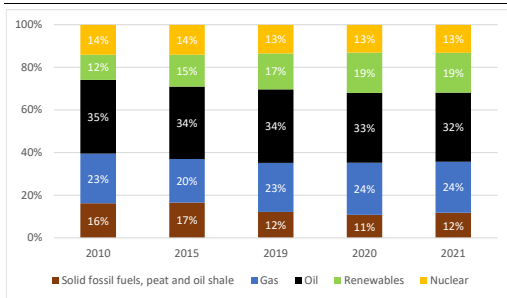


State of the Energy Union 2023 EU

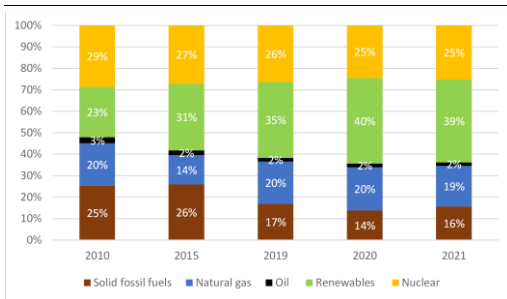
Key energy figures

Graph 1: Energy mix



Source: Eurostat

Graph 2: Electricity mix



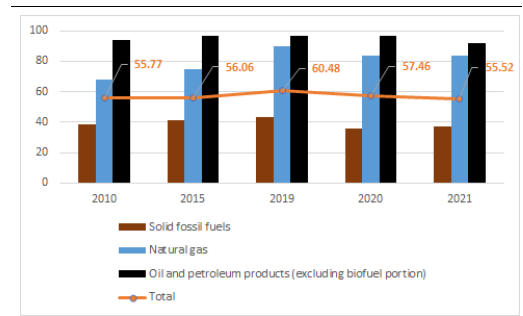
Source: Eurostat

- **Gross available energy** in the European Union in 2021 increased compared with 2020 (+6%). Oil continued to be the most significant energy source for the European economy, despite a long-term downward trend, while natural gas remained the second largest energy source.
- At EU level, **renewables make up the largest share of power generation**, followed by fossil fuels and nuclear energy.

Security, solidarity and trust

1. DIVERSIFICATION OF ENERGY SOURCES AND REDUCTION OF IMPORT DEPENDENCY

Graph 3: Import dependency on fossil fuels



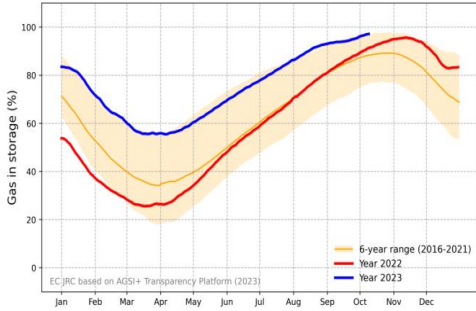
- (1) In percentages
- (2) Combustible renewables and electricity are excluded
- (3) The total amount takes into consideration the energy mix of the country

Source: Eurostat

- **Since February 2022**, the EU has ended all imports of Russian coal and reduced imports of Russian oil by about 90%.
- The EU has substantially reduced total Russian gas imports **since 2021**, from 150-155 bcm (accounting for 45% of total EU gas imports), falling to 79.9 bcm in 2022 (accounting for 24% of total EU gas imports) and 21 bcm in the first half of 2023 (accounting for 15% of total EU gas imports).
- **LNG**, by nature a diversified global source, has considerably increased since 2022 and is now the first source of gas supply to the EU.

2. FLEXIBILITY OF THE ENERGY SYSTEM

Graph 4: Gas storage levels



Source: JRC calculation based on AGSI+ Transparency Platform, 2023

- In June 2022, the **Gas Storage Regulation**¹ entered into force requiring Member States to fill their underground gas storage facilities to at least 80% of their capacity by 1 November 2022, rising to 90% for 2023 onwards.
- On 16 October the storage capacity in the EU was filled to almost 100%.

Integrated internal energy market

1. ELECTRICITY INTERCONNECTIVITY

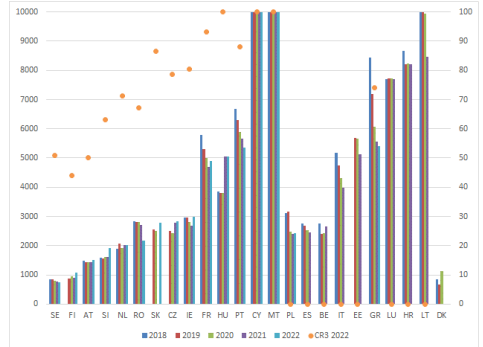
- Based on the received data², in 2021, seven Member States³ (IT, FR, IE, CY, EL, ES, RO) were below the 15% 2030 interconnection target, with five (IT, FR, IE, CY, ES) also remaining below the 2020 interconnection target. Overall, Member States have made good efforts to increase cross-border capacity and the completion of various Projects of Common Interest should further improve the interconnectivity levels.

¹ COM/2022/132 final – amending Regulation (EU) 2017/1938

² Since Member States used their own data sources the calculation might not be fully consistent between Member States.

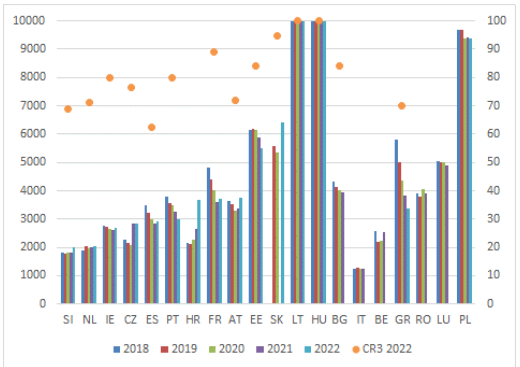
2. MARKET INTEGRATION

Graph 5: Index of concentration (HHI) for the household markets in electricity and CR3



Source: CEER 2023 out of ACER's Energy Retail and Consumer Protection 2023 Market Monitoring Report.

Graph 6: Index of concentration (HHI) for the household markets in gas and CR3



Source: CEER 2023 out of ACER's Energy Retail and Consumer Protection 2023 Market Monitoring Report.

Rollout of electricity smart meters

- In 2022, over 80% of households consumers were equipped with smart meter in 13 Member States, while eleven Member States have not started the process yet ⁽⁴⁾⁽⁵⁾.

⁽⁴⁾ ACER, CEER. Energy Retail and Consumer Protection, 2023 Market Monitoring Report.

⁽⁵⁾ 3 Member States did not report to CEER on this matter.

3. ENERGY POVERTY AND JUST TRANSITION

Table 1: Energy poverty

	EU		
	2020	2021	2022
Arrears on utility bills (households %)	6.5%	6.4%	6.9%
Inability to keep home adequately warm (household %)	7.5%	6.9%	9.3%
Population living in dwelling with presence of lead, damp and rot (population %)	14.8%	:	:

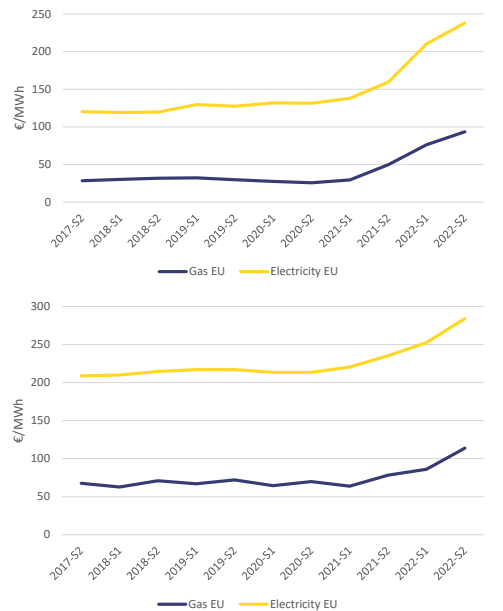
Source: Eurostat

Territorial Just Transition Plans for the EU Member States:

- The Territorial Just Transition Plans (TJTPs) have been prepared by **67 coal phase-out and carbon intensive regions of 26 EU Member States** and approved by the Commission, to which the three last are to be added soon.
- **TJTPs cover territories most negatively affected by the transition from the economic and social perspective**, in particular with regard to the expected adaptation of workers or job losses in fossil fuel production and use and the transformation needs of the production processes of industrial facilities with the highest greenhouse gas intensity.
- The TJTPs must be consistent with the integrated national energy and climate plans, and they are conditional for regions to be eligible for contributions from the Just Transition Mechanism, including its Just Transition Fund. **The Fund is allocated EUR 19.2 bln, of which EUR 10.9 bln** comes from the Next Generation EU and **EUR 8.5 bln** from the Multiannual **Financial Framework 2021 – 2027**.

4. ENERGY PRICES

Graph 7: Energy retail prices for industry (top) and households (bottom)



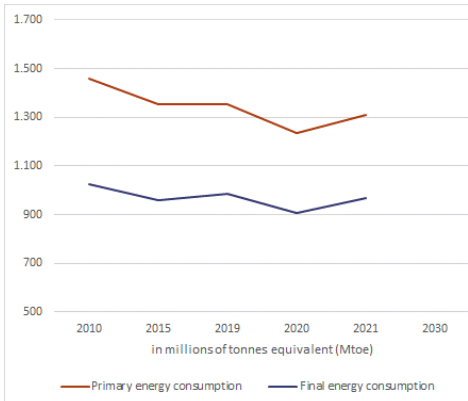
- (1) On electricity, the band consumption is for DC households and ID for industry
- (2) On gas, the band consumption is D2 for households and I4 for industry

Source: Eurostat

Energy efficiency

1. ENERGY EFFICIENCY

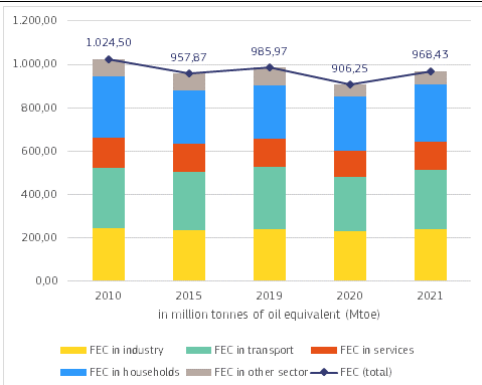
Graph 8: Primary and final energy consumption



Source: Eurostat

- In 2021, EU's **Primary Energy Consumption (PEC)** amounted to 1311.11 Mtoe, 3.2% lower than in 2019, while its **Final Energy Consumption (FEC)** amounted to 968.43 Mtoe, 1.8% lower than in 2019, despite the COVID-19 crisis recovery.

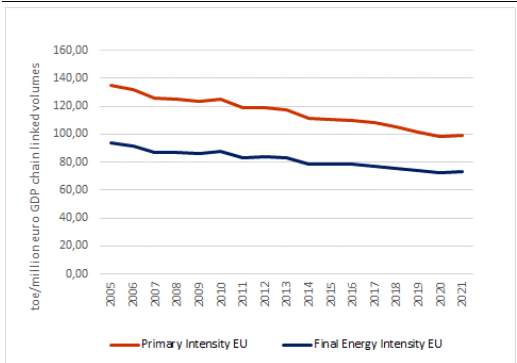
Graph 9: Final energy consumption by sector



Final energy consumption excludes consumption of the energy sector (including transformation and distribution losses) and non-energy use of energy carriers.

Source: Eurostat

Graph 10: Final and primary energy intensity



Source: Eurostat

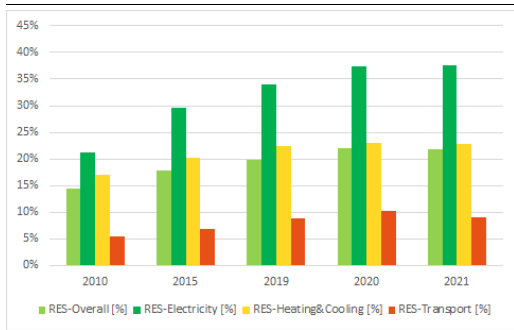
2. ENERGY SAVINGS IN BUILDINGS

- All EU countries have established a **Long Term Renovation Strategy (LTRS)** to support the renovation of their national building stock into a highly energy efficient and decarbonised building stock by 2050.
- In 2021, the final energy consumption of residential buildings **decreased by 1.85 %** compared to 2019.
- The sales of heat pumps amounted to **close to 3 million units** in 2022 representing an increase of **39 %** compared to 2021, as per the European Heat Pump Association (EHPA).

Decarbonisation and climate action

1. SECTORAL SHARE OF RENEWABLE ENERGY

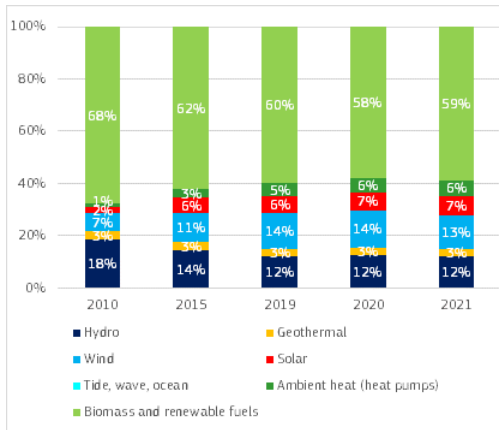
Graph 11: Share of renewable energy sources



(1) In % of gross final consumption of energy

Source: Eurostat

Graph 12: Renewable energy mix

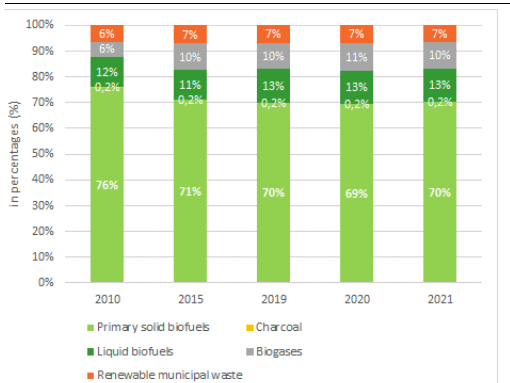


(1) In % of gross final consumption of energy

Source: Eurostat

2. BIOENERGY DEMAND

Graph 13: Bioenergy mix

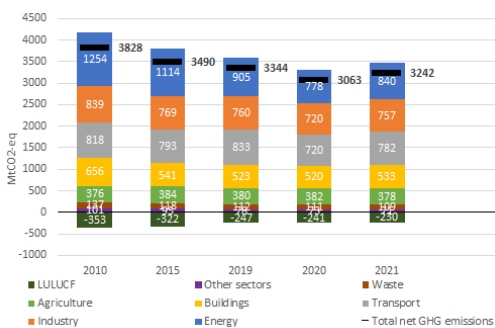


(1) Composition of bioenergy, in % of gross inland consumption of energy

Source: Eurostat

3. GREENHOUSE GAS EMISSIONS

Graph 14: Greenhouse gas emissions by sector



(1) Energy sector refers to electricity and heat production and petroleum refining.

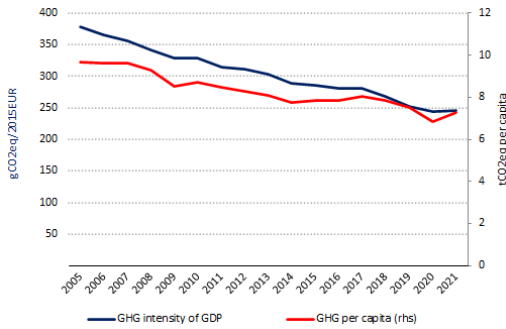
(2) Industry includes fuel combustion in manufacturing and construction and emissions in industrial processes and product use.

(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: EEA

Graph 15: GHG per capita and GHG intensity of GDP



(1) Total greenhouse gas emissions, including LULUCF and excluding international aviation.

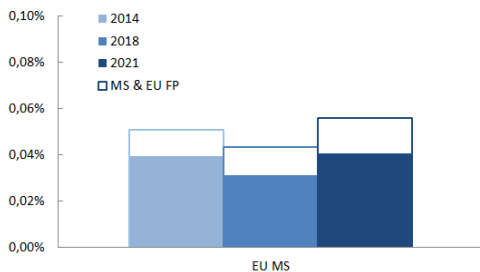
Source: Greenhouse gas inventory 1990-2021 (EEA). Real GDP in 2015-prices (AMECO, European Commission). Population (Eurostat).

Research, innovation and competitiveness

1. INVESTMENT IN R&I

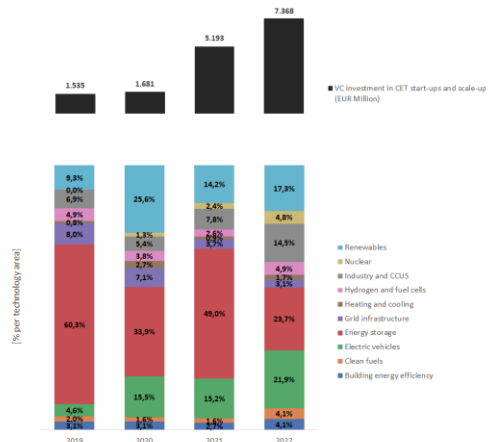
- In 2021, for the first time, the EU Member States' **public R&I spending** in the Energy Union priorities⁶ was – in current prices - higher than a decade ago. However, measured as share of Gross Domestic Product (GDP), public R&I spending in the Energy Union priorities, both at Member State and EU level, remained below the levels observed prior to 2016.

Graph 16: Public investment in Energy Union R&I priorities (in share of GDP)



Source: JRC SETIS (2023)

Graph 17: Venture capital investment in clean energy technology (start-ups and scale-ups)



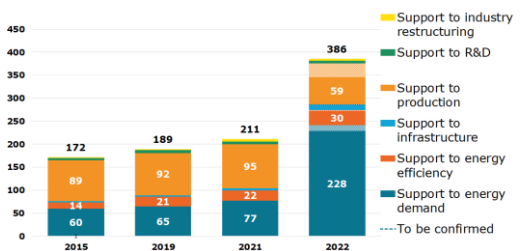
(1) Firms typically use venture capital to expand, break into new markets, and grow faster. Venture capital is essential for the growth of innovative firms and it is key to foster the EU's competitiveness and to strengthen the EU's technology sovereignty in the clean energy sector.

Source: JRC SETIS (2023)

- In the EU, Venture Capital (VC) investment in the clean energy domain reached EUR 7.4 bln in 2022, a 42% increase compared to 2021. The EU accounted for 19% - a growing share - of global VC investment in clean energy technology firms and ranked third behind the US (38%) and China (28%).

2. ENERGY SUBSIDIES

Graph 18: Energy subsidies by purpose

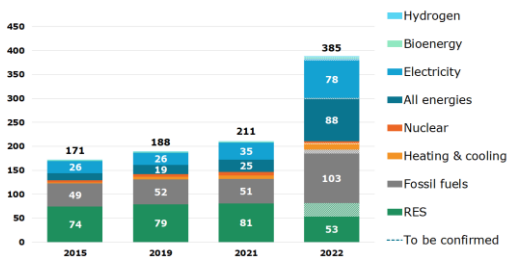


(1) Subsidies in EUR 2022 billion

(2) Some 2022 data were not fully available or validated at the time the study was completed (August 2023). For missing 2022 values, 2021 data were taken as a basis for an estimate. The estimated data are referred to as 'to be confirmed' in the graphs and indicated by hatching.

Source: Enerdata. Inventory of energy subsidies in the EU27 - 2023 edition

Graph 19: Energy subsidies by carrier



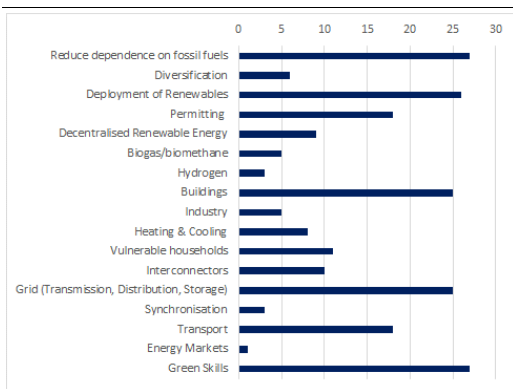
(1) Subsidies in EUR 2022 billion

(2) Some 2022 data were not fully available or validated at the time the study was completed (August 2023). For missing 2022 values, 2021 data were taken as a basis for an estimate. The estimated data are referred to as 'to be confirmed' in the graphs and indicated by hatching.

Source: Enerdata. Inventory of energy subsidies in the EU27 - 2023 edition

European Semester 2023

Graph 19: Energy-related 2023 Country-Specific Recommendations (27 Member States)



Source: European Commission based on Council Recommendations of the European Semester 2023

National Energy and Climate Plan (NECP)

- As of 20 October 2023, 16 draft updated NECPs have been submitted to the European Commission: Cyprus, Denmark, Estonia, Spain, Finland, Croatia, Hungary, Italy, Lithuania, Luxembourg, Malta, Netherlands, Portugal, Sweden, Slovenia and Slovakia.

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

Recovery and Resilience Plans (RRPs) and REPowerEU chapters

- To date the Commission has received **23 REPowerEU chapters**. **Bulgaria, Germany, Ireland and Luxembourg** still have to submit their REPowerEU chapter.
- Out of 23, the **Commission** has **endorsed**, and the **Council** has **approved** nine modified RRP with REPowerEU chapter: Czechia, Estonia, France, Malta, Netherlands, Portugal, Slovakia, Slovenia and Spain.
- So far, the Commission has received **36 payment requests** from **22 Member States**, disbursing a total of EUR 172 billion. The Member States that have not submitted payment requests are **Finland, Hungary, Netherlands, Poland and Sweden**.
- Overall, **EUR 292.6 billion in loans** have been requested under the RRF by 13 Member States. **Initially**, seven Member States had already requested **EUR 165.4 billion in loans** for their original RRP: **Cyprus, Greece, Italy, Poland, Portugal, Romania and Slovenia**. Following the revision of the RRF regulation, 10 Member States have requested **additional loans**, namely **Belgium, Czechia, Greece, Spain, Croatia, Hungary, Lithuania, Poland, Portugal and Slovenia**, for a total of **EUR 127.2 billion**.