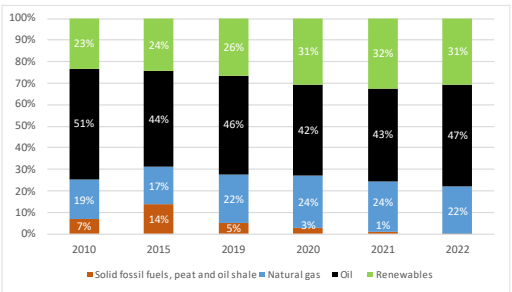
State of the Energy Union 2024: Portugal

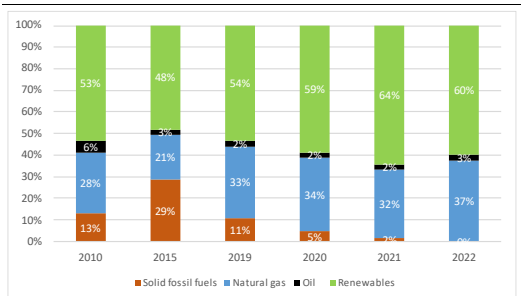
Key energy figures

Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 912 379 TJ. (1.6% of the total EU consumption).
Source: Eurostat

Graph 2: **Electricity mix**



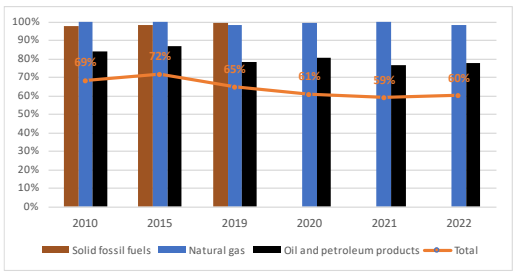
(1) The 2022 gross electricity production was 46.5 TWh. (1.7% of the total EU production).
Source: Eurostat

- Fossil fuels account for 69.3% of Portugal´s **energy mix** (similarly to 69% at EU level). The share of renewables was 30.7%.
- The **electricity mix** of Portugal is dominated by renewable energy which accounts for 59.8% of the electricity mix (compared to 39.4% at EU level). Fossil fuels account for the remaining 37.4% (compared to 38.6% at EU level).

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

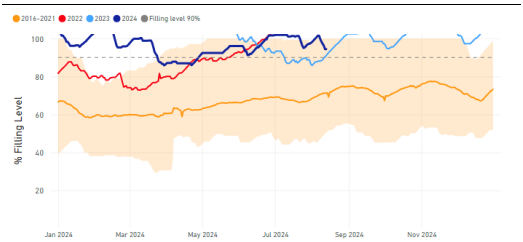
Graph 3: **Import dependency on fossil fuels**



(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 Portugal**



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

- Portugal has **one gas storage facility** with a total capacity of **0.32 bcm**, representing 6 % of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 95.55%.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

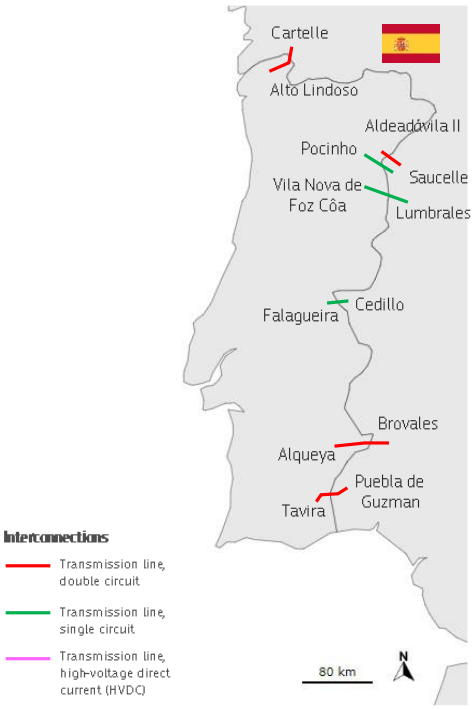
Table 1: **Electricity interconnectivity**

2024	2030 target
11.5 %	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

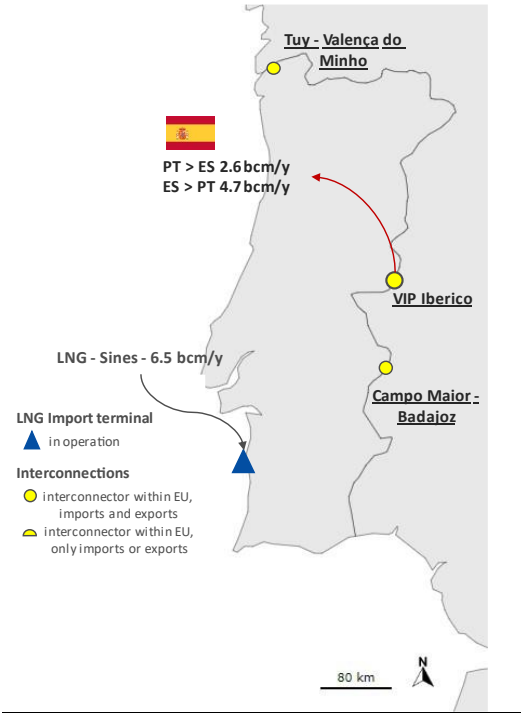
2. ENERGY TRANSMISSION INFRASTRUCTURE

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

- Portugal has reached 86% coverage for the rollout of smart meters based on a 15-minute interval by the end of 2023 [1].

Diversification of gas supplies

- In 2023, Portugal had 4 natural gas supply sources, the same as in 2021. Its three largest suppliers accounted for 92%, with Nigeria being the main supplier, holding a share of 40%. In 2021, Nigeria with 50%, the United States with 33%, and Algeria (12%) were Portugal's biggest natural gas supply sources. [2]

[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.

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	20.8	+ 4.4 pp	+0.4 pp	10.6
Arrears on utility bills	3.8	-1.5 pp	-1.8 pp	6.9
Share of pop. With leak, damp or rot in dwelling	29	+ 4.2 pp (2020)	+ 4.5 pp	15.5
AROP (At risk of poverty)	17	-1.4 pp	- 1.3 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 Portugal: EUR 1 359 million or 1.88 % of total SCF.

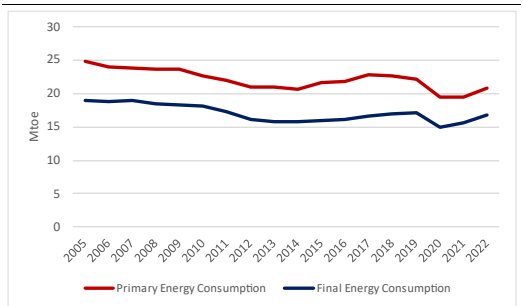
Just Transition Plan

- The Portuguese Territorial Just Transition Plans (TJTP) outline the transition away from fossil fuels and fossil-fuel based industry in the regions of Alentejo Litoral and Medio Tejo. The plans set out how the Just Transition Fund (JTF), with a national allocation of EUR 223 million, will support the development of renewable energy sources, economic diversification and business development, and research and innovation. Portugal anticipated its initial commitment for coal phase out set in the National and Climate Plan (NECP) for the year 2023 by closing the two plants and one refinery in 2021.

Energy efficiency

1. ENERGY EFFICIENCY

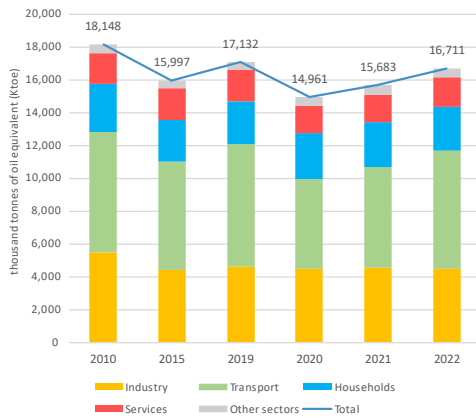
Graph 5: **Primary and final energy consumption**



Source: Eurostat

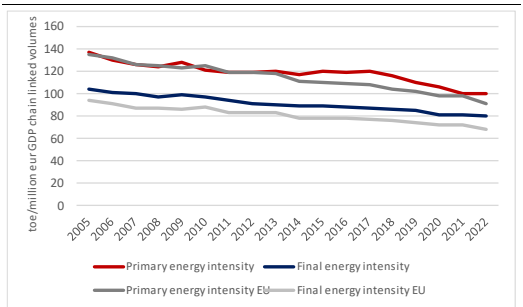
- In 2022, Portugal's **Primary Energy Consumption (PEC)** amounted to 20.8 Mtoe, 6.3% higher than in 2021, while its **Final Energy Consumption (FEC)** amounted to 16.7 Mtoe, 6.6% higher than in 2021.

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 Portuguese **residential sector** was **2.7 Mtoe**, representing **a reduction of 3.3%** compared to 2021. In the **services sector**, FEC was **1.8 Mtoe**, with an **8.1% increase** compared to 2021. However, climate

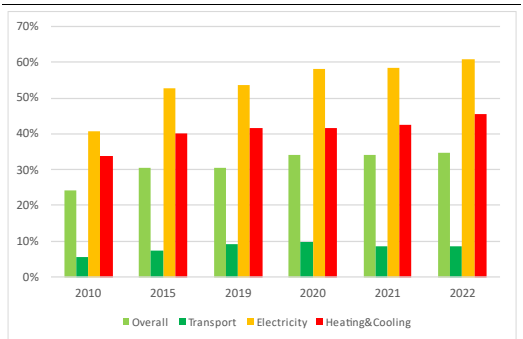
corrected data[3] show a **residential FEC increase of 8.0%** from 2021 to 2022, indicating that the above reduction is mostly climate-related (e.g. milder winter) rather than linked with an improvement of the building stock.

- Heating and cooling account for around **50%** of the country's residential final energy consumption, with renewables supplying approximately **46%** of the gross final energy consumption for heating and cooling. Around 50,000 heat pumps were sold in 2023, representing an increase of 24% compared to the sales of the previous year, reaching a total stock of around 335,000 installed heat pumps, as per the European Heat Pump Association (EHPA).
- In 2023, **3.8%** of the total population was experiencing difficulties on paying their utility bills while **17.4%** 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, 5.3% and 16.4%). This underlines the importance to increase rate and depth of building renovation, specifically of worst-performing buildings.

Decarbonisation and climate action

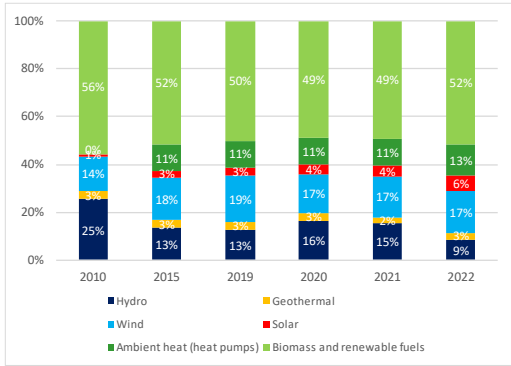
1. SECTORAL SHARE OF RENEWABLE ENERGY

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



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

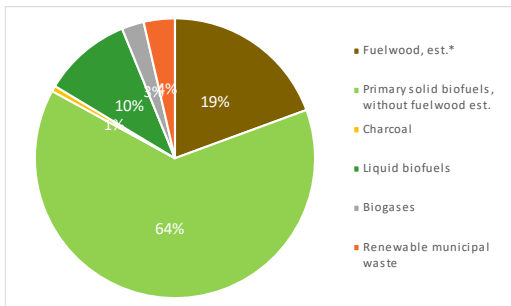
Graph 9: **Renewable energy mix**



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

2. BIOENERGY MIX

Graph 10: **Bioenergy mix**



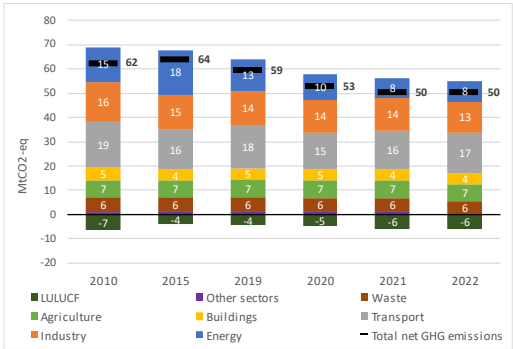
(1) In % of gross final consumption of energy (2022).
(2) * Fuelwood estimate, based on the Primary solid biofuels consumption in Other sectors, Eurostat and industry secondary data, DG ENER estimations.
Source: Eurostat and DG ENER

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

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

3. GREENHOUSE GAS EMISSIONS

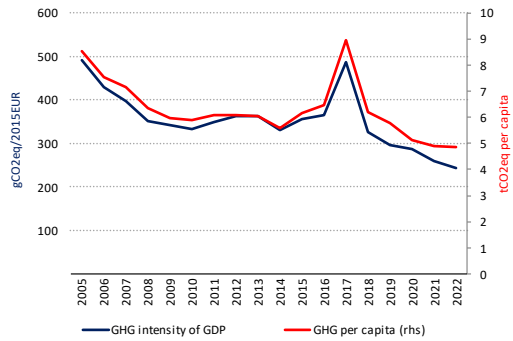
Graph 11: **Greenhouse gas emissions by sector**



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).

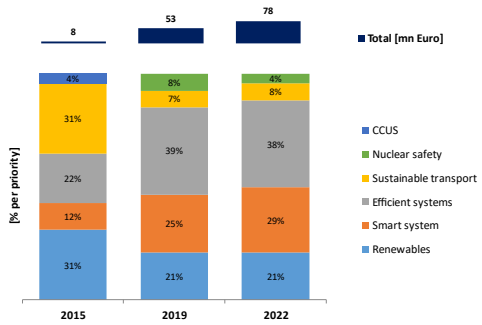
- With 244 gCO2eq/2015EUR, Portugal lies above the EU average in terms of GHG intensity of GDP.
- With 5 tonnes of CO2 equivalent per capita, Portugal is below the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see Progress on climate action (europa.eu).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

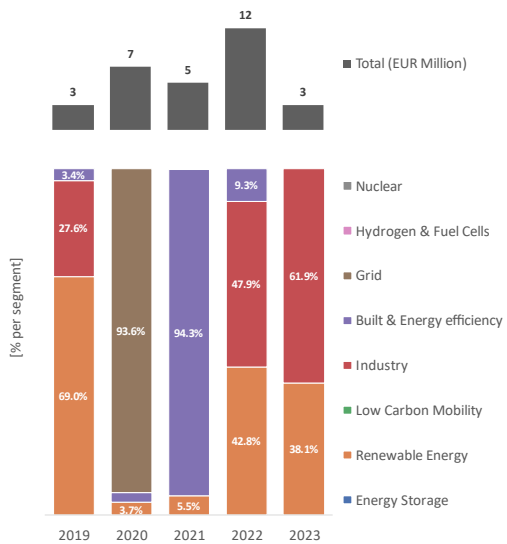
- Public investment in research and innovation (R&I) in Energy Union priorities[4] increased from 0.004% in 2015 to 0.032% in 2022 (share of GDP).[5]

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)

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

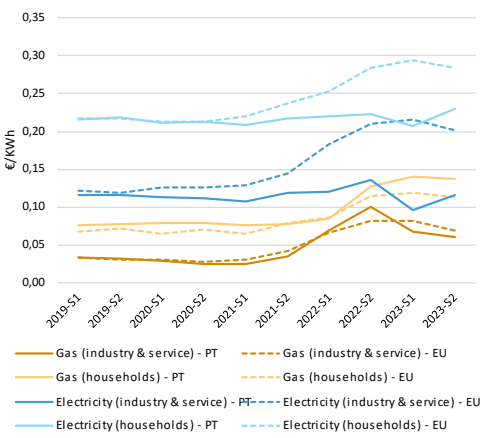
[5] Source: JRC SETIS 2024

2. NET-ZERO ENERGY TECHNOLOGIES

- Portugal remains highly dependent on nonEU countries for clean energy technologies, particularly components of solar modules. There have been positive developments in electrolyser manufacturing and Portugal has a growing foothold in the wind supply chain. It also has a lot of battery manufacturing potential. It imports most of its solar photovoltaic modules from China and has limited manufacturing capabilities throughout the photovoltaic supply chain. For wind, Portugal has manufacturing facilities for blades, generators, nacelles, and onshore/offshore towers. In 2023, the application for classifying the 15GWh lithium battery factory construction project in Sines as a Project of National Interest was submitted to the AICEP. Two lithium mining projects and at least one unit for lithium conversion are currently in progress. In 2022, Portugal's first proton exchange membrane electrolyser manufacturing factory came online. The facility aims to reach 500 MW of annual productive output by the end of 2025.

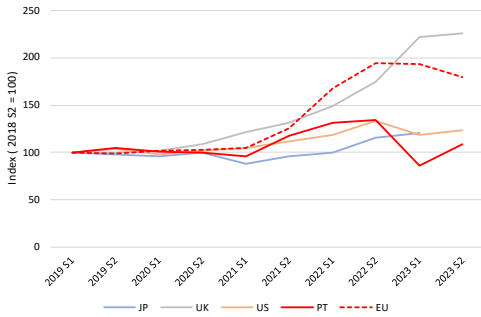
3. ENERGY PRICES DEVELOPMENT

Graph 15: **Portugal'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

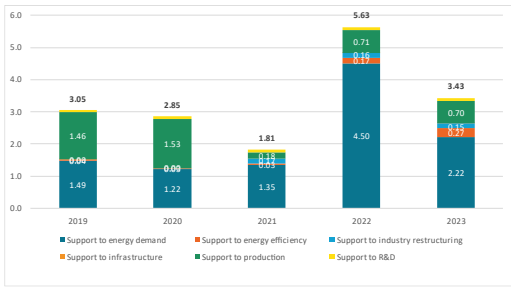
Graph 16: **Trends in electricity prices for non-household consumers (EU and foreign partners)**



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

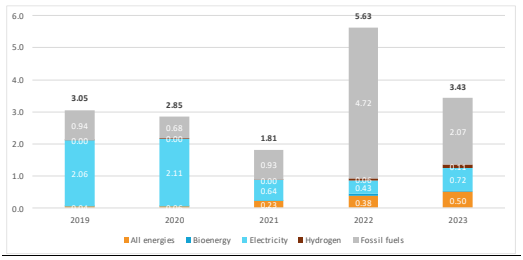
4. ENERGY SUBSIDIES

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**



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

European Semester 2024

- **Country Specific Recommendation (Energy):** Strengthen the capacity of the electricity transmission and distribution grid, in particular by improving connection procedures and increasing their transparency to incentivise investments in the national network and increase energy storage capacities.[6]
- For more information see the 2024 European Semester Country Report.

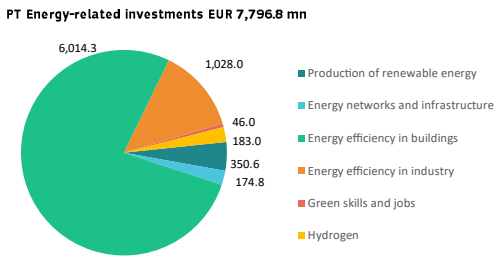
National Energy and Climate Plan (NECP)

- The **draft updated NECP** was submitted to the European Commission in July 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 Portuguese RRP has a total allocation of EUR 16.3 billion in grants and EUR 5.9 billion in loans, with 41 % of available funds supporting climate objectives.
- EUR 7.8 billion **are allocated to energy-related measures,** with the largest amount for **energy efficiency in buildings** [EUR 6.0 billion]:
  - **Energy renovation of** 7.6 million m^2 of **private residential buildings** by 2025, additionally to 50 physical One stop shop Espaços Cidadão Energia.
  - **Social housing, setting up a National Energy Poverty Observatory** to analyse and develop public policies for energy poverty eradication in Portugal. It further supports the construction of 3650 high energy efficiency social housing dwellings and 100 000 vouchers for households in energy poverty.
  - **Renovation of public buildings**, supporting the energy efficiency renovation of 2.3 million m^2 of central government public buildings.
- In December 2023 the Commission disbursed the 3rd and 4th payments of EUR 2.46 billion to Portugal. In July 2024 Portugal submitted the 5th payment request of EUR 2.9 billion.

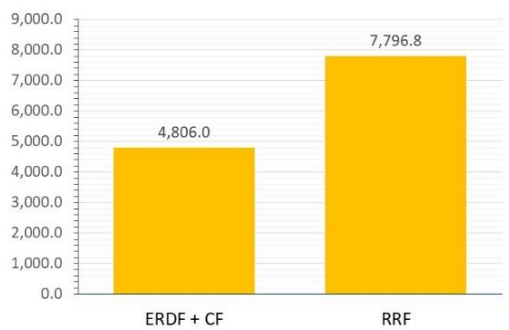
Graph 19: **Energy-related investments in the RRP (in EUR million)**



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 66.5 million.** For more information see the webpage innovation-fund-projects-country_en.

[6] Council of the European Union 11714/24.