Final energy consumption in industry - detailed statistics

Statistics Explained

Data extracted in May 2024
Planned article update: May 2025

" The industry sector, as one of the highest energy consumers in the EU, accounted for 25.1 % of final energy consumption in 2022. "

" Within the industrial sector, the highest energy consumers in the EU in 2022 were the chemical and petrochemical industry, the non-metallic minerals industry and the paper, pulp and printing industry. "

" Electricity (33.3 %) and natural gas (31.2 %) accounted for nearly two-thirds of final energy consumption in the EU's industry sector in 2022. "

Energy use is essential in the industry sector primarily for industrial processes, but also for non-process-related purposes, such as space heating, cooling or lighting. In the European Union (EU) in 2022, the industry sector accounted for 25.1 % of the final energy consumption , which made it the third highest consumer, after transport (31.0 %) and households (26.9 %). This article presents data on final energy consumption in industry in the EU, broken down by industrial activities and specific energy products, for the year 2022.[1]The term energy product refers to primary and secondary fuels or fuel groups such as natural gas, electricity, renewables, etc.[2]

Energy products used in the industry sector

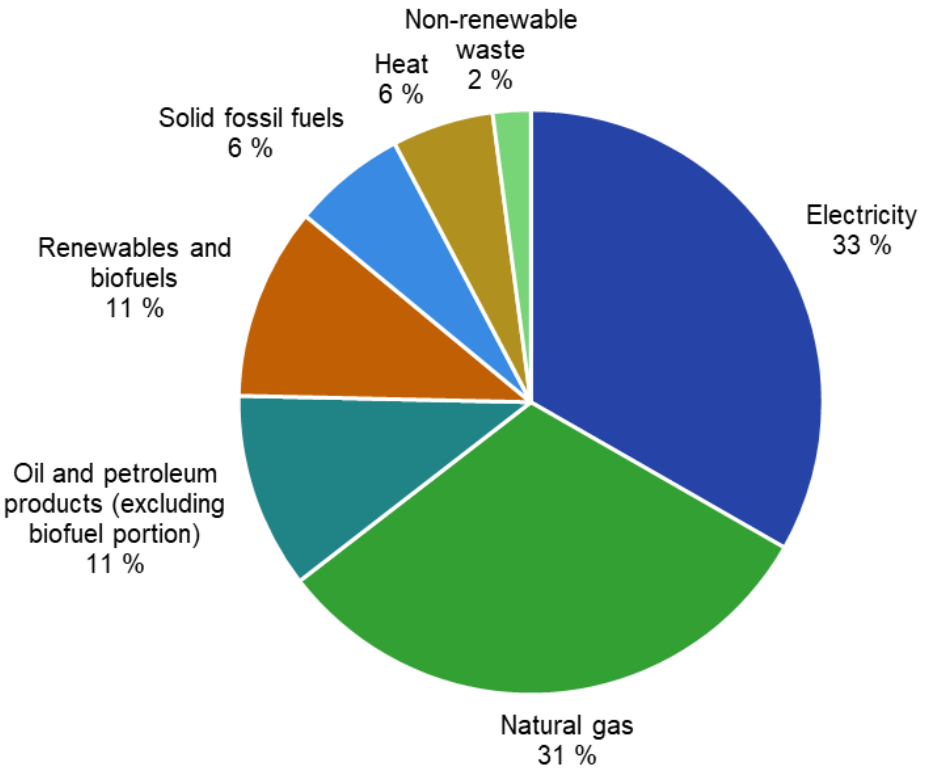
In 2022, electricity and natural gas accounted for almost two-thirds of final energy consumption in the EU's industry sector (33.3 % and 31.2 %, respectively). Oil and petroleum products accounted for 10.8 %, followed by renewables and biofuels (10.6 %). Solid fossil fuels[3]had a 6.3 % share in the mix, derived heat 5.6 %, whereas non-renewable waste accounted for 2.1 % (see Figure 1).

[1]Data for 2022 are available for all EU Member States, however only partially for Greece and Malta. Commission Implementing Decision (EU) 2021/553 of 29 March 2021 granted Greece and Malta derogations on several fuels and products for reference years 2020, 2021 and 2022.

[2]For the full list of energy products, please refer to Annex A of Regulation (EC) No 1099/2008 on energy statistics.

[3]Throughout the article, the term solid fossil fuels refers to primary coal products, derived coal products, manufactured gases, peat and peat products and oil shale and oil sands.

Final energy consumption in the industry sector by energy product, EU, 2022
(%)



Source: Eurostat (nrg_bal_s)

Figure 1: Final energy consumption in the industry sector by energy product, EU, 2022 (%) Source: Eurostat (nrg_bal_s)

Figure 1 shows the share of different energy products in final energy consumption in the EU industry sector in 2022. It also provides insight into the sector's dependence on fossil fuels . Natural gas, oil and petroleum products, solid fossil fuels and non-renewable waste combined directly accounted for over half (50.4 %) of final energy consumption in industry in 2022. However, if we look at absolute figures, the reliance of the EU's industry on fossil fuels was even stronger, given the relatively high share of fossil fuels in the generation of electricity and heat in the EU.

Figure 2 shows the evolution of different energy products used for energy purposes in the industry sector. There was a very prominent drop in solid fossil fuels (from 2 420 petajoules (PJ)[4]in 1990 to 596 PJ in 2022 or -75.4 %) and oil and petroleum products (from 2 288 PJ in 1990 to 1 025 PJ in 2022 or -55.2 %). On the other hand, renewables and biofuels followed a slow but steady upward trend in the same period (from 546 PJ in 1990 to 1 008 PJ in 2022 or +84.7 %). Since 1990 electricity and natural gas have continued to be the two most important energy products for industry. The total final energy consumption in industry showed a decrease in this period, from 12 990 PJ in 1990 to 9 473 PJ in 2022 (-27.1 %). Compared with 2021, the total final energy consumption in industry decreased by 6.3 % in 2022.

[4]Petajoule is a unit of energy equal to 1015joules.

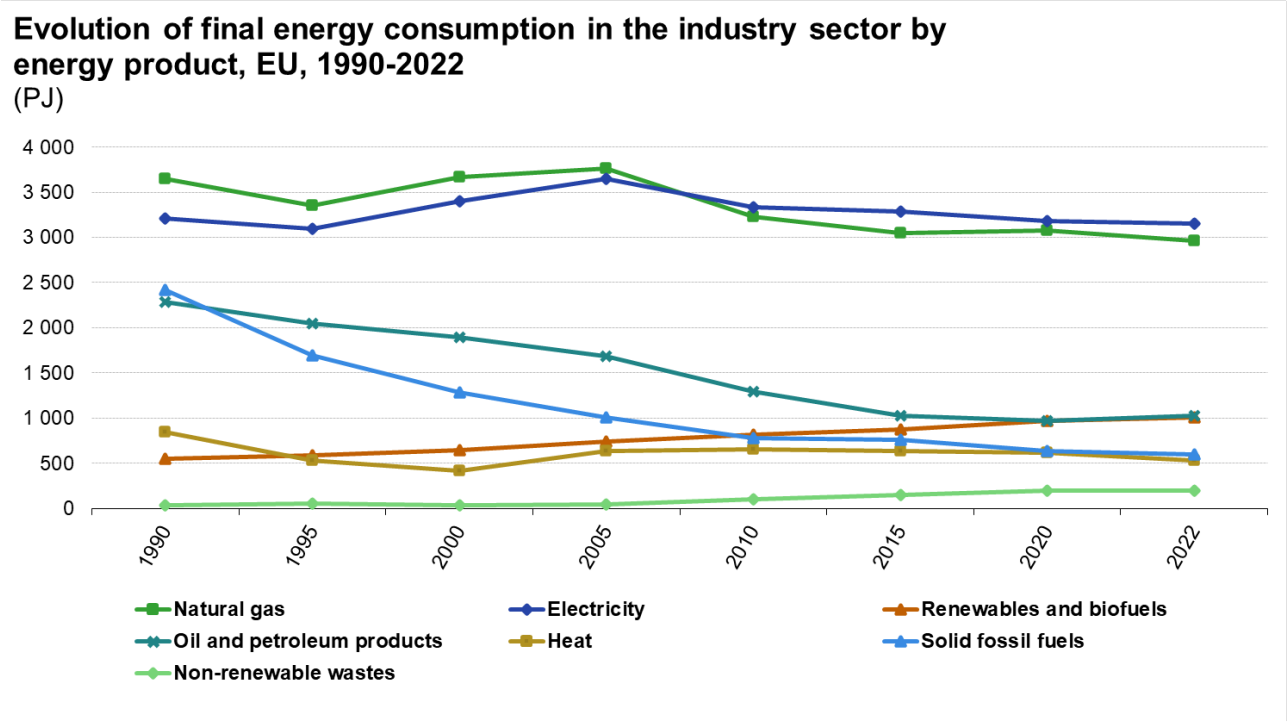


Figure 2: Evolution of final energy consumption in the industry sector by energy product, EU, 1990-2022 (PJ) Source: Eurostat (nrg_bal_s)

The highest industrial energy consumers in the EU

Figure 3 shows the final energy consumption in 2022 per industrial sector at EU level. The three sectors with the highest final energy consumption were the same as in 2021: the chemical and petrochemical industry (1 892 PJ or 20.0 % of the total final energy consumption in industry in 2022 in the EU), the non-metallic minerals industry (1 367 PJ or 14.5 %) and the paper, pulp and printing industry (1 279 PJ or 13.5 %). The only other sectors consuming more than 10 % of the total were the food, beverages and tobacco industry (1 156 PJ or 12.2 %) and the iron and steel sector (962 PJ or 10.2 %). The remainder of the article will focus in more detail on the final energy consumption of the three highest industrial final energy consumers at EU level.

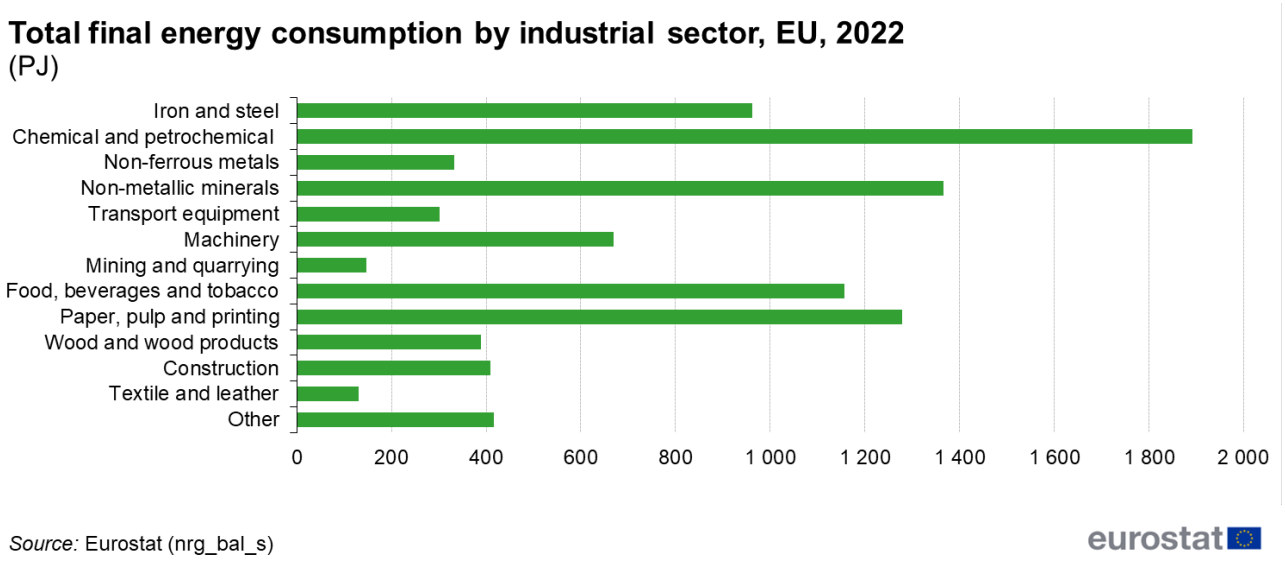
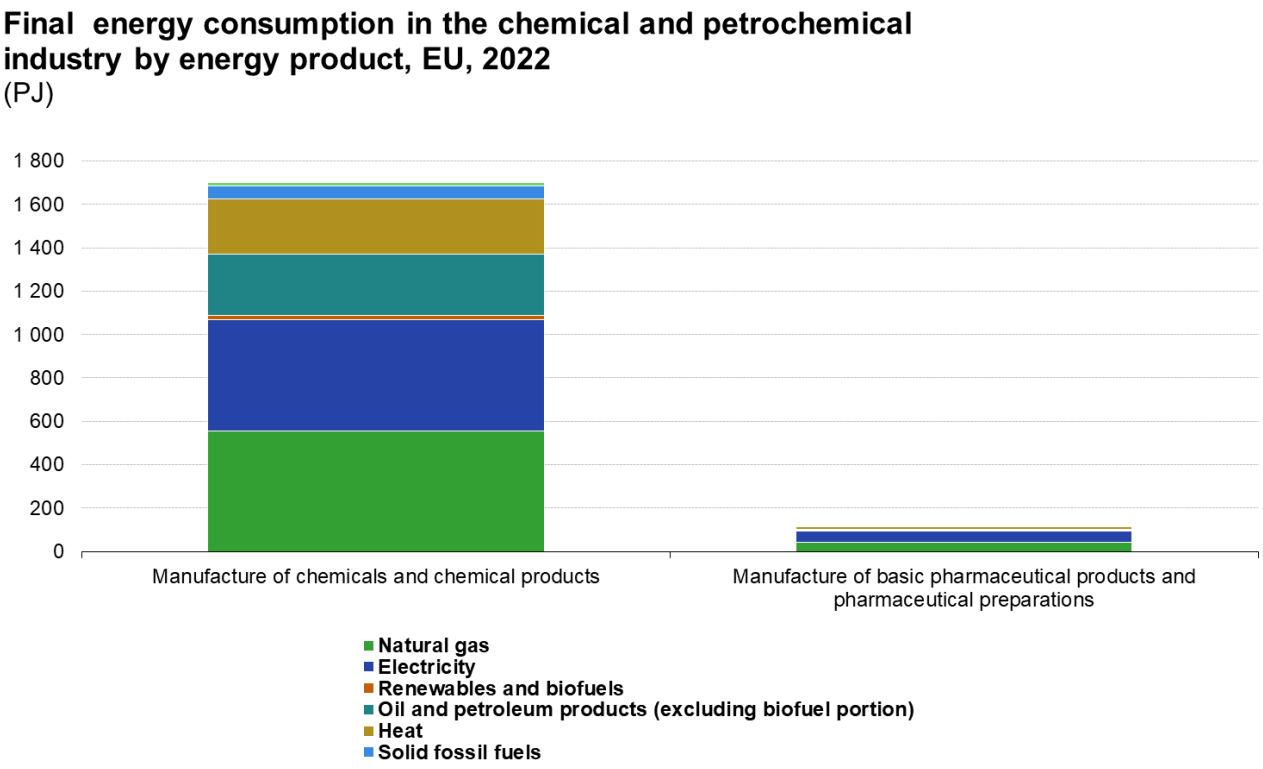


Figure 3: Total final energy consumption by industrial sector, EU, 2022 (PJ) Source: Eurostat (nrg_bal_s)

Chemical and petrochemical industry

As shown in Figure 4, the chemical and petrochemical industry, the highest industrial final energy consumer in the EU in 2022, was characterised by a strong dependence on natural gas. This was true for both the manufacture of chemicals and chemical products, which used 555 PJ (32.6 % of the total final energy consumption for this sector) of natural gas in 2022, as well as for the manufacture of basic pharmaceutical products and pharmaceutical preparations – a lesser energy consumer, with 42.9 PJ (36.5 %) of natural gas consumed in 2022. Electricity was the second most important energy product for the manufacture of chemicals and chemical products (30.2 %), and the
most important one for the manufacture of basic pharmaceutical products and pharmaceutical preparations (44.5 %).



Note: Partial data available for Greece and Malta. Confidential data not included.
Source: Eurostat (nrg_d_indq_n)

Figure 4: Total final energy consumption in the chemical and petrochemical industry by energy product, EU, 2022 (PJ) Source: Eurostat (nrg_d_indq_n)

Non-metallic minerals industry

The non-metallic minerals industry as a whole was also highly dependent on natural gas, as seen in Figure 5. This was especially true for the manufacture of glass and glass products (178 PJ or 69.2 %), as well as for the manufacture of other non-metallic mineral products (besides glass, glass products, cement, lime and plaster) (245 PJ or 62.4 %). On the other hand, natural gas did not have such a prominent role in the manufacture of cement, lime and plaster in 2022; instead, this sector used significant amounts of oil an petroleum products (175 PJ or 28.7 %) for energy purposes, as well as non-renewable waste (139 PJ or 22.7 %) and solid fossil fuels (91 PJ or 15.0 %). Renewables and biofuels also had a significant share (12.2 %) in the manufacture of cement, lime and plaster, unlike in the other sectors shown, where their role was negligible.

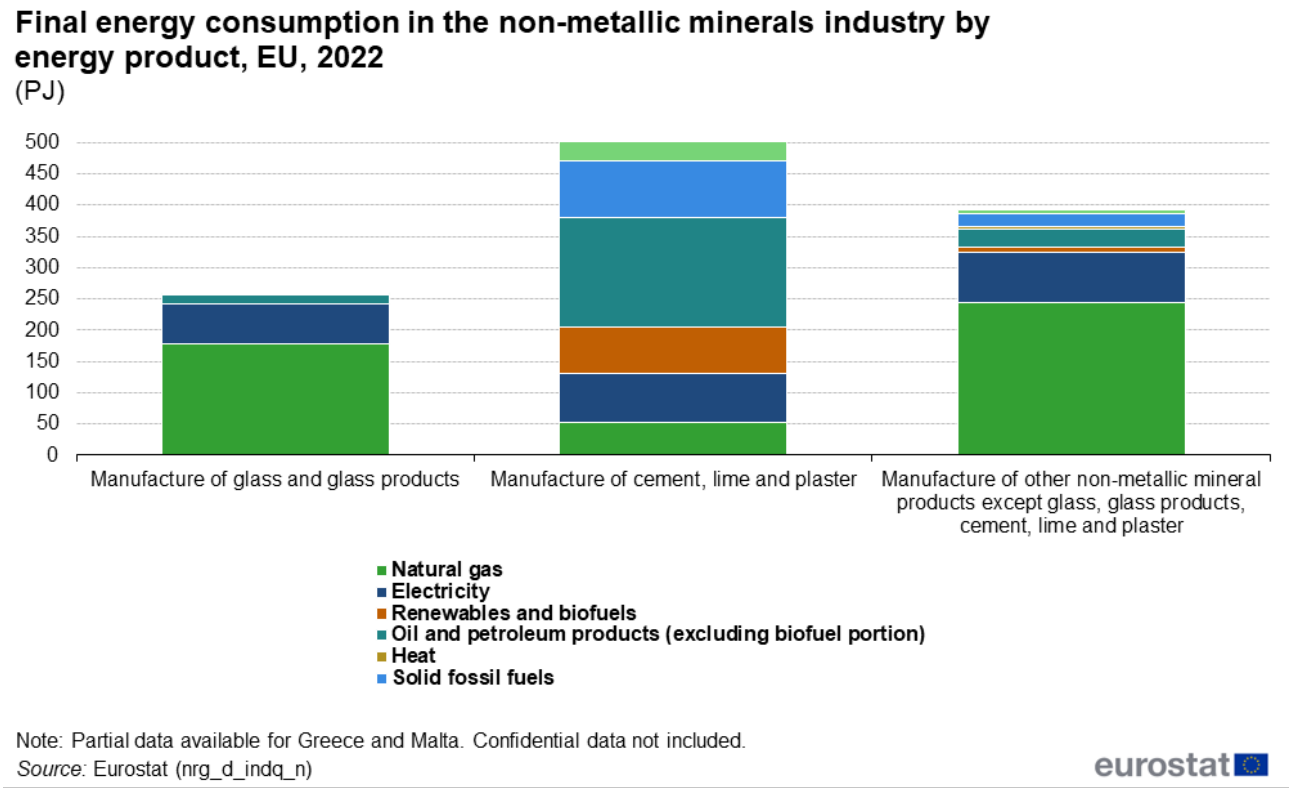


Figure 5: Total final energy consumption in the non-metallic minerals industry by energy product, EU, 2022 (PJ) Source: Eurostat (nrg_d_indq_n)

Paper, pulp and printing industry

In 2022, the paper, pulp and printing industry relied to a large extent on renewables and biofuels for energy use, particularly in the manufacture of pulp, where they were by far the most important fuel group (261 PJ or 65.4 %). In the manufacturing of paper and other paper products (pulp excluded), renewables and biofuels also had an important consumption share (147 PJ or 22.4 %), although the two most important energy products were electricity (258 PJ or 39.5 %) and natural gas (149 PJ or 22.7 %). These two subsectors, manufacture of paper and paper products and manufacture of pulp, were together the highest final energy consumers in the industry, using almost thirty times more energy than printing and reproduction of recorded media. Solid fossil fuels still had a small role in the manufacture of paper and paper products (pulp excluded) (16 PJ or 2.4 %), and an almost negligible one in manufacture of pulp (2 PJ or 0.4 %) (see Figure 6).

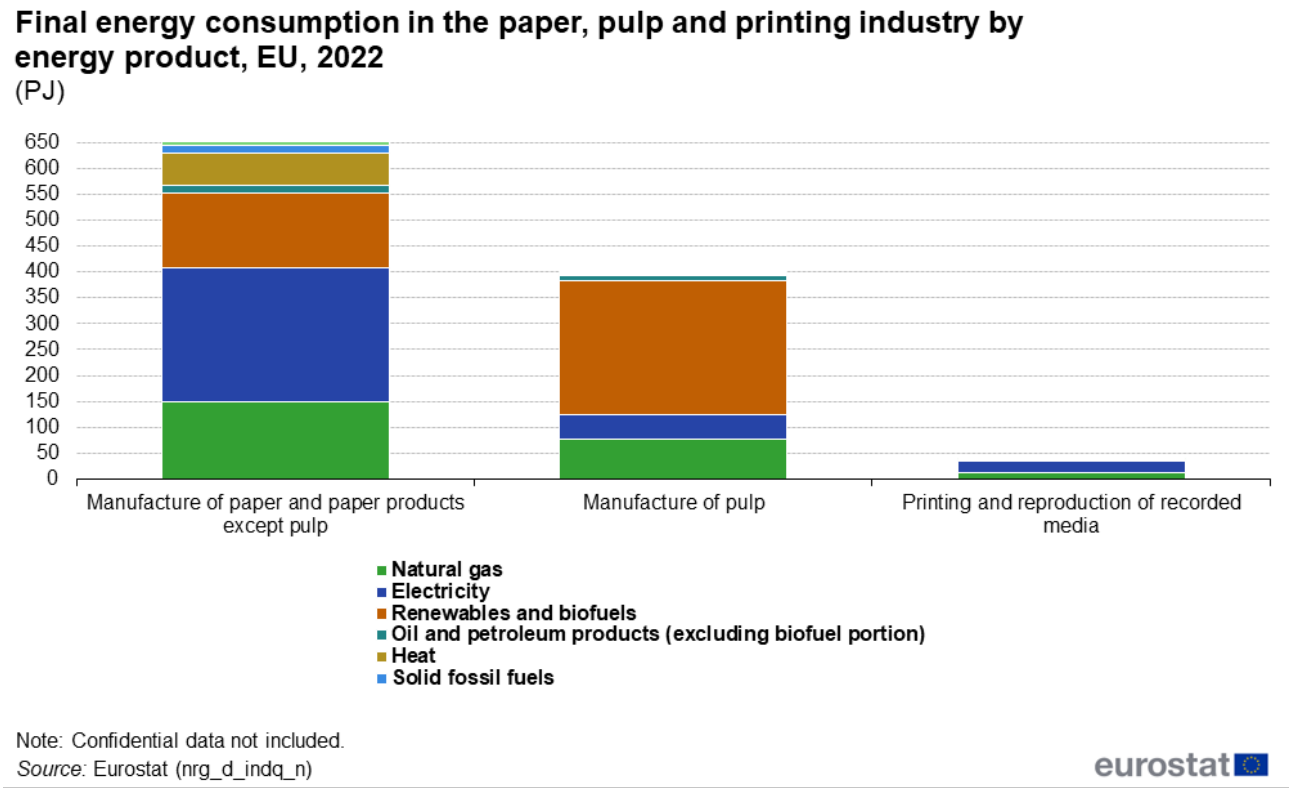


Figure 6: Total final energy consumption in the paper, pulp and printing industry by energy product, EU, 2022 (PJ) Source: Eurostat (nrg_d_indq_n)

Source data for tables and graphs

- Final energy consumption in industry - tables and figures

Data sources

The statistics presented in this article are based on the annual data submitted to Eurostat in line with Regulation (EC) 1099/2008 on energy statistics. Complete detailed data on energy consumption in industry are available for the period 2020-2022 for all but three EU Member States. In line with the derogations granted to them, Spain did not report detailed data on energy consumption in industry for 2020 and 2021, and Greece and Malta reported these data only partially for the three years. For several countries, the data are also available for the period 2017-2019, during which the reporting was voluntary. As of reference year 2020, the reporting is mandatory with a deadline of 31 March of the second year following the reference year. The methodology is harmonised for all reporting countries, resulting in a high level of comparability across countries.

Context

Over the past three decades, final energy consumption in industry in the European Union has been following a slight downward trend. This is a result of energy efficiency gains as well as of structural changes in the EU's economy. Nevertheless, industry is still one of the highest final energy consumers in the European Union. Any decarbonisation objectives as well as initiatives related to the security of energy supply must therefore take into account the energy needs of industry. Having recognised the need for a higher level of disaggregation of the statistics on final energy consumption in industry, in 2019 the Commission amended Regulation 1099/2008 of the European Parliament and of the Council on energy statistics to introduce obligatory reporting of the data on energy use of more disaggregated industrial sectors.

To pave the way for climate neutrality by 2050, as set out in the European Green Deal , the European Commission

released the " Fit for 55 " package in 2021. The package is a set of inter-connected proposals which should enable the EU to achieve the ambition of reducing its greenhouse gas emissions by at least 55 % by 2030 compared with 1990. The proposals directly affect the industry sector, for example, by expanding the scope of the EU Emissions Trading System , introducing the Carbon Border Adjustment Mechanism and tightening the requirements for renewable energy use.

In May 2022, prompted by global energy market disruptions, the Commission presented a number of measures in its REPowerEU plan, intended to diversify energy supply, boost energy savings and accelerate the transition to clean energy. As part of the plan to end the EU's dependence on Russian fossil fuels and, at the same time, to tackle the climate crisis, REPowerEU specifically calls for a transformation of industrial processes to replace gas, oil and coal with renewable electricity and fossil-free hydrogen.

In July 2022, the European Commission issued its Winter Preparedness Package, including a number of measures aimed at securing the supply of natural gas for the EU. As a result, the Council Regulation 1369/2022 on coordinated demand-reduction measures for gas was adopted shortly afterwards, with the aim to achieve a 15 % reduction in gas demand for a limited period of time and to help identify the industrial sectors most suitable to make the savings.

The EU's ambitious climate-related goals together with the current instability of energy supply and price volatility highlight the need for detailed data on final energy consumption in industry. In the current circumstances this concerns, in particular, the volumes of natural gas used in specific sectors, as well as, more generally, the degree of industry's dependence on fossil fuels and the potential to switch to more climate-friendly alternatives in each sector.

See also

- All articles on energy

Main tables

- Energy - selected datasets (t_nrg) , see:

Energy statistics - main indicators (t_nrg_indic)

Sustainable Development indicators Goal 7 - Affordable and clean energy (t_nrg_sdg_07)

Database

- Energy - detailed datasets (t_nrg) , see:

Energy statistics - quantities, annual data (nrg_quanta)

Disaggregated final energy consumption (nrg_d)

Disaggregated final energy consumption in industry - quantities by NACE Rev. 2 activity (nrg_d_indq_n)

Disaggregated final energy consumption in industry - calorific values (nrg_d_indcv)

Dedicated section

- Energy

Publications

- Energy, transport and environment statistics - 2020 edition
- Energy data - 2020 edition
- Sustainable development in the European Union — 2022 edition
- Shedding light on energy in the EU — 2023 interactive edition

Methodology

- Energy balances (ESMS metadata file — nrg_bal_esms)
- Energy statistics - quantities (European and national ESMS metadata file — nrg_quant_esms)
- Supply, transformation and consumption — commodity balances (ESMS metadata file — nrg_cb_esms)

Legislation

- Regulation 1099/2008
- A policy framework for climate and energy in the period from 2020 to 2030
- Energy Roadmap 2050
- Summaries of EU legislation: Moving toward competitive sustainable and secure energy for Europe

Visualisations

- Explore annual energy data - This interactive tool helps you to obtain an overview of key energy trends.
- Sankey diagram - Energy flows

External links

- A European Green Deal
- REPowerEU
- IEA Analysis - Industry

Notes

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