia	24	23	22	22	22	22	22	22	22	22
Slovakia	87	83	75	73	63	57	69	64	61	62
Finland	71	69	69	69	71	73	76	78	77	73
Sweden	126	134	143	141	145	149	173	177	184	186
United Kingdom	:	:	:	:	:	:	:	:	:	:
Former Yugoslav Republic of Macedonia	7	7	7	6	4	4	4	:	:	4
Turkey	108	108	107	107	102	114	134	159	166	168

Source: Eurostat (online data code: rail_eq_pa_csb)

Figure 3.1.2: Share of passenger cars, by fuel type, 2015

(%)



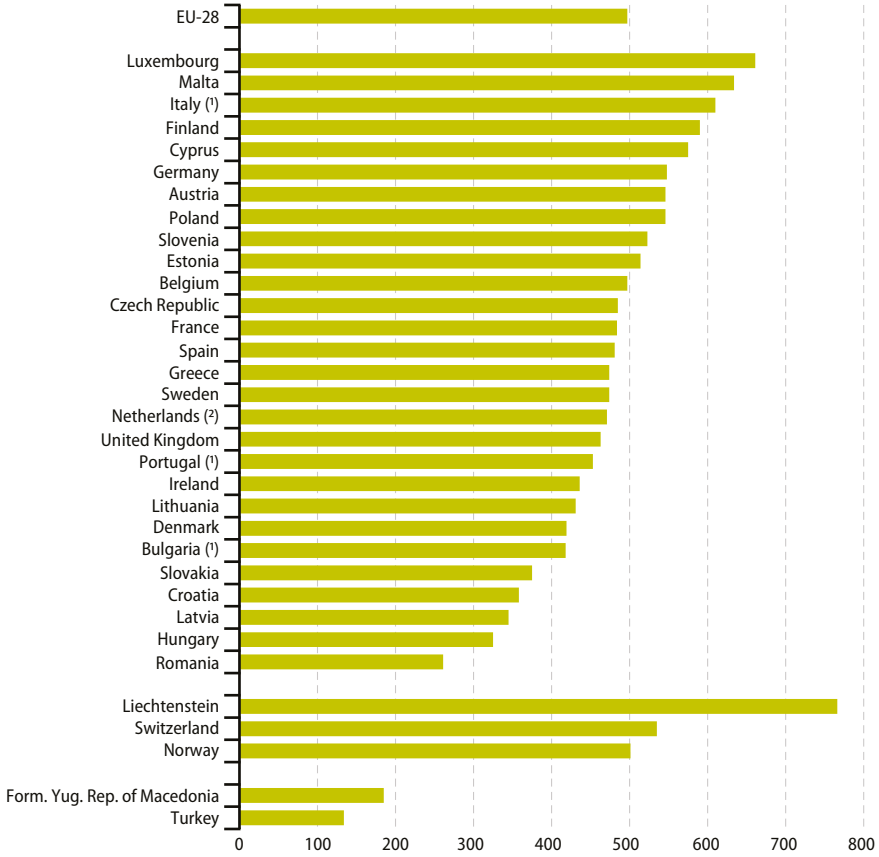
Note: Data not available for Bulgaria, Denmark, Greece, Netherlands and Slovakia.

(1) 2014 data instead of 2015

Source: Eurostat (online data code: road_eqs_carpda)

Figure 3.1.2 shows that in 2015 more than 50 % of the cars were petrol driven in 15 of 23 EU Member States for which data were available. The highest percentage of petrol-driven cars was reported by United Kingdom (92.6 %), followed by Cyprus (87.6 %) and Finland (75.6 %). Diesel-driven cars exceeded the 50 % threshold in France (69.8 %), Luxembourg (65.3 %), Lithuania (63 %), Belgium (61.5 %), Austria (56.9 %), Spain (56.6 %) and Portugal (50.4 %). The contribution of alternative fuels was significant in Poland (16 %), Latvia (8 %) and Italy (7.8 %, 2014 data).

Figure 3.1.3: Number of passenger cars per thousand inhabitants, 2015



(1) 2014 data instead of 2015.
(2) 2013 data instead of 2015.

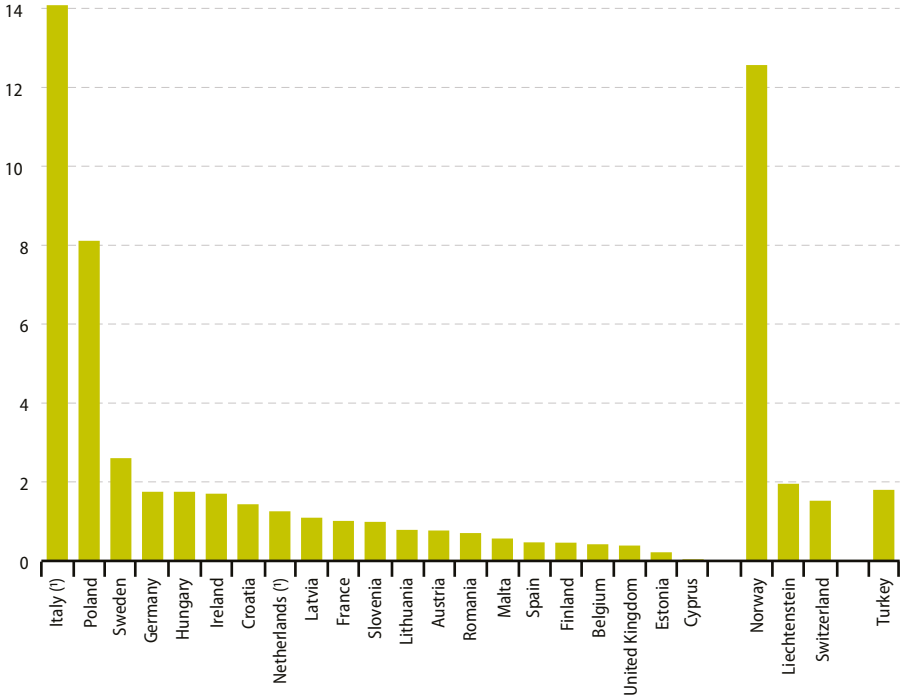
Source: Eurostat (online data code: road_eqs_carhab)

Amongst the EU Member States with the highest motorisation rates, i.e. passenger cars per thousand inhabitants, there are several small countries (Figure 3.1.3). Luxembourg, with 661 passenger cars per thousand 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 Malta with 634 cars per thousand inhabitants. Other countries with a high motorisation rate include Italy (610 cars: 2014 data), Finland (590 cars) and Cyprus (575 cars).

At the other end of the scale, a particularly low motorisation rate is recorded in Romania (261 cars), despite a growth in the number of registered cars of almost 19 % over the last five years. The motorisation rate is still substantially lower in the candidate countries than in the EU Member States.

Figure 3.1.4: New passenger cars with alternative fuel engine, 2015

(% of new passenger cars)



Note: Data not available for Bulgaria, Czech Republic, Denmark, Greece, Luxembourg, Portugal and Slovakia.

(1) 2013 data instead of 2015.

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

In the EU Member States, candidate 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 in the period from 2013 to 2015, although at a low level in most countries (Figure 3.1.4). In 2015, the highest share by far of alternative fuels in new registrations could be seen in Italy (14.1 %: 2013 data) and Poland (8.1 %) and, from the EFTA countries, in Norway (12.6 %). Far behind followed Sweden (2.6 %), Liechtenstein (2.0 %) and Turkey, Germany and Hungary with a share of 1.8 % passenger cars with alternative fuels amongst the new registrations. However, for the large majority of Member States, registrations of new passenger cars with alternative fuels made up less than 2 % of the total registrations in 2015.

Table 3.1.2: Renewal rate of passenger cars, 2006-2015

(passenger cars first registrations as share of total passenger cars, %)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	10.7	10.5	10.5	9.2	10.5	10.7	9.0	8.9	8.8	9.0
Bulgaria	10.3	16.8	14.9	8.0	7.2	7.1	7.0	6.9	7.0	:
Czech Republic	2.9	3.0	3.2	3.6	3.7	3.8	3.7	3.5	4.0	4.5
Denmark	5.3	9.9	7.1	:	:	:	:	:	:	:
Germany	7.4	:	7.5	9.1	6.9	7.4	7.1	6.7	6.8	7.1
Estonia	4.6	5.9	4.5	1.8	1.9	3.0	3.2	3.1	3.2	3.1
Ireland	9.7	10.3	7.9	3.0	5.4	5.3	4.0	3.8	4.2	6.3
Greece	6.7	6.6	5.9	4.8	2.9	2.1	1.2	1.3	1.7	1.9
Spain	7.9	7.5	5.4	4.4	4.5	3.7	3.2	3.4	4.0	4.9
France	6.6	6.7	:	7.2	7.0	6.8	5.8	5.3	5.4	5.8
Croatia	8.0	7.2	6.2	3.5	3.1	3.2	2.8	3.2	4.6	4.9
Italy	7.2	7.0	6.1	6.0	5.4	4.8	3.8	3.5	:	:
Cyprus	10.0	12.4	11.6	8.1	7.1	5.9	4.3	3.1	3.7	4.4
Latvia	11.8	11.8	5.9	1.9	4.2	7.1	8.1	8.8	2.0	2.1
Lithuania	11.6	13.9	11.5	8.1	9.5	7.7	8.7	8.6	11.3	10.6
Luxembourg	16.1	15.9	16.0	14.3	14.7	14.4	14.2	12.8	13.4	12.2
Hungary	4.7	4.2	5.8	:	2.1	2.6	3.6	4.2	5.3	6.3
Malta	4.6	4.3	4.2	6.7	5.6	6.4	5.2	5.1	5.8	6.1
Netherlands	6.7	6.8	6.6	5.1	6.2	7.1	6.3	5.3	:	:
Austria	7.3	7.0	6.9	7.3	7.4	7.9	7.3	6.9	6.5	6.5
Poland	6.9	7.7	8.0	5.2	5.1	5.1	4.8	5.1	5.2	5.5
Portugal	:	:	:	:	5.3	3.8	2.6	:	4.2	:
Romania	9.7	12.3	14.6	7.7	7.2	4.1	5.4	6.0	:	6.4
Slovenia	6.1	6.7	6.8	5.4	5.7	5.6	4.7	4.9	5.1	5.6
Slovakia	:	10.2	9.8	9.3	7.6	7.5	7.2	6.1	6.5	6.8
Finland	5.8	4.9	5.2	3.3	3.9	4.3	3.7	3.3	3.3	3.4
Sweden	7.2	7.6	6.0	5.3	7.1	7.4	6.8	6.5	7.1	7.8
United Kingdom	:	:	7.4	7.0	7.0	6.7	:	:	:	8.6
Liechtenstein	7.8	8.2	7.9	6.3	6.6	7.4	7.5	6.8	6.3	7.1
Norway	6.8	7.6	6.3	5.6	6.9	7.1	7.0	7.0	6.7	6.8
Switzerland	6.9	7.2	7.2	6.6	7.3	7.9	7.8	7.2	6.9	7.3
Former Yugoslav Republic of Macedonia	5.1	6.8	6.8	4.6	15.9	12.8	10.9	:	:	7.6
Turkey	6.5	5.5	5.2	5.0	6.4	7.4	6.5	7.1	5.9	7.0

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

In 2015, the renewal rate of passenger cars (the ratio of first registered to total passenger cars) in the EU-28 ranged from 1.9 % in Greece to 12.2 % in Luxembourg (Table 3.1.2). Renewal rates of passenger cars have had a tendency to decrease in the majority of EU Member States since 2008, likely as a consequence of the global financial and economic crisis, however in 2015 an increase can be noted in some countries.

Table 3.1.3: Motorisation rate of lorries and road tractors, 2006-2015

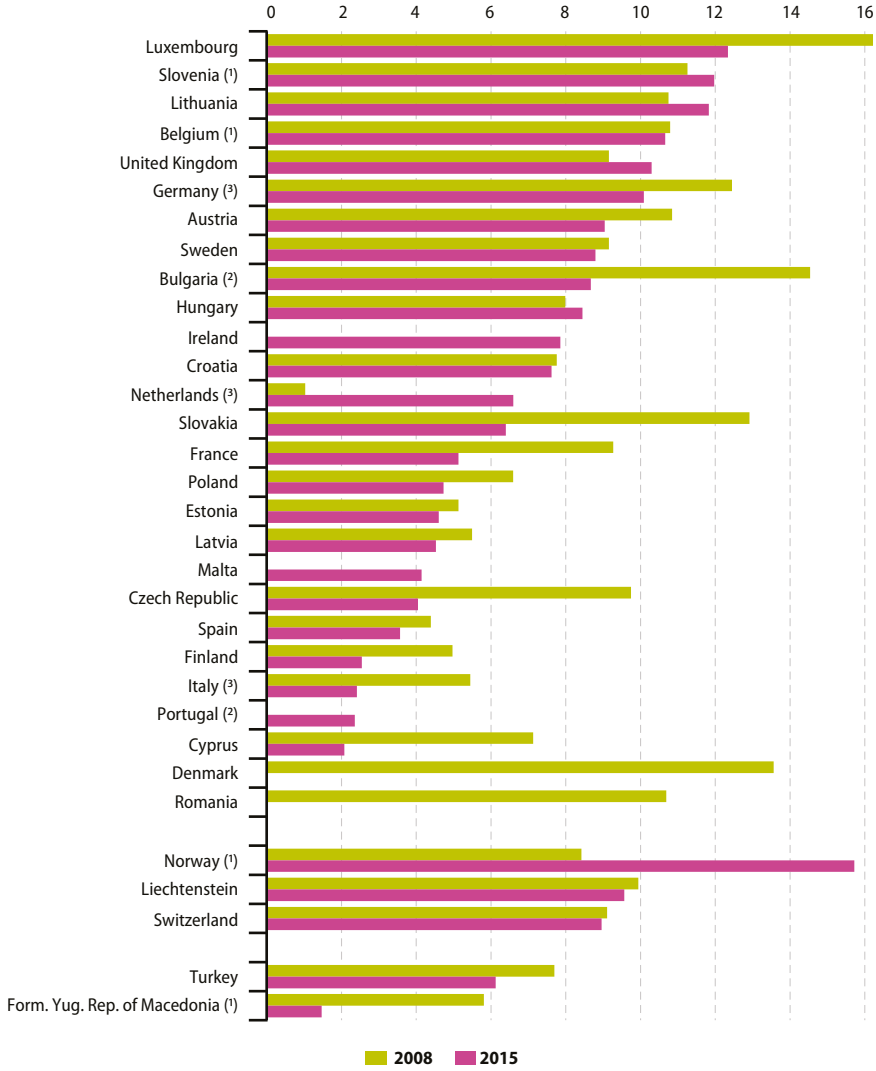
(number of lorries and road tractors per thousand inhabitants)

	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	64	65	67	67	68	69	70	:	:	:
Bulgaria	30	35	40	43	45	47	50	53	57	:
Czech Republic	48	54	59	58	57	57	58	57	:	62
Denmark	9	9	9	:	:	:	:	:	:	:
Germany	34	30	31	31	32	33	34	35		
Estonia	:	:	62	61	61	63	66	70	73	77
Ireland	:	:	:	:	:	:	70	:	69	72
Greece	:	:	:	:	:	:	:	:	:	:
Spain	116	120	118	116	114	113	110	:	108	109
France	90	92	87	87	88	89	90	103	103	102
Croatia	38	38	39	38	36	35	32	33	33	35
Italy	:	69	69	70	70	70	70	68	:	:
Cyprus	156	155	157	156	147	141	132	126	122	123
Latvia	54	59	59	56	34	35	37	46	42	43
Lithuania	41	45	47	46	43	45	46	48	34	35
Luxembourg	66	68	71	70	71	72	71	70	70	70
Hungary	46	47	45	47	46	47	47	47	48	50
Malta	102	102	106	104	103	103	102	103	104	103
Netherlands	61	62	63	62	61	59	58	57	:	:
Austria	44	45	46	47	48	49	50	50	51	52
Poland	63	66	71	73	78	82	83	85	88	90
Portugal	:	:	:	:	137	135	119	119	129	:
Romania	21	24	31	32	33	34	36	:	:	:
Slovenia	35	39	42	41	41	41	41	:	:	:
Slovakia	39	44	50	54	55	56	57	58	59	61
Finland	73	76	82	85	89	93	96	74	101	104
Sweden	53	55	56	55	56	58	58	59	60	61
United Kingdom	:	:	61	59	59	59	:	:	:	63
Liechtenstein	72	73	76	76	78	80	83	84	84	85
Norway	105	110	110	109	108	108	109	:	:	:
Switzerland	42	43	43	43	43	44	45	46	47	48
Former Yugoslav Republic of Macedonia	8	8	8	9	9	16	15	:	:	19
Turkey	33	38	40	41	10	10	10	49	50	52

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

Figure 3.1.5: Renewal rate of lorries and road tractors, 2008 and 2015

(lorries and road tractors first registrations as share of total lorries and road tractors, %)



Note: Data not available for Greece.

(1) Only road tractors.
(2) 2014 data instead of 2015.
(3) 2013 data instead of 2015.

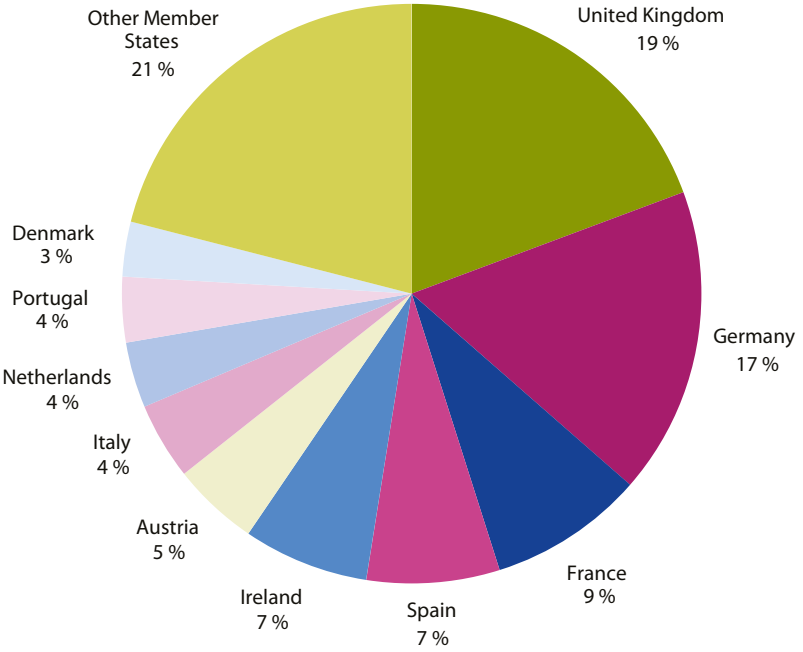
Source: Eurostat (online data codes: road_eqr_tracmot, road_eqr_tracm, road_eqr_lormot, road_eqs_lorroa and road_eqs_lorroa_h)

In 2015, the motorisation rate of lorries and road tractors in the EU-28 varied from 35 lorries and road tractors per thousand inhabitants in Croatia and Lithuania to 123 in Cyprus (Table 3.1.3). These variations are probably partly due to the fact that the EU Member States register very light lorries and vans differently. Besides Cyprus, rates above 100 were also recorded in Spain (109), Finland (104), Malta (103) and France (102). By contrast, in addition to Croatia and Lithuania, a low motorisation rate of lorries and road tractors was also recorded in Latvia (43). Between 2006 and 2015, the trend was not consistent among EU Member States. The highest increases were observed in the eastern EU Member States, especially in Slovakia (58.4 %), Poland (43.2 %) and Finland (42.3 %). On the other hand, the highest decreases were recorded in Cyprus (21.4 %), Latvia (-19.8 %) and Lithuania (14.1 %).

Among those EU Member States for which data are available (Figure 3.1.5), six recorded renewal rates for lorries and road tractors above 10 % in 2015: Luxembourg (12.3 %), Slovenia (12.0 %), Lithuania (11.8 %), Belgium (10.7 %), United Kingdom (10.3 %) and Germany (10.1 %, 2013 data). There was a decrease in renewal rates for most EU Member States between 2008 and 2015. This decrease was strongest for Slovakia (6.5 percentage points (pp)), Bulgaria (5.9 pp), the Czech Republic (5.7 pp) and Cyprus (5.1 pp).

Figure 3.1.6: EU air fleet by operator country, top 10 countries, 2015

(%)



Source: Eurostat (online data code: avia_eq_arc_typ)

In 2015, the largest numbers of commercial aircraft were reported by the four largest EU Member States and Ireland (Figure 3.1.6). The largest air fleet was recorded in the United Kingdom (1 262 aircraft, accounting for a 19 % share of the EU total), followed by Germany (1 119; 17 % share), France (565; 9 % share), Spain (485; 7 % share) and Ireland (458; 7 % share). In terms of number of aircraft per million inhabitants, Malta (335) and Luxembourg (203) held the highest value, Poland (3) and Romania (2) the lowest.

Table 3.1.4 shows that over the last 16 years (2000 2015), significant increases in the number of self-propelled barges were recorded in Bulgaria (1 450 %, 2014 data), Croatia (375 %) and Lithuania (218 %), 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 fleets. For example, Bulgaria's self-propelled barge fleet only included 31 vessels in 2014, compared to 2 vessels in 2000.

Table 3.1.4: Number of inland waterways vessels, 2015

	Self-propelled barge		Tug and pusher		Dumb and pushed vessel	
	Number	% change since 2000	Number	% change since 2000	Number	% change since 2000
Belgium (1)	874	-35.9	:	:	263	66.5
Bulgaria (1)	31	1 450.0	38	11.8	117	-35.7
Czech Republic (1)	30	-55.2	78	-25.7	107	-39.2
Germany	1 168	-12.4	411	:	861	-30.3
Estonia (2)	9	:	2	:	3	:
France	804	-32.4	:	:	363	-46.7
Croatia	19	375.0	40	-13.0	111	-20.7
Italy (1)	66	-97.9	17	-82.3	81	-81.4
Latvia	:	:	:	:	:	:
Lithuania	35	218.2	19	72.7	50	354.5
Luxembourg	:	:	:	:	:	:
Hungary	70	-70.5	58	-30.1	252	-36.0
Netherlands	:	:	:	:	:	:
Austria	:	:	:	:	:	:
Poland	89	-15.2	217	-11.4	511	32.0
Romania	154	:	328	-64.7	1 134	-33.8
Slovakia	23	91.7	32	-20.0	104	-48.5
Finland	197	42.8	32	6.7	46	53.3
United Kingdom (2)	158	-15.1	92	1.1	287	-20.5
Switzerland (2)	13	:	8	:	3	:

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

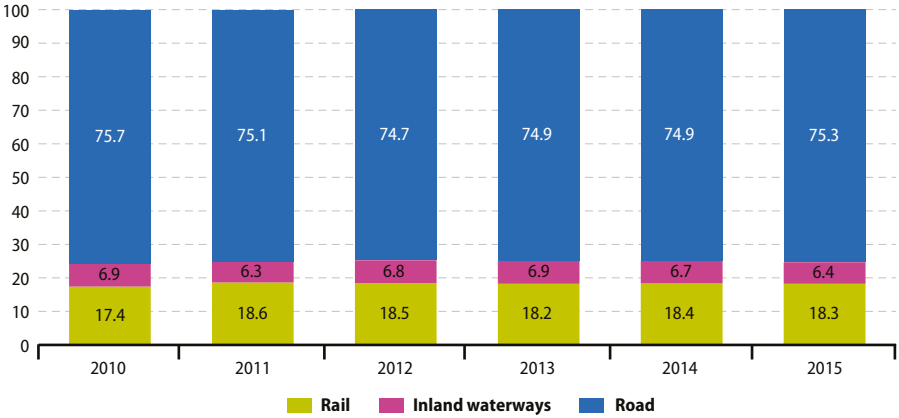
(1) 2014 data instead of 2015.
(2) 2013 data instead of 2015.

Source: Eurostat (online data code: iww_eq_age and iww_eq_loadcap)

3.2 Freight transport

Figure 3.2.1: Freight transport in the EU-28: modal split of inland transport, 2010-2015

(% of total tonne-kilometres)



Note: Rail transport estimated for Belgium, inland waterways transport estimated for Finland, road freight transport for Malta not included (negligible).

Sources: Eurostat (online data codes: rail_go_typeall (rail), iww_go_atygo (inland waterways), road_go_ta_tott (national road transport), road_go_ca_c (road cabotage transport) and Eurostat computations (international road transport).

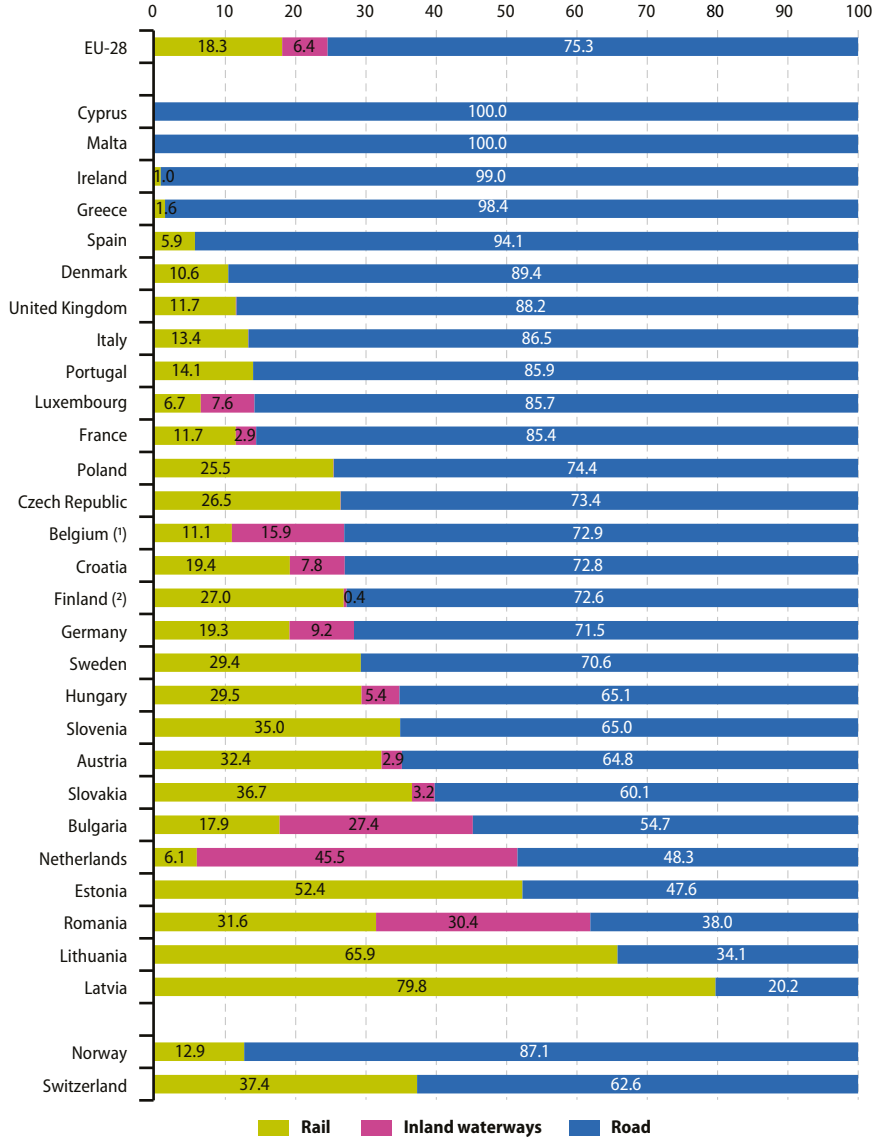
Road transport continues to have the largest share of EU freight transport performance among the three inland transport modes. Figure 3.2.1 shows that in 2015, road transport accounted for just over three quarters (75.3 %) of the total inland freight transport (based on tonne-kilometres performed). This share has remained almost unchanged since 2010, although a slight decrease in the share of road was noted over the period from 2010 to 2014. However, in 2015 this share increased slightly from the previous year (0.4 percentage points (pp)).

Since 2010, the share of rail in the transport performance of the inland modes has increased. From 2011 onwards, the share of rail has remained stable at around 18.5 %. In 2015, rail transport accounted for 18.3 % of the EU total, almost unchanged compared to the previous year (-0.1 pp). The share of inland waterways in EU freight transport fluctuates between 6 % and 7 %, in 2015 recording a share of 6.4 % of the total inland transport performance.

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 (Figure 3.2.2). The modal split at country level varies considerably. In particular, the modal split depends on the availability of a given mode. Only 17 of the Member States have navigable inland waterways. In addition to not having navigable inland waterways, Cyprus and Malta do not have railways; thus, for these two Member States the share of road freight transport is 100 % by default.

Figure 3.2.2: Modal split of inland freight transport, 2015

(% of total tonne-kilometres)



(1) Rail freight transport estimated.
(2) Inland waterways freight transport estimated.

Sources: Eurostat (online data code: rail_go_typeall (rail), iww_go_atygo (inland waterways), road_go_ta_tott (national road transport), road_go_ca_c (road cabotage transport) and Eurostat computations (international road transport).

Table 3.2.1: Evolution of total freight transport by rail, 2014 and 2015

	2014			2015			Change in 2015			Change
	Detailed reporting	Simplified reporting	Total	Detailed reporting	Simplified reporting	Total	Detailed reporting	Simplified reporting	Total	Total
	(million tkm)									(%)
EU-28 (1)	402 555	8 584	411 139	403 760	11 801	415 561	1 205	3 217	4 422	+1.1
Belgium	:c	:c	:c	:c	:c	:c	:c	:c	:c	:c
Bulgaria	2 572	867	3 439	3 267	382	3 650	696	-485	211	6.1
Czech Republic	14 574	-	14 574	15 261	-	15 261	687	-	687	4.7
Denmark	2 455	-	2 455	2 273	-	2 273	-182	-	-182	-7.4
Germany (2)	112 629	-	112 629	114 341	-	114 341	1 712	-	1 712	1.5
Estonia	3 256	-	3 256	3 117	-	3 117	-139	-	-139	-4.3
Ireland	100	-	100	96	-	96	-3	-	-3	-3.3
Greece	311	-	311	294	-	294	-18	-	-18	-5.7
Spain	10 068	317	10 385	10 223	907	11 131	155	590	745	7.2
France	32 596	-	32 596	34 252	-	34 252	1 656	-	1 656	5.1
Croatia	2 119	-	2 119	2 184	-	2 184	64	-	64	3.0
Italy	18 123	2 034	20 157	18 342	2 440	20 781	219	405	624	3.1
Cyprus	-	-	-	-	-	-	-	-	-	-
Latvia	19 441	-	19 441	18 906	-	18 906	-535	-	-535	-2.8
Lithuania	14 307	-	14 307	14 036	-	14 036	-271	-	-271	-1.9
Luxembourg	208	-	208	207	-	207	-1	-	-1	-0.5
Hungary	10 158	-	10 158	10 010	-	10 010	-149	-	-149	-1.5
Malta	-	-	-	-	-	-	-	-	-	-
Netherlands	6 169	-	6 169	6 545	-	6 545	376	-	376	6.1
Austria	19 270	1 224	20 494	19 187	1 078	20 266	-82	-145	-228	-1.1
Poland	47 439	2 634	50 073	46 753	3 850	50 603	-686	1 216	530	1.1
Portugal	2 434	-	2 434	2 688	-	2 688	253	-	253	10.4
Romania	12 085	180	12 264	11 761	1 912	13 673	-324	1 733	1 409	11.5
Slovenia	3 847	263	4 110	3 854	321	4 175	7	58	65	1.6
Slovakia	8 544	284	8 829	8 309	130	8 439	-235	-154	-390	-4.4
Finland	9 597	-	9 597	8 468	-	8 468	-1 129	-	-1 129	-11.8
Sweden	21 296	-	21 296	20 583	-	20 583	-713	-	-713	-3.3
United Kingdom	22 143	-	22 143	21 990	-	21 990	-153	-	-153	-0.7
Liechtenstein	-	12	12	-	13	13	-	1	+1	6.7
Norway	3 539	-	3 539	3 498	-	3 498	-40	-	-40	-1.1
Switzerland	11 667	646	12 313	11 685	746	12 431	18	100	118	1.0
Montenegro	-	94	94	-	112	112	-	18	18	18.6
Former Yugoslav Republic of Macedonia	411	-	411	278	-	278	-133	-	-133	-32.4
Turkey	11 601	-	11 601	10 178	-	10 178	-1 423	-	-1 423	-12.3

Note: Cyprus and Malta have no railways.

(1) Estimated.
(2) 2015 data based on quarterly figures.

Source: Eurostat (online data code: rail_go_typeall)

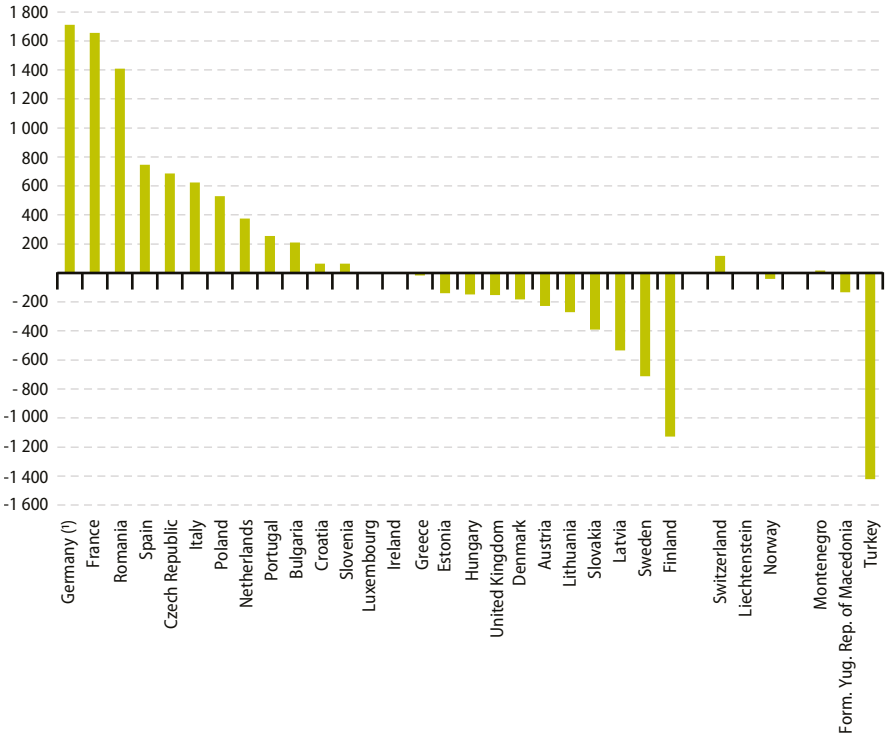
In 2015, the total EU-28 rail freight transport performance can be estimated at around 416 billion tonne-kilometres, showing a decrease of about 1.1 % compared with 2014 (Table 3.2.1).

Despite the general increasing trend, the patterns at national level show substantial differences among countries. Thirteen out of the EU's 28 Member States for which data are available recorded a decrease in freight transport performance between 2014 and 2015.

The highest increase in rail freight transport performance was recorded by Romania (11.5 %), followed by Portugal (10.4 %) and Spain (7.2 %). At the other end of the scale, the largest decrease between 2014 and 2015 was recorded in Finland (-11.8 %), followed by Denmark (-7.4 %).

Figure 3.2.3: Development of freight transport by rail: change between 2014 and 2015

(million tonne-kilometres)



Note: Cyprus and Malta have no railways; data for Belgium are confidential.

(1) Based on quarterly data.

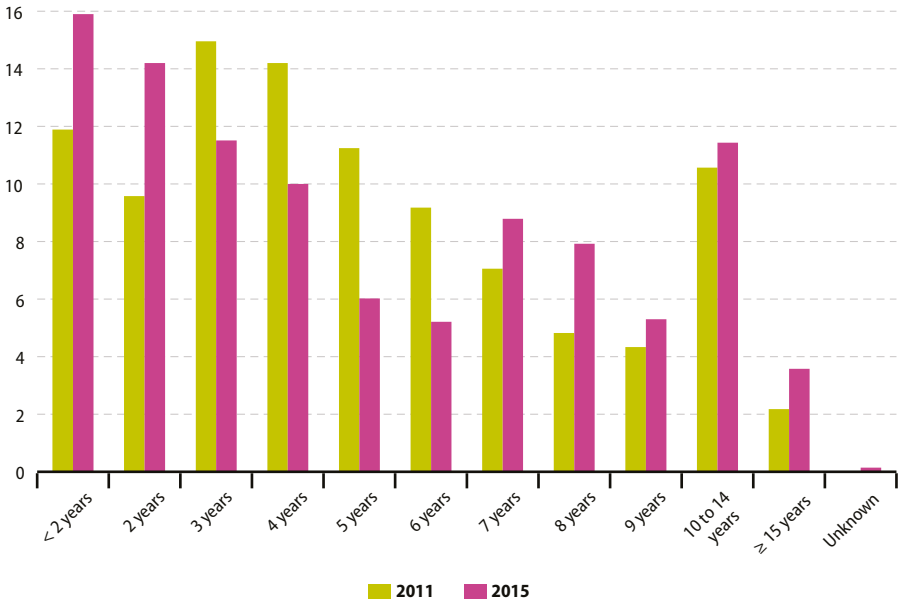
Source: Eurostat (online data code: rail_go_typeall)

A growth in transport performance between 2014 and 2015 could be noticed for twelve EU Member States (Figure 3.2.3). However, the picture is quite different depending on the country considered.

In absolute terms, Finland recorded the largest decrease (-1.1 billion tonne-kilometres between 2014 and 2015). In contrast, three countries reported absolute increase of more than 1 billion tonne-kilometres over the same period, namely Germany, France (both 1.7 billion tonne-kilometres) and Romania (1.4 billion tonne-kilometres).

Figure 3.2.4: Road goods transport in the EU-28 by age of vehicle, 2011 and 2015

(% of total tonne-kilometres)



Note: Provisional data for 2015.

Source: Eurostat (online data code: road_go_ta_agev)

Figure 3.2.4 shows that road freight vehicles that were less than 2 years old dominated the European market in 2015, with around 280 billion tonne-kilometres (15.9 % of the total tonne-kilometres).

In 2015, vehicles 5 years old or less accounted for 57.6 % of the total tonne-kilometres with those over 10 years old performing only 15.0 % of tonne-kilometres.

Between 2011 and 2015 there has been a strong decline in road freight transport performed (in tonne-kilometres) by vehicles between 3 years and 6 years old; in contrast, transport performed by vehicles of 3 years old and less, and vehicles aged 7 years or more has increased over the same period. Transport performed by very old road freight vehicles (over 15 years) has continuously increased between 2011 and 2015 (66.0 %), increasing by 7.6 % between 2014 and 2015; however, it represents only 3.6 % of the total tonne-kilometres.

It must be noted that Malta is excluded from the scope of Regulation (EU) No 70/2012 for road freight transport statistics.

Table 3.2.2: Road freight transport by axle configuration, 2015

(million tonne-kilometres)

	Lorry	Lorry and trailer	Road tractor and semi-trailer	Total
EU-28 (1)	148 246	188 507	1 170 117	1 507 406
Belgium	:	:	:	:
Bulgaria	2 844	2 051	27 186	32 297
Czech Republic	6 252	25 007	25 943	57 200
Denmark	1 456	3 371	10 667	15 500
Germany (2)	23 175	67 028	219 938	310 142
Estonia	247	423	5 592	6 263
Ireland	1 751	144	8 004	9 900
Greece	5 135	2 358	12 271	19 764
Spain	11 170	3 575	194 617	209 390
France	16 388	3 364	133 827	153 580
Croatia	879	1 524	8 035	10 439
Italy	:	:	:	:
Cyprus	187	:	375	563
Latvia	464	1 567	12 636	14 670
Lithuania	1 436	2 477	22 555	26 485
Luxembourg	790	750	7 307	8 850
Hungary	:	:	:	:
Malta	:	:	:	:
Netherlands	:	:	:	:
Austria	3 517	3 910	17 008	24 436
Poland	20 270	8 893	231 399	260 713
Portugal	2 133	710	28 991	31 835
Romania	8 315	8 761	21 948	39 023
Slovenia	847	2 194	14 855	17 902
Slovakia	1 931	1 574	30 030	33 540
Finland	2 089	17 469	4 902	24 488
Sweden	2 494	31 002	7 940	41 502
United Kingdom	34 476	355	124 091	158 924
Norway	4 463	8 037	10 626	23 136

(1) Provisional data.

(2) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_axle)

Road tractors and semi-trailers carried 77.6 % of total EU-28 tonne-kilometres in 2015 (Table 3.2.2). At individual Member State level, almost all countries had more than 60 % of their transport performance carried by road tractors and semi-trailers. Only Sweden and Finland had a large majority of tonne-kilometres performed by lorries and trailers (74.7 % in Sweden and 71.3 % in Finland).

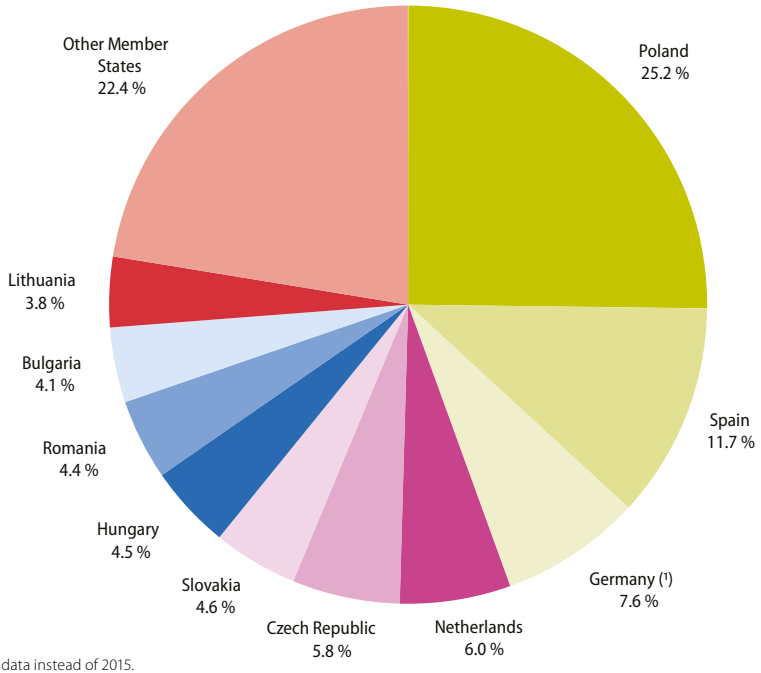
In 2015, Poland continued to have the highest share in EU international transport (25.2 %) and saw the share of international transport in its total road freight transport growing from 56.8 % in 2011 to 59.8 % in 2015 (Figure 3.2.5).

Poland is followed by Spain with a share of 11.7 % in EU international transport and an increase in the share of international transport in its total road freight transport from 31.2 % in 2011 to 34.5 % in 2015.

EU-28 share of cross-trade is 24.9 % and cabotage represents 5.2 % (Figure 3.2.6). For six Member States (Lithuania, Bulgaria, Slovakia, Luxembourg, Hungary and Slovenia), the share of cross-trade in international transport represented more than 40 % of international transport. It can be observed that for Luxembourg the share of cabotage is also very high with 21.9 %. This can be explained by the small geographical size and location of the country.

Figure 3.2.5: Share of each Member State in EU-28 total international road freight transport, 2015

(% of tonne-kilometres)

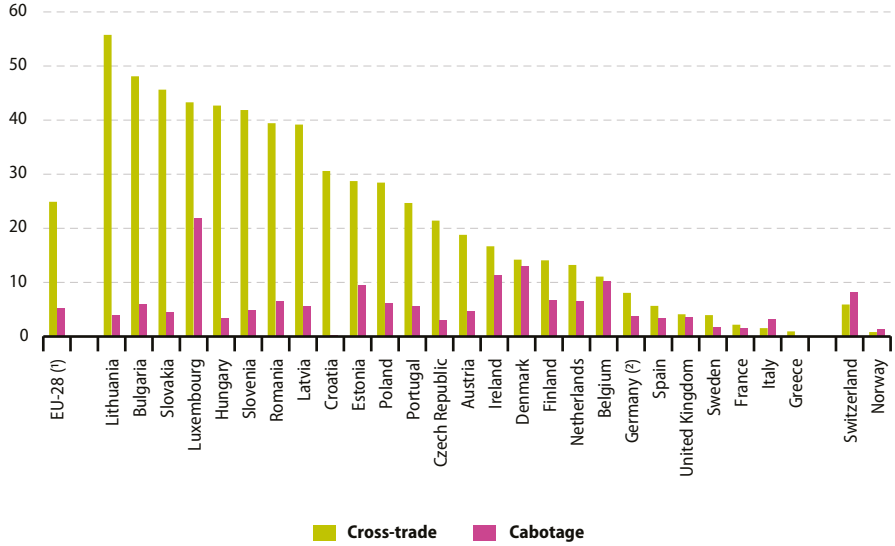


(1) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_tott)

Figure 3.2.6: Share of cross-trade and cabotage in international road freight transport, 2015

(% of tonne-kilometres)



Note: Data not available for Cyprus.

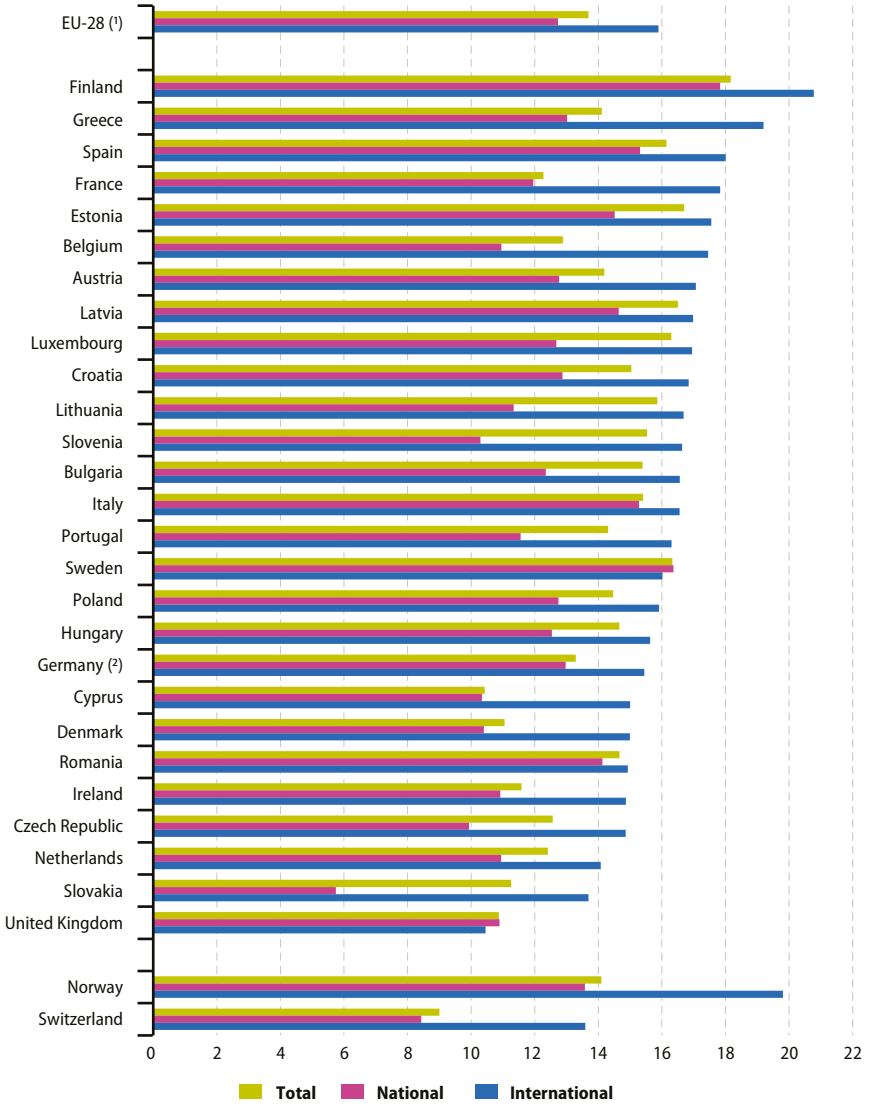
(1) Provisional data.
(2) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_tott)

Average load provides information on the average weight in tonnes carried per road vehicle in each Member State and at EU level (Figure 3.2.7). EU-28 average vehicle loads were 13.7 tonnes in 2015, with national loads of 12.7 tonnes and international loads of 15.9 tonnes. Finland had the highest international load at 20.8 tonnes as well as the highest national load at 17.8 tonnes. Vehicle loads were higher for longer distance journeys with the exception of the United Kingdom and Sweden. It can be noticed that the average load in national transport in Slovakia was 54.9 % below the EU average.

Figure 3.2.7: Average loads for total road freight transport, 2015

(tonnes)



Note: Data not available for Cyprus.

(1) Provisional data.
(2) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_tott)

Table 3.2.3: Road freight transport by distance class, 2015

(million tonne-kilometres)

	Less than 150 km		From 150 to 299 km		From 300 to 999 km		Over 1 000 km	
	2015	Change 2011-2015 (%)	2015	Change 2011-2015 (%)	2015	Change 2011-2015 (%)	2015	Change 2011-2015 (%)
EU-28 (1)	416 191	0.2	362 046	1.6	675 349	0.6	312 593	4.6
Belgium	9 787	-7.2	10 453	21.0	15 174	-8.6	1 492	-11.5
Bulgaria	3 227	18.8	3 137	32.4	9 541	58.1	16 453	62.8
Czech Republic	12 632	54.3	8 778	24.4	21 833	-5.0	14 085	-15.0
Denmark	5 043	-4.5	4 293	1.7	5 096	-1.2	1 069	-26.8
Germany (2)	89 932	5.9	71 989	-0.2	127 502	-10.0	11 348	-30.3
Estonia	912	-2.1	716	-7.5	1 765	16.6	2 853	6.4
Ireland	4 026	5.6	3 398	-0.5	1 529	-17.0	756	-10.4
Greece	5 904	-15.4	2 985	-10.8	6 734	-2.9	4 150	31.0
Spain	33 637	-8.4	26 277	2.4	92 320	1.7	57 153	6.4
France	47 656	-13.9	35 279	-15.9	66 641	-19.2	4 013	-32.4
Croatia	1 827	-11.3	1 758	12.8	4 240	20.7	2 612	45.6
Italy	30 021	-23.1	31 491	-21.0	46 846	-13.1	8 459	-15.1
Cyprus	534	-41.2	17	-10.5	1	-75.0	12	20.0
Latvia	2 028	19.7	1 211	-0.1	2 793	54.1	8 443	15.5
Lithuania	1 427	39.1	1 883	60.4	6 471	65.5	16 683	8.5
Luxembourg	1 300	-14.3	1 691	-10.9	3 792	-19.3	312	-55.9
Hungary	5 657	4.1	5 321	1.6	13 536	21.9	13 711	9.1
Malta	:	:	:	:	:	:	:	:
Netherlands	24 690	34.5	19 190	9.8	20 644	-32.2	5 537	-25.3
Austria	9 090	10.2	5 541	-6.1	7 836	-23.4	2 123	-38.9
Poland	34 187	3.5	35 781	29.4	108 672	40.9	82 069	17.5
Portugal	4 811	-22.9	4 367	-2.7	9 058	6.7	13 543	-21.4
Romania	4 802	11.8	3 837	36.8	12 977	82.0	17 402	43.6
Slovenia	1 708	-1.4	1 514	10.3	7 764	23.3	6 886	-1.4
Slovakia	3 349	13.2	3 354	22.3	13 303	42.3	13 499	-4.2
Finland	7 474	-14.4	5 886	-18.7	9 607	1.4	1 523	7.3
Sweden	12 900	40.0	9 799	23.6	14 861	2.6	3 358	37.8
United Kingdom	57 630	4.2	62 100	6.7	44 813	3.6	2 599	-23.7
Norway	7 343	7.1	4 513	37.0	9 360	23.9	1 920	29.6
Switzerland	7 859	1.2	2 581	-1.4	1 732	-27.1	:	-

(1) Provisional data.

(2) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_dc)

At EU-28 level, most of the goods are carried over distances between 300 km and 999 km (38.2 % in 2015) (Table 3.2.3). This is also the case for most of the countries. However, in specific cases, some countries have different patterns.

For some island Member States or countries with an important domestic market, the share of road freight transport over short distances (less than 150 km) is higher: Ireland, Cyprus, the Netherlands and Austria. On the opposite, countries with important international transport usually have a higher share of road freight transport over long distances (over 1 000 km), such as Bulgaria, Latvia, Lithuania, Hungary, Portugal, Romania and Slovakia.

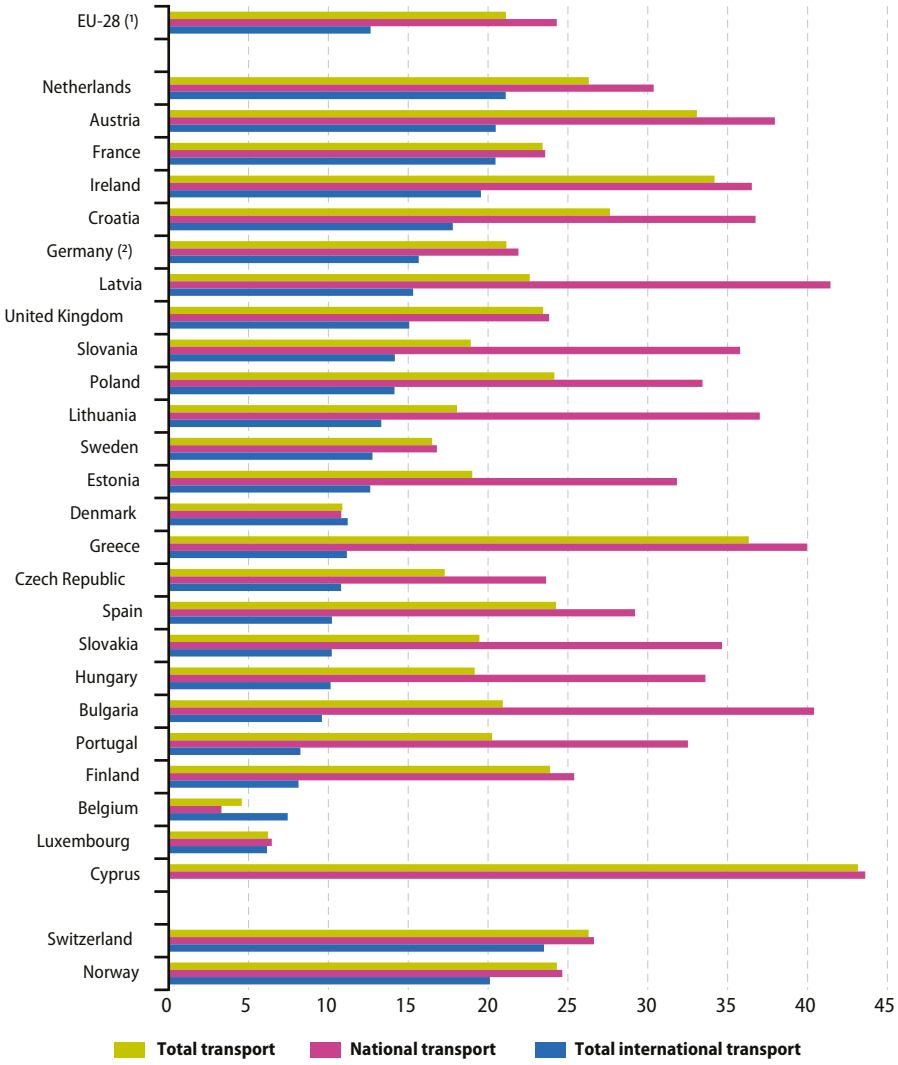
Figure 3.2.8 illustrates that a fifth of journeys at EU-28 level were performed by empty vehicles (21.1 % in 2015). The share of empty journeys grows to 24.3 % for national transport, but is only 12.6 % for international transport in 2015.

At the total transport level, most Member States fall in the range between 15 % and 30 % empty journeys. However, the figure for Cyprus is 43.2 %, probably a reflection of the journeys carrying goods imported through ports and construction traffic, which is largely one way. Empty journeys for Greece and Ireland, recording 36.3 % and 34.2 % empty vehicle-kilometres respectively, again possibly reflect port and construction traffic. At the other extreme are Belgium with 4.6 % empty vehicle-kilometres, Luxembourg with 6.2 % and Denmark with 10.9 %.

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 three countries being over 20 % (the Netherlands with 21.1 %, France and Austria 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 3.2.8: Share of empty journeys in the total road journeys by type of operation, 2015

(% of vehicle-kilometres)



Note: Data not available for Italy and Romania.

(1) Provisional data.
(2) 2014 data instead of 2015.

Source: Eurostat (online data code: road_go_ta_tott)

Table 3.2.4: EU-28 road freight transport by group of goods (NST 2007), 2013-2015

NST2007	Million tonnes					Billion tonne-kilometres				
	2013	2014	2015	Share in 2015 (%)	Change 2014-15 (%)	2013	2014	2015	Share in 2015 (%)	Change 2014-15 (%)
Agriculture, forestry and fishery products	1 232	1 290	1 301	9.1	0.9	185	189	196	11.1	3.8
Coal and lignite; crude petroleum and natural gas	184	109	153	1.1	40.2	11	10	10	0.6	-2.0
Metal ores and peat	3 515	3 629	3 628	25.3	0.0	126	129	135	7.6	4.4
Food products, beverages and tobacco	1 647	1 626	1 713	11.9	5.3	294	290	302	17.1	4.2
Textiles and textile products; leather and leather products	71	64	67	0.5	4.6	19	17	16	0.9	-2.5
Wood and wood products (except furniture); pulp, paper and paper products; printed and recorded media	565	564	581	4.1	3.1	118	114	120	6.8	5.5
Coke and refined petroleum products	474	470	505	3.5	7.4	49	48	51	2.9	6.3
Chemicals and chemical products; rubber and plastic products; nuclear fuel	536	561	571	4.0	1.6	121	123	126	7.1	2.6
Other non-metallic mineral products	1 777	1 771	1 726	12.0	-2.5	137	136	138	7.8	1.0
Basic metals and fabricated metal products (except machinery and equipment)	544	549	530	3.7	-3.4	122	121	120	6.8	-1.4
Machinery and equipment	262	262	272	1.9	4.1	55	54	54	3.1	0.9
Transport equipment	235	255	265	1.9	3.9	63	66	69	3.9	4.1
Furniture and other manufactured goods	96	103	109	0.8	5.7	29	30	31	1.8	3.2
Secondary raw materials, wastes	1 100	1 135	1 121	7.8	-1.3	63	67	70	4.0	4.3
Mail, parcels	173	171	184	1.3	8.1	37	36	39	2.2	7.2
Equipment and material for transport of goods	256	279	298	2.1	6.7	38	38	41	2.3	6.2
Goods moved in removals; baggage accompanying travellers	139	148	159	1.1	7.3	13	14	14	0.8	1.1
Mixture of different types of goods which are transported together	819	811	785	5.5	-3.2	175	179	172	9.8	-3.7
Unidentifiable goods	159	162	206	1.4	27.6	26	26	28	1.6	7.9
Other goods	168	176	159	1.1	-9.5	35	36	34	1.9	-5.3

Note: Provisional data for 2015.

Source: Eurostat (online data code: road_go_ta_tg)

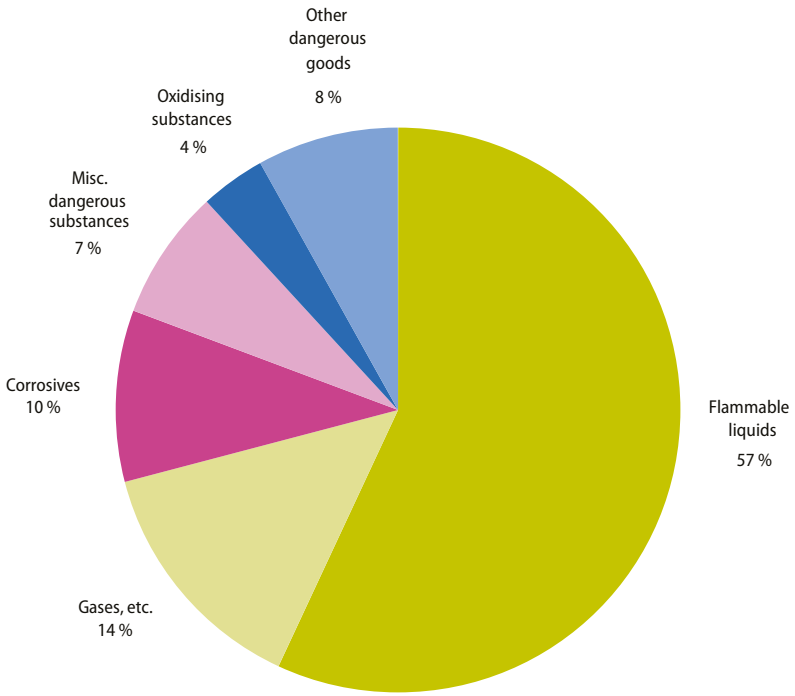
In terms of tonnage, in 2015 European freight transport increased for the second year in a row (1.4 % compared to 2014). Within the major product groups, the rises the most marked concerned coal, lignite, crude petroleum and natural gas (40.2 %) and mail and parcels (8.1 %). Metal products (-3.4 %) and other non-metallic mineral products (-2.5 %) saw the highest decreases (Table 3.2.4).

The major product groups were mining and quarrying products (25.3 % of the total), other non-metallic mineral products (12.0 %), food, beverages and tobacco (11.9 %) and agricultural products (9.1 %).

In terms of tonne-kilometres, the major product groups were food, beverages and tobacco (17.1 % of the total), agricultural products (11.1 %), other non-metallic mineral products (7.8 %), metal ores (7.6 %) and chemicals (7.1 %) as well as wood products and metal products (both 6.8 %). There were falls of 2.5 % for textiles, textile products, leather and leather products and 2.0 % for coal, lignite, crude petroleum and natural gas. There was a rise of 7.2 % in mail and parcels between 2014 and 2015.

Figure 3.2.9: EU-28 road transport of dangerous goods by type of goods, 2015

(% of tonne-kilometres)



Note: Provisional data.

Source: Eurostat (online data code: road_go_ta_dg)

The transport of dangerous goods in the EU-28 reached almost 82 billion tonne-kilometres in 2015 (+8.8 % compared to 2014). The largest group of dangerous goods was flammable liquids, taking over more than half of the total.

Two other groups, gases (compressed, liquefied or dissolved under pressure) and corrosives, accounted for 14.0 % and 9.8 % respectively. This represents very little change compared with previous years (Figure 3.2.9).

Table 3.2.5: Main country-to-country flows in intra EU-28 road freight transport, 2015

Rank	Pair of countries		Total tonnes (million)	Hauliers of first country (%)	Hauliers of second country (%)	All other hauliers (%)	Main other haulier
1	Germany (1)	Netherlands	83.8	26.6	58.9	14.4	Poland
2	Belgium	France	51.9	42.3	26.4	31.3	Luxembourg
3	Belgium	Netherlands	51.2	19.5	70.2	10.3	Poland
4	Germany (1)	Poland	49.9	4.6	94.6	0.8	Lithuania
5	Germany (1)	France	45.9	41.8	15.5	42.7	Poland
6	Belgium	Germany (1)	39.4	15.8	38.5	45.6	Netherlands
7	Spain	France	38.2	82.1	6.1	11.8	Portugal
8	Austria	Germany (1)	34.7	33.5	35.1	31.4	Hungary
9	Czech Republic	Germany (1)	29.4	75.9	12.9	11.2	Poland
10	Germany (1)	Italy	20.0	31.0	20.3	48.7	Poland
11	Spain	Portugal	19.5	43.8	55.5	0.6	Romania
12	France	Italy	17.4	25.8	39.0	35.2	Poland
13	France	Netherlands	16.0	10.5	55.0	34.4	Belgium
14	Czech Republic	Poland	14.6	12.6	86.3	1.1	Slovakia
15	Czech Republic	Slovakia	13.6	52.2	45.2	2.6	Germany (1)
16	Ireland	United Kingdom	12.6	37.5	61.3	1.2	Poland
17	Germany (1)	Denmark	11.9	63.5	9.4	27.1	Poland
18	Germany (1)	Spain	11.9	6.2	62.8	31.0	Poland
19	Austria	Italy	10.8	34.5	20.2	45.3	Slovenia
20	Germany (1)	Luxembourg	8.1	49.5	38.9	11.6	Poland

(1) 2014 data instead of 2015.

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

When looking at the European road transport at the more detailed country-to-country level, France appeared in several of the top 20 intra-EU country-to-country flows (Table 3.2.5). However, French hauliers generally have a share substantially lower than 50 % in the bilateral flows, with the lowest a 6.1 % share of the road freight traffic between Spain and France. French hauliers achieved their highest shares in Belgium/France traffic (26.4 %) and France/Italy traffic (25.8 %).

The penetration of third-country hauliers in the main flows varied substantially. Third-country penetration varied from 45.3 % for Austria/Italy traffic, 35.2 % for France/Italy and 34.4 % for France and the Netherlands to 1.2 % for Ireland/United Kingdom, 1.1 % for the Czech Republic/Poland and 0.6 % for Spain/Portugal.

The nationality of the main third-party hauliers involved in the transport movements shows the success of Polish hauliers in their entry into third-country markets. Poland emerged as the most successful third country with its hauliers appearing as the main other haulier in several of the top 20 country to country markets. In most cases, there is a geographical link between the third country and the countries where the transport is performed.

Regarding extra-EU flows, i.e. transport between an EU country and an extra-EU country, five extra-EU states emerge as main trading partners: Switzerland, Norway, Russia, Turkey and San Marino (Table 3.2.6). With three exceptions, all the trading was with close neighbours. Switzerland's traffic was with France (11.7 % of the total extra-EU transport), Italy, Austria, Belgium and the Netherlands, while Norway had links with Sweden and Denmark. Russia mainly traded with Poland, Turkey with Bulgaria and San Marino with Italy.

Table 3.2.6: Main country-to-country flows in extra EU-28 road freight transport, 2015

Rank	Pair of countries		Total tonnes (million)	% in total extra EU-28 tonnes
1	Germany (1)	Switzerland	19.0	24.9
2	Sweden	Norway	9.5	12.5
3	France	Switzerland	8.9	11.7
4	Italy	Switzerland	4.9	6.4
5	Switzerland	Austria	3.1	4.1
6	Russia	Poland	2.0	2.6
7	Turkey	Bulgaria	1.6	2.1
8	Switzerland	Belgium	1.4	1.9
9	Norway	Denmark	1.3	1.7
10	Norway	Germany (1)	1.2	1.6
11	Netherlands	Switzerland	1.1	1.4
12	San Marino	Italy	1.0	1.3

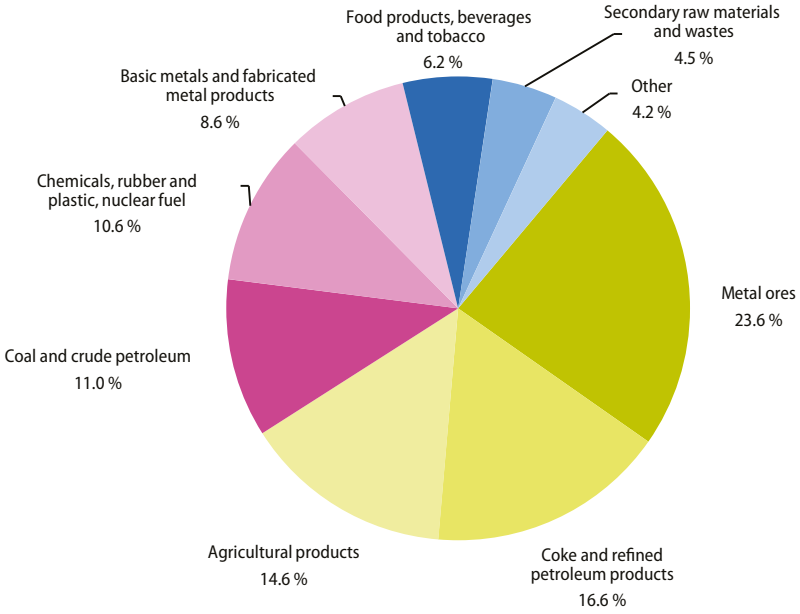
(1) 2014 data instead of 2015.

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 2015 are metal ores, coke and refined petroleum and products of agriculture (Figure 3.2.10). This was similar to the results in 2014. Compared with 2014, while the share of metal ores and coal and crude petroleum in total transport performance decreased by 0.1 and 0.7 percentage point respectively, the share of coke and refined petroleum products rose by 0.2 percentage points and the share of products of agriculture by 1.1 percentage points. In terms of tonne-kilometres, the top-three products accounted for more than half of all goods transport on EU inland waterways in 2015.

Figure 3.2.10: EU-28 inland waterways transport performance by main type of goods, 2015

(% of tonne-kilometres)



Source: Eurostat (online data code: iww_go_atygo)

Table 3.2.7: Gross weight of seaborne freight handled in all ports, 2005-2015

(million tonnes)

	2005	2010	2011	2012	2013	2014	2015			Growth 2014-2015 (%)
	Total						Inwards	Outwards	Total	
EU-28	3 742	3 670	3 767	3 737	3 719	3 789	2 278	1 561	3 838	1.3
Belgium	207	228	233	224	228	238	129	113	241	1.5
Bulgaria	25	23	25	26	29	27	13	15	27	-0.3
Denmark	100	87	93	88	88	92	55	40	95	3.1
Germany	285	276	296	299	297	304	173	123	296	-2.6
Estonia	47	46	48	44	43	44	10	25	35	-19.8
Ireland	52	45	45	48	47	47	34	17	51	6.7
Greece	150	128	134	153	161	168	91	76	167	-0.7
Spain	400	377	404	420	397	428	255	192	447	4.5
France (1)	341	316	322	303	304	298	197	101	298	-0.1
Croatia	26	24	22	19	19	19	12	6	19	1.8
Italy	509	494	500	477	457	443	293	166	458	3.4
Cyprus	7	7	7	6	7	7	6	4	10	42.9
Latvia	60	59	67	73	67	72	7	61	68	-5.6
Lithuania	26	38	43	41	40	41	15	29	43	4.9
Malta	4	4	3	3	3	3	3	0	4	7.1
Netherlands	461	539	533	552	558	570	407	188	594	4.2
Poland	55	60	58	59	64	69	40	30	70	1.1
Portugal	65	66	68	68	78	80	51	36	87	8.2
Romania	48	38	39	40	44	44	20	25	45	1.8
Slovenia	13	15	16	17	17	18	13	7	20	10.7
Finland	100	109	115	105	105	106	49	49	98	-7.4
Sweden	178	180	177	173	162	168	92	78	170	1.3
United Kingdom	585	512	519	501	503	503	314	183	497	-1.3
Iceland	6	6	6	6	7	7	5	2	7	6.9
Norway	192	185	189	206	207	201	62	131	194	-3.6
Montenegro	:	:	:	1	1	1	1	1	1	19.8
Turkey	:	338	359	375	379	379	237	175	412	8.7

(1) Partially estimated for 2009-2014.

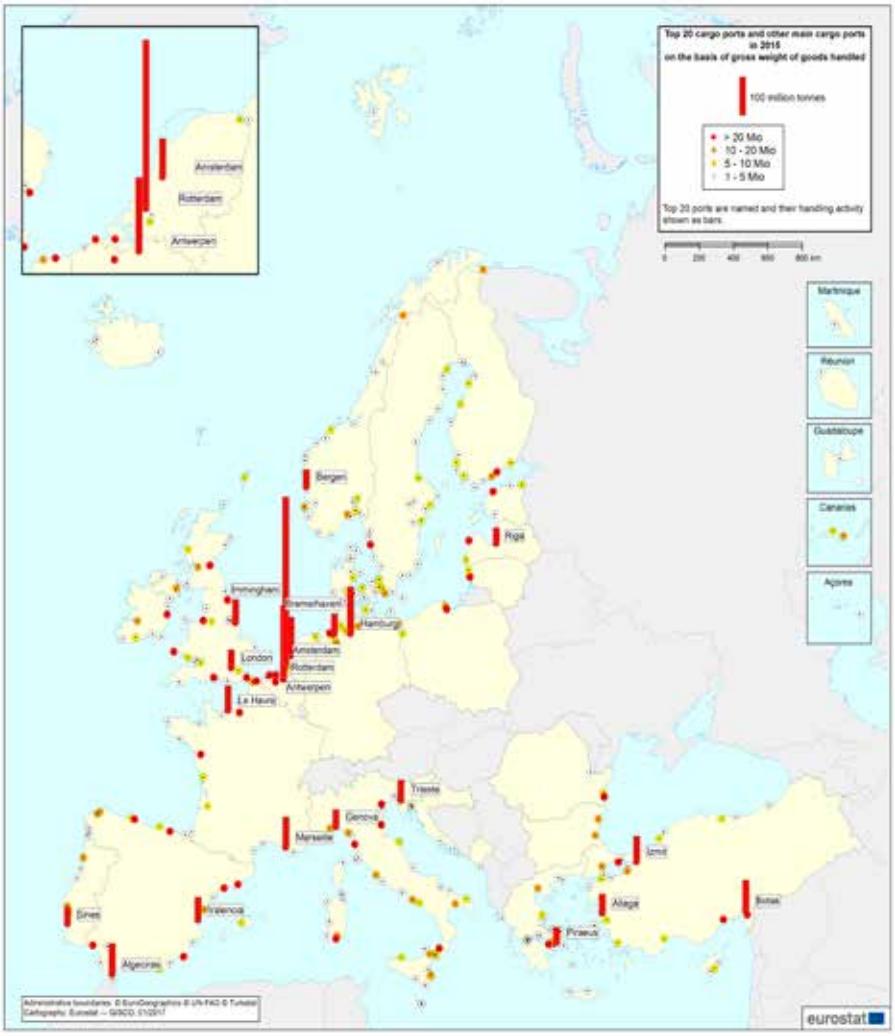
Source: Eurostat (online data code: mar_mg_aa_cwhd)

The total gross weight of goods handled in EU ports is estimated at just above 3.8 billion tonnes in 2015, an increase of 1.3 % from 2014 (Table 3.2.7). According to the latest figures, the EU port freight activity sustained its slow growth in 2015.

The Netherlands has reported the largest volumes of seaborne freight handling in Europe every year since overtaking the United Kingdom in 2010. At 594 million tonnes, the volume of seaborne goods handled in Dutch ports represented 15.5 % of the EU-28 total in 2015. The Netherlands was followed by the United Kingdom and Italy, with shares of 12.9 % and 11.9 % of the EU total, respectively.

Compared with 2014, the largest relative increases in port freight activity among the Member States were recorded by Cyprus (42.9 %), Slovenia (10.7 %), and Portugal (8.2 %). There were also substantial increases in the candidate countries Montenegro (19.8 %) and Turkey (8.7 %). The largest relative decreases were recorded in Estonia (-19.8 %), Finland (-7.4 %) and Latvia (-5.6 %).

Map 3.2.1: Main cargo ports in the reporting countries by gross weight of freight handled, 2015



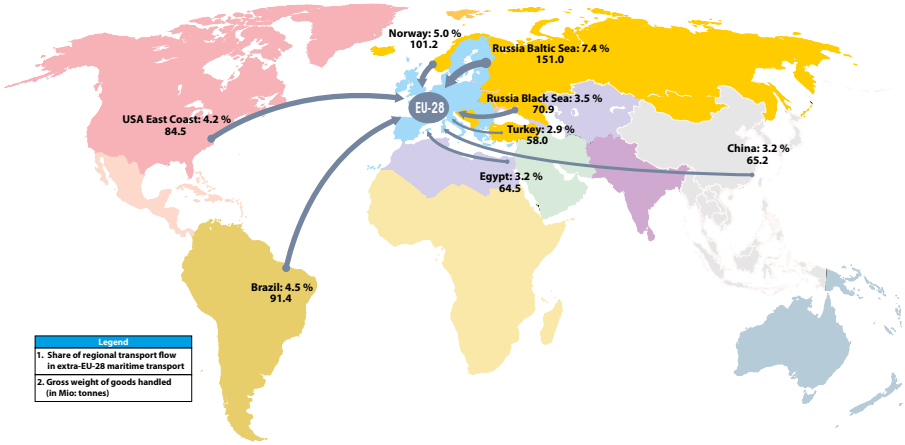
Source: Eurostat (online data code: mar_mg_aa_pwhd)

Rotterdam, Antwerpen and Hamburg, all located on the North Sea coast, maintained their positions as Europe's top three ports in 2015, both in terms of the gross weight of goods handled and in terms of the volume of containers handled in the ports (Map 3.2.1). 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 2015, a slight increase compared to 2014. The largest port in Europe, Rotterdam in the Netherlands, on its own accounted for close to 10 % of the total tonnage handled in the countries reporting maritime freight data to Eurostat.

The EU seaborne transport of goods increased from 2014 to 2015. The majority of these goods were transported to or from ports outside the EU, making maritime transport the most important mode for long distance transport of goods to or from the EU.

All of the top eight maritime flows of goods between the EU and its main international partner regions in 2015 were inward flows (Map 3.2.2). In declining order, these were the inward flows of goods from the Baltic Sea region of Russia (7.4 % of the total EU seaborne transport), Norway (5.0 %), Brazil (4.5 %), the East Coast of the USA (4.2 %), the Black Sea region of Russia (3.5 %), China (3.2 %), Egypt (3.2 %) and Turkey (2.9 %).

Map 3.2.2: Main maritime extra EU-28 transport flows by gross weight of freight handled, 2015



Source: Eurostat (online data code: mar_go_aa)

Table 3.2.8: Air freight and mail loaded and unloaded, 2015

	Total transport		National transport		International intra-EU-28 transport		International extra-EU-28 transport	
	Thousand tonnes	Growth 2014-2015 (%)	Thousand tonnes	Growth 2014-2015 (%)	Thousand tonnes	Growth 2014-2015 (%)	Thousand tonnes	Growth 2014-2015 (%)
EU-28 (1)	14 587	1.8	576.2	-0.8	2 508	8.2	11 504	0.6
Belgium	1 126	11.0	1.0	193.2	370	11.2	755	10.8
Bulgaria	32	36.6	0.0	-31.3	15	6.8	16	87.2
Czech Republic	58	0.2	0.1	-64.3	26	4.5	32	-2.4
Denmark	211	0.9	0.8	-8.3	74	3.3	136	-0.2
Germany	4 326	-0.2	117.0	-0.2	1 023	5.3	3 186	-1.9
Estonia	16	-17.5	0.0	-	8	-5.4	8	-26.5
Ireland	149	7.6	4.6	-7.9	75	3.4	69	13.8
Greece	62	3.3	5.9	-3.3	36	-3.4	20	21.1
Spain	594	0.1	57.6	-5.5	178	7.1	359	-2.2
France	2 381	3.5	201.9	1.7	565	5.3	1 614	3.1
Croatia	7	4.1	0.6	-8.2	5	7.1	2	0.5
Italy	917	6.1	45.0	2.4	278	6.8	594	6.1
Cyprus	28	-1.7	0.0	-	18	-4.4	10	3.9
Latvia	17	-46.5	0.0	-	9	-9.2	7	-64.8
Lithuania	15	12.8	0.0	-	9	1.8	6	35.6
Luxembourg	737	4.2	0.0	-	48	-7.4	689	5.1
Hungary	66	6.2	0.0	-	44	8.7	22	1.4
Malta	16	5.1	0.0	-	12	7.3	4	-0.6
Netherlands	1 712	-0.9	0.0	-100.0	64	4.7	1 648	-1.1
Austria	217	-0.5	0.2	-6.7	58	-4.5	158	1.0
Poland	93	10.0	3.1	-22.2	53	14.6	37	7.4
Portugal	133	-1.2	14.3	-2.7	50	2.2	69	-3.1
Romania	33	7.3	0.0	-3.7	27	7.8	6	5.6
Slovenia	9	3.8	0.0	-	8	10.7	1	-28.5
Slovakia	21	14.7	0.0	0.0	19	17.7	2	-7.9
Finland	182	-4.5	2.4	-1.3	75	5.9	105	-10.7
Sweden	146	3.1	15.2	0.3	58	3.2	73	3.7
United Kingdom	2 405	0.0	106.3	-3.5	423	6.7	1 876	-1.3

(1) Double-counting is excluded in the intra-EU-28 and total EU-28 aggregates by considering only departure declarations.

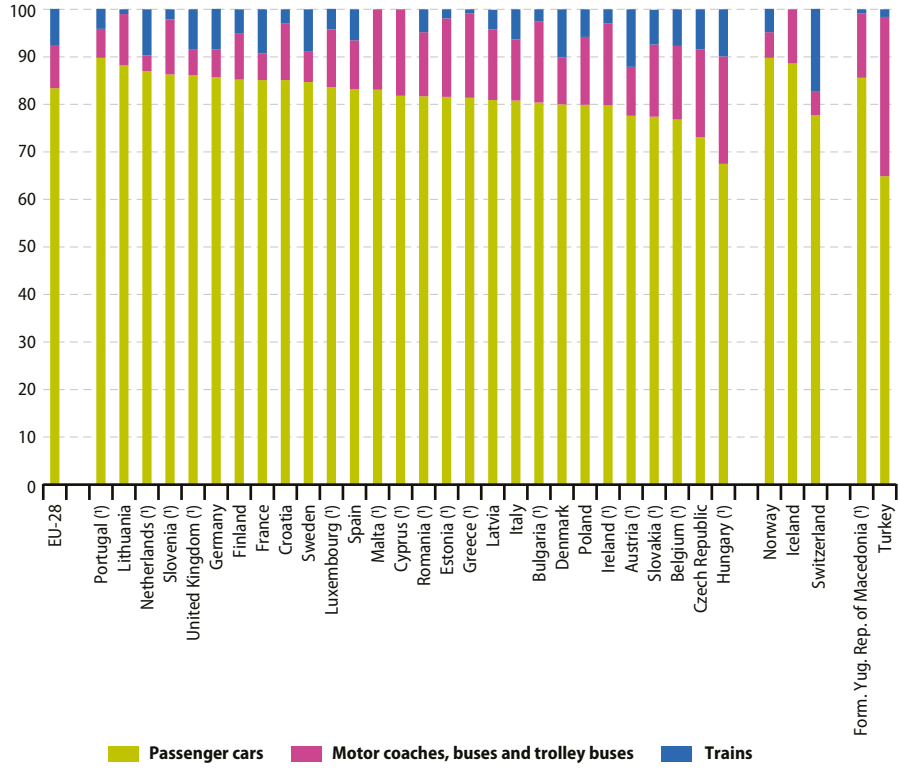
Source: Eurostat (online data code: avia_gooc)

The growing importance of the international transport segment is reflected in air freight and mail transport figures at EU level (Table 3.2.8). In 2015, growth rates of 8.2 % and 0.6 % were recorded for international intra-EU and extra-EU respectively, compared with 2014. In contrast, domestic freight and mail transport recorded a decrease of 0.8 % over the same period. Table 3.2.8 shows that the evolution of freight and mail transport by air between 2014 and 2015 varies significantly at country level, with growth rates ranging from -46.5 % in Latvia, to +36.6 % in Bulgaria.

3.3 Passenger transport

Figure 3.3.1: Modal split of inland passenger transport, 2014

(% of total inland passenger-kilometres)



Note: Cyprus, Malta and Iceland have no railways.

(!) Includes estimates or provisional data.

Source: Eurostat (online data code: tran_hv_psmod)

Figure 3.3.1 shows that passenger cars accounted for 83.4 % of inland passenger transport in the EU-28 in 2014, with motor coaches, buses and trolley buses (9.1 %) and trains (7.6 %) both accounting for less than a tenth of all traffic (as measured by the number of inland passenger-kilometres (pkm) travelled by each mode).

Between 2004 and 2014 the relative importance of the use of passenger cars was quite stable, with its share always within the range of 83.0 % to 83.7 %. Over this period, the relative importance of passenger transport by train increased fairly steadily from 6.7 % in 2004 to 7.6 % in 2014. Combined with this development was a fall in the importance of passenger transport by motor coaches, buses and trolley buses, down from 9.9 % in 2004 to 9.1 % by 2014.

In 2015, there were around 392 billion passenger-kilometres travelled on national railway networks in the EU This figure was considerably higher than the 23 billion passenger-kilometres travelled on international journeys.

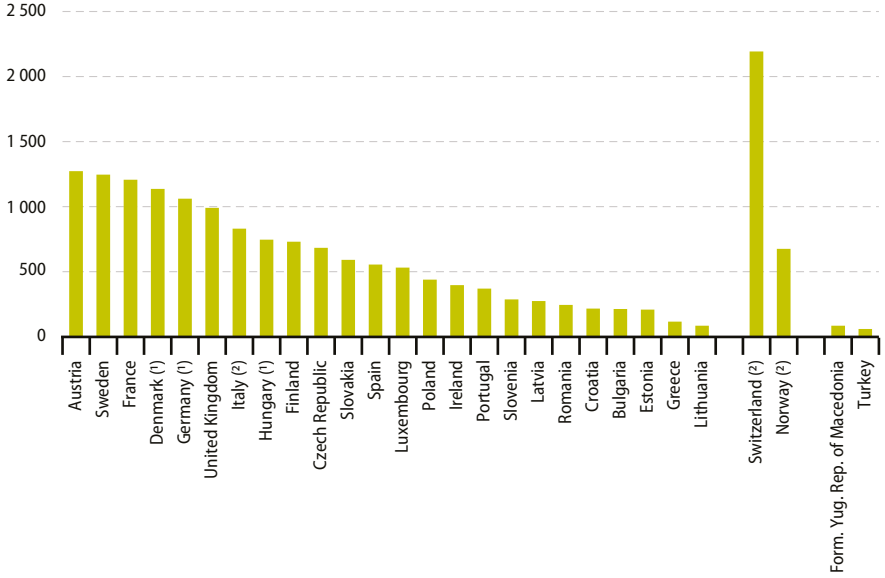
In order to compare the relative importance of rail transport between countries, the data can be normalised by expressing the level of passenger traffic in relation to population. Figure 3.3.2 shows that travel on the national rail network in Austria, Sweden, France, Denmark (2014 data) and Germany (2014 data) averaged more than thousand passenger-kilometres per inhabitant in 2015.

However, this was well below the average recorded in Switzerland (2 193 passenger-kilometres per inhabitant).

By contrast, in 2015, the lowest average distances travelled on national railway networks were recorded in Greece (116 passenger-kilometres per inhabitant) and Lithuania (85 passenger-kilometres), while the average in Turkey (61 passenger-kilometres) was lower still and that in the former Yugoslav Republic of Macedonia (85 passenger-kilometres) was equal to the average distance travelled in Lithuania.

Figure 3.3.2: National rail passenger transport, 2015

(passenger-kilometres per inhabitant)



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

(1) 2014 data instead of 2015.
(2) Provisional data.

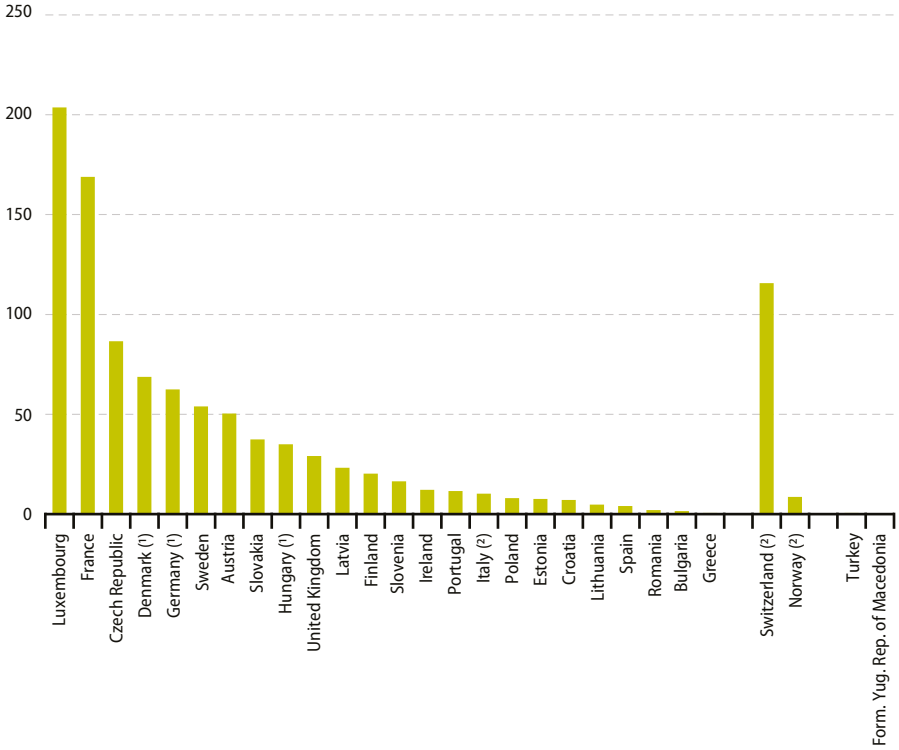
Source: Eurostat (online data codes: rail_pa_typepkm and demo_gind)

In terms of international rail travel, the only EU Member States to report averages of more than 100 passenger-kilometres per inhabitant in 2015 were Luxembourg (204 passenger-kilometres) and France (169 passenger-kilometres) (Figure 3.3.3); this level was also surpassed in Switzerland (116 passenger-kilometres).

These figures may reflect, among others, the proximity of international borders, the importance of international commuters within the workforce, access to high-speed rail links, and whether or not international transport corridors run through a particular country.

Figure 3.3.3: International rail passenger transport, 2015

(passenger-kilometres per inhabitant)



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

(1) 2014 data instead of 2015.
(2) Provisional data.

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

Table 3.3.1: Evolution of rail passenger transport between 2014 and 2015

(thousand passengers)

	National			International			Total		
	2014	2015	Growth 2014-2015 (%)	2014	2015	Growth 2014-2015 (%)	2014	2015	Growth 2014-2015 (%)
EU-28 (1)	9 010 969	9 205 610	2.2	156 187	157 118	0.6	9 167 161	9 361 117	2.1
Belgium	:c	:c	:c	:c	:c	:c	:c	:c	:c
Bulgaria	24 325	22 284	-8.4	289	234	-19.0	24 615	22 518	-8.5
Czech Republic	172 255	171 976	-0.2	3 450	4 170	20.9	175 705	176 146	0.3
Denmark (2)	197 549	:	:	12 403	:	:	209 952	213 000	1.5
Germany (2)	2 678 025	2 670 893	-0.3	15 055	14 015	-6.9	2 693 080	2 684 908	-0.3
Estonia	5 808	6 604	13.7	97	55	-43.3	5 905	6 659	12.8
Ireland	37 804	39 347	4.1	713	313	-56.1	38 517	39 660	3.0
Greece (2)	13 356	16 008	19.9	43	32	-25.6	13 399	16 040	19.7
Spain	558 301	560 902	0.5	1 019	1 039	2.0	559 320	561 941	0.5
France	1 114 684	1 197 822	7.5	42 994	43 256	0.6	1 157 679	1 241 078	7.2
Croatia	21 528	21 331	-0.9	361	318	-11.9	21 889	21 649	-1.1
Italy	818 577	826 020	0.9	3 145	3 474	10.5	821 722	829 494	0.9
Cyprus	-	-	-	-	-	-	-	-	-
Latvia	18 938	16 885	-10.8	252	179	-29.0	19 190	17 065	-11.1
Lithuania	3 672	3 430	-6.6	454	360	-20.7	4 126	3 790	-8.1
Luxembourg	15 466	16 133	4.3	6 037	6 363	5.4	21 503	22 496	4.6
Hungary (2)	143 407	:c	:c	2 603	:c	:c	146 010	144 398	-1.1
Malta	-	-	-	-	-	-	-	-	-
Netherlands (3)	:c	:c	:c	:c	:c	:c	339 179	392 153	15.6
Austria	222 381	230 921	3.8	10 234	9 667	-5.5	232 616	240 588	3.4
Poland	250 460	263 178	5.1	1 426	1 144	-19.8	251 887	264 322	4.9
Portugal	128 139	130 195	1.6	156	226	44.9	128 295	130 421	1.7
Romania	64 525	61 001	-5.5	225	217	-3.6	64 751	61 218	-5.5
Slovenia	14 054	13 792	-1.9	381	343	-10.0	14 435	14 135	-2.1
Slovakia	45 706	56 991	24.7	3 392	3 301	-2.7	49 098	60 292	22.8
Finland	67 744	75 524	11.5	518	428	-17.4	68 262	75 952	11.3
Sweden	195 022	201 745	3.4	12 258	12 689	3.5	207 280	214 434	3.5
United Kingdom	1 659 637	1 702 234	2.6	20 109	19 847	-1.3	1 679 746	1 722 081	2.5
Liechtenstein	:	:	:	:	:	:	96	97	1.0
Norway	69 867	73 339	5.0	473	497	5.1	70 341	73 836	5.0
Switzerland	452 898	469 052	3.6	13 629	14 000	2.7	466 527	483 051	3.5
Montenegro	:	:	:	:	:	:	922	1 122	21.7
Form. Yug. Rep. of Macedonia	791	1 013	28.1	12	9	-25.0	803	1 022	27.3
Turkey	78 247	95 186	21.6	156	132	-15.4	78 403	95 318	21.6

(1) Estimated.
(2) Share in total is based on 2014 data instead of 2015; 2015 data is the sum of quarterly data.
(3) 2014 and 2015 totals are the sum of quarterly data.

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

All in all, seventeen of the EU Member states reported increases in passenger transport by rail (in thousand passengers) between 2014 and 2015 (Table 3.3.1). The largest increases were recorded in Slovakia (22.8 %), Greece (19.7 %) and the Netherlands (15.6 %). In contrast, the transport of passengers decreased by 11.1 % in Latvia, 8.5 % in Bulgaria and 8.1 % in Lithuania.

Concerning the evolution of international transport between 2014 and 2015, the largest increases were reported by Portugal (44.9 %) and Czech Republic (20.9 %). In contrast, the largest decreases were reported by Ireland (56.1 %) and Estonia (-43.3 %). For national transport, Slovakia registered the largest increase with 24.7 % and Latvia the largest decrease with -10.8 %.

Table 3.3.2: Air transport: passengers carried, 2015

	Total transport		National transport		International intra-EU-28 transport		International extra-EU-28 transport	
	Thousand passengers	Growth (%) 2014-2015	Thousand passengers	Growth (%) 2014-2015	Thousand passengers	Growth (%) 2014-2015	Thousand passengers	Growth (%) 2014-2015
EU-28 (1)	920 041	4.9	161 315	3.8	416 818	7.8	341 907	2.1
Belgium	30 959	7.6	28	-28.3	22 251	10.4	8 680	1.1
Bulgaria	7 611	1.2	163	-2.0	5 431	5.3	2 016	-8.2
Czech Republic	12 672	4.9	108	21.3	8 977	9.4	3 587	-5.3
Denmark	30 096	3.8	1 930	-1.1	20 018	5.6	8 147	0.7
Germany	193 936	4.0	23 157	1.6	102 897	5.0	67 882	3.4
Estonia	2 161	7.0	20	17.6	1 622	6.1	520	9.5
Ireland	29 545	12.3	71	15.5	25 108	12.0	4 366	14.0
Greece	42 096	7.6	7 482	19.4	27 564	9.1	7 050	-7.0
Spain	174 653	5.6	30 881	5.7	118 168	6.6	25 604	1.3
France	140 868	3.3	28 166	0.9	61 966	5.5	50 735	2.1
Croatia	6 572	7.0	467	0.4	4 997	8.2	1 107	5.0
Italy	127 665	5.4	29 657	1.7	73 978	8.8	24 031	0.1
Cyprus	7 591	3.6	0	-100.0	5 345	8.4	2 246	-6.4
Latvia	5 146	7.2	0	20.0	3 793	9.8	1 352	0.3
Lithuania	4 227	11.3	0	40.6	3 254	10.6	973	13.6
Luxembourg	2 652	8.9	1	64.8	2 280	12.7	371	-9.6
Hungary	10 228	13.0	0	-100.0	8 092	13.1	2 136	12.6
Malta (2)	4 620	7.7	0	6 375.0	4 188	9.3	431	-6.0
Netherlands	64 571	5.9	2	232.2	39 164	6.8	25 405	4.6
Austria	26 754	1.4	530	-8.5	18 128	2.1	8 096	0.6
Poland	28 907	12.4	1 588	7.5	21 621	15.9	5 699	2.2
Portugal	36 006	10.6	3 662	23.7	26 028	11.1	6 315	2.3
Romania	12 581	15.3	506	0.8	10 254	15.7	1 821	18.0
Slovenia	1 436	9.9	0	-	814	9.3	622	10.6
Slovakia	1 944	16.3	22	-2.7	1 577	19.3	345	5.6
Finland	17 479	1.8	2 599	3.3	10 761	1.0	4 119	3.0
Sweden	34 011	3.8	7 447	1.2	19 873	5.6	6 691	1.6
United Kingdom	232 270	5.6	22 829	4.4	137 883	7.7	71 559	2.1

(1) Double counting is excluded in the intra-EU-28 and total EU-28 aggregates by considering only departure declarations.

(2) National transport for Malta increased from 5 passengers carried in 2014 to 259 passengers in 2015.

Source: Eurostat (online data code: avia_paoc)

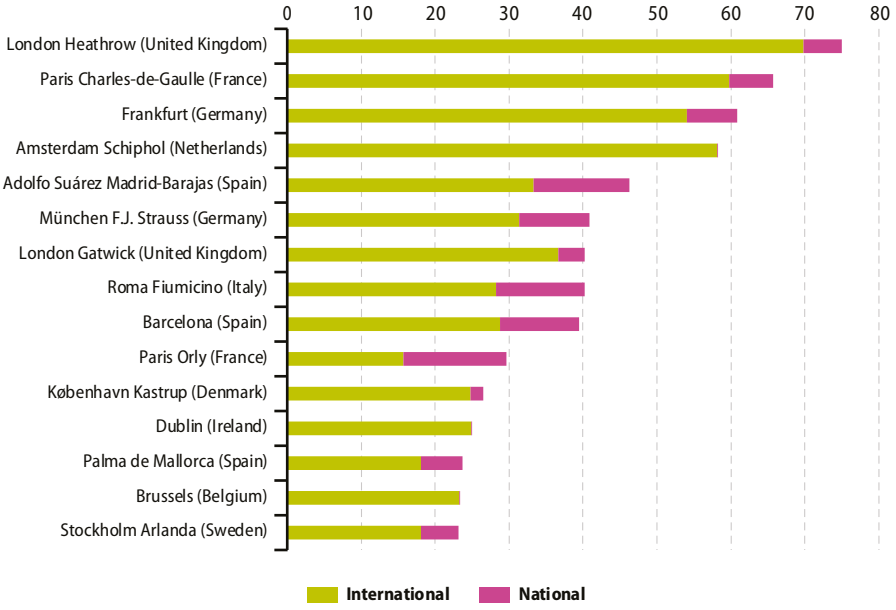
In 2015, the total number of passengers travelling by air in the European Union could be established at 920 million, an increase of 4.9 % compared to 2014 (Table 3.3.2). The disparity in total growth of air passengers by Member State between 2014 and 2015 is substantial, with year-on-year growth rates ranging from 1.2 % in Bulgaria to 16.3 % in Slovakia.

Figure 3.3.4 illustrates that London Heathrow was the busiest airport in the EU-28 in terms of passenger numbers in 2015 (75 million), as it has been since the beginning of the time series in 1993. It was followed — at some distance — by Paris Charles de Gaulle airport (66 million), Frankfurt airport (61 million) and Amsterdam's Schiphol airport (58 million). The same four airports have been the largest four in the EU since 2011 when Amsterdam Schiphol moved from fifth to fourth place.

The overwhelming majority of passengers through the four largest airports in the EU were on international flights; the lowest share was recorded for Frankfurt airport (88.7 %), rising to 100.0 % for Amsterdam Schiphol. By contrast, national (domestic) flights accounted for 28.0 % of the 46 million passengers carried through the EU's fifth busiest passenger airport in 2015, namely Adolfo Suárez Madrid-Barajas. There were also relatively high proportions of passengers on national flights to and from Paris Orly (47.2 %), Roma Fiumicino (29.7 %) and Barcelona airport (27.0 %).

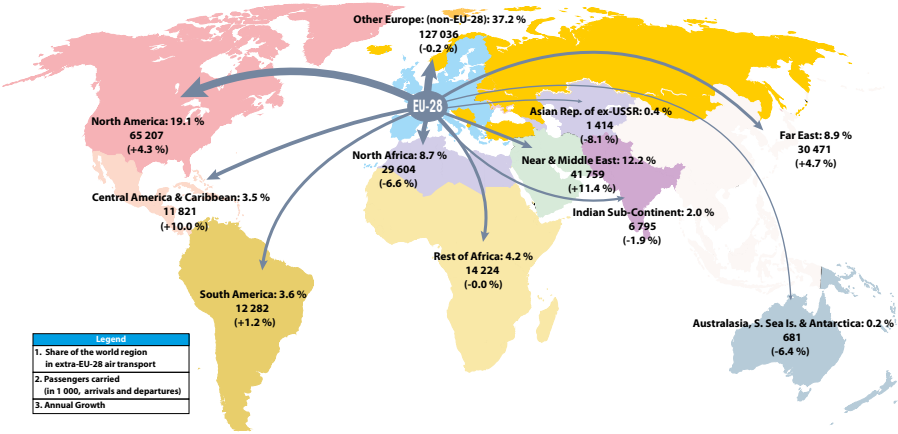
Figure 3.3.4: Top 15 airports in the EU-28 by passengers carried (embarked and disembarked), 2015

(million passengers)



Source: Eurostat (online data code: avia_paoa)

Map 3.3.1: Extra EU-28 transport of passengers by air: share in total extra-EU-28 transport, passengers carried and annual growth rate, 2015



Source: Eurostat (online data code: avia_paexcc) and Statistics explained article 'Air transport statistics'

Map 3.3.1 presents some elements of the extra-EU-28 air transport of passengers.

With a 11.4 % increase between 2014 and 2015, Near and Middle East is the partner world region with the highest increase for EU passenger transport. The highest decrease is recorded for North Africa (- 6.6 %). The continued decrease of Australia (- 6.4 %) could be partially linked to the increase in Middle East – more passengers taking indirect flight to Australia changing in Near and Middle East airports.

When it comes to maritime transport, the total number of passengers embarking and disembarking in EU ports is estimated at close to 395 million in 2015, a rise of 0.6 % from the previous year (Figure 3.3.5). Over the last five years, however, the total number of passengers embarking and disembarking in EU ports has fallen by 7.0 %. 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 3.3.5: Number of seaborne passengers embarked and disembarked in all ports, EU-28, 2002-2015

(million passengers)

Source: Eurostat (online data code: mar_mp_aa_cph)

At 70 million and close to 66 million seaborne passengers, respectively, Italian and Greek ports handled a combined share of more than 34 % of the total number of passengers embarking and disembarking in EU ports in 2015 (Table 3.3.3). In consequence, Italy and Greece remained the main countries in terms of EU seaborne passenger transport, despite both countries recording decreases in passengers embarking and disembarking compared to 2014 (-2.7 % and -1.0 %, respectively). The two leading countries were followed by Denmark with close to 42 million passengers embarking and disembarking in 2015, a slight increase from 2014.

Table 3.3.3: Number of seaborne passengers embarked and disembarked in all ports, 2012-2015

(thousand passengers)

	2012	2013	2014	2015					Growth rate 2014-2015 (%)	Growth rate 2010-2015 (%)
	Total	Total	Total	Inwards	Outwards	Cruise	Non cruise	Total		
EU-28	397 975	399 802	392 890	198 215	197 151	12 402	382 965	395 367	0.6	-7.0
Belgium	850	859	821	422	422	491	353	844	2.8	1.8
Bulgaria	1	2	1	0	2	0	2	2	60.1	67.4
Denmark	40 965	41 266	41 353	20 854	20 793	366	41 280	41 647	0.7	-0.8
Germany	29 481	29 848	30 780	14 944	15 143	1 226	28 862	30 087	-2.2	4.5
Estonia	12 654	13 146	13 654	7 062	7 102	11	14 153	14 164	3.7	26.6
Ireland	2 758	2 747	2 755	1 359	1 392	1	2 750	2 751	-0.2	-10.9
Greece	72 728	72 748	66 340	32 852	32 828	385	65 295	65 680	-1.0	-23.6
Spain	21 629	22 871	23 486	12 570	12 443	2 591	22 422	25 013	6.5	16.2
France	24 815	25 637	26 638	13 113	13 020	930	25 203	26 133	-1.9	-4.0
Croatia	26 706	27 355	23 523	13 974	13 297	52	27 220	27 271	15.9	8.5
Italy	76 735	73 238	72 225	35 145	35 123	4 139	66 129	70 268	-2.7	-19.8
Cyprus	91	99	76	35	33	67	1	68	-11.0	-36.7
Latvia	826	872	802	295	307	0	602	602	-25.0	-10.9
Lithuania	286	280	280	136	150	0	286	286	1.9	14.1
Malta	8 535	9 170	9 669	4 740	4 740	0	9 479	9 479	-2.0	14.2
Netherlands (1)	1 706	1 738	1 819	941	969	:	1 910	1 910	5.0	-4.2
Poland	2 358	2 201	2 224	1 205	1 217	0	2 421	2 421	8.9	-6.9
Portugal	565	555	551	292	291	47	536	583	5.8	-16.8
Romania	0	0	1	0	0	1	0	1	15.8	142.7
Slovenia	34	28	27	17	17	0	34	34	25.7	-13.6
Finland	18 264	18 524	18 487	9 431	9 386	0	18 817	18 817	1.8	5.3
Sweden	29 471	29 146	29 244	14 985	14 516	143	29 357	29 500	0.9	-2.3
United Kingdom	26 516	27 472	28 135	13 845	13 961	1 951	25 854	27 805	-1.2	-3.5
Iceland (1)	710	751	723	369	368	:	737	737	1.9	15.5
Norway (2)	6 003	7 898	7 908	4 015	3 296	80	7 231	7 311	-7.5	24.4
Montenegro	319	184	108	48	51	0	99	99	-8.2	:
Turkey	1 828	2 058	2 150	1 151	1 081	526	1 706	2 233	3.8	41.6

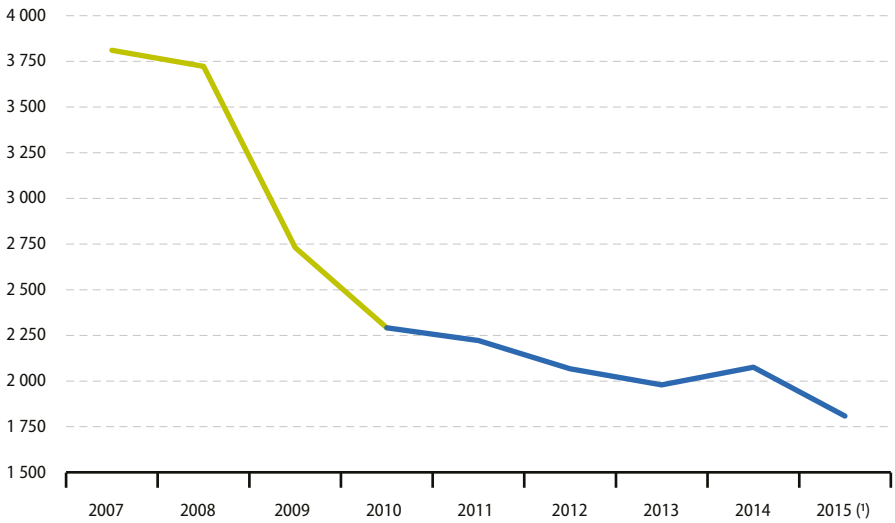
(1) Excluding cruise passengers.

(2) International maritime passenger transport only.

Source: Eurostat (online data codes: mar_mp_aa_cph and mar_mp_aa_cphd)

3.4 Transport safety

Figure 3.4.1: Number of rail accidents in the EU, 2007-2015



Note: Data not available for Croatia and Luxembourg for the period 2007-2009. From 2010 onwards, both countries are included. Fully harmonised data from 2010 onwards as all countries started to apply common definitions. Cyprus and Malta have no railways.

(1) Provisional data.

Source: Eurostat (online data code: tran_sf_railac)

Railway safety data are collected by the European Union Agency for Railways (ERA), which was formed to develop common technical specifications and common approaches to safety among EU Member States. The number of railway accidents has been declining between 2007 and 2015 (Figure 3.4.1). At EU level, the number has been reduced by well over a half since 2007 (from 3 811 to 1 808 accidents). In 2015, the decrease compared with the previous year was particularly marked (-13 %), but not in all categories: the numbers of collisions and fires in rolling stock have barely decreased.

Looking at the detailed 2015 figures in Table 3.4.1, the largest single category of accidents at EU-28 level are accidents to persons caused by rolling stock in motion (excluding suicides), representing 57 % of all accidents. Typically, these are accidents involving persons that are on the railway tracks (unauthorised persons or trespassers) and are then hit by a running train. Accidents at level crossings, including pedestrians, is the other important category, with a total number of 469 accidents (26 % of the total). Together, these accidents represent 83 % of the total number of significant accidents.

Poland and Germany have registered the highest number of accidents; both countries having a share of 17 % of all accidents recorded in the EU-28 in 2015. With a total of 156 accidents, the much smaller Member State, Hungary had a share of 8.6 %. In Luxembourg not a single accident was reported while in Ireland only one accident occurred (a collision).

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

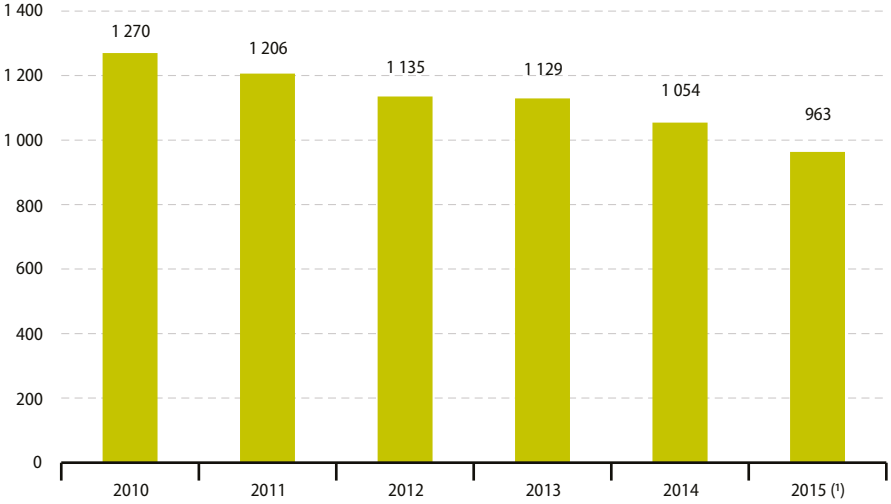
Table 3.4.1: Number of rail accidents, by type of accident, 2015

	Total	Collisions	Derailments	Level crossing accidents (including pedestrians)	Accidents to persons by rolling stock in motion (excl. suicides)	Fires in rolling stock	Other accidents
EU-28 (1)	1 808	123	77	469	1 024	30	85
Belgium	21	0	1	14	6	0	0
Bulgaria	48	3	6	6	33	0	0
Czech Republic	94	14	5	36	27	4	8
Denmark	13	3	0	2	6	0	2
Germany	306	40	9	61	157	3	36
Estonia	12	0	0	10	2	0	0
Ireland	1	1	0	0	0	0	0
Greece	29	1	2	12	14	0	0
Spain	42	3	6	8	24	0	1
France (1)	150	27	11	41	53	8	10
Croatia	27	0	0	11	16	0	0
Italy	97	4	3	19	67	2	2
Latvia	25	0	0	5	20	0	0
Lithuania	13	0	0	3	10	0	0
Luxembourg	0	0	0	0	0	0	0
Hungary	156	2	6	33	102	6	7
Netherlands	31	8	1	12	7	2	1
Austria	77	7	5	33	27	1	4
Poland	307	3	9	74	218	0	3
Portugal	23	1	3	6	13	0	0
Romania	141	1	0	29	111	0	0
Slovenia	14	1	0	10	2	0	1
Slovakia	87	0	2	22	60	1	2
Finland	13	0	0	10	2	0	1
Sweden	40	3	3	9	16	2	7
United Kingdom	40	1	5	3	31	0	0
Channel Tunnel	1	0	0	0	0	1	0
Norway	19	10	3	3	2	0	1
Switzerland	37	3	1	4	25	0	4

(1) Provisional data for total, derailments and other accidents.

Source: Eurostat (online data code: tran_sf_railac)

Figure 3.4.2: Persons killed in railway accidents in the EU, 2010-2015



(1) Provisional data.

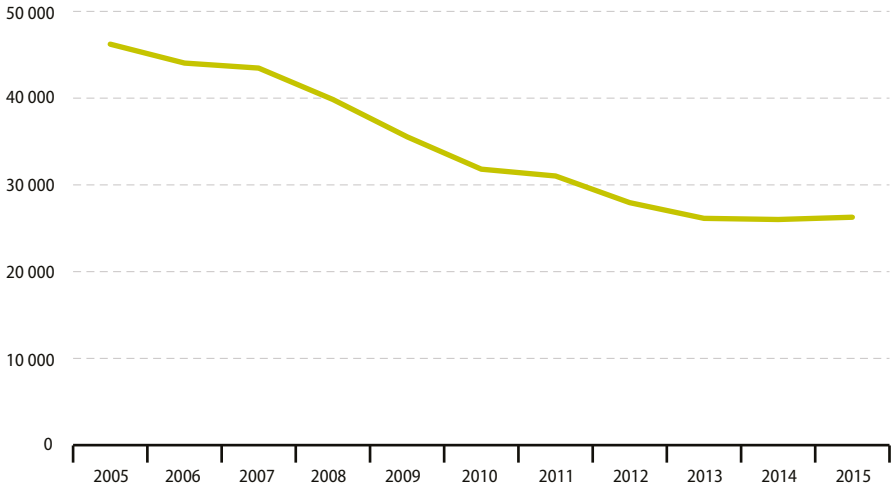
Source: Eurostat (online data code: tran_sf_railvi)

Figure 3.4.2 shows the absolute number of persons killed in railway accidents. At the level of the EU, the number of fatalities has gradually decreased, from 1 270 in 2010 to 963 in 2015 (24.2 %). Only a fraction of the registered fatalities are actually railway passengers.

Suicides occurring on the railways are reported separately, and with 2 762 reported cases in 2015, these outnumber by a considerable margin the victims accounted for in the railway safety statistics. The number of suicides is significant in all Member States.

Rail transport remains a very safe mode of transport. The European Union Agency for Railways has estimated that for the period 2010-2014, the fatality risk for passengers travelling on board of trains was 0.14 fatalities per billion train-kilometres in the EU as a whole.

Figure 3.4.3: Total number of persons killed in road traffic accidents in the EU, 2005-2015



Source: Eurostat (online data code: tran_r_acci) and DG MOVE

Road mobility comes at a high price in terms of lives lost: in 2015, slightly over 26 thousand persons lost their lives in road accidents within the EU-28.

The steady decrease in the number of persons killed on Europe's roads appears to have come to a standstill. Nevertheless, despite the globally positive trend over the last decade (Figure 3.4.3), the road death toll in 2015 is still more than 22 times the total number of persons killed in rail and air transport combined.

The number of road traffic persons killed in the various countries and regions depends on both structural differences (size of the country/region; composition, density and quality of the road network, characteristics of the population) and socio-economic differences (characteristics of the vehicle stock, transit and tourist traffic, behavioural aspects, etc.). In general, improvements in the passive safety of new passenger cars (gradual introduction of safety-enhancing technical devices, improved design for a better protection of pedestrians) may be considered as having a particular positive effect on the reduction of road traffic accident victims.

In absolute terms, the most significant decreases in the number of road traffic persons killed between 2009 and 2015 (Table 3.4.2) were observed in Malta (-47.6 %), Greece (-45.5 %), Norway (-44.8 %), Denmark (-41.3 %) and Spain (37.8 %). Conversely, decreases were less significant in Netherlands (-13.8 %) and Finland (4.7 %).

Apart from Malta, the lowest numbers of road persons killed per million inhabitants at national level (Figure 3.4.4) were recorded in Norway (23 persons killed per million inhabitants), Sweden (27) and United Kingdom (28). On the other end of the spectrum, the highest figures were noted for Lithuania (83), Latvia and Romania (both at 95), and Bulgaria (98).

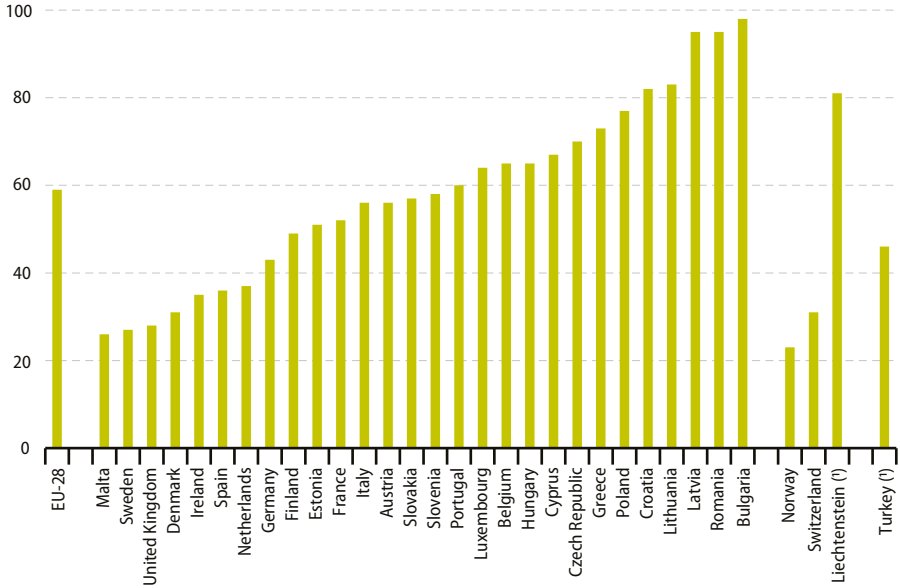
Table 3.4.2: Persons killed in road traffic accidents, 2009 and 2015

(number of persons killed)

	2009	2015	Change 2009-2015 (%)
Belgium	943	732	-22.4
Bulgaria	901	708	-21.4
Czech Republic	901	738	-18.1
Denmark	303	178	-41.3
Germany	4 152	3 459	-16.7
Estonia	100	67	-33.0
Ireland	238	162	-31.9
Greece	1 456	793	-45.5
Spain	2 714	1 689	-37.8
France	4 443	3 459	-22.1
Croatia	548	348	-36.5
Italy	4 237	3 428	-19.1
Cyprus	71	57	-19.7
Latvia	254	188	-26.0
Lithuania	370	242	-34.6
Luxembourg	48	36	-25.0
Hungary	822	644	-21.7
Malta	21	11	-47.6
Netherlands	720	621	-13.8
Austria	633	479	-24.3
Poland	4 572	2 938	-35.7
Portugal	767	624	-18.6
Romania	2 797	1 893	-32.3
Slovenia	171	120	-29.8
Slovakia	384	310	-19.3
Finland	279	266	-4.7
Sweden	358	259	-27.7
United Kingdom	2 337	1 804	-22.8
Liechtenstein	1	:	:
Norway	212	117	-44.8
Switzerland	349	253	-27.5
Turkey	4 324	3 524	-18.5

Source: Eurostat (online data code: tran_r_acci)

Figure 3.4.4: Number of persons killed in road traffic accidents per million inhabitants, 2015



(1) 2014 data instead of 2015.

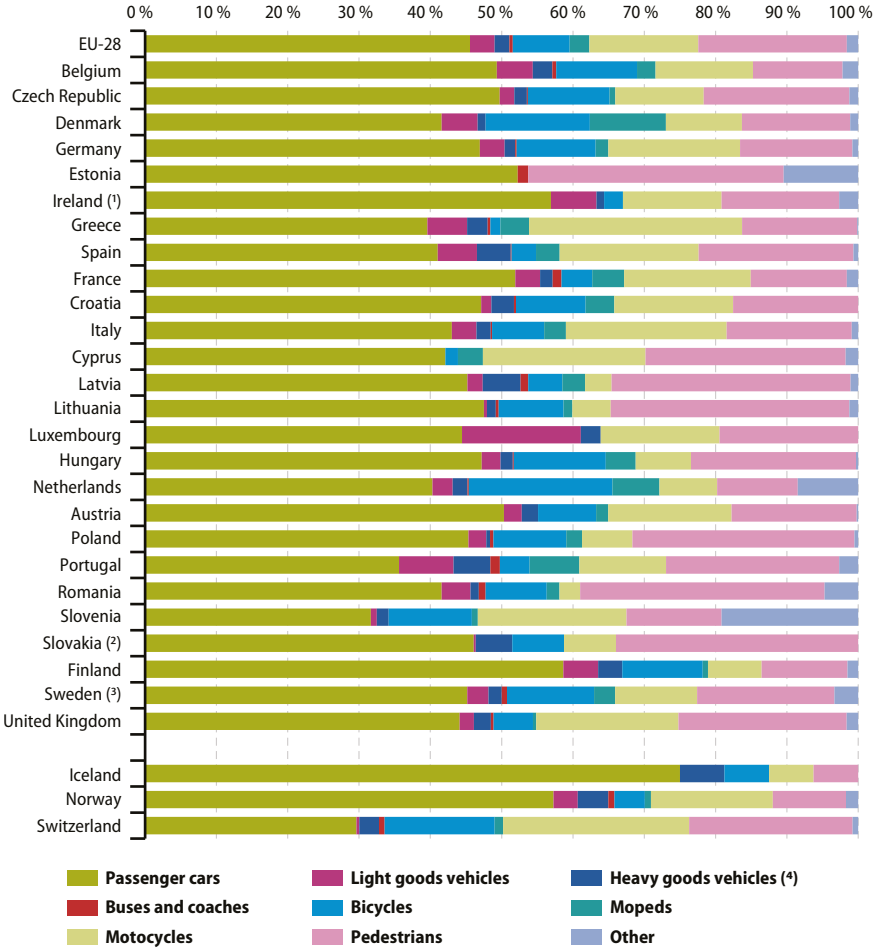
Source: Eurostat (online data code: tran_r_acci)

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 fatalities than in countries where this is less the case. Figure 3.4.5 shows that cyclists accounted for 20.2 % of all road accident deaths in the Netherlands; the figure for Denmark was 14.6 %. At the other end of the spectrum, in Greece cyclists accounted for 1.4 % of deaths and in Estonia and Luxembourg, no cyclists were killed. Greece, however, had the highest share concerning motorcycle fatalities (among countries for which detailed data are available): 29.9 % of all road accident fatalities in Greece were among motorcyclists. Cyprus had the second-highest share (22.8 % — behind passenger car fatalities, 42.1 % and pedestrians, 28.1 %). In Denmark, Portugal and the Netherlands, the remaining 'two-wheeled' category — mopeds — accounted for 10.7 %, 7.0 % and 6.6 % of all fatalities respectively, a much larger share than in other countries.

A high number of pedestrians are killed in road accidents: in 2015, pedestrians accounted for nearly 21 % of all road accident deaths in the EU. This share varies considerably between countries, from under 6.3 % in Iceland to nearly 36 % in Estonia and Romania.

Figure 3.4.5: Road accident fatalities by category of vehicles, 2015

(share of total)

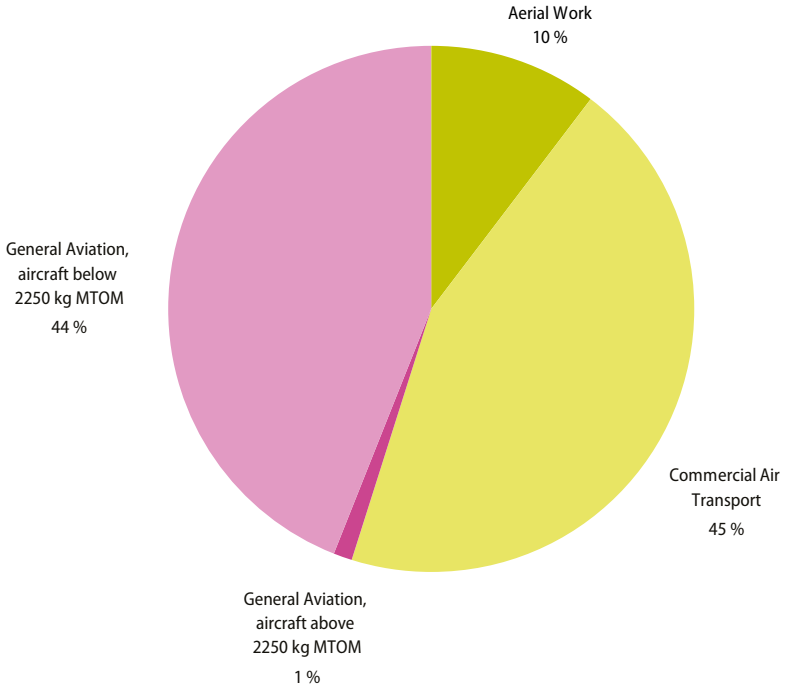


Note: Data not available for Bulgaria and Malta.

(1) 2013 data instead of 2015.
(2) 2010 data instead of 2015.
(3) 2014 data instead of 2015.
(4) Heavy goods vehicles include road tractors.

Source: Eurostat (online data code: tran_sf_roadve), based on the CARE database.

Figure 3.4.6: Persons killed in air accidents in the EU involving aircraft registered in the EU Member States by aviation category, 2015



Note: Provisional data.

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

In 2015, a total of 348 persons died in accidents occurring on EU territory involving aircraft registered in the countries of the European Union.

Most air accident fatalities in the European Union in 2015 (45 %) were registered in the category 'Commercial air transport'. More specifically, this corresponded to 155 persons killed. These fatalities occurred in three accidents: one in Slovakia (4 fatalities), one in Spain (1 fatality), and one in France (150 fatalities).

In previous years, the 'General aviation' sub-category 'Aircraft with a maximum take-off mass (MTOM) of under 2250 kg' normally had the highest share. This sub-category essentially includes small aeroplanes, gliders, 'microlights' and balloons. In 2015, this sub-category claimed 153 lives (44 % of the total). A further 10 % (corresponding to 36 fatalities) were registered in 'Aerial work' accidents. Only four persons (1 %) were killed in General Aviation accidents involving aircraft over 2250 kg MTOM.

4 Environment indicators

4.1 Emissions of greenhouse gases and air pollutants

In the reporting of emissions of air pollutants (as well as greenhouse gases), two different approaches are internationally established: air emissions accounts and national air emission inventories (see Table 4.1.1).

National air emission inventories are used, for example, for reporting obligations under the Kyoto Protocol. Significant differences between the totals for air emission inventories and air emissions accounts may occur in certain countries where very large resident businesses engage in international water and air transport services. For instance, in Denmark, carbon dioxide emissions reported in the accounts are 95 % higher than those reported in inventories. This difference is due to a very large Danish shipping business operating vessels worldwide and hence bunkering most of its fuel and emitting most of its emissions outside Denmark: these emissions abroad are not accounted for in the Danish emission inventory. For the EU as a whole, the differences between totals from air emissions accounts and from emission inventories are much less pronounced.

In 2015, greenhouse gas emissions in the EU-28 were down by 22 % compared with 1990 levels, representing an absolute reduction of 1 265 million tonnes of CO_2-equivalents, putting 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 2015, greenhouse gas emissions were the highest in Germany (21 % of the EU-28 total or 926.5 million tonnes of CO_2-equivalents), followed by the United Kingdom and France. The biggest decreases compared to 1990 were reported for Lithuania, Latvia and Estonia (–58 %, –56 % and –55 % respectively). On the other side of the spectrum, the biggest increases compared to 1990 were reported for Cyprus (+44 %), Spain (+19 %) and Portugal (+18 %) (see Figure 4.1.1).

Figure 4.1.2 shows that there was a general downward trend to emissions during the 1990–99 period (aside from a relative peak in 1996, when a cold winter led to an increase in heating requirements). From 1999 to 2006 the evolution of greenhouse gas emissions within the EU-28 remained relatively unchanged, although it started falling at a modest pace through to 2008. The year 2009 saw a sharp drop in emissions as a consequence of the global financial and economic crisis and the resulting reduced industrial activity. Emissions increased in 2010 and decreased again from 2011 onwards. In 2015, GHG emissions increased for the first time since 2010 by 0.6 % (28.1 million tonnes of CO_2-equivalents) compared to 2014.

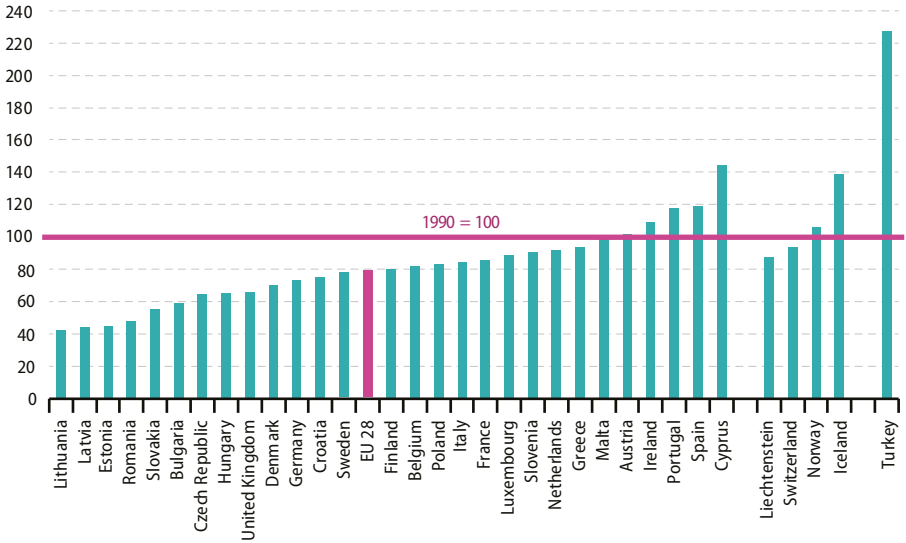
Table 4.1.1: Differences between inventories and accounts

National emission inventories (territory principle)	Air emission accounts (residence principle)
The emissions are attributed to the country where the emission takes place.	The emissions are attributed to the country in which the economic operator causing the emission is resident.
Emissions are assigned to processes which are classified according to their technical nature (for example combustion in power plants or solvent use).	Emissions are classified to the economic activity following the NACE classification of the system of national accounts.
Emissions from international navigation and aviation are allocated to countries in which the associated fuel is bunkered independent of where the operator is resident.	Emissions from international navigation and aviation are allocated to countries in which the operator of the ship/aircraft is resident independent of where the emission geographically takes place.

Source: Eurostat

Figure 4.1.1: Total greenhouse gas emissions (including international aviation and indirect CO_2, excluding LULUCF), by country, 2015

(index 1990=100)

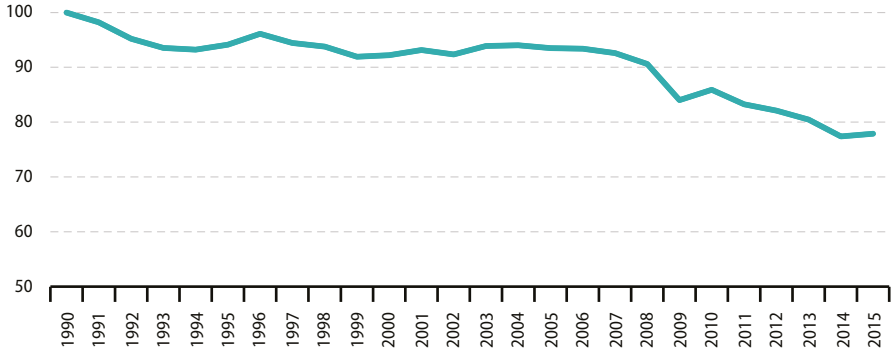


Note: LULUCF = land use, land use change and forestry.

Source: Eurostat (online data code: env_air_gge) and European Environment Agency

Figure 4.1.2: Total greenhouse gas emissions (including international aviation and indirect CO_2, excluding LULUCF) trend, EU-28, 1990–2015

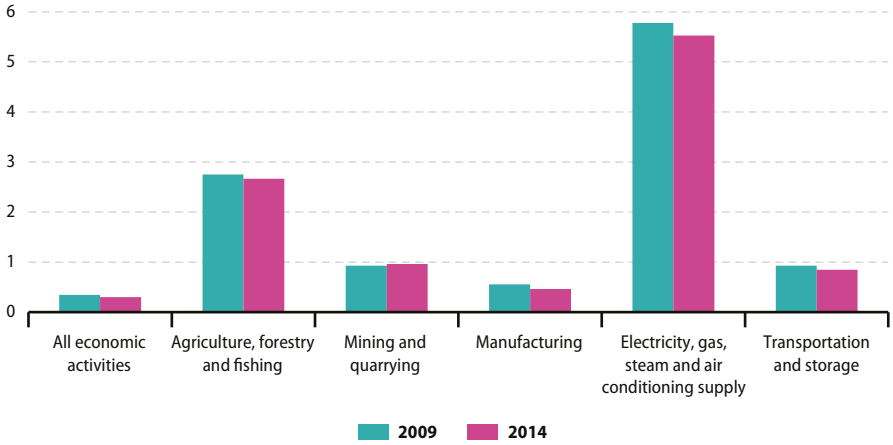
(index 1990=100)



Source: Eurostat (online data code: env_air_gge) and European Environment Agency

Figure 4.1.3: Greenhouse gas intensity by economic activity, EU-28, 2009 and 2014

(kg of CO_2 equivalents per euro of gross value added (GVA))



Source: Eurostat (env_ac_ainah_r2) and (nama_10_a64)

Among the EU Member States, the GHGs emitted by the various producers and households varied considerably (see Table 4.1.2). These differences are, in part, due to different economic structures and different mixes of renewable and non-renewable energy sources. In nearly half (12) of the EU Member States businesses supplying electricity, gas, steam and air conditioning were the main producers of GHGs in 2014, 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 and Hungary.

Table 4.1.2: Greenhouse gas emissions by economic activity, 2014

(thousand tonnes of CO_2 equivalents)

	All economic activities	Agriculture, forestry and fishing	Mining and quarrying	Manu-facturing	Electricity, gas, steam and air conditioning supply	Transport and storage	Other services, water supply and construction	House-holds	Economic activities plus households
EU-28	3 565 958	524 411	75 038	853 698	1 145 316	497 709	469 787	846 187	4 412 145
Belgium	86 552	11 827	45	35 520	15 908	8 260	14 991	25 073	111 625
Bulgaria	47 313	3 521	419	5 893	30 134	5 617	1 730	8 851	56 164
Czech Republic	104 701	8 683	7 152	19 596	49 252	8 392	11 626	10 307	115 008
Denmark	78 311	12 587	1 828	5 649	12 483	39 220	6 544	7 501	85 812
Germany	766 266	77 282	7 216	163 322	351 671	85 364	81 412	182 281	948 547
Estonia	20 317	1 452	104	2 552	13 443	1 553	1 214	1 011	21 329
Ireland	44 587	19 501	264	6 349	10 703	2 911	4 859	12 391	56 977
Greece	77 612	9 264	28	13 683	40 594	6 861	7 181	14 653	92 264
Spain	247 701	43 521	2 885	77 548	62 362	33 799	27 586	63 655	311 356
France	328 875	93 426	1 099	96 778	23 522	44 009	70 040	120 719	449 594
Croatia	17 051	3 010	849	4 465	3 786	993	3 949	5 258	22 309
Italy	313 419	38 628	4 146	92 381	90 812	45 482	41 970	98 736	412 155
Cyprus	6 642	651	20	1 742	2 952	398	879	1 683	8 325
Latvia	10 534	3 207	44	1 518	1 899	2 386	1 480	2 023	12 557
Lithuania	20 650	4 028	10	5 175	2 345	7 510	1 581	2 836	23 486
Luxembourg	7 429	722	6	1 466	742	3 740	753	1 580	9 009
Hungary	45 366	8 598	737	9 848	12 255	4 017	9 911	13 689	59 055
Malta	5 505	111	5	45	1 607	3 409	328	402	5 907
Netherlands	186 682	28 723	3 094	43 905	50 552	29 118	31 289	35 748	222 430
Austria	58 440	8 595	1 125	26 712	6 887	6 520	8 602	13 650	72 091
Poland	339 858	45 297	15 996	63 395	157 239	29 111	28 820	49 746	389 603
Portugal	57 130	10 407	240	18 335	12 113	5 632	10 402	8 203	65 333
Romania	97 147	18 060	5 007	24 528	28 980	7 406	13 165	15 697	112 844
Slovenia	14 010	1 944	296	2 305	4 527	4 056	882	3 116	17 126
Slovakia	35 541	3 211	1 052	17 887	4 692	5 056	3 643	4 541	40 082
Finland	56 114	8 117	423	14 219	16 545	10 448	6 362	5 511	61 625
Sweden	51 947	9 577	1 078	14 383	6 986	12 797	7 125	9 594	61 540
United Kingdom	440 259	50 462	19 873	84 497	130 324	83 642	71 461	127 733	567 992
Norway	54 967	6 035	15 217	11 678	1 753	16 880	3 404	5 221	60 188
Switzerland	32 828	7 045	62	7 957	608	7 508	9 648	18 215	51 043
Turkey	370 998	53 325	7 227	126 030	134 723	24 869	24 823	91 636	462 634

Source: Eurostat (online data code: env_ac_ainah_r2)

The ratio of greenhouse gas emissions (in tonnes of CO_2 equivalents) to gross value added (in million euros) measures the greenhouse gas intensity in economic activities. 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 2010 as the reference year. With 5.5 kg of CO_2 equivalents per euro, the supply of electricity, gas, steam and air conditioning had by far the highest greenhouse gas intensity in the EU-28 in 2014. Agriculture, forestry and fishing had the second highest greenhouse gas intensity, 2.7 kg of CO_2 equivalents per euro. Between 2009 and 2014, the largest fall in greenhouse gas intensity in relative terms was observed in manufacturing (-16.8 %), while the biggest reduction in absolute terms was observed for the supply of electricity, gas, steam and air conditioning (-0.25 kg of CO_2 equivalents per euro). There were also reductions in intensity for the other activities shown in Figure 4.1.3 except for mining and quarrying where the greenhouse gas intensity increased by 3.6 %.

The carbon footprint is a measure of how much CO_2 was emitted along the full production chain of a product that ends up in the EU-28 as final consumption or investment, irrespective of the industry or country where the CO_2 emission occurred.

Carbon footprints offer a complementary perspective to GHG inventories and air emissions accounts and footprints are estimated from the perspective of the final product and where it ends up, and are therefore also referred to as consumption-based accounts. The EU-28 final use of products encompasses consumption by private households and governments as well as the use of products for gross fixed capital formation, or in other words investments, such as buildings, plants and machinery, motor vehicles, and infrastructure.

The EU-28's total carbon footprint was equal to 7.2 tonnes CO_2 per inhabitant in 2014. It consists of about 1.6 tonnes of CO_2 per inhabitant directly emitted by private households from burning fossil fuels (for example for heating dwellings and fuelling private vehicles) and 5.6 tonnes per inhabitant emitted indirectly along the production chains of final products which were either consumed or invested within the EU-28.

Table 4.1.3 breaks down the carbon footprint into the most important products, the final use of which causes these carbon footprints. With 855 kilogrammes of CO_2 per inhabitant 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 627 kilogrammes of CO_2 per inhabitant, while the final use of food products, beverages and tobacco products ranks third with a carbon footprint of 416 kilogrammes of CO_2 per inhabitant.

Table 4.1.3: Domestic and imported CO_2 emissions induced by final use of products, EU-28, 2014

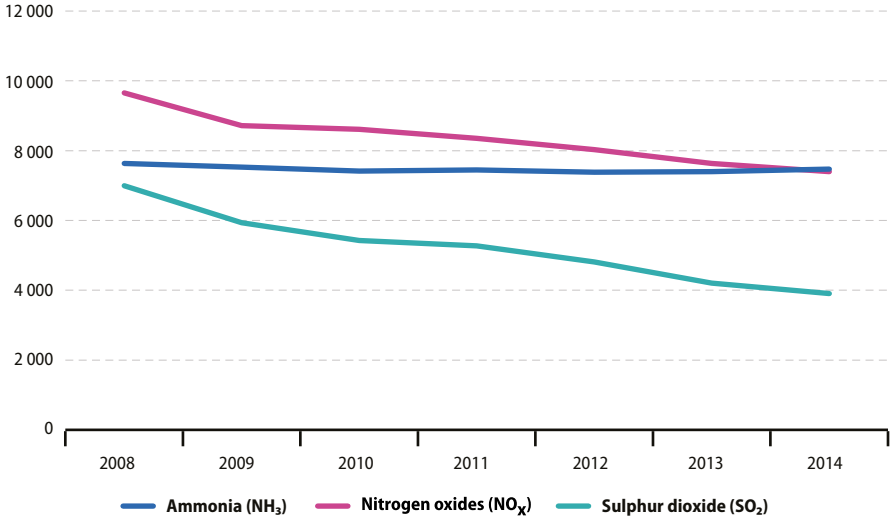
CPA product	Final consumption expenditure		Gross capital formation		Domestic final use, total	
	Domestic emissions	Imported emissions	Domestic emissions	Imported emissions	Global emissions	
	kg of CO_2 per inhabitant					%
Electricity, gas, steam and air-conditioning	817	36	2	0	855	11.9
Constructions and construction works	27	5	500	94	627	8.7
Food products, beverages and tobacco products	320	95	1	1	416	5.8
Public administration and defence services; compulsory social security services	183	29	1	0	213	3.0
Coke and refined petroleum products	107	90	7	6	210	2.9
Accommodation and food services	171	33	-0	-0	204	2.8
Retail trade services, except of motor vehicles and motorcycles	157	23	13	2	196	2.7
Land transport services and transport services via pipelines	176	18	-1	0	193	2.7
Real estate services (excl imputed rents)	159	25	4	1	189	2.6
Wholesale trade services, except of motor vehicles and motorcycles	124	23	29	5	181	2.5
Human health services	142	31	0	0	173	2.4
Motor vehicles, trailers and semi-trailers	69	41	32	20	162	2.3
Air transport services	117	31	0	0	148	2.1
Products of agriculture, hunting and related services	77	24	7	3	110	1.5
Machinery and equipment n.e.c.	3	2	62	40	106	1.5
Education services	92	11	0	0	103	1.4
Scientific research and development services	9	3	66	21	100	1.4
Chemicals and chemical products	56	27	1	2	86	1.2
Textiles, wearing apparel and leather products	38	50	-3	-0	85	1.2
Other products	691	217	213	117	1 238	17.2
Total	3 534	815	936	311	5 596	77.7
Direct emissions by private households	1 606	0	0	0	1 606	22.3
All CPA products plus direct emissions by private households	5 140	815	936	311	7 202	100.0

Note: estimates.

Source: Eurostat (online data code: env_ac_io10)

Figure 4.1.4: Emissions of acidifying gases, EU-28, 2008–2014

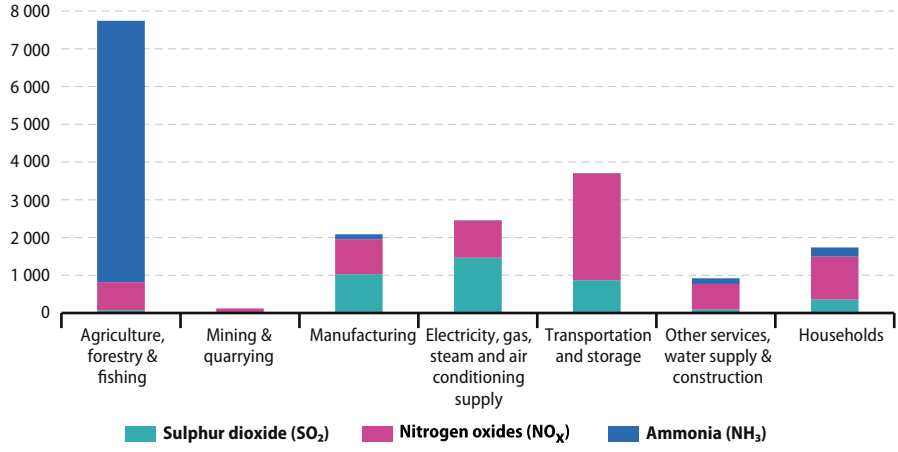
(thousand tonnes of SO_2 equivalents)



Source: Eurostat (env_ac_ainah_r2)

Figure 4.1.5: Emissions of acidifying gases by economic activity, EU-28, 2014

(thousand tonnes of SO_2 equivalents of SO_2, NO_x, and NH_3)



Source: Eurostat (env_ac_ainah_r2)

Several air pollutants contribute to the acidification of the environment. The most important ones are discussed in this article and comprise sulphur dioxide (SO_2), nitrogen oxides (NO_x) and ammonia (NH_3). The impact of SO_2, NO_x 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, NO_x and NH_3 is commonly measured in SO_2 equivalents (SO_2-eq.).

In 2014, emissions of ammonia accounted for the highest share of the acidifying potential (39.8 % or 7.5 million tonnes of SO_2-eq.) followed by nitrogen oxides (39.4 % or 7.4 million tonnes of SO_2-eq.) and sulphur dioxide (20.8 % or 3.9 million tonnes of SO_2-eq.). The emission of acidifying gases decreased by 20.2 % between 2008 and 2014. This represents a reduction of 4.9 million tonnes of SO_2-eq. emissions. Emissions of nitrogen oxides fell by 23.4 %, ammonia by 2.1 % and sulphur dioxide by 44.2 % (see Figure 4.1.4).

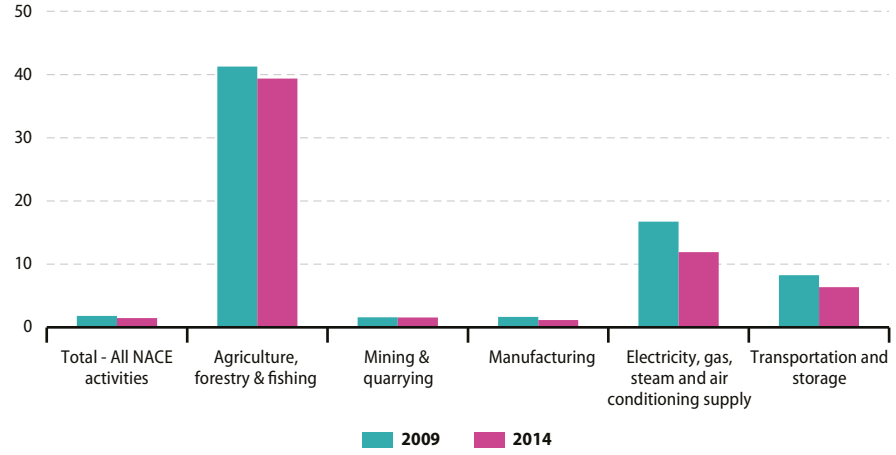
Agriculture, forestry and fishing account for the largest share in all industries: In 2014, these activities contributed 41 % of total acidifying potential emitted by industries, compared with 35 % in 2009. Ammonia is the largest contributor to the acidifying emissions from agriculture, forestry and fishing with 7.5 million tonnes of SO_2-eq. The second largest production activity in 2014 was transportation and storage with a share of 20 % or 3.7 million tonnes of SO_2-eq., followed by the electricity, gas, steam and air conditioning supply industry (13 % or 2.5 million tonnes of SO_2-eq.). While the largest share of emissions in transport came from NO_x, in the electricity, gas, steam and air conditioning supply industry SO_2 emissions were predominant (see Figure 4.1.5).

All activities recorded significant drops in acidifying emissions. The biggest decrease was observed in electricity, gas, steam and air conditioning supply industry, which dropped from 3.7 to 2.5 million tonnes of SO_2-eq. (- 33.6 %) between 2009 and 2014. The more systematic use of end-of-pipe pollution filters and the use of more efficient combustion technologies in the electricity and heat production are the main contributors to this development.

The ratio of acidifying gas emissions in tonnes of SO_2-eq. per million euros of gross value added (GVA) measures the intensity of acidifying gas emissions of industries (see Figure 4.1.6). In 2014, agriculture, forestry and fishing showed the highest intensity with 39.4 grammes per euro. This is due to the fact that the agriculture, forestry and fishing industry has large emissions of ammonia and has a comparatively low contribution to the GVA of the economy. Compared to the year 2009 the intensity of acidifying gas emissions decreased in all main industries. The biggest decrease was recorded for manufacturing industry (-31.6 %).

Figure 4.1.6: Intensity of acidifying gas emissions by economic activity, EU-28, 2009 and 2014

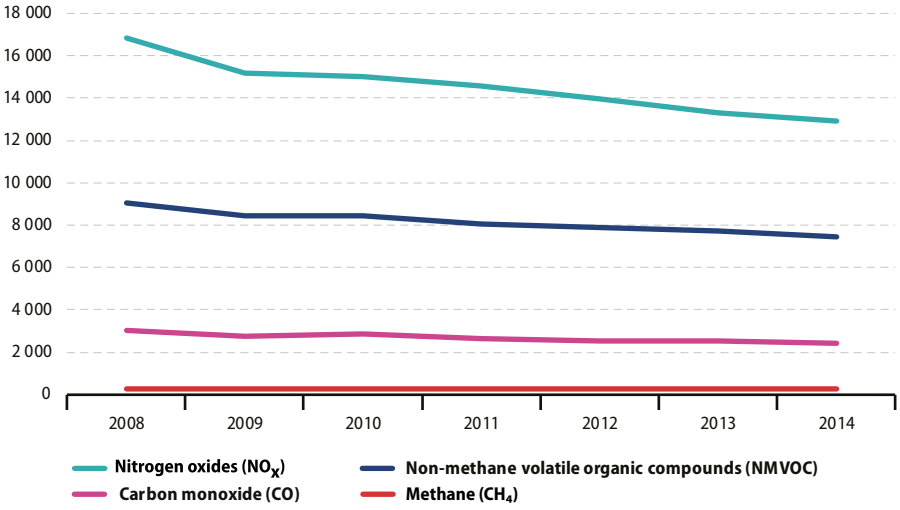
(grammes of SO_2 equivalents per EUR of gross value added (GVA))



Source: Eurostat (env_ac_aeint_r2)

Figure 4.1.7: Emissions of ozone precursors, EU-28, 2008-2014

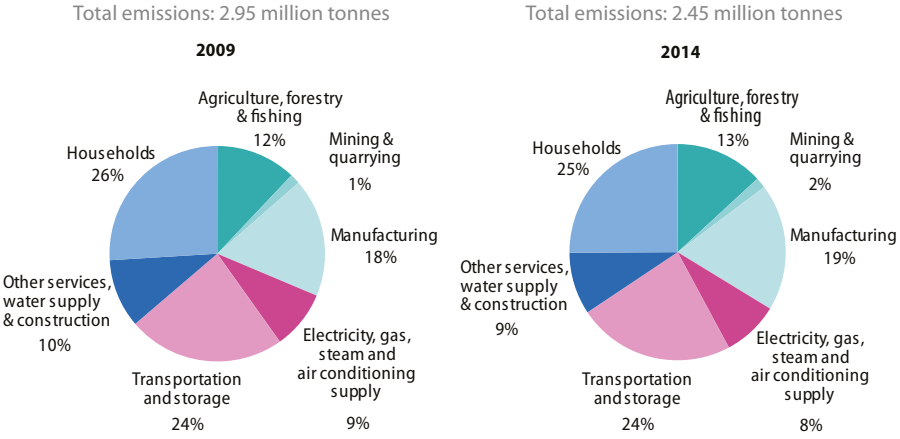
(thousand tonnes of NMVOC equivalents)



Source: Eurostat (env_ac_ainah_r2)

Figure 4.1.8: Emissions of ozone precursors by economic activity, EU-28, 2009 and 2014

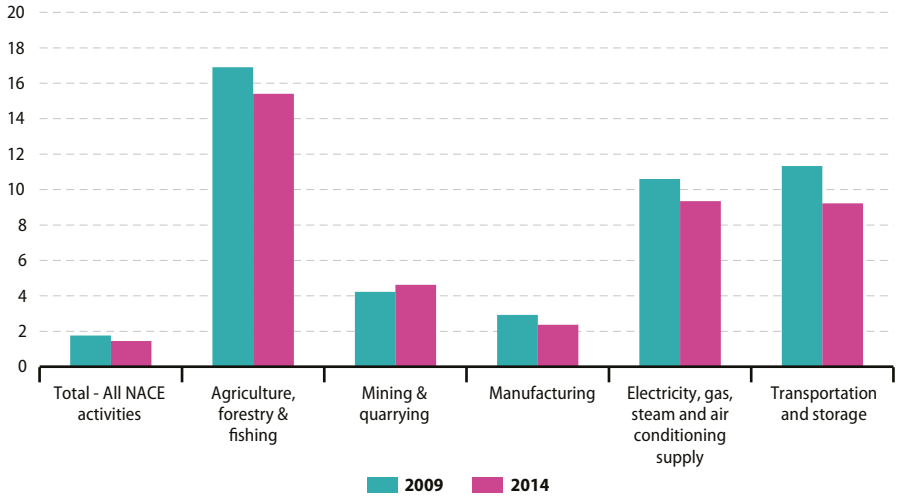
(% of total emissions in NMVOC equivalents)



Source: Eurostat (online data code: env_ac_ainah_r2)

Figure 4.1.9: Intensity of ozone precursor emissions by economic activity, EU-28, 2009 and 2014

(grammes of NMVOC equivalents per EUR of gross value added (GVA))



Source: Eurostat (env_ac_ainah_r2 and nama_10_a64)

Emissions of ozone precursors in the EU fell between 2008 and 2014 for all pollutants (see Figure 4.1.7). The emissions of NMVOC, NO_x, CO and CH_4 decreased by 21 % or 6.1 million tonnes of NMVOC equivalents (NMVOC-eq.).

The main pollutants contributing to tropospheric ozone formation are NO_x and NMVOC with 56 % and 32.4 % respectively (Figure 4.1.8). Between 2008 and 2014, the emissions of NO_x fell by 30.5 % or 3.9 million tonnes of NMVOC-eq., and CO by 25.3 % or 0.7 million tonnes of NMVOC-eq.

With 25 % private households have been the biggest contributor to total emissions of ozone precursors in 2014; closely followed by the transport industry with 24 %. The manufacturing industry is the third largest emitter with 19 % (see Figure 4.1.8). Between 2009 and 2014, the biggest absolute drop occurred in the transport industry (0.9 million tonnes of NMVOC-eq. or -14.1 %).

Ozone precursor emission intensity is the ratio of ozone precursor emissions in tonnes of NMVOC equivalents per million euro of gross value added (GVA). Figure 4.1.9 shows that in 2014 agriculture, forestry and fishing (15.4 grammes NMVOC-eq. per euro) showed the highest intensity, followed by the electricity, gas, and steam industry and the transportation industry. Compared to year 2009 the intensity decreased in all main industries except mining and quarrying. The biggest decrease was observed in transportation and storage (-18.5 %).

4.2 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 (see definitions in the section on data sources and availability). Natural resources include biomass, metal ores, non-metallic minerals and fossil energy materials.

Various indicators are taken from the economy wide material flow accounts framework — most prominently domestic material consumption (DMC). DMC related to gross domestic product (GDP) is used to monitor resource productivity in the context of the Europe 2020 Strategy.

The total DMC of the EU-28 economy was estimated at 13 tonnes per capita in 2016. The EU-28's DMC was dominated by non-metallic minerals, making up nearly half of the total in 2016, around 6 tonnes per capita. Biomass and fossil energy materials each made up approximately a quarter of DMC, some 3.3 and 3.0 tonnes per capita respectively. Metal ores constitute the smallest of the four main categories, their consumption being at a level of 0.7 tonnes per capita (see Table 4.2.1).

The level of DMC differed greatly among the EU Member States, ranging from 7 to 10 tonnes per capita in Italy, Spain, the United Kingdom and the Netherlands to 33 tonnes per capita in Finland in 2016. Furthermore, the structure of DMC — by main material category — varies between the Member States, as can be seen from Table 4.2.1. The composition of DMC in each Member State is influenced by domestic extraction and by natural endowments with material resources, and the latter may form an important structural element of each economy.

The consumption of non-metallic minerals was lowest in the Netherlands and Italy (1.6 and 2.3 tonnes per capita, respectively) and highest in Finland and Romania (above 18 tonnes per capita). As well as Finland, non-metallic minerals constitute a significant part of DMC in several other EU Member States, notably Austria, Luxembourg, Estonia, Denmark and Sweden (above 10 tonnes per capita).

Regarding biomass, consumption was highest in Latvia (13.7 tonnes per capita), Ireland (8.1 tonnes per capita), Finland and Lithuania (both above 6 tonnes per capita). In Ireland, fodder crops and grazed biomass made up the biggest share of this category, while in the other EU Member States with high values forestry played a major role in the economy. Among the Member States, consumption of biomass was lowest in Malta, below 2 tonnes per capita.

EU Member States with substantial amounts of fossil fuel consumption included Estonia (9.4 tonnes per capita, due to the domestic extraction of oil shale), Malta (6.9 tonnes per capita), the Czech Republic (5.6 tonnes per capita), Bulgaria (5.4 tonnes per capita) and Germany (5.0 tonnes per capita, due to the domestic extraction of lignite). Latvia, Croatia, Portugal, Sweden, Lithuania, Spain and France reported the lowest consumption among the Member States for fossil energy materials, below 2.0 tonnes per capita.

Finally, consumption of metal ores was by far highest in Sweden (5.7 tonnes per capita), Bulgaria (5.1 tonnes per capita) and Finland (4.6 tonnes per capita) because of their metal mining activities.

Besides the structure of the economy and climatic conditions, population density may explain — at least in part — differences between EU Member States 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-28 average whereas higher per capita consumption may be observed for low population density Member States like Finland, Estonia and Sweden.

Table 4.2.1: Domestic material consumption by main material category, 2016

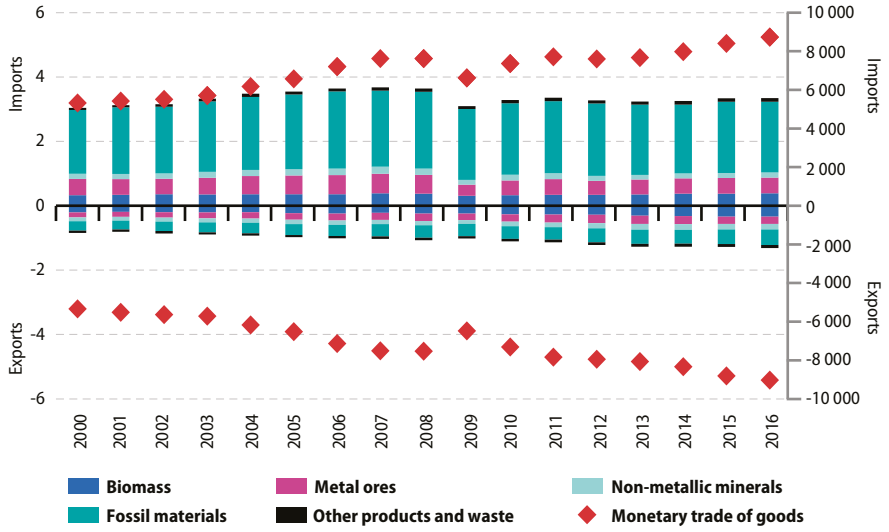
(tonnes per capita)

	Total	Biomass	Metal ores	Non-metallic minerals	Fossil energy materials	Other
EU-28	13.0	3.3	0.7	6.0	3.0	0.0
Belgium	12.6	4.3	0.4	5.1	3.1	-0.3
Bulgaria	20.6	2.7	5.1	7.5	5.4	-0.2
Czech Republic	15.2	2.1	0.4	7.0	5.6	0.0
Denmark	21.0	5.4	0.2	11.6	3.6	0.2
Germany	15.6	3.4	0.5	6.7	5.0	-0.0
Estonia	25.3	4.5	0.2	11.4	9.4	-0.1
Ireland	22.6	8.1	1.5	8.4	4.4	0.2
Greece	12.1	2.1	0.5	4.6	4.8	-0.0
Spain	8.4	2.8	0.4	3.5	1.8	-0.1
France	10.9	3.2	0.3	5.5	1.9	0.1
Croatia	10.1	2.5	0.2	5.7	1.6	0.1
Italy	7.0	2.3	0.3	2.3	2.1	-0.1
Cyprus	15.2	2.1	1.1	9.1	2.5	0.3
Latvia	23.0	13.7	0.1	7.9	1.3	0.0
Lithuania	14.5	6.2	0.1	6.7	1.7	-0.3
Luxembourg	21.5	3.6	1.4	11.7	3.9	0.9
Hungary	10.8	3.9	0.3	4.4	2.3	-0.1
Malta	13.8	1.3	0.4	4.6	6.9	0.5
Netherlands	9.4	2.7	0.1	1.6	4.9	0.2
Austria	21.7	4.9	0.9	12.7	3.1	0.2
Poland	16.6	4.7	1.1	7.0	4.0	-0.1
Portugal	15.6	3.2	1.3	9.2	1.7	0.1
Romania	24.5	3.1	0.4	18.7	2.3	0.0
Slovenia	12.7	2.2	0.3	6.9	3.4	-0.1
Slovakia	12.4	3.5	0.6	5.6	2.4	0.2
Finland	33.0	6.5	4.6	18.3	3.3	0.3
Sweden	24.1	5.9	5.7	10.4	1.8	0.4
United Kingdom	8.7	2.5	0.2	3.6	2.2	0.2
Norway (1)	36.5	2.2	4.2	19.6	11.0	-0.5
Switzerland	11.5	2.1	0.3	7.0	1.7	0.4
Form. Yug. Rep. of Macedonia (1)	9.3	2.7	1.7	1.4	3.5	0.0
Serbia (1)	15.4	4.1	2.6	2.4	6.3	0.0
Turkey (2)	12.1	3.1	1.0	6.6	1.5	-0.0

Note: 'Other' includes 'Other products' and 'Waste for final treatment and disposal'.
(1) 2015 data instead of 2016.
(2) 2014 data instead of 2016.
Source: Eurostat (online data code: env_ac_mfa and demo_gind)

Figure 4.2.1: Physical trade of goods and monetary trade of goods by main material category, EU-28, 2000-2016

(tonnes per capita, left Y-axis; EUR per capita, right Y-axis)



Note: monetary trade of goods in euro, chain linked volumes (2010)

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

Table 4.2.2: EU imports and exports by stage of manufacturing, 2016

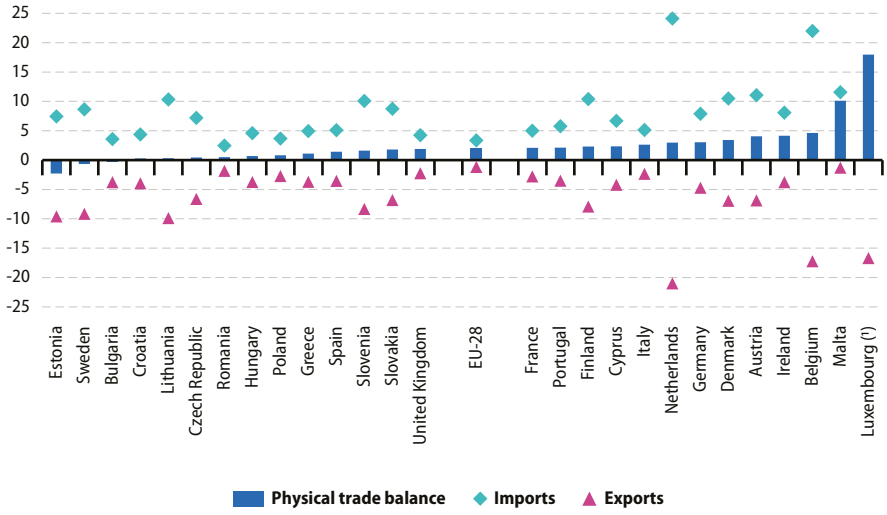
(tonnes per capita)

		2016
Imports	Finished products	0.9
	Semi-finished products	0.4
	Raw products	2.1
Exports	Finished products	0.8
	Semi-finished products	0.3
	Raw products	0.2

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

Figure 4.2.2: Physical trade balance (imports minus exports) by country, 2016

(tonnes per capita)



(1) Physical imports of Luxembourg account for 34.8 tonnes per capita

Source: Eurostat (env_ac_mfa) (demo_gind)

In monetary terms EU imports and exports of goods are balanced. From a physical perspective however — measured as the actual weight of traded goods — the EU's trade pattern with the rest of the world is quite different (see Figure 4.2.1). At 3.3 tonnes per capita on average per year, physical imports of goods are about three times the size of exports, which account for 1.1 tonne per capita on average per year from 2000 to 2016.

Between 2000 and 2008, both physical imports and exports increased by 22.8 % and 30.6 %, respectively. However, the economic crisis had different effects on trade: during the period 2008-2016, imports decreased to the 2004 level, while exports continued to increase strongly, except for a short decrease between 2008 and 2009.

Figure 4.2.2 shows the physical trade balance (weight of imported goods minus exported goods) for all EU Member States in 2016. Most EU Member States import more than they export (i.e. net importers). Excluding Luxembourg and Malta, outliers with a balance of 18.0 and 10.1 tonnes per capita, respectively, there are eleven EU Member States with net imports above the EU average (2.0 tonnes per capita) and fifteen countries below it. The main net exporting countries are Estonia (wood, fossil energy materials), Latvia (wood) and Sweden (metal ores).

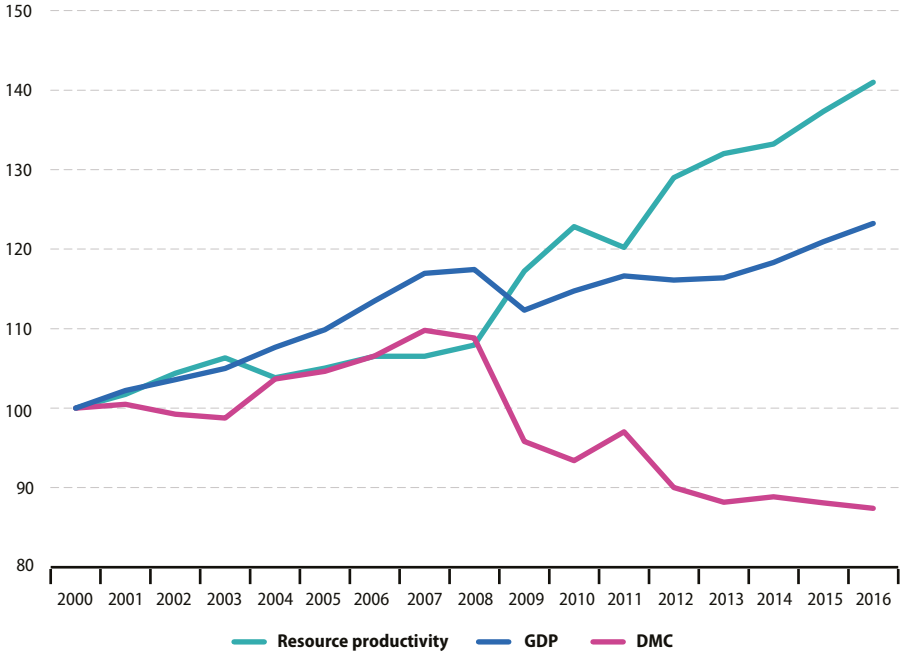
Data on physical imports and exports of goods are available in a breakdown by stage of manufacturing. A distinction is made between three stages: finished products, semi-finished products and raw products (see Table 4.2.2).

The EU's exports of finished products (0.8 tonnes per capita) are about 60 % of total exports. Exports of semi-finished products (23 % of total imports) are at about the same level as their imports (0.3 tonnes per capita).

And, as regards raw products, a factor 9 difference can be observed between imports and exports in 2016; they account for 63 % and 18 % of total imports and exports, respectively. Physical trade data show a certain dependency on the rest of the world for raw materials driven by the aptitude of the EU economy to transform low-value raw products into high-value finished and semi-finished products.

Figure 4.2.3: EU-28 resource productivity in comparison to GDP and DMC, 2000-2016

(index 2000=100)



Note: GDP in chain-linked volumes, reference year 2010. DMC = domestic material consumption.

Source: Eurostat (online data codes: nama_10_gdp and env_ac_mfa)

Table 4.2.3: Resource productivity, GDP and DMC, by country, 2016

	GDP_{PPS} per capita	DMC per capita	Resource productivity (GDP_{PPS}/DMC)	
	(PPS per capita)	(tonnes per capita)	(PPS per kilogram)	(Index EU-28 = 100)
EU-28	29 052	13.0	2.2	100 .0
Belgium	34 038	12.6	2.7	121.0
Bulgaria	13 942	20.6	0.7	30.4
Czech Republic	25 408	15.2	1.7	74.8
Denmark	36 502	21.0	1.7	77.8
Germany	35 857	15.6	2.3	103.2
Estonia	21 488	25.3	0.9	38.1
Ireland	50 900	22.6	2.3	101.1
Greece	19 523	12.1	1.6	72.3
Spain	26 558	8.4	3.2	142.1
France	30 392	10.9	2.8	124.9
Croatia	17 213	10.1	1.7	76.5
Italy	27 883	7.0	4.0	178.2
Cyprus	23 763	15.2	1.6	70.3
Latvia	18 889	23.0	0.8	36.7
Lithuania	21 717	14.5	1.5	67.2
Luxembourg	78 351	21.5	3.6	163.4
Hungary	19 491	10.8	1.8	80.5
Malta	27 776	13.8	2.0	90.5
Netherlands	37 334	9.4	4.0	177.3
Austria	36 871	21.7	1.7	76.3
Poland	20 332	16.6	1.2	54.8
Portugal	22 364	15.6	1.4	64.3
Romania	17 171	24.5	0.7	31.4
Slovenia	24 061	12.7	1.9	84.8
Slovakia	22 416	12.4	1.8	80.8
Finland	31 536	33.0	1.0	42.8
Sweden	36 159	24.1	1.5	67.2
United Kingdom	31 288	8.7	3.6	160.7
Norway (1)	46 526	36.5	1.3	57.1
Switzerland (1)	46 915	11.4	4.1	184.1
Former Yugoslav Republic of Macedonia (1)	10 512	9.3	1.1	50.7
Serbia (1)	10 499	15.4	0.7	30.5
Turkey (2)	17 049	12.1	1.4	62.9

Note: GDP in current prices, Purchasing Power Standards (PPS). DMC = domestic material consumption.
(1) 2015 data instead of 2016.
(2) 2014 data instead of 2016.
Source: Eurostat (online data codes: env_ac_mfa, nama_10_gdp and demo_gind)

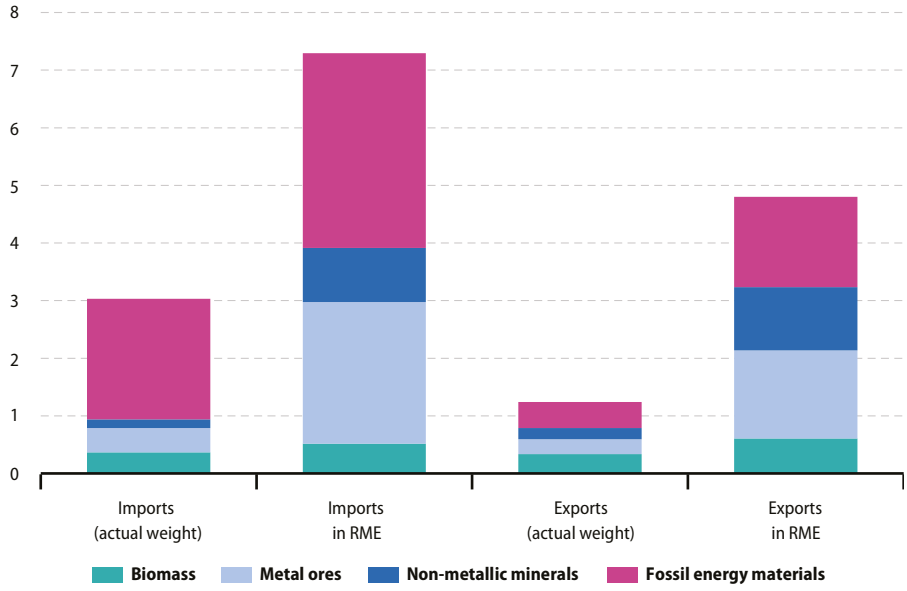
Resource productivity is measured as gross domestic product (GDP) over domestic material consumption (DMC). Two different versions of GDP are used in this article. GDP at market prices expressed in chain-linked volume is used for comparisons over time as it shows the development of the economic aggregate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

Resource productivity in the EU-28 economy increased by 41 % between 2000 and 2016 (see Figure 4.2.3 and Table 4.2.3). Starting from the economic crisis (-4.4 % in GDP in 2008-09) the significant increase in resource productivity (30.6 %) in the period 2008-16 was caused mostly by a 19.7 % fall of DMC in the same period. The crisis affected the material-intensive industries of manufacturing and construction more than the services industries. Material consumption therefore fell more than GDP, which recovers as of 2009. From 2000 to 2016, the EU Member States' resource productivity developed quite differently, although it increased in nearly all countries except for Malta and Romania.

Expressed in GDP in PPS over DMC, the resource productivity amounts to 2.23 euro/kg for the aggregated EU-28 economy in 2016. The ratio varies considerably across EU Member States from 0.68 euro/kg in Bulgaria to 3.98 euro/kg in Italy.

Figure 4.2.4: Comparison of the actual weight of traded goods with trade in raw material equivalents (RME), EU-28, 2014

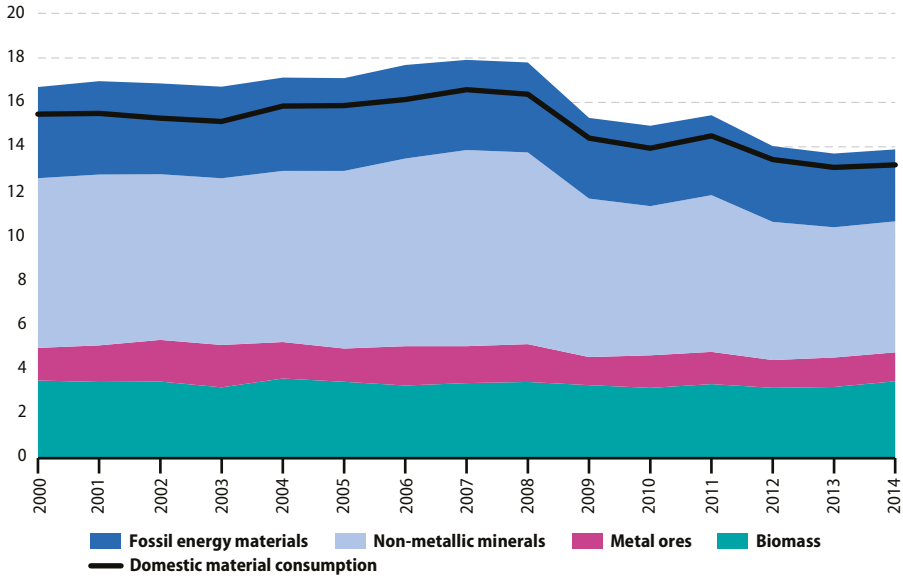
(tonnes per capita)



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

Figure 4.2.5: Raw material consumption (RMC) by main material categories, EU-28, 2000-14

(tonnes per capita)



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

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. Eurostat has developed a model to estimate the RME of imports and exports for the aggregated EU-28 economy. 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.

Figure 4.2.4 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 7.3 tonnes per capita, 2.4 times higher than actual physical imports. At 4.8 tonnes per capita, exports in RME are 3.9 times higher than actual physical exports.

The physical trade balance (imports minus exports) in RME is 2.5 tonnes per capita whereas the actual physical trade balance itself is 1.8 tonnes per capita. 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 economy-wide material flow accounts (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 4.2.5 shows the development of the EU's material footprint or 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 2014, the absolute difference between RMC and DMC is 0.70 tonnes per capita. The minimum difference over the time period shown is 0.61 tonnes per capita, in 2012, and the maximum difference is 1.62 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 14 % in the EU-28 between 2000 and 2007. Domestic extraction of non-metallic minerals increased by 18 % in the same period. Gross value added in construction decreased by 11 % during the economic crisis (2010 compared to 2008) and by 8 % in 2013 (compared to 2010).

Domestic extraction of non-metallic minerals decreased by 20 % (2010 compared to 2008) and by 10 % in 2013 (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.

4.3 Waste

Data on waste generation and treatment in the European Union (EU) is collected in accordance with Regulation (EC) No 2150/2002 of the European Parliament and Council on waste statistics. Starting with reference year 2004, the Regulation requires EU Member States to provide data on the generation, recovery and disposal of waste every two years.

In 2014, the total waste generated in the EU-28 by all economic activities and households amounted to 2 503 million tonnes; this was the highest amount recorded for the EU-28 during the period 2004-2014. Relatively high quantities of waste were generated in Bulgaria and Romania and a relatively low quantity in Italy (see Table 4.3.1).

Almost two thirds (64 % or 3.2 tonnes per inhabitant) of the total waste generated in the EU-28 in 2014 was major mineral wastes. Major mineral wastes are some mineral waste types that arise in large quantities and originate mainly from the mining and construction sector. The relative share of major mineral wastes in the total waste generated varied considerably between EU Member States. Figure 4.3.1 shows an analysis of the amount of waste generated in a standardised form, in relation to population size. The high levels of waste generated in some of the smaller EU Member States can be clearly seen, with a particularly high value recorded for Bulgaria where on average 24.9 tonnes of waste were generated per inhabitant in 2014, five times the 4.9 tonnes per inhabitant average across the EU-28. Several of the Member States with particularly high levels of waste generated per inhabitant reported very high shares of waste from mining and quarrying, while elsewhere construction and demolition often contributed high shares.

In the EU-28, 891 million tonnes of waste excluding major mineral wastes were generated in 2014, equivalent to 36 % of the total waste generated. When expressed in relation to population size, the EU-28 generated, on average, 1.8 tonnes per inhabitant of waste excluding major mineral wastes in 2014 (see Figure 4.3.2).

The share of different economic activities and of households in total waste generation in 2014 is presented in Figure 4.3.2. In the EU-28, construction contributed 34.7 % of the total in 2014 and was followed by mining and quarrying (28.2 %), manufacturing (10.2 %), waste and water services (9.1 %) and households (8.3 %); the remaining 9.5 % was waste generated from other economic activities, mainly services (3.9 %) and energy (3.7 %).

Table 4.3.1: Waste generation by economic activities and households, 2014

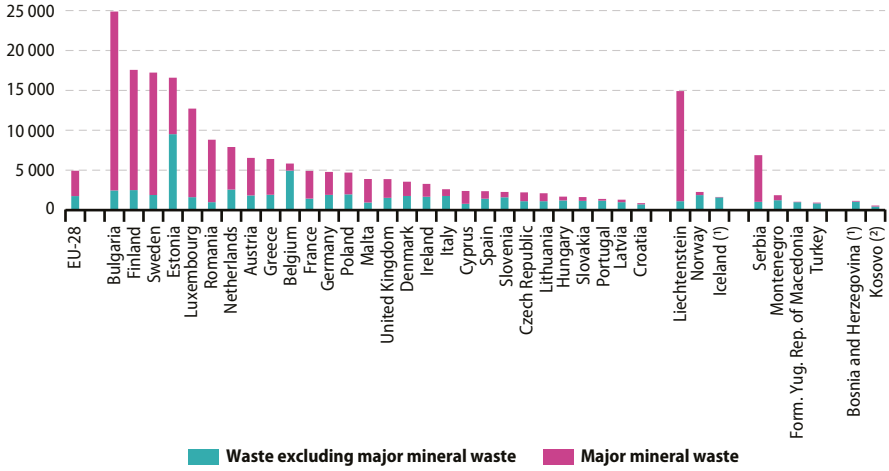
	Total		Mining and quarrying	Manufacturing	Energy	Construction and demolition	Other economic activities	Households
	(million tonnes)	(kg per inhabitant)	(%)					
EU-28	2 502.9	4 931	28.1	10.2	3.7	34.7	14.9	8.3
Belgium	65.6	5 838	0.1	21.7	2.1	40.2	27.3	8.6
Bulgaria (1)	179.7	24 872	88.6	:	5.1	0.7	4.0	1.5
Czech Republic	23.4	2 223	1.0	18.8	4.3	40.2	21.8	13.9
Denmark	20.1	3 558	0.1	6.4	5.4	52.6	18.5	17.1
Germany	387.5	4 785	1.9	15.8	2.6	53.3	16.9	9.5
Estonia	21.8	16 587	36.3	20.2	32.6	3.1	5.6	2.2
Ireland (1)	15.2	3 285	17.8	:	2.1	12.4	57.6	10.0
Greece	69.8	6 404	67.9	7.0	15.6	0.7	2.3	6.5
Spain	110.5	2 378	16.9	13.4	4.8	18.5	28.3	18.3
France	324.5	4 913	0.7	6.7	0.5	70.2	13.1	8.8
Croatia (1)	3.7	879	0.1	:	3.2	16.6	48.9	31.2
Italy	159.1	2 617	0.6	16.7	2.0	32.5	29.5	18.6
Cyprus (2)	2.1	2 406	:	:	:	31.0	48.9	20.2
Latvia	2.6	1 315	0.2	9.4	27.8	17.3	18.3	27.1
Lithuania	6.2	2 114	0.4	42.1	1.6	7.0	30.1	18.7
Luxembourg	7.1	12 713	1.8	4.0	0.0	84.5	6.1	3.4
Hungary	16.7	1 688	0.5	16.2	13.9	20.7	31.0	17.7
Malta (1)	1.7	3 896	2.2	:	0.2	74.5	13.8	9.3
Netherlands	133.2	7 901	0.1	10.1	1.3	68.1	14.1	6.4
Austria	55.9	6 541	0.1	9.7	0.9	72.1	9.8	7.5
Poland	179.0	4 710	42.3	17.6	12.2	9.5	13.7	4.6
Portugal	14.6	1 402	1.9	17.9	1.2	10.3	36.3	32.3
Romania (1)	175.6	8 820	87.0	:	4.0	0.6	6.2	2.2
Slovenia	4.7	2 273	0.2	28.1	13.5	17.4	28.9	12.0
Slovakia (1)	8.9	1 636	3.2	:	6.1	15.6	55.4	19.6
Finland	96.0	17 572	65.4	10.7	1.5	17.0	3.7	1.7
Sweden	167.0	17 226	83.2	3.4	1.1	5.3	4.5	2.5
United Kingdom	251.0	3 885	10.5	3.2	1.3	48.0	26.0	11.0
Iceland (3)	4.5	1 651	0.0	17.6	0.3	2.1	36.1	44.0
Liechtenstein	0.6	14 919	1.7	2.0	0.1	0.0	0.4	95.9
Norway (1)	11.7	2 283	2.8	:	1.3	23.0	52.7	20.3
Montenegro	1.2	1 872	22.5	5.2	31.7	9.2	15.3	16.1
Form. Yug. Rep. of Macedonia	2.2	1 058	3.4	67.9	23.3	0.5	4.9	0.0
Serbia	49.1	6 890	84.5	1.8	9.1	0.6	0.7	3.3
Turkey (4)	73.1	947	4.2	:	32.8	:	20.2	42.8
Bosnia and Herzegovina (3)	0.5	1 161	1.6	27.2	71.1	0.0	0.0	0.0
Kosovo (5)	1.0	574	19.3	7.0	0.0	0.3	26.3	47.0

(1) Other economic activities includes manufacturing.
(2) Other economic activities includes mining, quarrying, manufacturing and energy.
(3) 2012 data instead of 2014.
(4) Other economic activities includes also manufacturing, construction and demolition.
(5) 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: env_wasgen)

Figure 4.3.1: Waste generation, 2014

(kg per inhabitant)

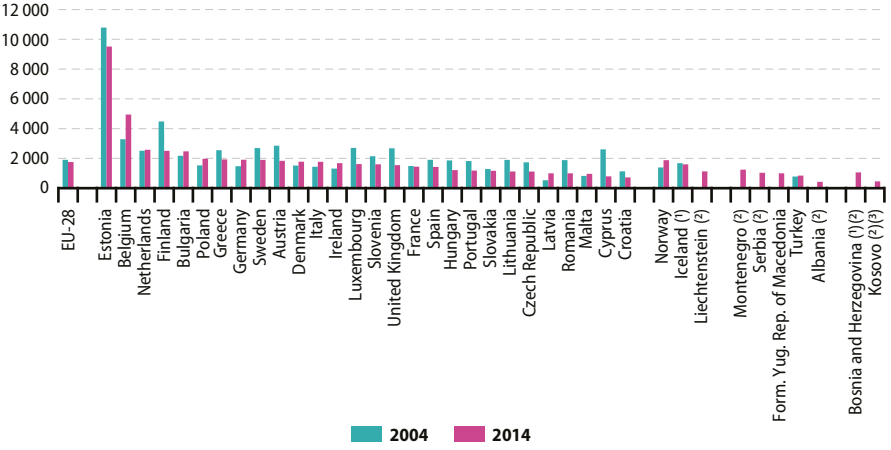


(1) 2012 data instead of 2014.
(2) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

Source: Eurostat (online data code: env_wasgen)

Figure 4.3.2: Waste generation, excluding major mineral wastes, 2004 and 2014

(kg per inhabitant)

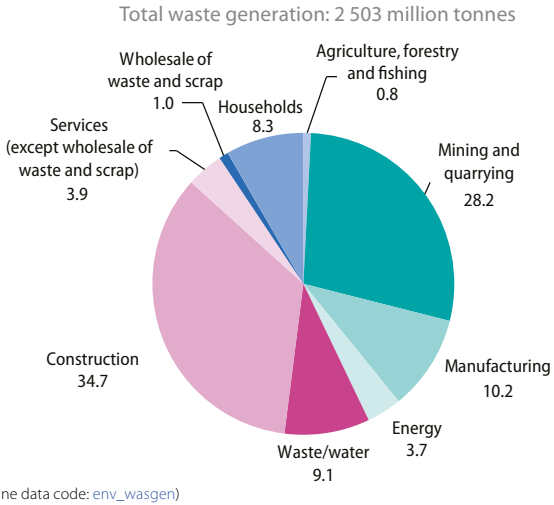


(1) 2012 data instead of 2014.
(2) 2004: not available.
(3) This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Opinion on the Kosovo declaration of independence.

Source: Eurostat (online data code: env_wasgen)

Figure 4.3.3: Waste generation by economic activities and households, EU-28, 2014

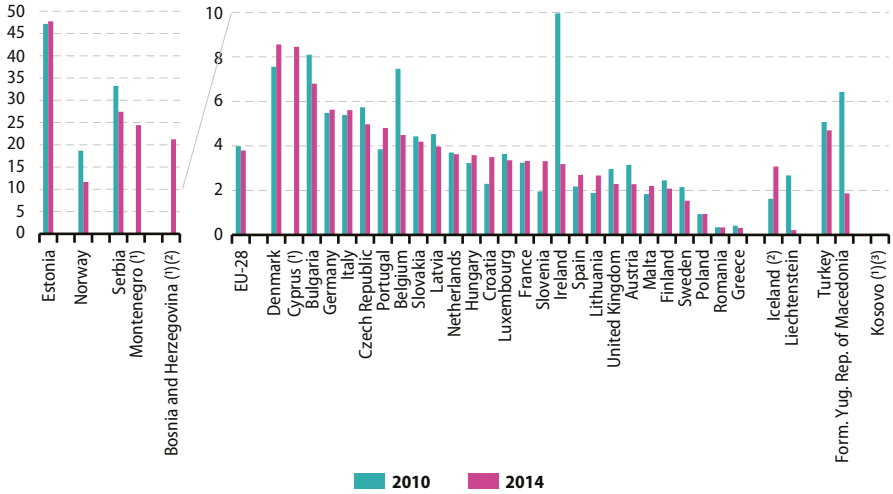
(%)



Source: Eurostat (online data code: env_wasgen)

Figure 4.3.4: Hazardous waste generated, 2010 and 2014

(% share of total waste)



Note: the two parts of the figure have different scales for the y-axis.

(1) 2010: not available.
(2) 2012 data instead of 2014.
(3) 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: env_wasgen)

Hazardous waste may pose an elevated risk to human health and to the environment if not managed and disposed of safely. Among the waste generated in the EU-28 in 2014, some 95.0 million tonnes (3.8 % of the total) were classified as hazardous waste.

In 2014, the share of hazardous waste in total waste generation was below 9.0 % in all of the EU Member States except for Estonia, where it made up a 47.7 % share of the total due to energy production from oil shale. Among the non-member countries shown in Figure 4.3.4, Serbia recorded the highest share of hazardous waste in total waste generation (27.4 %) due to intensive activity in mining and quarrying, and was followed by Montenegro (24.4 %), Bosnia and Herzegovina (21.2 %, 2012 data) and Norway (11.7 %).

Table 4.3.2: Waste treatment, 2014

	Total (million tonnes)	Landfill	Incineration	Energy recovery (%)	Backfilling	Recycling
EU-28	2 319.5	47.4	1.5	4.7	10.2	36.2
Belgium	42.8	8.2	4.3	13.6	0.0	73.9
Bulgaria	175.7	97.9	0.0	0.1	0.0	2.0
Czech Republic	19.9	17.3	0.4	5.1	29.1	48.1
Denmark	17.7	21.7	0.0	20.7	0.0	57.6
Germany	370.7	19.2	2.3	10.5	25.3	42.7
Estonia	20.7	65.6	0.0	2.5	11.9	20.0
Ireland	10.0	42.6	0.1	7.2	37.4	12.7
Greece	67.1	88.4	0.0	0.2	8.1	3.2
Spain	103.4	47.9	0.0	3.4	12.6	36.1
France	299.7	29.3	2.0	4.5	10.7	53.6
Croatia	3.5	51.1	0.0	1.4	2.0	45.5
Italy	129.2	16.0	5.2	1.6	0.2	76.9
Cyprus	1.8	58.9	0.0	1.7	25.9	13.5
Latvia	1.9	34.8	0.0	8.7	0.9	55.5
Lithuania	4.5	67.6	0.1	4.1	2.5	25.8
Luxembourg	8.5	38.3	0.0	2.5	16.0	43.3
Hungary	13.7	39.4	0.7	8.9	3.7	47.3
Malta	1.6	28.9	0.4	0.0	37.5	33.3
Netherlands	130.6	45.4	1.0	7.9	0.0	45.7
Austria	53.9	38.6	0.2	6.5	20.1	34.7
Poland	182.4	24.9	0.4	2.7	21.5	50.5
Portugal	9.9	31.8	10.0	3.1	0.0	55.0
Romania	172.2	94.4	0.0	1.3	0.6	3.7
Slovenia	5.4	9.2	0.6	4.9	33.5	51.8
Slovakia	7.1	53.8	0.8	4.4	0.0	40.9
Finland	93.3	80.9	0.5	4.8	0.0	13.8
Sweden	163.3	84.4	0.1	4.7	1.6	9.3
United Kingdom	209.0	41.5	3.6	0.9	10.4	43.6
Iceland (1)	0.5	30.7	0.0	2.7	0.6	66.0
Norway	11.7	17.9	0.5	35.8	5.3	40.5
Montenegro	1.0	98.8	0.0	0.1	0.0	1.0
Former Yugoslav Republic of Macedonia	1.5	98.7	1.3	0.0	0.0	0.0
Albania	1.2	74.8	3.1	0.5	0.0	21.6
Serbia	49.4	97.3	0.0	0.1	0.0	2.6
Turkey	79.3	70.2	0.0	0.7	:	29.0

(1) 2012 data instead of 2014.

Source: Eurostat (online data code: env_wastrt)

In 2014, some 2 320 million tonnes of waste were treated in the EU-28 (see Table 4.3.2). This includes the treatment of waste imported into the EU and the reported amounts are therefore not directly comparable with those on waste generation.

Nearly half (47.4 %) of the waste treated in the EU-28 in 2014 was disposed of other than through incineration (landfilling). A further 36.2 % of the waste treated in the EU-28 in 2014 was sent to recovery operations other than energy recovery and backfilling (for simplification referred to as recycling). Just over one tenth (10.2 %) of the waste treated in the EU-28 was backfilled, while the remainder was sent for incineration, either with energy recovery (4.7 %) or without (1.5 %). 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 (Bulgaria, Romania, Greece, Sweden and Finland).

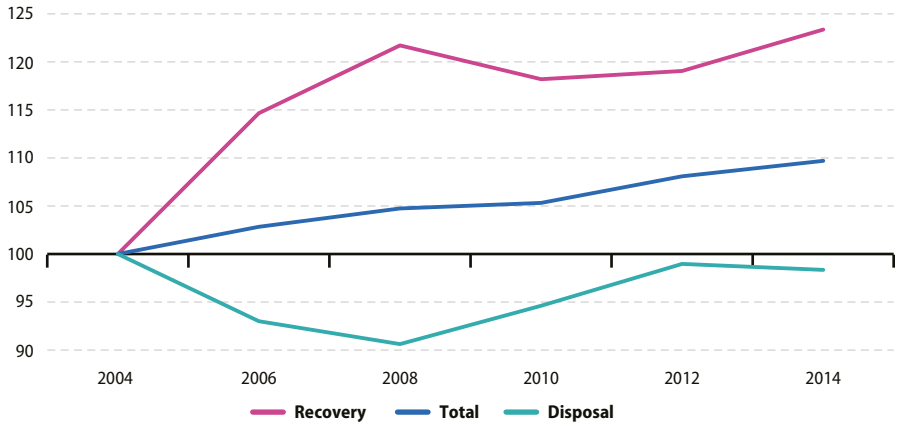
Figure 4.3.5 shows the development of waste treatment in the EU-28 for the main treatment categories during the period from 2004 to 2014. The quantity of waste subject to disposal in 2014 was 1.7 % lower than it had been in 2004; its share in total waste treatment fell from 54.6 % to 48.9 %. The quantity of waste recovered grew by 23.4 % from 960 million tonnes in 2004 to 1 185 million tonnes in 2014; as a result, the share of such recovery in total waste treatment rose from 45.4 % in 2004 to 51.1 % by 2014.

Eurostat has developed a new set of waste management indicators monitoring progress towards more recycling and less disposal. At EU-level, the landfilling of waste has been continuously reduced in recent years and amounted to 196 million tonnes or 25 % of domestically generated waste ([1]) excluding major mineral wastes in 2014. When related to population, 385 kg per inhabitant of waste excluding major mineral wastes were landfilled on average in the EU (see Table 4.3.3).

([1]) Amount of domestically generated waste treated = Waste treated in country (WstatR data) + waste exported for treatment (COMEXT data) – Waste imported for treatment (COMEXT data).

Figure 4.3.5: Development of waste treatment, EU-28, 2004-2014

(index 2004=100)



Source: Eurostat (online data code: env_wastrt)

Table 4.3.3: Landfilling of domestically generated waste excluding major mineral wastes in the EU, 2014

(thousand tonnes, kg/inhabitant, %)

	Landfilling of domestically generated waste		
	1 000 t	kg/hab	%
EU-28	195 541	385	25
Belgium	1 177	105	3
Bulgaria	13 700	1 897	82
Czech Republic	2 652	252	22
Denmark	321	57	4
Germany	15 944	197	11
Estonia	9 016	6 858	77
Ireland	1 155	250	24
Greece	14 316	1 314	81
Spain	25 760	554	47
France	19 801	300	23
Croatia	1 428	337	47
Italy	16 651	274	21
Cyprus	448	526	59
Latvia	532	267	26
Lithuania	828	283	38
Luxembourg	46	82	6
Hungary	4 799	486	46
Malta	228	534	68
Netherlands	1 082	64	2
Austria	1 462	171	12
Poland	20 610	542	26
Portugal	2 888	278	31
Romania	11 655	585	54
Slovenia	248	120	10
Slovakia	2 560	472	51
Finland	1 831	335	17
Sweden	1 419	146	9
United Kingdom	23 190	359	28

Source: Eurostat (online data code: env_wasoper)

Table 4.3.4: Municipal waste generated by country in selected years, 1995-2015

(kg per capita)

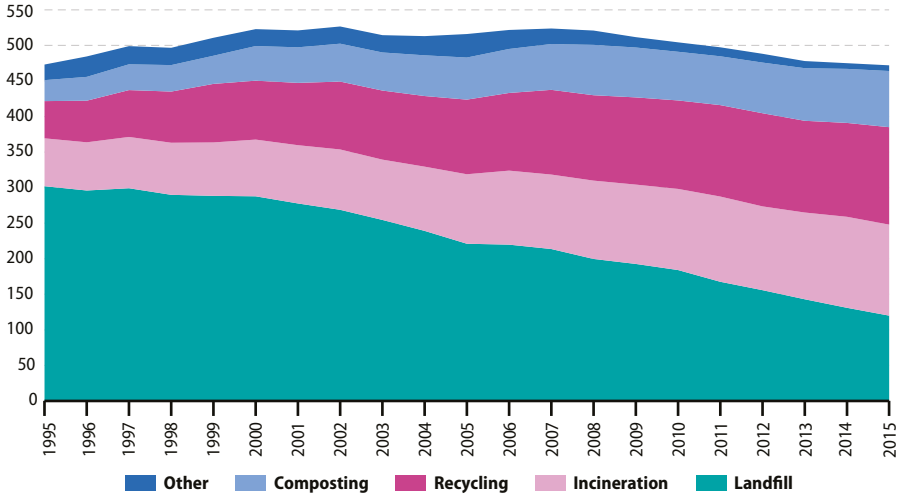
	1995	2000	2005	2010	2015	Change (%) 1995-2015
EU-28	:	521	515	504	477	:
EU-27	473	523	517	505	477	0.8
Belgium	455	471	482	456	419	-7.9
Bulgaria	694	612	588	554	419	-39.6
Czech Republic	302	335	289	318	316	4.6
Denmark	521	664	736	:	789	51.4
Germany	623	642	565	602	625	0.3
Estonia	371	453	433	305	359	-3.2
Ireland	512	599	731	624	:	:
Greece	:	412	442	532	:	:
Spain	505	653	588	510	434	-14.1
France	475	514	530	533	502	5.7
Croatia	:	262	336	379	393	:
Italy	454	509	546	547	486	7.0
Cyprus	595	628	688	689	638	7.2
Latvia	264	271	320	324	433	64.0
Lithuania	426	365	387	404	448	5.2
Luxembourg	587	654	672	679	625	6.5
Hungary	460	446	461	403	377	-18.0
Malta	387	533	623	601	624	61.2
Netherlands	539	598	599	571	523	-3.0
Austria	437	580	575	562	560	28.1
Poland	285	320	319	316	286	0.4
Portugal	352	457	452	516	:	:
Romania	342	355	383	313	:	:
Slovenia	596	513	494	490	449	-24.7
Slovakia	295	254	273	319	329	11.5
Finland	413	502	478	470	500	21.1
Sweden	386	428	477	439	447	15.8
United Kingdom	498	577	581	509	485	-2.6
Iceland	426	462	516	481	:	:
Norway	624	613	426	469	421	-32.5
Switzerland	600	656	661	708	725	20.8
Montenegro	:	:	:	:	533	:
Former Yugoslav Republic of Macedonia	:	:	:	351	:	:
Serbia	:	:	:	363	259	:
Turkey	441	465	458	407	400	-9.3
Bosnia and Herzegovina	:	:	:	332	:	:
Kosovo([1])	:	:	:	:	178	:

([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: env_wasmun)

Figure 4.3.6: Municipal waste treatment by type of treatment, EU-27, 1995 – 2015

(kg per capita)



Source: Eurostat (online data code: env_wasmun)

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

Table 4.3.4 shows waste for selected years, covering the period 1995 to 2015. For 2015, municipal waste generation totals vary considerably, ranging from 789 kg per capita in Denmark to 247 kg per capita in Romania. 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.

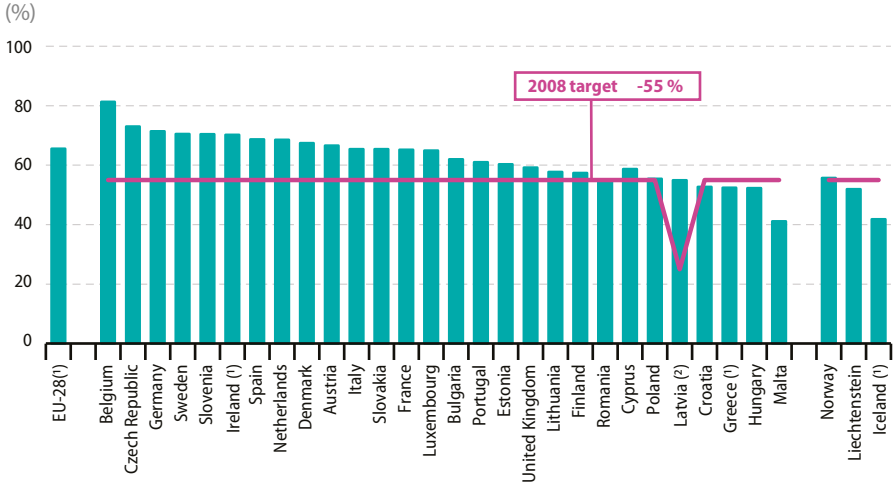
In 16 of the 31 countries (Member States and EFTA), the amount of municipal waste generated per capita increased between 1995 and 2015. The highest average annual growth rates were recorded for Malta, Greece (both 2.4 %), Latvia and Denmark (both 2.1 %). Bulgaria showed the largest reduction, with an average annual decrease of -2.5 %, followed by Romania, -1.6 % and Slovenia, -1.4 %.

Figure 4.3.6 shows the amount of waste generated at EU-27 level and the amount of waste by treatment category (landfill, incineration, recycling, composting). 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.

The total municipal waste landfilled in the EU-27 fell by 83 million tonnes, or 58 %, from 144 million tonnes (302 kg per capita) in 1995 to 61 million tonnes (120 kg per capita) in 2015.

During the last ten years (2005-2015) landfilling has fallen by as much as 8.2 % per year on average. As a result, the landfilling rate compared with municipal waste generation, in the EU-27 dropped from 63.8 % in 1995 to 25.3 % in 2015.

Figure 4.3.7: Recycling rate for all packaging, 2014

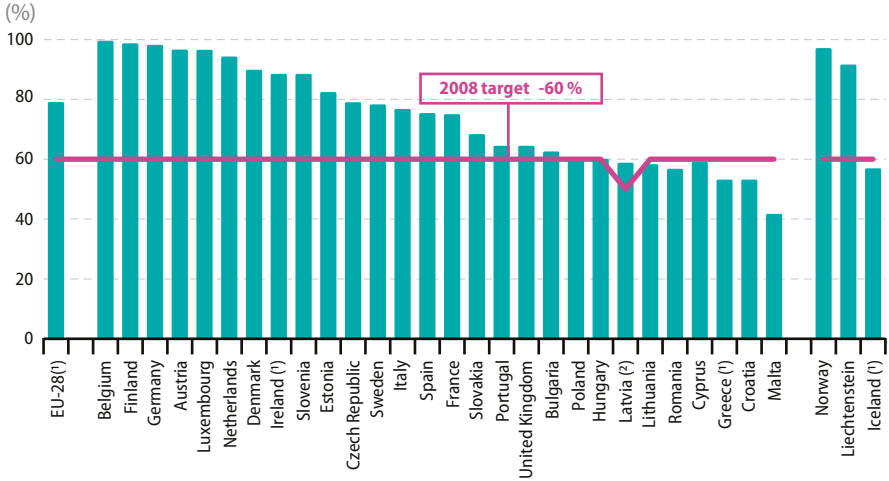


Note: ranked in descending order of recycling rate.

(1) Estimate: Iceland (2012 data); Ireland, Greece (2013 data)
(2) Latvia: compliance with 2001 target: 25% recycling rate for all packaging

Source: Eurostat (online data code: env_waspac)

Figure 4.3.8: Recovery rate for all packaging, 2014



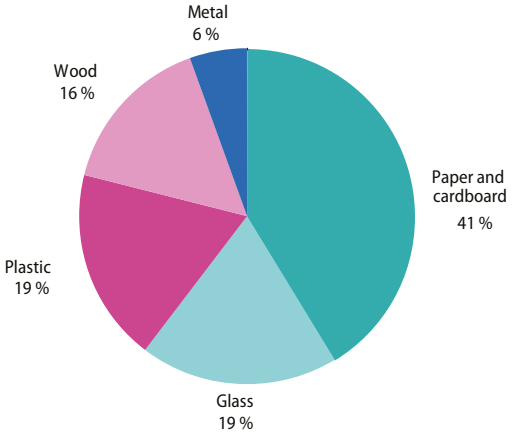
Note: ranked in descending order of recovery rate.

(1) Estimate: Iceland (2012 data); Ireland, Greece (2013 data)
(2) Latvia: compliance with 2001 target: 50% recovery rate for all packaging

Source: Eurostat (online data code: env_waspac)

Figure 4.3.9: Shares of packaging waste generated by weight, EU-28, 2014

(%)

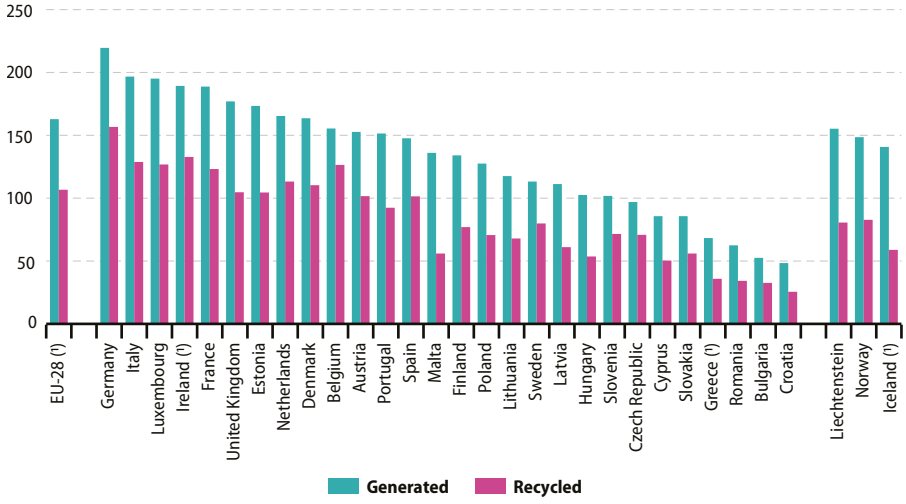


Note: data for the EU-28 aggregate have been estimated by Eurostat.

Source: Eurostat (online data code: env_waspac)

Figure 4.3.10: Volume of all packaging waste generated and recycled per inhabitant, 2014

(kg per inhabitant)



Note: ranked on 'Waste generated'.

(') Estimate: Iceland (2012 data); Ireland, Greece (2013 data)

Source: Eurostat (online data code: env_waspac)

Figure 4.3.7 shows the recycling rates of packaging waste for the EU Member States and EEA/EFTA countries in 2014. The recycling covers material recycling, and other forms of recycling (e.g. organic recycling). The '2008 target' of 55 % recycled packaging waste was met by all Member States except Croatia, Greece, Hungary and Malta. Latvia only needs to achieve the target of 55 % for the reference year 2015.

The recovery rate for packaging waste of 60 % which should be achieved by all EU Member States and EEA/EFTA countries in 2014 (except Latvia) is shown in Figure 4.3.8 together with the performance of each country. The recovery covers energy recovery, other forms of recovery, incineration at waste incinerators with energy recovery, and total recycling. The recovery rates in Hungary, Lithuania, Romania, Cyprus, Greece, Croatia and Malta were below the '2008 target' of 60 %.

Figure 4.3.9 shows that 'paper and cardboard', 'glass', 'plastic', 'wood' and 'metal' are, in that order, 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 2014.

In 2014, 162.9 kg of packaging waste was generated per inhabitant in the EU-28. This quantity varied between 48.3 kg per inhabitant in Croatia and 220 kg per inhabitant in Germany (See Figure 4.3.10). Romania, Bulgaria and Croatia (62.5 kg, 52.4 kg and 48.3 kg/inhabitant, respectively) exhibited the EU's lowest amounts of generated and recycled packaging waste. Germany (219.5 kg/inhabitant), Italy (196.8 kg/inhabitant) and Luxembourg (195.1 kg/inhabitant) report the highest amounts of packaging waste generated.

Germany, Italy and Ireland report the highest amounts of packaging material recycled (156.7 kg/inhabitant; 128.7 kg/inhabitant; 132.7 kg/inhabitant respectively). Estonia had the highest amount (173.3 kg/inhabitant) of packaging waste generation among the Member States that joined the EU in 2004 and after.

Table 4.3.5: Total number of end-of-life vehicles, 2007-2014

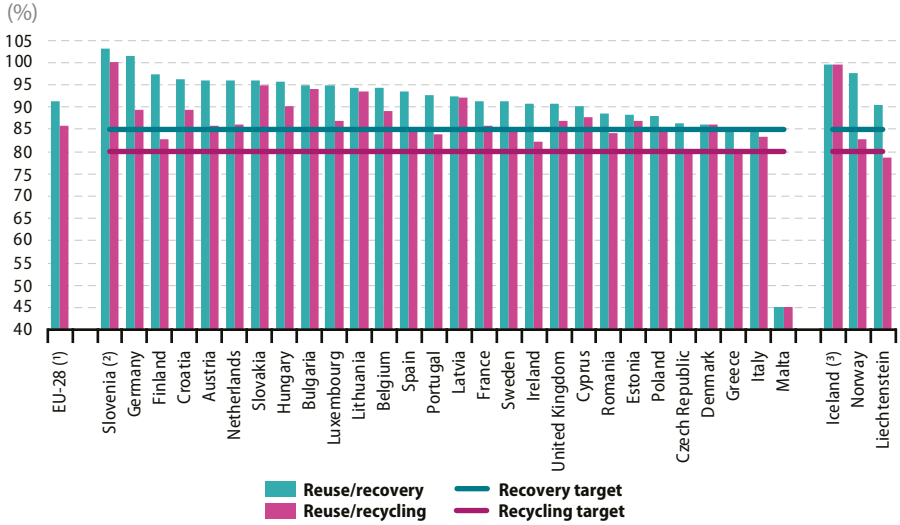
(number of cars)

	2007	2008	2009	2010	2011	2012	2013	2014
EU-28	:	:	:	:	:	6 290 000	6 230 000	6 150 000
EU-27 (1)	6 500 000	6 270 000	9 000 000	7 350 000	6 750 000	6 250 000	6 200 000	6 130 000
Belgium	127 949	141 521	140 993	170 562	165 016	160 615	134 506	126 835
Bulgaria	23 433	38 600	55 330	69 287	62 937	57 532	61 673	80 862
Czech Republic	72 941	147 259	155 425	145 447	132 452	125 587	121 838	131 987
Denmark	99 391	101 042	96 830	100 480	93 487	106 504	125 650	104 413
Germany	456 436	417 534	1 778 593	500 193	466 160	476 601	500 322	512 163
Estonia	12 664	13 843	7 528	7 268	11 413	12 835	14 712	14 720
Ireland	112 243	127 612	152 455	158 237	134 960	102 073	92 467	86 950
Greece	47 414	55 201	115 670	95 162	112 454	84 456	86 205	82 863
Spain	881 164	748 071	952 367	839 637	671 927	687 824	734 776	724 820
France	946 497	1 109 876	1 570 593	1 583 283	1 515 432	1 209 477	1 115 280	1 084 766
Croatia	:	:	:	:	:	35 213	32 135	19 388
Italy	1 692 136	1 203 184	1 610 137	1 246 546	952 461	902 611	876 052	853 584
Cyprus	2 136	14 273	17 303	13 219	17 145	17 547	13 212	11 160
Latvia	11 882	10 968	10 590	10 640	9 387	10 228	9 003	9 268
Lithuania	15 906	19 534	19 656	23 351	26 619	22 885	26 482	29 982
Luxembourg	3 536	2 865	6 908	6 303	2 341	2 834	2 290	2 225
Hungary	43 433	37 196	26 020	15 907	13 043	15 357	14 897	15 283
Malta	:	:	:	330	2 526	2 530	1 198	2 646
Netherlands	166 004	152 175	191 980	232 448	195 052	187 143	183 451	188 487
Austria	62 042	63 975	87 364	82 144	80 004	64 809	73 993	59 904
Poland	171 258	189 871	210 218	259 576	295 152	344 809	402 416	454 737
Portugal	90 509	107 746	107 946	107 419	77 929	92 008	92 112	86 713
Romania	36 363	51 577	55 875	190 790	128 839	57 950	37 989	42 138
Slovenia	8 409	6 780	7 043	6 807	6 598	5 447	:	:
Slovakia	28 487	39 769	67 795	35 174	39 717	33 469	36 858	29 175
Finland	15 792	103 000	96 270	119 000	136 000	119 000	99 300	94 540
Sweden	228 646	150 197	133 589	170 658	184 105	185 616	189 748	186 967
United Kingdom	1 138 496	1 210 294	1 327 517	1 157 438	1 220 873	1 163 123	1 149 459	1 106 846
Iceland	:	9 386	5 109	4 195	4 075	5 824	4 463	:
Liechtenstein	82	91	72	107	94	114	326	188
Norway	95 128	130 018	95 000	112 537	124 563	119 905	141 452	139 920

(1) Eurostat estimates for 2007-2009 and 2013-2014. For reasons of comparison, EU-27 data are also shown for 2012-2014, although EU-28 data are available.

Source: Eurostat (online data code: env_waselvt)

Figure 4.3.11: Recovery and recycling rate for end-of-life vehicles, 2014



Note: ranked on 'Reuse/recovery'.

(1) Eurostat estimate.
(2) 2012 data instead of 2014.
(3) 2013 data instead of 2014.

Source: Eurostat (online data code: env_waselvt)

Table 4.3.5 shows the total number of end-of-life vehicles from 2007 to 2014. The total number of end-of-life vehicles reported in the EU-27 rose sharply, from 6.3 million in 2008 to 9.0 million in 2009. Germany was the primary contributor to this rise with an increase of 1.4 million vehicles, while other major contributors included France with 0.46 million more vehicles, Italy with 0.41 million more and Spain with 0.20 million more. This increase can be mostly attributed to the presence of national scrapping schemes introduced in the context of the financial crisis in 2008 and 2009. From 2009 to 2014 the number of reported end-of-life vehicles fell by 32 %, to 6.1 million vehicles. This reduction was mostly due to the decrease of their number especially in Germany (1.3 million), Italy (0.7 million), France (0.5 million), Spain and the United Kingdom (both 0.2 million). In 2014, the end-of-life vehicles in these five countries made up 70 % of the EU-28 total.

As displayed in Figure 4.3.11, in 2014 all reporting EU Member States, except Malta, were in compliance with the reuse/recycling targets; Malta was the only Member State that did not comply with the reuse/recovery target having achieved a share of 45 %. Slovenia met their targets in 2012 (the last reported year) and Iceland in 2013.

Due to capacity limitations in some countries not all vehicles were treated in the same year, This may result in a decline in the recycling/recovery rate, e.g. for Malta the volume treated (respectively exported for treatment) is much less than the volume of end-of-life vehicles in 2014. This may as well result in high calculated recycling/recovery rates (>100 %) when remaining stocks from the previous years were treated in the following years e.g. in Germany and Slovenia.

Table 4.3.6: Waste electrical and electronic equipment (WEEE), total collected, by EEE category, 2014

(tonnes)

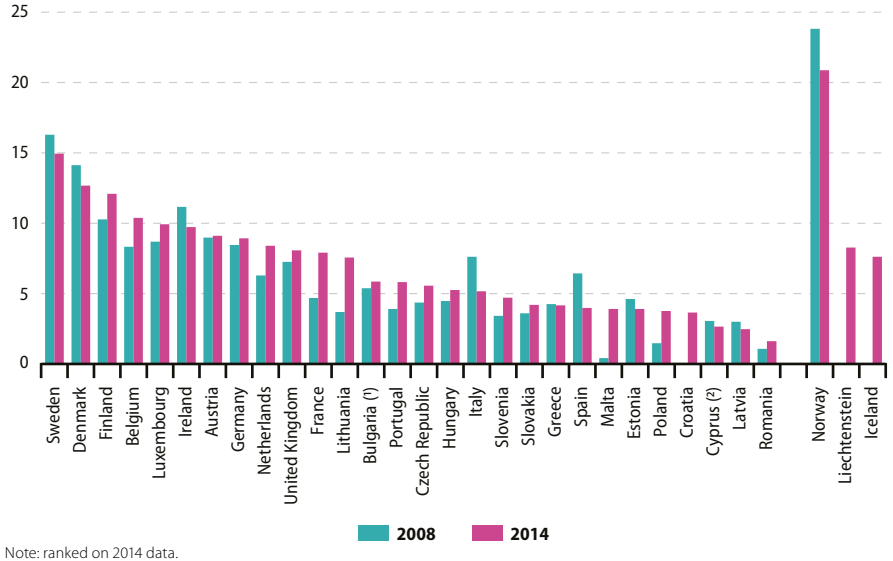
	Total waste	Large household appliances	Small household appliances	IT and tele-communications equipment	Consumer equipment	Other
EU-28	3 453 653	1 668 890	329 837	606 466	603 548	244 911
Belgium	116 345	50 781	13 028	18 364	24 007	10 164
Bulgaria	42 310	30 286	3 790	2 549	3 494	2 191
Czech Republic	58 585	27 828	6 235	8 813	12 769	2 940
Denmark	71 557	32 890	5 405	11 625	17 195	4 442
Germany	722 968	239 662	126 943	144 476	152 008	59 879
Estonia	5 140	1 854	331	1 165	1 479	312
Ireland	44 911	23 797	1 920	6 412	9 066	3 716
Greece	45 420	27 317	3 246	5 191	7 834	1 831
Spain	184 818	101 827	14 263	20 205	27 994	20 529
France	522 793	292 730	34 478	67 731	99 972	27 884
Croatia	15 488	5 275	317	2 722	6 376	800
Italy	314 210	142 666	20 983	59 582	71 306	19 673
Cyprus (1)	2 283	1 124	279	477	326	77
Latvia	4 921	2 490	400	528	439	1 064
Lithuania	22 186	12 429	1 422	3 144	2 142	3 048
Luxembourg	5 518	2 586	412	678	1 278	564
Hungary	51 775	28 682	5 633	8 995	6 235	2 231
Malta	1 673	971	8	330	289	74
Netherlands	141 805	64 496	10 219	29 699	27 741	9 650
Austria	77 726	31 199	8 415	18 057	14 780	5 276
Poland	143 256	76 513	16 346	14 278	16 303	19 815
Portugal	60 467	33 154	8 594	11 218	6 232	1 269
Romania	32 159	20 465	1 021	4 803	3 513	2 356
Slovenia	9 692	4 535	940	2 253	1 271	693
Slovakia	22 716	11 590	1 969	2 691	3 119	3 346
Finland	66 014	33 917	2 680	9 381	16 073	3 963
Sweden	144 858	71 306	5 790	24 006	34 225	9 531
United Kingdom	522 059	296 520	34 770	127 093	36 082	27 593
Iceland	3 435	1 696	354	715	418	252
Liechtenstein	308	75	117	58	52	5
Norway	107 236	49 402	5 570	14 448	15 182	22 634

(1) 2013 data instead of 2014.

Source: Eurostat (online data code: env_waselee)

Figure 4.3.12: Waste electrical and electronic equipment (WEEE), total collected, 2008 and 2014

(kg per inhabitant)



Note: ranked on 2014 data.

(1) 2008: Eurostat estimate.
(2) 2013 data instead of 2014.

Source: Eurostat (online data code: env_waselee)

Table 4.3.6 shows the amount of WEEE collected by equipment category. Large household appliances account for approximately 1.7 million tonnes or 48 % of the total WEEE collected in the EU-28. IT and telecommunication equipment and Consumer equipment are the second (~18 %) and third (~17 %) largest categories for WEEE collection, accounting for 606 thousand tonnes and 604 thousand tonnes respectively. Small household appliances contributed 330 thousand tonnes or about 10 % to WEEE collection. The remaining seven categories together ('Other') totalled about 245 thousand tonnes or 7 % of WEEE collected. The breakdown for these last four groups does not include data for Italy.

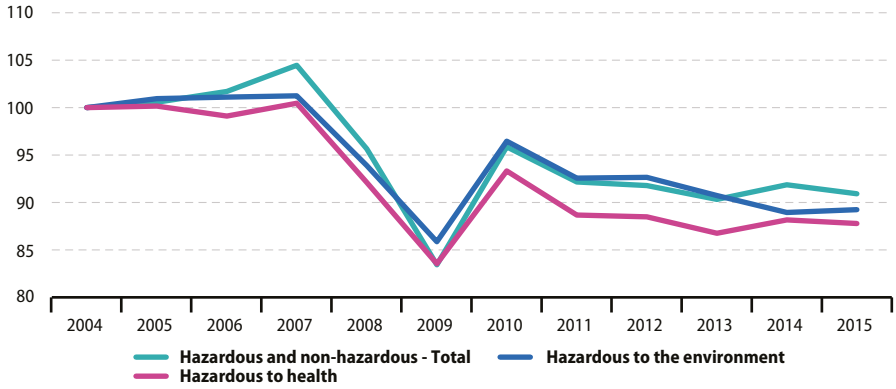
Figure 4.3.12 shows the amount of WEEE collected by country in kg per inhabitant for the years 2008 and 2014. The figure illustrates both the level of separate collection in the countries and the evolution from 2008 to 2014.

In 2014, the total amount of collected WEEE varied considerably across EU Member States, ranging from 1.6 kg per inhabitant in Romania to 14.9 kg per inhabitant in Sweden. Norway has maintained high WEEE collection rates of 20.9 kg per inhabitant.

4.4 Chemicals

Figure 4.4.1: Production of chemicals, EU-28, 2004–15

(index 2004=100)

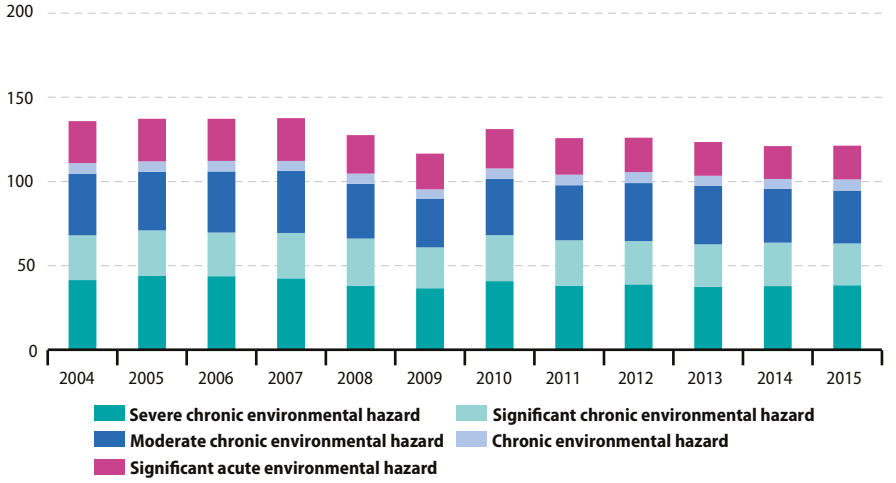


Note: the y-axis is cut.

Source: Eurostat (online data codes: env_chmhaz)

Figure 4.4.2: Production of chemicals hazardous to the environment, EU-28, 2004–15

(million tonnes)

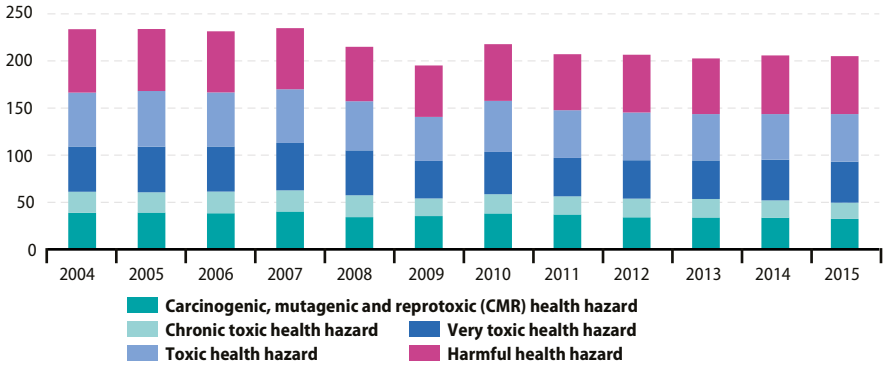


Note: the different classes of chemicals are ranked according to their environmental effect from the most harmful (bottom class) up to the least harmful (top class).

Source: Eurostat (online data code: env_chmhaz)

Figure 4.4.3: Production of chemicals hazardous to health, EU-28, 2004–2015

(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)

The total production of industrial chemicals in the EU-28 increased each year between 2004 and 2007, rising overall by 4.5 % to peak at 371 million tonnes in 2007. During the financial and economic crisis, production fell by 31 million tonnes (or 8.4 %) in 2008 and by a further 43 million tonnes (or 12.8 %) in 2009. 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 remained relatively stable during the period 2011–2015 (327, 326, 320, 326 and 323 million tonnes), which was still 40–50 million tonnes below the pre-crisis peak in 2007 (see Figure 4.4.1).

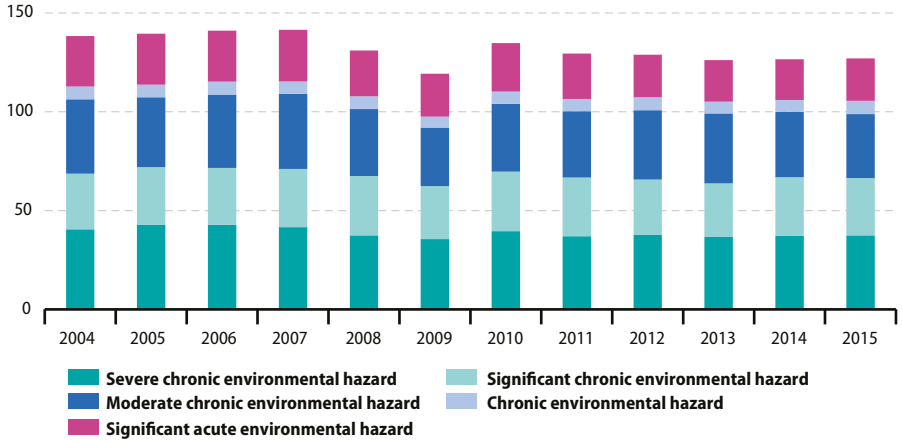
The production of chemicals harmful to the aquatic environment fell by 21 million tonnes (or 15.2 %) between 2007 and 2009 to a low of 117 million tonnes in 2009. There was a strong rebound in the production of chemicals hazardous to the environment in 2010, followed by another decrease in 2011. During the period 2011–2015 the production of these five classes remained relatively stable between 121 and 126 million tonnes (see Figure 4.4.2).

The EU-28 production of chemicals hazardous to health (all five toxicity classes together) reached a peak of 235 million tonnes in 2007. Production fell by 20 million tonnes in 2008 and by the same amount in 2009 to a level of 195 million tonnes. The rebound in activity in 2010 (+23 million tonnes) made up for the losses recorded in 2009 but was followed by further reductions in 2011 (-11 million tonnes). The EU-28 level of production of chemicals hazardous to health in 2015 was 205 million tonnes, almost 30 million tonnes less than in 2004 (see Figure 4.4.3).

EU-28 production of the most toxic chemicals - carcinogenic, mutagenic and reprotoxic (CMR) hazard — fluctuated between 38.4 and 40.1 million tonnes over the period from 2004 to 2007. Production fell by 5.9 million tonnes between 2007 and 2008 to stand at 34.2 million tonnes. There was a recovery in the level of production of CMRs in 2009 and 2010, as the production of CMR chemicals rose to 38.2 million tonnes. From 2010, the level of production of CMR chemicals declined once more to reach 32.3 million tonnes by 2015.

Figure 4.4.4: Consumption of chemicals hazardous to the environment, EU-28, 2004–2015

(million tonnes)

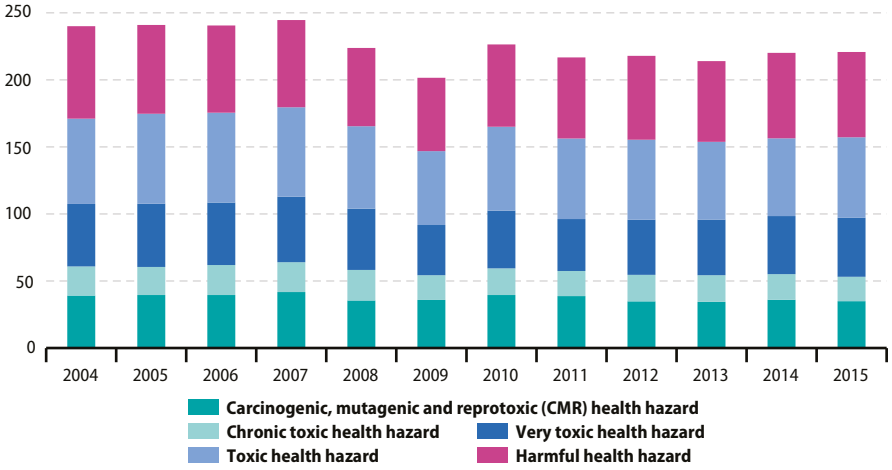


Note: the different classes of chemicals are ranked according to their environmental impact from the most harmful (bottom class) up to the least harmful (top class).

Source: Eurostat (online data code: env_chmhaz)

Figure 4.4.5: Consumption of chemicals hazardous to health, EU-28, 2004–15

(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)

The relative share of CMR chemicals in total EU-28 chemical production fell from 10.9 % in 2004 to 10.0 % by 2015.

Consumption volumes result by adding the net import / export to the production volumes of the chemicals. While the production figures of the individual chemicals remain relatively constant over time, the import / export figures vary considerably.

The total consumption of industrial chemicals in the EU-28 – similar to the total production – increased between 2004 and 2007, rising overall by 4.8 % to peak at 389 million tonnes in 2007. During the financial and economic crisis, consumption fell by 34 million tonnes (or 8.7 %) in 2008 and by a further 49 million tonnes (or 13.9 %) in 2009. The rebound in activity in 2010 made up for the losses reported in 2009. In 2011, the consumption of chemicals in the EU-28 decreased again and then remained relatively stable during the period 2011–2013 (340, 340 and 339 million tonnes), which was still approximately 50 million tonnes below the pre-crisis peak in 2007. After 2013 consumption increased again to 350 million tonnes in 2015.

Figure 4.4.4 shows the timeline for the apparent consumption of chemicals harmful to the aquatic environment from 2004 – 2015. In general, differences between the consumption and the production of chemicals are small. Net trade adds between 1.7 % and 4.7 % (2015) to the sum of the production of the five classes of chemicals harmful to the aquatic environment. This corresponds to 2.3 and 5.7 million tonnes of chemicals - the highest net imports resulted in 2015.

Figure 4.4.5 shows the time lines for the apparent consumption of chemicals hazardous to health from 2004 – 2015. As already mentioned in the case of chemicals hazardous to the environment, differences between the consumption and production are small. Net trade adds between 2.8 % and 7.7 % to the sum of the production of the five classes of chemicals hazardous to health.

4.5 Forestry

The EU-28 had close to 182 million hectares of forests and other wooded land, corresponding to 43 % of its land area (excluding lakes and large rivers). Wooded land covers a slightly greater proportion of the land than is used for agriculture (some 41 %). In seven EU Member States, more than half of the land area was wooded in 2015. Just over three quarters of the land area was wooded in Finland and Sweden, while Slovenia reported 63 %; the remaining four EU Member States, each with shares in the range of 54–56 %, were Estonia, Latvia, Spain and Portugal, and in Greece the share of wooded area was 50 %.

Forestry is part of a special sector for the reporting on greenhouse gases under the UNFCCC called land use, land use change and forestry (LULUCF). This is because only a small part of its emissions and removals count towards compliance with targets - only those quantities resulting from human activities beyond the natural carbon cycles. In this sector, there is a very big difference between reported and accounted quantities. The EU proposed on 20 July 2016 to fully integrate the LULUCF sector into the EU 2030 climate and energy framework.

Land use includes our use of soil, trees, plants, biomass and timber, and is in a unique position to contribute to climate policy because the LULUCF sector not only emits greenhouse gases but also removes CO_2 from the atmosphere. According to the data compiled by the EEA for the EU-28 as a whole, forest land and harvested wood products are the two sub-sectors of LULUCF that absorb and store CO_2 from the atmosphere. The other six sub-sectors of LULUCF are for the time being mostly net CO_2-emitters: cropland, grassland, wetlands, settlements, other land and other LULUCF. This assertion may not hold for individual Member States because the way land is managed determines whether it is a source or sink of CO_2. For example, grassland will become a sink if it is managed without disturbing the soil, and forests can become sources of CO_2 when more timber is felled than grows in a given time period.

The data compiled by the EEA for the EU-28 cover the official data reported to the UNFCCC by the Member States under Regulation (EU) N° 525/2013 on "a mechanism for monitoring and reporting greenhouse gas emission (MMR)". EU forest land alone removes up to 10.4 % of the total EU-28 greenhouse gas emissions every year. When carbon stored in harvested wood products is added to the removals of forest land, the two sectors combined absorb up to 11.1 % of total annual EU greenhouse gas emissions (see Table 4.5.1).

However, contrary to the reporting on emissions of the industrial sectors, the reported emissions and removals of CO_2 in the LULUCF sector cannot be used as such to demonstrate compliance with the targets, but are subject to a set of accounting rules. The main justification for the accounting approach in LULUCF is that a significant part of the removals associated with carbon stocks in forests and soils is the result of the natural greenhouse gas cycle. While reporting concerns an inventory of all emissions and removals, accounting aims to identify those emissions and removals that are human-induced and the result of additional action by humans over and above the natural carbon cycles that have always existed on the planet.

In the Commission's recent proposal on integrating LULUCF into EU climate policy, the probable average annual surplus of CO_2 removals in the LULUCF sector without additional measures would be limited to less than 20 million tonnes of CO_2-equivalent per year at EU-28 level on agricultural land. This sink is estimated to increase to over 90 million tonnes of CO_2-equivalent per year if additional action is taken on agricultural land and afforestation is carried out.

Table 4.5.1: Reported greenhouse gas emissions and removals by forests and harvested wood products, EU-28, 1990-2015

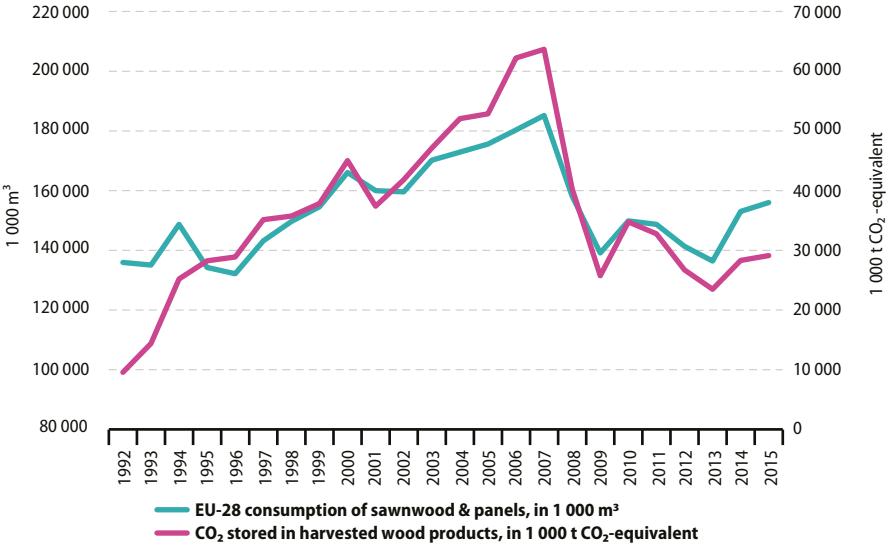
	All sectors and indirect CO_2	Forest land	Harvested wood products	Sum of removals by forest land and HWP(1)	Removals	
					By forest land and harvested wood products	By forest land
	(million tonnes of CO_2-equivalent)				(% of all emissions)	
1990	5 415.3	-374.5	-26.2	-400.8	-7.4	-6.9
1991	5 287.5	-407.6	-16.2	-423.7	-8.0	-7.7
1992	5 141.4	-382.4	-9.6	-392.0	-7.6	-7.4
1993	5 040.2	-384.9	-14.4	-399.3	-7.9	-7.6
1994	5 002.8	-385.7	-25.2	-410.9	-8.2	-7.7
1995	5 033.1	-399.9	-28.2	-428.1	-8.5	-7.9
1996	5 109.9	-422.9	-28.9	-451.8	-8.8	-8.3
1997	5 010.9	-419.1	-35.1	-454.2	-9.1	-8.4
1998	4 947.4	-434.7	-35.7	-470.5	-9.5	-8.8
1999	4 813.5	-456.2	-37.8	-494.1	-10.3	-9.5
2000	4 854.1	-414.7	-45.0	-459.7	-9.5	-8.5
2001	4 887.4	-437.0	-37.4	-474.4	-9.7	-8.9
2002	4 864.7	-414.3	-41.8	-456.2	-9.4	-8.5
2003	4 970.0	-390.7	-47.1	-437.8	-8.8	-7.9
2004	4 933.9	-418.5	-52.1	-470.6	-9.5	-8.5
2005	4 897.1	-416.8	-52.9	-469.6	-9.6	-8.5
2006	4 868.4	-427.4	-62.2	-489.6	-10.1	-8.8
2007	4 856.6	-394.9	-63.7	-458.5	-9.4	-8.1
2008	4 705.9	-447.4	-40.3	-487.7	-10.4	-9.5
2009	4 341.3	-459.9	-25.7	-485.7	-11.2	-10.6
2010	4 457.0	-434.5	-34.8	-469.2	-10.5	-9.7
2011	4 312.3	-431.5	-32.7	-464.2	-10.8	-10.0
2012	4 248.0	-438.8	-26.7	-465.5	-11.0	-10.3
2013	4 145.3	-445.0	-23.5	-468.5	-11.3	-10.7
2014	3 977.1	-431.4	-28.3	-459.7	-11.6	-10.8
2015	4 004.8	-417.2	-29.1	-446.4	-11.1	-10.4

(1) HWP = Harvested wood products.

Source: Eurostat (online data code: env_air_gge), based on European Environment Agency data.

A direct objective of the accounting rules is to increase human-induced CO_2 removals in the LULUCF sector, where the EU – as any other party under the UNFCCC - will have to make additional efforts. One such effort could be the substitution of some of the steel and concrete used in the construction industry by timber products. The carbon stored in harvested wood products is mainly calculated for long-lived products such as the sawnwood used for construction or the wood panels used for interior finishing. Eurostat's data are used to estimate wood products consumed (i.e. production + imports – exports). Figure 4.5.1 shows data for the two main wood products along with the EEA estimates of carbon stored in harvested wood products. There is quite a good fit between the consumption of sawnwood and panels and the EEA estimate of CO_2 stored in harvested wood products in the EU-28. Both lines show the sharp drop in production due to the financial and economic crisis in 2008-09.

Figure 4.5.1: Consumption of wood products and storage of CO_2, EU-28, 1992 - 2015



Note: different scale on the left and right axis.

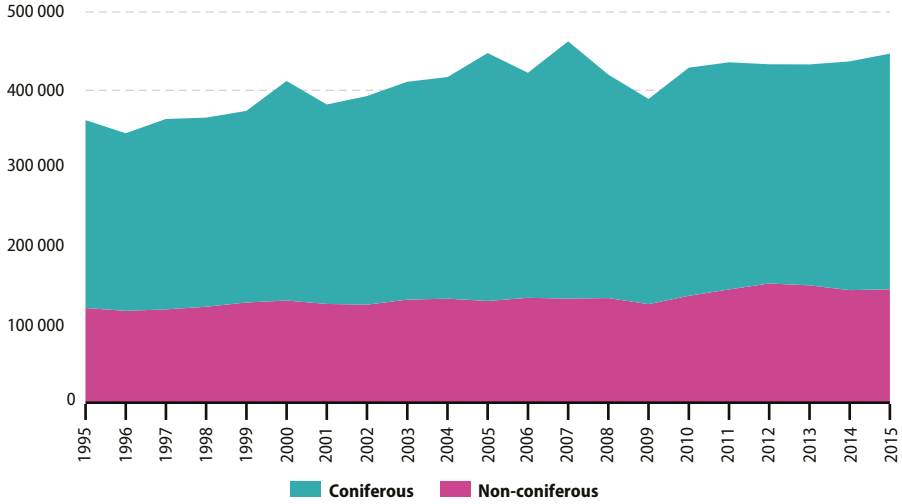
Source: Eurostat (online data codes: env_air_gge, for_swpan)

The overall level of EU-28 roundwood production reached an estimated 447 million m³ in 2015, only 15 million m³ (3.4 %) less than the peak output level recorded in 2007. Note that some of the peaks (most recently 2000, 2005 and 2007) in roundwood production were due to forestry and logging having to cope with unplanned numbers of trees that were felled by severe storms.

From 1996 to 2007, there was a steady increase in the level of roundwood production in the EU-28. While the output of non-coniferous (broadleaved or hardwood) species remained relatively stable, there were greater year-on-year differences for coniferous (softwood) species (see Figure 4.5.2). The financial and economic crisis led to a drop in the level of EU-28 coniferous production in 2008, a finding confirmed by a further reduction in 2009. The output has since returned to pre-crisis levels of approximately 302 million m³ per annum. Non-coniferous production increased relative to coniferous production ever since the crisis years. In 2010, EU-28 total roundwood production rebounded strongly by 10 % and continued to rise in 2011, levelled out in 2012 and 2013, and increased by 2 % in 2015.

Figure 4.5.2: Annual production of roundwood, EU-28, 1995–2015

(thousand m³)



Note: data have been estimated by Eurostat.

Source: Eurostat (online data code: for_removv)

Table 4.5.2: Roundwood production, 2000-2015

(thousand m^3)

	2000	2005	2010	2011	2012	2013	2014	2015
EU-28	411 764	447 502	428 785	435 668	433 173	432 975	436 843	446 819
EA-19	236 540	232 925	243 366	239 602	237 347	235 341	231 980	241 939
Belgium	4 510	4 950	4 827	5 128	6 663	:	:	:
Bulgaria	4 784	5 862	5 668	6 205	6 092	6 155	5 570	6 372
Czech Republic	14 441	15 510	16 736	15 381	15 061	15 331	15 476	16 163
Denmark	2 952	2 962	2 669	2 583	:	3 180	3 180	:
Germany	53 710	56 946	54 418	56 142	52 338	53 207	54 356	55 613
Estonia	8 910	5 500	7 200	7 110	7 290	7 655	8 000	7 736
Ireland	2 673	2 648	2 618	2 635	2 580	2 760	2 828	2 908
Greece	2 245	1 523	1 048	1 196	:	1 092	1 217	:
Spain	14 321	15 531	16 089	15 428	14 657	15 560	16 395	16 719
France	65 865	52 499	55 808	55 041	51 495	51 304	51 866	51 005
Croatia	3 669	4 018	4 477	5 258	5 714	5 436	5 926	5 178
Italy	9 329	8 691	7 844	7 744	7 744	:	5 759	5 052
Cyprus	21	10	9	8	11	9	9	11
Latvia	14 304	12 843	12 534	12 833	12 530	12 708	12 885	12 294
Lithuania	5 500	6 045	7 097	7 004	6 921	7 053	7 351	6 414
Luxembourg	260	249	275	261	:	:	:	381
Hungary	5 902	5 940	5 740	6 232	5 946	6 027	5 798	:
Malta	0	0	0	0	0	0	0	:
Netherlands	1 039	1 110	1 081	982	8 063	1 108	8	1 173
Austria	13 276	16 471	17 831	18 696	18 021	17 390	17 089	17 550
Poland	26 025	31 945	35 467	37 180	38 015	38 940	40 862	41 375
Portugal	10 831	10 746	9 648	10 961	10 711	10 610	11 152	11 533
Romania	13 148	14 501	13 112	14 359	16 088	15 195	15 330	15 315
Slovenia	2 253	2 733	2 945	3 388	3 341	3 415	5 099	5 054
Slovakia	6 163	9 302	9 599	9 213	8 063	8 063	9 168	8 995
Finland	54 542	52 250	52 125	52 778	49 967	56 992	57 033	59 411
Sweden	63 300	98 200	72 200	71 900	69 499	69 600	73 300	74 300
United Kingdom	7 791	8 519	9 718	10 020	10 120	10 821	11 184	10 550
Iceland	0	0	:	:	4	:	:	:
Liechtenstein	:	:	25	26	23	19	12	8
Norway	8 156	9 667	10 443	10 291	10 572	11 598	11 376	11 876
Switzerland	9 238	5 285	4 938	4 861	4 466	4 577	4 709	4 357
Montenegro	:	:	915	915	915	915	915	:
Former Yugoslav Republic of Macedonia	1 052	822	631	597	779	691	691	:
Turkey	15 939	16 185	20 597	21 039	21 959	20 858	22 835	:
Brazil	235 402	231 570	235 432	253 144	266 769	264 443	264 443	:
Canada	201 845	203 121	142 013	148 178	148 183	152 076	154 259	:
China	323 646	302 037	350 633	346 359	341 662	347 512	347 512	:
Indonesia	137 830	123 791	113 849	117 994	117 523	115 232	115 232	:
India	318 553	350 451	358 066	358 293	357 761	357 226	357 226	:
Russia	158 101	182 000	175 499	191 225	192 055	194 461	203 000	:
United States	466 549	467 347	376 572	395 141	387 512	396 818	398 693	:

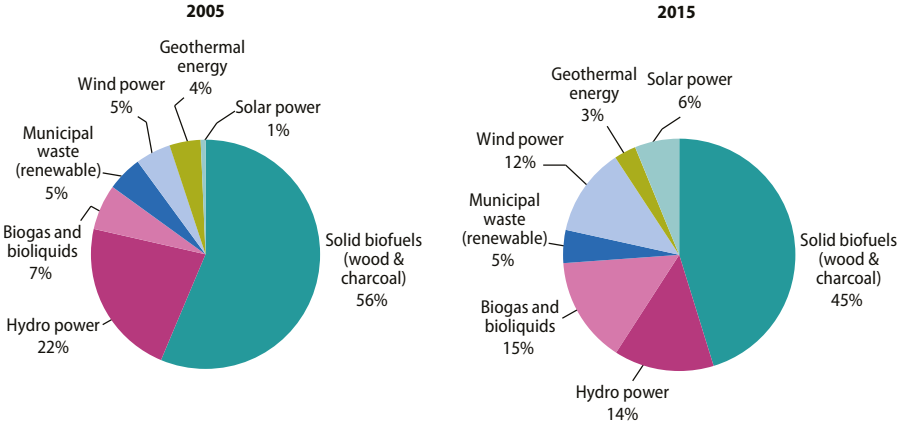
Source: Eurostat (online data code: for_remov)

Among the EU Member States, Sweden produced the most roundwood (74 million m^3) in 2015, followed by Finland, Germany and France (each producing between 51 and 59 million m^3) (see Table 4.5.2). Slightly more than one fifth (21.9 %) of the EU-28's roundwood production in 2015 was used as fuelwood, while the remainder was industrial roundwood used for sawnwood and veneers, or for pulp and paper production.

In 2015, five EU Member States (Ireland, Latvia, Portugal, Slovakia and Sweden) reported that over 90 % of their total roundwood production was industrial roundwood. In Denmark and Greece (both in 2014), France, Italy and Cyprus, over half of the roundwood produced was fuelwood. For Bulgaria, Croatia, Lithuania and Romania, the share of fuelwood varied between 33 and 45 % of roundwood production. In many EU Member States, however, no estimates of fuelwood consumption by households are included in the numbers reported. Separate studies would be needed to produce such estimates, because this wood may be acquired informally, including from forests owned by households. The numbers are probably under-reported in several EU Member States, given the recent increases in the EU's production of wood pellets and other agglomerates used for energy and the share of wood in gross inland energy consumption, most of which should come from harvested fuelwood.

Figure 4.5.3: Gross inland consumption of renewable energy, EU-28, 2005 and 2015

(%)



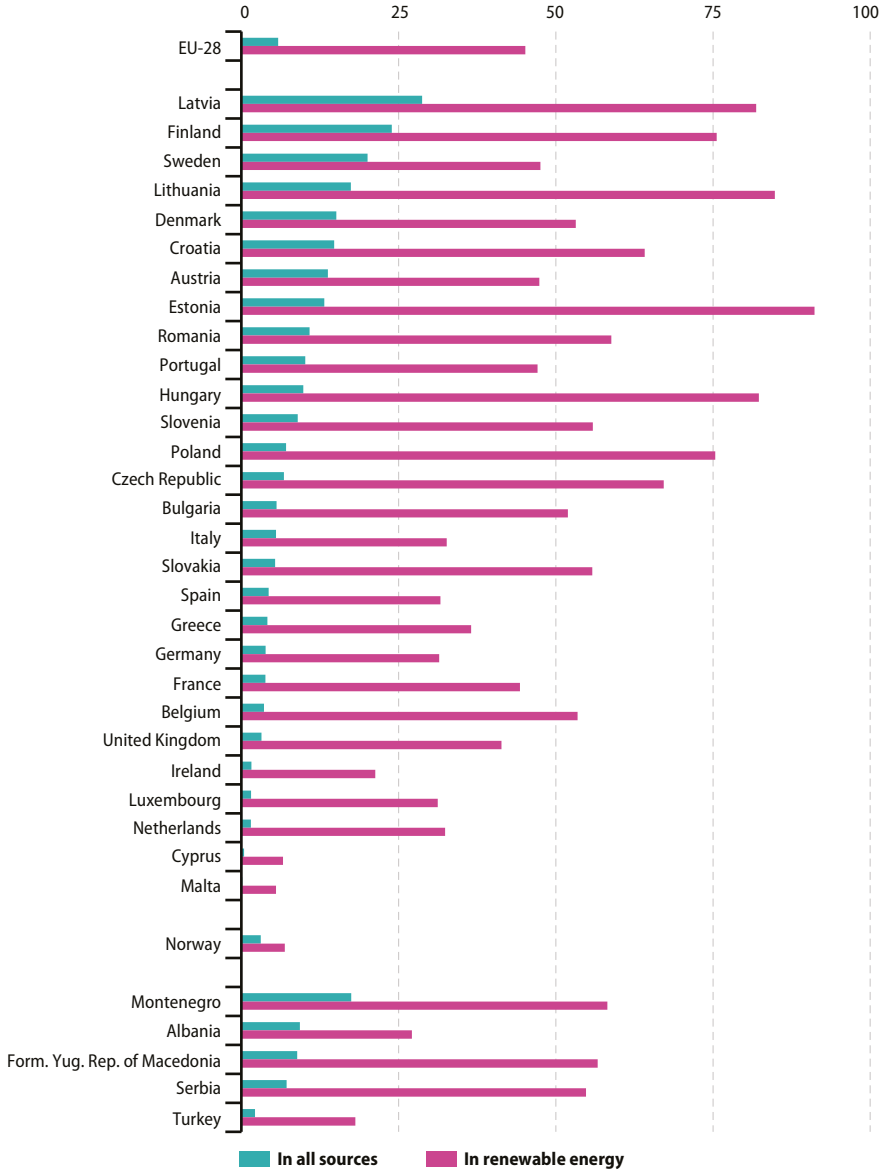
Source: Eurostat (online data codes: nrg_107a)

Between 2005 and 2015, the consumption of renewable energy within the EU-28 increased by 73.2 %. Some renewable energy sources grew exponentially. The consumption of solar energy for example, grew by 1 475 % between 2005 and 2015. However, the consumption of more established renewable energy sources, such as biomass other than wood (including municipal waste) also increased substantially (+184 %) during the same period. Among renewable energy sources, total biomass (wood and other biomass including municipal waste) plays an important role, accounting for two thirds (65 %) of the gross inland energy consumption of renewables in the EU-28 in 2015. As part of this biomass total, wood and agglomerated wood products such as pellets and briquettes provided the highest share of energy of biological origin, accounting for almost half (45 %) of the EU-28's gross inland energy consumption of renewables in 2015 (see Figure 4.5.3).

In many EU Member States, wood was the most important single source of energy from renewables. As shown in Figure 4.5.4, wood and wood products accounted for 5.9 % of the total energy consumed within the EU-28 in 2015. The share of wood and wood products in gross inland energy consumption ranged from over 20 % in Latvia, Finland and Sweden down to less than 1 % in Cyprus and Malta. Wood was the source for more than three quarters of the renewable energy consumed in Estonia, Lithuania, Latvia, Finland, Hungary and Poland. By contrast, the share of wood in the mix of renewables was relatively low in Cyprus and Malta (where the lowest share was reported, 5.5 %); this was also the case in Norway (6.9 %).

Figure 4.5.4: Wood as a source of energy, 2015

(% share of wood and wood products in gross inland energy consumption)



Source: Eurostat (online data codes: nrg_100a and nrg_107a)

Table 4.5.3: Economic indicators for forestry and logging, 2005 and 2014

(million EUR, current basic prices)

	Gross output		Gross value added at basic prices (million EUR)		Gross fixed capital formation		Gross value added/forest area available for wood supply (EUR/hectare)	
	2005	2014	2005	2014	2005	2014 (1)	2005	2014 (2)
EU-28	:	48 392	:	25 156	:	:	:	187
Belgium	:	429	:	89	:	:	:	133
Bulgaria	266	681	84	248	11	18	33	112
Czech Republic	1 424	2 264	496	883	63	110	197	384
Denmark	:	757	:	322	:	:	:	563
Germany	4 141	8 603	1 738	3 053	168	263	160	280
Estonia	:	604	:	239	:	:	:	120
Ireland	:	539	:	145	:	:	:	229
Greece	71	82	54	63	4	16	16	18
Spain	1 582	1 273	787	1 042	:	:	57	71
France	5 531	6 811	2 968	3 285	472	231	195	205
Croatia	:	310	:	184	:	19	:	106
Italy	456	1 517	365	1 217	83	222	47	148
Cyprus	2	5	2	3	2	1	38	63
Latvia	:	1 045	:	393	:	:	:	125
Lithuania	172	1 609	102	696	10	133	55	362
Luxembourg	9	26	6	20	1	3	69	231
Hungary	339	449	132	196	24	:	79	110
Malta	:	:	:	:	:	:	:	:
Netherlands	133	252	46	113	10	7	157	375
Austria	1 786	2 461	873	1 215	155	155	261	364
Poland	1 991	5 205	1 110	2 376	137	205	132	289
Portugal	1 066	1 191	810	845	93	92	367	404
Romania	531	331	314	128	:	47	62	28
Slovenia	195	374	115	231	8	14	99	203
Slovakia	624	795	259	330	33	37	148	185
Finland	3 235	4 741	2 422	3 396	388	442	121	174
Sweden	:	4 622	:	3 781	:	648	:	191
United Kingdom	791	1 416	357	662	20	453	118	211
Norway	:	1 173	:	585	:	66	:	71
Switzerland	525	882	186	337	83	130	158	279

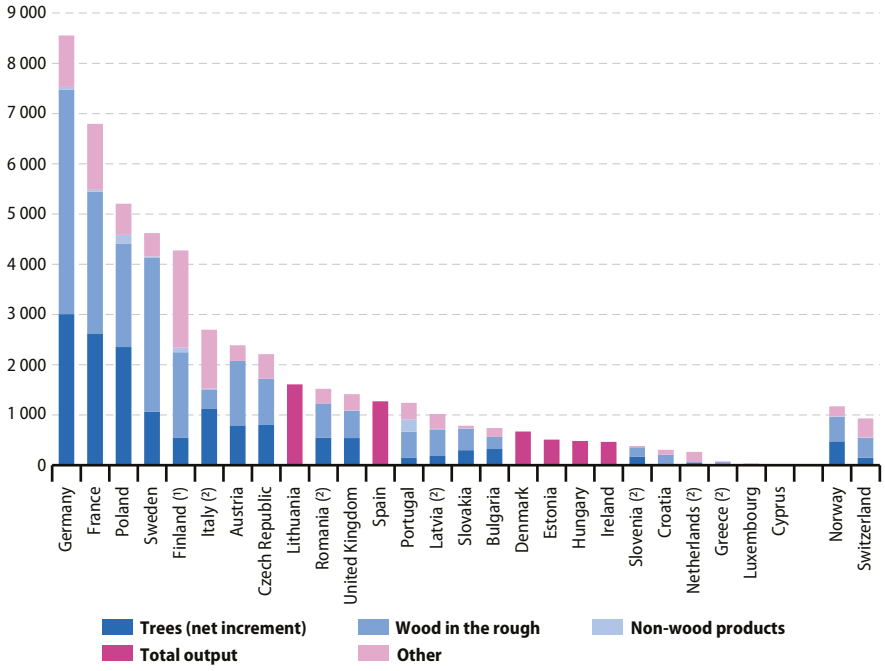
(1) 2013 data used instead of 2014 for Greece, Italy, the Netherlands, Romania, Slovenia, Finland and Norway.
(2) 2015 forest area used for the calculation.
Source: Eurostat (online data codes: for_eco_cp and for_area)

A range of economic indicators are presented for forestry and logging activities across EU Member States in Table 4.5.3. The data come from EU forest accounts and the largest forestry and logging activities on the basis of gross value added generated in 2014 were found in Sweden, Finland and France.

Figure 4.5.5 shows the output of the forestry and logging activity by type of output among the EU-28, Norway and Switzerland in 2014. For countries where the breakdown is missing, the breakdown for 2012 or 2013 is used. From the data available, we see that the output of wood in the rough (logs) is highest in Germany, France and Sweden with respectively 4 4670, 2 820 and 3 070 million euro. The net increment of forest trees in managed forests is also highest in Germany (3 000), followed by France (2 620) and Poland (2 350). On the other hand, the output on non-wood products varies from 254 million euro in Portugal (the main producer of cork), 180 in Poland, 55 in Germany to 0.6 million euro in Slovenia. The category "Other", which includes services, secondary activities and other products, shows the highest output in Finland (1 930) followed by France (1 310) and Italy (1 170).

Figure 4.5.5: Output of forestry and logging by type, 2014

(million EUR, current basic prices)



(1) 2012 data instead of 2014.
(2) 2013 data instead of 2014.

Source: Eurostat (online data codes: for_sup_cp)

The ratio of value added generated within the forestry and logging industry compared with the forest area available for wood supply is an indicator that can be used to analyse the productivity of forestry activities across the EU (see Figure 4.5.6). The indicator shows that in 2014, the highest amounts of value added per forest area in the EU were in Denmark, Portugal, the Czech Republic, the Netherlands and Austria.

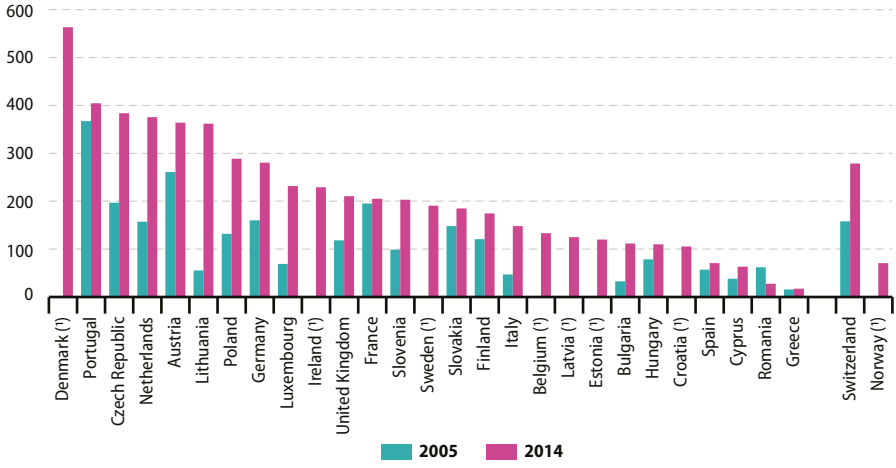
The largest workforce was recorded in Poland, with 72 700 persons employed in 2015. There were also relatively large workforces in Romania (51 600), Italy (50 500), Germany (36 500) and France (31 900).

The ratio of labour input per area of exploited forest provides information on the labour intensity of the sector across the EU Member States, see Figure 4.5.7. This indicator varies considerably between countries, ranging from a high of around 19.5 employed persons per thousand hectares in Cyprus to less than 2 employed persons per 1 000 hectares in Spain, Sweden, Greece and Finland. Some of the differences across EU Member States may, at least in part, be explained by factors such as the density of the growing stock, the tree species and the local terrain in areas where forestry and logging takes place.

Across the EU-28, manufacturing employment fell by 16.8 % during the 2000–2015 period, while the largest losses among the three wood-based industries shown in Figure 4.5.8 were recorded for furniture manufacturing (29.0 % fewer persons employed). Pulp, paper and paper products was less affected (22.2 % reduction in employment during the 2000–15 period), while employment in manufacturing of wood products dropped by 26.5 %. The forestry and logging industry had an employment increase of 6.9 % from 2004 to 2015, this may be explained by the ever-present need to manage forests and to the increasing demand for fuelwood.

Figure 4.5.6: Forestry and logging value added per forest area available for wood supply, 2005 and 2014

(EUR /hectare, current basic prices)



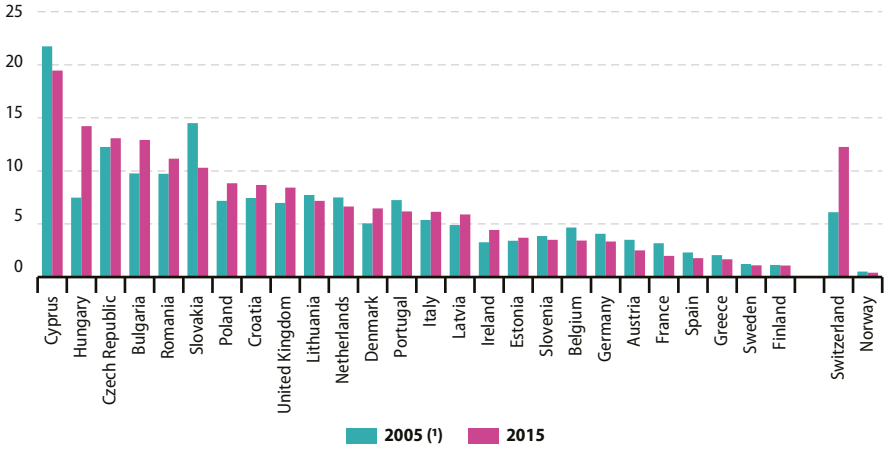
Note: ranked on 2014. Malta: not applicable. Forest area: 2015 data used for the calculation.

(1) 2005: not available.

Source: Eurostat (online data codes: for_eco_cp and for_area)

Figure 4.5.7: Employment per area of forest available for wood supply, 2005 and 2015

(persons employed/thousand hectares)



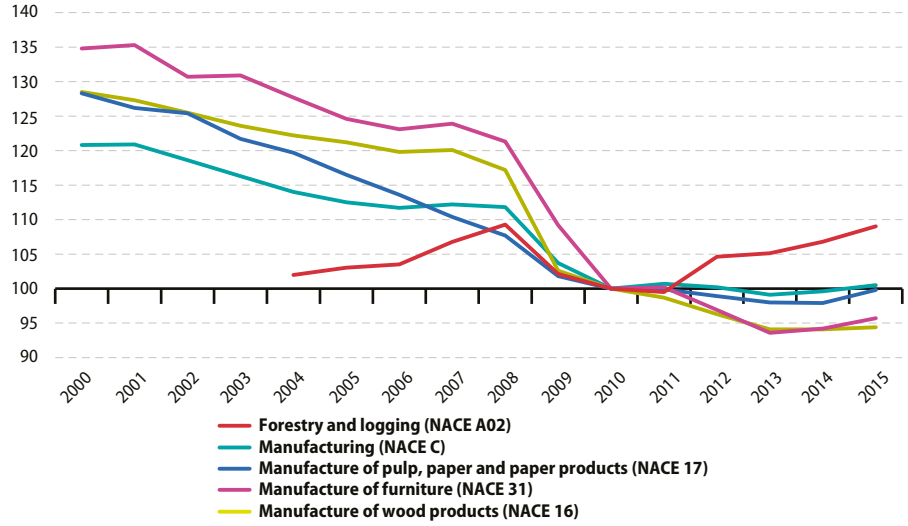
Note: ranked on 2015. EU Member States that are not shown are not available or not applicable.

(1) 2008 LFS employment data used for the calculation.

Source: Eurostat (online data codes: for_emp_lfs, for_emp_lfs1, for_area, for_remov and for_eco_cp)

Figure 4.5.8: Employment in wood-based industries compared with total manufacturing, EU-28, 2000–2015

(index 2010=100)



Source: Eurostat (online data codes: sts_inlb_a, for_emp_lfs1 and for_emp_lfs)

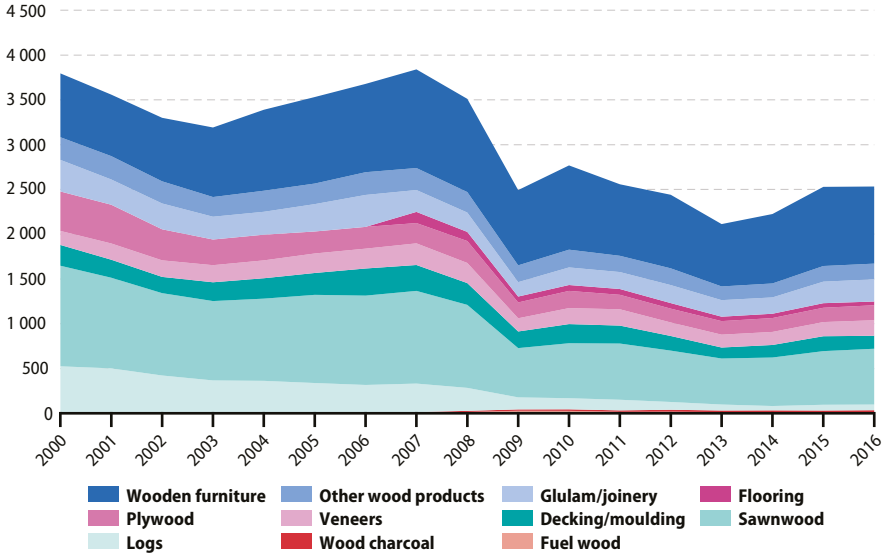
The EU has agreed a voluntary scheme titled the Forest Law Enforcement, Governance and Trade (FLEGT) action plan to fight illegal logging in tropical countries and the associated trade. One key element of the plan is to ensure that only legally harvested timber is imported to the EU. The EU's legal framework for the scheme is Regulation 2173/2005 on the establishment of a FLEGT licensing scheme for imports of timber into the European Community' and Regulation 1024/2008 laying down detailed measures for the introduction of the scheme.

For FLEGT countries, wooden furniture is the most important export to the EU-28, followed by sawnwood (see Figure 4.5.9), which however declined strongly in 2008-2009 and has only recently started to recover. Overall, imports from FLEGT countries used to be much greater than those from China, but as of 2007, imports from FLEGT countries dropped while imports from China increased sharply.

Like the EU-28, China is a consumer of tropical timber, which it transforms into wood products. The most important wood products imported to the EU-28 from China are wooden furniture and other wood products as shown in Figure 4.5.10. Wooden flooring is a trade code only created in 2007 and we can see that the EU-28 is buying quite a lot of it from China.

Figure 4.5.9: Wood products imported to the EU-28 from FLEGT countries, 2000-2016

(million EUR)

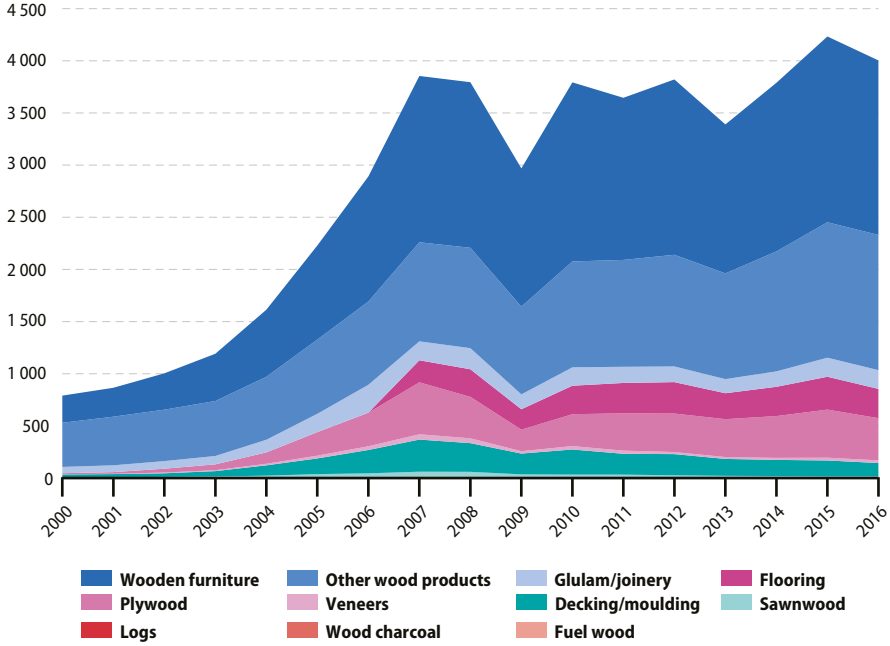


Note: the quantities of "Fuel wood" and "Wood charcoal" are too small to be legible.

Source: Eurostat (COMEXT)

Figure 4.5.10: Wood products imported to the EU-28 from China, 2000-2016

(million EUR)



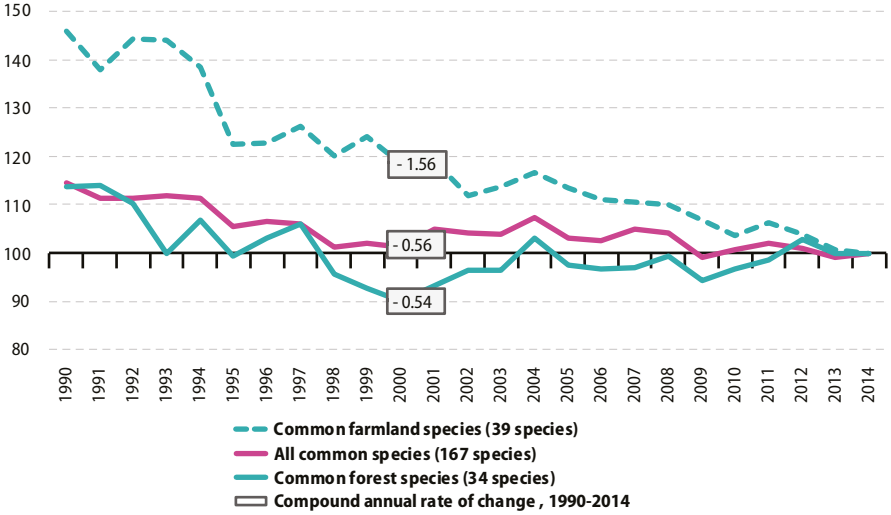
Note: The quantities of "Fuel wood" , "Wood charcoal" and "Logs" are too small to be legible.

Source: Eurostat (COMEXT)

4.6 Biodiversity

Figure 4.6.1: Common bird indices, EU, 1990–2014

(aggregated index of population estimates of selected groups of breeding bird species, 2014=100)



Note: estimate based on 26 Member States.

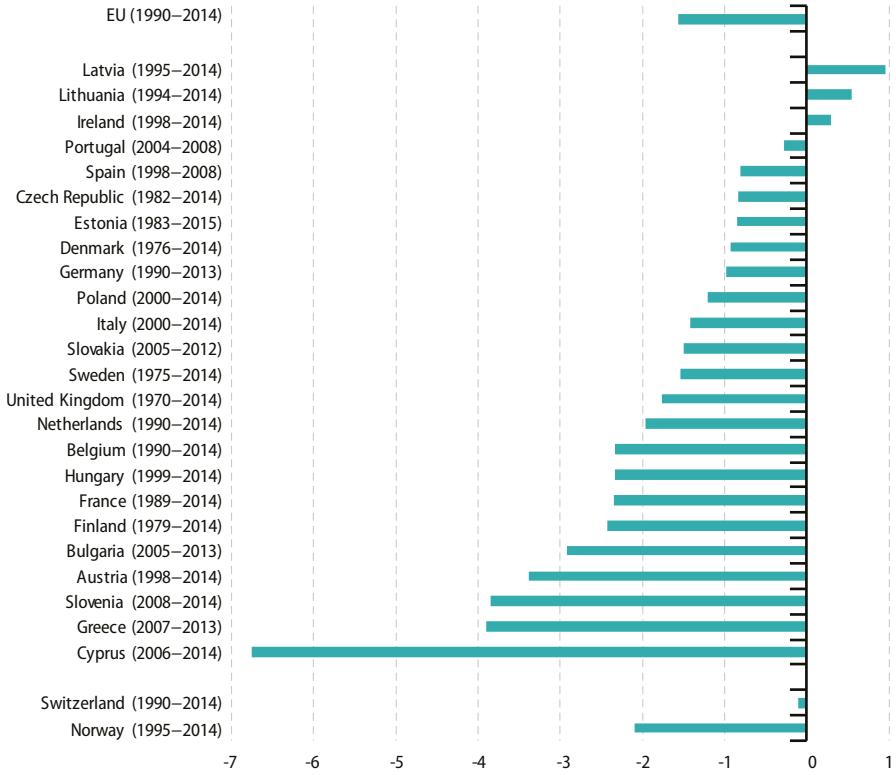
Source: EBCC / RSPB / BirdLife / Statistics Netherlands; Eurostat (online data code: env_bio3)

Between 1990 and 2000 there was a general decline in the EU's populations of both common farmland birds and common forest birds. This pattern was even sharper before 2000 for common farmland birds, resulting in a huge decline by 46 % between 1990 and 2014 (indexed on 2014). Many of these losses can be attributed to changes in land use and agricultural practices, including the intensification of crop rotation patterns and of pesticide use. While the number of common forest birds in the EU declined by 24 percentage points between 1990 and 2000 (indexed on 2014), there was a small recovery during the period 2000–2014, so that the overall decline between 1990 and 2014 was around 14 %, which was the same for all common species in the same period.

Figure 4.6.1 also presents the overall change in each EU bird index 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. At -1.56 %, the EU value of the compound annual rate of change is highest for common farmland birds, while the value for common forest species was -0.54 %, and -0.56 % for the aggregated value of all the monitored species. Using these average annual rates of change, the EU's farmland birds declined by 'only' 39 % over 25 years (1990–2014), while the forest birds and all birds each declined by 14 %.

Figure 4.6.2: Compound annual rate of change of the common farmland bird index

(most recent year compared to base year, %)



Source: Eurostat (online data code: env_bio2)

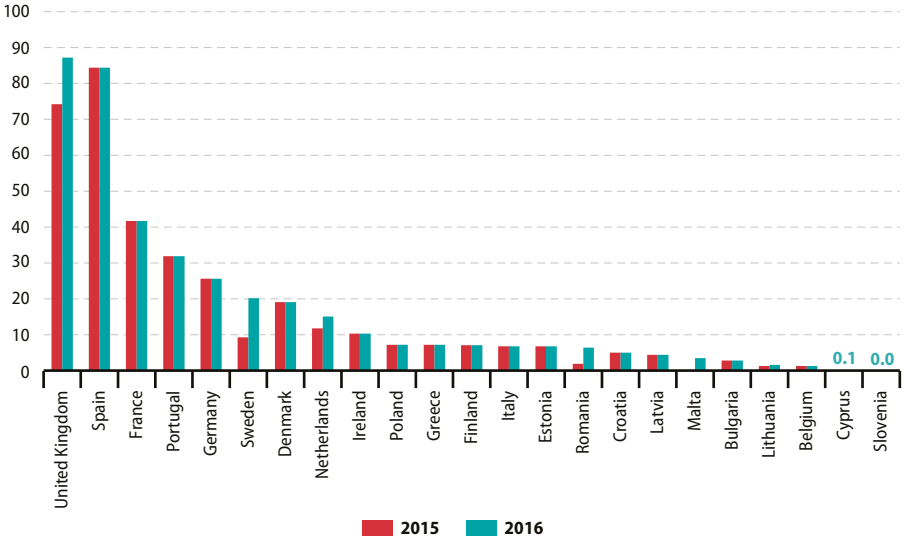
Figure 4.6.2 shows the compound annual rates of change of common farmland species at national level. The different time coverage of the data reflects each country's participation in the pan-European common bird monitoring scheme, so there are fewer data available going back beyond 1990.

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. Only Latvia, Lithuania and Ireland had any improvement in their farmland bird index.

11 countries (Portugal, Spain, the Czech Republic, Estonia, Denmark, Germany, Poland, Italy, Slovakia, Sweden and Switzerland) have negative values, but are still above the EU average of -1.56 %. In the remaining 12 countries, the values indicate poorer performances, with a compound annual rate of change below -3.00 % in Austria, Slovenia and Greece and reaching -6.76 % in Cyprus.

Figure 4.6.3: Natura 2000 protected marine area, comparison between 2015 and 2016

(thousand km²)



Note: The Czech Republic, Luxembourg, Hungary, Austria and Slovakia: not relevant.

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

Areas protected for the preservation of biodiversity are proposed by the EU Member States under the Habitats Directive and under the Birds Directive. Some 788 thousand km² of the EU-28's terrestrial area were protected or proposed for protection as of 2016, around 18 % of the total land area. Known as Natura 2000, it is the largest network of protected areas in the world. Economic activities are allowed under Natura 2000, so the impact of these areas on biodiversity depends on the way they are managed in practice.

Given that the process of designating terrestrial Natura 2000 areas is well advanced, there were only small increases in the extent of such areas in Member States between 2015 and 2016.

In addition to protected terrestrial areas, there were nearly 400 thousand km² of protected marine areas in EU-28 waters in 2016.

More than half – 213 000 km² or 53.9 % – were located in waters around the United Kingdom, Spain and France (see Figure 4.6.3). Between 2015 and 2016, a number of Member States achieved a considerable increase in designating marine protected areas: Malta (more than 1 700 %), Romania (236 %), Sweden (117 %), the Netherlands (28 %), Lithuania (19 %) and the United Kingdom (17 %).

Defining Natura 2000 areas offshore is work in progress and it could take another decade before the network is fully completed in the seas. The technical difficulty is primarily linked to challenges in identifying the location and extent of deep-sea reef habitats. There are further challenges in identifying areas where marine species, in particular dolphins and whales, congregate.

4.7 Water

Table 4.7.1: Groundwater and surface water abstraction, 2005-2015

(million m^3)

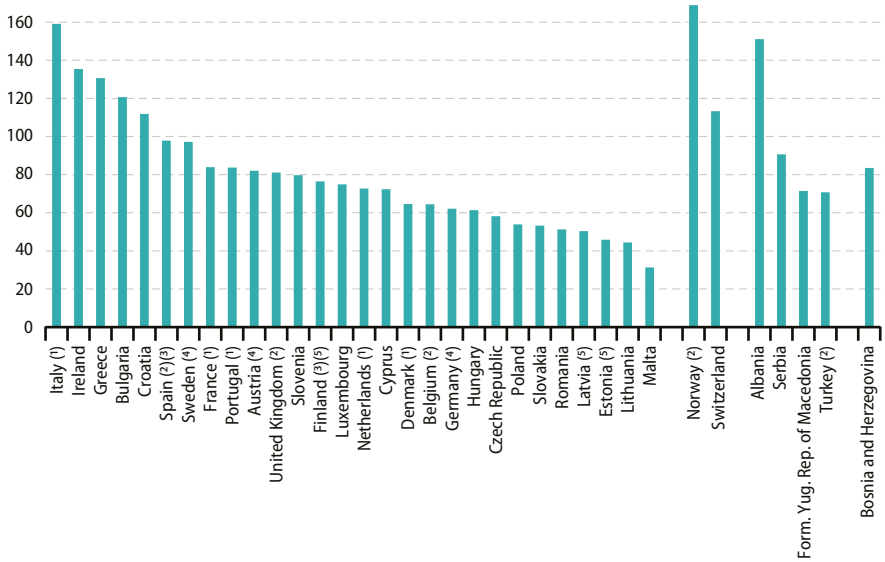
	Groundwater abstraction			Surface water abstraction		
	2005	2010	2015	2005	2010	2015
Belgium (1)	636	612	632	5 753	5 341	:
Bulgaria	597	557	558	5 439	5 403	5 071
Czech Republic	385	377	366	1 564	1 573	1 237
Denmark (2)	628	649	737	16	5	9
Germany (3)	6 033	5 841	:	29 524	27 195	:
Estonia (2)	274	296	199	1 304	1 546	1 525
Ireland (4)	364	196	:	435	561	:
Greece (5)	3 772	5 615	5 611	5 882	4 319	4 297
Spain (2)	6 387	6 601	6 304	31 643	29 009	26 613
France	6 319	5 983	:	27 554	22 356	:
Croatia (6)	464	485	428	:	190	225
Italy	:	:	:	:	:	:
Cyprus	140	140	150	95	61	82
Latvia (7)	102	170	155	136	105	92
Lithuania	157	179	157	2 208	583	254
Luxembourg	:	23	26	:	24	20
Hungary	566	535	492	4 363	4 835	:
Malta	32	41	43	0	0	3
Netherlands	1 010	994	:	10 536	9 927	:
Austria	:	:	:	:	:	:
Poland	2 633	2 722	2 608	8 889	8 923	8 486
Portugal (8)	4 794	:	:	:	:	:
Romania	724	624	590	4 577	5 595	5 868
Slovenia	184	185	182	739	740	714
Slovakia	374	341	326	533	260	248
Finland (9)	285	:	:	6 298	:	:
Sweden	346	348	:	2 285	2 342	:
United Kingdom (2)	2 336	2 152	2 053	7 988	6 111	5 232
Iceland (2)	160	3 268	2 971	5	35	40
Norway (10)	:	:	:	2 476	:	:
Switzerland (11)	:	1 005	:	:	1 000	:
Former Yugoslav Republic of Macedonia (2)(4)	68	:	207	1 089	885	42
Albania	:	:	262	:	:	932
Serbia	554	514	469	3 234	3 377	3 603
Turkey (12)	11 622	13 138	14 600	33 062	33 818	39 113
Bosnia and Herzegovina	295	150	326	56	191	108
Kosovo (13)	137	139	152	26	33	12

(1) Groundwater: 2014 data instead of 2015.
(2) 2014 data instead of 2015.
(3) 2004 data instead of 2005.
(4) 2009 data instead of 2010.
(5) 2011 data instead of 2010.
(6) Groundwater: 2006 data instead of 2005.
(7) Groundwater: 2013 data instead of 2015.
(8) Groundwater: 2007 data instead of 2005.
(9) Surface water: 2006 data instead of 2005.
(10) Surface water: 2003 data instead of 2005.
(11) 2012 data instead of 2010.
(12) Surface water: 2014 data instead of 2015.
(13) 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: env_wat_abs)

Figure 4.7.1: Total freshwater abstraction for public water supply, 2015

(m^3 per inhabitant)



(1) 2012 data instead of 2015.
(2) 2014 data instead of 2015.
(3) Estimate.
(4) 2010 data instead of 2015.
(5) 2013 data instead of 2015.
Source: Eurostat (online data code: env_wat_abs)

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. In 2015, total abstraction of freshwater ranged between 46 million m^3 in Luxembourg and 32.6 billion m^3 in Spain (2014 data). Between 2005 and 2015 - see Table 4.7.1 for the precise reference period covered for each EU Member State - the volume of freshwater abstracted rose at its fastest pace in Malta (+ 40 %), while the largest decreases were recorded in Slovakia (- 37 %) and Lithuania (- 83 %).

Differences among EU Member States are also apparent when looking at the breakdown of water abstraction between 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 10:1 in the Netherlands (2012 data), Romania and Bulgaria. At the other end of the range, the volume of water abstracted from groundwater resources was at least fifteen times as high as the volume of surface water abstraction in Denmark (2014 data) and Malta, the latter not disposing of exploitable surface waters at all.

In terms of water abstractions per inhabitant, in 2015 EU Member States had annual rates of freshwater abstraction ranging from 159.1 m^3 of water per inhabitant in Italy (2012 data) down

to a low of 31.3 m^3 per inhabitant in Malta - see Figure 4.7.1. Some of the patterns of freshwater abstraction from public supply reflect specific conditions in the EU Member States: for example, in Ireland (135.5 m^3 per inhabitant) the use of water from the public supply was still free of charge for many households, while in Bulgaria (120.7 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 (169 m^3 per inhabitant, 2014 data).

Table 4.7.2: Water use by economic sector — public water supply, 2015

(million m^3)

	All NACE activities and households	of which:				
		Agriculture, forestry and fishing	Industry and construction	of which: Manufacturing	Services	Households
Belgium (1)	567.9	8.9	93.5	:	:	:
Bulgaria	380.9	3.5	74.1	31.5	44.6	258.6
Czech Republic	481.3	7.5	42.5	:	109.2	322.0
Denmark	:	:	:	:	:	:
Germany (1)	4 233.3	6.0	606.3	418.0	80.5	3 540.5
Estonia (2)	49.8	0.3	7.9	7.8	:	:
Ireland (3)	669.0	:	:	:	:	:
Greece	1 182.1	35.1	94.4	73.4	31.8	1 020.8
Spain (4)	3 669.3	25.5	403.6	353.7	812.2	2 428.1
France (1)	3 622.0	:	:	:	:	3 388.0
Croatia	:	:	91.1	:	:	179.6
Italy (2)	5 232.2	:	:	:	:	:
Cyprus	79.7	:	2.0	1.9	:	77.7
Latvia	73.8	0.4	4.7	0.8	0.4	68.3
Lithuania	101.2	0.1	9.6	9.2	22.8	68.6
Luxembourg	:	:	:	:	:	42.2
Hungary	443.4	1.2	58.8	6.3	47.5	335.9
Malta	27.7	0.2	2.8	2.0	6.0	18.8
Netherlands (4)	1 067.9	41.9	141.3	130.8	101.4	783.3
Austria (5)	587.0	:	:	:	:	381.0
Poland	1 595.1	:	31.4	18.7	160.8	1 236.5
Portugal (4)	:	:	:	:	:	:
Romania	774.2	1.6	203.2	:	70.5	498.9
Slovenia	112.0	3.1	9.4	9.3	20.8	78.5
Slovakia	288.1	:	:	:	:	:
Finland	:	:	:	:	:	:
Sweden	:	:	:	:	:	:
United Kingdom (3)	3 968.0	120.0	345.0	263.0	601.0	2 902.0
Iceland (4)	:	0.0	0.0	0.0	0.0	63.0
Norway (4)	:	24.0	90.0	:	50.0	366.0
Switzerland (2)	808.0	41.2	80.0	76.5	141.8	544.0
Albania	280.2	:	:	:	75.0	12.0
Former Yugoslav Republic of Macedonia (4)	:	:	31.6	11.4	:	244.6
Serbia	423.2	:	17.7	14.4	88.2	317.3
Turkey (4)	3 681.8	23.9	111.8	44.4	1 046.1	2 500.0
Bosnia and Herzegovina (3)	140.1	1.5	12.6	:	14.3	109.3
Kosovo (6)	120.0	58.5	6.7	4.7	4.6	50.4

(1) 2013 data instead of 2015.
(2) 2012 data instead of 2015.
(3) 2011 data instead of 2015.
(4) 2014 data instead of 2015.
(5) 2010 data instead of 2015.
(6) 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: env_wat_cat)

The main users of water from public water supply in the EU are households. Across all of the EU Member States for which data are available, a higher amount of water from public water supply was used by households than by enterprises (as defined by all NACE activities). Note that the total water use of enterprises can be higher as many of them in addition to public water supply rely on self supply of water (see Table 4.7.2).

Table 4.7.3: Use of water by the domestic sector (households and services) — all sources, 2005-2015

(m^3 per inhabitant)

	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	29.1	29.7	28.4	26.6	26.1	:	:	:	:	:	:
Bulgaria	43.2	45.1	46.4	46.2	45.4	44.7	45.1	45.9	46.7	45.4	47.1
Czech Republic (1)	:	:	:	:	46.4	44.4	44.2	43.9	42.6	42.2	43.0
Denmark	:	:	:	:	:	:	:	:	:	:	:
Germany	:	:	:	:	:	44.9	:	:	46.3	:	:
Estonia	:	:	:	:	:	:	:	:	:	:	:
Ireland	:	:	:	:	:	:	:	:	:	:	:
Greece (2)	58.6	58.4	56.7	:	:	:	94.6	94.9	95.7	96.3	96.9
Spain	79.1	76.0	81.7	80.0	76.7	72.7	73.3	73.6	71.2	71.0	:
France (3)	:	:	:	64.6	64.1	114.4	120.2	140.6	143.7	:	:
Croatia	:	:	:	:	:	:	:	:	:	:	:
Italy	:	:	:	:	:	:	:	:	:	:	:
Cyprus	:	:	:	:	:	:	:	:	:	:	:
Latvia	:	:	:	:	:	57.4	93.6	64.8	44.1	44.8	56.8
Lithuania	:	:	:	28.9	27.7	34.5	35.5	35.0	37.8	40.6	50.9
Luxembourg	:	:	:	:	:	:	:	:	:	:	:
Hungary (2)	46.9	:	:	:	:	38.9	39.0	39.2	38.0	37.5	38.9
Malta	55.1	59.5	59.4	60.3	55.2	60.3	61.6	64.2	64.2	63.6	64.3
Netherlands	54.1	54.7	54.1	54.1	53.9	55.8	55.3	55.0	55.0	54.7	:
Austria	:	:	:	:	:	:	:	:	:	:	:
Poland (2)	36.4	36.6	36.0	36.4	35.9	36.0	36.0	35.9	35.5	35.7	36.8
Portugal (2)	47.3	50.0	53.4	57.0	59.7	:	:	:	:	:	:
Romania (2)	:	:	:	:	:	:	:	33.9	35.1	30.4	28.7
Slovenia (2)	:	:	:	:	:	:	:	49.1	47.2	47.6	48.1
Slovakia	:	:	:	:	:	:	:	:	:	:	:
Finland	:	:	:	:	:	:	:	:	:	:	:
Sweden (2)	77.5	:	:	:	:	:	:	:	:	:	:
United Kingdom (2)	:	:	:	:	:	:	55.6	:	:	:	:
Iceland	:	:	:	:	:	251.9	257.5	250.3	239.2	196.5	:
Norway (1)(5)	100.3	102.4	102.2	102.8	104.0	:	:	:	:	:	80.5
Switzerland	:	:	:	:	:	:	:	119.9	:	:	:
Former Yugoslav Republic of Macedonia (2)	41.3	:	:	:	:	:	:	:	:	:	:
Albania (2)	:	:	:	:	:	:	:	:	:	:	30.1
Serbia (2)	61.7	60.2	60.6	60.1	59.2	59.2	60.7	60.4	60.4	55.4	57.0
Turkey (4)	:	:	:	:	:	40.6	:	43.3	:	46.6	:
Bosnia and Herzegovina (2)	32.3	29.8	31.6	32.5	33.0	33.2	33.7	34.0	32.2	:	:
Kosovo (2)(6)	:	:	:	:	:	22.9	26.3	26.8	26.8	28.4	30.6

(1) Self and other supply for households: not available.

(2) Public water supply only.

(3) Public water supply for services: not available.

(4) Self and other supply for services: not available.

(5) 2015: provisional.

(6) 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: env_wat_cat and demo_pjan)

A majority of the EU Member States for which data are available (see Table 4.7.3) reported values for water use by the domestic sector (services and households) more or less stable over time (2005-2015). However, a strong increase was recorded in France (+122 %; 2008–2013, without public water supply for services), Lithuania (+76 %; 2008–2015) and Greece (+65 %; 2005–2015), while the only EU country reporting a marked decreases was Slovenia (-15 %) in only 4 years (2012–2015).

Self and other water supply is a major source of water for the manufacturing sector in several EU Member States (see Table 4.7.4). In the Netherlands, for example, self and other water supply accounted for 3.5 billion m^3 of water use in 2013, while public supply accounted for only 0.1 billion m^3.

Table 4.7.4: Water use in manufacturing by supply category, 2005-2015

(million m^3)

	Public water supply						Self and other water supply					
	2005	2007	2009	2011	2013	2015	2005	2007	2009	2011	2013	2015
Belgium	101.8	102.7	95.2	:	:	:	1 276.1	1 290.7	1 120.4	:	:	:
Bulgaria	46.4	48.3	36.3	34.8	24.7	31.5	293.2	305.2	203.0	175.3	169.3	186.3
Czech Republic	:	:	:	:	:	:	:	:	253.3	234.0	214.7	226.7
Denmark	:	:	:	:	:	:	:	:	:	:	:	:
Germany	:	:	:	372.3	418.0	:	:	:	:	4 565.8	3 940.6	:
Estonia	:	:	:	7.2	7.9	:	:	:	:	21.6	19.9	:
Ireland	:	:	:	:	:	:	:	:	:	:	:	:
Greece	:	:	:	73.4	73.4	73.4	:	:	:	116.1	116.1	116.1
Spain	485.4	446.2	384.6	359.1	355.6	:	1 208.7	993.2	794.2	723.4	703.2	:
France	:	:	:	:	:	:	:	:	1 819.0	1 805.0	1 589.0	:
Croatia	:	:	:	:	:	:	:	:	180.9	286.2	124.8	55.2
Italy	:	:	:	:	:	:	:	:	:	:	:	:
Cyprus	2.6	2.5	2.5	2.4	2.0	:	2.6	3.7	3.1	2.3	1.3	:
Latvia	56.9	58.6	:	1.2	1.2	0.8	:	:	:	18.9	17.1	13.5
Lithuania	:	:	8.1	7.9	8.6	9.2	:	:	25.5	30.7	32.5	31.1
Luxembourg	:	:	:	:	:	:	:	:	:	:	:	1.9
Hungary	11.4	:	:	7.3	6.1	6.3	:	:	:	:	:	:
Malta	2.4	1.9	1.9	1.9	1.7	2.0	1.0	1.0	1.0	1.0	1.0	1.0
Netherlands	143.4	143.6	140.8	134.8	136.8	:	3 433.0	3 448.6	3 896.6	3 603.5	3 504.7	:
Austria	:	:	:	:	:	:	:	:	:	:	:	:
Poland	20.3	19.0	12.5	13.2	12.5	18.7	650.8	685.2	573.2	652.2	627.7	640.6
Portugal	8.1	8.7	17.1	:	:	:	:	:	280.6	:	:	:
Romania	:	:	:	:	:	:	:	:	:	:	:	:
Slovenia	12.4	:	:	:	10.7	9.3	:	:	:	:	43.1	40.8
Slovakia	:	:	:	:	:	:	:	:	:	:	:	:
Finland	:	:	:	:	:	:	:	:	:	:	:	:
Sweden	102.0	102.0	:	:	:	:	1 893.0	1 893.0	:	:	:	:
United Kingdom	:	:	:	263.0	:	:	:	:	:	:	:	:
Norway	185.4	191.5	165.1	:	:	:	969.0	999.8	862.1	:	:	:
Switzerland	:	:	:	:	:	:	:	:	:	:	:	:
Former Yugoslav Republic of Macedonia	193.5	:	:	202.6	352.9	:	:	:	:	254.2	421.3	:
Serbia	36.8	28.6	18.6	13.9	13.5	14.4	109.2	103.7	88.2	130.1	98.3	107.0
Kosovo (1)	:	:	:	5.5	5.7	4.7	:	:	:	:	4.0	5.0

(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: env_wat_ind, env_wat_cat)

Similar in Germany, where the figures were 3.9 billion m^3 and 0.4 billion m^3, respectively (2013 data). The volume of water use from self and other water supplies was 34 times as high as that from public supply in Poland, 26 times as high in the Netherlands (2013 data) and 18 times in Latvia.

Statistics on the proportion of the population connected to at least secondary wastewater treatment plants integrate sewage treatment of any type (urban, other, and independent). This share has also been generally increasing and was above 80 % in 15 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 the United Kingdom (2014 data), the Netherlands, Luxembourg, Germany (2013 data) and Austria (2014 data). At the other end of the range, less than one in two households were connected to at least secondary wastewater treatment plants in Romania and Croatia, while the same was also true in Iceland (2010 data), Turkey (2014 data), Albania, Serbia and Bosnia and Herzegovina (see Table 4.7.5).

Table 4.7.5: Share of the population connected to at least secondary urban wastewater treatment, 2005-2015

(%)

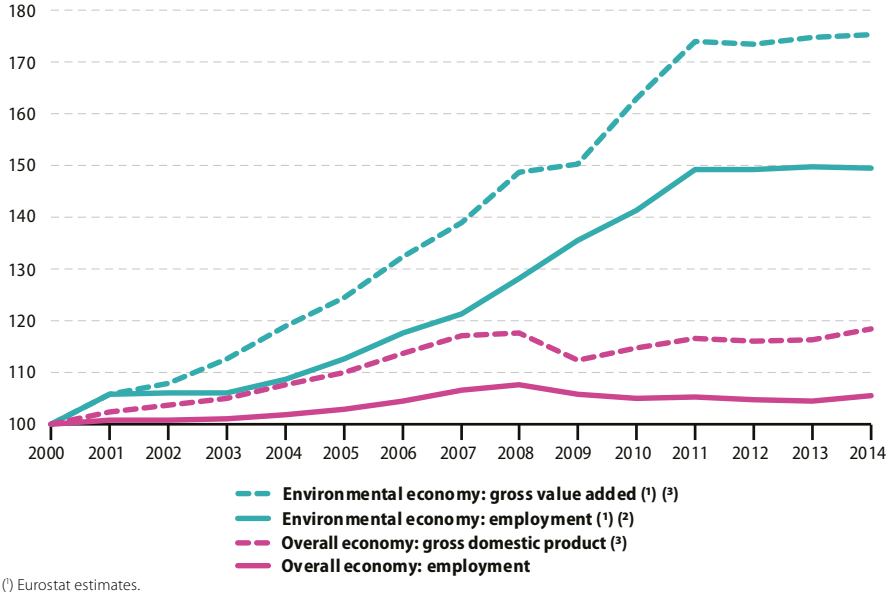
	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
Belgium	54.4	57.4	68.7	71.0	72.8	75.0	77.2	81.4	84.2	:	:
Bulgaria	38.3	38.8	39.6	41.3	42.7	45.1	53.6	53.9	54.5	54.8	60.6
Czech Republic	72.8	71.9	73.0	75.4	75.7	76.9	78.0	78.0	79.8	80.6	80.8
Denmark	:	:	:	:	89.4	88.0	88.4	88.4	90.1	91.0	:
Germany	97.3	:	91.9	:	:	95.5	95.5	95.4	95.4	:	:
Estonia	73.0	73.0	73.5	79.5	79.5	78.3	81.1	81.2	82.1	83.0	:
Ireland	:	:	59.0	:	71.0	:	63.0	:	65.0	65.0	:
Greece	:	:	85.0	:	87.4	87.4	88.2	:	92.8	92.8	:
Spain	:	88.0	:	88.0	:	93.0	:	94.8	:	92.9	:
France	:	:	:	:	:	77.7	79.8	80.1	80.5	80.4	:
Croatia	8.6	8.9	22.0	:	:	:	36.9	36.9	36.9	36.9	36.9
Italy	:	:	:	57.0	83.0	:	:	57.0	:	:	:
Cyprus	29.8	:	:	:	:	:	:	:	:	:	:
Latvia	63.8	62.9	60.9	54.3	60.9	58.1	63.9	66.1	67.2	:	:
Lithuania	:	:	:	:	:	:	:	63.1	64.3	69.4	72.3
Luxembourg	:	:	:	:	:	91.3	90.9	96.1	96.3	97.0	96.6
Hungary	41.7	45.3	49.8	50.0	52.1	69.4	70.9	72.8	72.6	73.7	76.7
Malta	13.2	9.3	8.4	14.8	15.2	6.6	92.3	92.3	92.2	92.2	:
Netherlands	99.0	99.1	:	99.3	:	99.3	99.4	99.4	99.4	99.4	99.4
Austria	:	91.8	:	92.6	:	93.9	:	94.5	:	95.0	:
Poland	58.1	60.7	61.8	62.9	64.1	64.5	65.5	68.5	70.2	71.4	72.6
Portugal	42.6	37.0	51.0	52.0	55.8	:	:	:	:	:	:
Romania	16.9	19.7	20.4	18.1	20.6	22.0	31.0	34.6	35.4	37.5	39.6
Slovenia	32.1	47.6	48.8	51.1	52.9	51.3	54.0	54.7	56.1	56.0	57.6
Slovakia	:	:	:	:	:	:	:	:	:	:	:
Finland	:	:	:	:	:	83.0	83.0	83.0	83.0	:	:
Sweden	86.0	86.0	86.0	86.0	86.0	86.0	86.0	87.0	87.0	87.0	:
United Kingdom	99.0	:	:	96.9	97.0	99.5	:	:	:	100.0	:
Iceland	2.0	:	:	2.0	:	1.0	:	:	:	:	:
Norway	58.0	58.6	58.5	58.8	59.3	59.2	61.4	62.6	62.6	62.8	65.7
Switzerland	97.0	:	:	:	:	98.0	:	:	98.0	:	:
Albania	:	:	:	:	:	:	:	:	:	26.0	28.0
Serbia	6.4	6.9	6.9	7.5	8.9	8.6	8.8	9.0	9.4	10.0	10.6
Turkey	28.5	29.6	31.1	31.4	35.2	37.6	:	42.0	:	43.1	:
Bosnia and Herzegovina	1.5	1.6	1.6	1.7	1.7	1.7	1.8	1.8	1.8	:	:

Source: Eurostat (online data code: env_ww_con)

4.8 Environmental goods and services

Figure 4.8.1: Development of key indicators for the environmental economy and the overall economy, EU-28, 2000–2014

(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 and env_ac_egss2)

The environmental economy encompasses two broad groups of activities and/or products: 'environmental protection' - all activities related to preventing, reducing and eliminating pollution and any other degradation of the environment; 'resource management' - preserving and maintaining the stock of natural resources and hence safeguarding against depletion.

According to Eurostat estimates, employment in the EU-28's environmental economy rose from 2.8 million full-time equivalents (FTEs) in 2000 to 4.2 million full-time equivalents in 2014. The environmental economy in the EU-28 generated EUR 710 billion of output and EUR 289 billion of value added in 2014. Between 2000 and 2014, employment and value added in the environmental economy grew considerably faster than employment in the overall economy and gross domestic product (GDP) (see Figure 4.8.1).

During the period 2000–2013 there was a steady pattern of net job creation within the environmental economy. Annual employment increases were in the range of 2–6 % for most years. Its growth substantially reduced its pace in 2012 and 2013 again and a very slight contraction was recorded in 2014.

Table 4.8.1: Employment, production and value added in the environmental economy, by activity, EU-28, 2014

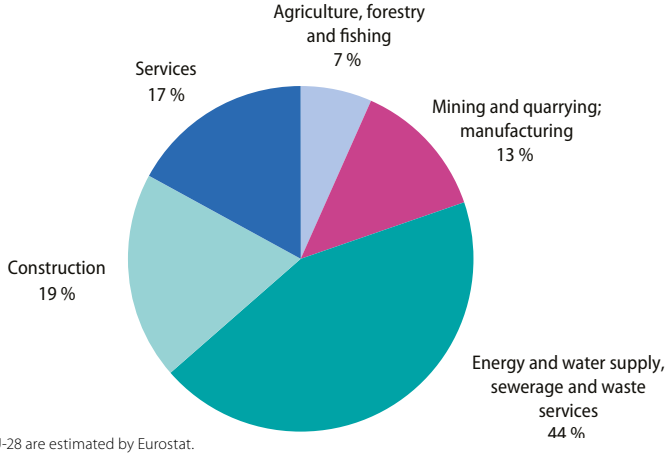
	Employment (thousand full-time equivalents)	Output (EUR billion)	Gross value added (EUR billion)
Total	4 164	710	289
Agriculture, forestry and fishing	334	32	20
Mining, quarrying and manufacturing	577	117	37
Energy and water supply, sewerage and waste services	1 422	337	128
Construction	1 104	143	55
Services	727	81	49

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

Source: Eurostat (online data code: env_ac_egss3)

Figure 4.8.2: Gross value added of the environmental economy, by activity, EU-28, 2014

(%)



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

Source: Eurostat (online data code: env_ac_egss3)

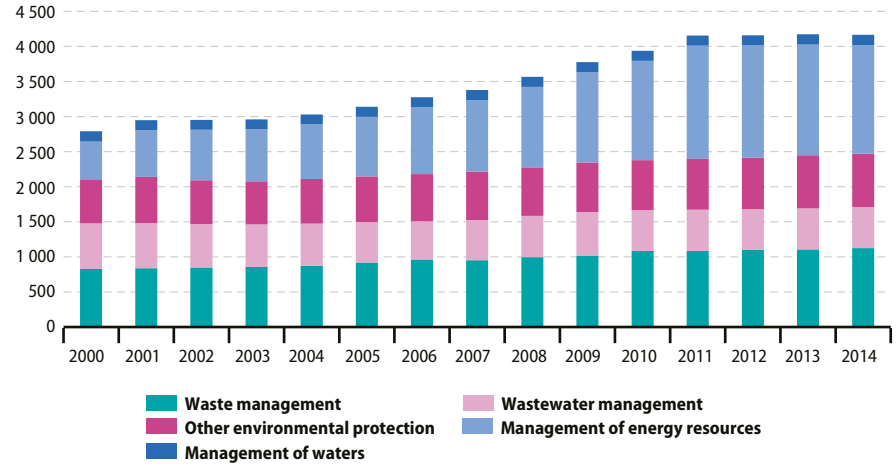
Table 4.8.1 shows that most employment within the environmental economy of the EU-28 in 2014 was found in: energy and water supply, sewerage, waste management and remediation activities (NACE Sections D and E) with 1.4 million full-time equivalents; and construction (NACE Section F) with 1.1 million full-time equivalents. By contrast, the environmental economy employed 727 000 full-time equivalents in services activities, 577 000 full-time equivalents in mining, quarrying and manufacturing, and 334 000 full-time equivalents in agriculture, forestry and fishing.

The activity with the highest contribution to the gross value added of the EU-28's environmental economy in 2014 was energy and water supply, sewerage, waste management and remediation activities, with EUR 128 billion, or 44 % of the total (see Figure 4.8.2). This was by far the largest activity, and mainly includes the production of energy from renewable sources and gas from agricultural by-products and waste. The activity with the second highest contribution to the gross value added of the environmental economy was construction, reporting EUR 55 billion of value added, 19 % of the total. This activity includes the construction of buildings with low-energy consumption and passive buildings, as well as the refurbishment of existing buildings to improve energy consumption, noise insulation work, maintenance and repair of water networks, construction work for wastewater and waste treatment plants and sewerage systems. The third largest activity grouping was services, which generated EUR 49 billion of value added, 17 % of the total for the environmental economy. The remaining activities contributed 13 % of the total in the case of mining, quarrying and manufacturing and 7 % in the case of agriculture, forestry and fishing.

Note that the energy and water supply, sewerage, waste management and remediation activities generated 44 % of the value added of the environmental economy with 34 % of the labour input, whereas construction generated 19 % of the value added with 27 % of the labour input.

Figure 4.8.3: Employment in the environmental economy, by domain, EU-28, 2000–2014

(thousand full-time equivalents)

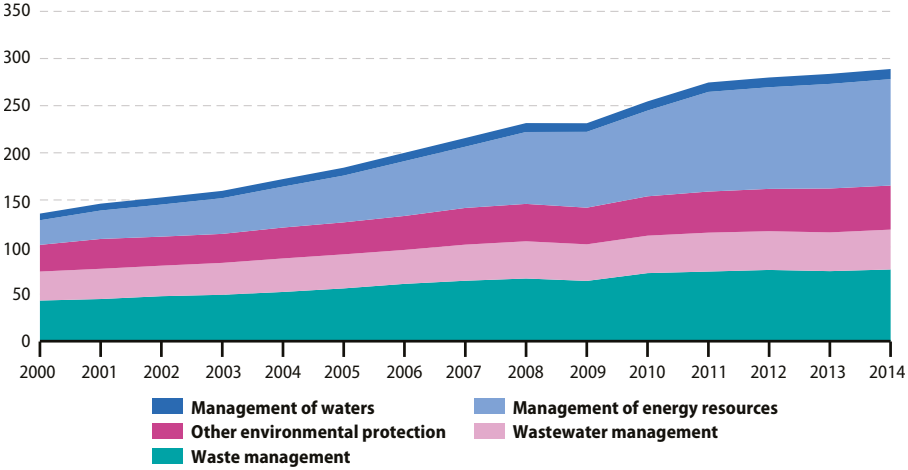


Note: data for EU-28 are estimated by Eurostat.

Source: Eurostat (online data code: env_ac_egss1)

Figure 4.8.4: Gross value added of the environmental economy, by domain, EU-28, 2000–2014

(billion EUR)



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

Source: Eurostat (online data code: env_ac_egss2)

Figure 4.8.3 analyses employment by environmental domain according to (groupings of) the classification of environmental protection activities (CEPA) and the classification of resource management activities (CReMA), which are specific classifications for environmental accounts. The figure presents an analysis by type of environmental action performed (environmental protection or resource management) and type of natural asset concerned.

The evolution of the gross value added of the environmental economy since 2000 is shown in Figure 4.8.4. It increased from EUR 135 billion in 2000 to EUR 289 billion in 2014 (note that these developments are shown in current price terms), as the environmental economy's contribution to overall GDP increased from 1.4 % to 2.1 % during the period under consideration. Gross value added of the environmental economy rose steadily between 2000 and 2008 to reach EUR 231 billion. It remained unchanged during 2009 as a result of the impact of the financial and economic crisis, but has been consistently growing for the subsequent years up to 2014.

4.9 Environmental taxes

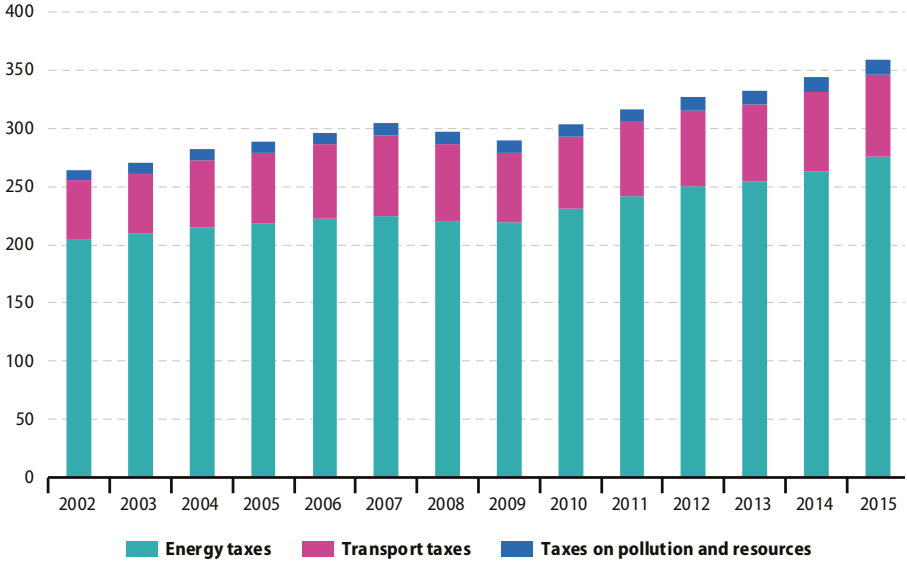
Environmental taxes have a tax base which is a physical unit of something that has a proven, specific negative impact on the environment. European statistics distinguish environmental taxes relating to energy, transport, pollution and resources.

The total government revenue from environmental taxes in the EU-28 in 2015 amounted to EUR 359.3 billion; this figure represents 2.4 % of the EU-28 gross domestic product (GDP) and 6.3 % of the total government revenues from compulsory levies.

From 2002 to 2015, the total environmental tax revenue in the EU increased by 2.4 % per year (at current prices) on average whereas GDP at market prices rose at an annual average of 2.7 %. In 2015, the level of environmental tax revenues was some EUR 95 billion higher than in 2002 (see Figure 4.9.1). However, the financial and economic crisis caused a severe contraction in economic activity in the EU, leading to lower tax revenue in 2008 and 2009. In 2010, environmental tax revenues returned to an upward path.

Figure 4.9.1: Total environmental tax revenue by type of tax, EU-28, 2002–2015

(billion EUR)



Source: Eurostat (online data code: env_ac_tax)

Table 4.9.1: Environmental tax revenue by type, 2015

(million EUR)

	Total environmental taxes	Energy taxes	Transport taxes	Taxes on pollution/ resources
EU-28	359 294	275 392	71 269	12 633
Belgium	8 658	5 303	2 858	496
Bulgaria	1 314	1 156	129	28
Czech Republic	3 491	3 231	229	31
Denmark	10 847	6 024	4 199	625
Germany	58 169	48 326	9 833	10
Estonia	558	491	12	54
Ireland	4 901	2 992	1 864	45
Greece	6 560	5 189	1 371	0
Spain	20 306	16 987	2 546	773
France	47 559	38 823	5 869	2 867
Croatia	1 801	1 126	370	304
Italy	55 722	45 423	9 717	582
Cyprus	525	404	120	1
Latvia	659	508	128	23
Lithuania	677	623	17	37
Luxembourg	949	864	69	15
Hungary	2 905	2 128	497	280
Malta	269	138	109	22
Netherlands	22 946	12 815	6 990	3 141
Austria	8 202	5 216	2 908	77
Poland	11 395	9 765	912	718
Portugal	4 354	3 192	1 123	40
Romania	3 889	3 508	372	8
Slovenia	1 510	1 157	177	176
Slovakia	1 392	1 181	142	69
Finland	6 116	4 165	1 854	97
Sweden	9 931	7 799	2 005	128
United Kingdom	63 690	46 857	14 849	1 984
Iceland	263	180	60	23
Norway	8 251	4 574	3 346	331
Serbia	1 410	1 200	98	112

Source: Eurostat (online data code: env_ac_tax)

Table 4.9.2: Environmental tax revenue by type, 2015

(% of total revenues from taxes and social contributions, excluding imputed social contributions)

	Total environmental taxes	Energy taxes	Transport taxes	Taxes on pollution/ resources
EU-28	6.31	4.83	1.25	0.22
Belgium	4.68	2.87	1.54	0.27
Bulgaria	10.00	8.80	0.98	0.22
Czech Republic	6.09	5.64	0.40	0.05
Denmark	8.56	4.75	3.31	0.49
Germany	4.97	4.13	0.84	0
Estonia	8.13	7.16	0.18	0.79
Ireland	8.02	4.90	3.05	0.07
Greece	10.26	8.11	2.14	0
Spain	5.57	4.66	0.70	0.21
France	4.75	3.88	0.59	0.29
Croatia	10.91	6.82	2.24	1.85
Italy	7.85	6.40	1.37	0.08
Cyprus	9.01	6.94	2.06	0.02
Latvia	9.28	7.15	1.81	0.32
Lithuania	6.24	5.74	0.16	0.34
Luxembourg	4.90	4.46	0.36	0.08
Hungary	6.77	4.96	1.16	0.65
Malta	9.09	4.67	3.67	0.76
Netherlands	8.98	5.02	2.74	1.23
Austria	5.51	3.51	1.95	0.05
Poland	8.17	7.00	0.65	0.51
Portugal	7.03	5.16	1.81	0.06
Romania	8.65	7.80	0.83	0.02
Slovenia	10.63	8.15	1.25	1.24
Slovakia	5.50	4.67	0.56	0.27
Finland	6.65	4.53	2.02	0.11
Sweden	5.14	4.03	1.04	0.07
United Kingdom	7.43	5.47	1.73	0.23
Iceland	4.75	3.25	1.08	0.41
Norway	6.11	3.39	2.48	0.24
Serbia	10.96	9.33	0.76	0.87

Source: Eurostat (online data code: env_ac_tax)

Energy taxes (which include taxes on transport fuels) represented by far the highest share of overall environmental tax revenue, accounting for 76.7 % of the EU-28 total in 2015. Energy taxes were particularly prominent in the Czech Republic, Lithuania, Luxembourg and Romania, where they accounted for more than nine tenths of total environmental tax revenues. By contrast, energy taxes slightly exceeded 50 % of the revenues from environmental taxes in Malta (51.3 %), and accounted only for 55-56 % of the total in Norway (55.4 %), Denmark (55.5 %) and the Netherlands (55.9 %).

Transport taxes represented the second most important contribution to total environmental tax revenues, with 19.8 % of the EU-28 total in 2015. Their relative significance was considerably higher in Austria (35.5 % of all revenues from environmental taxes), Ireland (38 %) and Denmark (38.7 %) and even more so in Malta (40.3 %) and Norway (40.6 %).

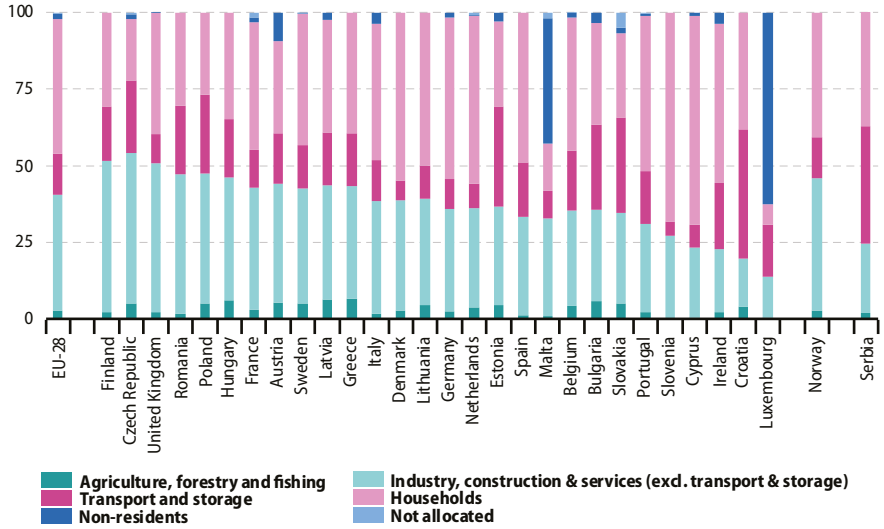
The smallest shares of transport taxes in total revenues from environmental taxes were in Estonia (2.2 %) and in Lithuania (2.5 %).

Pollution and resource taxes represented a relatively small share (3.5 %) of total environmental tax revenues in the EU-28 in 2015. 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.

However, a much higher share for pollution and resource taxes was observed in Croatia (16.9 %), and in the Netherlands (13.7 %). By contrast, in Greece no taxes of this category have been levied and in Germany, Cyprus and Romania marginal amounts of the pollution and resource taxes were recorded.

Figure 4.9.2: Energy taxes by economic activity, 2014

(% of energy tax revenue)



Note: ranked on the share of environmental taxes paid by businesses (agriculture, forestry, fishing, industry, construction, services, transport and storage).

Source: Eurostat (online data code: env_ac_taxind2)

Table 4.9.3: Energy taxes by economic activity, 2014

(million EUR)

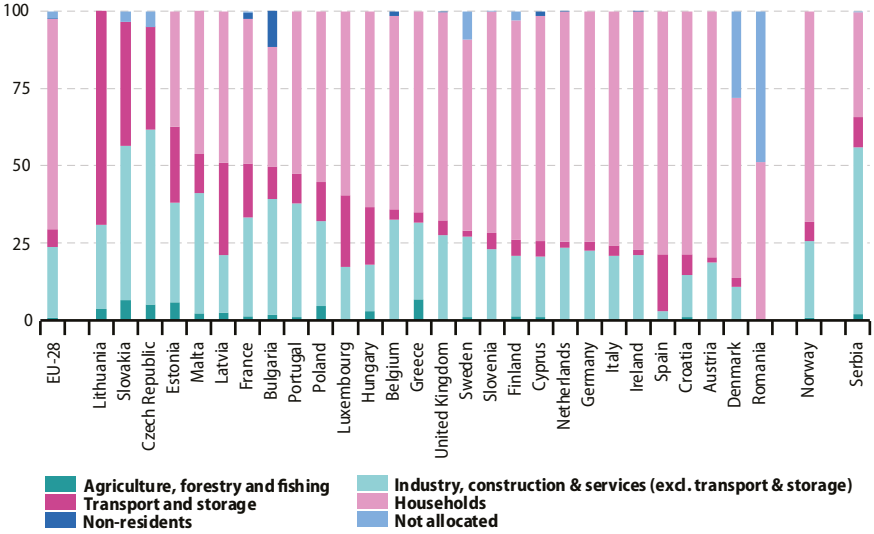
	Agriculture, forestry and fishing	Industry, construction and services (excl. transport and storage)	Transport and storage	Households	Non-residents	Not allocated
EU-28	7 071.9	99 711.6	34 908.5	115 888.9	4 783.6	741.6
Belgium	206.0	1 532.8	958.9	2 141.0	82.3	1.0
Bulgaria	58.4	302.8	282.0	338.1	34.8	0.0
Czech Republic	152.2	1 489.4	721.4	605.7	53.1	15.7
Denmark	158.9	2 232.8	390.2	3 385.2	0.0	0.0
Germany	1 217.8	16 187.0	4 856.6	25 608.0	818.9	0.0
Estonia	20.4	149.9	150.8	129.3	13.5	0.0
Ireland	60.6	579.2	603.7	1 455.3	105.2	0.0
Greece	338.9	1 930.5	897.8	2 058.7	0.0	0.0
Spain	205.9	5 173.3	2 820.0	7 895.8	0.0	0.0
France	983.1	13 697.4	4 294.8	14 281.6	558.1	527.0
Croatia	40.6	158.6	428.2	387.1	0.0	0.0
Italy	746.9	17 621.4	6 389.9	21 281.0	1 830.8	0.0
Cyprus	1.3	94.0	30.1	279.7	4.2	0.0
Latvia	30.6	185.3	85.2	181.6	12.6	0.0
Lithuania	25.6	202.4	63.1	289.5	0.0	0.0
Luxembourg	3.3	120.9	151.8	61.0	563.1	0.0
Hungary	119.1	802.3	382.9	695.6	0.0	0.0
Malta	1.2	40.9	11.4	19.8	52.3	2.5
Netherlands	463.0	4 109.0	994.0	6 923.0	52.0	107.0
Austria	265.9	1 954.6	824.0	1 526.6	467.2	0.0
Poland	447.3	3 698.1	2 248.5	2 344.5	0.0	0.0
Portugal	65.5	828.8	496.6	1 458.7	23.2	10.8
Romania	56.7	1 474.1	720.0	987.0	0.0	0.0
Slovenia	0.0	304.2	52.5	767.6	0.0	0.0
Slovakia	59.2	345.4	365.1	322.6	22.1	57.4
Finland	94.7	2 015.5	727.8	1 251.8	0.0	0.0
Sweden	373.1	2 851.8	1 063.0	3 251.2	9.1	20.1
United Kingdom	875.8	19 629.4	3 898.5	15 962.0	81.2	0.0
Norway	129.0	2 065.4	637.2	1 947.1	0.0	0.0
Switzerland (1)	80.6	1 175.2	290.3	2 688.1	680.4	0.0
Form. Yug. Rep. of Macedonia (1)	13.7	57.3	25.1	28.2	0.8	0.0
Serbia	20.3	248.2	421.2	:	:	:
Turkey (1)	0.3	17 627.2	341.0	:	:	1 680.2

(1) 2013 data instead of 2014.

Source: Eurostat (online data code: env_ac_taxind2)

Figure 4.9.3: Transport taxes by economic activity, 2014

(% of transport tax revenue)



Note: ranked on the share of environmental taxes paid by businesses (agriculture, forestry, fishing, industry, construction, services, transport and storage).

Source: Eurostat (online data code: env_ac_taxind2)

Across the EU Member States, businesses paid a little more than half (54 %) of all energy tax revenue collected by governments in 2014. The contribution of households, albeit lower, was also significant (at 44 % in 2014). The remainder (2 %) relates to the amounts paid 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 63 %) collected from non-residents largely due to non-resident purchases of petrol and diesel. In Malta this share is also substantial (at 41 %).

In 2014, the share of energy taxes paid by households in Cyprus and Slovenia (at 68 % for both), Denmark and the Netherlands (at 55 % both) was considerably higher than the EU-28 (weighted) average of 44 % (see Figure 4.9.2). On the other hand, the share of taxes borne by households was relative low in Luxembourg (7%), Malta (15 %) and the Czech Republic (20 %). The share of energy tax revenues levied on industry, construction and services other than transportation and storage amounted to 38 % for the EU-28 as a whole, ranging from 13 % in Luxembourg to 48-49 % in the United Kingdom, Czech Republic and Finland. The third most important contribution to energy tax revenue (13 % for EU-28) originated from transportation and storage activities. In some Member States this activity contributed to more than a quarter of total energy tax revenue: Croatia (42 %), Estonia (33 %), Slovakia (31 %), Bulgaria (28 %) and Poland (26 %). The contribution of agriculture, forestry and fishing to the total energy taxes accounted for less than 3 % for the EU-28, ranging from 0 % in Slovenia to 6 % in Bulgaria, Greece, Latvia and Hungary.

On average among the EU Member States, the share of transport taxes paid by households was much higher than the share paid by businesses: 68 % compared with 30 % (see Figure 4.9.3). This is because in most EU Member States households pay a larger share of the motor vehicle tax revenues (an important component of transport tax revenue) than businesses.

However, in some Member States a structure of transport tax revenue by payer considerably differs, with households contributing marginally to transport tax revenues in Lithuania, Slovakia and Czech Republic.

Table 4.9.4: Transport taxes by economic activity, 2014

(million EUR)

	Agriculture, forestry and fishing	Industry, construction and services (excl. transport and storage)	Transport and storage	Households	Non-residents	Not allocated
EU-28	516.0	15 717.1	3 913.7	46 251.8	231.6	1 554.4
Belgium	9.8	898.4	97.8	1 745.5	44.2	0.0
Bulgaria	2.2	45.6	12.5	47.1	14.1	0.0
Czech Republic	11.1	121.2	71.0	0.4	0.0	10.8
Denmark	25.9	397.7	105.3	2 270.8	0.0	1 085.8
Germany	18.4	2 129.5	258.2	7 083.0	0.0	0.0
Estonia	0.7	3.7	2.8	4.2	0.0	0.0
Ireland	5.7	368.1	29.3	1 372.8	1.1	0.0
Greece	89.7	323.9	43.8	853.7	0.0	0.0
Spain	2.6	69.9	461.1	1 953.4	0.0	0.0
France	81.0	2 021.7	1 098.8	2 971.4	116.1	37.0
Croatia	3.6	50.4	24.7	290.3	0.0	0.0
Italy	28.2	2 014.5	316.1	7 419.3	0.0	0.0
Cyprus	1.3	22.7	5.7	85.1	1.7	0.0
Latvia	2.9	21.0	34.0	55.9	0.0	0.0
Lithuania	0.8	5.9	15.1	0.0	0.0	0.0
Luxembourg	0.0	11.7	15.8	40.6	0.0	0.0
Hungary	13.9	71.0	87.1	297.8	0.0	0.0
Malta	2.2	36.7	12.1	43.7	0.0	0.0
Netherlands	27.3	1 510.5	132.2	4 875.0	10.0	0.0
Austria	9.3	526.7	53.4	2 286.1	0.0	0.0
Poland	37.5	229.0	104.8	457.8	0.0	0.0
Portugal	11.8	372.5	95.8	534.6	0.0	0.0
Romania	:	:	:	201.4	0.0	191.9
Slovenia	0.3	39.1	8.8	122.4	0.0	0.0
Slovakia	10.1	78.7	62.7	0.0	0.0	5.6
Finland	22.3	362.7	95.7	1 311.0	0.0	54.0
Sweden	18.7	480.6	37.4	1 141.0	0.0	169.3
United Kingdom	78.9	3 503.7	631.7	8 787.8	44.4	0.0
Norway	25.9	924.9	227.7	2 528.0	0.0	0.0
Switzerland (1)	84.6	849.0	640.9	1 584.5	452.9	0.0
Serbia	1.9	50.3	9.3	:	:	:
Turkey (1)	18.7	1 785.7	476.7	:	:	6 160.2

(1) 2013 data instead of 2014.

Source: Eurostat (online data code: env_ac_taxind2)

Table 4.9.5: Implicit tax rate on energy (deflated), 2007-2015

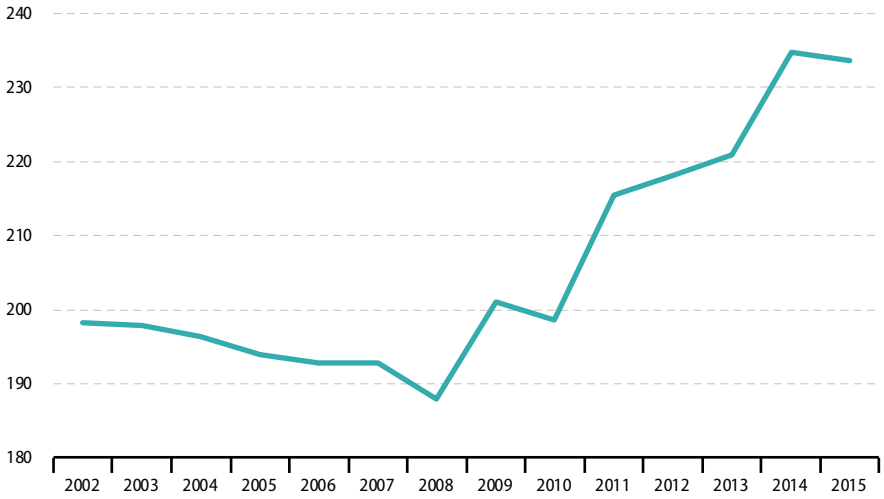
(EUR per tonne of oil equivalent)

	2007	2008	2009	2010	2011	2012	2013	2014	2015
EU-28	193	188	201	199	215	218	221	235	234
Belgium	135	126	131	130	144	137	124	139	139
Bulgaria	101	112	110	105	100	100	110	105	111
Czech Republic	127	129	131	131	142	134	128	133	136
Denmark	375	346	374	370	400	414	428	436	409
Germany	224	217	232	212	234	225	211	219	210
Estonia	103	107	131	130	133	139	130	144	153
Ireland	154	155	184	210	239	232	233	244	239
Greece	135	130	137	222	227	281	343	349	331
Spain	152	153	161	162	159	160	199	203	210
France	191	184	191	193	215	211	218	238	258
Croatia	135	119	123	136	118	115	136	162	171
Italy	265	246	275	275	320	365	365	402	369
Cyprus	165	158	161	183	196	198	230	253	244
Latvia	82	82	93	87	95	94	100	111	116
Lithuania	96	96	113	102	99	97	102	107	115
Luxembourg	224	222	219	205	211	216	206	203	195
Hungary	122	120	119	130	126	127	126	131	129
Malta	275	186	202	184	213	205	193	217	217
Netherlands	203	214	228	218	232	222	237	259	256
Austria	169	170	171	163	181	178	173	175	174
Poland	122	118	117	125	131	133	132	145	153
Portugal	184	179	179	176	177	179	177	179	190
Romania	88	76	91	99	95	96	107	131	143
Slovenia	172	167	212	215	207	227	225	238	237
Slovakia	103	104	101	93	102	102	100	108	111
Finland	118	128	130	123	153	151	149	148	154
Sweden	228	231	237	227	227	227	230	220	224
United Kingdom	218	216	239	238	255	248	253	275	282
Iceland	53	39	42	51	51	51	48	46	44
Norway	234	236	248	228	222	205	217	237	249
Serbia	66	69	92	87	87	90	104	126	133

Source: Eurostat (online data code: tsdcc360)

Figure 4.9.4: Implicit tax rate on energy (deflated), EU-28, 2002–2015

(EUR per tonne of oil equivalent)



Source: Eurostat (online data code: tsdcc360)

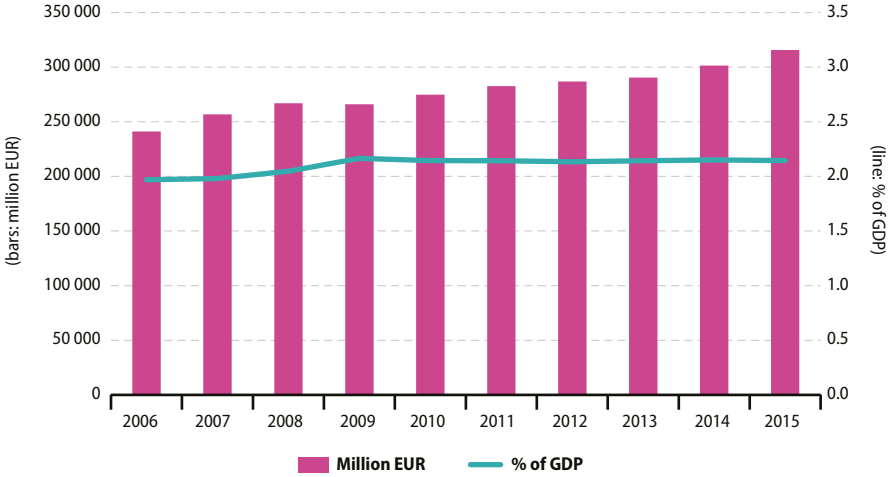
The implicit tax rate on energy is defined as the ratio of energy tax revenues to final energy consumption calculated for a calendar year. Energy tax revenues are measured in constant price euros (deflated with the implicit GDP deflator, prices of year 2010) and final energy consumption is measured in tonnes of oil equivalent (toe); as such the implicit tax rate on energy is expressed in terms of euros 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 2002 to 2015, the implicit tax rate on energy increased by 18 % in real terms (in other words, after deflating the energy tax revenue), changing from EUR 198.3 per toe to EUR 233.7 per toe (see Table 4.9.5 and Figure 4.9.4).

Between 2002 and 2008, the implicit tax rate on energy followed a slight downwards trend. Since 2008, strong annual increases have been observed except in 2010 and in 2015. 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.

4.10 Environmental protection expenditure

Figure 4.10.1: National expenditure on environmental protection, EU-28, 2006–2015

(million EUR and % of GDP)



Note: estimates. Different measurement on the two y-axes.

Source: Eurostat (online data codes: env_ac_pepsgg, env_ac_pepssp, env_ac_pepsnsp and nama_10_gdp)

Environmental protection expenditure relates to expenditure that is carried out with the purpose of protecting the environment. This covers spending on activities that are directly aimed at preventing, reducing and eliminating pollution or any other degradation of the environment.

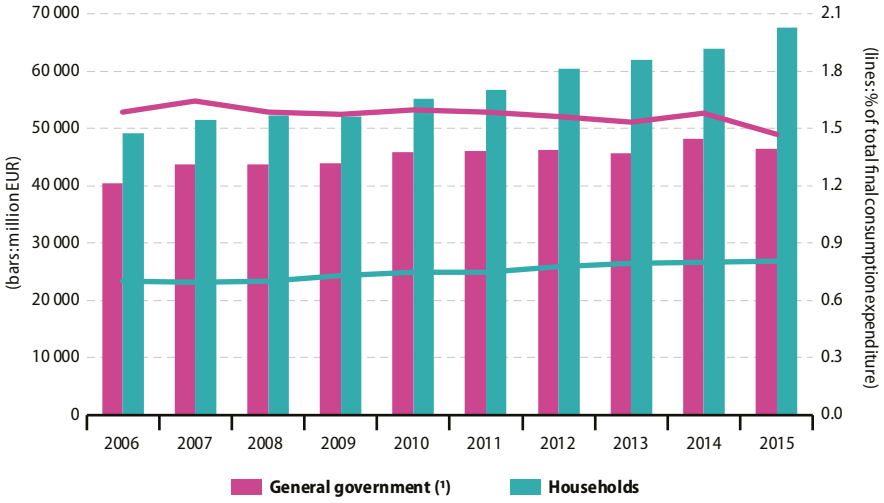
The main aggregate is the national expenditure on environmental protection, which represents the sum of current and capital expenditure on environmental protection in a domestic economy, including also the net financing of the related transactions with the rest of the world.

In 2015, national expenditure on environmental protection amounted to EUR 316 billion in the EU-28. Between 2006 and 2015 it grew by 31 % at current prices, which represents an average growth of 3 % per year - see Figure 4.10.1, left scale. In the years 2006-2008 an annual growth of 5 % was registered followed by a slight decrease (0.3 %) between 2008 and 2009, as the global financial and economic crisis unfolded. During the years 2009-2015 national expenditure on environmental protection grew more strongly again, at an annual pace of 3 %.

In the EU-28, national expenditure on environmental protection relative to gross domestic product (GDP) was 2.1 % in 2015. This ratio does not show strong evolutions over the period 2006-2015. An increase was observed between 2006 and 2009, spending on environmental protection moving from 2.0 % to 2.2 % of GDP. From 2009 onwards, very little annual changes occurred, the ratio remaining almost unchanged: in other words, the development of national expenditure on environmental protection at current prices was in line with that also observed for GDP.

Figure 4.10.2: Final consumption expenditure on environmental protection services, EU-28, 2006–2015

(million EUR and % of sectoral total final consumption expenditure)



Note: estimates. Different measurement on the two y-axes.

(1) Including non-profit institutions serving households (NPISH). Estimates for the total final consumption expenditure of general government and NPISH (used as the denominator for the share in %) do not include expenditure by NPISH in Croatia, Germany, Ireland, Luxembourg and the United Kingdom.

Source: Eurostat (online data codes: env_ac_cepsgh, nasa_10_nf_tr and nama_10_fcs)

Final consumption expenditure is one of the key components of national expenditure on environmental protection. In the EU-28, households spent some EUR 68 billion on environmental protection in 2015, accounting for about 59 % of the total final consumption expenditure on environmental protection. General government (including also non-profit institutions serving households (NPISH)) spent about EUR 47 billion (41 % of the total).

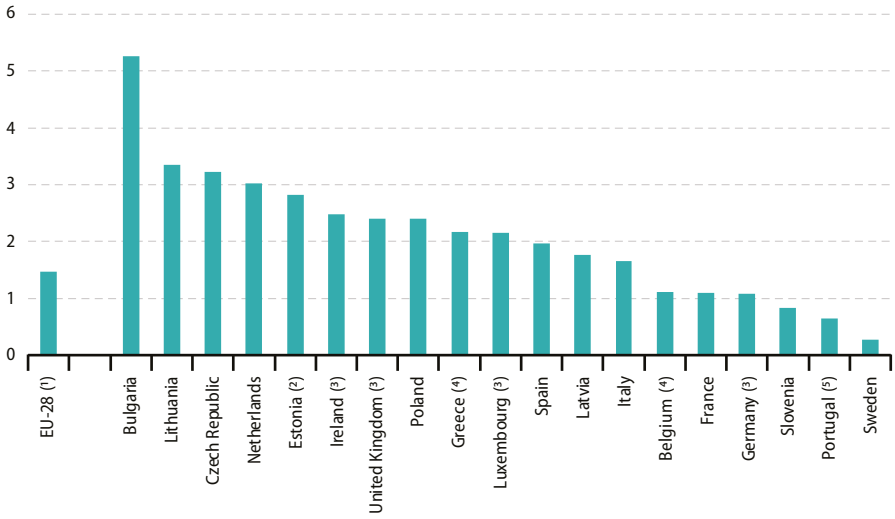
Between 2006 and 2015, general government expenditure at current prices grew by 15 %, which represents an average annual growth of 1.6 %. Expenditure by households grew at a higher pace with a total growth of 37 % over the whole period, i.e. an average annual growth of 3.6 % left scale.

The share of environmental protection expenditure within total final consumption expenditure stood at 1.5 % for general government in 2015, compared with 0.8 % for households (see Figure 4.10.2, right scale).

The share of environmental protection expenditure within total final consumption expenditure was 0.1 percentage points lower in 2015 than in 2006 for general government whereas an opposite movement was observed for households (share moving from 0.7 % in 2006 to 0.8 % in 2015).

Figure 4.10.3: General government and NPISH final consumption expenditure on environmental protection services, 2014

(% of general government and NPISH total final consumption expenditure)



Note: Denmark, Cyprus, Hungary, Malta, Austria, Romania, Slovakia, Finland, Croatia: not available.

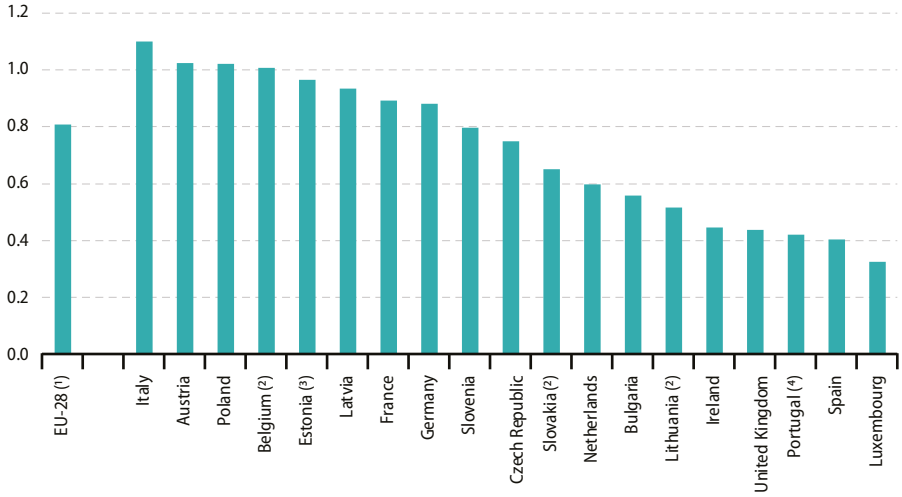
(1) Estimate. The estimate for the total final consumption expenditure of general government and NPISH (used as the denominator) does not include expenditure by NPISH in Croatia, Germany, Ireland, Luxembourg and the United Kingdom.
(2) 2010 data instead of 2014.
(3) The total final consumption expenditure of general government and NPISH (used as the denominator) does not include expenditure by NPISH.
(4) 2013 data instead of 2014.
(5) 2011 data instead of 2014; provisional.

Source: Eurostat (online data code: env_ac_cepsgh and nasa_10_nf_tr)

In EU Member States for which recent data are available, general government final consumption expenditure on environmental protection services ranged from 5.3 % to 0.3 % of total final consumption expenditure by general government (see Figure 4.10.3). This ratio was more than two times higher than EU average in Bulgaria (5.3 %), Lithuania (3.4 %), the Czech Republic (3.2 %) and the Netherlands (3.0 %). At the opposite of scale, the lowest shares were registered in Sweden (0.3 %), Portugal (0.6 %), Slovenia (0.8 %), Germany, France and Belgium (1.1 % in three last countries).

Figure 4.10.4: Households final consumption expenditure on environmental protection services, 2014

(% of households total final consumption expenditure)



Note: Denmark, Greece, Croatia, Cyprus, Hungary, Malta, Romania, Finland and Sweden: not available.

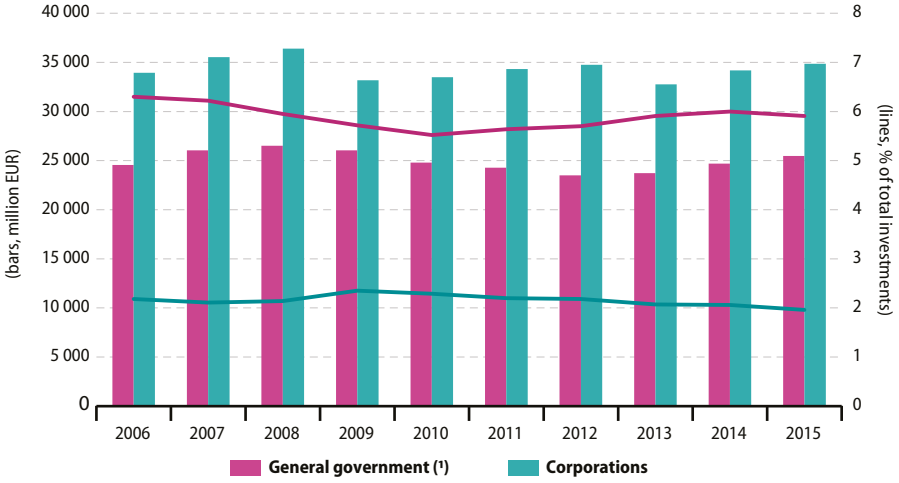
(1) Estimate.
(2) 2013 data instead of 2014.
(3) 2010 data instead of 2014.
(4) 2011 data instead of 2014; provisional.

Source: Eurostat (online data code: env_ac_cepsgh and nama_10_fcs)

For households, the share of final consumption expenditure on environmental protection over total final consumption had much smaller variations across the EU Member States than for general government: in Member States for which data are available household final consumption expenditure on environmental protection ranged between 1.1 % (Italy) and 0.3 % (Luxembourg) of the sector's total final consumption expenditure (see Figure 4.10.4).

Figure 4.10.5: Investment for environmental protection, EU-28, 2006–2015 (1)

(million EUR and % of total investment)



Note: estimates. Investment comprises gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets.

(1) Including non-profit institutions serving households (NPISH). Estimates for the total investment of general government and NPISH (used as the denominator for the share in %) do not include the total investment by NPISH.

Source: Eurostat (online data codes: env_ac_pepsgg, env_ac_pepssp, env_ac_pepsnsp and nasa_10_nf_tr)

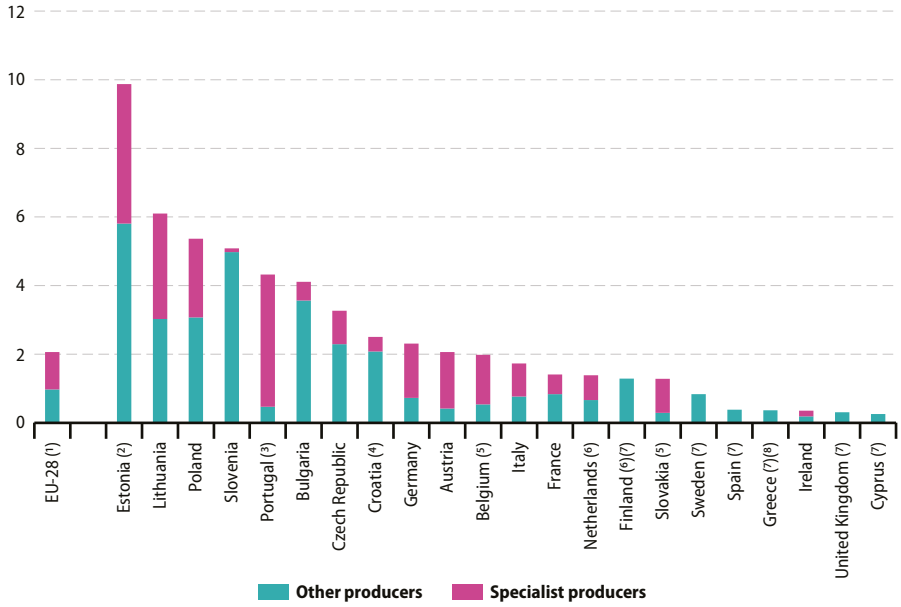
Another component of the national expenditure on environmental protection is the capital expenditure (in terminology of national accounts: gross fixed capital formation plus acquisitions less disposals of on-financial non-produced assets; here after referred to as investment).

In 2015, corporations in the EU-28 invested some EUR 35 billion on environmental protection (about 58 % of the total investment on environmental protection), compared to EUR 25 billion by general government (see Figure 4.10.5, left scale). Between 2006 and 2015, corporations' investment on environmental protection grew on average by 0.3 % per year (at current prices), close to the average annual growth for general government (average annual growth of 0.4 %). For both sectors, investment on environmental expenditure grew at a faster annual pace between 2006 and 2008: +3.5 % for corporations versus +3.9 % for general government. A turning point was observed around 2009. Over the period 2008-2015, an annual decrease of 0.6 % per year was recorded for corporations as well as for general government.

The relative importance of environmental protection investment can be analysed with the ratio relating the latter expenditure to the total investment by each sector. In the EU-28, in 2015 this share stood at 2.0 % for corporations, compared to 5.9 % for general government (see Figure 4.10.5, right scale). For both sectors the share of environmental protection investment over their total investment was higher in 2006 than in 2015: in 2006 it was 2.2 % for corporations and 6.3 % for general government.

Figure 4.10.6: Corporations' investment for environmental protection, 2014

(% of corporations' total investment)



Note: investment comprises gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets. Luxembourg, Denmark, Latvia, Hungary, Malta and Romania: not available.

(1) Estimates.
(2) Other producers: 2013 data instead of 2014; Specialist producers: 2010 data instead of 2014.
(3) Specialist producers: 2011 data instead of 2014; provisional.
(4) 2012 data instead of 2014.
(5) 2013 data instead of 2014.
(6) Other producers: 2012 data instead of 2014.
(7) Specialist producers: not available.
(8) Other producers: 2013 data instead of 2014.

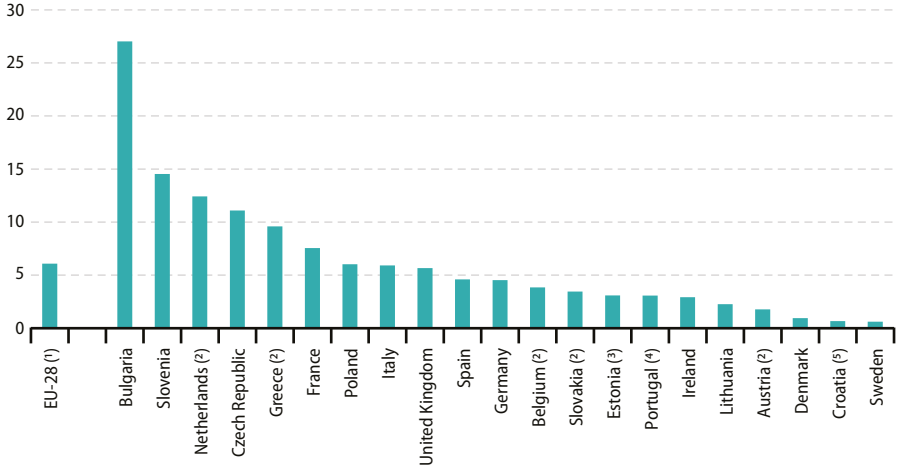
Source: Eurostat (online data code: env_ac_pepssp, env_ac_pepsnsp and nasa_10_nf_tr)

In the EU Member States, investment on environmental protection ranged between 0.3 % and 9.9 % of the total investment (see Figure 4.10.6). Investment on environmental protection is carried out by specialist producers or other producers for which investment on environmental protection is reported as ancillary activities. Based on the latest data available for both categories of producers, the highest shares were registered in Estonia (2010 data), Lithuania, Poland and Slovenia (above 5 %) while the lowest were observed in Ireland, Slovakia, the Netherlands, France, Italy and Belgium (shares lower than 2 %).

On average in the EU-28 investment by specialist producers accounted for 53 % of the environmental protection investments by corporations in 2015. From the latest available data by countries, more than two thirds of environmental protection investment by corporations were carried out by specialist producers in Portugal (2011 data), Austria, Belgium, Germany and Slovakia while the opposite situation occurred in Slovenia, Bulgaria, Croatia (2012 data) and the Czech Republic (more than two thirds of investments carried out by non-specialist producers acting for ancillary activities).

Figure 4.10.7: General government and non-profit institutions serving households (NPISH): investment for environmental protection, 2014

(% of general government total investment)



Note: investment comprises gross fixed capital formation and acquisitions less disposals of non-financial non-produced assets. Estimates for the total investment (used as the denominator for the share in %) do not include the total investment by NPISH. Cyprus, Latvia, Luxembourg, Hungary, Malta, Romania and Finland: not available.

(1) Estimate.
(2) 2013 data instead of 2014.
(3) 2010 data instead of 2014.
(4) 2011 data instead of 2014; provisional.
(5) 2012 data instead of 2014.

Source: Eurostat (online data code: env_ac_pepsgg and nasa_10_nf_tr)

In the EU Member States, environmental protection investment by the general government ranged between 0.6 % and 27 % of its total investment in 2015 (see Figure 4.10.7). This share was the highest in Bulgaria, Slovenia, the Netherlands and the Czech Republic (all with more than 10 %). The lowest shares were registered in Sweden, Croatia, Denmark and Austria (all with less than 2 %).

Table 4.10.1: General government and non-profit institutions serving households: output of environmental protection services, 2014

(million EUR)

	Total environmental protection	Wastewater management	Waste management	Protection of biodiversity	Pollution abatement	Other domains
EU-28 (1)(2)	112 508.7	16 452.8	64 577.6	10 265.7	4 579.9	16 632.8
Belgium (3)	2 069.8	195.7	1 230.2	152.7	160.5	330.8
Bulgaria (2)	278.0	7.2	223.5	13.3	7.6	26.4
Czech Republic	1 197.4	74.1	559.7	415.6	7.3	140.7
Denmark	122.7	0.0	3.4	90.6	5.6	23.2
Germany	13 954.0	5 815.0	:	1 086.0	:	2 354.0
Estonia (1)(4)	109.8	0.7	8.5	7.7	3.3	89.7
Ireland (1)	826.2	601.4	1.1	50.4	68.8	104.5
Greece	:	:	:	:	:	:
Spain	7 165.0	980.0	4 611.0	696.0	185.0	693.0
France	10 039.8	2 980.3	1 512.1	815.8	329.7	4 401.8
Croatia	:	:	:	:	:	:
Italy	14 672.0	729.0	9 025.0	3 433.0	656.0	829.0
Cyprus	:	:	:	:	:	:
Latvia	146.9	16.6	84.5	4.4	19.2	22.3
Lithuania (2)	235.7	81.6	86.3	13.5	10.0	44.2
Luxembourg	178.3	82.6	33.5	41.4	9.3	11.4
Hungary	:	:	:	:	:	:
Malta	:	:	:	:	:	:
Netherlands	10 525.0	3 427.3	4 641.2	513.1	446.9	1 496.4
Austria	486.5	0.1	381.6	35.5	60.6	8.8
Poland	1 901.0	871.5	179.2	42.0	503.9	304.5
Portugal (5)	911.9	129.6	448.0	7.0	19.3	307.9
Romania	:	:	:	:	:	:
Slovenia	69.5	8.5	7.2	20.8	7.1	25.9
Slovakia (3)	449.6	14.1	330.0	27.4	18.4	59.6
Finland	:	:	:	:	:	:
Sweden	:	:	:	:	:	:
United Kingdom	10 622.0	147.5	8 791.6	488.0	103.3	1 091.6

(1) Estimate.
(2) 2015 data instead of 2014.
(3) 2013 data instead of 2014.
(4) 2010 data instead of 2014.
(5) 2011 data instead of 2014; provisional.
Source: Eurostat (online data code: env_ac_pepsgg)

Regarding the production of environmental protection services its distribution by environmental protection activities follows different patterns according the institutional sector and the country considered. In most EU Member States the output of environmental protection services by general government was concentrated in the following environmental protection activities: waste management, wastewater management and protection of biodiversity.

As regards pollution abatement activities the highest share was registered in Poland (27 %) far above Latvia (13 %), Austria (12 %) and Slovenia (10 %) - see Table 4.10.1. The other domains include research and development, general environmental administration and management, education, training and information relating to the environment, as well as activities leading to indivisible expenditure and activities not elsewhere classified. The share of those activities exceeded one third of total environmental protection activities in Estonia (82 % 2010 data), France (44 %), Slovenia (37 %) and Portugal (34 %, 2011 data).

Table 4.10.2: Corporations as specialist producers: market output of environmental protection services for CEPA 2, CEPA 3 and CEPA 4, 2014

(million EUR)

	Total (CEPA 2 to 4)	Wastewater management	Waste management	Protection and remediation of soil, groundwater and surface water
EU-28 (1)(2)	142 020.8	44 532.3	91 513.9	5 974.6
Belgium (3)	4 384.1	1 315.4	2 868.7	200.0
Bulgaria (2)	162.8	45.5	117.0	0.3
Czech Republic	3 284.1	647.5	2 442.2	194.4
Denmark	3 672.6	1 304.7	2 367.8	:
Germany	:	:	:	:
Estonia (4)	264.6	58.5	206.0	0.1
Ireland	993.5	140.9	848.1	4.5
Greece	:	:	:	:
Spain	9 717.0	1 733.5	7 778.3	205.3
France	18 854.8	4 314.1	13 747.7	793.0
Croatia	:	:	:	:
Italy	17 816.2	3 306.0	13 153.6	1 356.6
Latvia	281.2	93.7	181.4	6.0
Lithuania (2)	432.2	68.7	363.4	0.1
Luxembourg	285.6	112.7	169.0	3.9
Hungary	:	:	:	:
Malta	:	:	:	:
Netherlands	5 226.0	745.1	4 087.4	393.5
Austria	6 422.4	1 954.3	3 589.4	878.7
Poland	3 813.6	2 164.8	1 625.7	23.1
Portugal (5)	1 651.3	580.3	1 061.8	9.3
Romania	:	:	:	:
Slovenia	181.3	18.8	162.5	0.0
Slovakia (3)	604.9	208.6	379.6	16.7
Finland	:	:	:	:
Sweden	:	:	:	:
United Kingdom	15 595.3	8 855.0	6 385.4	354.8

(1) Estimates.
(2) 2015 data instead of 2014.
(3) 2013 data instead of 2014.
(4) 2010 data instead of 2014.
(5) 2011 data instead of 2014; provisional.

Source: Eurostat (online data code: env_ac_pepssp)

As regards the specialist producers in the corporate sector only three environmental protection activities are covered: wastewater management, waste management and protection and remediation of soil, groundwater and surface water (see Table 4.10.2). Among these three domains, waste management was predominant in terms of market output in all Member States except in Poland and United Kingdom where wastewater management had the highest share. The last domain covered (protection and remediation of soil, groundwater and surface water) generally had a lower importance, Austria being the only Member State where its share (14 %) exceeded 10 %.

Table 4.10.3: Other corporations: ancillary output of environmental protection services, 2014

(million EUR)

	Total environmental protection	Protection of ambient air and climate	Wastewater management	Waste management	Other domains
EU-28 (1)(2)	27 151.3	6 652.1	6 252.2	5 685.0	8 561.9
Belgium (3)	190.8	27.6	69.0	57.9	36.3
Bulgaria (2)	184.3	56.1	40.6	45.1	42.6
Czech Republic	492.7	78.1	215.6	109.0	90.1
Denmark	:	:	:	:	:
Germany (1)	4 821.9	2 353.2	1 458.6	921.4	88.7
Estonia (4)	20.9	:	6.1	:	4.1
Ireland	:	:	:	:	:
Greece	:	:	:	:	:
Spain	815.8	267.9	302.7	167.8	77.4
France	4 958.1	613.1	707.1	513.5	3 124.4
Croatia (3)	45.9	6.0	13.2	14.8	12.0
Italy	:	:	:	:	:
Cyprus	18.9	10.0	3.0	5.3	0.5
Latvia	3.6	0.7	1.5	0.2	1.2
Lithuania (2)	6.8	0.7	2.1	2.8	1.2
Luxembourg	:	:	:	:	:
Hungary	:	:	:	:	:
Malta	:	:	:	:	:
Netherlands	:	:	32.0	:	140.0
Austria	555.8	167.4	148.0	177.6	62.9
Poland	969.6	441.3	169.4	99.5	259.4
Portugal (5)	134.7	21.2	35.8	43.1	34.6
Romania	:	:	:	:	:
Slovenia	189.4	23.1	36.3	109.9	20.1
Slovakia (2)	140.5	9.6	72.5	34.4	23.9
Finland (6)	339.3	134.3	135.1	36.7	33.1
Sweden	435.9	:	:	:	:
United Kingdom	1 150.2	149.3	379.9	247.4	373.7

(1) Estimate.
(2) 2015 data instead of 2014.
(3) 2013 data instead of 2014.
(4) 2010 data instead of 2014.
(5) 2011 data instead of 2014; provisional.
(6) 2012 data instead of 2014.

Source: Eurostat (online data code: env_ac_pepsnsp)

In most EU Member States ancillary output of environmental protection by non-specialist producers was more evenly distributed by environmental domains (see Table 4.10.3). The domain of protection of ambient air and climate had the highest share in Cyprus (53 %), Germany (49 %) and Poland (46 %). Wastewater management activities had the highest shares in Slovakia (52 %), the Czech Republic (44 %) and Latvia (42 %). Waste management was the highest in Slovenia (58 %) and Lithuania (42 %). The other environmental protection domains include protection and remediation of soil, groundwater and surface water, noise and vibration abatement, protection of biodiversity and landscapes, protection against radiation, R&D, general environmental administration and management, education, training and information relating to the environment, as well as activities leading to indivisible expenditure and activities not elsewhere classified. Ancillary output covering those activities had a higher share than the other environmental protection domains (considered individually) in France (63 %), Latvia (33 %) and the United Kingdom (32 %).

Annexes

Annex A: 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

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.

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

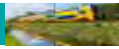
Final energy consumption is the energy consumed in the following sectors: industry, transport, commercial and public services, agriculture/forestry, fishing, residential and other. It excludes the non-energy consumption, deliveries to the energy transformation sector and for the own use of the energy 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, bituminous coal and sub-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.

Lignite and derived products

Lignite and derived products include lignite, peat, brown coal/lignite briquettes and peat briquettes.

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 import

Net import 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, lignite: 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.
- 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.
- 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 includes hydroelectricity, biomass, wind, solar, tidal and geothermal energies.

Annex B: Terms 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 http://ec.europa.eu/eurostat/ramon/nomenclatures/index.cfm?TargetUrl =LST_NOM_DTL_GLOSSARY&StrNom=CODED2&StrLanguageCode=EN

Further clarification of the terms used in transport statistics can be found in the Eurostat/ITF/ UNECE 'Illustrated Glossary for Transport Statistics' publication, available at http://ec.europa.eu/eurostat/ramon/other_documents/transport_glossary_4_ed/index.cfm?TargetUrl=DSP_TRANSPORT_GLOSSARY_4_ED and in the glossary of Statistics Explained under http://ec.europa.eu/eurostat/statistics-explained/index.php/Category:Transport_glossary

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, pipelines, 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. For some missing data, figures from miscellaneous international or national bodies have been used and some estimates (put in italics) have been made.

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) 2016/2032 of the European Parliament and of the Council of 26 October 2016 amending Regulation (EC) No 91/2003 on rail transport statistic (OJ. L 317 of 23.11.2016)
- 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) 2016/1954 of the European Parliament and of the Council of 26 October 2016 amending Regulation (EC) 1365/2006 of the European Parliament and of the Council of 6 September 2006 on statistics of goods transport by inland waterways and repealing Council Directive 80/1119/EEC (O.J. L 311 of 17.11.2016)
- 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 (O.J. L 141 of 6.6.2009)
- Aviation passengers, freight and traffic: 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)
- 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 collection of other types of data such as regional transport indicators.

The main dissemination channel used for Eurostat data is the online database which covers, starting from the early 1980s; millions of transport figures from EU Member States plus, to a lesser extent, statistics from EFTA, Mediterranean and candidate countries. Online publications on transport under http://europa.eu/!uK78nB and Statistics Explained articles under http://ec.europa.eu/eurostat/statistics-explained/index.php/Transport are also available on the Eurostat website.

Annex C: Glossary of terms used in the environment 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:Environment_glossary

CO_2 equivalent

CO_2equivalent 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 derivable 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 derivable 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 extraction used plus the simple mass weight of imported goods.

Domestic material consumption (DMC)

Domestic material consumption (DMC) is one indicator derivable 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 Classification of Environmental Protection Activities (CEPA 2000), which distinguishes nine environmental domains: protection of ambient air and climate (CEPA 1); wastewater management (CEPA 2); waste management (CEPA 3); protection and remediation of soil, groundwater and surface water (CEPA 4); noise and vibration abatement (CEPA 5); protection of biodiversity and landscape (CEPA 6); protection against radiation (CEPA 7); research and development (CEPA 8) and other environmental protection activities (CEPA 9).

Environmental goods and services sector

The environmental goods and services sector, abbreviated as EGSS and also called environment industry or eco-industries, consists of a heterogeneous set of producers of goods and services aiming at the protection of the environment and the management of natural resources.

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.

Environmental taxes are broken down by economic activity from the perspective of the entities paying the taxes:

- producers, in a breakdown by the classification of economic activities, NACE Rev.2 (A*64 aggregation level as set out in ESA),
- households,
- non-residents.

EPEA National expenditure on environmental protection

National expenditure on environmental protection is calculated in Environmental Protection Expenditure Accounts (EPEA) as the sum for all EU Member States of the following components:

- total environmental protection output,
- plus environmental protection investment (including gross fixed capital formation and acquisition less disposals of non-financial non-produced assets),
- minus intermediate consumption of environmental protection services by corporations as specialist producers.

The imports, exports and international transfers of environmental protection services between the EU-28 and the rest of the world, as well as the VAT and other taxes less subsidies on environmental protection services, are not estimated yet due to incomplete data sources.

For the specific economic categories (e.g. output, gross fixed capital formation, intermediate consumption), the ESA 2010 definitions are followed.

EPEA sectors

Institutional sectors are defined in SEEA CF 2012 and ESA 2010. In Environmental Protection Expenditure Accounts (EPEA), the following groupings are used: corporations, general government (and non-profit institutions serving households), households and the rest of the world (as beneficiary or origin of transfers for environmental protection; results for the rest of the world are not presented in chapter 4.10 of the publication).

The corporations sector covers all units classified in national accounts in sectors S.11 and S.12. The corporations sector comprises:

I. 'specialist producers' of environmental protection services, i.e. the units whose principal activity is the production of environmental protection services (primarily the entities classified to NACE Divisions 37 and 39 and Groups 38.1 and 38.2), The secondary output of environmental protection services by corporations is also included in the data for specialist producers.

II. corporations producing environmental protection services as their ancillary activities.

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 Decision 280/2004/EC. According to the Kyoto Protocol anthropogenic emissions of the six greenhouse gases (the 'Kyoto basket') are aggregated using the global warming potential: carbon dioxide (CO2), methane (CH4) and nitrous oxide (N2O) and hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and sulphur hexafluoride (SF6).

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 activities economiques 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 estimate 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 are 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 estimate 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

Traded goods 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.

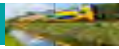
Waste

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.

For areas not covered by a municipal waste scheme, an estimate has been made of the amount of waste generated.

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

Water net abstraction (= water withdrawal):

Water gross abstraction minus returned water.

Cooling water:

This is water which is used to absorb and remove heat. In the questionnaire 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 41 (NACE/ISIC) independently of the sector involved. Deliveries of water from one public supply undertaking to another are excluded.

Wastewater treatment:

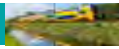
The major aim of wastewater treatment is to remove as much of the pollution (dissolved substances and suspended solids) as possible before the remaining water, called effluent, is discharged back to the environment. Primary treatment typically removes about 60 % of suspended solids from wastewater by 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 D: Calorific values and conversion factors

Calorific values

		kJ (NCV)	kgoe (NCV)
Hard coal	1 kg	>20000	>0.478
Recovered hard coal	1 kg	13800- 28300	0.330 - 0.676
Patent fuels	1 kg	26 800 - 31400	0.640 - 0.750
Hard coke	1 kg	28 500	0.681
Brown coal	1 kg	5600- 10500	0.134 - 0.251
Lignite	1 kg	<20000	<0.478
Peat	1 kg	7800- 13800	0.186 - 0.330
Brown coal briquettes	1 kg	20 000	0.478
Tar	1 kg	37 700	0.9
Benzol	1 kg	39 500	0.943
Oil equivalent	1kg	41 868	1
Crude oil	1 kg	41 600 - 42 800	0.994 - 1.022
Feedstocks	1 kg	42 500	1.015
Refinery gas	1 kg	49 500	1.182
LPG	1 kg	46 000	1.099
Motor spirit	1 kg	44 000	1.051
Kerosenes, jet fuels	1 kg	43 000	1.027
Naphtha	1 kg	44 000	1.051
Gas diesel oil	1 kg	42 600	1.017
Residual fuel oil	1 kg	40 000	0.955
White spirit, industrial spirit	1 kg	43 600	1.041
Lubricants	1 kg	42 000	1.003
Bitumen	1 kg	39 000	0.931
Petroleum cokes	1 kg	32 000	0.764
Other petroleum products (paraffins, waxes, etc.)	1 kg	40 000	0.955
Natural gas	1 MJ (GCV)	900	0.022
Coke-oven gas	1 MJ (GCV)	900	0.022
Blast-furnace gas	1 MJ (GCV)	1 000	0.024
Works gas	1 MJ (GCV)	900	0.022
Nuclear energy	1 MJ (GCV)	1 000	0.024
Biomass	1 MJ (GCV)	1 000	0.024
Solar energy	1 MJ (GCV)	1 000	0.024
Geothermal energy	1 MJ (GCV)	1 000	0.024
Hydro energy	1 kWh	3 600	0.086
Wind energy	1 kWh	3 600	0.086
Derived heat	1 MJ (GCV)	1 000	0.024
Electrical energy	1 kWh	3 600	0.086

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/kg. The conversion coefficients from the specific units to kgoe (kilogramme of oil equivalent) are thus computed by dividing the conversion coefficients to the kilojoules by 41 868.



Calorific values

The following prefixes are used for multiples of TOE, joules, watts and watt hours:

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}

peta (P) = 1 000 000 000 000 000 or 10^{15}

Energy conversion

From \ To	TJ	Gcal	Mtoe	MBtu	GWh
TJ	1	238. 8	2.388×10^{-5}	947.8	0 .2778
Gcal	4.1868×10^{-3}	1	1×10^{-7}	3 96.8	1.163×10^{-3}
Mtoe	4.1868×10^{4}	1×10^{7}	1	3.968×10^{7}	11 630
Mbtu	1.0551×10^{-3}	0 252	2.52×10^{-8}	1	2.931×10^{-4}
GWh	3.6	860	8.6×10^{-5}	3 412	1

Annex E: A practical guide to accessing European statistics

The simplest way to access Eurostat's broad range of statistical information is through the Eurostat website (http://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 statistical book 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, http://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.

Online data codes can also be fed into the 'Search' function on Eurostat's website, which is found in the upper-right corner of the Eurostat homepage, at http://ec.europa.eu/eurostat.

The results from such a search present related dataset(s) and possibly publication(s) and metadata. By clicking on these hyperlinks users are taken to product page(s)([2]), which provide some background information about each dataset/publication or set of metadata. For example, it is possible to move directly to the data from the data product page by clicking the TGM or Data Explorer icons presented under the 'View table' sub-heading.

Note that the data on the Eurostat's website is frequently updated.

Note also that the description above presents the situation as of the end of September 2017.

Statistics Explained

Statistics Explained is part of Eurostat's website — it provides easy access to Eurostat's statistical information. It can be accessed via a link under Publications, or directly at http://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 2017 Statistics Explained contained almost 900 statistical and background articles and some 1 900 glossary pages in English. About 90 of these articles, corresponding to the content of the Eurostat yearbook and Eurostat regional yearbook, are available in French and German, and 20 representative ones have been translated into 19 other EU languages. As a result, 560 articles in 21 languages besides English can be consulted.

([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

([2]) The product page can also be accessed by using a hyperlink, for example, http://ec.europa.eu/eurostat/product?code=<data_code>, where <data_code> is to be replaced by the online data code in question.

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The EU Open Data Portal (http://data.europa.eu/euodp/en/data) provides access to datasets from the EU. Data can be downloaded and reused for free, both for commercial and non-commercial purposes.

PDF: KS-DK-17-001-EN-N
Print: KS-DK-17-001-EN-C

Energy, transport and environment indicators

This publication presents a selection of topical data. Most data cover the European Union and its Member States, while some indicators are provided for other countries, such as members of EFTA, and candidate countries and potential candidates to the European Union.

This publication may be viewed as an introduction to European statistics and provides a starting point for those who wish to explore the wide range of data that is freely available on Eurostat's website at

http://ec.europa.eu/eurostat/

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