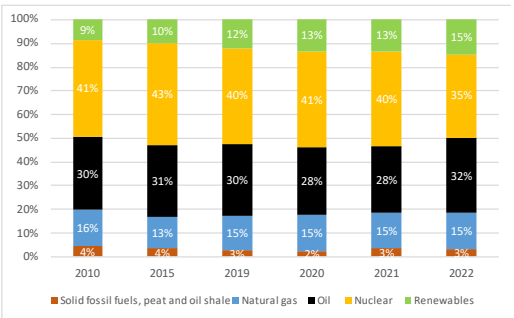
State of the Energy Union 2024: France

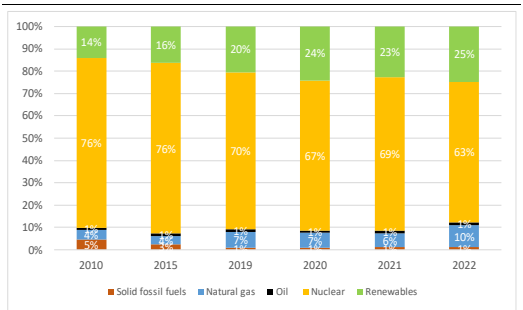
Key energy figures

Graph 1: **Energy mix**



(1) The 2022 gross inland energy consumption was 9.2 million TJ. (16.2% of the total EU consumption).
Source: Eurostat

Graph 2: **Electricity mix**



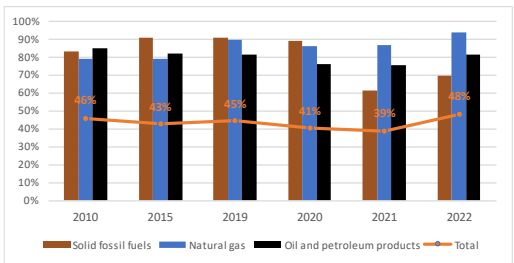
(1) The 2022 gross electricity production was 469.2 TWh. (16.8% of the total EU production).
Source: Eurostat

- Fossil fuels account for the half (50.3%) of France's **energy mix** (compared to 69% at EU level). The share of nuclear was 35.1% and renewables 14.6%.
- The **electricity mix** of France is dominated by nuclear energy (62.8%). Renewable energy accounts for almost a quarter (24.7%) of the electricity mix (compared to 39.4% at EU level) and the fossil fuels for 12.4% (compared to 38.6% at EU level).

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

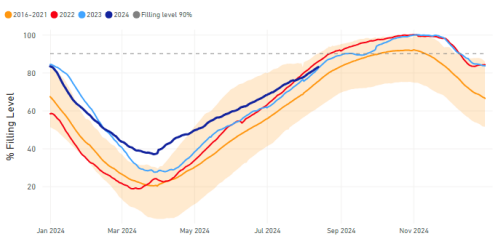
Graph 3: **Import dependency on fossil fuels**



(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 France**



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

- France has **fourteen gas storage facilities** with a total capacity of **11.2 bcm**, representing 30% of its annual gas consumption in 2022.
- On 17 August 2024, the country's storage capacity was filled to 85.11%.

3. NUCLEAR FUEL DIVERSIFICATION

- Although EDF shows not being in any significant way dependent on Russian uranium or services, EDF is dependent on Russia for recycling its spent nuclear fuel (uranium), since certain steps of the recycling process can be currently carried out only in Russia. However, over the last few years France has taken steps to further strengthen European and global West enrichment capacities by launching projects/initiatives to extend its own capacities through the extension of the Georges Besse II enrichment plant.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

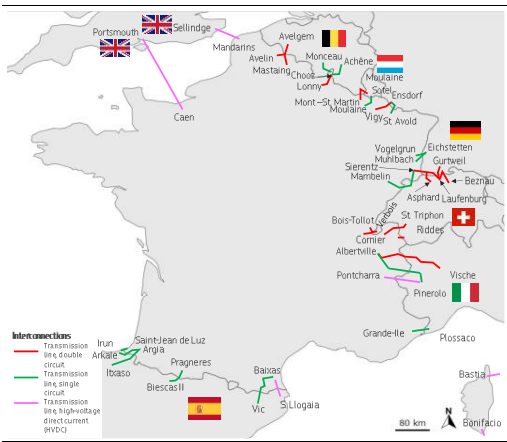
Table 1: **Electricity interconnectivity**

2024	2030 target
5.6 %	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

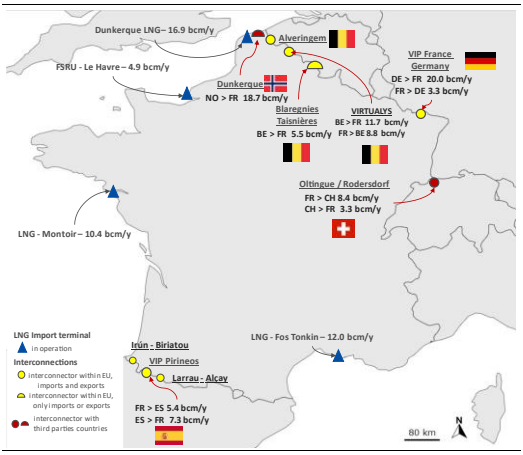
2. ENERGY TRANSMISSION INFRASTRUCTURE

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

- The price of a share of electricity produced by the incumbent EDF (100 TWh /year) is fixed by law. This system, known as ARENH (Accès Régulé à l'Électricité Nucléaire Historique), will expire in 2025.

Rollout of electricity smart meters

- France has a high electricity smart meter rollout, with 94% of household consumers being equipped with smart meters in 2023.(1)

Diversification of gas supplies

- In 2023, France had 7 natural gas supply sources, compared to 8 in 2021. Its three largest suppliers accounted for 80%, with the United States being the main supplier, holding a share of 40%. In 2021, Norway with 35%, Russia with 15% and the Netherlands (9%) were France 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	12.1	+6.1 pp	+7.2 pp	10.6
Arrears on utility bills	7.5	+0.4 pp	+1.4pp	6.9
Share of pop. With leak, damp or rot in dwelling	21.1	+ 3.1 pp (2020)	+10 pp	15.5
AROP (At risk of poverty)	15.4	+1.1 pp	+2.2 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 France: EUR 8 807 million or 11.20 % of total SCF.

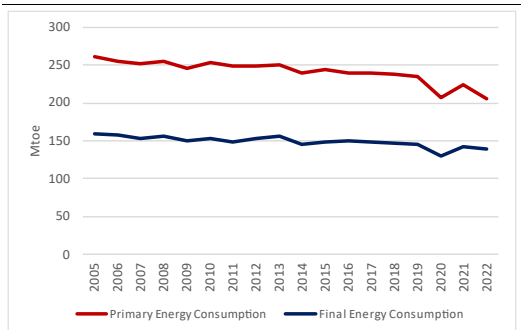
Just Transition Plan

- The French Territorial Just Transition Plans (TJTP) delineate the transformation of fossil fuel and heavy sectors in 10 regions across the six departments. These plans detail how the Just Transition Fund (JTF) endowed with a national allocation of EUR 1,03 billion, will aid in mitigating the impacts of sectoral transformations, steering towards a carbon-neutral economy. The commitment to phase out coal is set for 2027 in the final 2024 NECP for both Cordemais and Saint Avold.

Energy efficiency

1. ENERGY EFFICIENCY

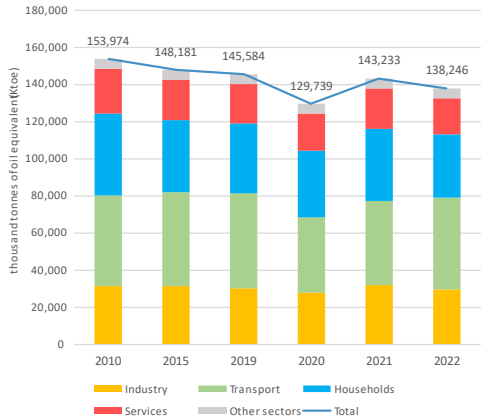
Graph 5: **Primary and final energy consumption**



Source: Eurostat

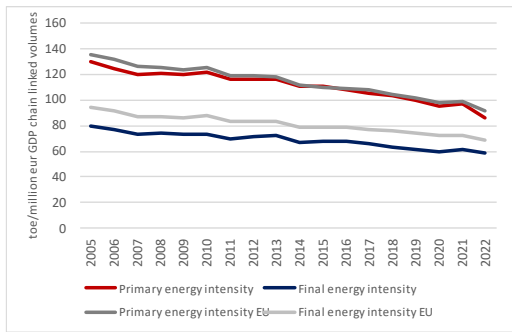
- In 2022, France's **Primary Energy Consumption (PEC)** amounted to 205.6 Mtoe, 8.6% lower than in 2021, while its **Final Energy Consumption (FEC)** amounted to 138.5 Mtoe, 3.1% lower than in 2021.

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 French **residential sector** was **37.4 Mtoe**, representing **a reduction of 11.8%** compared to 2021. In the **services sector**, FEC was **20.1 Mtoe**, with an **8.0% decrease** compared to 2021. However, climate corrected data[(3)] show a **residential FEC increase of 4.5%** 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.

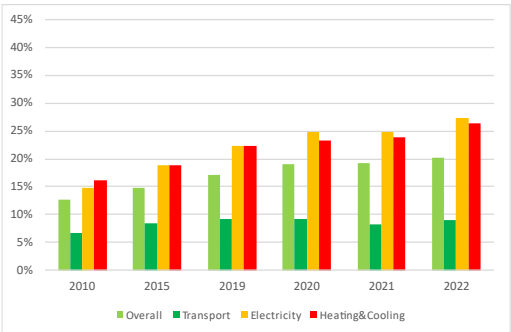
[(3)] Following JRC's methodology (see for reference "Energy Consumption and Energy Efficiency trends in the EU, 2000 – 2020).

- Heating and cooling account for around **80%** of the country's residential final energy consumption, with renewables supplying approximately **26%** of the gross final energy consumption for heating and cooling. Around 720 000 heat pumps were sold in 2023, representing an increase of 16% compared to the sales of the previous year, reaching a total stock of around 6.0 million installed heat pumps, as per the European Heat Pump Association (EHPA).
- In 2023, **7.5%** of the total population was experiencing difficulties on paying their utility bills while **12.1%** was not able to keep their home adequately warm over the cold periods of the year (growing from 2021, when such figures were, respectively, 7.1% and 6.0%). This underlines the importance to increase rate and depth of building renovation, specifically of worst-performing buildings.

Decarbonisation and climate action

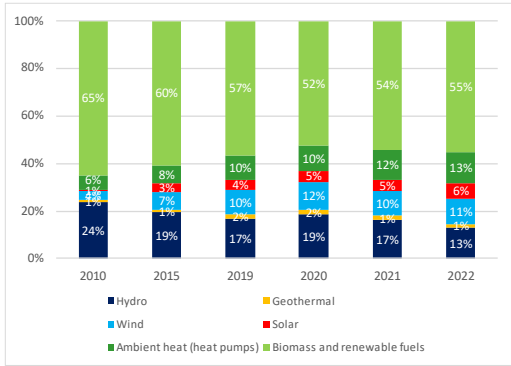
1. SECTORAL SHARE OF RENEWABLE ENERGY

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



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

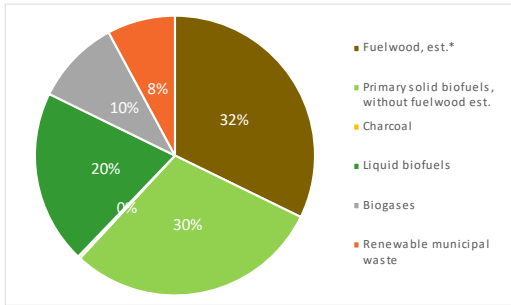
Graph 9: **Renewable energy mix**



(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 (up to 10)**

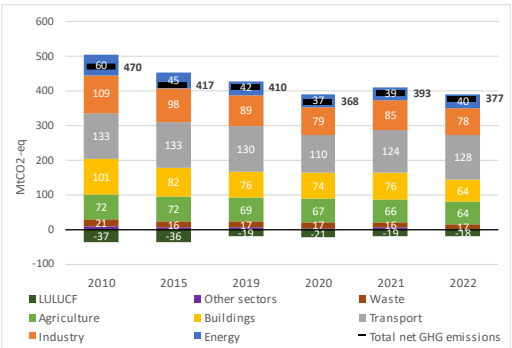
Name	Description
Houdain bus station HRS (TADAO/Bulle 6 SMTAG)	0.5 MW connected to the grid
Fébus Pau bus station HRS	0.75 MW connected to the grid
Vallée Hydrogène Grand Ouest (VHyGO) - H2 Ouest (Phase 1)	750kW from renewables
Vallée Hydrogène Grand Ouest (VHyGO) - EffiH2	1MW from renewables
Hyport - Toulouse-Blagnac Airport	2MW connected to the grid
AuxHYGen (Phase 1)	1MW connected to the grid

Vallée Hydrogène Grand Ouest (VHyGO) - Saint-Nazaire	1.5 MW from offshore wind
Sirea - Castres site	0.43 MW from solar PV
Sealhyfe	1 MW from offshore wind
Porte de St Cloud HRS station	2.5 MW online since 2023

Source: European Commission based on IEA data

4. GREENHOUSE GAS EMISSIONS

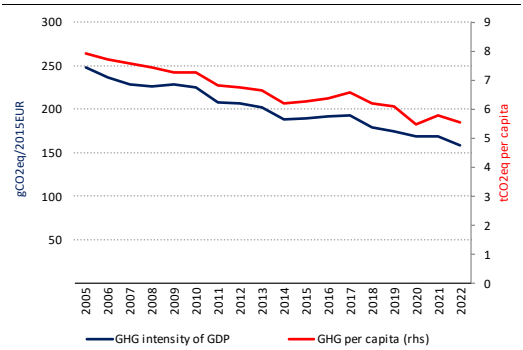
Graph 11: **Greenhouse gas emissions by sector**



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).

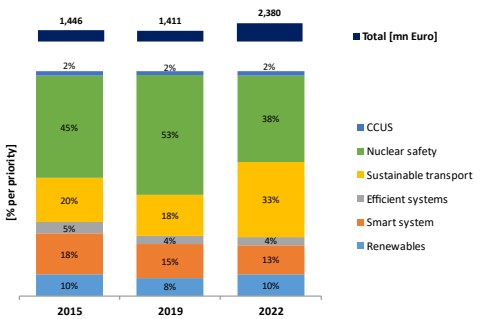
- With 158 gCO2eq/2015EUR, France lies below the EU average in terms of GHG intensity of GDP.
- With 6 tonnes of CO2 equivalent per capita, France is below the EU average in terms of GHG emissions per capita.
- For more detailed information on country profiles see Progress on climate action (europa.eu).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

- Public investment in research and innovation (R&I) in Energy Union priorities[4] increased from 0.066% in 2015 to 0.090% in 2022 (share of GDP).[5]

Graph 13: **Public investment in Energy Union R&I priorities**

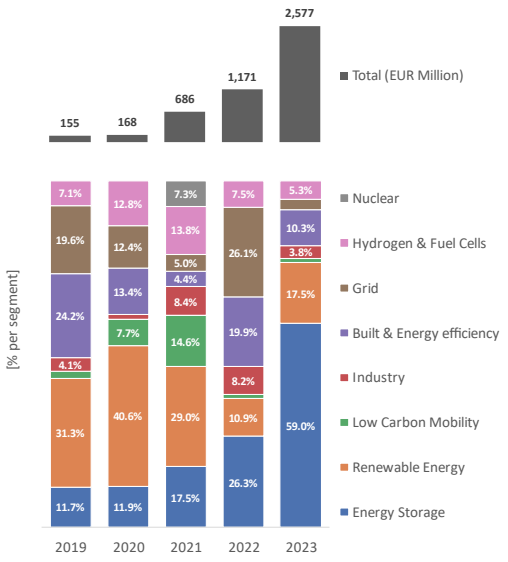


Source: JRC SETIS 2024

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

(5) Source: JRC SETIS 2024

Graph 14: **Venture capital investment in net-zero energy technology (start-ups and scale-ups)**



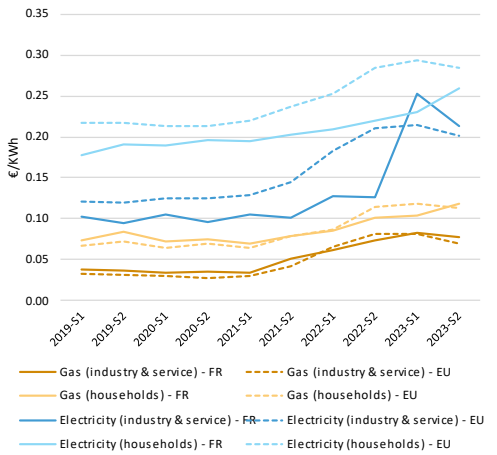
(1) Firms typically use venture capital to expand, break into new markets, and grow faster. Venture capital is essential for the growth of innovative firms and it is key to foster the EU's competitiveness and to strengthen the EU's technology sovereignty in the net-zero energy sector.
Source: JRC elaboration based on PitchBook data (08/2024)

2. NET-ZERO ENERGY TECHNOLOGIES

- France has a strong manufacturing base in low-carbon technologies and components (including hydrogen and nuclear), and it is expected to expand it to other decarbonised generation technologies, in particular new offshore windfarms. France is among the leading worldwide exporters of nuclear technologies in Europe. The French recovery and resilience plan focuses heavily on hydrogen, and France is one of the world's top hydrogen providers. France is well positioned in the field of hydrogen, with industry leaders in electrolysis and fuel cell technologies. There are French companies among the biggest European manufacturers of nuclear equipment and smart meters. There are also major new French players in the batteries field, with as many as four gigafactories planned in France. In October 2021, France announced the 'France 2030', a EUR 54 billion investment plan for 2030. This targets French industrial development in the energy, automotive and space sectors, including EUR 8 billion earmarked for energy technology investment in the decarbonisation of industry, in hydrogen and in small modular reactors, and EUR 4 billion for electric and plug-in hybrid vehicles. Public investment in research and innovation (R&I) as an EU Energy Union priority increased from 0.066% in 2015 to 0.090% in 2022 (as a share of GDP). There was nonetheless an upward trend in venture capital invested in climate tech start-ups and scale-ups (25% in 2023 compared to 2.4% in 2020, as a percentage of total venture capital invested in France), with France representing nearly 11% of the EU's total venture capital investment in climate tech start-ups and scaleups. These investments play a key role in bridging the gap between R&I and market uptake, helping to boost EU competitiveness.

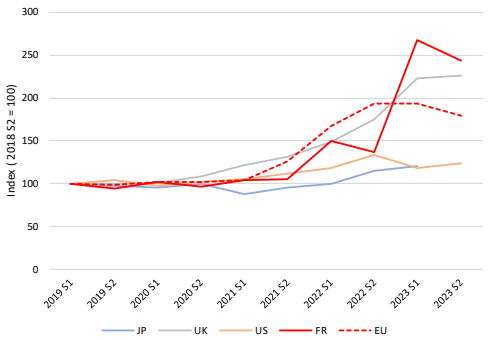
3. ENERGY PRICES DEVELOPMENT

Graph 15: **France'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

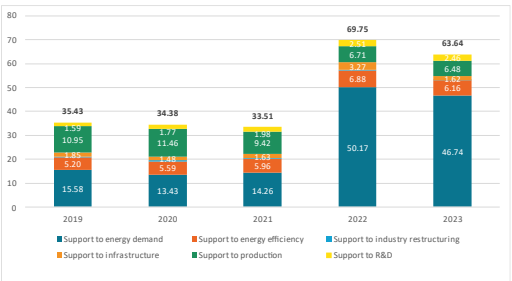
Graph 16: **Trends in electricity prices for non-household consumers (EU and foreign partners)**



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

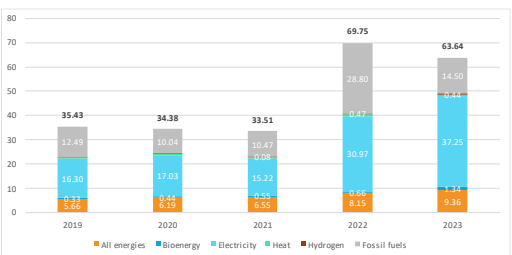
4. ENERGY SUBSIDIES

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

- **Country Specific Recommendation (Energy):** Improve the business environment by reducing the administrative burden. Foster business R&D intensity, including by better targeting public support schemes. Accelerate the energy transition by deploying renewable energies faster, including by adopting secondary legislation, setting up the 'renewables acceleration areas' and promoting storage technologies. [6]
- 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.

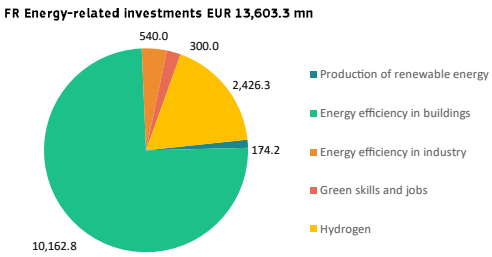
Recovery and Resilience Plan (RRP and REPowerEU chapter)

- The French RRP has a total allocation of EUR 40.3 billion (only grants), with 49.5 % of available funds supporting climate objectives.
- **EUR 13.6 billion are allocated to energy-related measures,** with the largest amount for **energy efficiency in buildings (EUR 10.2 billion):**
  - **residential buildings:** EUR 3.1 billion supporting the energy renovation of 1.75 million residential buildings and EUR0.5 billion for 40 000 social housing units.
  - **public buildings:** EUR 6.4 billion supporting energy renovation works for over 6 700 public buildings, (over 28 million m^2), 681 schools, as well as medical and medico-social establishments, and cultural sites (heritage renovations).

[6] Council of the European Union 11702/24.

- On 5 June 2024, the Commission disbursed the 3rd payment of EUR 7.5 billion to France.
- With the support of the RRF, more than 700 000 homes (MaPrime Rénov) and more than 40 000 social dwellings have been already energy renovated since 2020.

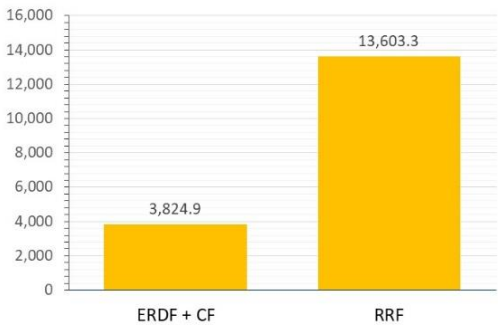
Graph 19: **Energy-related investments in the RRP (in EUR million)**



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 504.3 million.** For more information see the webpage innovation-fund-projects-country_en.
- **CEF-Energy: EUR 164.9 million** (8.5% of total EU contribution, for 2021-2027). For more information see CINEA's Project Portfolio dashboard.