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Energy: Renewable Energy Sources

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Main sector indicators

> Greenhouse gas emissions in the European Union decreased by 27 percent from 1990 to 2022, that is -1.327 million tons of CO_2 equivalent.

For the European Union's energy sector, 2023 represents a turning point towards energy independence and a strong momentum in renewable energy production. Although in 2020 the COVID-19 pandemic slowed down the world economy and, consequently, reduced greenhouse gas emissions, the world continued on its path to reach a temperature rise of more than 3°C by the end of the century. The report from the United Nations Environment Programme[1] remains relevant and warns that without significant behavioral changes at all levels, from governmental and institutional to personal and local, the goal of the Paris Agreement to limit the temperature increase to below 2°C, with a target of 1.5°C by 2100, remains unattainable, with catastrophic consequences for humanity and the world as we know it. The accumulation of anthropogenic emissions of greenhouse gases is the main reason for the climatic extremes we have witnessed in recent years. The burning of fossil fuels is responsible for about three-quarters of anthropogenic greenhouse gas emissions. The International Energy Agency[2] points out that in 2022, six countries in the world (China, the United States, India, the EU-27, Russia, and Brazil) accounted for 50.1 percent of the world's population, 61.2 percent of the world's gross domestic product, 63.4 percent of global fossil fuel consumption, and 61.6 percent of global greenhouse gas emissions. Globally, greenhouse gas emissions continued to increase by 1 percent, i.e., 729 million tons of CO_2 ($MtCO_2eq$) equivalent, totaling 53,786 $MtCO_2eq$.

In 2022, of the total global greenhouse gas emissions, the European Union member states were collectively responsible for 6.7 percent or 3,587 $MtCO_2eq$. In 2021, the European Union managed to contain the increase in greenhouse gas emissions by 6 percent compared to the pandemic year of 2020, and, in 2022, achieved a decrease in emissions by -1 percent compared to 2021. In the period from 1990 to 2022, the European Union's net greenhouse gas emissions decreased by 27 percent or -1,327 $MtCO_2eq$.

1 Emissions Gap Report 2020, https://www.unep.org/emissions-gap-report-2020

2 IEA (2022), Global Energy Review: CO_2 Emissions in 2021, IEA, Paris, https://www.iea.org/reports/global-energy-review-co2-emissions-in-2021-2

Due to the need to speed up the transition to clean energy in the European Union, motivated not only by measures to prevent climate change but also to reduce dependence on energy imports, in 2023, the Renewable Energy Directive (EU) 2018/2001[3] (the so-called RED II), was revised into (EU) 2023/2413[4] (the so-called RED III). The revised RED III Directive entered into force on October 20, 2023. The transposition period into the national legislative framework was 18 months, i.e., until May 21, 2025, but some parts related to issuing permits for renewable energy production facilities came into effect as early as July 2024, if the member state had transposed the Directive into national legislation.

The purpose of the RED III Directive is to accelerate the transition to clean energy and increase the ambition to a binding minimum share of 42.5 percent of energy from renewable sources (RS) by 2030 but aiming for 45 percent. The direction of the European Union is clear: a climate-neutral Europe by 2050, decoupling economic growth from greenhouse gas emissions and resources, and a fair and inclusive transition, while increasing the resilience and independence of the energy system.

In the State of the Energy Union Report 2024[5], the European Commission analyzes the joint response of the European Union to the unprecedented two-year energy crisis, assesses the current state of the green transition at national, European, and global levels, and identifies future challenges and opportunities that await Europe on its way to achieving the ambitious climate and energy targets for 2030 and 2050.

The report shows how the European Union collectively responded to Russian aggression in Ukraine and to Russia's use of energy supplies as a weapon by accelerating the transition to clean energy, diversifying supplies, and reducing energy consumption. The implementation of the REPowerEU plan and a series of urgent legislative measures made it possible for Europe to avoid disruptions in energy supply, reduce the pressure on energy markets, prices, and consumers, and continue with the structural reform of the energy system. This was achieved through the implementation of legislative acts related to the European Green Deal, the wider introduction of energy from renewable sources, and the increase in energy efficiency. The European Union is well on its way to achieving the targets of the REPowerEU plan. It was better prepared to ensure energy supply during the winter of 2023–2024, thanks to well-coordinated measures for filling gas storages, diversification of routes and infrastructure for energy import,

3 Directive (EU) 2018/2001.

4 Directive - EU - 2023/2413 - EN - Renewable Energy Directive - EUR-Lex, https://eur-lex.europa.eu/eli/dir/2023/2413/oj/eng

5 COM/2024/404, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024DC0404&qid=1739370086578

investments in energy from renewable sources and energy efficiency, and joint efforts to reduce energy demand. In 2023, the first results of the REPowerEU plan were statistically recorded.

State of the Energy Union[6] – a selection of some of the main achievements:

- Emissions of greenhouse gases in the European Union were reduced by 32.5 percent[7] compared to 1990 levels. During that period, the European Union economy grew by around 67 percent, indicating that economic growth has been successfully decoupled from emissions of greenhouse gases.
- Data submitted by European Union member states by April 2, 2024, show that, in 2023, greenhouse gas emissions covered by the Emissions Trading System (ETS) decreased by 15.5 percent compared to 2022 levels, i.e., they were lower by around 47 percent than in 2005. This puts the European Union well on track towards its target of -62 percent of greenhouse gas emissions by 2030.
- Gas demand in the European Union decreased by 18 percent from August 2022 to May 2024. This saved about 138 billion cubic meters (m^3) of gas. Due to the sanctions of the European Union banning seaborne imports of Russian crude oil and refined petroleum products, as well as Russian coal, Russian gas imports (fossil gas from pipelines and liquefied natural gas, or fossil gas) decreased from 45 percent of total gas imports in the European Union in 2021 to just 18 percent by August 2024.
- As part of the REPowerEU plan, special emphasis is placed on the domestic production of renewable hydrogen and biomethane, which is a renewable version of fossil gas produced by purifying biogas.
- Wind energy has surpassed gas production and has become the second largest source of electricity in the European Union, after nuclear energy. With 56 GW of new solar capacity installed in 2023, the European Union has broken another record, surpassing the 40 GW installed in 2022. Onshore and offshore wind energy in the European Union had a total cumulative installed capacity of 221 GW (201 GW onshore, 19 GW offshore), of which 16 GW was installed in 2023.[8]
- While the assessment of the draft of the revised National Energy and Climate Plans (NECPs) in December 2023 showed that member states intend to step up measures at the national and regional level to achieve the targets of the "Fit for 55" package and the REPowerEU plan, some ambitions are insufficient, including bottlenecks and

6 See more details at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52024DC0404&qid=1739370086578

7 Excluding emissions from international aviation and maritime transport.

8 Initial indications (Ember) show that in the first half of 2024 around 50 percent of electricity was generated from renewable sources. In addition, more electricity was produced from wind and solar energy than from all fossil fuels combined.

missing links for integrated infrastructure to achieve the Union's targets for 2030 and increase climate resilience. The Commission has made recommendations and is working closely with member states to help them achieve the Union's 2030 targets on time, based on the final revised National Energy and Climate Plans.

- Support to Ukraine, including its energy sector, remains a top priority for the Commission and all 27 member states. It is estimated that the Union Civil Protection Mechanism has allocated EUR 900 million in assistance to Ukraine. The Ukraine Energy Support Fund has proven crucial in supporting the procurement of energy equipment, such as the delivery of thousands of generators and power transformers, and has mobilized more than EUR 500 million by August 2024. Under the EU Instrument for Ukraine, worth EUR 50 billion, based on the Ukraine Plan, Ukraine will receive consistent funding to help with recovery and fostering of sustainable economic growth until 2027, while its energy system had EUR 96 million of assistance available from the Ukraine Energy Support Fund for the winter of 2024.

Eurostat results[9] (2025) indicate that, in 2023, the total share of energy from renewable sources in gross final energy consumption reached 24.5 percent at the level of the European Union, which is about 1.5 percentage points more compared to the previous year. The achieved share of energy from renewable sources needs to be doubled by 2030 to achieve the ambitious target of at least 42.5 percent of energy from renewable sources, which simultaneously reduces greenhouse gas emissions and the EU's dependence on imported energy sources. Achieving this target depends significantly on the successful implementation of the Energy Efficiency Directive[10], which was also revised in 2023. This Directive establishes the principle of "energy efficiency first" as a basic principle of the Union's energy policy. Energy efficiency helps reduce overall energy consumption, which significantly contributes to the reduction of greenhouse gas emissions by avoiding the unnecessary use of energy and, thus, the burning of fossil fuels. Together with other rules related to energy and climate, the Directive aims to reduce greenhouse gas emissions by at least 55 percent compared to 1990, or an additional reduction of 11 percent in total energy consumption by 2030.

The Republic of Croatia, as one of the 27 member states of the European Union, participates in achieving the common target. In 2023, the total share of energy from renewable sources continued its two-year decline,

9 Renewable energy statistics, https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics#Share_of_renewable_energy_more_than_doubled_between_2004_and_2022

10 Energy Efficiency Directive (EU/2023/1791), https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=OJ%3AJOL_2023_231_R_0001&qid=1695186598766

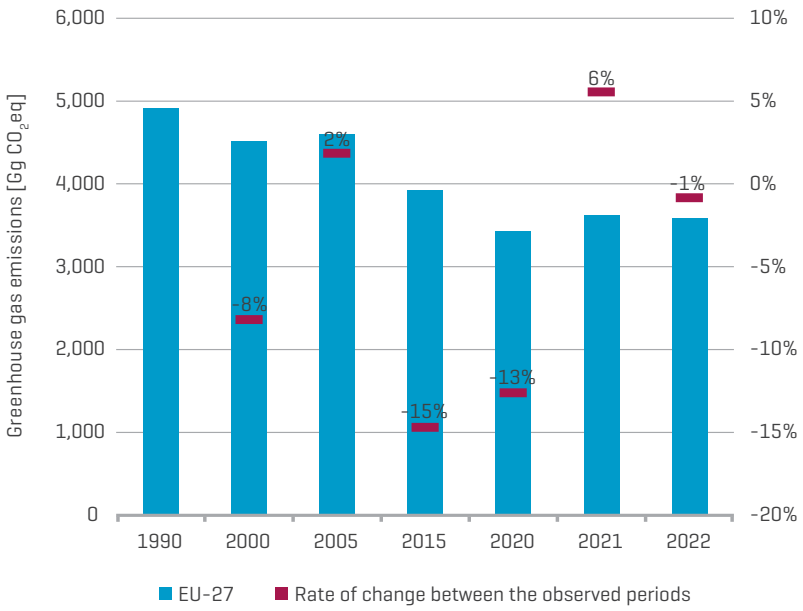
reaching 28.05 percent — a 2.95 percentage point decrease from the 2020 share. In 2023, Croatia had a 58.83 percent share of renewable energy in electricity production, 0.92 percent of renewable energy in transport, and 36.17 percent in heating and cooling, making the total share of energy from renewable sources in gross final energy consumption 28.05 percent, or an annual decrease of 0.04 percentage points.

For the period up to 2030, the target of the share of energy from renewable sources in gross final energy consumption has been increased to at least 42.5 percent, aiming for 45 percent (RED III). When defossilizing transport, member states can choose between a) a binding target of 14.5 percent reduction in the intensity of greenhouse gas emissions in transport by 2030, or b) a binding target of at least 29 percent of energy from renewable sources in the final energy consumption in transport by 2030. The new rules establish a binding sub-target of 5.5 percent of advanced biofuels (mainly produced from biomass that is not suitable for human and animal consumption, listed in Annex IX, RED II) and renewable fuels of non-biological origin (RFNBOs) in the share of energy from RS in transport. Hydrogen and synthetic fuels derived from hydrogen are mostly considered under RFNBO. Within this target, a minimum requirement of 1 percent of RFNBO's share in the total share of energy from renewable sources in transport is prescribed.

Figure 1 shows the trend of reducing greenhouse gas emissions in the European Union, which, in the period from 1990 to 2022, amounted to -27 percent or -1.327 million tons of CO_2 equivalent.

_Figure 1
Trend of greenhouse gas emissions for the European Union from 1990 to 2022

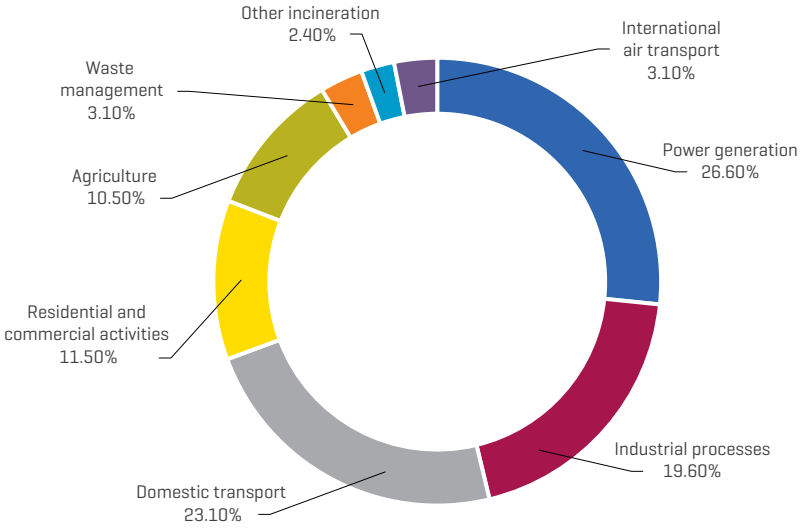
Source: EEA (2025).



Anthropogenic emissions of greenhouse gases are, for the most part, related to the consumption of energy sources in the daily activities of society and are created as a by-product of fuel combustion in power plants, cars, industrial processes, or homes. Agriculture, industry, and the waste sector are also sources of greenhouse gas emissions. Agriculture is the largest emitter of the greenhouse gases methane (28 times CO_2 equivalent) and nitrogen suboxide (265 times CO_2 equivalent). The peculiarity of the European Union's greenhouse gas emissions structure (Figure 2) is the fact that the energy sector accounts for only a quarter (26.6 percent) of the total 3,587 $MtCO_2eq$ emissions of greenhouse gases for the year 2022. It is followed by greenhouse gas emissions from domestic transport (23.1 percent) and industrial processes (19.6 percent).

_Figure 2
Shares of greenhouse gas emissions by sector in the European Union for 2022

Source: EEA (2025).



Once international transport, which is regulated through European Union legislation, is included in the calculation of greenhouse gas emissions, the decline in net greenhouse gas emissions increases to 31 percent for the observed period between 1990 and 2022. European climate law[11] set the reduction of greenhouse gas emissions of the European Union by a minimum of 55 percent by 2030, compared to the emission levels of 1990, as a legal obligation. Preliminary results suggest that 2023 could be a record year for the annual reduction rate of greenhouse gas emissions by as much as 8 percent, which would be a significant step towards climate neutrality for the European Union. According to the reported projections of member states, it appears that by 2030, they would achieve a 49 percent reduction in greenhouse gas emissions compared to 1990, but fail to achieve the 55 percent target.

11 EUR-Lex - 32021R1119 - EN - EUR-Lex, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:32021R1119

The European Union's target of becoming climate-neutral by 2050 is also a step towards achieving energy autonomy and strengthening the competitiveness of the European Union, as well as of all member states. With only five years left until 2030, a key milestone for achieving energy and climate targets, dependence on fossil fuels must be urgently reduced as it increases both energy costs and dependence on third countries, while also accelerating the effects of climate change already being felt across Europe. In 2023 alone, the European Union imported fossil fuels worth more than 430 billion euros. That is 430 billion euros that could be redirected to investments in a clean transition, leading to greater autonomy and security in the European Union.[12]

> The Eurostat report states that in 2023, energy from renewable sources had a share of 24.5 percent in gross final energy consumption in the European Union, which represents an increase by 1.5 percentage points compared to last year.

The Eurostat report[13] states that energy from renewable sources had a share of 24.5 percent in gross final energy consumption in the European Union in 2023, which is an increase in the share of energy from RS by 1.5 percentage points compared to the previous year. The new political period is defined by the Directive (EU) 2018/2001[14] (the so-called RED II) and its amendment, Directive (EU) 2023/2413, which increases the binding common target of the share of energy from renewable sources in total gross final energy consumption from 32 percent to 42.5 percent (aiming for 45 percent), which is between the 40 percent specified in the "Fit for 55" package[15] and 45 percent in the REPowerEU plan. In contrast to the previous political period, no individual targets were assigned per country, but the member states commit themselves through the implementation of the National Energy and Climate Plans (the so-called NECPs) to the cumulative share of energy from RS being equal to the common target for 2030, and individually at least equal to the target from 2020.

> The new binding target for the share of energy from renewable sources by 2030 is set at 42.5 percent, aiming for 45 percent.

In total, 24 member states of the European Union achieved an increase in the share of RS in gross final energy consumption in 2023, and two member states recorded a decrease in the share of RS compared to 2022, while one member state, Croatia, maintained the same share as the previous year. The largest shares of energy from RS are recorded in (Figure 3): Sweden (66.4 percent), Finland (50.7 percent), Denmark (44.4 percent), Latvia (43.2 percent), Estonia (41 percent), Austria (40.8 percent), and Portugal (36.2 percent). Other member states have less than a third of the share of energy from RS, while Ireland (15.3 percent), Malta (15.1 percent), Belgium (14.7 percent), and Luxembourg (14.4 percent) have

12 Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. EU-wide assessment of the final updated national energy and climate plans. Delivering the Union's 2030 energy and climate objectives. {SWD(2025) 140 final}, https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:52025SC0140

13 See more details at: https://ec.europa.eu/eurostat/statistics-explained/index.php?title=Renewable_energy_statistics

14 See more details at: https://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:32018L2001&from=EN#title_1

15 EU economy and society to meet climate ambitions (europa.eu), https://ec.europa.eu/commission/presscorner/detail/en/ip_21_3541

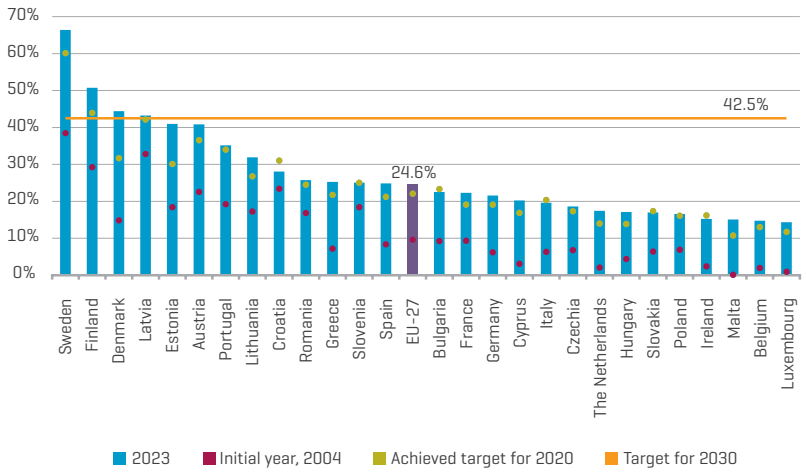
the smallest share of energy from RS. The largest relative increase in the share of energy from RS was achieved by Austria (6.7 percentage points), Bulgaria (3.5 percentage points), and Spain and Finland (3 percentage points each).

_Figure 3

The share of energy from RS in the total gross final energy consumption compared to the initial year of 2004, 2020, and the realized share in 2023, in percentages by member states of the European Union*

Note: * Total share of energy from renewable sources by member states of the European Union and common EU-27 target, 2004–2023, expressed in percentages, according to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



Greater efforts are expected from the 21 member states, given that only six member states are either above the expected target (Sweden with 66.4 percent, Finland with 50.7 percent, Denmark with 44.4 percent, and Latvia with 43.2 percent) or very close to it (Estonia with 41 percent and Austria with 40.8 percent). As many as 14 member states lag behind the average share of renewable sources in the European Union's gross final consumption for 2023. Deviation from common policies related to the European Union's climate and energy targets is recorded in five member states (Croatia, Bulgaria, Italy, Slovakia, and Ireland), which achieved a lower share of renewable energy than in 2020, which was the year of the first legislative framework defined by the RED I Directive. Of these countries, Croatia experienced the largest decline by 3 percentage points (Figure 3).

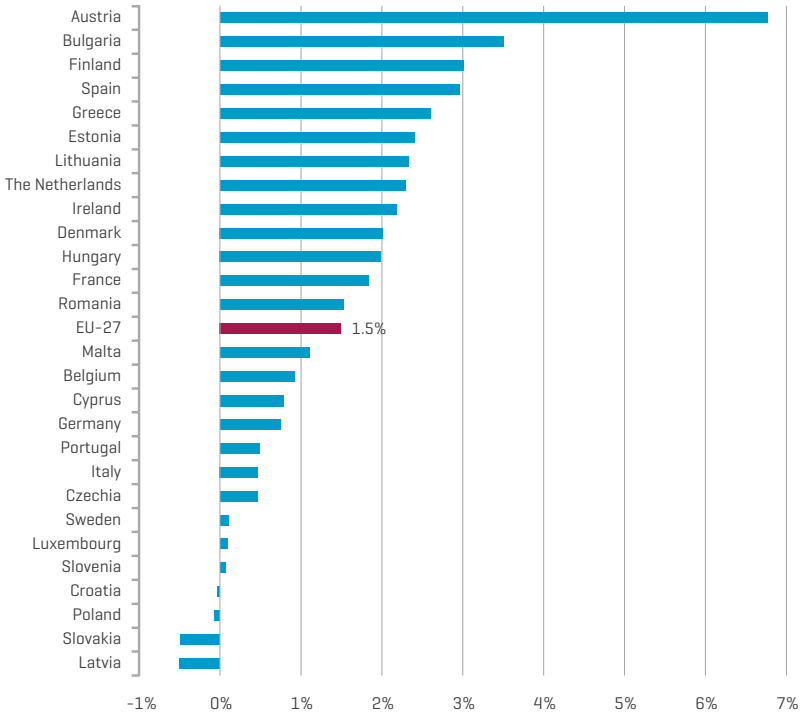
When observing the achievement of the share of renewable sources, it is important to highlight two decisive factors: the increase in energy production from renewable sources by components or sectors and the reduction in total energy consumption, as defined by the Energy Efficiency Directive[16]. It is thus possible for a member state to achieve an increase in production of energy from renewable sources that is not reflected in the percentage share due to an increase in total energy consumption. Similarly, it is possible that constant production of energy from renewable sources is recorded as a percentage increase due to a decrease in total energy consumption.

16 Revised Energy Efficiency Directive (EU/2023/1791).

_Figure 4

Annual growth in the share of energy from renewable sources in total gross final energy consumption in 2023 compared to 2022, in percentage points by European Union member states

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



Looking at the year-on-year rate of change in 2023 (Figure 4), annual growth is observed in 23 member states, with Austria (6.8 percentage points or an annual growth rate of 19.9 percent), Bulgaria (3.5 percentage points or an annual growth rate of 18.3 percent), Spain (3 percentage points or an annual growth rate of 13.5 percent), and Finland (3 percentage points or an annual growth rate of 6.3 percent) standing out in particular. The annual growth achieved at the EU level amounted to 6.5 percent or 1.5 percentage points. Four member states (Croatia, Poland, Slovakia, and Latvia) experienced an annual decline in the share of energy from renewable sources, in absolute and relative terms.

When the total share of renewable sources is broken down into its three basic components, i.e., the share of renewable sources in electricity, the share of renewable sources in transport, and the share of renewable sources in heating and cooling energy, different trends can be observed (Figure 5).

_Figure 5

Evolution of the share of energy from renewable sources in the total gross final energy consumption of the European Union from 2004 to 2023, by components*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

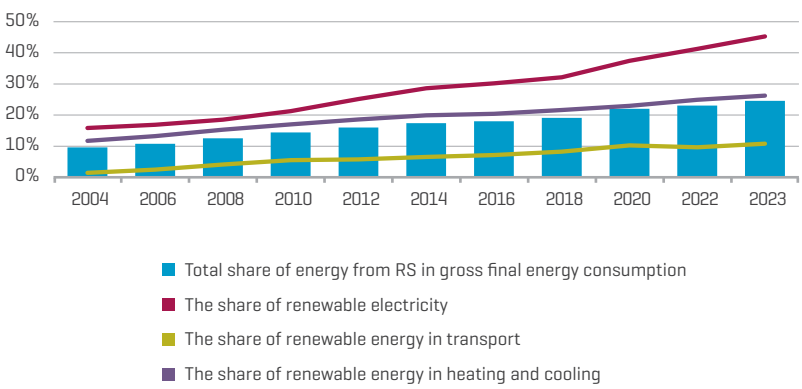
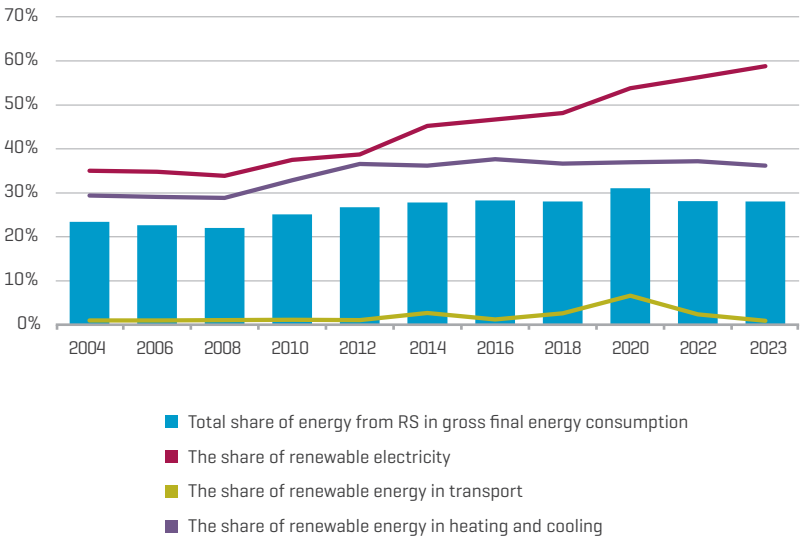


_Figure 6

Evolution of the share of energy from renewable sources in the total gross final energy consumption of the Republic of Croatia from 2004 to 2023, by components*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards. Note that the Republic of Croatia became a full member of the European Union in 2013.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



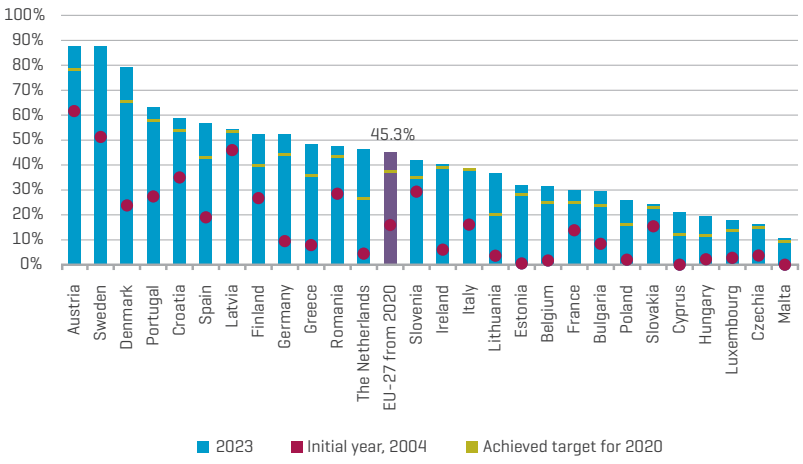
In 2023, the share of renewable sources in electricity production experienced the greatest growth compared to the starting year of 2004, i.e., from 16 percent to 45 percent. At the same time, renewable sources in the transport and heating and cooling sectors achieved more modest shares. The share of energy from renewable sources in transport increased from 1 percent in 2004 to 11 percent in 2023. The share of energy from renewable sources in heating and cooling increased from 12 percent in 2004 to 26 percent in 2023. Croatia exhibited a different trend in the observed period (Figure 6) than the one shown in Figure 5, because Croatia only gained full membership in the EU in 2013. In 2013 and 2023, a total share of energy from renewable sources in gross final consumption of 28 percent was achieved. The share of renewable electricity amounted to 59 percent, the share of renewable energy in heating and cooling amounted to 31 percent, while the share of renewable energy in transport amounted to 1 percent. The evolution of the share of energy from renewable sources in the total gross final energy consumption of the Republic of Croatia indicates uneven growth, with continuous growth of renewable electricity.

_Figure 7

The share of energy from renewable sources in total gross final energy consumption compared to the initial year of 2004, 2020, and the achieved share in 2023, in percentages by European Union member states*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

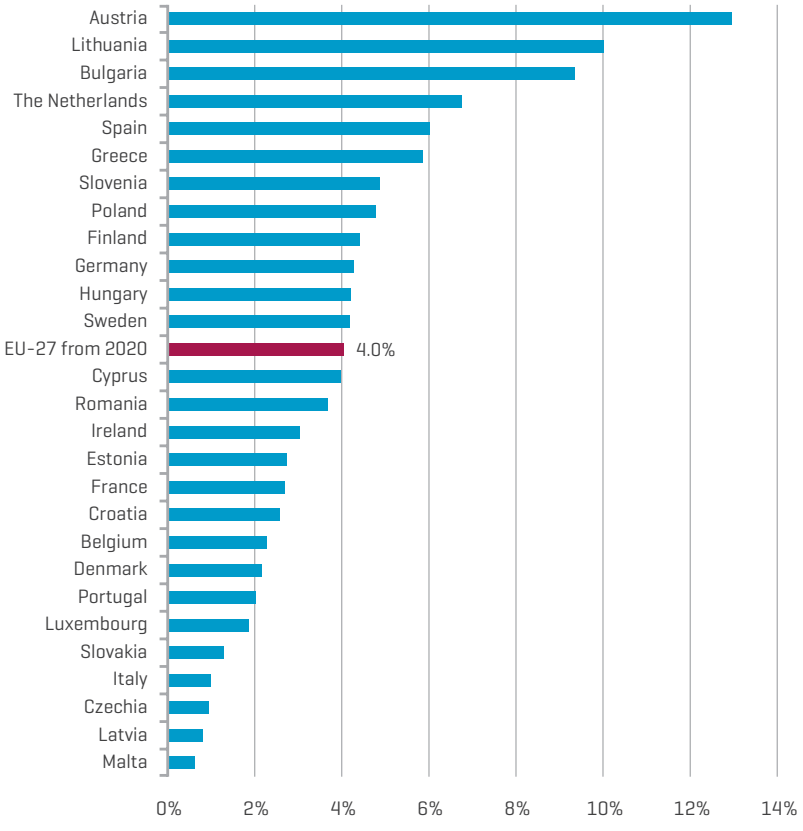


Production and shares of renewable electricity

Strong electrification is being recorded in all member states, with all states achieving higher shares of electricity from renewable sources in 2023 compared to those achieved in 2020. In 2023, the share of electricity from renewable sources at the EU level was 45.3 percent, while 12 member states produced more electricity from renewable sources than the European Union average. In 2023, Austria (87.8 percent) and Sweden (87.5 percent) were close to achieving 90 percent of their electricity from renewable sources, followed by Denmark with 79.4 percent. In 2024, Austria, Sweden, and Latvia already had a more favorable initial position in the production of electricity from renewable sources, due to their large share of hydropower in production. The biggest jump in production of electricity from renewable sources was made by Denmark, which increased its share from 23.8 percent (in 2004) to 79.4 percent (in 2023) in less than two decades.

Figure 8
Annual change in the share of electricity from renewable sources in 2023 compared to 2022, in percentage points by European Union member states

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



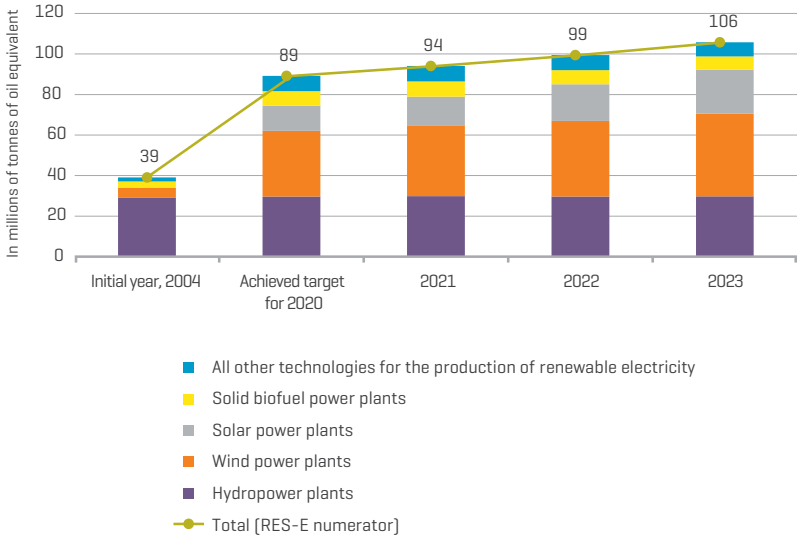
When observing the annual rate of change (Figure 8), all member states are achieving annual growth, with Austria (13 percentage points or an annual growth rate of 17.3 percent), Lithuania (10 percentage points or an annual growth rate of 37.8 percent), and Bulgaria (9.3 percentage points or an annual growth rate of 46.5 percent) standing out in particular. The annual growth achieved at the European Union level was 21.1 percent, or 4 percentage points.

_Figure 9
Production of energy from renewable sources in gross electricity consumption in the European Union, from 2004 to 2023*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



The achieved share of electricity from renewable sources of 45.3 percent or 105.8 Mtoe is mainly due to investments in electricity production from wind power plants (40.7 Mtoe or 39 percent) and solar power plants (21.7 Mtoe or 20 percent) (Figure 9). Hydropower production (29.8 Mtoe or 28 percent) was stable throughout the observed period. The acceptance of wind and solar electricity production requires investment in electricity grid infrastructure in order to accommodate the increased share of unstable production in the grid and ensure a stable supply of electricity to consumers at affordable prices. The only renewable source that enables stable electricity production is biomass, which participates in production with 6.6 Mtoe or 6 percent, as power plants running on solid biofuels, such as wood chips or pellets, and as biogas, which is categorized under other technologies. Other technologies achieved production of 7 Mtoe or a share of 7 percent.

The Republic of Croatia recorded a share of 58.83 percent of electricity from renewable sources, which is higher than the EU average of 45.3 percent for 2023. When looking at the structure of electricity production from renewable sources in the Republic of Croatia, the dominance of hydropower in large hydroelectric power plants, which have maintained production from the years before accession to the European Union in 2013, can be observed. In 2023, hydroelectric power plants accounted for

_Figure 10

Production of energy from renewable sources in gross electricity consumption in the Republic of Croatia, from 2004 to 2023*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

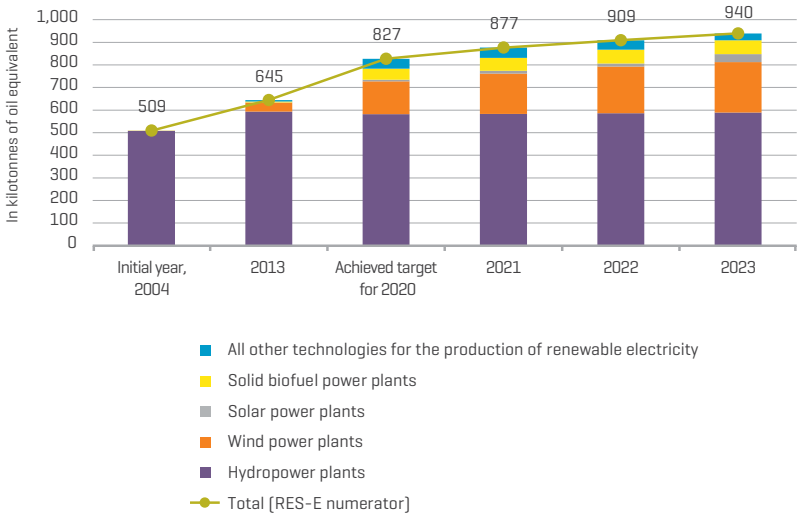
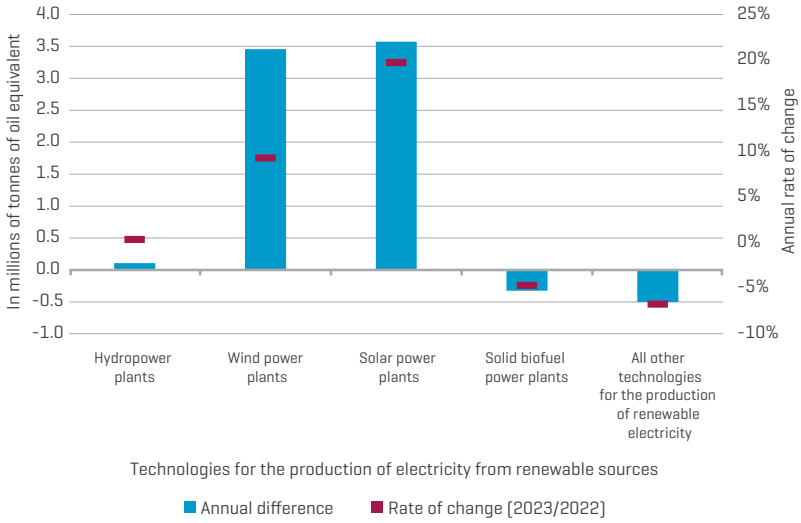


_Figure 11

Annual change in electricity production from renewable sources in the European Union for 2023 compared to 2022, by production technology (in absolute and relative amounts)

Note: Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



63 percent or 589.6 ktoe. This is followed by wind power plants with 24 percent or 222.7 ktoe and power plants using solid biofuels (dominantly wood chips) with 60.7 ktoe or 6 percent. Solar power plants (35.5 ktoe) generate a modest 4 percent, considering the 20 percent share in the entire European Union and the number of sunny hours in the Republic of Croatia. All other technologies for electricity production from renewable sources account for 31.1 ktoe or 3 percent.

Shares of electricity from renewable sources are calculated according to the methodology described in RED I or RED II (Figure 10), as electricity production from renewable sources in the numerator divided by total electricity production from all sources. The reduction in electricity consumption from all sources is the result of energy efficiency measures and intensive electrification through investments in electricity production from renewable sources.

_Figure 12

Annual change in electricity production from renewable energy in the Republic of Croatia for 2023 compared to 2022, by production technology (in absolute and relative amounts)

Note: Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

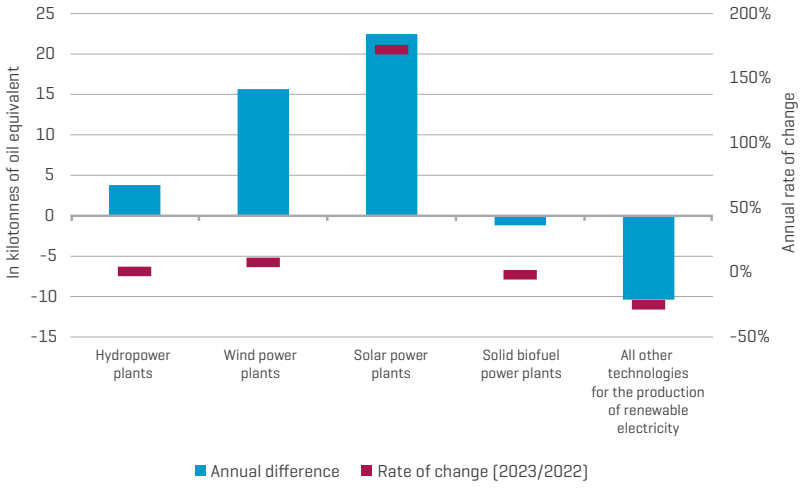


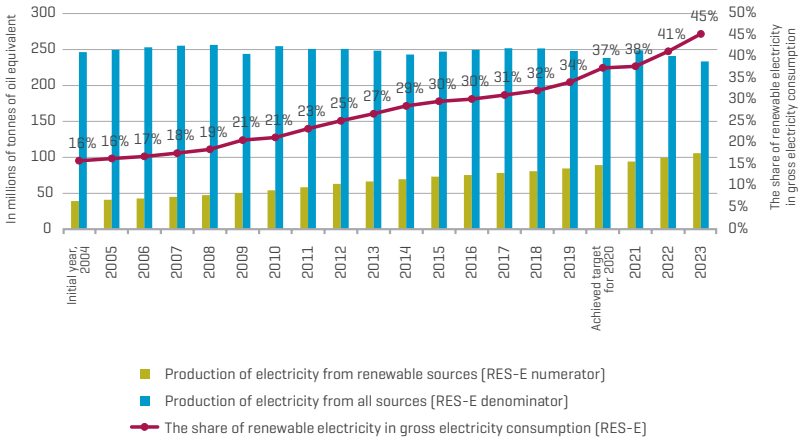
_Figure 13

Production and share of electricity from renewable sources in gross electricity consumption in the European Union, from 2004 to 2023*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

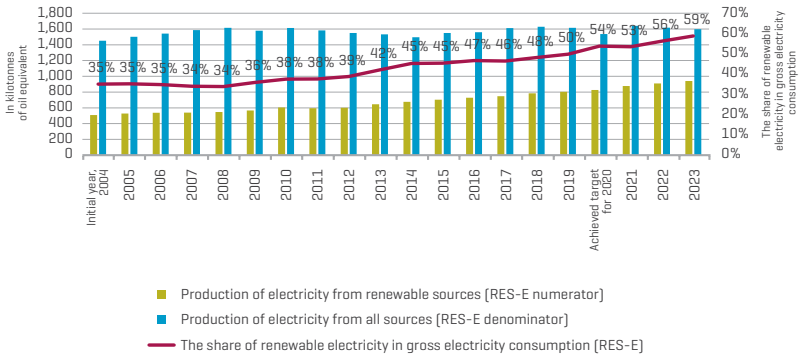


In 2023, investments in solar power plants were a dominant phenomenon in the Republic of Croatia, with an annual rate of change of as much as 172 percent or an increase in production capacity of 22.5 ktoe. A negative rate of change was recorded by solid biofuel power plants (-2 percent or -1.2 ktoe) and all other technologies for the production of renewable electricity (dominantly biogas power plants) (-25 percent or -10.4 ktoe).

Within the European Union, the Republic of Croatia contributes with 0.94 Mtoe of electricity production from renewable sources, achieving a significant 59 percent share of renewable electricity in gross electricity consumption. There is no noticeable decline in total electricity production from all sources; thus, the national trend differs from the overall trend of the European Union.

_Figure 14

Production and share of electricity from renewable sources in gross electricity consumption in the Republic of Croatia, from 2004 to 2023*



Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Production from hydropower plants has been normalized, with pumps turned off. Production from wind power plants has been normalized. Solar power plants include photovoltaic power plants and solar thermal power plants. All other technologies include electricity generation from gaseous and liquid fuels from biomass, renewable municipal waste, geothermal energy, tidal energy, and ocean energy.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

Production and shares of renewable energy for heating and cooling

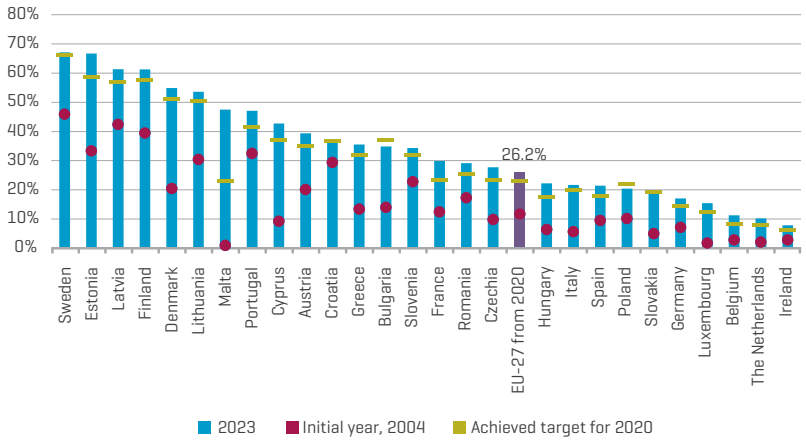
The energy used for heating and cooling depends not only on production, but also on consumption, which is determined by the needs for heating and cooling. Due to mild and shorter winters, the heating season is shortened, which reduces the fuel consumption needed for heating. Hot summers increase the demand for cooling, often through increased electricity consumption in air conditioning units.

In 2023, at the EU level, the total share of energy from renewable sources used for heating and cooling was 26.2 percent, with 17 member states above the average and 10 below it. The Republic of Croatia achieved a 36.2 percent share in heating and cooling from renewable sources (Figure 15).

Figure 15
The share of energy from renewable sources used for heating and cooling compared to the initial year of 2004, 2020, and the achieved share in 2023, in percentages by European Union member states*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

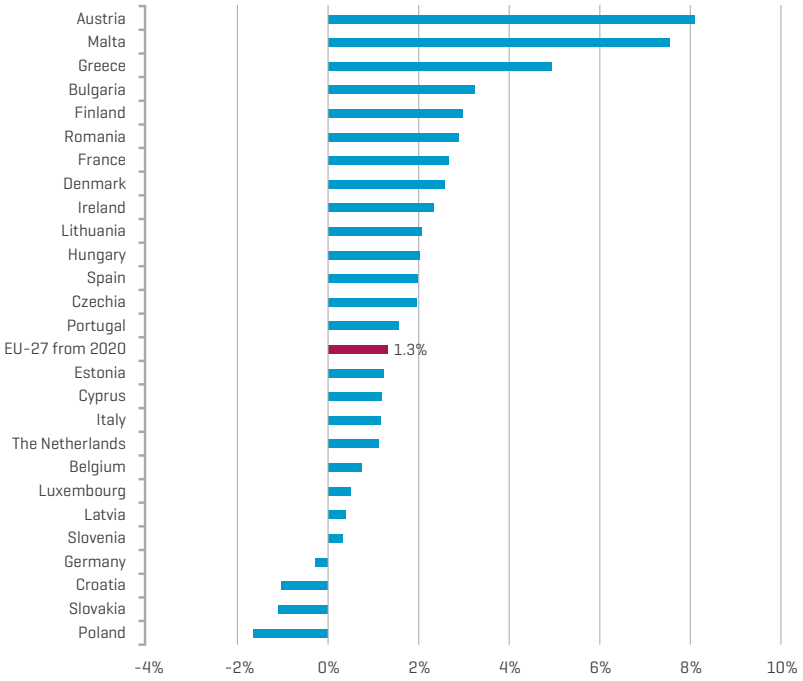


An overview of the annual rate of change by member state in the share of energy from renewable sources for heating and cooling (Figure 16) indicates a large range of changes, from 25.9 percent (Austria) to -7.5 percent (Poland). A total of 23 member states achieved an increase in their share, while Germany (-1.6 percent), Croatia (-2.8 percent), Slovakia (-5.5 percent), and Poland (-7.5 percent) recorded a decrease.

_Figure 16

Annual change in the share of energy from renewable sources for heating and cooling in 2023 compared to 2022, in percentage points by European Union member states

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



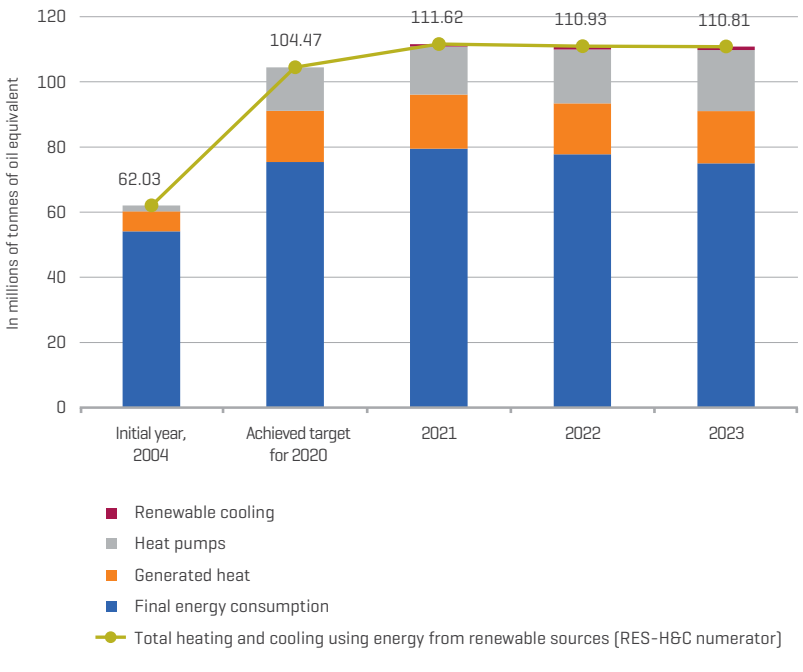
Over the last three years (from 2021 to 2023), the production of energy from renewable sources for heating and cooling in the European Union has remained stable, amounting to approximately 111 Mtoe. The shares of technologies that produced energy for heating and cooling changed slightly, with an increase in the share of heat pumps. In 2023, the share of heat pumps was 17 percent or 18.75 Mtoe. The majority source of renewable energy in heating and cooling in the European Union is final thermal energy consumption, predominantly produced from solid biofuels, i.e., biomass such as firewood, wood pellets in households, and wood residue or chips in larger plants and district heating.

_Figure 17

Production and share of energy from renewable sources in heating and cooling in the European Union, from 2004 to 2023*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



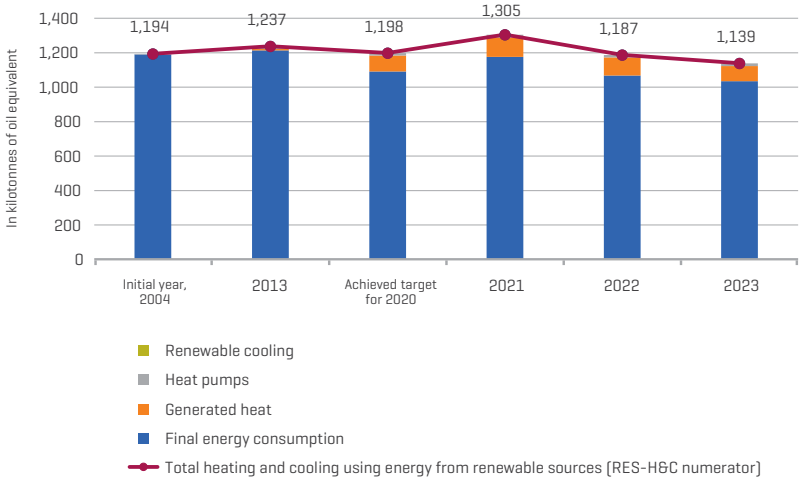
The production of energy from renewable sources for heating and cooling in the Republic of Croatia has also ranged within a narrow range of 1.1 to 1.3 Mtoe from 2004 to 2023 (Figure 18). The shares of technologies that produced energy for heating and cooling changed slightly, with an increase in the share of extracted heat. The share of heat pumps is not visible in Figure 18, and it amounted to 15.7 ktoe or 1.4 percent. In 2023, the share of extracted heat was 8 percent or 88.6 ktoe. The majority source of renewable energy in heating and cooling in the Republic of Croatia (91 percent or 1,034 ktoe) is final thermal energy consumption, predominantly produced from solid biofuels, i.e., biomass such as firewood, wood pellets in households, and some wood residue or chips in larger plants and district heating.

_Figure 18

Production and share of energy from renewable sources in heating and cooling in the Republic of Croatia, from 2004 to 2023*

Note: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



The annual rate of change by technology (Figure 19) indicates an increase in heat pumps by 15 percent, particularly in aerothermal and hydrothermal heat pumps. On the other hand, final energy consumption decreased by 4 percent, or -2.8 Mtoe, which in absolute terms is greater than the increase in heat pumps. There are no records for renewable cooling.

_Figure 19

Annual change in production of energy from renewable sources for heating and cooling in the European Union for 2023 compared to 2022, by production technology (in absolute and relative amounts)

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

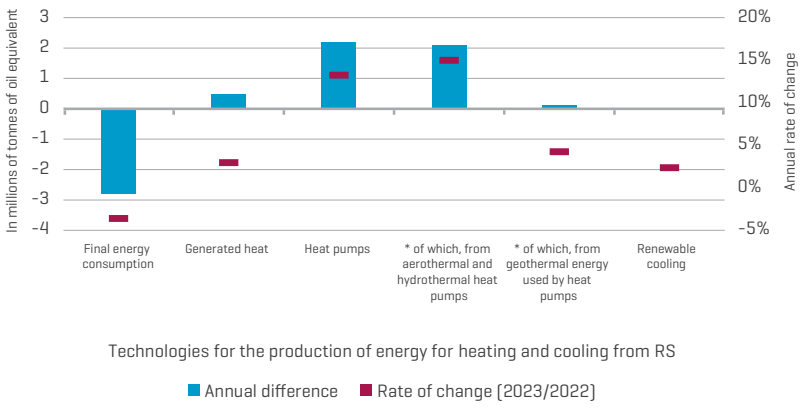
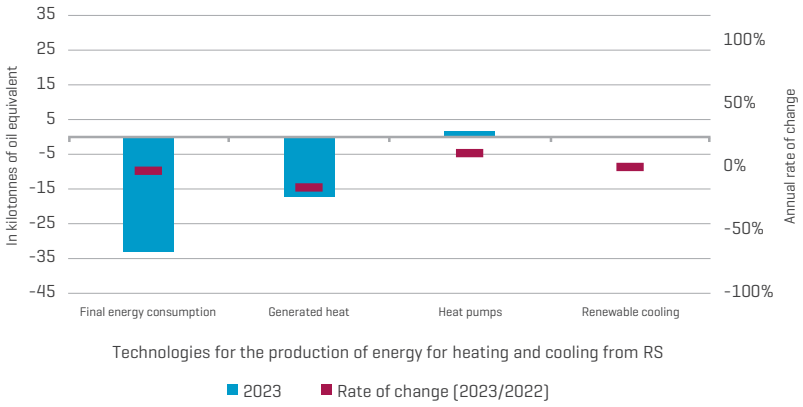


_Figure 20

Annual change in production of energy from renewable sources for heating and cooling in the Republic of Croatia for 2023 compared to 2022, by production technology (in absolute and relative amounts)

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



In the Republic of Croatia, in 2023, compared to 2022, a decrease in final consumption by -3 percent and generated heat by -16 percent is recorded (Figure 20). There are no records for renewable cooling.

Unlike electricity consumption and the transport sector, total fuel consumption for heating and cooling at the EU level is decreasing, while the share of total heating and cooling energy from renewable sources is increasing (Figure 21). Figure 21 shows that the real quantity, measured in Mtoe, has been increasing continuously since 2004, while the relative share, measured in percentage, follows this increase with larger shares due to reduced total consumption. Since the Russian aggression against Ukraine in 2022, the reduced consumption of fossil gas for heating, driven by the REPowerEU plan, has resulted in a significant decrease in fuel consumption for heating and cooling.

_Figure 21

Trend in consumption of energy from renewable sources in heating and cooling in the European Union in the period from 2004 to 2023 and corresponding shares*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

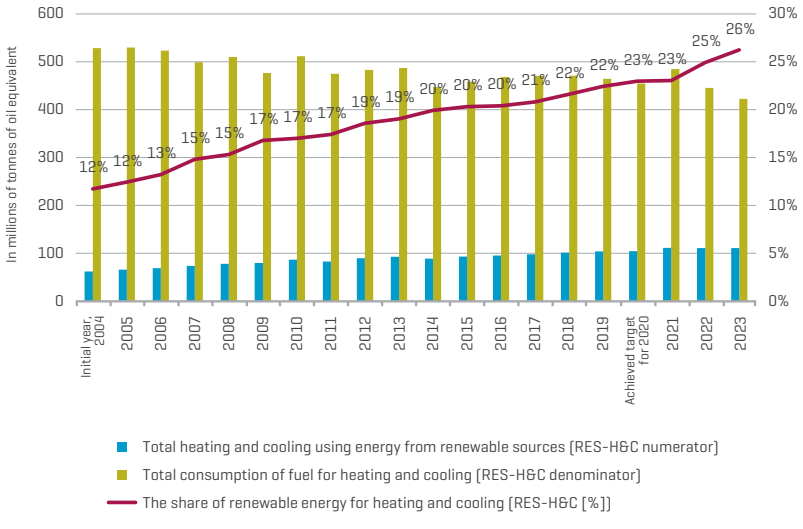
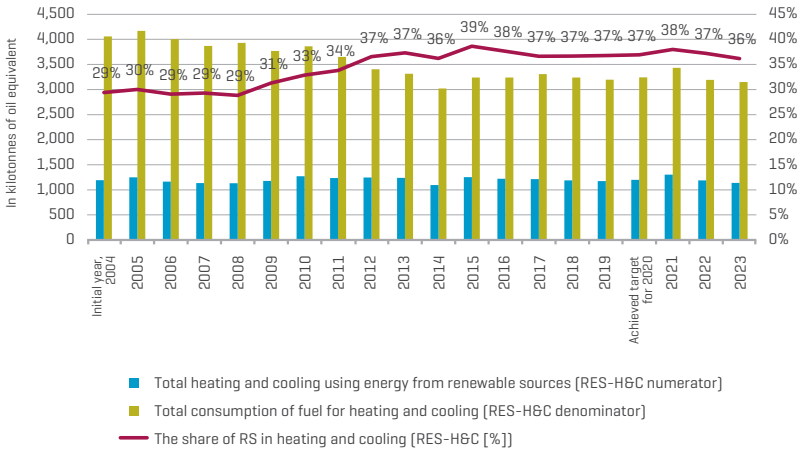


_Figure 22

Trend in consumption of energy from renewable sources in heating and cooling in the Republic of Croatia in the period from 2004 to 2023 and corresponding shares*



Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

The Republic of Croatia joined the European Union with a high share of energy from renewable sources for heating and cooling of 37 percent, which was achieved mainly through the consumption of firewood in households. By observing the trend in the consumption of energy from renewable sources for heating and cooling in the Republic of Croatia in the period from 2004 to 2023, one can observe a correlation in total fuel consumption for heating and cooling with total heating and cooling energy from renewable energy sources since 2013, resulting in a trend in the share of energy from renewable sources in heating and cooling between 36 and 39 percent. In 2023, the share of energy from renewable sources in heating and cooling in the Republic of Croatia was 36 percent, i.e., one percentage point lower than the previous year.

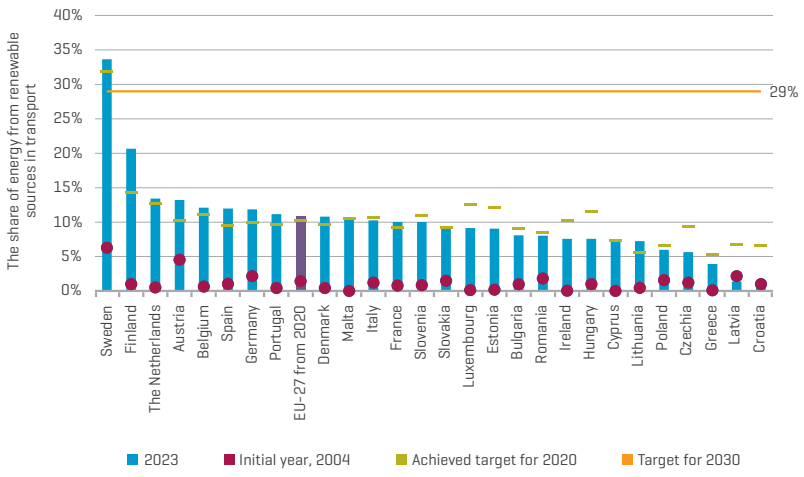
Production and shares of renewable energy in transport

In 2023, the share of energy from renewable sources in transport accounted for 10.8 percent of gross final energy consumption at the EU level (Figure 23), which represents an increase of 1.2 percentage points compared to the previous year. All renewable energy used in transport has been taken into account: liquid biofuels, hydrogen, biomethane, "green" electricity, etc. Sweden already achieves a 29 percent share of energy from renewable energy sources in transport (33.6 percent), but most member states are far from the new target for 2030. The closest to Sweden is Finland (20.6 percent), followed by the Netherlands (13.4 percent), Austria (13.2 percent), Belgium (12.1 percent), Spain (12 percent), Germany (11.9 percent), Portugal (11.2 percent), Denmark (10.8 percent), Malta (10.7 percent), Italy (10.3 percent), France, and Slovenia (10 percent each), as member states that recorded more than a 10 percent share of RS in transport in 2023. A total of 13 member states recorded a decrease in the share of energy from renewable sources in transport in 2023 compared to 2020.

Figure 23
Total share of energy from renewable sources in transport by EU member states and common EU-27 target*

Note: * From 2004 to 2023, expressed in percentages, according to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

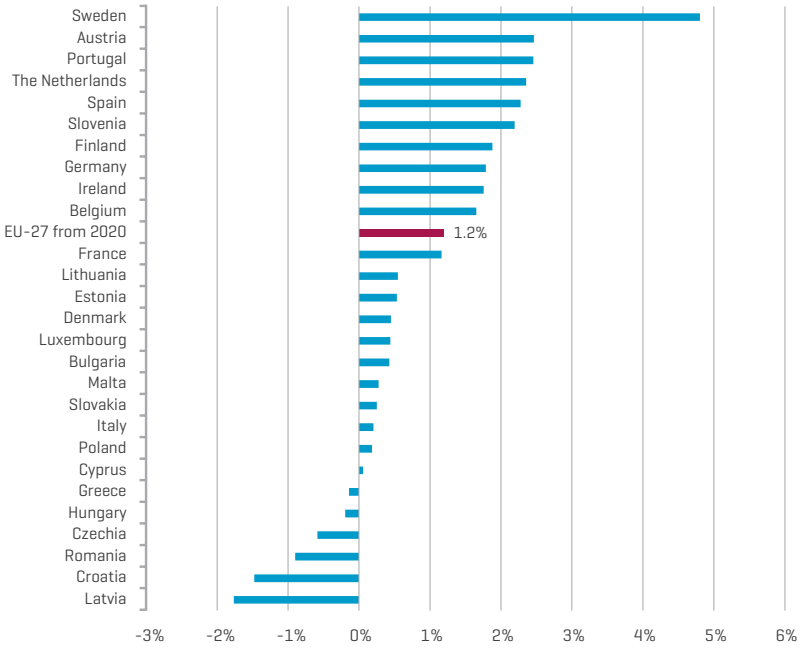


In 2023, the annual change in the share of energy from renewable sources in transport was positive, amounting to 1.2 percentage points at the EU level (Figure 24). However, this positive progress is not balanced across the achievements of all member states. Ten member states achieved rates of change higher than average, 11 member states achieved positive progress, while 6 member states recorded an annual decline in production in 2023 compared to 2022.

_Figure 24

Annual change in production of energy from renewable sources in transport in 2023 compared to 2022, in percentage points by European Union member states

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



The share of energy from renewable sources in transport in the European Union in energy units varies within a narrow range from 24 to 29 Mtoe (Figure 25), with compliant biofuels contributing around two-thirds (61 percent in 2023).

_Figure 25

Production of energy from renewable sources in transport in the European Union, from 2004 to 2023, by fuel*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

** In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

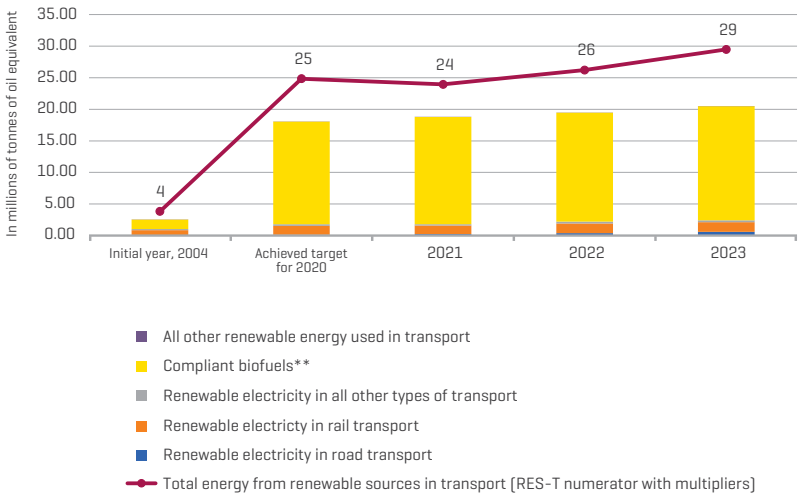
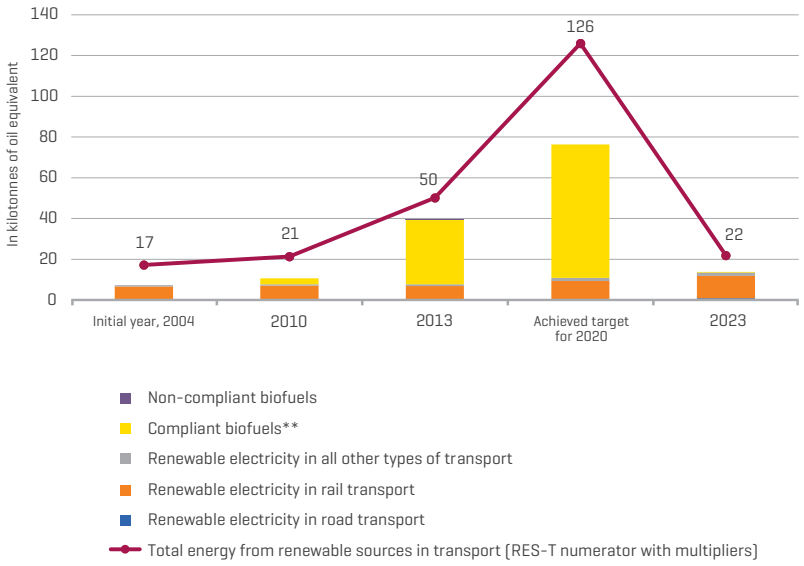


_Figure 26
Production of energy from renewable sources in transport in the Republic of Croatia, from 2004 to 2023, by fuel*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

** In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).

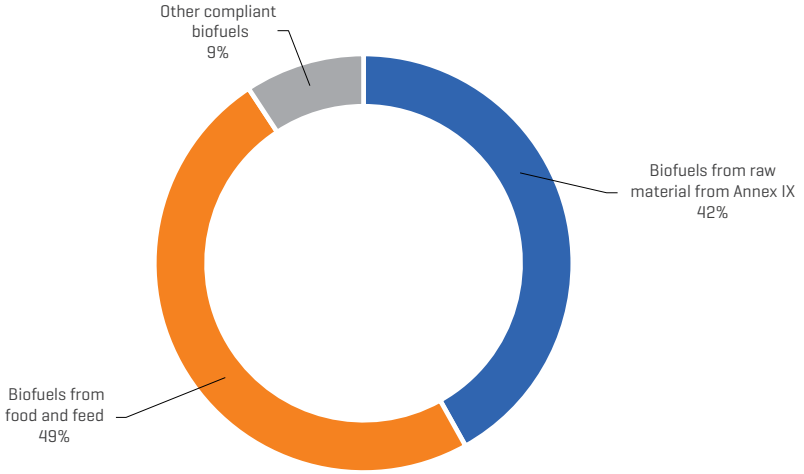


In 2023, the share of energy from renewable sources in transport in the Republic of Croatia did not maintain continuity of growth and recorded a decline in the production of compliant biofuels to a level below the level achieved in 2013, when the Republic of Croatia joined the European Union. The renewable electricity used in transport amounted to 13.49 ktoe. By using the methodology for calculating the share of energy from renewable sources in transport (RES-T denominator), with multipliers, the total share amounts to 21.87 ktoe (Figure 26).

A more detailed insight into the group of compliant biofuels used in the European Union (Figure 27) for 2023 shows the contribution of biofuels from food and feed (7.57 Mtoe or 49 percent), biofuels from waste and residues listed in Annex IX of the RED II Directive (7.57 Mtoe or 42 percent), and other compliant biofuels (1.67 Mtoe or 9 percent). The share of biofuels from food and feed is limited to a total of 7 percent, while the energy value of biofuels produced from raw materials listed in Annex IX of the RED II Directive is double-counted.

_Figure 27
Cross-section of compliant biofuels for 2023 in the European Union

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



Of the compliant biofuels, in 2023, 0.28 ktoe or 100 percent of biofuels from food and feed were placed on the fuel market of the Republic of Croatia, while the share of biofuels from raw materials listed in Annex IX, whose energy value is double-counted through the multiplier, was not recorded.

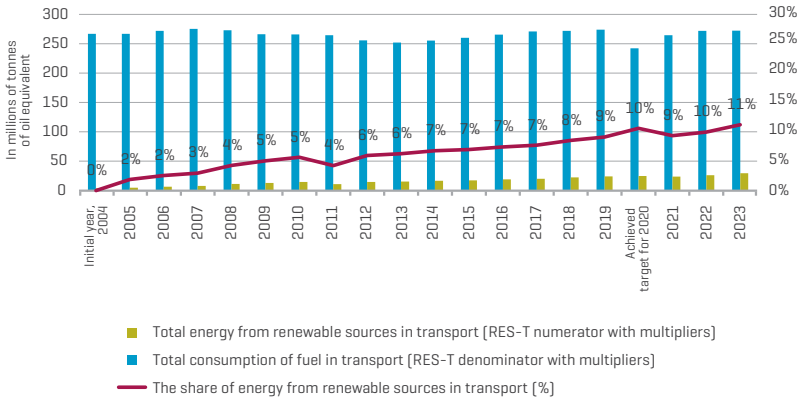
Defossilization of the transport sector represents one of the greatest challenges in achieving common energy and climate targets. Although real production of energy from renewable sources in the European Union has been increasing continuously in the period from 2004 to 2023, its share varies due to the increase in total energy consumption in transport (Figure 28). Figure 28 shows that the real quantity, measured in Mtoe, has been increasing continuously since 2015, while the relative share, measured in percentage, has not followed this increase.

_Figure 28
Trend in consumption of energy from renewable sources in transport in the European Union in the period from 2004 to 2023 and corresponding shares*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



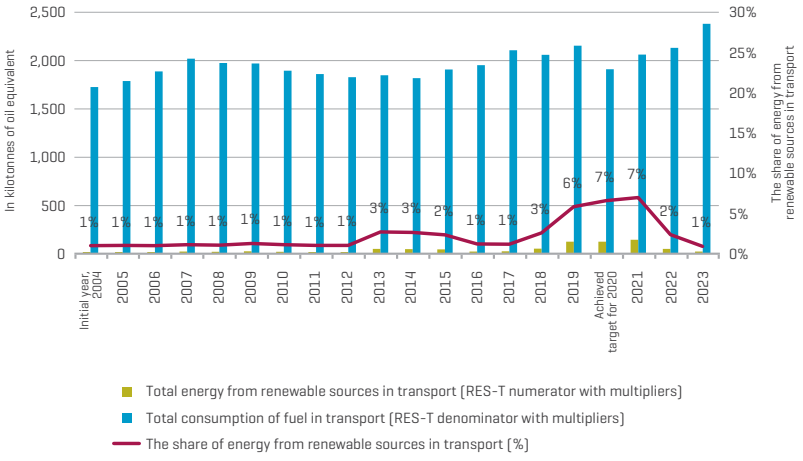
By observing the trend in the consumption of energy from renewable sources in transport in the Republic of Croatia in the period from 2004 to 2023, an increase in fuel consumption in transport over the last three years and a decrease in the consumption of energy from renewable sources can be observed (Figure 29).

_Figure 29
Trend in consumption of energy from renewable sources in transport in the Republic of Croatia in the period from 2004 to 2023 and corresponding shares*

Notes: * According to the methodology from Directive 2009/28/EC until 2020 and Directive (EU) 2018/2001 from 2021 onwards.

In the period from 2004 to 2010, the consumption of all biofuels was included in this category. Since 2011, only biofuels that comply with sustainability criteria and greenhouse gas emission savings have been included.

Source: Eurostat, SHARES 2024 summary results (March 7, 2025).



Integrated National Energy and Climate Plan

National Energy and Climate Plans (NECPs)[17] for the period 2021–2030 are an essential strategic planning tool that enables a fair, resilient, and climate-neutral Europe and directs the necessary investments for the climate and energy transition, helping to mobilize private and public investments.

The NECPs enable each EU member state to communicate concrete actions and policies aimed at achieving the climate and energy policy targets for 2030 and meeting the common EU target. The NECPs originate from Regulation (EU) 2018/1999 on the Governance of the Energy Union and Climate Action (Governance Regulation). The NECPs have a default content template that is organized into five dimensions of the Energy Union:

- decarbonization
- energy efficiency
- energy security
- internal energy market
- research, innovation, and competitiveness.

The NECPs were first published in 2020 and are updated every other year. They have since been updated to include the ambitious targets set by the European Green Plan, the "Fit for 55" legislative package, and the REPowerEU plan, but also due to adaptation to external factors, market dynamics, and available innovations. In 2025, EU member states updated their NECPs. On May 28, 2025, the Commission published its EU-wide assessment of the final updated National Energy and Climate Plans (NECPs), accompanied by the Commission Staff Working Document with individual assessments for the 23 final updated NECPs submitted and assessed to date. Member states were required to submit these final updated NECPs by June 30, 2024, taking into account the Commission's recommendations on the

17 See more details at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025DC0274&qid=1749138488640

draft of the updated NECPs.[18] The joint results of the individual NECPs, after their drafting and negotiation, brought the following conclusions[19]:

- Based on the projections of the member states, the European Commission estimates that the total net emissions of greenhouse gases[20] will be reduced by around 54 percent in 2030 compared to 1990, which shows that the EU is well on its way to achieving the 2030 target. This will depend on the full implementation of existing and additional policies and measures by member states, as well as EU policies.
- It is expected that greenhouse gas emissions from sectors covered by the Effort Sharing Regulation (ESR)[21] will be reduced by around 38 percent by 2030 compared to 2005, which is around 2 percentage points short of the EU target of 40 percent.
- Although several member states have stepped up measures in the agriculture, forestry, and land use sectors compared to the draft plans for 2025, there is still a gap of around 45–60 $MtCO_2$ equivalent (around 100 percent to 140 percent of the additional removal target) compared to the 2030 target in the Land Use, Land Use Change, and Forestry Regulation (LULUCF)[22].
- When it comes to climate change adaptation, only some NECPs sufficiently address preparedness and resilience to the impacts of climate change. Only a few plans consider measures for water supply resilience.
- Most member states report national contributions that are in line with the EU's binding target for 2030 for a renewable energy share of at least 42.5 percent. However, a small gap in ambition of 1.5 percentage points remains.
- Despite the higher contribution of member states to the EU energy efficiency target of 11.7 percent by 2030, ambitions of member states are still insufficient to achieve the EU target, with a gap of 31.1 Mtoe for final energy consumption and 47.3 Mtoe for primary energy consumption. In terms of final energy consumption, this corresponds to an EU ambition level of 8.1 percent.
- In all plans, energy security is improved due to lower gas consumption and diversification of energy sources, including a greater role for nuclear energy in electricity and heat production in several member states.

18 See more details at: https://mzozt.gov.hr/azurirani-integrirani-nacionalni-energetski-i-klimatski-plan-republike-hrvatske-za-razdoblje-od-2021-2030-necp/9220

19 See more details at: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025DC0274&qid=1749138488640

20 Total net greenhouse gas emissions (including the LULUCF sink), including Commission estimates of emissions from international transport regulated by EU law. The estimates take into account preliminary information provided by Belgium, Estonia, and Poland, which have not yet submitted their final national energy and climate plans. For more details see annex at https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52025DC0274&qid=1749138488640

21 Regulation (EU) 2023/857 amending Regulation (EU) 2018/842.

22 Regulation (EU) 2023/839 amending Regulation (EU) 2018/841.

However, infrastructure needs to be better adapted to a decarbonized energy system, increased electrification based on variable renewable energy sources, and unpredictable threats such as climate change and cybersecurity.

- In the internal energy market, member states have introduced new measures to promote flexibility, stabilize the market, and facilitate the penetration of renewable energy sources in their final plans. However, additional measures are needed to develop cross-border interconnections and further market integration.
- The final NECPs show an increased focus on industry competitiveness, supply chain resilience, innovation, and skills development. However, with a few exceptions, the plans generally lack specific and implementable targets in these areas.
- Approximately half of the plans recognize the importance of phasing out fossil fuel subsidies, but most do not include a list of existing fossil fuel subsidies, specific deadlines, and measures to phase them out.
- When it comes to just transition, the plans mainly describe the impact of the energy transition on skills and training needs, but lack a detailed analysis of the effects on society and the labor market, particularly for vulnerable households, employees, and regions. More specific measures and a clear indication of the financial resources needed to mitigate these impacts would be useful. Moreover, member states do not provide an adequate analytical basis for the preparation of their social climate plans.
- Most member states take energy poverty into account and outline structural or income support measures with a focus on energy efficiency, renovation of buildings, and decarbonization. At the same time, only a few member states provide clear definitions of energy poverty or set concrete targets for its reduction.
- Estimates of investments of member states have increased significantly compared to the draft plans, but they need to be further refined and a comprehensive strategy for mobilizing public and private finance to improve investor certainty needs to be developed. This would enable the NECPs to become concrete investment plans.
- Most plans provide a clear overview of the public consultation process for the preparation of the final NECPs. Participation processes could have been more inclusive and effective if more information had been provided and longer consultation deadlines had been given.

Revised Integrated National Energy and Climate Plan of the Republic of Croatia

For the Republic of Croatia, the Integrated National Energy and Climate Plan (NECP) for the period from 2021 to 2030, in accordance with Article 12 of the Act on Strategic Planning and Development Management System of the Republic of Croatia (Official Gazette 123/17, Official Gazette 151/22) is adopted by the Government of the Republic of Croatia at the proposal of the Ministry of Economy and Sustainable Development.

On March 26, 2025, the Government of the Republic of Croatia adopted the revised Integrated National Energy and Climate Plan for the Republic of Croatia for the period from 2021 to 2030 (NECP). According to the Conclusion of the Government of the Republic of Croatia on the NECP, the Ministry of Environmental Protection and Green Transition and the Ministry of Economy are responsible for coordinating activities in its implementation. In accordance with the Conclusion of the Government of the Republic of Croatia, the Ministry of Economy submitted the revised NECP to the European Commission on March 27, 2025.

The NECP has been revised to enable the implementation of the new EU energy and climate legislative package "Fit for 55" and for Croatia to make a proportionate contribution to the common target of reducing greenhouse gas emissions by -55 percent by 2030 compared to 1990. The long-term target of Croatia, as a member state of the European Union, is to set itself on a path to achieving net climate neutrality by 2050.

_Table 1
The most important indicators and targets of NECP for the year 2030 for the Republic of Croatia

Source: Ministry of Environmental Protection and Green Transition (2025).

Indicator	Target
Reduction in greenhouse gas emissions in the ETS sector, compared to 2005	-62%
Reduction in greenhouse gas emissions in non-ETS sectors, compared to 2005	-16.7%
Value of net greenhouse gas removal in 2030	-5,527 kt CO_2eq
Share of renewable energy sources (RES) in gross final energy consumption	42.5%
Share of renewable energy sources (RES) in final energy consumption in transport	24.6%
Primary energy consumption (total energy consumption without non-energy consumption)	336.9 PJ (8.05 Mtoe)
Final energy consumption	246.2 PJ (5.88 Mtoe)

The Act on Climate Change and Ozone Layer Protection stipulates that the NECP is an implementing document of the long-term Low-Carbon Development Strategy and that the ministry responsible for its development is the ministry responsible for energy in cooperation with the ministry responsible for climate.

The NECP was developed and revised under the EU Regulation on the Governance of the Energy Union and Climate Action (Regulation (EU) 2018/1999) and is key to achieving the shared ambition of climate neutrality adopted in the "European Climate Law" (Regulation (EU) 2021/1119). Regulation (EU) 2018/1999 provides for regular updates of national plans, and the Republic of Croatia, by taking into account significant changes in the energy and economic sectors, has carried out an appropriate revision of its Integrated National Energy and Climate Plan.

_Table 2 **Overview of the main indicators, targets, and contributions of the final updated NECP for the Republic of Croatia**

Indicator	2020	Progress compared to the latest available data	National targets and contributions for 2030	Assessment of the level of ambition for 2030
Binding target for greenhouse gas emissions from the sector according to the Effort Sharing Regulation (ESR), compared to 2005 (%)		2022: 0.1% 2023: -9.9%	-16.7%	NECP: -21.3%
Binding target for additional net removals of greenhouse gas emissions referred to in the Regulation on Land Use, Land Use Change, and Forestry (LULUCF) ($MtCO_2$ equivalent of net greenhouse gases removed)		2022: reported net removal of -4.9 $MtCO_2$ equivalent	-0.6 $MtCO_2$ equivalent (additional target)	According to projections, insufficient ambition: a shortfall of 2 $MtCO_2$ equivalent compared to the target for 2030.
National target / contribution to energy from renewable sources Share of energy from renewable sources in gross final energy consumption (%)	31.0% (SHARES) 20% (target)	2021: 31.3% 2022: 28.1% 2023: 28.1%	42.5%	Croatia's contribution of 42.5% is slightly below the required 44%, according to the equation in Annex II of the Governance Regulation[23].
National contribution to energy efficiency				According to projections, Croatia is achieving its targets.
Primary energy production	10.7 Mtoe	2022: 8.30 Mtoe 2023: 8.54 Mtoe	8.050 Mtoe	Croatia's contribution to primary energy production is 8.05 Mtoe. Equation from Annex I of the recast of the Energy Efficiency Directive[24]: 6.83 Mtoe.
Final energy consumption	7 Mtoe	2022: 6.89 Mtoe 2023: 7.11 Mtoe	5.88 Mtoe	Croatia's final energy consumption of 5.88 Mtoe is in line with the national contribution under EU legislation.
Electricity interconnection level (%)	52.5%	2024: 36.7%	15%	Croatia exceeds the EU's interconnection target.

Source: Commission Staff Working Document accompanying the document. Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. EU-wide assessment of the final updated national energy and climate plans. Delivering the Union's 2030 energy and climate objectives {COM(2025) 274 final}[25].

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