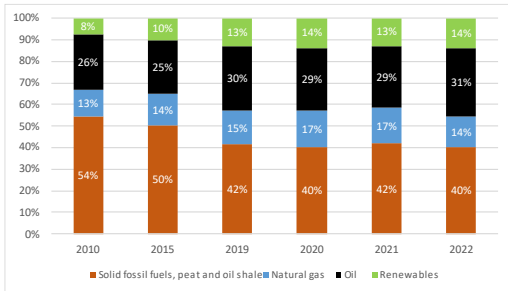


State of the Energy Union 2024: Poland

Key energy figures

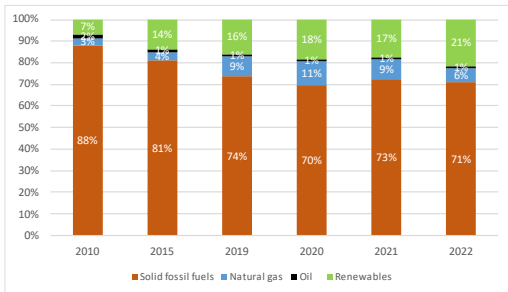
Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 4.4 million TJ. (7.8% of the total EU consumption).

Source: Eurostat

Graph 2: **Electricity mix**



(1) The 2022 gross electricity production was 178.7 TWh. (6.4% of the total EU production).

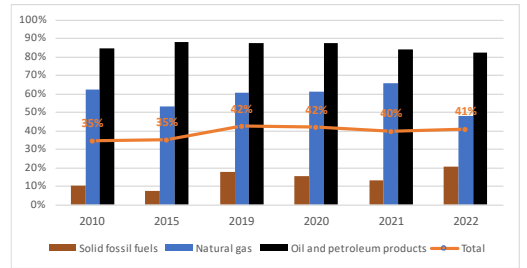
Source: Eurostat

- Fossil fuels account for 86% of Poland's **energy mix** (compared to 69% at EU level). The share of renewables was 14%.
- The **electricity mix** of Poland is dominated by fossil fuels with 78.5% (compared to 38.6% at EU level). Renewable energy accounts for the remaining 21.4% of the electricity mix (compared to 39.4% at EU level).

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

Graph 3: **Import dependency on fossil fuels**



(1) The graph shows the Member States' import dependency on third countries by fuel type.

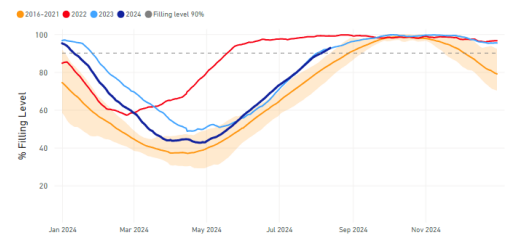
(2) Combustible renewables and electricity are excluded.

(3) The total amount takes into consideration the energy mix of the country.

Source: Eurostat

2. FLEXIBILITY OF THE ENERGY SYSTEM

Graph 4: **Storage levels in Poland**



Source: JRC calculation based on AGSI+ Transparency Platform, 2024

- Poland has **seven gas storage facilities** with a total capacity of **3.8 bcm**, representing 19% of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 94.41%.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

Table 1: Electricity interconnectivity

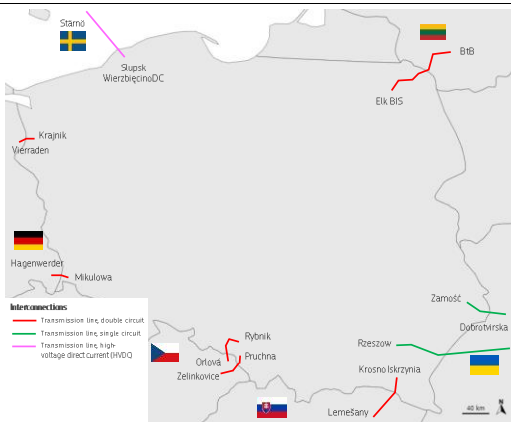
2024	2030 target
5.1 %	At least 15%

1) The electricity interconnectivity is a ratio of electricity import capacity of a given Member State (sum of net transfer capacities of interconnectors with neighbouring Member States) and its total power generation capacity. The 2030 level represents the general interconnectivity target of 15%.

Source: European Commission's own calculations based on the ENTSO-E Winter Outlook 2023-2024 data

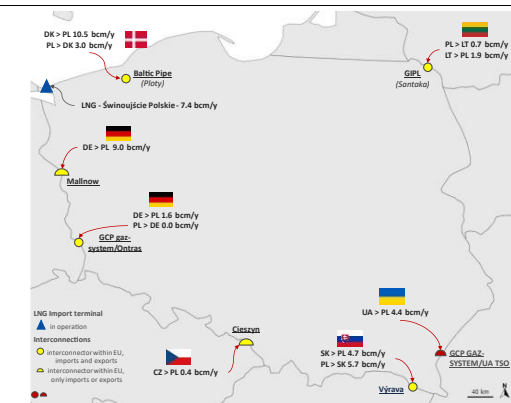
2. ENERGY TRANSMISSION INFRASTRUCTURE

Map 1: Cross-border electricity infrastructure



Source: DG ENER map recreation (based on ENTSO-E)

Map 2: Cross-border gas infrastructure



(1) The capacities are based on ENTSO-G 2024 capacity dataset (as of 11 January 2024) and the ENTSO-G Transparency Platform.

Source: DG ENER map recreation (based on ENTSO-G)

(1) ACER, 2024 Retail Market Monitoring Report, Energy retail and decarbonisation (forthcoming).

3. MARKET INTEGRATION

Rollout of electricity smart meters

- At 27%, Poland has progressed with rollout of smart meters; however, access of consumers to near real time consumption data is not granted⁽¹⁾.

Diversification of gas supplies

- In 2023, Poland had 13 natural gas supply sources, compared to 8 in 2021. Its three largest suppliers accounted for 68%, with Norway being the main supplier, holding a share of 30%. In 2021, Russia with 50%, its own domestic production with 17%, and Germany (10%) were Poland's biggest natural gas supply sources.⁽²⁾

4. ENERGY POVERTY, SOCIAL CLIMATE PLAN AND JUST TRANSITION

Table 2: Energy poverty

Indicator	%		Evolution compared to	EU average
	2023	2021		
EED NECPs four main indicators				
Inability to keep home adequately warm	4.7	+1.5 pp	-1.3 pp	10.6
Arrears on utility bills	4	-1.2 pp	-4.5 pp	6.9
Share of pop. With leak, damp or rot in dwelling	5.7	-0.3 pp	-6.2 pp	15.5
AROP (At risk of poverty)	14	-0.8 pp	-1pp	16.2

Source: Eurostat

Social Climate Plan

- Member States need to submit these plans to the European Commission by June 2025.
- Maximum financial allocation for Poland: EUR 12 714 million or 17.61 % of total SCF.

Just Transition Plan

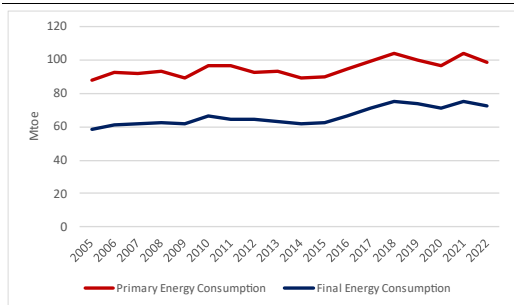
- The Polish Territorial Just Transition Plans (TJTP) outline the transition away from coal in five regions – Wielkopolska, Lower Silesia, Silesia with oświęcimski powiat in Małopolska, and Łódzkie (area of Bełchatów). The plans set out how the Just Transition Fund (JTF), with the EU largest national allocation of EUR 3.8 billion, will support the conversion of fossil fuel power plants, workers, and local communities. In the 2023 draft National Energy and Climate Plan (NECP), Poland set itself a coal phase-out commitment for 2049.

(2) ACER-CEER Annual Report Monitoring: the Internal Gas Market in 2022 and 2023.

Energy efficiency

1. ENERGY EFFICIENCY

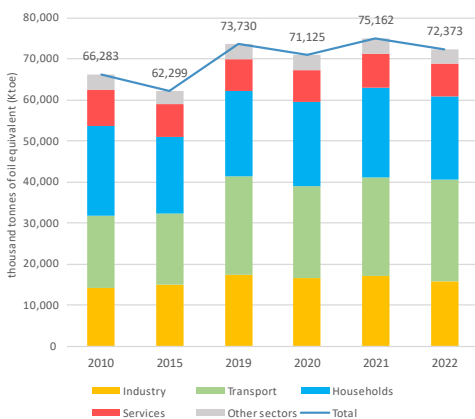
Graph 5: Primary and final energy consumption



Source: Eurostat

- In 2022, Poland's **Primary Energy Consumption (PEC)** amounted to 98.6 Mtoe, 5.2% lower than in 2021, while its **Final Energy Consumption (FEC)** amounted to 72.4 Mtoe, 3.6% lower than in 2021.

Graph 6: Final energy consumption by sector

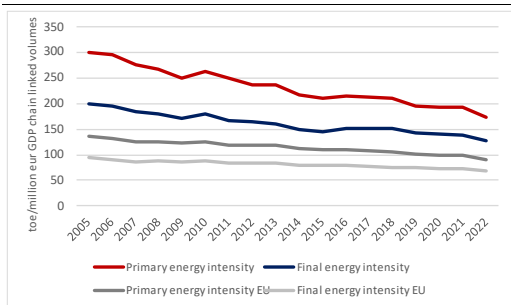


(1) Final energy consumption excludes consumption of the energy sector (including transformation and distribution losses) and non-energy use of energy carriers.

Source: Eurostat

(3) Following JRC's methodology (see for reference "Energy Consumption and Energy Efficiency trends in the EU, 2000 – 2020).

Graph 7: Primary and final energy intensity



Source: Eurostat

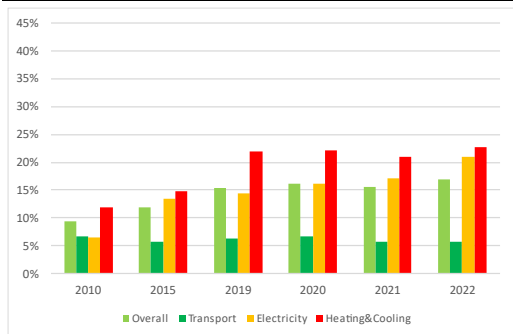
2. ENERGY PERFORMANCE OF BUILDINGS

- In 2022, Final Energy Consumption (FEC) in the Polish **residential sector** was **20.3 Mtoe**, representing a **reduction of 6.9%** compared to 2021. In the **services sector**, FEC was **8.2 Mtoe**, with an **3.7% decrease** compared to 2021. However, climate corrected data⁽³⁾ show a **residential FEC increase of 2.4%** from 2021 to 2022, indicating that the above reduction is mostly climate-related (e.g. milder winter) rather than linked with an improvement of the building stock.
- Heating and cooling account for around **81%** of the country's residential final energy consumption, with renewables supplying approximately **23%** of the gross final energy consumption for heating and cooling. Around 125,000 heat pumps were sold in 2023, representing a decrease of 40% compared to the sales of the previous year, reaching a total stock of around 664,000 installed heat pumps, as per the European Heat Pump Association (EHPA).
- In 2023, **4.0%** of the total population was experiencing difficulties on paying their utility bills while **4.7%** was not able to keep their home adequately warm over the cold periods of the year (with a mixed evolution compared to 2021, when such figures were, respectively, 5.2% and 3.2%). This underlines the importance to increase rate and depth of building renovation, specifically of worst-performing buildings.

Decarbonisation and climate action

1. SECTORAL SHARE OF RENEWABLE ENERGY

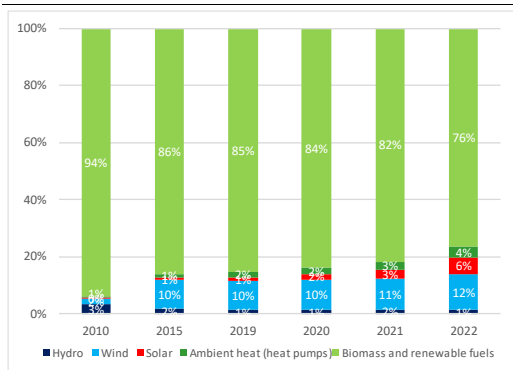
Graph 8: Share of renewable energy sources



(1) In % of gross final consumption of energy.

Source: Eurostat

Graph 9: Renewable energy mix

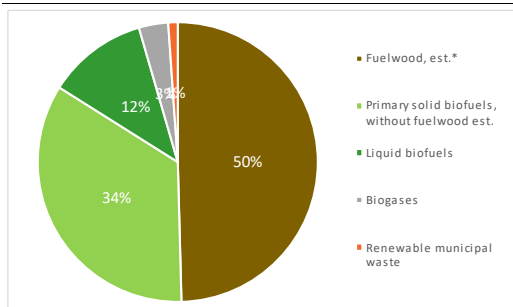


(1) In % of gross final consumption of energy.

Source: Eurostat

2. BIOENERGY MIX

Graph 10: Bioenergy mix



(1) In % of gross final consumption of energy (2022).

(2) * Fuelwood estimate, based on the Primary solid biofuels consumption in Other sectors, Eurostat and industry secondary data, DG ENER estimations.

Source: Eurostat and DG ENER

- For more information see the dedicated [website on biomethane country fiches](#).

3. HYDROGEN

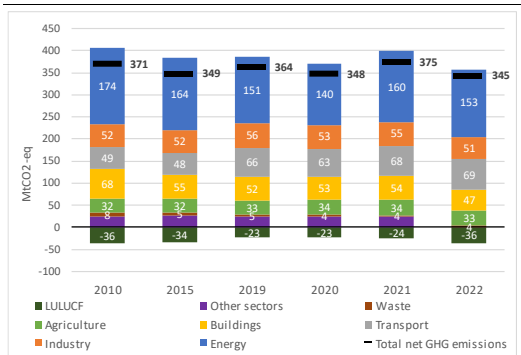
Table 3: Operational hydrogen projects

Name	Description
Tauron CO2-SNG	18 Nm ³ /h connected to the grid
Trzebinia refinery	350 t H ₂ /y online since 2021

Source: European Commission based on IEA data

4. GREENHOUSE GAS EMISSIONS

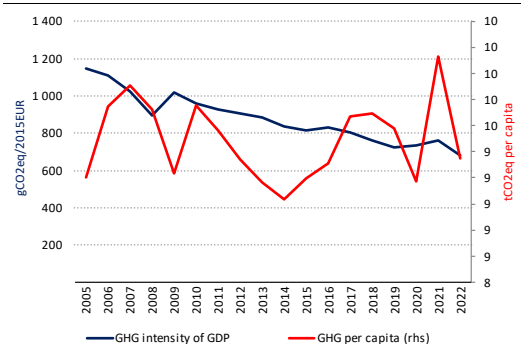
Graph 11: Greenhouse gas emissions by sector



Based on UNFCCC GHG Inventory reporting as per the IPCC categories: (1) Energy sector refers to electricity and heat production and petroleum refining. (2) Industry includes fuel combustion in manufacturing and construction and emissions in industrial processes and product use. (3) Buildings include emissions from energy use in residential and tertiary buildings, and energy use in agriculture and fishery sectors. (4) Total net GHG emission including LULUCF and excluding international aviation.

Source: Greenhouse gas inventory 1990-2022 (EEA)

Graph 12: GHG per capita and GHG intensity of GDP



(1) Total greenhouse gas emissions, including LULUCF and excluding international aviation.

Source: Greenhouse gas inventory 1990-2022 (EEA). Real GDP in 2015-prices (AMECO, European Commission). Population (Eurostat).

- With 682 gCO₂eq/2015EUR, Poland lies above the EU average in terms of GHG intensity of GDP.

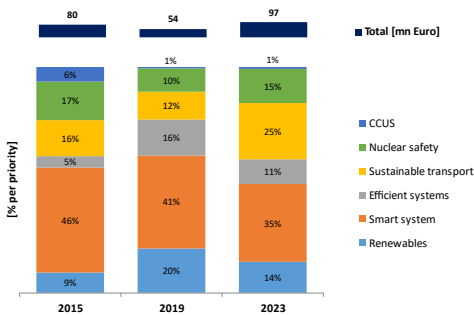
- With 9 tonnes of CO2 equivalent per capita, Poland is above the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see [Progress on climate action \(europa.eu\)](https://ec.europa.eu/eurostat/tgm/table.do?tab=table&init=1&language=en&plugin=1).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

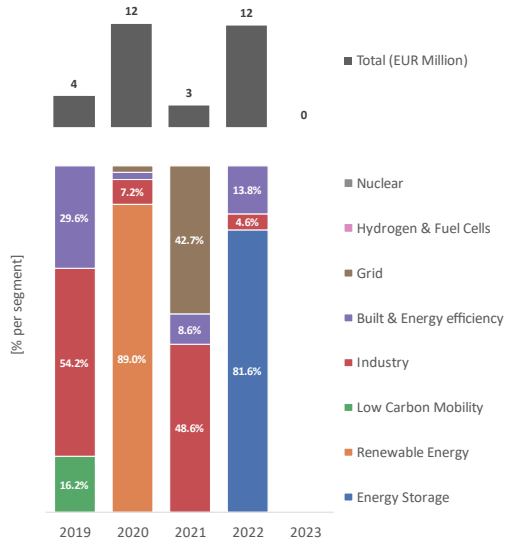
- Public investment in research and innovation (R&I) in Energy Union priorities⁽⁴⁾ decreased from 0.019% in 2015 to 0.013% in 2023 (share of GDP).⁽⁵⁾

Graph 13: Public investment in Energy Union R&I priorities



Source: JRC SETIS 2024

Graph 14: Venture capital investment in net-zero energy technology (start-ups and scale-ups)



(1) Firms typically use venture capital to expand, break into new markets, and grow faster. Venture capital is essential for the growth of innovative firms and it is key to foster the EU's competitiveness and to strengthen the EU's technology sovereignty in the net-zero energy sector.

Source: JRC elaboration based on PitchBook data (08/2024)

2. NET-ZERO ENERGY TECHNOLOGIES

- Poland exhibits considerable manufacturing capacity for clean technologies and has great potential for further increases, notably in the battery and solar PV supply chain. There are several module manufacturing units throughout the country, which all together have an estimated 450 MW annual output capacity. Additionally, a cell manufacturing plant with a targeted capacity of 100 MW came online in Wrocław in 2021, and the first Polish gigafactory for cell production is underway in Racibórz, expected to start production in 2025/2026. Poland is active in the production of onshore wind towers and blades. To keep pace with Poland's growing offshore wind sector, three large-scale assembly lines for offshore towers and nacelles are currently in progress in Szczecin and Gdansk. Regarding energy storage and production of batteries, Poland leads Europe in lithium-ion battery production, with net exports exceeding 6 billion EUR in 2022. Displaying a current capacity of 70 GWh/y, the main battery producer in Poland is a Korean-

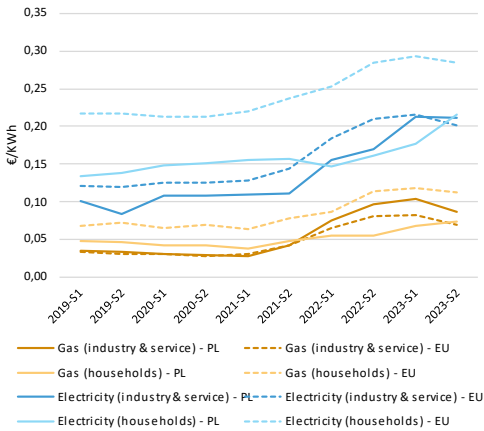
⁽⁴⁾ Renewables, smart system, efficient systems, sustainable transport, CCUS and nuclear safety, COM(2015) 80 final ('Energy Union Package').

⁽⁵⁾ Source: JRC SETIS 2024

owned facility in Biskupice Podgórne, which is poised to achieve an annual output target of 115 GWh by 2025. A European company also invests in the large-scale battery manufacturing plants with an estimated capacity of 40 GWh in 2024, that are expected to bolster Poland's leading position on the market and further contribute to the EU's goals for autonomy in the net-zero industry. Also, essential production units for electrolytes, cathodes and separators are already operational in Poland, and additional capacity is in development. Regarding the green hydrogen supply chain, promising initiatives are underway in Poland. Two dynamic firms based in Gdansk have recently initiated the production of electrolyzers, there are other small enterprises in this sector. The National Strategy for Hydrogen, which is expected to be updated, also features hydrogen prominently in R&I, production, and end use sectors. Poland is also interested in supporting the emergence of Hydrogen Valleys, as part of the national and European priority.

3. ENERGY PRICES DEVELOPMENT

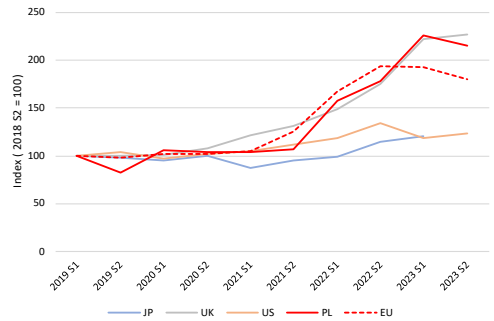
Graph 15: Poland's energy retail prices for households and industry & service



- (1) For industry, consumption bands are I3 for gas and IC for electricity, which refer to medium-sized consumers and provide an insight into affordability.
- (2) For households, the consumption bands are D2 for gas and DC for electricity.
- (3) Industry prices are shown without VAT and other recoverable taxes/levies/fees as non-household consumers are usually able to recover VAT and some other taxes.

Source: Eurostat

Graph 16: Trends in electricity prices for non-household consumers (EU and foreign partners)

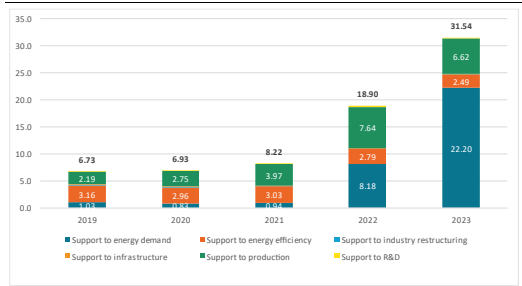


- (1) For Eurostat data (EU and PL), the band consumption is ID referring to large-sized consumers with an annual consumption of between 2 000 MWh and 20 000 MWh, such as in electricity intensive manufacturing sectors, and gives an insight into international competitiveness.
- (2) JP = Japan

Source: Eurostat, IEA

4. ENERGY SUBSIDIES

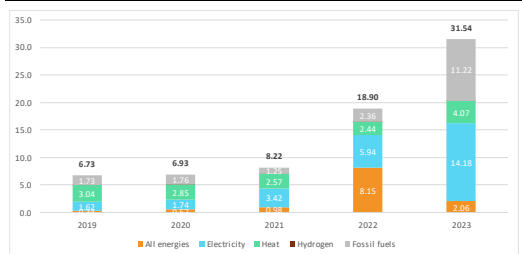
Graph 17: Energy subsidies by purpose



- (1) Subsidies in EUR 2023 billion
- (2) Some 2023 data were not fully available or validated at the time the study was completed (August 2024). For missing 2023 values, 2022 data were taken as a basis for an estimate.

Source: Enerdata. Inventory of energy subsidies in the EU27 – 2024 edition

Graph 18: Energy subsidies by carrier



- (1) Subsidies in EUR 2023 billion
- (2) Some 2023 data were not fully available or validated at the time the study was completed (August 2024). For missing 2023 values, 2022 data were taken as a basis for an estimate.

Source: Enerdata. Inventory of energy subsidies in the EU27 – 2024 edition

European Semester 2024

- **Country Specific Recommendation (Energy):** Take measures to accelerate the phase-out of fossil fuels in the district heating sector by shifting to renewable energy.⁽⁶⁾
- For more information see the [2024 European Semester Country Report](#).

National Energy and Climate Plan (NECP)

- The **draft updated NECP** was submitted to the European Commission in March 2024.
- Member States were due to submit their **final updated NECP by 30 June 2024**, taking into account the Commission recommendations.
- **The final updated NECP** was not submitted yet to the European Commission.
- For documents and information see the dedicated [webpage of the European Commission on the NECPs](#).

Recovery and Resilience Plan (RRP and REPowerEU chapter)

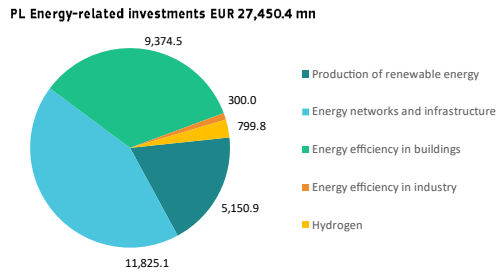
- The Polish RRP has a total allocation of EUR 25.3 billion in grants and EUR 34.5 billion in loans, with 46.6 % of available funds supporting climate objectives.
- EUR 14 billion **are allocated to energy-related measures**, with the largest amount for **energy networks and infrastructure** [EUR 11.8 billion]:
 - **Storage:** reform to remove existing legal barriers to the development of storage, including investments in energy storage systems.
 - **Grids:** development of transmission networks, distribution infrastructures in rural areas, smart electricity infrastructure and regulatory solutions for accelerated integration of renewables into distribution grids. EUR 300 million will support the energy efficiency and the decarbonisation of district heating systems and EUR 631 million for the construction of

⁽⁶⁾ Council of the European Union 11713/24.

natural gas infrastructure to meet immediate security of supply needs.

- In April 2024 the Commission disbursed the 1st payment of EUR 6.3 billion to Poland, after having confirmed that Poland has satisfactorily fulfilled the relevant milestones and targets, including those related to the implementation of four energy reforms.

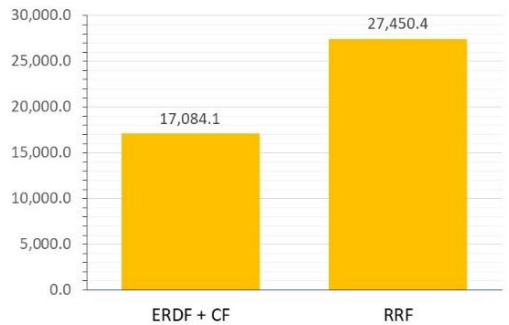
Graph 19: **Energy-related investments in the RRP (in EUR million)**



Source: European Commission

EU Funds supporting energy related investments

Graph 20: **Energy-related investments across EU funds (in EUR million) (*)**



(*) European Regional Development Fund (ERDF) + Cohesion Fund (CF): comprise EU grants & national cofinancing; RRF: comprise grants & loans. Investment categories can also differ across funds.

Source: European Commission

- **Innovation Fund: EUR 312.6 million.** For more information see the webpage [innovation-fund-projects-country_en](#).
- **Modernisation Fund: EUR 1,908.0 million** (approved and/or confirmed Investments from 2021-2024). For more information see the webpage [modernisationfund.eu](#).

- **CEF-Energy: EUR 97.6 million** (5.0% of total EU contribution, for 2021-2027). For more information see [CINEA's Project Portfolio dashboard](#).