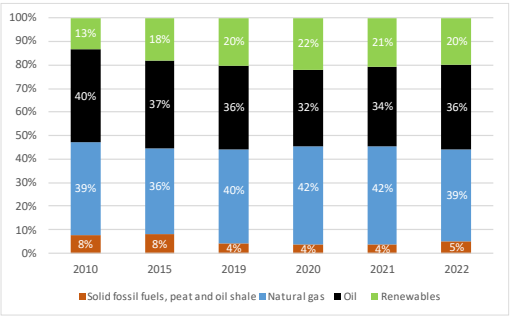
State of the Energy Union 2024: Italy

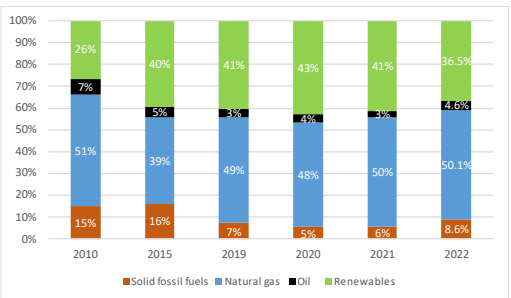
Key energy figures

Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 6 million TJ. (10.6% of the total EU consumption).
Source: Eurostat

Graph 2: **Electricity mix**



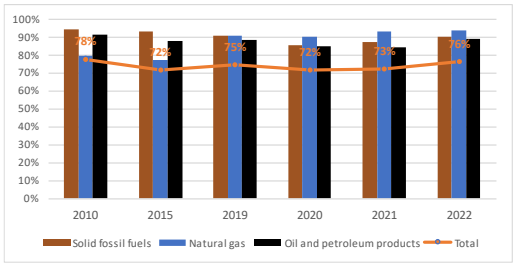
(1) The 2022 gross electricity production was 282.1 TWh. (10.1% of the total EU production).
Source: Eurostat

- Fossil fuels account for 80% of Italy's **energy mix** (compared to 69% at EU level), with renewables covering the remaining 20%.
- The **electricity mix** of Italy is dominated by fossil fuels which account for 63.3 (compared to 38.6% at EU level). Renewable energy accounts for the remaining 36.5% (compared to 39.4% at EU level).

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

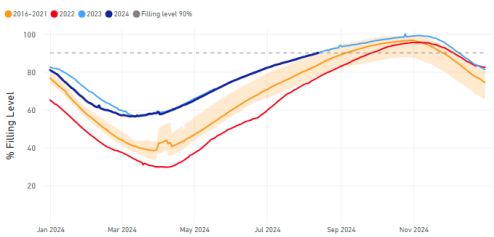
Graph 3: **Import dependency on fossil fuels**



(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 Italy**



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

- Italy has **fifteen gas storage facilities** with a total capacity of **19.04 bcm**, representing 29% of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 90.97%.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

Table 1: **Electricity interconnectivity**

2024	2030 target
5.0 %	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

Rollout of electricity smart meters

- Italy has 100% smart meter roll out, according to the latest ACER/CEER Market Monitoring Report [1].

Diversification of gas supplies

- In 2023, Italy had 19 natural gas supply sources, compared to 14 in 2021. Its three largest suppliers accounted for 63%, with Algeria being the main supplier, holding a share of 37%. In 2021, Russia with 38%, Algeria with 23%, and Azerbaijan (10%) were Italy'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	9.5	+1.4 pp	- 5.7 pp	10.6
Arrears on utility bills	4.1	-2.4	-0.7 pp	6.9
Share of pop. With leak, damp or rot in dwelling	17.1	-2.5 pp (2020)	+ 1 pp	15.5
AROP (At risk of poverty)	18.9	-1.2 pp	- 1.4 pp	16.2

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.

Social Climate Plan

- Member States need to submit these plans to the European Commission by June 2025.
- Maximum financial allocation for Italy: EUR 7 806 million or 10.81 % of total SCF.

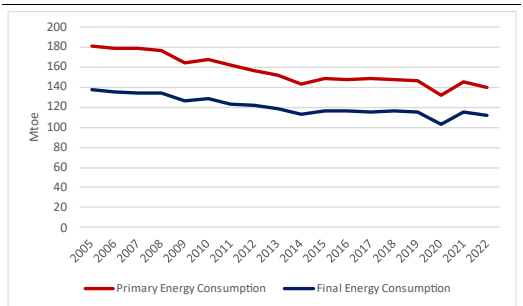
Just Transition Plan

- The Italian Territorial Just Transition Plan (TJTP) outlines the transition away from coal in the areas of Taranto (Apulia) and Sulcis-Iglesiente (Sardinia). The plan sets out how the Just Transition Fund (JTF), with a national allocation of EUR 1.029 billion, will support the conversion of fossil fuel power plants, workers, and local communities. Coal phase-out commitment in 2025 (with the exception of installations located in Sardinia where difficulties related to new interconnections with the Continent (Tyrrhenian link and SA.CO.I.3) and to the development of renewables and accumulations that are essential to ensure the technical grid security conditions bring the phase out to 2028.

Energy efficiency

1. ENERGY EFFICIENCY

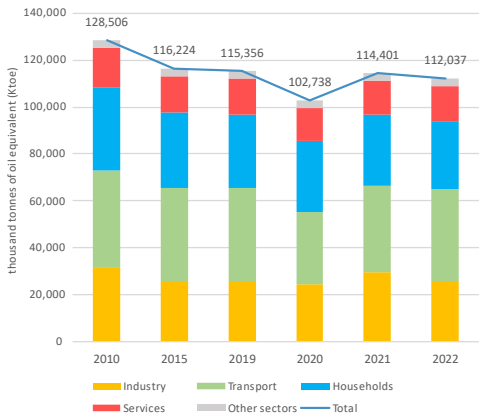
Graph 5: **Primary and final energy consumption**



Source: Eurostat

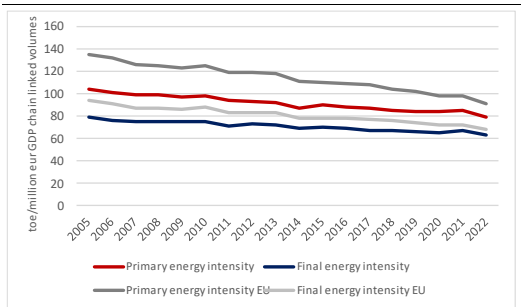
- In 2022, Italy's **Primary Energy Consumption (PEC)** amounted to 139.6 Mtoe, 4.1% lower than in 2021, while its **Final Energy Consumption (FEC)** amounted to 111.7 Mtoe, 2.7% lower than in 2021.

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

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



Source: Eurostat

2. ENERGY PERFORMANCE OF BUILDINGS

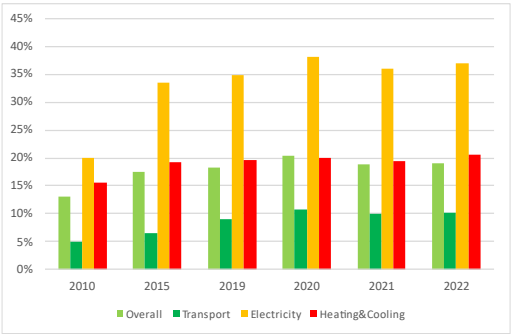
- In 2022, Final Energy Consumption (FEC) in the Italian **residential sector** was **29.3 Mtoe**, representing **a reduction of 5.0%** compared to 2021. In the **services sector**, FEC was **14.5 Mtoe**, with an **2.0% increase** compared to 2021.
- Heating and cooling account for around **80%** of the country's residential final energy consumption, with renewables supplying approximately **21%** of the gross final energy consumption for heating and cooling. Around 378,000 heat pumps were sold in 2023, representing a decrease of 26% compared to the sales of the previous year, reaching a total stock of around 4.1 million installed heat pumps, as per the European Heat Pump Association (EHPA).
- In 2023, **4.1%** of the total population was experiencing difficulties on paying their utility bills while **9.5%** 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, 6.5% and 8.1%). This underlines the importance to increase rate and depth of building renovation, specifically of worst-performing buildings.

Decarbonisation and climate action

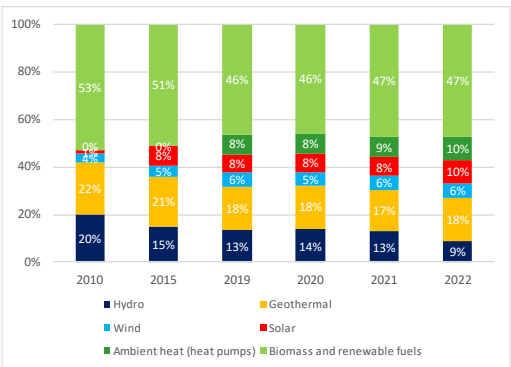
1. SECTORAL SHARE OF RENEWABLE ENERGY

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



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

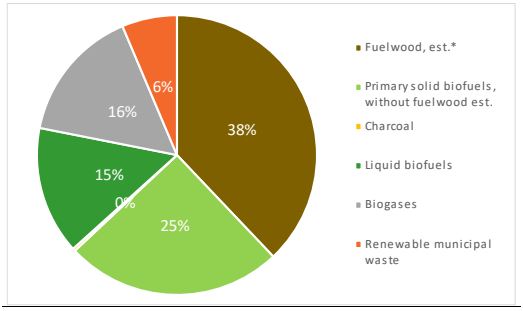
Graph 9: **Renewable energy mix**



(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. HYDROGEN

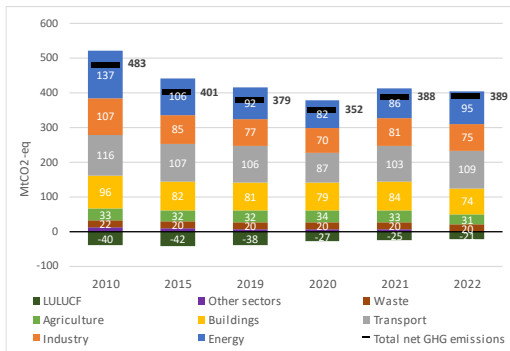
Table 3: **Operational hydrogen projects**

Name	Description
Troia, STORE&GO	0.2MW connected to the grid
REFLEX	10m3 H2/h online since 2018
Hydrogen Valley South Tyrol - Bolzano, CHIC	1.5MW online since 2014
INGRID	1.2 MW online since 2016
Sapio - Mantova	1500 Nm3 H2/h online since 2016

Source: European Commission based on IEA data

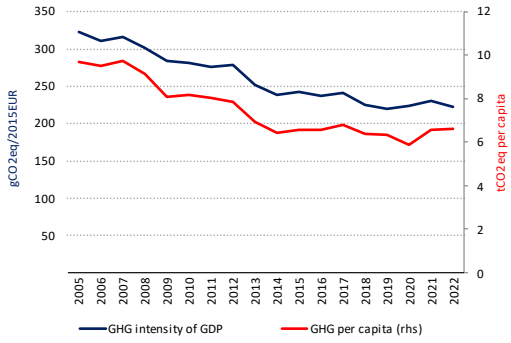
4. GREENHOUSE GAS EMISSIONS

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).

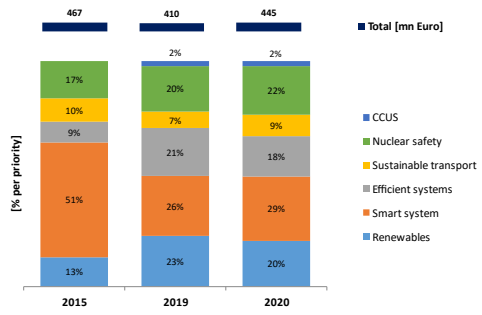
- With 223 gC02eq/2015EUR, Italy lies below the EU average in terms of GHG intensity of GDP.
- With 7 tonnes of C02 equivalent per capita, Italy is at the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see Progress on climate action (europa.eu).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

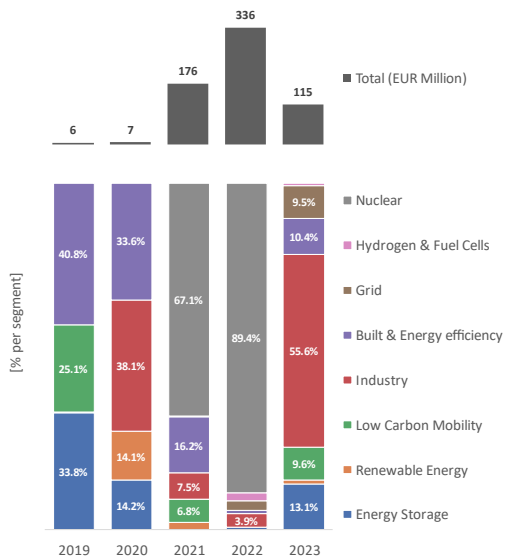
- Public investment in research and innovation (R&I) in Energy Union priorities [3] decreased from 0.028% in 2015 to 0.027% in 2020 (share of GDP). [4]

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 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

- Italy remains one of the leading clean technology markets, hosting a substantial number of solar PV and wind energy manufacturing facilities. Regarding manufacturing capacity for solar PV components, more than 22% of building integrated photovoltaics come from Italy. Italy is between the top two biggest producers within the EU and has companies listed among the leading EU producers of backsheets and

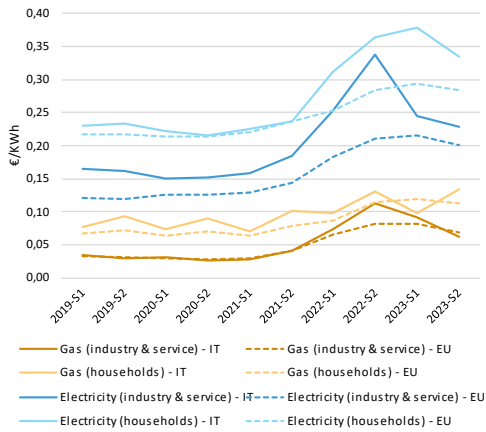
[3] Renewables, smart system, efficient systems, sustainable transport, CCUS and nuclear safety, COM(2015) 80 final ('Energy Union Package').

[4] Source: JRC SETIS 2024

foils. Italian companies are also leading modules manufacturers, with one actor in the Italian electricity market and a gigafactory in Sicily, whose expansion is set to result in a 15-fold increase in its production capacity to 3 GW per year from the current 200 MW. And two other hubs of the PV industry are located in the Veneto region, which can each achieve a production capacity of 1 GW/year. The Italian RRP allocates nearly EUR 90 million to the PV gigafactory in Sicily, which is now underway, highlighting how this project fundamentally contributes to the European strategy to build an increasingly autonomous renewable supply chain. In Northern Italy, one company comes in fourth position at EU level (after Spain, Germany and Austria) but is leader in the national market with production of inverters reaching 7 GW. For wind, Italy has manufacturing facilities for onshore towers and blades, operating in Lombardy and Apulia. Component production facilities are located between Lombardy and the Veneto. At the end of 2017, the ex-Whirlpool industrial site in Taverola was converted with the aim of creating the first Mediterranean cluster to produce lithium batteries. In 2019, the European Commission approved the construction of a 8GWh/year gigafactory with an integrated pilot line for end-of-life battery recycling, as an Important Project of Common European Interest (IPCEI). In 2022, a second plant in Taverola received funding from the Ministry of Economic Development and the IPCEI fund amounting to EUR 417m to launch a start-up to produce lithium-ion batteries. Other lithium-ion manufacturing facilities for the automotive sector have been announced in 2022 in Termoli, with a forecast production of 40 GWh, and in Ivrea with a gigafactory planned to open in 2025 with 3 000 jobs and a productive capacity up to 45 GWh/year. Important actors in the electrolyser sector have launched manufacturing units for AEM (Anion Exchange Membrane) and alkaline electrolysers. The facility in San Miniato has a production capacity of 300 MW/year. With additional investment, it aims to reach a total annual production capacity equivalent to 1.3 GW.

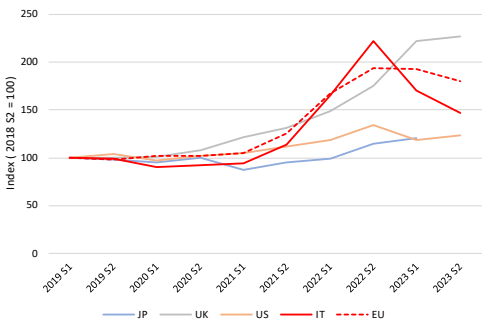
3. ENERGY PRICES DEVELOPMENT

Graph 15: **Italy'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

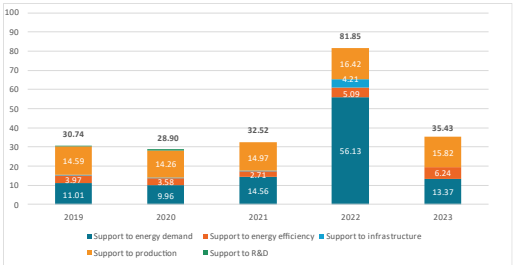
Graph 16: **Trends in electricity prices for non-household consumers (EU and foreign partners)**



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

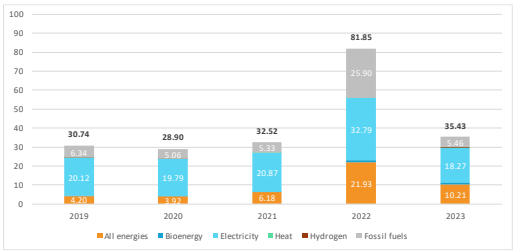
4. ENERGY SUBSIDIES

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.

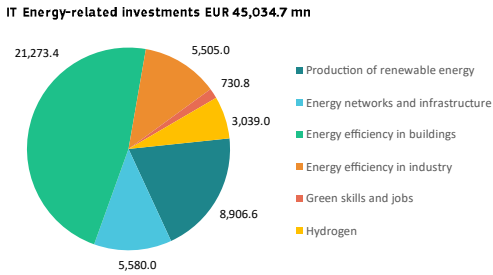
National Energy and Climate Plan (NECP)

- 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 submitted to the European Commission in July 2024.
- For documents and information see the dedicated webpage of the European Commission on the NECPs.

Recovery and Resilience Plan (RRP and REPowerEU chapter)

- The Italian RRP has a total allocation of EUR 71.8 billion in grants and EUR 122.6 billion in loans with 39% of available funds supporting climate objectives.
- **EUR 45 billion are allocated to energy-related measures,** with the largest amount for energy efficiency in buildings [EUR 21.3 billion]:
  - Investment so-called **'Superbonus'** worth EUR 13.95 billion, finances the **energy renovation of residential buildings** in the form of a tax deduction over five years and covers a wide range of interventions, such as PV systems with related storage systems or infrastructure for charging electric vehicles;
  - Investment supporting **renovation for low-income and vulnerable households** and alleviate energy poverty, initially providing at least EUR 1.38 billion of financial support.
- In August 2024, the Commission disbursed the 5th payment of EUR 11 billion to Italy.

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

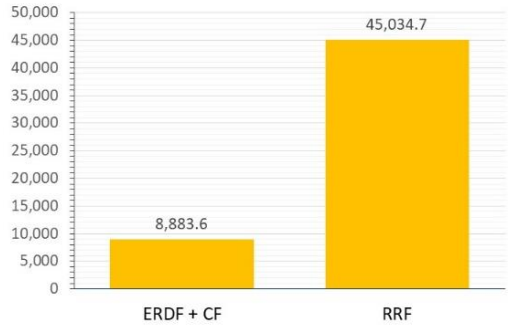


Source: European Commission

[5] Council of the European Union 11704/24.

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 161.4 million.** For more information see the webpage innovation-fund-projects-country_en.
- **CEF-Energy: EUR 153.8 million** (8.0% of total EU contribution, for 2021-2027). For more information see CINEA's Project Portfolio dashboard.