



8th Environment Action Programme

Energy consumption: primary and final energy consumption in Europe



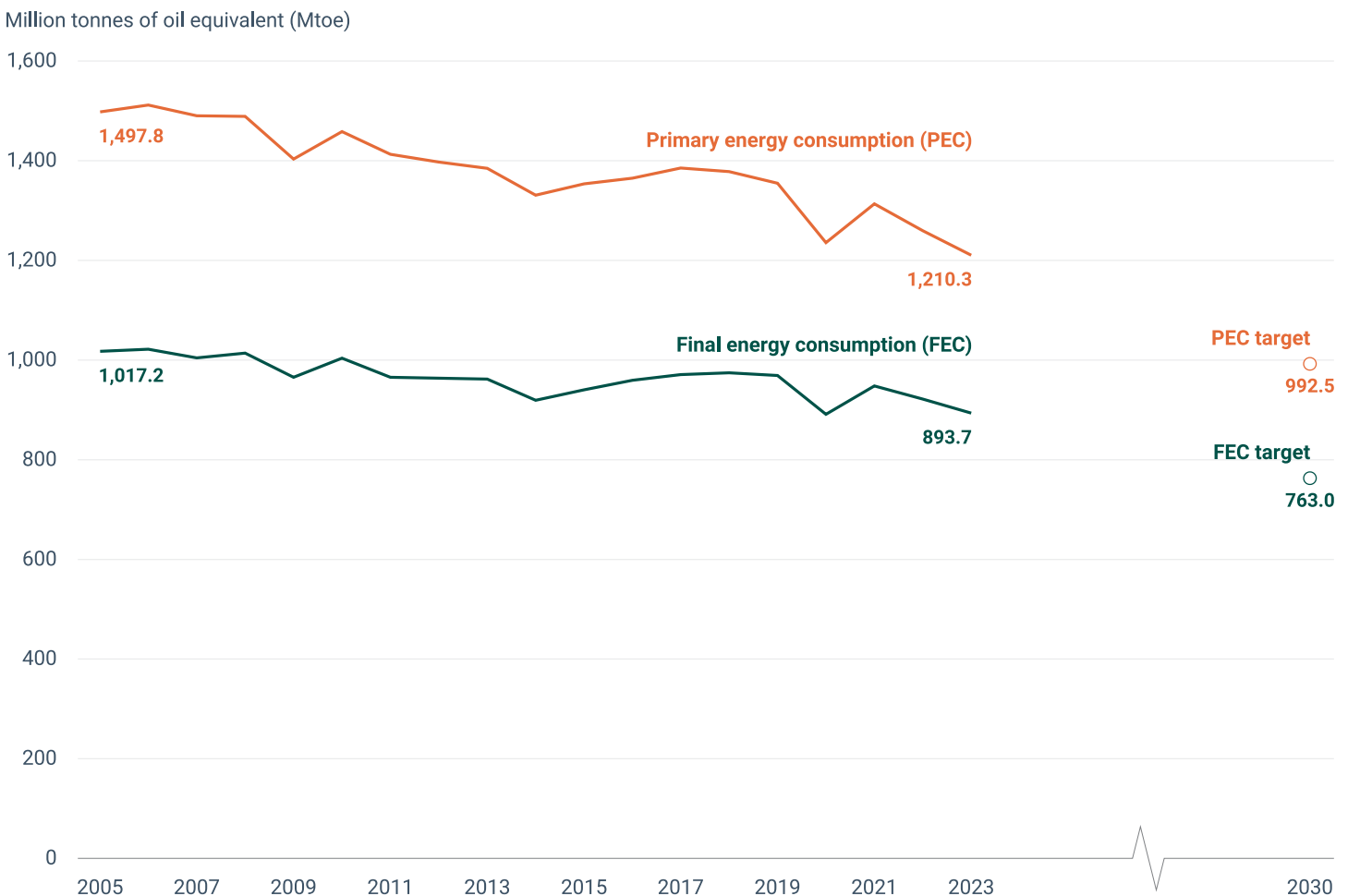
Primary and final energy consumption in the European Union

Published 31 Jan 2025

[Home](#) > [Analysis and data](#) > [Indicators](#) > Primary and final energy consumption ...

The European Union's primary energy consumption (PEC) by end users in 2023 fell by 3.9% compared to 2022 and final energy consumption (FEC) fell by 3.0%. This progress is an improvement compared to historical trends in energy efficiency. The rate of reduction observed in both PEC and FEC over the past three years suggests that the 2030 energy efficiency targets could be achieved, provided that the observed rate of reduction persists through the end of this decade. This also highlights the importance of maintaining decisive action to put the EU on track to meet both the PEC and FEC targets.

Figure 1. Primary and final energy consumption in the European Union



Reducing energy consumption typically leads to a reduction in **environmental pressures** associated with the production and consumption of energy. It supports the achievement of **EU renewable energy and GHG targets**, lowers emissions of air pollutants with its associated health benefits, enhances energy security and reduces import energy dependency.

The EU's recast **Energy Efficiency Directive** sets a **binding target** of 992.5 million tonnes of oil equivalent (Mtoe) for PEC, and an indicative target of 763Mtoe for FEC to be achieved by 2030. PEC represents the total energy demand within a country, including losses. FEC represents the energy used by final consumers.

EU-wide PEC levels in 2023 were 1210Mtoe, while EU-wide FEC levels were 894Mtoe. This represents a **decrease** of 3.9% and 3.0% respectively compared to 2022. Despite energy prices falling since their peak in 2022, prices still remained high in 2023, which contributed to an economic incentive to cut back on energy consumption.

Policies to address energy efficiency measures and reduce reliance on fossil fuels, as well as mild winter conditions, also contribute to decreases in both PEC and FEC. The EU took **active measures** to save energy, such as the **Council Regulation** on coordinated demand reduction measures for gas, where Member States agreed to reduce gas demand by 15% compared to average consumption in the past five years. This collectively led to significant decreases in energy consumption by industry and households.

The full time series of developments show that overall reductions since 2005 in energy efficiency in Europe have been more pronounced for PEC (-19.2%) than for FEC (-12.1%). The replacement of fossil fuels and nuclear energy by **renewables** in electricity generation typically reduces PEC without affecting FEC. The **share of renewable energy** in the EU has also more than doubled since 2005. Various other factors contributed to the reduction of energy demand, such as energy saving measures, energy transformation improvements, structural changes towards less energy intensive industries and increasingly warmer winters because of climate change.

Compared to average annual reductions of the last 10 years, reaching the ambitious **2030 targets** will require continued introduction of robust measures. Based on this longer-term historical trend, the EU is not yet on track to meet the 2030 targets on energy consumption. Yet recent figures show three consecutive years of promising reductions at a rate that would need to be sustained through the end of this decade for the targets to be met.

Figure 2. Change in energy consumption of EU Member States between 2005 and 2023



Twenty-five Member States decreased their **PEC** between 2005 and 2023, with Greece as the highest achiever, followed by Italy and Germany. PEC in 2023 for Cyprus remained slightly above their 2005 level (+1.14%), while Poland experienced a more prominent increase in PEC (+5.74%). Poland’s significant decrease in coal consumption was overcompensated by an increase in the consumption of gas and liquid fuels.

Twenty-three Member States decreased their **FEC** in the same time frame. Greece showed the greatest decrease in this category again, followed by the Netherlands and Luxembourg. Four Member States saw their FEC increase, with the highest being Malta at 46.08%.

Eighteen Member States decreased their PEC between 2022 and 2023, with Bulgaria and Estonia having the largest relative reductions of 13.98% and 13.53% respectively. Of the nine Member States whose PEC increased, France lead at 3.30%. Nineteen Member States decreased their FEC between 2022 and 2023, with Slovenia and Austria having experienced the greatest drop at 4.14% and 3.85% respectively. Of the eight Member States whose FEC increased, Czechia and Portugal topped the chart with 2.94% and 2.47% respectively.

Supporting information

Definition

Final energy consumption (FEC) represents the energy used by final consumers (such as households, transport, industry etc) for all energy uses. It is the energy that reaches the final consumer’s door.

Primary energy consumption (PEC) represents the total energy demand within a country, excluding the energy products consumed for purposes other than producing useful energy (non-energy uses, e.g., oil for plastics). For example, the electricity consumed by a household counts towards FEC; the fuel burned to generate that electricity and bring it to the household counts towards PEC.

Methodology

PEC-FEC

To ensure comparability with energy efficiency targets, this indicator is defined according to Eurostat methodology for final energy consumption (Europe 2020-2030) [FEC2020-2030] and primary energy consumption (Europe 2020-2030) [PEC2020-2030].

Primary energy consumption (Europe 2020-2030) = gross inland consumption (all products total) - gross inland consumption (ambient heat (heat pumps)) - final non-energy consumption (all products total).

Final energy consumption (Europe 2020-2030) = final energy consumption (all products total) - final energy consumption (ambient heat (heat pumps)) + international aviation (all products total) + transformation input blast furnaces (all products total) - transformation output blast furnaces (all products total) + energy sector blast furnaces (solid fossil fuels) + energy sector blast furnaces (manufactured gases) + energy sector blast furnaces (peat and peat products) + energy sector blast furnaces (oil shale and oil sands) + energy sector blast furnaces (oil and petroleum products) + energy sector blast furnaces (Natural gas).

Data set used: 'Complete energy balances nrg_bal_c'

Codes:

- FEC2020-2030 Final energy consumption (Europe 2020-2030)/all products;
- PEC2020-2030 Primary energy consumption (Europe 2020-2030)/all products;
- GIC Gross inland consumption/all products;
- NRG_BF_E Energy sector – blast furnaces – energy use/all products;
- FC_NE Final non-energy consumption/all products;
- FC_TRA_E Final consumption – transport sector – energy use/renewables and biofuels;
- FC_E Final consumption – energy use/ambient heat;
- PPRD Primary production/ambient heat.

Details about this methodology are available from Eurostat at: [ENERGY BALANCE GUIDE \(Draft 31 January 2019\)](#).

The time series for the EU-27 was made by summing the values for each year of the 27 countries that are currently Member States, regardless of whether they were members of the EU in any given year.

Proxy data

Values for 2005-2022 are compiled by Eurostat. Approximated figures for 2023 are based on EEA estimates.

Policy/environmental relevance

The [Energy Efficiency Directive \(2012/27/EU\)](#) established a set of binding measures to help the EU reach its target of decreasing energy consumption by 20% by 2020, compared with projected levels. This was amended by [Directive \(EU\) 2018/2002](#), which provides a policy framework for 2030 and beyond. [A new amendment was agreed in 2023](#), which set new targets for 2030.

The composition of the energy mix and the level of consumption provide an indication of the environmental pressures associated with energy consumption. The type and magnitude of the environmental impacts associated with energy consumption, such as resource depletion, greenhouse gas emissions, air pollutant emissions, water pollution and the accumulation of radioactive waste, strongly depend on the types and amounts of fuels consumed, as well as on the abatement technologies applied.

This indicator is a headline indicator for monitoring progress towards achieving the aims of the [8th Environment Action Programme \(8th EAP\)](#). It contributes mainly to monitoring progress towards energy efficiency aspects of [Article 2.f of the 8th EAP](#) which requires: ‘promoting environmental aspects of sustainability and significantly reducing key environmental and climate pressures related to the Union’s production and consumption, in particular in the areas of energy, industry, buildings and infrastructure, mobility, tourism, international trade and the food system’. The European Commission Communication on the 8th EAP monitoring framework specifies that this indicator should monitor the achievement by 2030 of the recently agreed 2030 EU targets as detailed in the next paragraph ^[1].

Targets

On 20 September 2023, the EU officially published the recast [Energy Efficiency Directive \(EU\) 2023/1791](#), which set a target for the reduction of final energy consumption (FEC) of at least 11.7% in 2030, compared with the energy consumption forecasts for 2030 made in 2020. This translates into a mandatory target of 763Mtoe for FEC, and an indicative target of 993Mtoe for primary energy consumption (PEC). Member states will benefit from flexibilities in reaching the target.

For more information, see the [European Commission website on the Energy Efficiency Directive](#) and the [recent agreement](#).

Sources:

EC, 2022a, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the monitoring framework for the 8th Environment Action Programme: Measuring progress towards the attainment of the Programme’s 2030 and 2050 priority objectives, COM/2022/357 final, [EUR-Lex - 52022DC0357 - EN - EUR-Lex \(europa.eu\)](#)

Eurostat, 2023. Complete energy balances (NRG_BAL_C), PEC (2020-2030) and FEC (2020-2030). <https://ec.europa.eu/eurostat/databrowser/bookmark/dea184ea-4883-453d-ba24-71e960a4f161?lang=en>. Accessed May 2024.

Accuracy and uncertainties

Methodology uncertainty

No uncertainty has been specified.

Data sets uncertainty

No uncertainty has been specified.

Rationale uncertainty

No uncertainty has been specified.

Data sources and providers

- [Simplified Energy Balances: Primary Energy Consumption - Energy Efficiency Directive](#), Statistical Office of the European Union (EUROSTAT)

- [Simplified Energy Balances: Final Energy Consumption - Energy Efficiency Directive](#), Statistical Office of the European Union (EUROSTAT)

▼ Metadata

DPSIR

Driving forces

Topics

Energy # Climate change mitigation # Energy efficiency

Tags

8th EAP # ENER016 # Energy # Energy efficiency # Targets

Temporal coverage

2005-2030

Geographic coverage

| | |
|-----------|-------------|
| Austria | Belgium |
| Bulgaria | Croatia |
| Cyprus | Czechia |
| Denmark | Estonia |
| Finland | France |
| Germany | Greece |
| Hungary | Ireland |
| Italy | Latvia |
| Lithuania | Luxembourg |
| Malta | Netherlands |
| Poland | Portugal |
| Romania | Slovakia |
| Slovenia | Spain |
| Sweden | |

Typology

Efficiency indicator (Type C - Are we improving?)

UN SDGs

SDG7: Affordable and clean energy

Unit of measure

FIG1: Million tonnes of oil equivalent (Mtoe);

FIG2: Percentage change compared to 2005

Frequency of dissemination

Once a year

▼ References and footnotes

1. EC, 2022, Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions on the monitoring framework for the 8th Environment Action Programme: Measuring progress towards the attainment of the Programme's 2030 and 2050 priority objectives. COM(2022) 357 final
[↗](#)