This article describes the electricity market in the European Union (EU) with an analysis of electricity production/generation (the two terms are used synonymously) according to a range of different energy sources. It also provides information concerning electricity consumption by households and concludes with statistics on the level of market liberalisation (as measured by the share of the largest generator) within electricity markets.

**Electricity generation**

Total net electricity generation in the EU-28 was 3.10 million gigawatt hours (GWh) in 2017 — which was similar to the year before, following an increasing trend (see Figure 1). The level of net electricity generation in the EU-28 in 2017 was 3.6 % lower than its relative peak of 2008, when total output stood at 3.22 million GWh.
Germany had the highest level of net electricity generation in 2017 among the EU Member States, accounting for 19.7% of the EU-28 total, just ahead of France (17.1%); the United Kingdom (10.3%) was the only other Member State with a double-digit share.

During the period covering 2007 to 2017, there was an overall reduction of 2.2% in the level of EU-28 net electricity generation (see Figure 2). This pattern was repeated in 15 of the 28 EU Member States. The largest overall contractions were registered in Lithuania (-69.0%), Luxembourg (-44.3%) and Malta (-26.4%), while there were also double-digit reductions in Denmark, Hungary, Finland, the United Kingdom and Greece. By contrast, among the 13 EU Member States where there was a higher level of electricity generation in 2017 (compared with 2007), double-digit increases were recorded in Latvia, Portugal, the Netherlands, Ireland, Sweden and Austria.

It should be noted that changes in electricity generation do not directly reflect changes in electricity consumption as they are also affected by changes in the different energy products used for energy production and by changes in electricity imports and exports. For example, decommissioning Lithuania’s only nuclear power plant contributed to the big decrease in electricity generation in Lithuania and the big increase in Latvia which started to generate more electricity domestically to compensate for the amount of electricity previously imported from Lithuania. Electricity production decreased due to the closure of an electricity plant in Malta and as a consequence imports from Italy increased. Luxembourg also increased its electricity imports.

Between 2016 and 2017, the largest annual increases in electricity generation were recorded for Malta (97.5%), Latvia (18.5%), Estonia (7.8%) and Sweden (5.2%). At the other end of the range, there were 8 EU Member States which reported a fall in their level of electricity generation in 2017, with the largest reductions in Croatia (-6.2%), Portugal (-2.0%), Finland (-1.8%) and Romania (-1.5%).
Almost half (49.0 %) of the net electricity generated in the EU-28 in 2017 came from combustible fuels (such as natural gas, coal and oil), while a quarter (25.0 %) came from nuclear power stations. Among the renewable energy sources shown in Figure 3, the highest share of net electricity generation in 2017 was from wind turbines (11.4 %), followed by hydropower plants (10.4 %) and solar power (3.8 %).
The relative importance of renewable energy sources in relation to EU-28 net electricity generation grew between 2007 and 2017 from 14.2% to 25.8%, while there was a relatively large decrease in the importance of combustible fuels from 58.1% to 49.0% and also a reduction in the share of electricity generated from nuclear power plants from 27.6% to 25.0%. Among the renewable energy sources, the proportion of net electricity generated from solar and wind increased greatly: from 0.1% in 2007 to 3.8% in 2017 for solar power and from 3.2% in 2007 to 11.4% in 2017 for wind turbines.

**Household electricity consumption**

During the 10-year period from 2007 to 2017, the consumption of electricity by households rose in the EU-28 by 0.1% (see Figure 4). These figures on overall household electricity consumption are likely to be influenced, in part, 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. Other influences include the extent of ownership and use of electrical household appliances and consumer goods as well as the use of energy saving devices.
Electricity consumption by households rose at a much faster rate than the EU-28 average between 2007 and 2017 in Romania (where the overall growth was 21.3%), while an increase of 18.8% was recorded for Bulgaria and a rise of 16.6% in Malta. At the other end of the range, household electricity consumption fell in 9 of the EU Member States, generally by less than 20%. Among these nine Member States with decreases in electricity consumption, the largest reductions were recorded in Belgium (17.2%), the United Kingdom (14.4%) and Portugal (9.2%).

**Market shares**

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 5). The small island nation of Cyprus was characterised by a complete monopoly in both 2007 and 2017, with 100% of their electricity being generated by the largest (sole) generator. Four other EU Member States — Croatia, Estonia, France and Slovakia — reported shares of at least 70%. In half of the 26 Member States for which data are available (no data for Bulgaria or the Netherlands), the largest electricity generator provided less than 50% of the market, with the lowest share (14.2%) being recorded in Lithuania.
Figure 5: Market share of the largest generator in the electricity market, 2007 and 2017 (\% of total generation)Source: Eurostat (nrg_ind_331a)

An analysis of developments between 2007 and 2017 reveals that among the 24 EU Member States for which data are available (no data for Bulgaria or the Netherlands; incomplete data for Luxembourg, Austria and the United Kingdom), the majority (18) saw a reduction in the market share of their leading electricity generator. The most rapid developments were in Lithuania, Malta, Latvia, Slovenia and Greece where the largest generator lost at least 30 \% of its own market share. There was one Member State where there was no change in the market share of the largest generator (Cyprus), while the five Member States where the share of the largest generator within the electricity generation market increased were the United Kingdom (2007-2013), Hungary, Germany, Croatia and Poland. Among three of these five Member States, the share of the largest generator was fairly stable during 2007-2017 (in Germany it was around 30 \%, in Croatia it was around 85 \% and in Poland it was around 17 \%), whereas in Hungary it rose from 40.9 \% to 51.3 \%. In the United Kingdom there was volatility due to mergers and demergers as reflected in the values of 15.3 \% in 2008, 51.7 \% in 2012 and 29.3 \% in 2013.

Source data for tables and graphs
- Electricity production, consumption and market overview: tables and figures

Data sources

Electricity is produced as a primary or secondary product in power plants. The total amount of electricity produced is referred to as gross electricity production. However, power plants consume some electricity for their own use (in plant auxiliaries and in other transformers) and net electricity production is obtained by deducting this amount from gross production. Net production is distributed through national transmission and distribution grids to final consumers, transformed to heat in boilers or heat pumps, stored using pumped storage, or traded (exported or imported).

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 EU Member States 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. During 2009, a number of these proposals were adopted by the European Parliament and the Council:

- Regulation (EC) No 713/2009 of 13 July 2009 establishing an agency for the cooperation of energy regulators;
- Regulation (EC) No 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; since March 2011, this Directive and others linked to the third legislative package have been transposed into national law.

On 17 November 2010, the European Commission presented its Energy infrastructure priorities for 2020 and beyond — a blueprint for an integrated European energy network (COM(2010) 677 final), detailing priority corridors for the transport of electricity, gas and oil. This was given a legal basis in April 2013 through the European Parliament and Council’s Regulation (EU) No 347/2013 on guidelines for trans-European energy infrastructure. Based on this, in October 2013, the European Commission adopted a list of 248 key energy infrastructure projects referred to as projects of common interest (PCI). It is intended that these will benefit from faster and more efficient planning procedures and improved regulatory treatment, as well as possibly accessing financial support from the Connecting Europe Facility (CEF). The list is composed of projects that are deemed to have significant benefits for at least two EU Member States, contribute to market integration and further competition, enhance the security of supply, and reduce carbon dioxide emissions.

Improving infrastructure also features in the Energy Security Strategy (COM(2014) 330 final). This lists completing the internal energy market and building missing infrastructure links as one of five priority areas for action. For more information see the introductory article on energy statistics.

The use of nuclear power for electricity generation 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 issues may be balanced against concerns over safety and waste from nuclear power plants, the safety issues being highlighted following the Fukushima Daiichi nuclear disaster that resulted from the Great East Japan (or Tohoku) earthquake and subsequent tsunami in March 2011. While some EU Member States have continued with existing reactors or plans to construct new nuclear reactors others decided to review, and in some cases, changed policies for existing plants, as well as cancelling planned nuclear constructions. Following the accident in Fukushima, the legal and regulatory framework for the safety of nuclear installations established by Council Directive 2009/71 was reviewed. In July 2014, an amendment (Council Directive 2014/87) was adopted. Among its many objectives the amendment: strengthens the role and independence of national regulatory authorities; sets up an EU system of peer reviews for nuclear installations; aims to increase transparency on nuclear safety matters; lays down regular safety assessments of installations; and establishes new provisions for on-site emergency preparedness and response.

Electricity production, consumption and market overview 7
Other articles

- All articles on energy

Tables

- Energy (t_nrg), see:
  
  Energy statistics - main indicators (t_nrg_indic)
  Energy statistics - quantities (t_nrg_quant)
  Energy statistics - prices (t_nrg_price)

Database

- Energy (nrg), see:
  
  Energy statistics - quantities, annual data (nrg_quanta)
  Energy statistics - market structure indicators - natural gas and electricity (nrg_market)

Dedicated section

- Energy

Publications

- Shedding light on energy in the EU — A guided tour of energy statistics (digital publication) — 2016 edition
- Energy, transport and environment indicators — 2018 edition

Methodology

- Supply, transformation and consumption — commodity balances (ESMS metadata file — nrg_cb_esms)

Legislation

- Directive 2009/72 of 13 July 2009 concerning common rules for the internal market in electricity
- Regulation (EC) No 714/2009 of 13 July 2009 on conditions for access to the network for cross-border exchanges in electricity
External links

- Eurelectric — Electricity for Europe — Statistics — 2015 edition
- European Commission — Directorate-General for Energy — Electricity Regulatory Forum
- International Energy Agency (IEA) — Electricity

View this article online at http://ec.europa.eu/eurostat/statistics-explained/index.php/Electricity_production,_consumption_and_market_overview