Electricity production, consumption and market overview

Statistics Explained

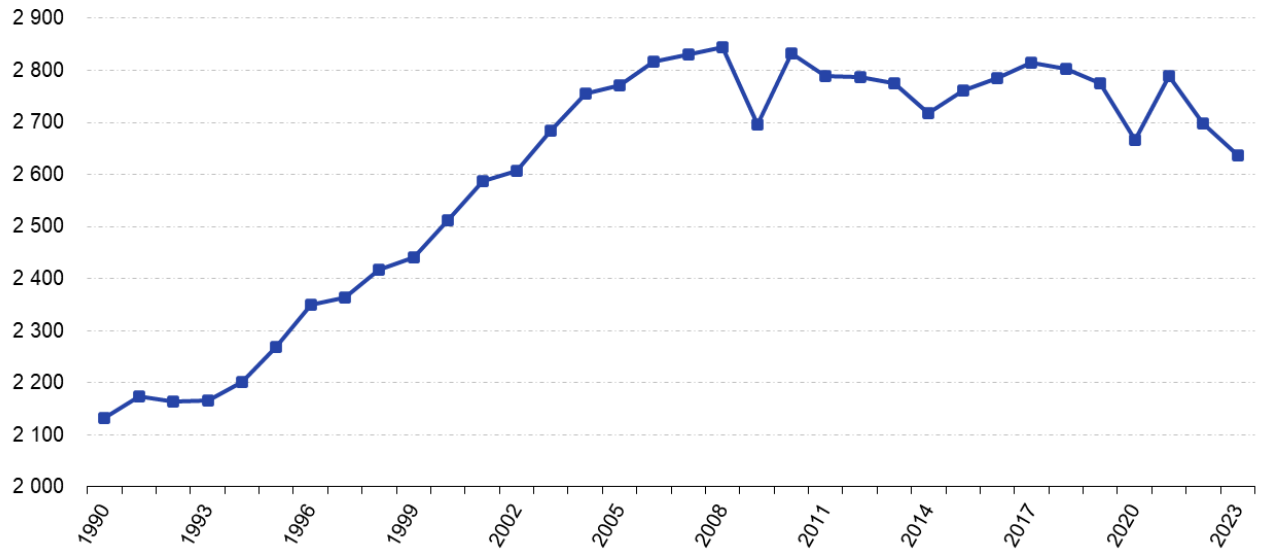
Data extracted in November 2025.
Planned article update: December 2026.

Highlights

Total net electricity generation in the EU was 2 637 TWh in 2023, 2.3% below the 2022 value.

Wind, hydro and solar were used to produce 40.8% of the total net electricity generated in the EU in 2023.

Net electricity generation, EU, 1990-2023
(TWh)



Source: Eurostat (online data code: nrg_ind_peh)

eurostat

Source: Eurostat (nrg_ind_peh)

This article describes the electricity market in the European Union (EU) with an analysis of electricity production/generation (the 2 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 was 2 637 Terawatt hours (TWh) in 2023 — a reduction of 2.3% compared with the year before (see Figure 1). The level of net electricity generation in the EU in 2023 was 7.3% lower than its relative peak in 2008, when total output stood at 2 844 TWh.

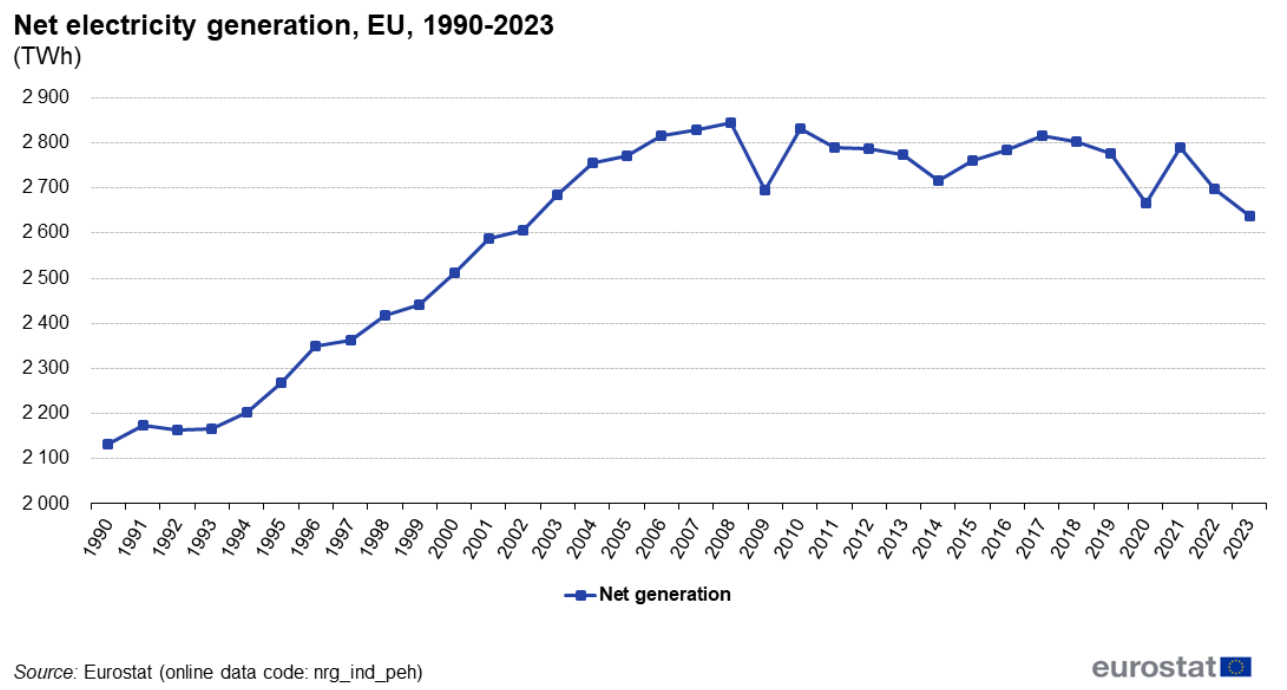


Figure 1: Net electricity generation, EU, 1990-2023 Source: Eurostat (nrg_ind_peh)

France had the highest level of net electricity generation in 2023 among the EU countries, accounting for 19.1% of the EU total, ahead of Germany (18.5%) and Spain (10.5%), that were the only other EU countries with a double-digit share.

During the period covering 2013 to 2023, there was a decrease of 4.9% in the level of EU net electricity generation (see Figure 2). The largest overall increases were registered in Lithuania (28.2%), Croatia (24.5%) and Cyprus (23.5%). Among the EU countries where there was a lower level of electricity generation in 2023 (compared with 2013), a the biggest reduction was recorded in Estonia (-58.5%), Germany (-18.7%) and Luxembourg (-12.4%).

It should be noted that changes in electricity generation do not directly reflect changes in electricity consumption as consumption is also affected by electricity imports and exports.

Between 2022 and 2023, the largest annual increases in electricity generation were recorded for Latvia (27.8%). At the other
end of the scale, the largest reductions were observed in Estonia (-34.8%), Bulgaria (-19.7%), and Belgium (-12.6%).

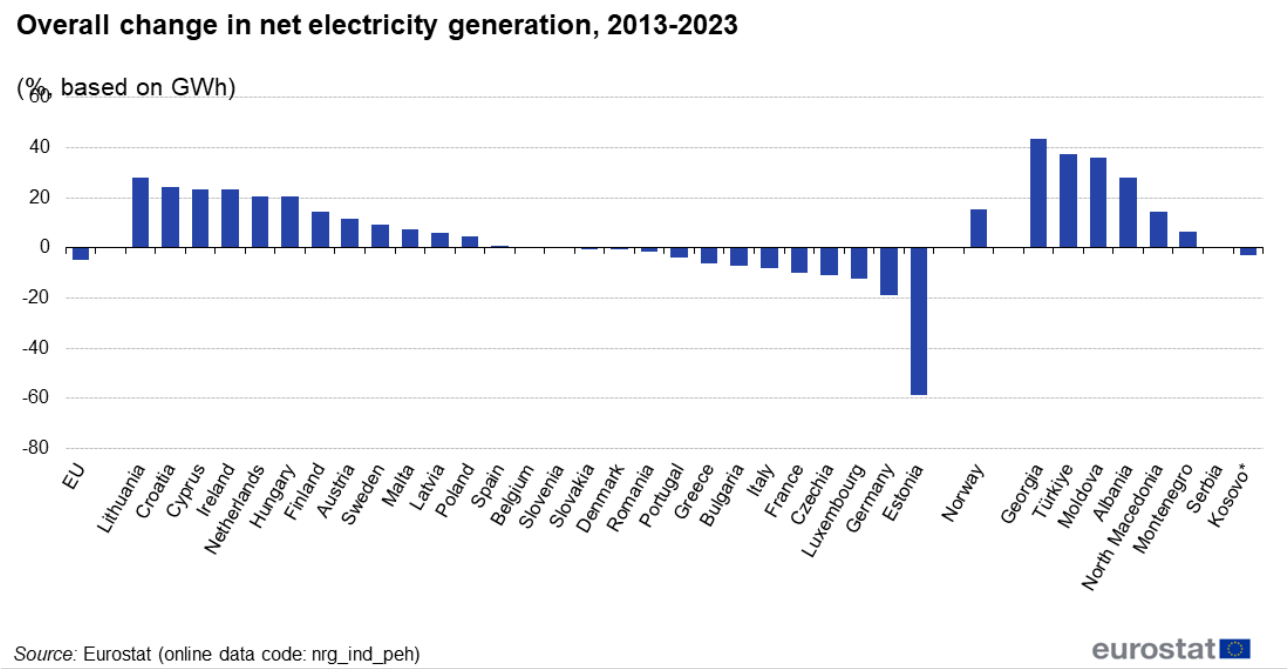


Figure 2: Overall change in net electricity generation, 2013-2023 Source: Eurostat (nrg_ind_peh)

More than half (63.6%) of the net electricity generated in the EU in 2023 came from non-combustible primary sources, with combustible fuels such as natural gas, coal and oil accounting for the rest. Less than a quarter (22.3%) came from nuclear power stations. Among the renewable energy sources shown in Figure 3, the highest share of net electricity generation in 2023 was from wind turbines (17.9%), followed by hydropower plants (13.5%) and solar power (9.5%).

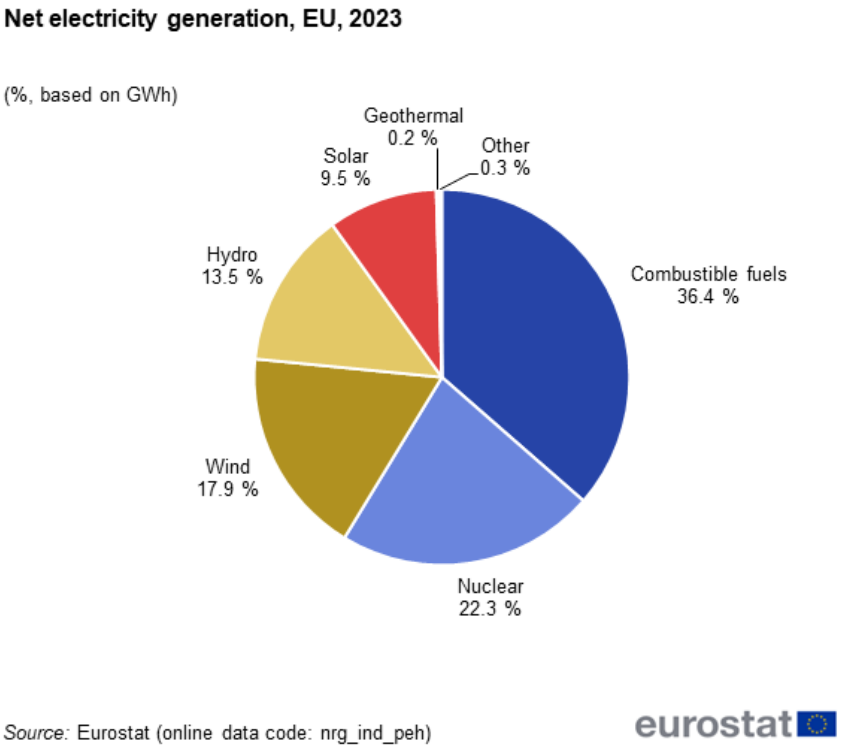


Figure 3: Net electricity generation, EU, 2023 Source: Eurostat (nrg_ind_peh)

The relative significance of renewable energy sources in relation to EU net electricity generation increased between

2013 and 2023 from 24.7% to 41.1%, while there was a relatively large decrease in the significance of combustible fuels from 47.5% to 36.4% and also a reduction in the share of electricity generated from nuclear power plants from 27.6% to 22.3%. Among the renewable energy sources, the proportion of net electricity generated from solar and wind increased greatly: from 3.0% in 2013 to 9.5% in 2023 for solar power and from 7.5% in 2013 to 17.9% in 2023 for wind turbines.

Household electricity consumption

During the 10-year period from 2013 to 2023, the consumption of electricity by households decreased in the EU by 3.3% (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.

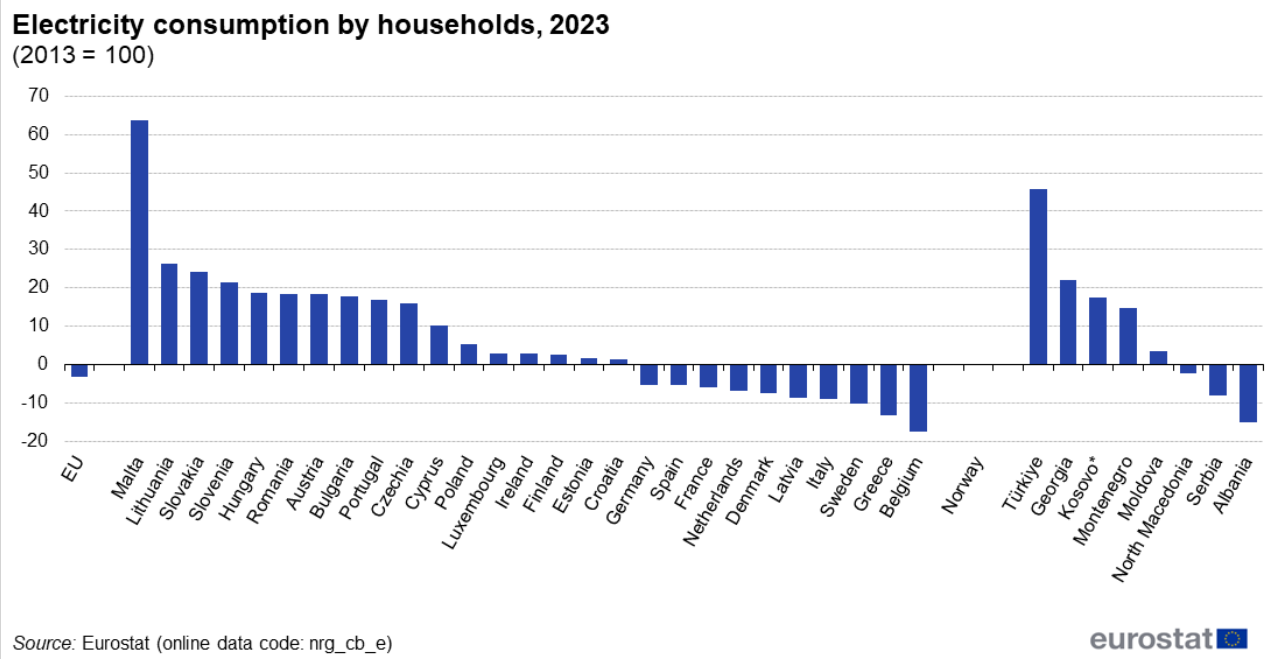


Figure 4: Electricity consumption by households, 2023 Source: Eurostat (nrg_cb_e)

Electricity consumption by households rose at a much faster rate than the EU average between 2013 and 2023 in Malta (where the overall increase was 63.6%), while an increase of 26.3% was recorded in Lithuania and 24.2% in Slovakia. At the other end of the scale, household electricity consumption fell in 3 of the EU countries by a double digit percentage (Belgium -17.4%, Greece -13.3% and Sweden -10.3%).

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). Four EU countries — Cyprus, Croatia, France and Slovakia — reported shares higher than 70%. The lowest shares were reported for Lithuania (9.2%) and Poland (13.0%).

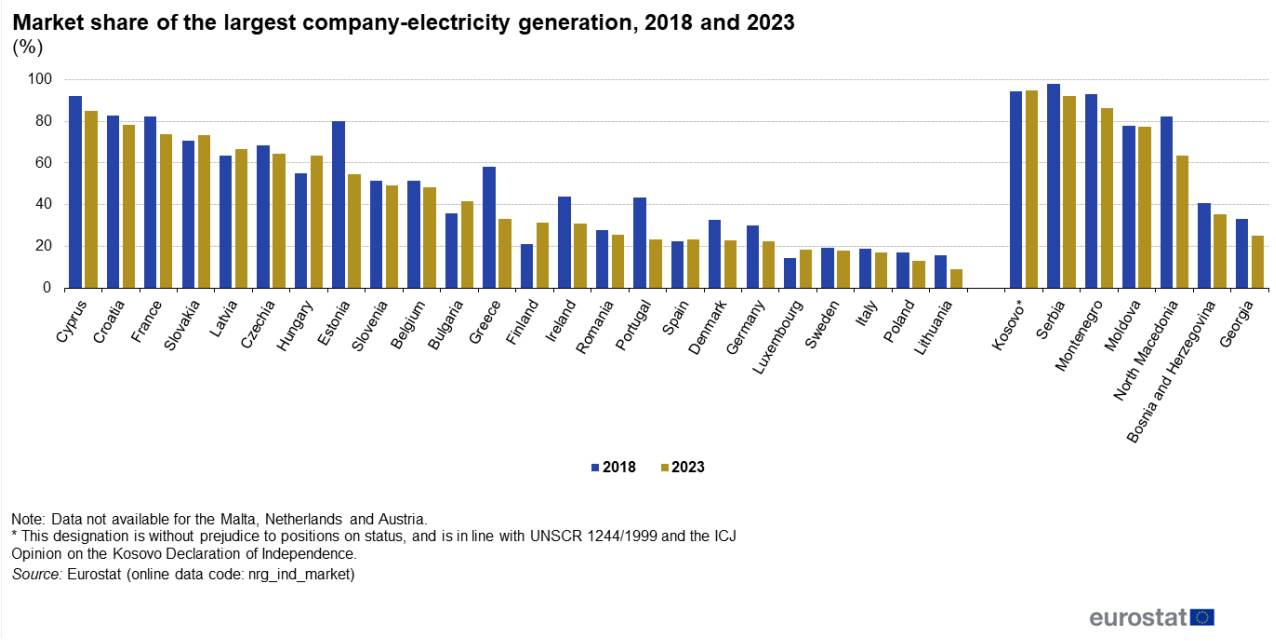


Figure 5: Market share of the largest generator in the electricity market, 2018 and 2023 Source: Eurostat (nrg_ind_market)

An analysis of developments between 2018 and 2023 reveals that among the 24 EU countries for which data are available (no data for Austria, Malta and the Netherlands), 7 EU countries saw an increase in the market share of their leading electricity generator. The most rapid developments were in Portugal where the largest generator lost 46.3% of its own market share between 2018 and 2023. The 2 countries where the share of the largest generator within the electricity generation market increased the most were Finland (51.1%) and Luxembourg (27.4%).

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

In December 2019, the EU Green Deal *The European Green Deal* (COM(2019) 640 final) was adopted. Through the EU Green Deal, the European Commission provides an action plan to boost the efficient use of resources by moving to a clean, circular economy, restoring biodiversity and reducing pollution. The EU aims to be climate

neutral in 2050. The framework for achieving climate neutrality is provided by the EU Green Deal *European Climate Law* (COM(2020) 80 final). Reaching this target will require action by all sectors of our economy, including investing in environmentally-friendly technologies, supporting industry to innovate, rolling out cleaner, cheaper and healthier forms of private and public transport, decarbonising the energy sector, ensuring buildings are more energy efficient and working with international partners to improve global environmental standards.

The Fit for 55 legislative proposals cover a wide range of policy areas including climate, energy, transport and taxation, setting out the ways in which the Commission will reach its updated 2030 target in real terms.

The electricity market was liberalised for small business consumers in July 2004 and for all consumers in July 2007. However, initially the opening-up of markets faced a number of shortcomings and several legal packages followed. The most relevant recent ones are:

On 1 January 2020, the Regulation (EU) No 2019/943 of 5 June 2019 on the internal market for electricity entered into force. An important part of the new electricity market design, agreed under the Clean energy for all Europeans package , the regulation establishes the fundamental principles for an efficient electricity market. In the framework of Clean energy for all Europeans package, the Directive (EU) 2019/944 of 5 June 2019 on common rules for the internal market for electricity and amending Directive 2012/27/EU was adopted. The Directive (EU) 2019/944, among others focuses on: "The internal market for electricity, which has been progressively implemented throughout the Union since 1999, aims, by organising competitive electricity markets across country borders, to deliver real choice for all Union final customers, be they citizens or businesses, new business opportunities, competitive prices, efficient investment signals and higher standards of service, and to contribute to security of supply and sustainability." A key part of the Clean energy for all Europeans package is to make the EU electricity market fit for the clean energy transition based on Regulation (EU) 2019/942 of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators .

Explore further

Other articles

- All articles on energy

Database

- Energy - detailed datasets (nrg) , see:

Energy statistics - quantities, annual data (nrg_quanta)

Energy statistics - market structure indicators - natural gas and electricity (nrg_market)

Thematic section

- Energy

Publications

- Shedding light on energy in the EU — A guided tour of energy statistics (digital publication) — 2016 edition
- Energy balance sheets — 2017 data — 2019 edition
- Energy, transport and environment statistics — 2019 edition

Selected datasets

- Energy - selected datasets (t_nrg) , see:

Energy statistics - main indicators (t_nrg_indic)

Energy statistics - quantities (t_nrg_quant)

Energy statistics - prices (t_nrg_price)

Methodology

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

External links

- Eurelectric
- International Energy Agency (IEA) — Electricity

Legislation

- Directive 2019/944 of 5 June 2019 on common rules for the internal market for electricity
- Summaries of EU legislation: Internal market in electricity

- Regulation (EC) 2019/942 of 5 June 2019 establishing a European Union Agency for the Cooperation of Energy Regulators
- Summaries of EU legislation: Agency for the cooperation of national energy regulators
- Regulation (EC) No 2019/943 of 5 June 2019 on the internal market for electricity
- Summaries of EU legislation: Cross-border exchanges in electricity