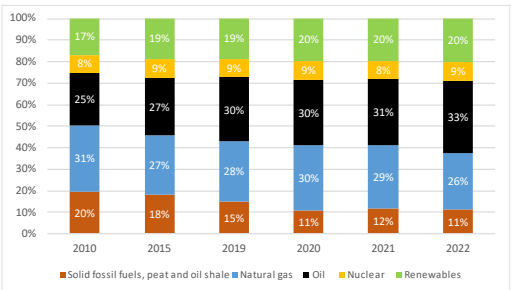
State of the Energy Union 2024: Romania

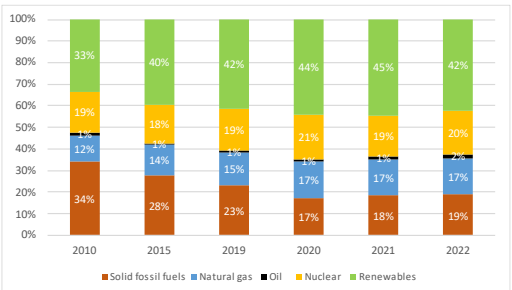
Key energy figures

Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 1.3 million TJ. (2.3% of the total EU consumption).
Source: Eurostat

Graph 2: **Electricity mix**



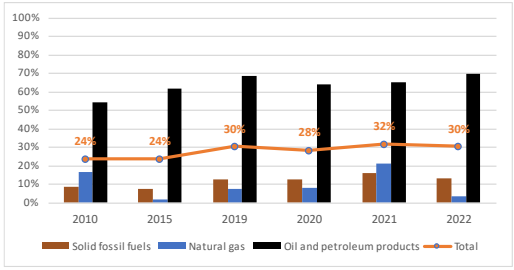
(1) The 2022 gross electricity production was 55.6TWh. (2% of the total EU production).
Source: Eurostat

- Fossil fuels account for 71% of Romania´s **energy mix** (compared to 69% at EU level). The share of renewables was 20.1% and nuclear 8.9%.
- The **electricity mix** of Romania is dominated by renewables with 42.4% (compared to 39.4% at EU level) and fossil fuels with 37.6% (compared to 38.6% at EU level). Nuclear energy accounts for the remaining 19.9% of the electricity mix.

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

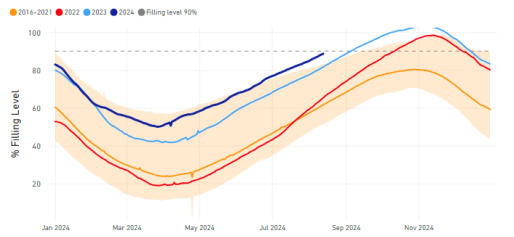
Graph 3: **Import dependency on fossil fuels**



(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 Romania**



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

- Romania has **six gas storage facilities** with a total capacity of **3.1 bcm**, representing 31% of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 89.58%.

3. NUCLEAR FUEL DIVERSIFICATION

- Romania remains fully committed to contributing to the ambitious EU climate targets and energy security perspective. In that context, the country plans to expand its nuclear power programme by increasing its installed capacity. Two new nuclear power reactors (CANDU design with around 700 MWe capacity each of them) are being considered for construction, complementing the existing ones (Units 1 and 2). Additionally, SMR technology with an installed capacity of 462 MWe is considered to complement the nuclear generation. In December 2022, project company RoPower and NuScale Power signed a contract for the front-end engineering and design (FEED) work for a VOYGR-6 SMR plant at Doicești in Romania's Muntenia region. FEED Phase 2 contract for this project was signed in July 2024.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

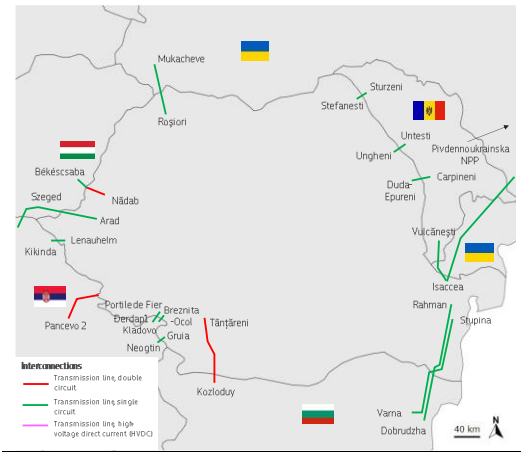
Table 1: **Electricity interconnectivity**

2024	2030 target
16.3 %	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

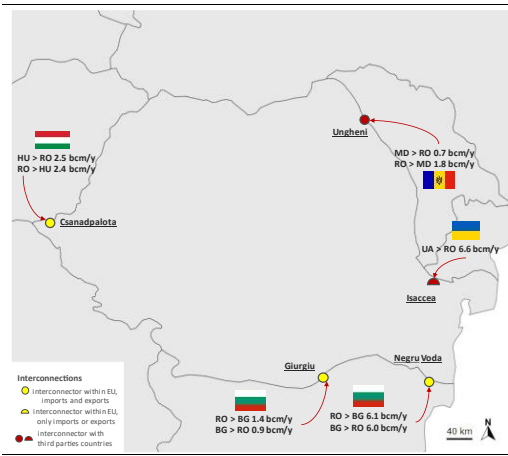
2. ENERGY TRANSMISSION INFRASTRUCTURE

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)

3. MARKET INTEGRATION

- Romania's wholesale electricity and gas markets are heavily influenced by market interventions that exceed the expired EU framework on emergency measures. In April 2023, the Commission opened an infringement procedure against Romania (INFR(2023)2032) for restricting electricity exports, violating Articles 35 and 36 TFEU, Directive (EU) 2019/944, and Regulation (EU) 2019/943. The Commission considered this measure equivalent to a quantitative export restriction under Article 35 TFEU, without justification under Article 36 TFEU, also breaching the Electricity Directive and Regulation.

Rollout of electricity smart meters

- 23% of energy consumers in Romania have smart meters. Smart meters are a key tool in enabling energy consumers to participate in some form of flexibility regarding their energy consumption [1].

Diversification of gas supplies

- In 2023, Romania had 3 natural gas supply sources, compared to 4 in 2021. Its main supplier accounted for 100%, with its own domestic production being the primary source. In 2021, its own domestic production with 72%, Russia with 24%, and Hungary (3%) were Romania'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
EED NECPs four main indicators	2023	2021	2017	
Inability to keep home adequately warm	12.5	+2.4 pp	+ 1.2 pp	10.6
Arrears on utility bills	13.6	+ 6.3	-2.3pp	6.9
Share of pop. With leak, damp or rot in dwelling	7.5	-4.7 pp (2020)	- 3.6 pp	15.5
AROP (At risk of poverty)	21.1	- 1.4 pp	- 2.5 pp	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 Romania: EUR 6 682 million or 9.26 % of total SCF.

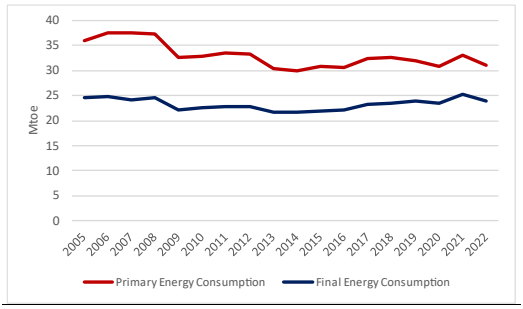
Just Transition Plan

- The Romanian Territorial Just Transition Plans (TJTP) outline the transition away from coal in energy production and decarbonise the economy in the regions with carbon intensive industries. The regions covered by the transition plans are counties Dolj, Gorj Hunedoara, for transition away from coal and Mures, Galati and Prahova for transition from carbon intensive industries. The plans set out how the Just Transition Fund (JTF), with a national allocation of EUR 2.1 billion, will support the development of renewable energy sources, economic diversification, upskilling and training of the workforce and modernisation of industries. Coal phase-out commitment of Romania is for 2032.

Energy efficiency

1. ENERGY EFFICIENCY

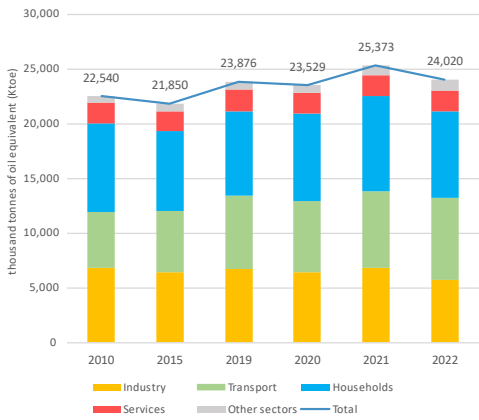
Graph 5: **Primary and final energy consumption**



Source: Eurostat

- In 2022, Romania's **Primary Energy Consumption (PEC)** amounted to 31 Mtoe, 6.3% lower than in 2021, while its **Final Energy Consumption (FEC)** amounted to 24 Mtoe, 5.3% lower than in 2021.

Graph 6: **Final energy consumption by sector**

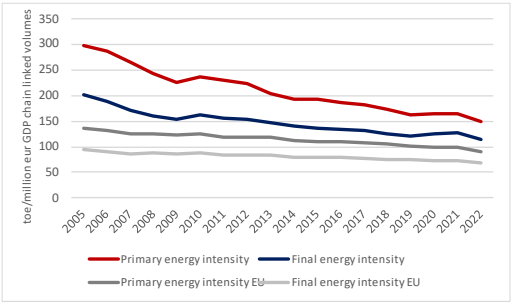


(1) Final energy consumption excludes consumption of the energy sector (including transformation and distribution losses) and non-energy use of energy carriers.
Source: Eurostat

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

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

Graph 7: **Primary and final energy intensity**



Source: Eurostat

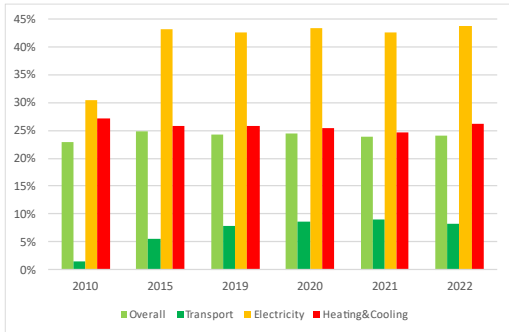
2. ENERGY PERFORMANCE OF BUILDINGS

- In 2022, Final Energy Consumption (FEC) in the Romanian **residential sector** was **7.9 Mtoe**, representing **a reduction of 9.9%** compared to 2021. In the **services sector**, FEC was **1.9 Mtoe**, with an **2.9% increase** compared to 2021.
- Heating and cooling account for around **76%** of the country's residential final energy consumption, with renewables supplying approximately **26%** of the gross final energy consumption for heating and cooling. As per the European Heat Pump Association (EHPA), there are no data available for Romania.
- In 2023, **13.6%** of the total population was experiencing difficulties on paying their utility bills while **12.5%** was not able to keep their home adequately warm over the cold periods of the year (growing from 2021, when such figures were, respectively, 7.3% and 10.1%). This underlines the importance to increase rate and depth of building renovation, specifically of worst-performing buildings.

Decarbonisation and climate action

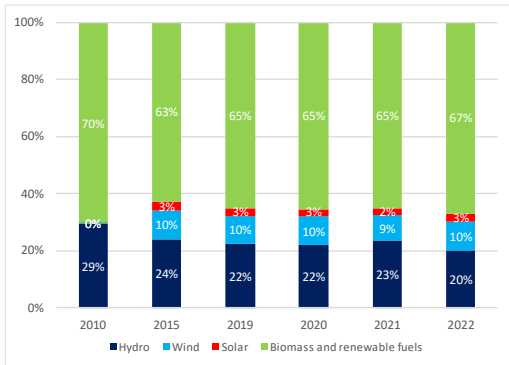
1. SECTORAL SHARE OF RENEWABLE ENERGY

Graph 8: **Share of renewable energy sources**



(1) In % of gross final consumption of energy.
Source: Eurostat

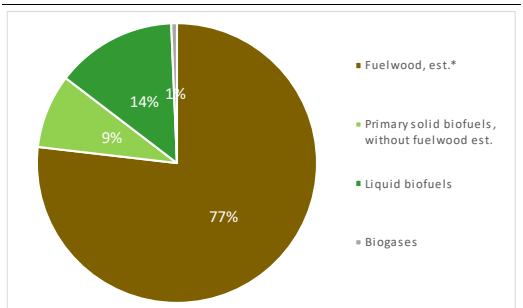
Graph 9: **Renewable energy mix**



(1) In % of gross final consumption of energy.
Source: Eurostat

2. BIOENERGY MIX

Graph 10: **Bioenergy mix**

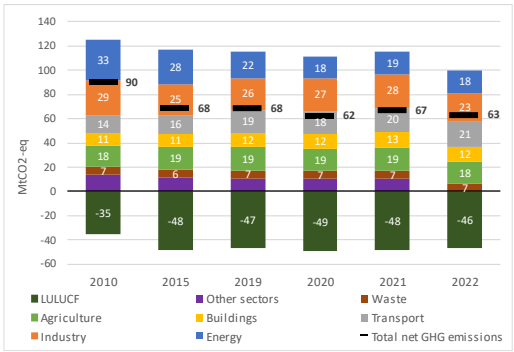


(1) In % of gross final consumption of energy (2022).
(2) * Fuelwood estimate, based on the Primary solid biofuels consumption in Other sectors, Eurostat and industry secondary data, DG ENER estimations.
Source: Eurostat and DG ENER

- For more information see the dedicated website on biomethane country fiches.

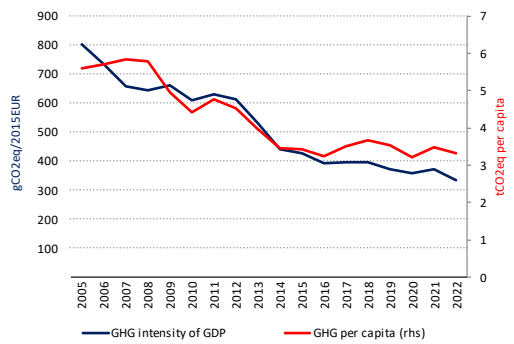
3. GREENHOUSE GAS EMISSIONS

Graph 11: **Greenhouse gas emissions by sector**



Based on UNFCC 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 335 gCO2eq/2015EUR, Romania lies above the EU average in terms of GHG intensity of GDP.
- With 3 tonnes of CO2 equivalent per capita, Romania is below the EU average in terms of GHG emissions per capita.

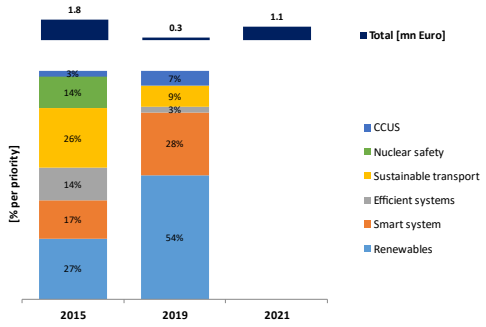
- For more detailed information on country profiles see Progress on climate action (europa.eu).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

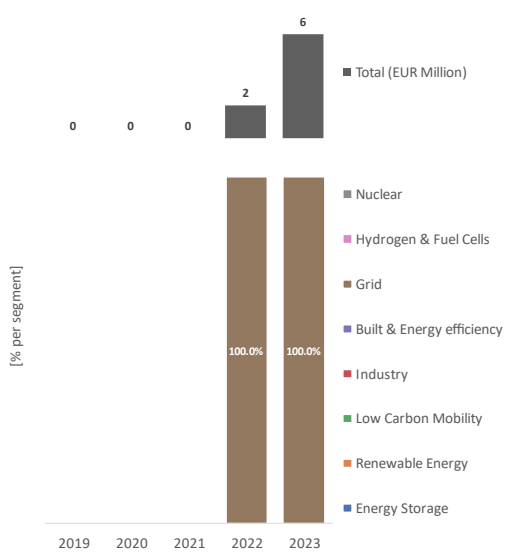
- Public investment in research and innovation (R&I) in Energy Union priorities [3] decreased from 0.0011% in 2015 to 0.0005% in 2021 (share of GDP). [4]

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

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

(4) Source: JRC SETIS 2024

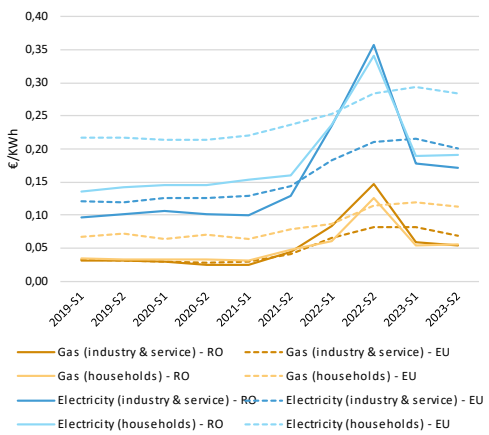
growth of innovative firms and it is key to foster the EU's competitiveness and to strengthen the EU's technology sovereignty in the net-zero energy sector.
Source: JRC elaboration based on PitchBook data (08/2024)

2. NET-ZERO ENERGY TECHNOLOGIES

- Romania currently has limited manufacturing capacity for clean technologies, but several promising initiatives could make the country a significant hub for the production of batteries and key solar components. Since 2016, a lithium-ion battery manufacturer has been operating out of Bucharest with a capacity of 0.2 GWh a year. Supported by an investment agreement with the EIT InnoEnergy (Horizon Europe Programme), in 2022 this Romanian battery producer announced plans to scale up production output to 2 GWh by 2024 and to 8 GWh by 2026. More recently, in June 2023 a Belgian company launched a EUR 1.4billion investment into building a 22 GWh/y lithiumion battery cell factory in Galati, expected to be fully operational in 2026. There has been a 150 MW solar module manufacturing unit in Giurgiu since 2012, and a 100 MW assembly line has recently been set up in Transylvania. Two large-scale photovoltaic manufacturing projects (modules, cells and ingot/wafers) led by German and Hungarian companies are also underway.

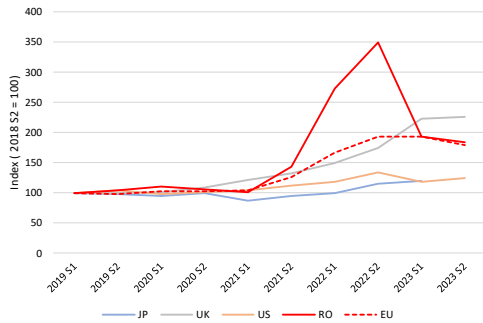
3. ENERGY PRICES DEVELOPMENT

Graph 15: **Romania'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

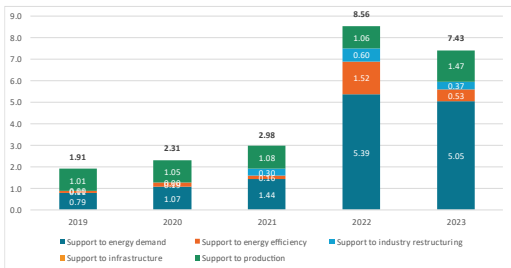
Graph 16: **Trends in electricity prices for non-household consumers (EU and foreign partners)**



(1) For Eurostat data (EU and RO), 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

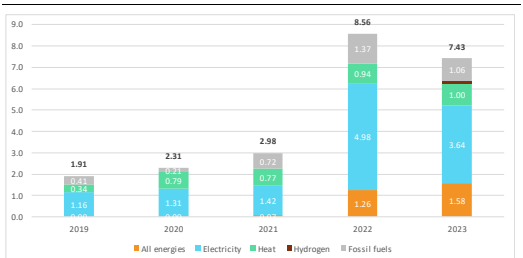
4. ENERGY SUBSIDIES

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

European Semester 2024

- **No Country Specific Recommendation for Energy** [5]
- For more information see the 2024 European Semester Country Report.

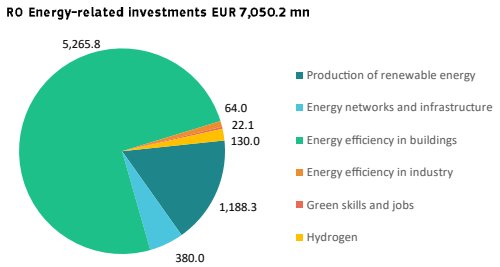
National Energy and Climate Plan (NECP)

- The **draft updated NECP** was submitted to the European Commission in November 2023.
- 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 Romanian RRP has a total allocation of EUR 13.6 billion in grants and EUR 14.9 billion in loans, with 44% of available funds supporting climate objectives.
- EUR 7 billion **are allocated to energy-related measures,** with the largest amount for **energy efficiency in buildings** [EUR 5.3 billion]:
  - **focused on residential and public buildings**, voucher schemes in the REPowerEU chapter (focused on single-family houses), and various investments in many other components, targeting public administration buildings, schools, hospitals, museums.
  - Investments are combined with reforms, such as the **development of one-stop shops** and with the **implementation of a National Building Register**.
- Overall (including pre-financing and disbursement of the first two payment requests), the Commission disbursed EUR 9 billion to Romania. Among the milestones and targets satisfactorily fulfilled, more than ten refer to energy related measures. For example, 2 335 MW of coal and lignite-fired installed electricity generation capacity has been decommissioned.

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

- **Modernisation Fund: EUR 4,679.3 million** (approved and/or confirmed Investments from 2021-2024). For more information see the webpage modernisationfund.eu.
- **CEF-Energy: EUR 50.7 million** (2.6% of total EU contribution, for 2021-2027). For more information see CINEA's Project Portfolio dashboard.

[5] Council of the European Union 11715/24.