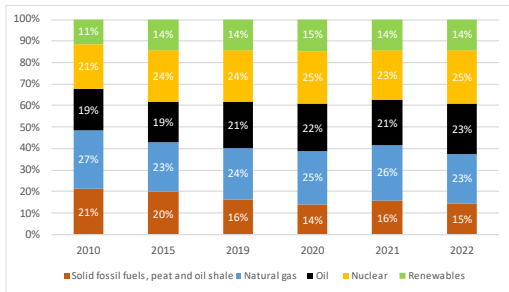


State of the Energy Union 2024: Slovakia

Key energy figures

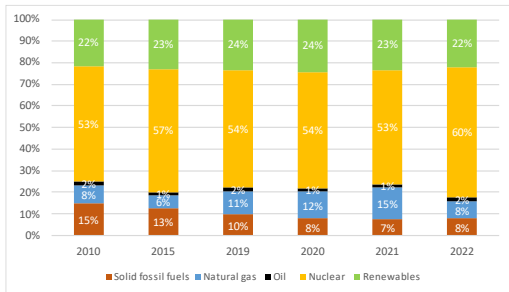
Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 690 613 TJ. (1.2% of the total EU consumption).

Source: Eurostat

Graph 2: **Electricity mix**



(1) The 2022 gross electricity production was 26.6 TWh. (1% of the total EU production).

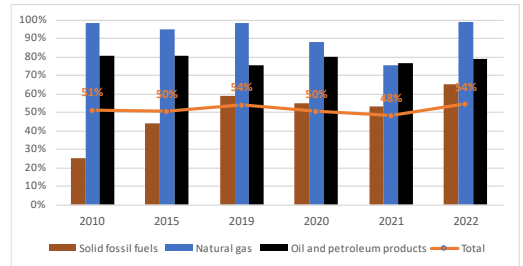
Source: Eurostat

- Fossil fuels account for 60.8% of Slovakia's **energy mix** (compared to 69% at EU level). The share of nuclear was 24.8% and renewables 14.4%.
- The **electricity mix** of Slovakia is dominated by nuclear energy (60%). Renewable energy accounts for 22.3% of the electricity mix (compared to 39.4% at EU level) and fossil fuels for 17.6% (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.

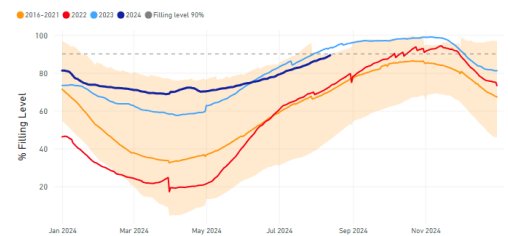
(2) Combustible renewables and electricity are excluded.

(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 Slovakia**



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

- Slovakia has **two underground gas storage facilities** with a total capacity of **3.38 bcm**, representing 75% of its annual gas consumption in 2022.
- On 17 August 2023, the country's storage capacity was filled to 90.78%.

3. NUCLEAR FUEL DIVERSIFICATION

- Slovenské elektrárne continues to depend on Russian nuclear fuel supply, as well as certain spare parts for its VVER-440 nuclear power plants, but efforts to reduce this dependency are progressing well. In August 2023, Slovenské Elektrárne signed an agreement with Westinghouse for the licensing and supply of VVER-440 fuel assemblies. In July 2024, Slovenské elektrárne also concluded a VVER-440 nuclear fuel supply agreement with the French company Framatome⁽¹⁾.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

Table 1: Electricity interconnectivity

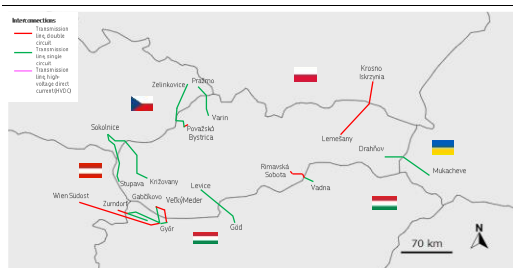
2024	2030 target
47.8 %	At least 15%

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

2. ENERGY TRANSMISSION INFRASTRUCTURE

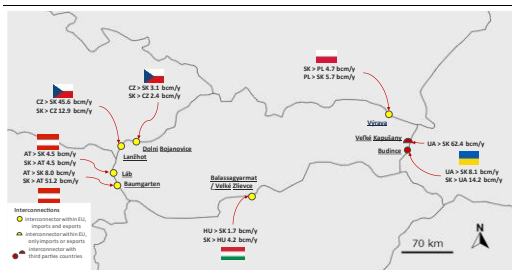
Map 1: Cross-border electricity infrastructure



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

(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](#).

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

- For the years 2023 and 2024, pursuant to an agreement between the Slovak government and Slovenske elektrarne, 5.79 TWh of electricity was marketed at a fixed price of 61.2077 EUR/MWh with a view to supply household consumers. This represents more than 20% of the electricity demand in Slovakia.

Rollout of electricity smart meters

- Slovakia has 15% smart meter rollout, especially for consumers connected to the distribution system at a low voltage level with an annual electricity consumption of at least 4 MWh and prosumers.⁽²⁾

Diversification of gas supplies

- In 2023, Slovakia had 5 natural gas supply sources, the same as in 2021. Its three largest suppliers accounted for 92%, with Russia being the main supplier, holding a share of 70%. In 2021, Russia with 68%, Czechia with 29%, and Austria (3%) were Slovakia's biggest natural gas supply sources.⁽³⁾

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

(3) 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
	2023	2021	2017		
EED NECPs four main indicators					
Inability to keep home adequately warm	8.1	+ 2.3 pp	+3.8 pp		10.6
Arrears on utility bills	7.2	+2.6 pp	+1.7 pp		6.9
Share of pop. With leak, damp or rot in dwelling	5.8	+ 0.9 (2020)	- 0.9 pp		15.5
AROP (At risk of poverty)	14.3	+ 2 pp	+ 1.9 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 Slovakia: EUR 1 701 million or 2.36 % of total SCF.

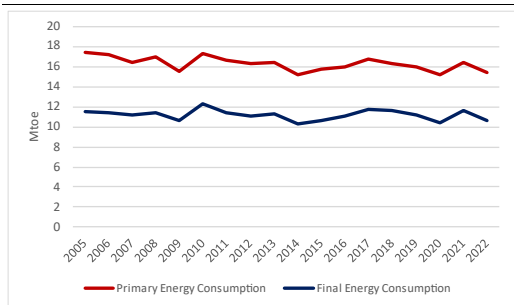
Just Transition Plan

- The Slovak Territorial Just Transition Plans (TJTP) outline the transition away from coal extraction and coal-fired electric power generation in the regions of Trenčín, Banská Bystrica, and Košice. The plans set out how the Just Transition Fund (JTF), with a national allocation of EUR 459 million, will support energy efficiency, the development of renewable energy sources, economic diversification, and modernisation of industries. While Slovakia committed to phase out coal by 2023, its plans under the draft updated National Energy and Climate Plan seem to be inconsistent with approved TJTP.

Energy efficiency

1. ENERGY EFFICIENCY

Graph 5: Primary and final energy consumption

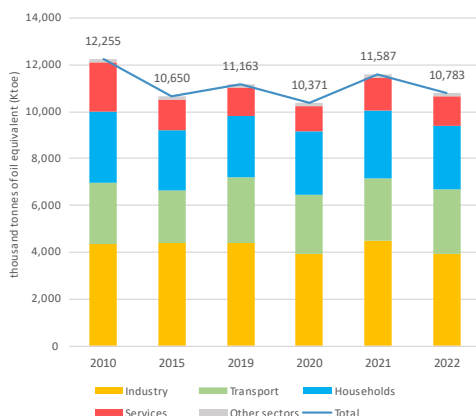


Source: Eurostat

- In 2022, Slovakia's **Primary Energy Consumption (PEC)** amounted to 15.4 Mtoe, 6.3% lower than in 2021, while its **Final**

Energy Consumption (FEC) amounted to 10.6 Mtoe, 8.1% lower than in 2021.

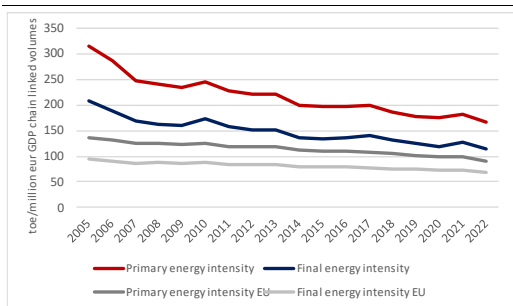
Graph 6: Final energy consumption by sector



(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 Slovak **residential sector** was **2.7 Mtoe**, representing a **reduction of 6.8%** compared to 2021. In the **services sector**, FEC was **1.3 Mtoe**, with an **9.2% decrease** compared

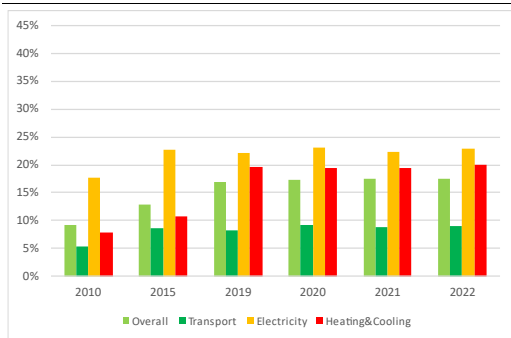
to 2021. However, climate corrected data⁽⁴⁾ show a **residential FEC increase of 0.7%** from 2021 to 2022, indicating that the above reduction is mostly climate-related (e.g. milder winter) rather than linked with an improvement of the building stock.

- Heating and cooling account for around **84%** of the country's residential final energy consumption, with renewables supplying approximately **20%** of the gross final energy consumption for heating and cooling. Around 12,000 heat pumps were sold in 2023, representing a decrease of 11% compared to the sales of the previous year, reaching a total stock of around 56,000 installed heat pumps, as per the European Heat Pump Association (EHPA).
- In 2023, **7.2%** of the total population was experiencing difficulties on paying their utility bills while **8.1%** was not able to keep their home adequately warm over the cold periods of the year (growing from 2021, when such figures were, respectively, 4.6% and 5.8%). 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

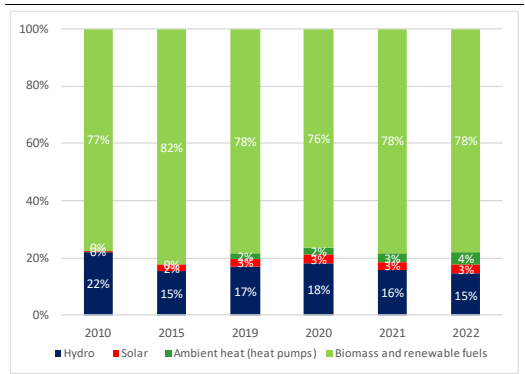


(1) In % of gross final consumption of energy.

Source: Eurostat

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

Graph 9: Renewable energy mix

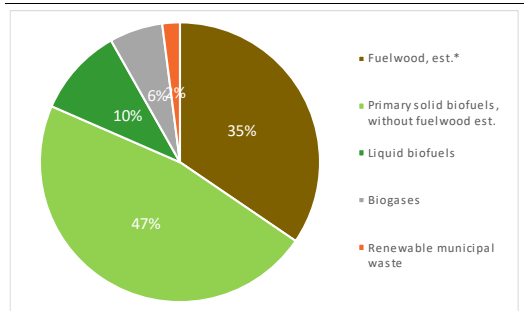


(1) In % of gross final consumption of energy.

Source: Eurostat

2. BIOENERGY MIX

Graph 10: Bioenergy mix



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

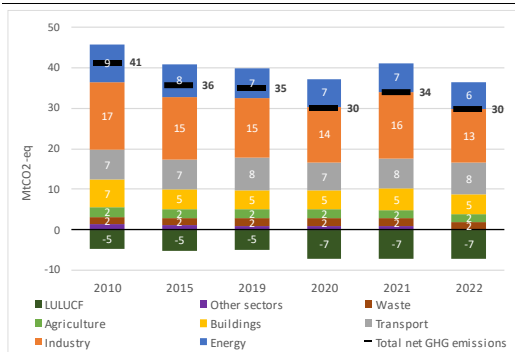
(2) * Fuelwood estimate, based on the Primary solid biofuels consumption in Other sectors, Eurostat and industry secondary data, DG ENER estimations.

Source: Eurostat and DG ENER

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

3. GREENHOUSE GAS EMISSIONS

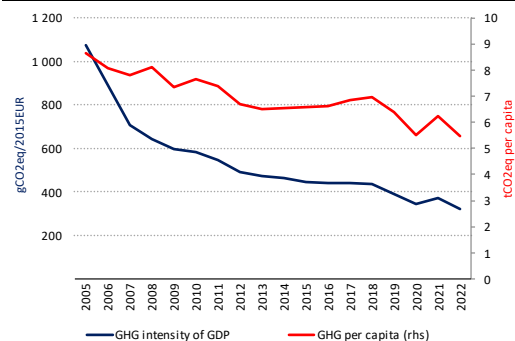
Graph 11: Greenhouse gas emissions by sector



Based on UNFCCC GHG Inventory reporting as per the IPCC categories: (1) Energy sector refers to electricity and heat fuel 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 323 gCO2eq/2015EUR, Slovakia lies above the EU average in terms of GHG intensity of GDP.
- With 5 tonnes of CO2 equivalent per capita, Slovakia is below the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see [Progress on climate action \(europa.eu\)](https://progress-on-climate-action.europa.eu).

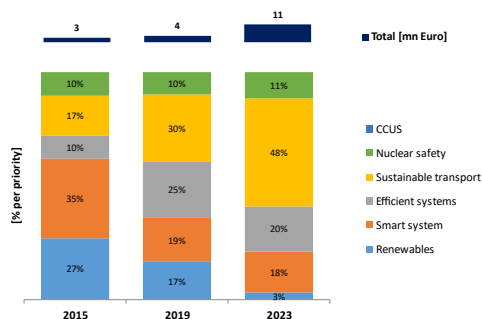
(5) Renewables, smart system, efficient systems, sustainable transport, CCUS and nuclear safety, COM(2015) 80 final ('Energy Union Package').

Research, innovation and competitiveness

1. INVESTMENT IN R&I

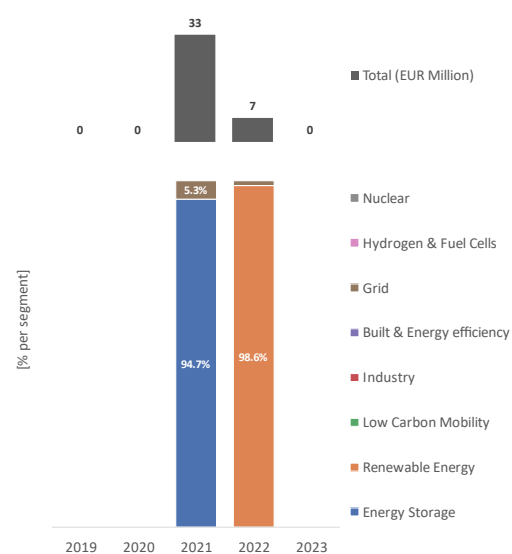
- Public investment in research and innovation (R&I) in Energy Union priorities⁽⁵⁾ increased from 0.004% in 2015 to 0.009% in 2023 (share of GDP).⁽⁶⁾

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)

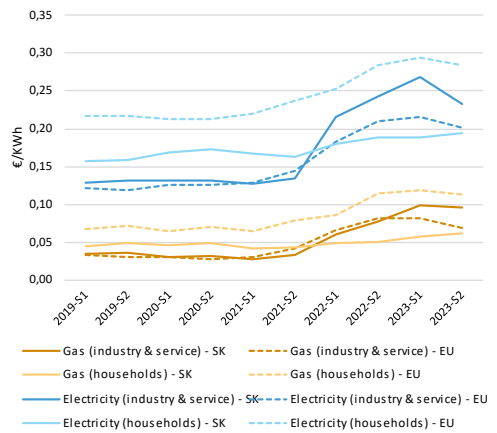
(6) Source: JRC SETIS 2024

2. NET-ZERO ENERGY TECHNOLOGIES

- Slovakia continues to depend on imports for clean energy technologies. Even so, there have been positive developments in battery manufacturing and Slovakia's foothold in the solar photovoltaic modules supply chain is growing. Slovakia has a lot of battery manufacturing potential, with one Chinese company investing in the country in power battery technology research and development and innovation. In November 2023, the government signed a Memorandum of Understanding with two battery companies, the Chinese one mentioned above and a Slovak one, to support the construction of a lithium-ion battery gigafactory with 10GWh in Slovakia by 2025, 20GWh in 2026 and 40GWh by 2027 to supply the electric vehicles market. The first Slovak battery production line was launched a month later. Despite the strong demand for it, solar modules manufacturing has only recently developed in Slovakia. The pioneer is a Slovak company founded in 2021, specialising in the production of photovoltaic panels, that plans to build a 150 MW plant in Vranov. The plant will produce double-sided glass panels and aims for a capacity of 500 MW by 2024. Possibilities for increasing the production of photovoltaic panels in Slovakia are also being explored thanks to a Memorandum of Understanding with Japan.

3. ENERGY PRICES DEVELOPMENT

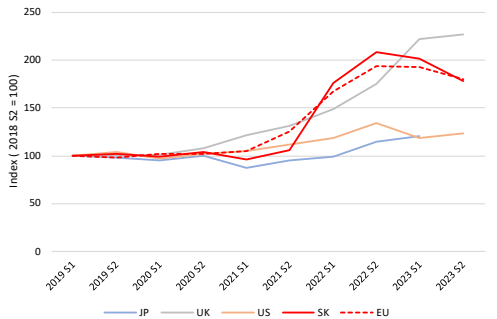
Graph 15: Slovakia's energy retail prices for households and industry & service



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

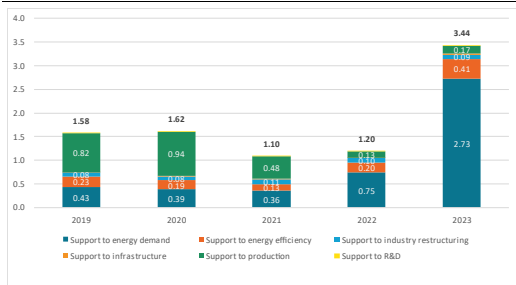


- For Eurostat data (EU and SK), the band consumption is ID referring to large-sized consumers with an annual consumption of between 2 000 MWh and 20 000 MWh, such as in electricity intensive manufacturing sectors, and gives an insight into international competitiveness.
- JP = Japan

Source: Eurostat, IEA

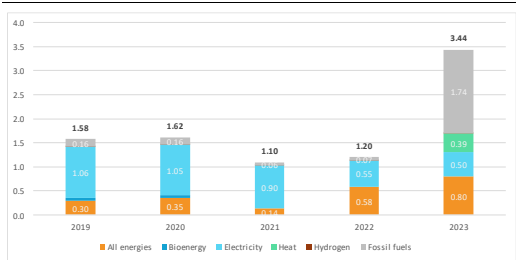
4. ENERGY SUBSIDIES

Graph 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

- **No Country Specific Recommendation for Energy**⁽⁷⁾
- 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 September 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.

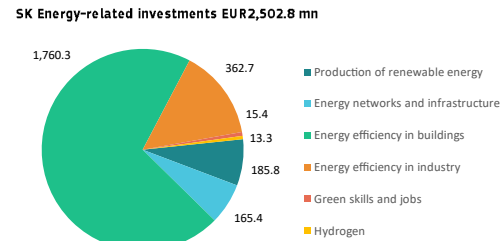
⁽⁷⁾ Council of the European Union 11717/24.

- For documents and information see the dedicated [webpage of the European Commission on the NECPs](#).

Recovery and Resilience Plan (RRP and REPowerEU chapter)

- The Slovak RRP has a total allocation of EUR 6.4 billion (only grants), with 48 % of available funds supporting climate objectives.
- EUR 2.5 billion **are allocated to energy-related measures**, with the largest amount for **energy efficiency in buildings** [EUR 1.8 billion]:
 - **reforms** of the REPowerEU chapter aiming at **improving the management of private and public buildings**;
 - **investments in large-scale renovation** aiming to make at least 25 164 family houses more efficient, including support for complete renovation of family houses, achieving at least 30% primary energy savings.
- In December 2023 the Commission disbursed the 3rd payment of EUR 662 million to Slovakia.

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 614.5 million** (approved and/or confirmed Investments from 2021-2024). For more information see the webpage modernisationfund.eu.