12 Energy

A competitive, reliable and sustainable energy sector is essential for all advanced economies. The energy sector has been under the spotlight in recent years due to a number of issues that have pushed energy to the top of national and European Union (EU) political agendas, these include:

- the volatility of oil prices;
- interruptions to energy supply from non-member countries;
- blackouts aggravated by inefficient connections between national electricity networks;
- the difficulties of market access for suppliers in relation to gas and electricity markets;
- increased attention to anthropogenic (human-induced) effects on climate change, in particular, increased greenhouse gas emissions.

The use of renewable energy sources is seen as a key element of European energy policy and should help to: reduce dependence on fuel from non-member countries; reduce emissions from carbon-based energy sources, and; decouple energy costs from oil prices. Another key aspect of the EU's energy policy is to constrain consumption by promoting energy efficiency, both within the energy sector itself and among end-users. Indeed, the EU is putting in place an ambitious energy policy – covering a broad range of energy sources from fossil fuels (oil, gas and coal) to nuclear energy and renewables (solar, wind, biomass, geothermal, hydroelectric and tidal). This policy is designed to bring about a new industrial revolution that will result in a low-energy economy, whilst making the energy consumed more secure, competitive and sustainable, with the goal of the EU becoming a world leader in renewable energy and low-carbon technologies.

In January 2007, the European Commission adopted a Communication (COM(2007) 1) proposing a new energy policy for Europe, with the goal of combating climate change and boosting the EU's energy security and competitiveness through the development of a more sustainable and low-carbon economy. Based on the European Commission's proposal, the European Council endorsed the following targets in March 2007, namely, to:

- reduce greenhouse gas emissions by at least 20 % (compared with 1990 levels) by 2020;
- improve energy efficiency by 20 % by 2020;
- increase the share of renewable energy in final energy consumption to 20 % by 2020;
- increase the share of renewable energy sources in the fuel used by the transport sector to 10 % by 2020.

In a Communication titled 'Towards a low carbon future' (COM(2007) 723 final), the European Commission put forward a strategic energy technology plan (SET-plan) in November 2007. This aims to support decarbonised energy technologies, such as off-shore wind, by accelerating their development and implementation.

In January 2008, the European Commission proposed a package of measures relating to energy and the climate in order to supplement existing initiatives. The European Council, on 11 and 12 December 2008, reached an agreement on an energy/climate change package that was endorsed by the European Parliament at the end of 2008. This breakthrough should help the EU to honour its commitments and to maintain its leading role in the search for an ambitious and comprehensive post-Kyoto global agreement.

In November 2008, the European Commission put forward its second strategic energy review (COM(2008) 781) that contained plans designed to achieve the objectives of sustainability, competitiveness and security of supply. These included a new strategy for building energy security and solidarity between EU Member States, as well as a package of energy efficiency proposals to make energy efficiency savings in areas such as buildings and energy-using products.

In July 2009, new rules to improve the security of gas supplies were introduced through Regulation 715/2009, designed to strengthen the existing system and ensure that all Member States and their gas market participants take effective action to prevent and mitigate the consequences of potential disruptions to gas supplies.

In order to meet the increasing requirements of policymakers for energy monitoring, the legislation relating to energy statistics has in recent years undergone a period of renewal. The new legal basis is Regulation 844/2010 on energy statistics. The data collection exercise covers all EU Member States, Iceland, Norway, Switzerland, Croatia, the former Yugoslav Republic of Macedonia and Turkey. Time series for energy statistics go back to 1985 for some countries, but are more generally available from 1990 onwards; monthly data are also available for certain indicators.

12.1 Energy production and imports

The dependency of the European Union (EU) on energy imports, particularly of oil and more recently of gas, forms the backdrop for policy concerns relating to the security of energy supplies. This subchapter looks at the production of primary energy in the EU and, as a result of the shortfall between production and consumption, the EU's increasing dependency on energy imports from non-member countries. Indeed, more than half (54.8 %) of the EU's gross inland energy consumption in 2008 came from imported sources.

Main statistical findings

Primary production

Production of primary energy in the EU-27 totalled 842.7 million tonnes of oil equivalent in 2008. This continued the generally downward trend of EU-27 production, as supplies of raw materials become exhausted and/or producers considered the exploitation of limited resources uneconomical. Production was dominated by the United Kingdom with a 19.5 % share of the EU-27 total, although this marked a considerable reduction when compared with a decade earlier (28.6 % of the EU-27 total in 1998). Indeed, the United Kingdom experienced by far the largest reduction in its output of primary energy, with production falling by 104.8 million tonnes of oil equivalent (toe) over the period from 1998 to 2008; the next largest decline was recorded in Poland (16.3 million toe). Germany, in contrast, maintained its level of production broadly in line with the 1998 level, while there was an expansion in the production of primary energy in France (up 11.0 million toe during the period under consideration); alongside the United Kingdom, Germany and France were the only other Member States to report that their production of primary energy was in excess of 100 million toe in 2008 (see Table 12.1).

Primary energy production in the EU-27 in 2008 was spread across a range of different energy sources, the most important of which was nuclear energy (28.7 % of the total); the significance of nuclear fuel was particularly high in Belgium, Spain, France, Lithuania, Slovakia and Sweden – where it accounted for more than half of the national production of primary energy. Around one fifth of the EU-27's total production of primary energy was accounted for by solid fuels (largely coal) and by natural gas, with shares of 21.0 % and 19.9 % respectively, while renewable energy sources (17.6 %) and crude oil (12.7 %) made up the remainder of the total (see Figure 12.1).

The growth of primary production from renewable energy sources exceeded that of all the other energy types, with particularly strong growth since 2002 (see Figure 12.2). Indeed, there appears to be something of a watershed since this date, as the production of renewables accelerated, rising by 48.8 % overall between 2002 and 2008 (and by 5.5 % between 2007 and 2008). In contrast, the production levels for the other sources

of energy generally fell between 1998 and 2008 – aside from a modest increase of 2.2 % for nuclear energy. The largest reductions in the production of primary energy were recorded for crude oil (-37.4 %), solid fuels (-25.3 %) and natural gas (-15.9 %).

Imports

The downturn in the primary production of hard coal, lignite, crude oil and natural gas has led to a situation where the EU is increasingly reliant on primary energy imports in order to satisfy demand. The EU-27's imports of primary energy exceeded exports by some 1 015.0 million toe in 2008. The largest net importers of primary energy were generally the most populous Member States, with the exception of the United Kingdom and Poland (where some indigenous reserves of oil/natural gas and coal remain). Since 2004 the only net exporter of primary energy among the EU Member States has been Denmark (see Table 12.2).

The origin of EU-27 energy imports has changed rapidly in recent years, as Russia has emerged as the leading supplier (see Table 12.3). In 2008, some 29.0 % of the EU-27's imports of crude oil were from Russia; this was slightly down on the peak of 30.4 % recorded in both 2006 and 2007. Russia was also the principal supplier of hard coal, its share of EU-27 imports rising from 7.9 % in 2000 to 23.7 % by 2008, well ahead of the next highest share recorded by South Africa (15.3 %). In contrast, Russia's share of EU-27 imports of natural gas declined from 40.4 % to 31.5 % between 2000 and 2008; note, however, that during this period the volume of natural gas imports from Russia remained relatively unchanged, while there was an increase in the share of natural gas imports from Norway (rising to 24.1 % of the total by 2008).

The security of the EU's primary energy supplies may be threatened if a high proportion of imports are concentrated among relatively few partners. More than two thirds (68.0 %) of EU-27 imports of natural gas in 2008 came from Russia, Norway or Algeria. A similar analysis shows that 52.4 % of EU-27 crude oil imports came from Russia, Norway and Libya, while 51.4 % of hard coal imports were from Russia, South Africa and the United States. Although their import volumes remain relatively small, there was some evidence of new partner countries emerging between 2000 and 2008. This was notably the case for hard coal imports from Indonesia, crude oil imports from Kazakhstan and Azerbaijan, or natural gas imports from Libya, Nigeria and Egypt.

EU-27 dependency on energy imports increased from less than 40 % of gross energy consumption in the 1980s to 54.8 % by 2008 (see Table 12.4), with the highest energy dependency rates recorded for crude oil (84.2 %) and for natural gas (62.3 %). The dependency on non-member countries for supplies of solid fuels and natural gas grew at a faster pace in the last decade than the dependency on crude oil (which was already at a high level). Since 2004, the EU-27's net imports of energy have been greater than its primary production; in other words, more than half of the EU-27's gross

inland energy consumption was supplied by net imports.

As it was a net exporter, Denmark was the only EU-27 Member State in 2008 with a negative dependency rate (see Figure 12.3). Among the other Member States, the lowest dependency rates were recorded by Estonia, the United Kingdom the Czech Republic and Romania (the only other countries to report dependency rates below 30 %); meanwhile, Malta, Luxembourg and Cyprus were almost entirely dependent on primary energy imports.

Data sources and availability

Energy commodities extracted or captured directly from natural resources are called primary energy sources, while energy commodities which are produced from primary energy sources in transformation plants are called derived products. Primary energy production covers the national production of primary energy sources and takes place when natural resources are exploited, for example, in coal mines, crude oil fields, hydropower plants, or in the fabrication of biofuels. Whenever consumption exceeds primary production, the shortfall needs to be accounted for by imports of primary or derived products.

The heat produced in a reactor as a result of nuclear fission is regarded as primary production of nuclear heat, alternatively referred to as, nuclear energy. It is calculated either on the basis of the actual heat produced or on the basis of reported gross electricity generation and the thermal efficiency of the nuclear plant. Primary production of coal and lignite consists of quantities of fuels extracted or produced, calculated after any operation for the removal of inert matter.

Transformation of energy from one form to another, such as electricity or heat generation from thermal power plants, or coke production from coke ovens is not considered as primary production. Net imports are calculated as the quantity of imports minus the equivalent quantity of exports. Imports represent all entries into the national territory excluding transit quantities (notably via gas and oil pipelines); exports similarly cover all quantities exported from the national territory.

Context

More than half of the EU-27's energy comes from countries outside the Union – and this proportion is rising. Much of this energy comes from Russia, whose disputes with transit countries have disrupted supplies in recent years – for example, between 6 and 20 January 2009, gas flows from Russia via Ukraine were interrupted.

The European Commission adopted its second strategic energy review in November 2008. This addressed how the EU could reduce its dependency on imported energy, thereby improving its security of supply, as well as reducing its emissions of greenhouse gases. The review encouraged energy solidarity among Member States, proposed an action plan to secure sustainable energy supplies, and adopted a package of energy efficiency proposals aimed at making energy savings in key

areas, such as buildings and energy-using products.

The European Commission made a proposal at the end of 2008 to repeal Directive 2004/67/EC concerning measures to safeguard security of natural gas supply. In response to the Russian-Ukrainian gas crisis of January 2009, the European Parliament and Council called for an accelerated revision of the Directive, arguing that the crisis demonstrated the need to define more clearly the roles of the gas industry, Member States and EU institutions to deal with potential supply disruptions. As a result, the European Council adopted a Directive (2009/119/EC) in September 2009 imposing an obligation on Member States to maintain minimum stocks of crude oil and/or petroleum products. These new measures for oil and gas markets are designed to ensure that all parties take effective action to prevent and mitigate the consequences of potential disruptions to supplies, while also creating mechanisms for Member States to work together to deal effectively with any major oil or gas disruptions which might arise; a coordination mechanism has been set-up so that Member States can react uniformly and immediately in emergency cases.

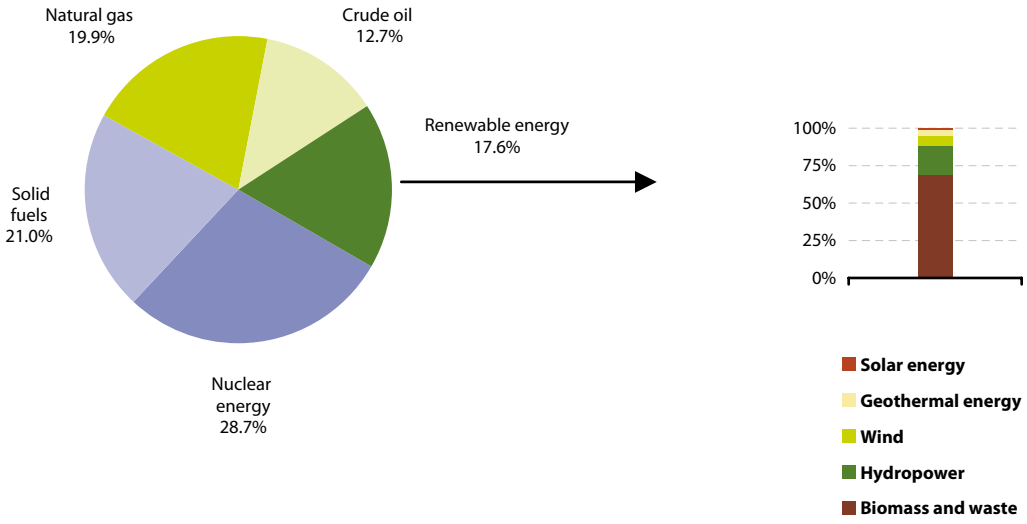
There are a number of on-going initiatives to develop gas pipelines between Europe and its eastern and southern neighbours. These include the north stream (between Russia and the EU via the Baltic Sea), the south stream (between Russia and the EU via the Black Sea) and Nabucco (connecting the Caspian region and Middle East to the EU); all three are scheduled to be in operation (at the latest) by the end of 2015.

Table 12.1: Energy production
(million tonnes of oil equivalent)

	Total production of primary energy		Share of total production 2008 (%)				
	1998	2008	Nuclear energy	Solid fuels	Natural gas	Crude oil	Renewable energy
EU-27	940.0	842.7	28.7	21.0	19.9	12.7	17.6
Euro area (EA-16)	439.3	456.8	41.9	14.5	17.8	2.8	22.9
Belgium	12.1	13.6	86.7	0.0	0.0	-	13.3
Bulgaria	10.2	10.1	40.4	47.9	1.6	0.2	9.9
Czech Republic	30.5	32.5	21.1	70.1	0.5	0.8	7.6
Denmark	20.3	26.5	-	-	34.0	54.1	11.9
Germany	131.7	132.5	28.9	37.8	8.5	2.3	22.4
Estonia	3.2	4.2	-	82.1	-	-	17.9
Ireland	2.4	1.5	-	42.4	23.3	-	34.3
Greece	10.0	10.0	-	83.3	0.1	0.6	15.9
Spain	32.0	30.3	50.3	13.9	0.1	0.4	35.4
France	124.0	135.0	84.0	0.0	0.6	0.8	14.7
Italy	30.1	26.4	0.0	0.3	28.7	20.1	51.0
Cyprus	0.0	0.1	-	-	-	-	100.0
Latvia	1.8	1.8	-	0.2	-	-	99.9
Lithuania	4.4	3.6	71.2	0.5	-	3.6	24.6
Luxembourg	0.1	0.1	-	-	-	-	100.0
Hungary	11.9	10.4	36.7	16.3	19.3	11.8	15.9
Malta	-	-	-	-	-	-	-
Netherlands	63.6	66.3	1.6	-	90.3	3.3	4.7
Austria	8.7	10.6	-	0.0	12.4	9.4	78.2
Poland	86.8	70.4	-	85.9	5.2	1.1	7.7
Portugal	3.7	4.4	-	0.0	-	-	100.0
Romania	29.2	29.1	10.0	24.0	30.9	16.5	18.6
Slovenia	3.0	3.6	44.4	32.5	0.1	0.0	22.9
Slovakia	4.7	6.1	70.7	10.2	1.4	0.3	17.3
Finland	13.1	16.3	36.4	7.1	-	-	56.4
Sweden	33.0	32.8	50.3	0.8	-	0.0	49.0
United Kingdom	269.3	164.5	8.2	6.4	38.1	44.4	2.9
Iceland	1.8	:	:	:	:	:	:
Norway	206.6	219.3	:	1.0	39.7	53.2	6.1
Switzerland	10.6	12.3	57.9	:	0.0	:	42.1
Croatia	4.0	3.9	:	0.0	55.8	22.2	22.0
Turkey	29.1	29.1	:	57.4	2.9	7.5	32.2

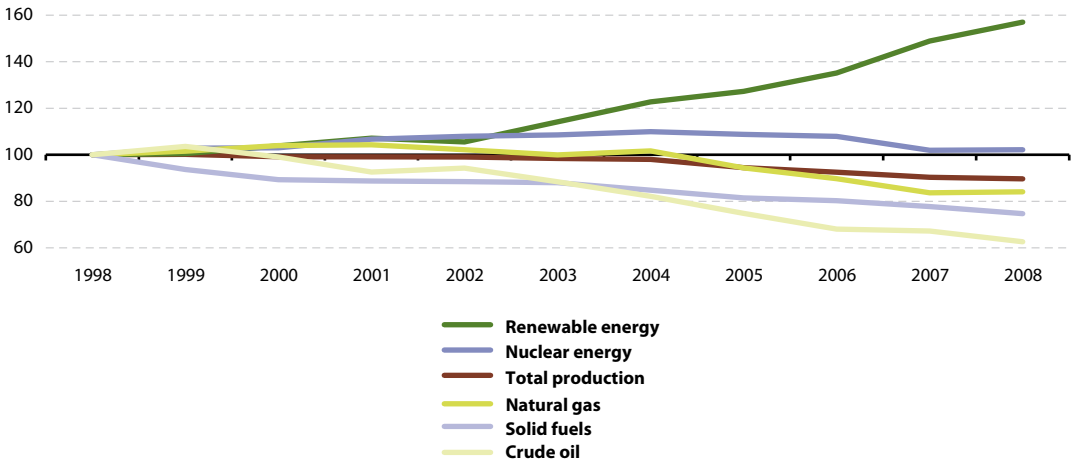
Source: Eurostat (ten00076, ten00080, ten00077, ten00079, ten00078 and ten00081)

Figure 12.1: Production of primary energy, EU-27, 2008
(% of total, based on tonnes of oil equivalent)



Source: Eurostat (ten00080, ten00077, ten00079, ten00078, ten00081 and ten00082)

Figure 12.2: Development of the production of primary energy (by fuel type), EU-27
(1998=100, based on tonnes of oil equivalent)



Source: Eurostat (ten00076, ten00081, ten00080, ten00079, ten00078 and ten00077)

Table 12.2: Net imports of primary energy

	(1 000 tonnes of oil equivalent)					(tonnes of oil equivalent per inhabitant)				
	2000	2002	2004	2006	2008	2000	2002	2004	2006	2008
EU-27	826 732	858 657	941 376	1 010 880	1 014 961	1.71	1.77	1.93	2.05	*2.04*
Euro area (EA-16)	795 294	813 614	848 185	868 166	850 889	2.54	2.58	2.65	2.69	*2.60*
Belgium	50 812	49 341	53 940	53 486	53 896	4.96	4.79	5.19	5.09	5.05
Bulgaria	8 718	8 936	9 241	9 540	10 543	1.06	1.13	1.18	1.24	1.38
Czech Republic	9 475	11 358	11 742	12 921	12 462	0.92	1.11	1.15	1.26	1.20
Denmark	-7 255	-8 610	-9 946	-7 930	-4 638	-1.36	-1.60	-1.84	-1.46	-0.85
Germany	205 682	209 252	215 533	215 558	211 181	2.50	2.54	2.61	2.61	2.57
Estonia	1 656	1 448	1 653	1 614	1 449	1.21	1.06	1.22	1.20	1.08
Ireland	12 270	13 742	13 865	14 221	14 261	3.25	3.52	3.44	3.38	*3.24*
Greece	22 065	23 308	24 708	24 857	25 484	2.02	2.12	2.24	2.23	2.27
Spain	99 334	108 012	115 282	124 054	122 500	2.48	2.64	2.72	2.83	2.71
France	134 196	137 477	141 485	141 895	141 472	2.22	2.24	2.27	2.25	2.21
Italy	153 527	153 542	159 548	164 570	157 064	2.70	2.69	2.76	2.80	2.63
Cyprus	2 547	2 586	2 417	2 971	3 032	3.69	3.67	3.31	3.88	3.84
Latvia	2 246	2 455	3 173	3 170	2 781	0.94	1.05	1.37	1.38	1.22
Lithuania	4 343	3 739	4 439	5 481	5 507	1.24	1.08	1.29	1.61	1.64
Luxembourg	3 630	3 950	4 535	4 662	4 498	8.37	8.90	9.97	9.94	9.30
Hungary	14 032	14 777	16 095	17 408	17 049	1.37	1.45	1.59	1.73	1.70
Malta	1 466	1 565	1 902	1 648	1 857	3.86	3.97	4.76	4.07	4.53
Netherlands	35 239	32 279	31 062	36 962	34 215	2.22	2.00	1.91	2.26	2.09
Austria	19 112	21 181	23 383	24 973	23 628	2.39	2.63	2.87	3.03	2.84
Poland	10 161	10 100	13 345	19 485	30 095	0.26	0.26	0.35	0.51	0.79
Portugal	21 881	22 519	22 653	21 569	21 263	2.15	2.18	2.16	2.04	2.00
Romania	8 129	9 165	12 000	11 901	11 289	0.36	0.42	0.55	0.55	0.52
Slovenia (1)	3 366	3 440	3 709	3 827	4 289	1.69	1.73	1.86	1.91	2.13
Slovakia	11 581	12 576	13 204	12 046	12 066	2.15	2.34	2.45	2.24	2.23
Finland	18 587	18 844	20 958	20 866	20 181	3.59	3.63	4.02	3.97	3.81
Sweden	19 182	19 913	20 373	19 797	19 752	2.16	2.24	2.27	2.19	2.15
United Kingdom	-39 249	-28 239	11 076	49 327	57 783	-0.67	-0.48	0.19	0.82	*0.94*
Iceland	1 036	969	1 072	*1 099*	:	3.71	3.38	3.69	*3.66*	:
Norway	-198 280	-208 707	-202 897	-188 231	-188 612	-44.27	-46.13	-44.33	-40.57	-39.82
Switzerland	14 079	15 047	15 168	16 111	15 419	1.97	2.07	2.06	2.16	2.03
Croatia	4 181	4 977	5 105	4 878	5 507	0.93	1.12	1.15	1.10	1.24
Turkey	51 062	51 107	58 705	69 293	72 872	0.76	0.74	0.83	0.96	1.03

(1) Tonnes of oil equivalent per inhabitant, break in series, 2008.

Source: Eurostat (ten00083 and tps00001)

Table 12.3: Main origin of primary energy imports, EU-27
(% of extra EU-27 imports)

	Hard coal								
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Russia	7.9	9.8	11.4	12.6	17.6	21.2	22.5	22.6	23.7
South Africa	21.2	23.2	26.8	27.1	23.4	22.7	21.5	18.5	15.3
United States	10.8	9.5	7.0	6.0	6.7	6.9	7.0	8.4	12.8
Colombia	12.3	10.7	10.6	10.9	10.7	10.6	10.6	11.7	11.1
Australia	15.1	13.9	14.6	14.7	13.4	11.9	11.0	12.0	10.8
Indonesia	4.8	4.8	5.7	6.1	6.1	6.5	8.5	7.1	6.7
Canada	3.4	3.3	2.7	1.8	1.9	2.9	2.5	2.9	2.4
Ukraine	1.1	1.4	1.7	1.1	1.9	1.8	1.3	1.5	1.9
Venezuela	1.8	1.4	1.7	2.4	1.0	0.9	0.8	1.0	0.9
Others	21.6	22.1	17.9	17.2	17.1	14.6	14.2	14.5	14.5
	Crude oil								
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Russia	18.7	22.7	26.1	28.1	30.0	29.9	30.4	30.4	29.0
Norway	19.3	17.9	17.4	17.5	17.3	15.5	14.3	13.8	14.0
Libya	7.6	7.3	6.6	7.6	7.9	8.1	8.5	9.1	9.3
Saudi Arabia	10.8	9.5	9.0	10.1	10.2	9.7	8.2	6.6	6.3
Iran	5.9	5.2	4.4	5.7	5.7	5.6	5.8	5.6	5.0
Kazakhstan	1.6	1.5	2.3	2.6	3.5	4.2	4.3	4.4	4.6
Nigeria	3.7	4.3	3.1	3.8	2.4	3.0	3.2	2.5	3.7
Iraq	5.2	3.4	2.7	1.4	2.0	2.0	2.7	3.1	3.1
Azerbaijan	0.6	0.8	0.9	0.9	0.8	1.1	1.9	2.6	2.7
Others	26.6	27.4	27.5	22.3	20.1	21.0	20.7	22.0	22.2
	Natural gas								
	2000	**2001**	**2002**	**2003**	**2004**	**2005**	**2006**	**2007**	**2008**
Russia	40.4	38.5	36.7	37.2	35.9	34.5	33.0	31.7	31.5
Norway	17.4	18.6	21.3	21.0	20.3	20.7	21.4	23.2	24.1
Algeria	19.6	17.0	17.2	16.4	14.8	15.3	13.8	12.7	12.4
Nigeria	1.5	1.9	1.8	2.6	3.0	3.0	3.6	3.9	3.3
Libya	0.3	0.3	0.2	0.2	0.3	1.4	2.1	2.5	2.5
Egypt	0.1	0.2	0.7	0.6	1.2	1.3	1.5	1.8	1.8
Qatar	0.0	0.0	0.0	0.0	0.0	1.4	2.1	1.5	1.4
Trinidad and Tobago	0.3	0.2	0.2	0.0	0.0	0.2	1.1	0.7	1.4
Croatia	0.0	0.0	0.0	0.0	0.0	0.0	0.3	0.2	0.2
Others	20.4	23.3	22.1	21.9	24.4	22.2	21.2	21.8	21.4

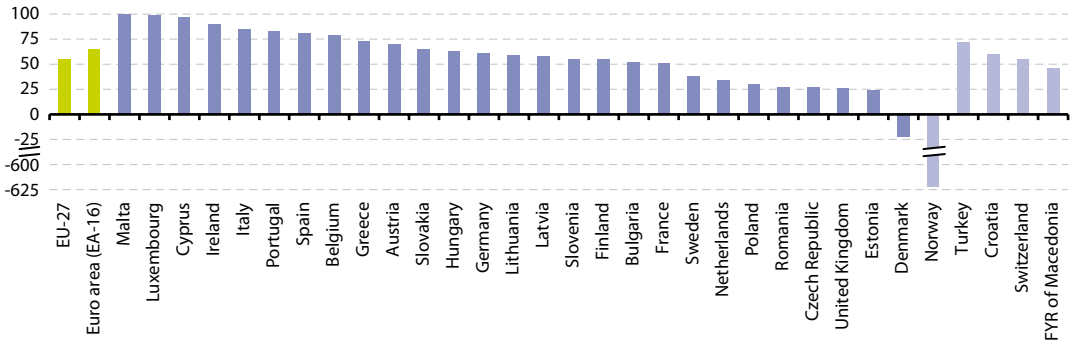
Source: Eurostat (nrg_122a, nrg_123a and nrg_124a)

Table 12.4: Energy dependency rate, EU-27
(% of net imports in gross inland consumption and bunkers, based on tonnes of oil equivalent)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008
All products	46.1	45.2	46.8	*47.5*	*47.6*	49.0	50.3	52.6	53.8	53.1	54.8
Solid fuels	26.6	27.8	30.7	33.8	33.1	34.9	38.1	39.9	41.1	41.5	44.9
Crude oil	76.0	73.0	74.5	76.7	75.4	77.7	80.0	81.6	83.2	82.9	84.2
Natural gas	45.6	47.9	48.9	47.3	51.2	52.5	54.0	57.7	60.8	60.3	62.3

Source: Eurostat (nrg_100a, nrg_101a, nrg_102a and nrg_103a)

Figure 12.3: Energy dependency rate - all products, 2008
(% of net imports in gross inland consumption and bunkers, based on tonnes of oil equivalent)



Source: Eurostat (tsdcc310 and nrg_100a)

12.2 Consumption of energy

The European Union (EU) has pledged to cut its energy consumption by 20 % (compared with projected levels) by 2020. This subchapter explains how the consumption of energy in the EU has evolved, highlighting a gradual shift from fossil fuels to renewable energy sources, such as solar energy, wind power, and biofuels; it also looks at the evolution of energy use within the transport sector.

In tandem with supply-side policies, the EU has launched a number of initiatives which aim to reduce energy demand and attempt to decouple it from economic growth. Several instruments and implementing measures exist in this field, including the promotion of co-generation, the energy performance of buildings (whether private or public buildings), and energy labelling of domestic appliances.

Main statistical findings

Consumption

Gross inland energy consumption of primary energy within the EU-27 in 2008 was 1 799 million tonnes of oil equivalent (toe). As such, gross inland consumption remained relatively unchanged throughout the period from 2003 to 2008, in contrast to a rising trend prior to this period (see Table 12.5).

The gross inland consumption of each Member State depends, to a large degree, on the structure of its energy system, the availability of natural resources for primary energy production, and the structure and development of each economy (general trends in economic growth); this is true not only for conventional fuels and nuclear power, but also for renewable energy sources. Gross inland consumption of primary energy rose at a fast pace in Spain throughout the period from 1998 to 2008. There was also a rapid expansion in energy consumption in Poland between 2003 and 2008, as witnessed by the second highest growth rate, behind Spain; the largest reductions in gross inland consumption of primary energy (during the same five-year period) were recorded in the United Kingdom and Germany.

Over the period 1998 to 2008 there was a gradual decline in the share of crude oil and petroleum products, solid fuels, and nuclear energy in total gross inland consumption, while an increasing share of EU-27 consumption was accounted for by natural gas and renewable energy sources (see Figure 12.4). The combined share of crude oil, petroleum products and solid fuels fell from 59.0 % of total consumption to 53.5 %, reflecting changes in the EU-27's energy mix and a move away from the most polluting fossil fuels. During the same period, the relative importance of natural gas and of renewable energy sources rose by 2.9 percentage points, reaching 24.5 % and 8.4 % of the EU-27's gross inland consumption by 2008; the relative importance of renewable energy sources rose to almost one third of the total in Sweden and Latvia, and was close to one

quarter of the total in Austria and Finland.

Final energy consumption (in other words, excluding energy used by power producers) in the EU-27, was equivalent to just under two thirds (64.9 %) of gross inland consumption, at 1 169 million toe in 2008. Almost one fifth (19.2 %) of the EU-27's final energy consumption was accounted for by Germany (see Table 12.6).

The lowest levels of energy intensity – a measure of an economy's energy efficiency – were recorded for Denmark and Ireland in 2008, while the most energy-intensive Member States were Bulgaria and Romania (see Figure 12.5). It should be noted that the economic structure of an economy plays an important role in determining energy intensity, as post-industrial economies with large service sectors will, a priori, have considerably lower energy use than economies characterised by heavy, traditional industries. Between 1998 and 2008, substantial energy savings were made in the Bulgarian and Romanian economies, as well as in the Baltic Member States, as the amount of energy required to produce a unit of economic output (as measured by the gross domestic product (GDP)) was almost halved (reductions of between 40 and 46 %).

End-users

An analysis of the final end use of energy shows three dominant categories: as transport, industry and households each accounted for at least one quarter of the EU-27's final energy consumption in 2008. The total energy consumption of all transport modes amounted to 374.3 million toe in 2008, almost one third (32.0 %) of the total (see Figure 12.6). There were, however, considerable differences in the development of energy consumption across transport modes in the EU-27, with the most rapid growth recorded for aviation (33.4 % between 1998 and 2008) and an upward trend for road transport (11.6 %), while the energy consumption of rail was relatively unchanged (-2.7 %) – see Figure 12.7. The largest increase in energy consumption among the different transport modes, in absolute terms, was recorded for road transport, where EU-27 consumption rose by 31.5 million toe between 1998 and 2008, compared with a 13.6 million toe increase for aviation. These changes in energy consumption reflect the popularity of each transport mode, but can also be influenced by technological changes, especially when these relate to fuel-efficiency gains.

Data sources and availability

Gross inland energy consumption represents the quantity of energy necessary to satisfy inland consumption of the geographical entity under consideration. It may be defined as primary production plus imports, recovered products and stock changes, less exports and fuel supply to maritime bunkers (for seagoing ships of all flags). It describes the total energy needs of a country (or entity), covering: consumption by the energy sector itself; distribution and transformation losses; final energy consumption by end-users; and statistical differences

Final energy consumption includes the consumption of energy by all users except the energy sector itself (whether for deliveries, for transformation, and/or its own use), and includes, for example, energy consumption by agriculture, industry, services and households, as well as energy consumption for transport. It should be noted that fuel quantities transformed in the electrical power stations of industrial auto-producers and the quantities of coke transformed into blast-furnace gas are not part of overall industrial energy consumption but of the transformation sector.

Energy intensity is measured as the ratio between gross inland consumption of energy and GDP; this indicator is a key indicator for measuring progress under the Europe 2020 strategy for smart, sustainable and inclusive growth. The ratio is expressed in kilograms of oil equivalent (kgoe) per EUR 1 000, and to facilitate analysis over time the calculations are based on GDP at constant prices (currently chain-linked 2000 prices). If an economy becomes more efficient in its use of energy and its GDP remains constant, then the ratio for this indicator should fall. The economic structure of an economy plays an important role in determining energy intensity, as post-industrial economies with large service sectors will, a priori, display relatively low energy intensity rates, while developing economies may have a considerable proportion of their economic activity within industrial sectors, thus leading to higher energy intensity.

Context

As well as supply-side policies to influence the production of energy, there is a growing trend for policy initiatives to focus on improving energy efficiency in an attempt to reduce energy demand and decouple it from economic growth. This process was given impetus by the integrated energy and climate change strategy that committed the EU to cut its energy consumption by 20 % by 2020 (in relation to projected levels) and, in so doing, simultaneously address the issues of import dependency, energy-related emissions, and energy costs.

To achieve these goals, the EU seeks to engage public opinion, decision-makers and market operators, while setting minimum energy efficiency standards and rules on labelling for products, services and infrastructure, in order to encourage significant reductions in consumption – for example, through the promotion of co-generation, improving the energy performance of buildings, or improving the information given to consumers with respect to the energy consumption of domestic appliances. Indeed, daily life is becoming increasingly dependent on energy-consuming devices. Without compromising standards of living, there are a range of actions that could be employed to reduce energy consumption across many European households. Aside from making efficiency savings, these measures could also cut average fuel bills, for example, by: turning the thermostat down; using thermostatic radiator valves; not

leaving televisions, music systems, DVD players or similar devices on stand-by; defrosting fridges and freezers regularly; turning off lights when leaving rooms; using low-energy light bulbs; insulating hot-water tanks and heating pipes; or using loft insulation and cavity wall insulation.

The EU harmonises national measures relating to the publication of information on the consumption of energy by household appliances, thereby allowing consumers to choose appliances on the basis of their energy efficiency – a range of different products (for example, light bulbs, refrigerators, washing machines) carry the EU's energy label that details the energy efficiency of products, rating them according to a scale that ranges from A to G, with 'A' as the most energy efficient products and 'G' for the least efficient products.

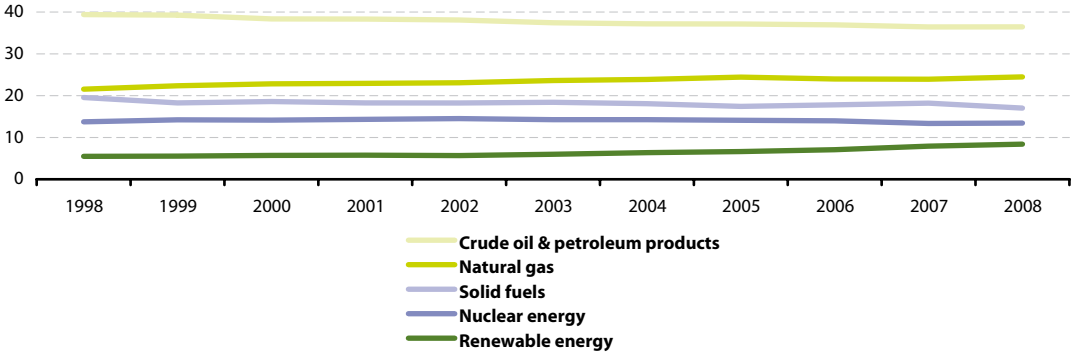
The transport sector is the fastest growing consumer of energy and producer of greenhouse gases, even if advances in transport technology and fuel have resulted in marked decreases in emissions of certain pollutants. There are many factors that impact on energy use within the transport sector, for example, overall economic growth, the efficiency of individual transport modes, the take-up of alternative fuels, and lifestyle choices. The globalised nature of the economy has fuelled demand for international freight movements (principally by ship), while within the Single Market there has been a considerable expansion in the use of road freight transport. The growth in demand for energy from the EU's transport sector is not confined to business, as it has been accompanied by an expansion in personal travel. The growth of low-cost airlines, an increase in motorisation rates (the average number of motor vehicles per inhabitant), a trend for living in suburban areas, or the expansion of tourism (more frequent breaks, and more long-haul destinations) are among some of the factors that have contributed to increased demand for energy as a result of personal travel.

Table 12.5: Gross inland consumption of primary energy
(million tonnes of oil equivalent)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Share in EU-27 2008 (%)
EU-27	1 723	1 711	1 724	*1 763*	*1 759*	1 803	1 825	1 825	1 826	1 808	1 799	100.0
Euro area (EA-16)	1 177	1 181	1 198	*1 228*	*1 228*	1 257	1 277	1 277	1 273	1 265	1 260	70.0
Belgium	60.1	61.1	61.5	60.3	58.4	61.6	61.5	61.1	60.4	57.3	58.3	3.2
Bulgaria	20.2	18.2	18.7	19.4	19.0	19.6	19.0	20.0	20.6	20.3	20.0	1.1
Czech Republic	41.2	38.5	40.5	41.5	42.0	45.6	45.9	44.4	46.4	46.3	45.1	2.5
Denmark	20.8	20.1	19.5	20.2	19.8	20.8	20.2	19.7	21.0	20.5	19.9	1.1
Germany	346.7	340.8	342.4	353.3	345.6	348.3	350.3	347.1	348.9	341.3	343.7	19.1
Estonia	5.4	5.0	5.0	5.1	5.0	5.5	5.7	5.6	5.4	6.1	5.9	0.3
Ireland	13.0	13.7	14.4	15.0	15.3	15.0	15.8	15.1	15.5	15.9	15.8	0.9
Greece	27.0	26.9	28.2	29.1	29.9	30.3	30.8	31.4	31.5	31.5	31.9	1.8
Spain	112.6	118.4	123.6	126.5	130.8	135.3	141.5	144.6	144.1	146.6	141.9	7.9
France	255.2	254.7	258.2	266.3	266.5	271.0	275.6	276.2	273.1	270.3	273.7	15.2
Italy	169.9	172.5	174.6	175.4	175.9	184.2	186.2	188.5	187.1	185.3	181.4	10.1
Cyprus	2.2	2.3	2.4	2.4	2.4	2.7	2.5	2.5	2.6	2.7	2.9	0.2
Latvia	4.3	4.0	3.7	4.1	4.0	4.3	4.4	4.5	4.6	4.8	4.6	0.3
Lithuania	9.3	7.9	7.1	8.1	8.6	9.0	9.1	8.6	8.4	9.1	9.2	0.5
Luxembourg	3.3	3.4	3.6	3.8	4.0	4.2	4.6	4.7	4.7	4.7	4.6	0.3
Hungary	25.6	25.5	25.0	25.5	25.9	27.1	26.6	28.0	27.8	27.0	26.8	1.5
Malta	0.8	0.9	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.9	0.9	0.1
Netherlands	76.6	75.8	77.2	*79.5*	*79.7*	81.9	83.8	82.5	80.6	85.5	83.7	4.7
Austria	29.2	29.3	29.1	30.8	31.1	32.7	33.3	34.6	34.3	33.9	33.9	1.9
Poland	96.2	93.8	90.8	90.9	89.5	91.8	92.2	93.4	98.1	97.8	98.8	5.5
Portugal	23.2	24.9	25.1	25.2	26.3	25.7	26.4	27.0	25.3	26.0	24.9	1.4
Romania	41.5	36.9	37.1	36.9	38.5	40.2	39.6	39.2	40.7	40.5	40.6	2.3
Slovenia	6.4	6.4	6.4	6.7	6.8	6.9	7.1	7.3	7.3	7.3	7.7	0.4
Slovakia	17.5	17.4	17.5	19.3	19.3	19.2	19.1	19.1	18.8	18.1	18.5	1.0
Finland	33.4	32.9	32.5	33.2	35.3	37.3	37.6	34.8	37.9	37.6	36.3	2.0
Sweden	50.6	50.2	47.6	50.6	51.7	50.7	52.7	51.7	50.4	50.2	50.0	2.8
United Kingdom	230.6	229.2	231.6	232.7	226.8	231.2	232.3	232.7	229.2	220.3	218.5	12.1
Iceland	2.7	3.1	3.2	3.4	3.4	3.4	3.5	3.6	4.3	:	:	-
Norway	25.5	26.8	26.1	26.5	24.1	27.3	28.2	26.7	27.2	27.3	29.8	-
Switzerland	26.1	26.1	25.9	27.4	26.5	26.6	26.9	26.9	28.1	26.9	28.0	-
Croatia	8.1	8.0	7.8	8.0	8.3	8.8	8.9	8.9	9.0	9.4	9.1	-
Turkey	72.5	71.2	77.6	71.6	75.5	79.4	82.0	85.4	94.7	101.5	100.3	-

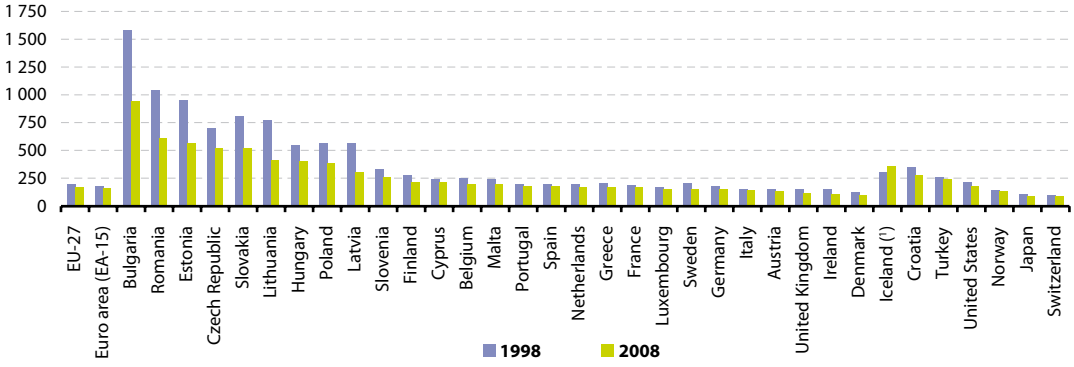
Source: Eurostat (ten00086)

Figure 12.4: Gross inland consumption, EU-27
(% of total consumption)



Source: Eurostat (nrg_102a, nrg_103a, nrg_101a, nrg_104a and nrg_1071a)

Figure 12.5: Energy intensity of the economy
(kg of oil equivalent per EUR 1 000 of GDP)



(1) 2006 instead of 2008.

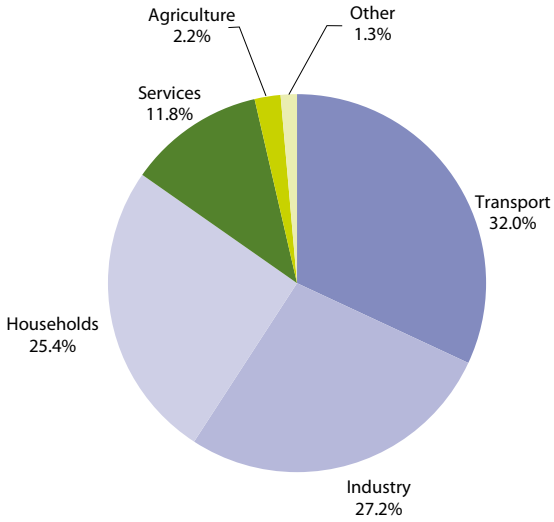
Source: Eurostat (tsien020)

Table 12.6: Final energy consumption
(million tonnes of oil equivalent)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Share in EU-27, 2008 (%)
EU-27	1 116	1 113	*1 117*	1 143	1 129	1 166	1 181	1 182	*1 186*	*1 165*	*1 169*	100.0
Euro area (EA-16)	*767*	770	*778*	800	*793*	821	832	832	*833*	*816*	*821*	70.2
Belgium	39.0	39.0	39.1	39.4	37.7	40.0	39.4	38.4	38.1	34.9	37.6	3.2
Bulgaria	9.9	8.8	8.6	8.6	8.7	9.4	9.2	9.7	10.1	9.9	9.6	0.8
Czech Republic	24.5	23.8	23.9	24.1	23.7	25.7	26.3	26.0	26.5	25.9	25.4	2.2
Denmark	15.0	15.0	14.6	15.0	14.7	15.1	15.3	15.4	15.6	15.7	15.5	1.3
Germany	223.5	218.7	218.1	223.9	219.2	226.2	225.3	222.0	226.2	216.0	224.0	19.2
Estonia	2.7	2.4	2.4	2.6	2.5	2.7	2.8	2.9	2.9	3.1	3.0	0.3
Ireland	9.3	9.9	10.7	11.1	11.2	11.5	11.8	12.5	13.1	12.2	13.2	1.1
Greece	18.2	18.2	18.6	19.2	19.5	20.5	20.3	20.8	21.4	21.9	21.2	1.8
Spain	71.9	74.5	79.6	83.4	84.8	90.4	94.4	97.5	96.1	98.8	95.4	8.2
France	151.6	151.3	151.1	157.4	153.0	157.1	158.7	158.0	157.1	154.1	156.3	13.4
Italy	120.3	124.8	124.9	126.2	125.6	131.1	134.9	136.7	135.4	133.9	128.2	11.0
Cyprus	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.8	1.9	2.0	0.2
Latvia	3.6	3.4	3.2	3.6	3.6	3.8	3.9	4.0	4.2	4.4	4.2	0.4
Lithuania	4.5	4.0	3.7	3.9	4.0	4.1	4.3	4.5	4.7	5.0	4.9	0.4
Luxembourg	3.2	3.4	3.6	3.7	3.7	4.0	4.4	4.4	4.4	4.4	4.3	0.4
Hungary	15.7	15.9	15.7	16.5	17.0	17.6	17.5	18.1	18.0	16.9	17.0	1.5
Malta	0.3	0.3	0.3	0.4	0.4	0.5	0.5	0.5	0.4	0.4	0.5	0.0
Netherlands	50.3	49.6	50.5	51.3	51.4	52.1	52.9	51.6	50.9	49.7	51.2	4.4
Austria	22.9	23.0	23.2	24.9	25.1	26.4	26.6	27.9	27.1	26.9	27.0	2.3
Poland	60.0	58.8	55.3	55.9	54.2	56.1	57.5	57.8	60.8	61.2	61.8	5.3
Portugal	16.2	16.7	17.7	18.1	18.4	18.4	18.7	18.7	18.5	18.7	18.3	1.6
Romania	26.2	22.4	22.5	23.0	23.1	24.2	25.5	24.7	24.8	24.0	24.9	2.1
Slovenia	4.3	4.3	4.4	4.6	4.5	4.7	4.8	4.9	4.9	4.9	5.2	0.4
Slovakia	10.5	10.3	10.3	10.9	11.1	10.7	10.8	10.6	10.7	10.5	10.7	0.9
Finland	24.3	24.7	24.2	24.2	25.2	25.7	26.2	25.4	26.9	26.7	25.9	2.2
Sweden	35.5	35.1	34.9	34.4	34.1	33.9	33.9	33.7	33.1	33.2	32.8	2.8
United Kingdom	150.8	153.6	154.3	155.2	150.6	152.2	153.5	153.9	152.3	149.7	148.6	12.7
Iceland	1.9	2.0	2.1	2.1	2.2	2.2	2.2	2.2	2.4	:	:	-
Norway	18.3	18.7	18.1	18.3	18.1	18.0	18.4	18.5	18.4	18.8	18.9	-
Switzerland	20.3	20.5	20.3	20.8	20.2	20.8	21.1	21.6	21.5	21.0	21.8	-
Croatia	5.2	5.4	5.3	5.5	5.6	6.0	6.1	6.3	6.4	6.5	6.6	-
Turkey	49.9	49.2	55.5	50.2	54.7	58.7	60.4	63.2	69.1	73.0	71.9	-

Source: Eurostat (ten00095)

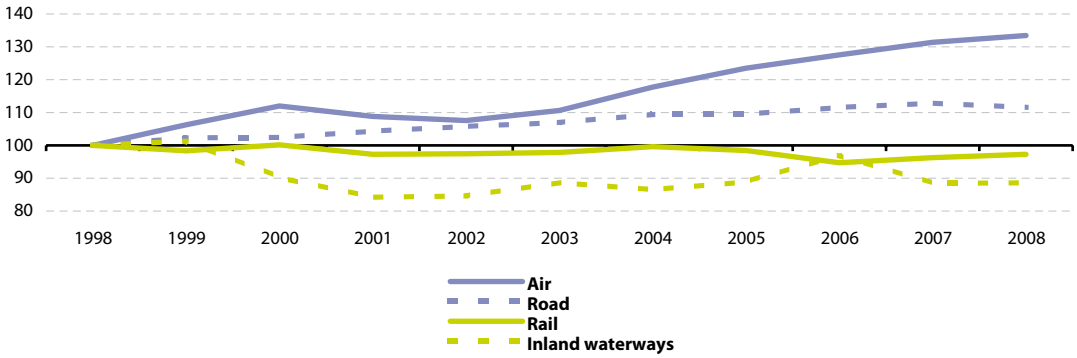
Figure 12.6: Final energy consumption, EU-27, 2008 (1)
(% of total, based on tonnes of oil equivalent)



(1) Provisional.

Source: Eurostat (tsdpc320)

Figure 12.7: Energy consumption by transport mode, EU-27 (1)
(1998=100, based on tonnes of oil equivalent)



(1) Provisional for road transport, 2006 to 2008.

Source: Eurostat (tsdtr250)

12.3 Electricity production

This subchapter describes the electricity market in the European Union (EU) with information on the breakdown of electricity generation according to a range of different fuels used within power stations. It also provides statistics on the level of market liberalisation (as measured by the share of the largest generator) within electricity markets and concludes with details concerning electricity consumption by households.

The European Commission launched its third legislative package to liberalise energy markets in September 2007. The proposals were designed to: create a competitive energy market; expand consumer choice; promote fairer prices; result in cleaner energy; and promote the security of supply. In order to reach these goals, the proposals sought to: separate production and supply from transmission networks; facilitate cross-border collaboration, investment and trade in energy; introduce more effective regulation; encourage greater market transparency; and increase solidarity between Member States.

Main statistical findings

Electricity generation

Total gross electricity generation in the EU-27 was 3.4 million gigawatt hours (GWh) in 2008 – which marked an increase of 0.2 % compared with the year before, but an increase of 15.9 % when compared with the volume of electricity generated in 1998. As such, electricity generation in the EU-27 grew, on average, by 1.5 % per annum between 1998 and 2008. Over the same ten-year period, the most rapid growth in electricity generation among the Member States was recorded in Luxembourg, at more than 10 % per annum (largely due to a significant increase in generating output in 2002 as new gas-fired capacity was introduced). Cyprus, Spain, Ireland and Greece recorded the next highest growth rates (expansions of between 3 and 5 % per annum). Lithuania, Denmark and Sweden were the only Member States to generate less electricity in 2008 than in 1998 (see Table 12.7).

Around one quarter of the total electricity generated in the EU-27 in 2008 came from nuclear power plants (27.8 %) and from natural gas-fired power stations (23.0 %); while coal-fired, lignite-fired and oil-fired power stations accounted for 16.1 %, 10.6 % and 3.1 % respectively of the total electricity generated. Among renewable energy sources, the highest share of total electricity generation in 2008 was from hydropower plants (10.6 %), followed by wind turbines and biomass-fired power stations, which generated 3.5 % and 3.2 % of the total respectively (see Figure 12.8).

The relative importance of natural gas increased at the expense of coal, lignite and oil, probably as a result of lower emissions from gas; its share of total electricity generation rose from 13.5 % in 1998 to 23.0 % by 2008. Over the same period, there was also an increase in the use of renewables, particularly wind turbines and biomass, although their contribution remained relatively small.

Market shares

Germany and France were the principal electricity generators in the EU-27 in 2008, with shares of 18.9 % and 17.1 % respectively, while the United Kingdom was the only other Member State to report a share in double-digits (11.5 %). The relative weight of Spain in EU-27 electricity generation rose quickly between 1998 and 2008, gaining 2.8 percentage points to reach 9.5 % (see Table 12.7).

One measure that is used to monitor the extent of electricity market liberalisation is the market share of the largest generator in each country (see Figure 12.9). The small island nations of Cyprus and Malta were both characterised by a complete monopoly in 2008, with 100 % of their electricity being generated by the largest (sole) generator. Two other Member States – Estonia and Greece – reported shares for the largest generator of more than 90 %. In 11 of the 23 Member States for which data are available, the largest generator provided less than 50 % of the total electricity generated, with the lowest shares (below 20 %) in the United Kingdom and Poland.

Household electricity consumption

During the ten-year period from 1998 to 2008, the consumption of electricity by households rose in the EU-27 by 17.2 % overall (see Figure 12.10). There was much faster growth in a number of Member States, in particular the southern Mediterranean countries of Cyprus, Spain and Greece, as well as Portugal, all three of the Baltic Member States, and Ireland. At the other end of the range, household electricity consumption fell in four of the Member States (Belgium, Bulgaria, Slovakia and Sweden). These figures on overall household electricity consumption are likely to be influenced, among others, by the average number of persons living in each household and by the total number of households – both of which are linked to demographic events.

Data sources and availability

Gross electricity generation at the plant level is defined as the electricity measured at the outlet of the main transformers. In other words, it includes the consumption of electricity in plant auxiliaries and in other transformers. Gross national electricity consumption comprises total gross national electricity generation from all fuels (including auto-production), plus electricity imports, minus exports. Final consumption of electricity covers the electricity delivered to the consumer's door (industry, transport, households and other sectors). It excludes deliveries for transformation and/or own use of energy producing activities, as well as network losses. The market share of electricity generators is based on their net electricity production, and as such the electricity used by generators for their own consumption is not taken into account.

Context

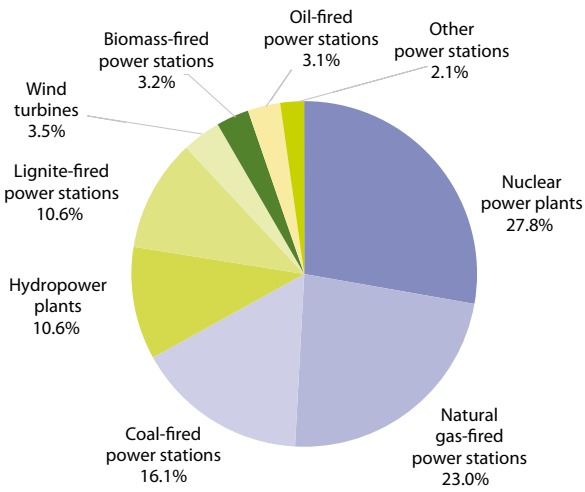
Since July 2004, small business consumers in the EU have been free to switch their gas or electricity supplier, and in July 2007 this right was extended to all consumers. Independent national regulatory authorities have been established across the Member Sates to ensure that

suppliers and network companies operate correctly. However, a number of shortcomings were identified in the opening-up of markets, and it was therefore decided to embark upon a third legislative package of measures with the aim of ensuring that all users could take advantage of the benefits provided by a truly competitive energy market. The European Commission launched its third legislative package to liberalise energy markets in September 2007. These proposals were designed to: create a competitive energy market; expand consumer choice; promote fairer prices; result in cleaner energy; and promote the security of supply. During 2009, a number of these proposals were adopted by the European Parliament and the Council. This draft of legislation will come into effect as of March 2011:

- Regulation 713/2009 of 13 July 2009 establishing an agency for the cooperation of energy regulators;
- Regulation 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity and repealing Regulation 1228/2003;
- Directive 2009/72/EC of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC.

The use of nuclear power for electricity generation has received renewed attention amid concerns about an increasing dependency on imported primary energy, rising oil and gas prices, and commitments to reduce greenhouse gas emissions. These have been balanced against long-standing concerns about safety and waste from nuclear power plants. Some Member States have recently started construction or have planned new nuclear reactors. On 25 June 2009, a European Council Directive (2009/71) was adopted concerning a framework for the nuclear safety of nuclear installations.

Figure 12.8: Electricity generation by fuel used in power stations, EU-27, 2008
(% of total, based on GWh)



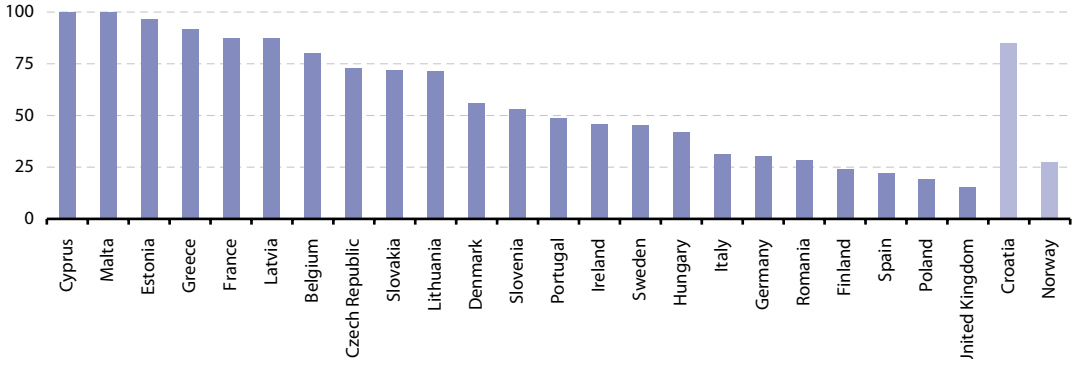
Source: Eurostat (nrg_105a)

Table 12.7: Gross electricity generation
(1 000 GWh)

	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	Share in EU-27 2008 (%)
EU-27	2 911	2 940	3 021	3 108	3 117	3 216	3 289	3 310	3 354	3 368	3 374	100.0
Euro area (EA-16)	1 976	2 018	2 091	2 142	2 159	2 234	2 299	2 308	2 350	2 359	2 379	70.5
Belgium	83.2	84.5	83.9	79.7	82.1	84.6	85.4	87.0	85.5	88.8	84.9	2.5
Bulgaria	41.7	38.2	40.9	44.0	42.7	42.6	41.6	44.4	45.8	43.3	45.0	1.3
Czech Republic	65.1	64.7	73.5	74.6	76.3	83.2	84.3	82.6	84.4	88.2	83.5	2.5
Denmark	41.1	38.9	36.1	37.7	39.3	46.2	40.4	36.2	45.6	39.2	36.4	1.1
Germany	556.7	555.5	571.6	586.3	571.6	599.5	616.8	620.3	636.6	637.1	637.2	18.9
Estonia	8.5	8.3	8.5	8.5	8.5	10.2	10.3	10.2	9.7	12.2	10.6	0.3
Ireland	21.2	22.0	24.0	25.0	25.2	25.2	25.6	26.0	27.5	28.2	29.7	0.9
Greece	46.3	49.9	53.8	53.7	54.6	58.5	59.3	60.0	60.8	63.5	63.7	1.9
Spain	195.2	209.1	225.2	238.0	246.1	262.9	280.0	294.0	299.5	305.1	313.7	9.3
France	511.0	524.0	540.7	549.8	559.2	566.9	574.3	576.2	574.6	569.8	576.0	17.1
Italy	259.8	265.6	276.6	279.0	284.4	293.9	303.3	303.7	314.1	313.9	319.1	9.5
Cyprus	3.0	3.1	3.4	3.6	3.8	4.1	4.2	4.4	4.7	4.9	5.1	0.2
Latvia	5.8	4.1	4.1	4.3	4.0	4.0	4.7	4.9	4.9	4.8	5.3	0.2
Lithuania	17.6	13.5	11.4	14.7	17.7	19.5	19.3	14.8	12.5	14.0	13.9	0.4
Luxembourg	1.3	1.0	1.2	1.2	3.7	3.6	4.1	4.1	4.3	4.0	3.6	0.1
Hungary	37.2	37.7	35.2	36.4	36.2	34.1	33.7	35.8	35.9	40.0	40.0	1.2
Malta	1.7	1.8	1.9	2.0	2.1	2.2	2.2	2.2	2.3	2.3	2.3	0.1
Netherlands	91.1	86.7	89.6	93.7	95.9	96.8	102.4	100.2	98.4	105.2	107.6	3.2
Austria	57.5	60.9	61.5	62.4	62.5	60.2	64.1	66.6	63.5	64.8	67.1	2.0
Poland	142.8	142.1	145.2	145.6	144.1	151.6	154.2	156.9	161.7	159.3	156.2	4.6
Portugal	39.0	43.3	43.8	46.5	46.1	46.9	45.1	46.6	49.0	47.3	46.0	1.4
Romania	53.5	50.7	51.9	53.9	54.9	56.6	56.5	59.4	62.7	61.7	65.0	1.9
Slovenia	13.7	13.3	13.6	14.5	14.6	13.8	15.3	15.1	15.1	15.0	16.4	0.5
Slovakia	25.5	27.7	30.7	32.1	32.4	31.2	30.6	31.5	31.4	28.1	29.0	0.9
Finland	70.2	69.4	70.0	74.5	74.9	84.2	85.8	70.6	82.3	81.2	77.4	2.3
Sweden	158.3	155.2	145.6	161.6	146.7	135.4	151.7	158.4	143.4	148.9	150.0	4.4
United Kingdom	362.7	368.2	377.1	384.8	387.2	398.2	393.9	398.3	397.3	397.0	389.4	11.5
Iceland	6.3	7.2	7.7	8.0	8.4	8.5	8.6	8.7	9.9	:	:	-
Norway	117.0	122.7	140.1	119.7	130.7	107.4	110.7	138.0	121.6	137.2	142.7	-
Switzerland	63.5	69.7	67.5	72.4	67.2	67.4	65.6	59.6	64.0	68.0	69.0	-
Croatia	10.9	12.2	10.7	12.2	12.3	12.7	13.3	12.5	12.4	12.2	12.3	-
Turkey	111.0	116.4	124.9	122.7	129.4	140.6	150.7	162.0	176.3	191.6	198.4	-

Source: Eurostat (ten00087)

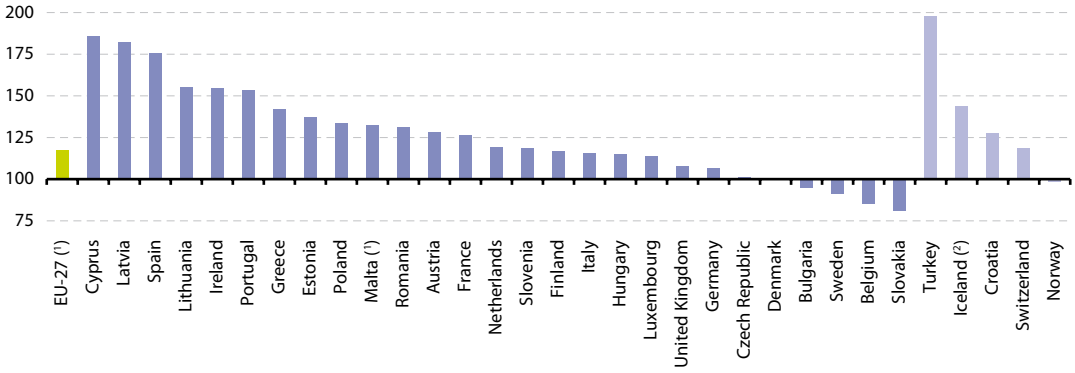
Figure 12.9: Market share of the largest generator in the electricity market, 2008 (1)
(% of total generation)



(1) Bulgaria, Luxembourg, the Netherlands and Austria, not available.

Source: Eurostat (tsier060)

Figure 12.10: Electricity consumption by households, 2008
(1998=100)



(1) Provisional.
(2) 2006.

Source: Eurostat (tsdpc310)

12.4 Renewable energy

This subchapter provides information in relation to recent statistics on renewable energy sources in the European Union (EU). Renewable energy sources include wind power, solar power (thermal, photovoltaic and concentrated), hydroelectric power, tidal power, geothermal energy and biomass.

The use of renewable energy has many potential benefits, including a reduction in greenhouse gas emissions, the diversification of energy supplies and a reduced dependency on fossil fuel markets (in particular, oil and gas). The growth of renewable energy sources may also have the potential to stimulate employment in Europe, through the creation of jobs in new 'green' technologies.

Main statistical findings

Primary production

The primary production of renewable energy within the EU in 2008 was 148.1 million tonnes of oil equivalent (toe) – a 17.6 % share of total primary energy production (see Table 12.8). The volume of renewable energy produced within the EU-27 increased overall by 57.0 % between 1998 and 2008, equivalent to an average increase of 4.6 % per year.

Among renewable energies, the most important source in the EU was biomass and waste, accounting for 69.1 % of primary renewables production in 2008. Hydropower was the other main contributor to the renewable energy mix (19.0 % of the total). Although its level of production remains relatively low, there was a particularly rapid expansion in the output of wind energy, which accounted for 6.9 % of the EU's renewable energy produced in 2008.

The largest producer of renewable energy within the EU in 2008 was Germany, with a 20.1 % share of the EU total; France (13.4 %) and Sweden (10.8 %) were the only other countries to record a double-digit share. There were considerable differences in the renewable energy mix across the Member States, which reflected to a large degree natural endowments and climatic conditions. For example, more than three quarters (75.7 %) of the renewable energy produced in Cyprus was from solar energy, while more than a third of the renewable energy in the relatively mountainous countries of Austria, Slovenia and Sweden was from hydropower (much higher shares were recorded in Norway and Switzerland). More than one third of the renewable energy production in Italy was from geothermal energy sources (where active volcanic processes still exist); this share rose to more than 80 % in Iceland.

The output of renewable energy in Germany grew at an average rate of 13.6 % per year between 1998 and 2008, as such its share of the EU-27 total rose by 11.2 percentage points from an 8.8 % share in 1998. There were also average growth rates in excess of 10 % per year recorded for Belgium, Hungary and the Czech Republic, where the fastest growth in renewable energy production was recorded, averaging 14.2 % per year between 1998 and 2008.

Consumption

Renewable energy sources accounted for 8.4 % of the EU's gross inland energy consumption in 2008 (see Table 12.9).

Almost one third (32.1 %) of the energy consumed in Sweden was derived from renewables in 2008, while Latvia, Austria and Finland reported that more than a quarter of their energy consumption was accounted for by renewables.

The EU seeks to have a 20 % share of its energy consumption from renewable sources by 2020; this target is broken down between the Member States with national action plans designed to plot a pathway for renewable energies in each country. Figure 12.11 shows the latest data available for the share of renewable energies in gross final energy consumption and the indicative targets that have been set for each country by 2020. The share of renewables in gross final energy consumption stood at 10.3 % in the EU in 2008, almost half the target that has been set for 2020.

Among the Member States, the highest share of renewables in gross final energy consumption in 2008 was recorded in Sweden (44.4 %), while Finland, Latvia and Austria each reported more than a quarter of their final energy consumption derived from renewables. Compared with the most recent data available for 2008, the indicative targets for Denmark, Ireland, Greece, France, Italy, Latvia, the Netherlands and the United Kingdom require each of these countries to increase their share of renewables in final energy consumption by at least 10 percentage points.

Electricity

Directive 2001/77/EC set indicative targets for the production of electricity from renewable energy sources: according to these, 21 % of the EU's gross electricity consumption should be sourced from renewables by 2010. The latest information available for 2008 (see Figure 12.12) shows that electricity generated from renewable energy sources contributed 16.7 % of the EU-27's gross electricity consumption. In Austria (62.0 %) and Sweden (55.5 %) more than half of all the electricity consumed was generated from renewable energy sources, largely as a result of hydropower and biomass. Across the Member States, only Germany and Hungary had already surpassed their indicative targets for 2010 by 2008; Belgium, Denmark, the Netherlands and Finland were each within a single percentage point of attaining their targets.

The growth in electricity generated from renewable energy sources during the period 1998 to 2008 largely reflects an expansion in two renewable energy sources; namely, wind turbines and biomass. Although hydropower remained the single largest source for renewable electricity generation in the EU in 2008, the amount of electricity generated was somewhat lower than a decade earlier (-2.6 %). In contrast, the volume of electricity generated from biomass increased by 244 %, while that from wind turbines rose by 953 %.

Transport

At the end of 2008, the EU agreed to set a target for each Member State, such that renewable energy sources (including biofuels, hydrogen or 'green' electricity) should account for at least 10 % of all fuel used within the transport sector by 2020. The average share of renewable energy sources across the EU was 3.5 % in 2008, ranging from a high of 7.1 % in Austria, and more than 6 % in Sweden, Slovakia and Germany, to less than 1 % in Latvia,

Denmark, Bulgaria, the Czech Republic, Estonia and Malta (see Figure 12.14).

Data sources and availability

The share of renewable energy in gross final energy consumption is identified as a key indicator for measuring progress under the Europe 2020 strategy for smart, sustainable and inclusive growth.

The share of renewables in gross final energy consumption may be considered as an estimate for the purpose of monitoring Directive 2009/28/EC on the promotion of the use of energy from renewable sources; note, the statistical system for some renewable energy technologies is not yet fully developed to meet the requirements of this Directive.

Electricity from renewable energy sources is defined as the ratio between electricity produced from renewable energy sources and gross national electricity consumption. Electricity produced from renewable energy sources comprises electricity generation from hydropower plants (excluding pumping), as well as electricity generated from biomass/wastes, wind, solar and geothermal installations.

The share of renewable energies in the fuel consumed by the transport sector is calculated on the basis of energy statistics, according to the methodology as described in Directive 2009/28/EC. Note, the contribution of all biofuels is currently included within the calculation for this indicator and that the data are not restricted to biofuels satisfying the sustainability criteria.

Context

The EU has set out plans for a new energy strategy based on a more secure, sustainable and low-carbon economy. Aside from combating climate change through a reduction in greenhouse gas emissions, the use of renewable energy sources is likely to result in more secure energy supplies, greater diversity in energy supply, less air pollution, as well as the possibility for job creation in environmental and renewable energy sectors.

The integrated energy and climate change strategy adopted in December 2008 provided a further stimulus for increasing the use of renewables to 20 % of total energy consumption by 2020, while calling for energy consumption and greenhouse gas emissions to both be cut by 20 %. Directive 2009/28/EC of the European Parliament and Council on the promotion of the use of energy from renewable sources set an overall goal across the EU-27 for a 20 % share of energy consumption to be derived from renewable sources by 2020, while renewables should also account for a 10 % share of the fuel used in the transport sector by the same date. The Directive changes the legal framework for promoting renewable electricity, requires national action plans to show how renewable energies will be developed in each Member State, creates cooperation mechanisms, and establishes sustainability criteria for biofuels (following concerns over their potential adverse effects on crop prices, food supply, forest protection, biodiversity, water and soil resources).

Table 12.8: Primary production of renewable energy

	Primary production (1 000 toe)		Share of total 2008 (%)				
	1998	2008	Solar energy	Biomass & waste	Geothermal energy	Hydropower energy	Wind energy
EU-27	94 343	148 134	1.2	69.1	3.9	19.0	6.9
Euro area (EA-16)	62 824	104 788	1.6	66.4	5.3	18.5	8.2
Belgium	678	1 806	0.5	94.4	0.2	1.9	3.1
Bulgaria	678	997	-	71.3	3.3	24.4	1.0
Czech Republic	650	2 456	0.2	91.9	-	7.1	0.9
Denmark	1 814	3 159	0.4	80.0	0.7	0.1	18.9
Germany	8 337	29 743	2.5	78.9	0.8	6.1	11.7
Estonia	512	755	-	98.3	-	0.3	1.5
Ireland	231	521	0.6	43.0	0.8	15.9	39.7
Greece	1 329	1 594	10.9	60.9	1.1	17.9	9.3
Spain	6 875	10 717	3.3	51.9	0.1	18.9	25.8
France	16 783	19 825	0.2	68.9	0.6	27.9	2.5
Italy	8 813	13 491	0.6	33.0	36.8	26.5	3.1
Cyprus	43	74	75.7	23.0	0.0	-	-
Latvia	1 756	1 782	-	84.7	-	15.0	0.3
Lithuania	612	883	-	94.8	0.1	4.0	1.2
Luxembourg	50	84	2.4	78.6	-	13.1	6.0
Hungary	483	1 656	0.2	91.8	5.8	1.1	1.1
Malta	:	:	:	:	:	:	:
Netherlands	1 691	3 135	0.8	87.2	0.1	0.3	11.7
Austria	6 030	8 292	1.4	56.7	0.5	39.4	2.1
Poland	3 883	5 457	0.0	95.0	0.2	3.4	1.3
Portugal	3 734	4 441	0.8	70.8	4.2	13.2	11.1
Romania	4 640	5 418	0.0	72.2	0.5	27.3	0.0
Slovenia	528	835	-	58.7	-	41.3	-
Slovakia	444	1 056	0.0	66.0	1.0	32.9	0.1
Finland	7 257	9 172	0.0	83.7	-	16.0	0.2
Sweden	14 206	16 051	0.1	61.9	-	37.0	1.1
United Kingdom	2 286	4 733	1.2	76.5	0.0	9.4	12.9
Iceland (1)	1 814	3 259	-	0.1	80.7	19.2	0.0
Norway	11 202	13 384	0.0	9.8	-	89.7	0.6
Switzerland	3 969	5 190	0.6	35.9	3.7	59.7	0.0
Croatia	845	864	0.5	46.9	0.3	51.9	0.3
Turkey	11 481	9 360	4.5	51.9	12.3	30.6	0.8

(1) 2006 instead of 2008.

Source: Eurostat (ten00081 and ten00082)

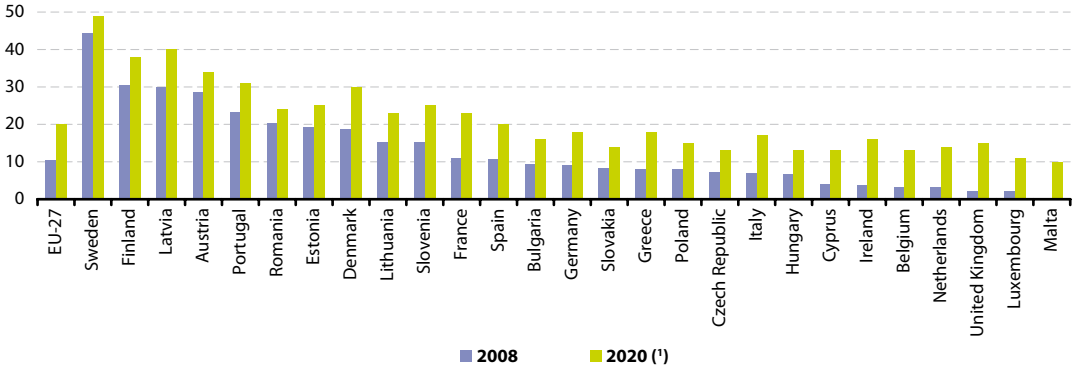
Table 12.9: Share of renewables in gross inland energy consumption, 2008
(%)

	Total	Biomass	Hydro	Geothermal	Wind	Solar
EU-27	8.39	5.85	1.56	0.32	0.56	0.10
Euro area (EA-16)	8.49	5.69	1.54	0.44	0.69	0.13
Belgium	3.73	3.55	0.06	0.01	0.09	0.02
Bulgaria	4.86	3.43	1.21	0.16	0.05	:
Czech Republic	5.02	4.57	0.39	:	0.05	0.01
Denmark	18.11	14.93	0.01	0.11	3.00	0.06
Germany	8.62	6.79	0.52	0.07	1.02	0.21
Estonia	11.04	10.80	0.03	:	0.19	:
Ireland	3.58	1.70	0.53	0.03	1.31	0.02
Greece	5.02	3.06	0.89	0.05	0.47	0.55
Spain	7.72	4.09	1.42	0.01	1.95	0.25
France	7.37	5.11	2.02	0.04	0.18	0.02
Italy	7.82	2.84	1.97	2.73	0.23	0.05
Cyprus	3.04	1.05	:	0.00	:	1.96
Latvia	30.08	24.16	5.81	:	0.11	:
Lithuania	9.27	8.76	0.38	0.01	0.12	:
Luxembourg	2.65	2.24	0.24	:	0.11	0.04
Hungary	6.10	5.60	0.07	0.36	0.07	0.01
Malta	:	:	:	:	:	:
Netherlands	4.17	3.69	0.01	0.00	0.44	0.03
Austria	25.29	14.69	9.63	0.12	0.51	0.35
Poland	5.69	5.41	0.19	0.01	0.07	0.00
Portugal	17.76	12.55	2.35	0.74	1.99	0.14
Romania	13.50	9.80	3.64	0.06	0.00	0.00
Slovenia	10.99	6.53	4.46	:	:	:
Slovakia	5.47	3.54	1.87	0.06	0.01	0.00
Finland	25.19	21.08	4.05	:	0.06	0.00
Sweden	32.10	19.86	11.88	:	0.34	0.02
United Kingdom	2.56	2.05	0.20	0.00	0.28	0.03
Iceland (1)	74.94	0.05	14.42	:	0.00	:
Norway	45.23	4.75	40.22	:	0.26	0.00
Switzerland	18.59	6.70	11.08	0.69	0.01	0.12
Croatia	8.63	3.58	4.92	0.03	0.03	0.04
Turkey	9.33	4.84	2.85	1.15	0.07	0.42

(1) 2006.

Source: Eurostat (nrg_100a, nrg_1071a and nrg_1072a)

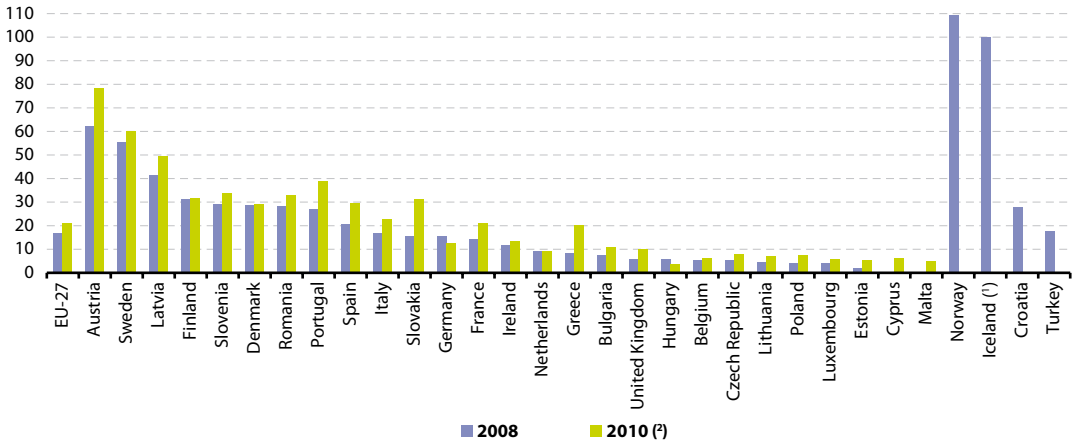
Figure 12.11: Share of renewables in gross final energy consumption
(%)



(1) Indicative targets for 2020.

Source: Eurostat (tsdcc110)

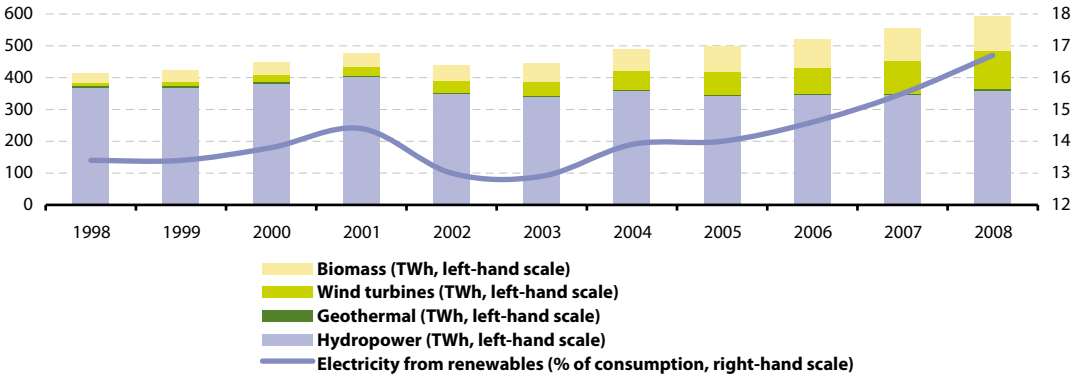
Figure 12.12: Proportion of electricity generated from renewable energy sources
(% of gross electricity consumption)



(1) 2006 instead of 2008.
(2) Indicative targets for 2010 are not available for Iceland, Norway, Croatia and Turkey.

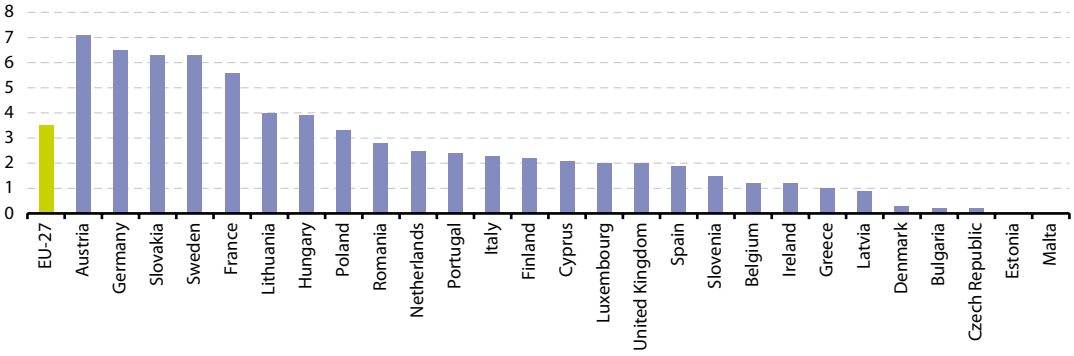
Source: Eurostat (tsien050)

Figure 12.13: Electricity generated from renewable energy sources, EU-27



Source: Eurostat (nrg_105a and tsdcc330)

Figure 12.14: Share of renewable energy in fuel consumption of transport, 2008
(%)



Source: Eurostat (tsdcc340)

12.5 Energy prices

This subchapter highlights the evolution of electricity and gas prices for both industrial and household users within the European Union (EU). The price of energy in the EU depends on a range of different supply and demand conditions, including the geopolitical situation, import diversification, distribution costs, environmental protection costs, severe weather conditions, or levels of excise and taxation; note that all of the prices presented in this subchapter include taxes and VAT for household consumers but exclude refundable taxes and VAT for industrial/business users.

Main statistical findings

Between the first half of 2009 and the first half of 2010, electricity prices for households increased in 16 of the EU Member States (see Table 12.10) while in nine of the Member States prices went down; Hungary and Malta did not report any price data. During the same period, prices of electricity for industrial/business users decreased in 13 of the Member States, rose in ten others and remained stable in Bulgaria. On average, the price of electricity for households in the EU-27 rose by 2.0 %, while it went down by 2.5 % for industrial users. There were a few notable exceptions to these trends among the EU Member States, as electricity prices fell by in excess of 10 % for household users in Ireland and in the Netherlands. For industrial users, the only countries to report double-digit price increase were Cyprus and Sweden, with increases in excess of 20 % for both of these Member States (while prices in Norway went up by more than 30 % and in Turkey by 14.5 %).

The price of electricity for households was more than three times higher in the most expensive Member State, Denmark (EUR 0.27 per kilowatt hour (kWh)), compared with the cheapest Member State, Bulgaria (EUR 0.08 per kWh). For industrial/business users, the price of electricity in Cyprus (EUR 0.15 per kWh) was slightly more than double the price in Bulgaria (EUR 0.065 per kWh). Some of the price differences between Member States may be attributed to taxes (for household users).

During the period from the first half of 2009 to the first half of 2010, natural gas prices for household consumers went down in 19 of the EU Member States, while they rose in three (Denmark, Poland and Sweden). For industrial/business users of natural gas, prices decreased in 17 of the Member States, but rose in five (Estonia and Lithuania joining the three Member States that also reported rising natural gas prices for household consumers). On average, the EU-27 price of natural gas for households fell by 10.4 % during the period considered, and by 15.5 % for industrial users. There was a significant price increase for industrial users of natural gas in Sweden (up 11.9 %), contrary to the general trend observed, while Swedish natural gas prices for households rose by 15.9 % between the first half of 2009 and the first half of 2010.

Indeed, the highest prices for household consumers of natural gas were registered in Sweden (EUR 28.71 per gigajoule (GJ) and in Denmark (EUR 29.70 per GJ), at nearly four times the lowest price which was recorded in Romania (EUR 7.64 per GJ). Among industrial users, the highest prices for natural gas were recorded in Denmark (EUR 15.81 per GJ), while the lowest prices were registered in the United Kingdom (EUR 5.94 per GJ). Due to the limited penetration of the natural gas markets in Greece, Cyprus, Malta and Finland (household sector only) gas prices for these countries are not presented.

Data sources and availability

Due to a change in methodology from 2007 onwards, there is a break in series and hence a relatively short time series available. Nevertheless, even in this relatively short timeframe, electricity and gas prices have fluctuated considerably - in particular, gas prices.

The transparency of energy prices is guaranteed within the EU through the obligation for EU Member States to send Eurostat information relating to prices for different categories of industrial and business users (prices for the household sector are provided on a voluntary basis), as well as data relating to market shares, conditions of sale, and pricing systems.

Electricity and gas tariffs or price schemes vary from one supplier to another. They may result from negotiated contracts, especially for large industrial users. For smaller consumers, they are generally set according to the amount of electricity or gas consumed along with a number of other characteristics; most tariffs also include some form of fixed charge. There is, therefore, no single price for electricity or gas. In order to compare prices over time and between countries, this subchapter shows information for consumption bands from the household sector and for industrial/business users. There are in total five different types of households for which electricity prices are collected following different annual consumption bands, while for natural gas statistics information is collated for three different types of household. Across industrial/business users, electricity prices are collected for a total of seven different types of users, while for natural gas prices there are six different types of users distinguished.

Statistics on electricity and natural gas prices charged to industrial/business users are collected under the legal basis of a European Commission Decision (2007/394/EC) of 7 June 2007 amending Council Directive (90/377/EEC) with regard to the methodology to be applied for the collection of gas and electricity prices. Directive 2008/92/EC of the European Parliament and Council of 22 October 2008 concerns procedures to improve the transparency of gas and electricity prices charged to industrial end-users. As noted above, gas and electricity prices for households are collected on a voluntary basis.

The prices presented cover average prices over a period of six months (semester) from January to June (semester 1 or S1) and from July to December (semester 2 or S2) of each year. Prices include the

basic price of the electricity/gas, transmission and distribution charges, meter rental, and other services. Electricity prices for household consumers are presented in this subchapter including taxes and value added tax (VAT) as this generally reflects the end price paid by consumers in the domestic sector. As industrial/business users are usually able to recover VAT and some other taxes, prices for these enterprises are shown without VAT in this subchapter. The unit for electricity prices in this subchapter is that of euro per kilowatt hour (EUR per kWh); a similar set of criteria are used for gas prices, except the unit changes to euro per gigajoule (EUR per GJ).

Context

The price and reliability of energy supplies, electricity in particular, are key elements in a country's energy supply strategy. Electricity prices are of particular importance for international competitiveness, as electricity usually represents a significant proportion of total energy costs for industrial and service-providing businesses. In contrast to the price of 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 electricity or gas. The price of electricity and gas is, to some degree, influenced by the price of primary fuels and, more recently, by the cost of carbon dioxide (CO_2) emission certificates.

These issues were touched upon in a Communication from the European Commission titled, 'Facing the challenge of higher oil prices' (COM(2008) 384), which called on the EU to become more efficient in its use of energy, and less dependent on fossil fuels - in particular, by following the approach laid out in the climate change and renewable energy package.

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. Deadlines were set for opening markets and allowing customers to choose their supplier: as of 1 July 2004 for business customers and as of 1 July 2007 for all consumers (including households). Certain countries anticipated the liberalisation process, while others were much slower in adopting the necessary measures. Indeed, significant barriers to entry remain in many electricity and natural gas markets as seen through the number of markets that are still dominated by (near) monopoly suppliers. In July 2009, the European Parliament and Council adopted a third package of legislative proposals aimed at ensuring a real and effective choice of suppliers, as well as benefits for customers. It is thought that increased transparency for gas and electricity prices should help promote fair competition, by encouraging consumers to choose between different energy sources (oil, coal, natural gas and renewable energy sources) and different suppliers. Energy price transparency can be made more effective by publishing and broadcasting as widely as possible prices and pricing systems.

Table 12.10: Half-yearly electricity and gas prices
(EUR)

	Electricity prices (per kWh)						Gas prices (per GJ)					
	Households (1)			Industry (2)			Households (3)			Industry (4)		
	2008s1	2009s1	2010s1	2008s1	2009s1	2010s1	2008s1	2009s1	2010s1	2008s1	2009s1	2010s1
EU-27	0.16	0.16	0.17	0.10	0.11	0.10	15.09	16.23	14.54	9.42	9.99	8.44
Euro area (EA-16)	0.16	0.17	0.18	0.10	0.11	0.11	17.05	18.41	15.98	9.93	10.55	8.90
Belgium	0.20	0.19	0.20	0.11	0.11	0.11	16.26	16.82	14.70	9.15	9.04	7.93
Bulgaria	0.07	0.08	0.08	0.06	0.06	0.06	9.85	13.14	10.21	5.72	8.74	6.66
Czech Republic	0.13	0.13	0.13	0.11	0.11	0.10	12.20	13.75	13.04	8.87	9.29	8.56
Denmark	0.26	0.27	0.27	0.09	0.09	0.09	:	25.55	29.70	:	15.43	15.81
Germany	0.21	0.23	0.24	0.11	0.11	0.11	17.81	18.00	15.70	12.40	11.98	10.10
Estonia	0.08	0.09	0.10	0.06	0.06	0.07	9.30	10.96	10.07	6.97	7.50	8.00
Ireland	0.18	0.20	0.18	0.13	0.12	0.11	15.09	17.89	13.79	11.05	9.30	7.83
Greece	0.10	0.12	0.12	0.09	0.09	0.09	:	:	:	:	:	:
Spain	0.14	0.16	0.17	0.10	0.12	0.12	15.98	16.98	14.83	7.64	8.70	7.70
France	0.12	0.12	0.13	0.07	0.07	0.07	14.46	15.29	14.46	9.23	10.01	9.19
Italy	0.20	0.21	0.20	0.14	0.15	0.14	17.47	21.04	17.15	9.34	11.08	8.24
Cyprus	0.18	0.16	0.19	0.14	0.12	0.15	:	:	:	:	:	:
Latvia	0.08	0.11	0.10	0.07	0.09	0.09	8.70	14.54	8.73	7.92	10.87	7.17
Lithuania	0.09	0.10	0.12	0.08	0.09	0.10	9.15	11.80	10.43	8.79	8.73	8.91
Luxembourg	0.16	0.19	0.17	0.10	0.12	0.10	15.48	13.68	12.07	10.49	11.21	10.26
Hungary	0.15	0.15	:	0.11	0.12	:	11.24	13.38	:	9.69	10.31	:
Malta	0.10	0.17	:	0.12	0.15	:	:	:	:	:	:	:
Netherlands	0.17	0.19	0.17	0.10	0.11	0.10	19.37	23.13	19.46	9.61	10.64	8.96
Austria	0.18	0.19	0.20	0.11	:	:	16.27	18.03	17.29	:	:	:
Poland	0.13	0.11	0.13	0.09	0.09	0.10	11.56	10.80	11.81	8.36	7.73	8.40
Portugal	0.15	0.15	0.16	0.09	0.09	0.09	17.37	16.78	16.49	8.69	9.81	7.62
Romania	0.11	0.10	0.10	0.09	0.08	0.09	9.21	8.11	7.64	7.79	6.52	6.19
Slovenia	0.11	0.13	0.14	0.09	0.10	0.10	15.51	18.28	16.00	10.12	12.13	10.53
Slovakia	0.14	0.15	0.15	0.12	0.14	0.12	11.42	12.83	12.11	8.92	11.30	9.11
Finland	0.12	0.13	0.13	0.06	0.07	0.07	:	:	:	7.90	8.50	8.40
Sweden	0.17	0.16	0.18	0.07	0.07	0.08	26.53	24.77	28.71	14.37	10.96	12.26
United Kingdom	0.15	0.15	0.14	0.10	0.11	0.10	10.99	11.84	11.26	7.73	8.35	5.94
Norway	0.16	0.16	0.20	0.08	0.08	0.10	:	:	:	:	:	:
Croatia	0.10	0.12	0.12	0.08	0.09	0.09	7.59	8.86	10.63	6.37	7.32	9.45
Turkey	0.10	0.11	0.13	0.07	0.08	0.09	9.04	10.84	8.98	7.04	7.99	6.66

(1) Annual consumption: 2 500 kWh < consumption < 5 000 kWh.
(2) Annual consumption: 500 MWh < consumption < 2 000 MWh.
(3) Annual consumption: 20 GJ < consumption < 200 GJ.
(4) Annual consumption: 10 000 GJ < consumption < 100 000 GJ.

Source: Eurostat (nrg_pc_204, nrg_pc_205, nrg_pc_202 and nrg_pc_203)