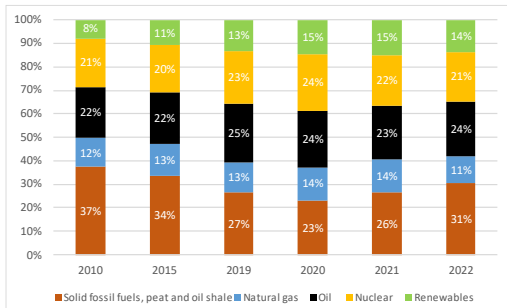


State of the Energy Union 2024: Bulgaria

Key energy figures

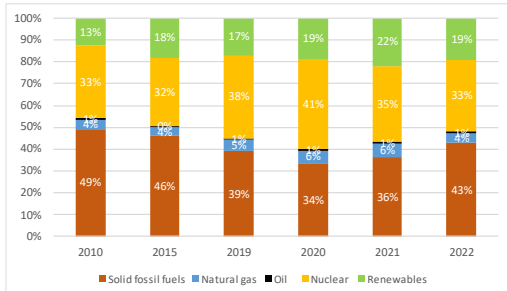
Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 859 900 TJ. (1.5% of the total EU consumption).

Source: Eurostat

Graph 2: **Electricity mix**



(1) The 2022 gross electricity production was 50.5 TWh. (1.8% of the total EU production).

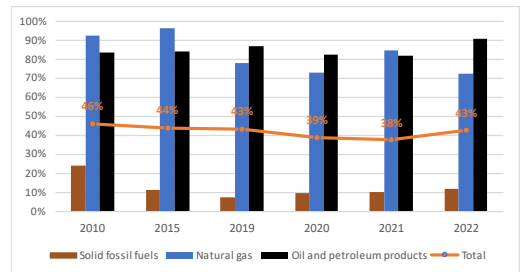
Source: Eurostat

- Fossil fuels account for almost two thirds (65.4%) of Bulgaria's **energy mix** (compared to 69% at EU level). The share of nuclear was 20.9% and renewables 13.8%.
- The **electricity mix** of Bulgaria is dominated by fossil fuels (48.2%) and nuclear energy (43.2%). Renewable energy accounts for 19.1% 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.

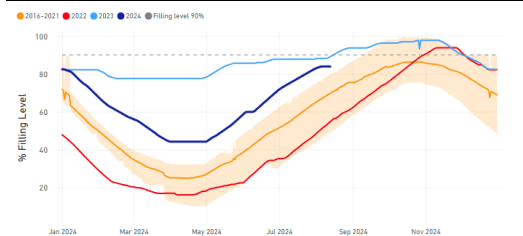
(2) Combustible renewables and electricity are excluded.

(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 Bulgaria**



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

- Bulgaria has **one underground gas storage facility** with a total capacity of **0.55 bcm**, representing 20% of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 83.83%.

3. NUCLEAR FUEL DIVERSIFICATION

- The nuclear fuel diversification process is well advanced. In December 2022, Bulgaria’s VVER-1000 Kozloduy nuclear power plant operator signed a contract with Westinghouse Electric Sweden for an alternative supply of nuclear fuel. The Bulgarian Nuclear Regulator has greenlit the phased transition to this type of nuclear fuel for Unit 5 of Kozloduy Nuclear Power Plant (NPP) at the end of April 2024. 43 fuel assemblies have been loaded in the Unit 5 reactor core during the planned annual outage in May 2024. Another recently signed contract with French company Framatome (on 24 March 2023) envisages delivery of fresh fuel for Unit 6 in autumn 2025.⁽¹⁾

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

Table 1: Electricity interconnectivity

2024	2030 target
16.8 %	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

⁽¹⁾ As stated by Framatome: *Following a dual track approach, in the short term, Framatome will fabricate fuel identical to the proven design currently used by the European VVER reactors. In parallel, Framatome is developing and qualifying European sovereign fuels of its own design for VVER 440 and 1000 reactors.* See link here: [Framatome to supply fuel to VVER reactors in Slovakia - Framatome](#).

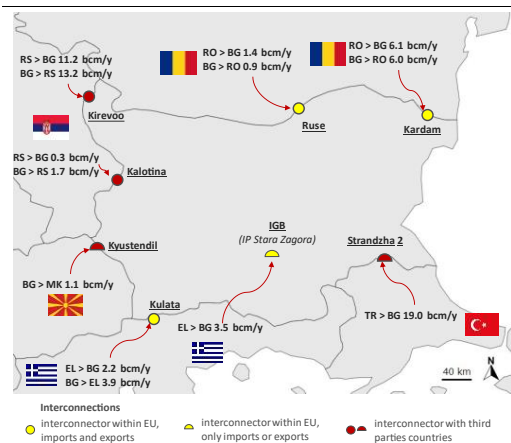
2. ENERGY TRANSMISSION INFRASTRUCTURE

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

- Despite recent legislative interventions as part of Bulgaria's RRP commitments, Bulgaria's electricity sector still lacks necessary levels of market liberalisation and integration at wholesale, balancing, and retail levels. At wholesale level, significant market interventions persist, with public service obligations on coal generators and quota systems benefiting a single public supplier. Legislation for full liberalisation is planned for June 2025. On balancing, Bulgaria underwent in the past year a reform of the balancing market. Completion of the liberalisation process, and the participation to the pan-EU balancing market, remains conditional on Bulgaria joining the to the automatic frequency restoration reserve (aFRR) platform PICASSO, planned for the second half of 2024.

Rollout of electricity smart meters

- In Bulgaria there is no data available on smart meter roll out as Bulgaria has not implemented the legislative framework yet or defined a roll out plan.

Diversification of gas supplies

- In 2023, Bulgaria had 4 natural gas supply sources, compared to 5 in 2021. Its three largest suppliers accounted for 98%, with Greece and Turkey being the main suppliers, holding a share of 67%. In 2021, Russia with 79%, Greece with 19%, and Azerbaijan (1%) were Bulgaria'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	2017	
EED NECPs four main indicators				
Inability to keep home adequately warm	20.7	-3 pp	-8.7 pp	10.6
Arrears on utility bills	17.8	-1.4pp	-13.3 pp	6.9
Share of pop. With leak, damp or rot in dwelling	8.4	-2.6 pp (2020)	-3.8 pp	15.5
AROP (At risk of poverty)	20.6	-1.5 pp	-2.8 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 Bulgaria: EUR 2 278 million or 3.85 % of total SCF.

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

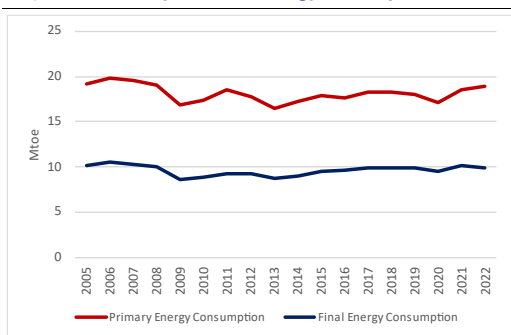
Just Transition Plan

- Bulgaria is finalising the Territorial Just Transition Plan (TJTP) outlining the move away from coal for three regions, Kyustendil, Pernik and Stara Zagora. The Just Transition Fund (JTF) programmes has allocated EUR 1.12 billion for Bulgaria that will support sustainable energy solutions, socials and employment measures and diversification of the local economy. Bulgaria committed to phase out coal in 2038.

Energy efficiency

1. ENERGY EFFICIENCY

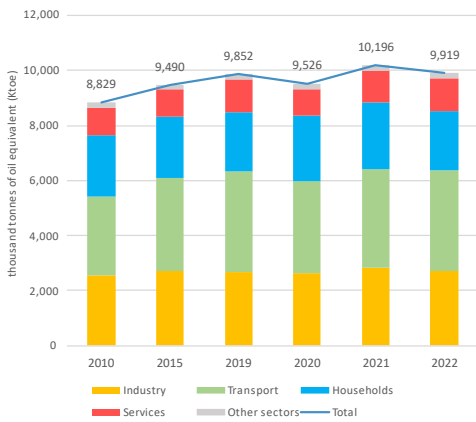
Graph 5: Primary and final energy consumption



Source: Eurostat

- In 2022, Bulgaria's **Primary Energy Consumption (PEC)** amounted to 18.9 Mtoe, 2% higher than in 2021, while its **Final Energy Consumption (FEC)** amounted to 9.9 Mtoe, 2.7% lower than in 2021.

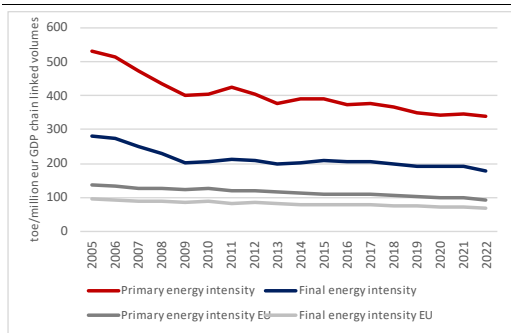
Graph 6: Final energy consumption by sector



(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

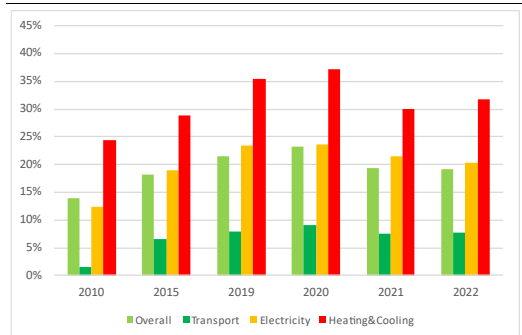
- In 2022, Final Energy Consumption (FEC) in the Bulgarian residential sector was **2.1 Mtoe**, representing a **reduction of 11%** compared to 2021. In the **services sector**, FEC was **1.2 Mtoe**, with an **1.8% increase** compared to 2021.
- Heating and cooling account for around **67%** of the country's residential final energy consumption, with renewables supplying approximately **32%** of the gross final energy consumption for heating and cooling. As per the European Heat Pump Association (EHPA), there are no data available for Bulgaria.
- In 2023, **17.8%** of the total population was experiencing difficulties on paying their utility bills while **20.7%** was not able to keep their home adequately warm over the cold periods of the year (decreasing from 2022, when such figures were, respectively, 19.2% and 17.7%).

However, this still 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

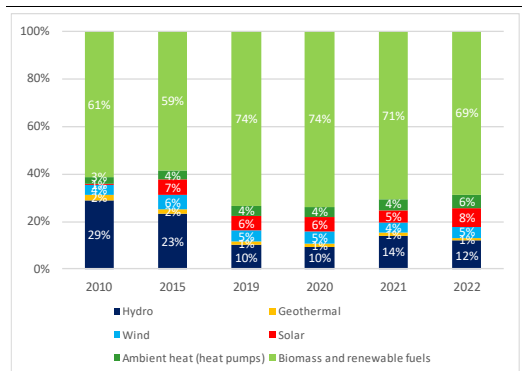
Graph 8: Share of renewable energy sources



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

Source: Eurostat

Graph 9: Renewable energy mix

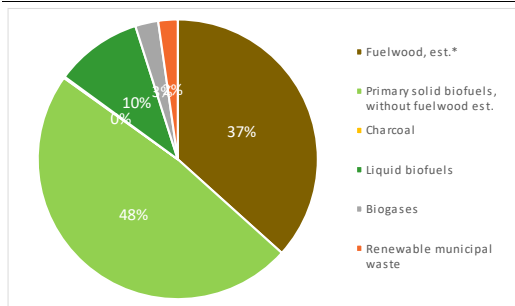


(1) In % of gross final consumption of energy.

Source: Eurostat

2. BIOENERGY MIX

Graph 10: **Bioenergy mix**



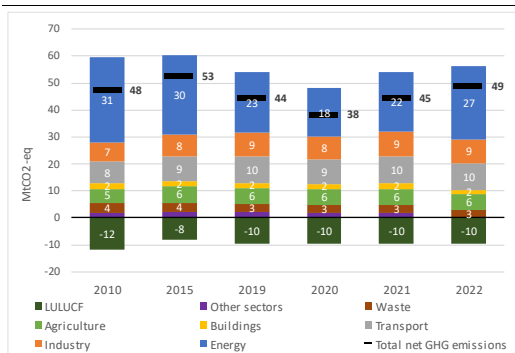
- (1) In % of gross final consumption of energy (2022).
- (2) * Fuelwood estimate, based on the Primary solid biofuels consumption in Other sectors, Eurostat and industry secondary data, DG ENER estimations.

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**

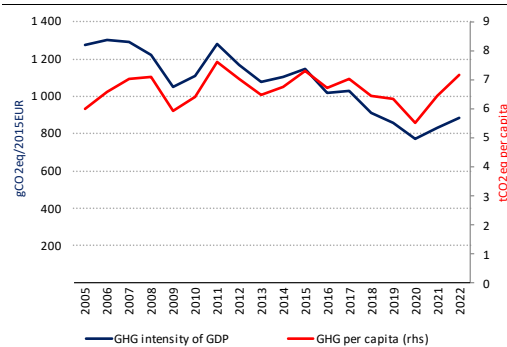


Based on UNFCCC GHG Inventory reporting as per the IPCC categories: (1) Energy sector refers to electricity and heat production and petroleum refining. (2) Industry includes fuel combustion in manufacturing and construction and emissions in industrial processes and product use. (3) Buildings include 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)

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

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 884 gCO₂eq/2015EUR, Bulgaria lies above the EU average in terms of GHG intensity of GDP.
- With 7 tonnes of CO₂ equivalent per capita, Bulgaria is at the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see [Progress on climate action \(europa.eu\)](#).

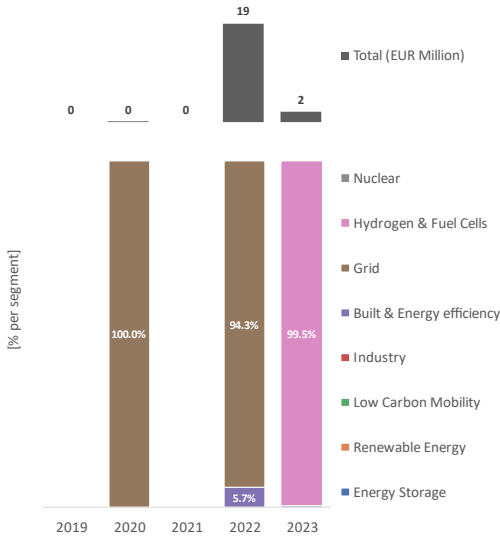
Research, innovation and competitiveness

1. INVESTMENT IN R&I

- Data related to public investment in Energy Union R&I priorities⁽³⁾ are not available⁽⁴⁾.

(4) Source: JRC SETIS 2024

Graph 13: **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.

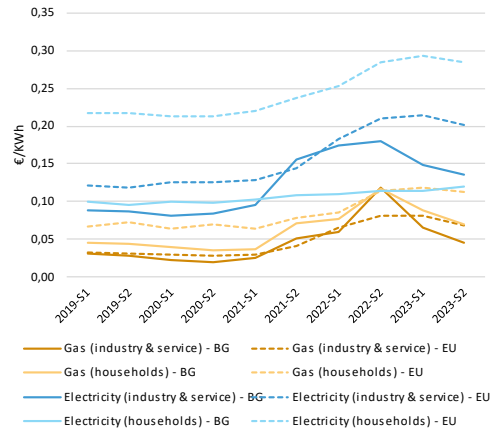
Source: JRC elaboration based on PitchBook data (08/2024)

2. NET-ZERO ENERGY TECHNOLOGIES

- Bulgaria has a track record of exporting batteries and shows potential in this sector. Two lead-acid battery manufacturing plants and one recycling facility (38 400 t/y) are in operation under a Bulgarian battery producer. The company operating them has unveiled plans to establish a 1 GW bipolar lead-acid manufacturing plant. A Belgian battery producer has expressed an interest in developing a lithium-ion battery manufacturing facility (10 GW/y), a R&D center and a recycling plant (50 000 t/y) in Bulgaria. And a Bulgarian-German joint-venture plans to create a Tier-1 PV panel manufacturing plant with an output capacity of 1 GW. Bulgaria also has a 10-20 MW manufacturing capacity for alkaline electrolyzers.

3. ENERGY PRICES DEVELOPMENT

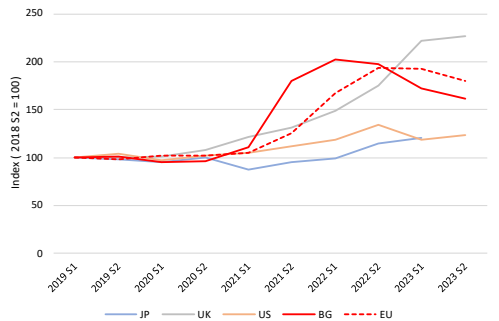
Graph 14: **Bulgaria's energy retail prices for households and industry & service**



- For industry, consumption bands are I3 for gas and IC for electricity, which refer to medium-sized consumers and provide an insight into affordability.
- For households, the consumption bands are D2 for gas and DC for electricity.
- 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 15: **Trends in electricity prices for non-household consumers (EU and foreign partners)**

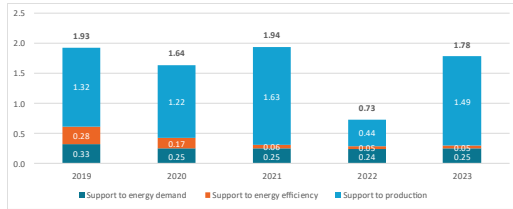


- For Eurostat data (EU and BG), the band consumption is ID referring to large-sized consumers with an annual consumption of between 2 000 MWh and 20 000 MWh, such as in electricity intensive manufacturing sectors, and gives an insight into international competitiveness.
- JP = Japan

Source: Eurostat, IEA

4. ENERGY SUBSIDIES

Graph 16: Energy subsidies by purpose

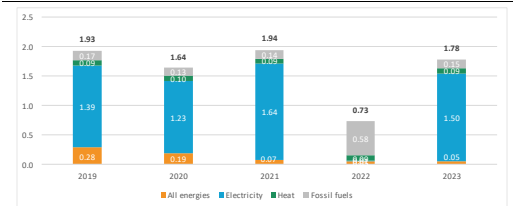


(1) Subsidies in EUR 2023 billion

(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 17: 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):** Reduce reliance on fossil fuels and accelerate the clean energy transition, particularly by shifting to renewable energy in district heating and deploying wind installations. Ensure sufficient storage capacities to increase the flexibility of the energy system. Strengthen the electricity grid infrastructure by introducing smart grid elements and increasing interconnection with neighbouring countries. Address energy poverty by implementing targeted measures to reduce the share of population unable to keep their homes adequately warm. Promote the deployment and uptake of sustainable urban and railway transport, including by accelerating the development of the necessary infrastructure.⁽⁵⁾
- For more information see the [2024 European Semester Country Report](#).

⁽⁵⁾ Council of the European Union 11694/24.

National Energy and Climate Plan (NECP)

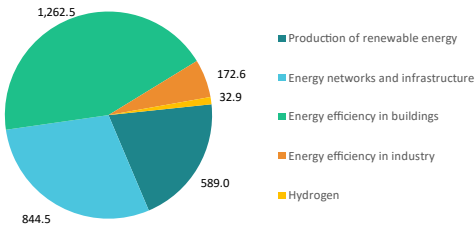
- The **draft updated NECP** was submitted to the European Commission in January 2024.
- Member States were due to submit their **final updated NECP by 30 June 2024**, taking into account the Commission recommendations.
- **The final updated NECP** was not submitted yet to the European Commission.
-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

Recovery and Resilience Plan (RRP and REPowerEU chapter)

- The Bulgarian RRP has a total allocation of EUR 6.2 billion (only grants), with 57.5 % of available funds supporting climate objectives.
- **EUR 2.9 billion are allocated to energy-related measures**, with the largest amount for **energy efficiency in buildings** [EUR 1.3 billion]:
 - **Residential building renovations** aiming to renovate **3.6 million m² of residential structures**, mainly going to renovations **achieving an average of at least 30% primary energy savings**;
 - **Non-residential public buildings** aiming **energy renovation** of at least **1.4 million m²**.
- The Commission already disbursed a 1st payment of EUR 1.37 billion to Bulgaria. Bulgaria satisfactorily fulfilled one milestone related to the energy transition, namely the establishment of the Energy Transition Commission, in its 1st payment request. **The 2nd payment request was submitted** in October 2023.

Graph 18: Energy-related investments in the RRP (in EUR million)

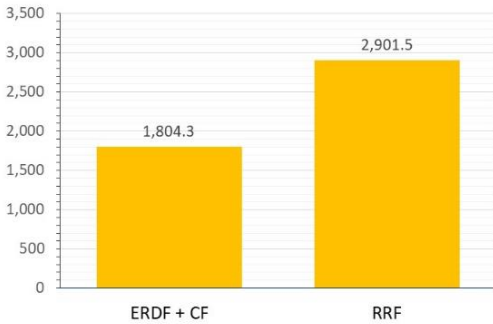
BG Energy-related investments EUR 2,901.5 mn



Source: European Commission

EU Funds supporting energy related investments

Graph 19: 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 189.7 million.** For more information see the webpage [innovation-fund-projects-country_en](#).
- **Modernisation Fund: EUR 261.8 million** (approved and/or confirmed Investments from 2021-2024). For more information see the webpage [modernisationfund.eu](#).
- **CEF-Energy: EUR 77.9 million** (4.0% of total EU contribution, for 2021-2027). For more information see [CINEA's Project Portfolio dashboard](#).