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ENERGY

Quarterly report

on European electricity markets

Market Observatory for Energy
DG Energy

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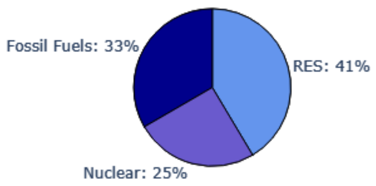
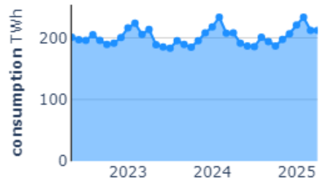
Electricity generation and consumption in Q1 2025 and year-on-year comparison



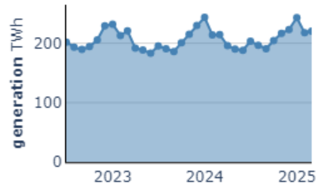
Electricity Mix



Electricity consumption

657 TWh

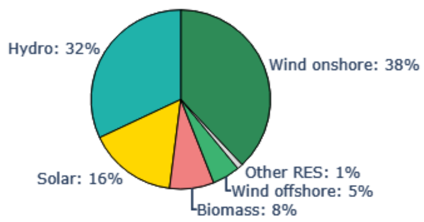
▲8 TWh



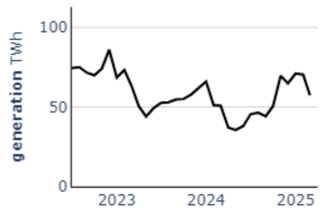
Electricity generation

681 TWh

▲9 TWh



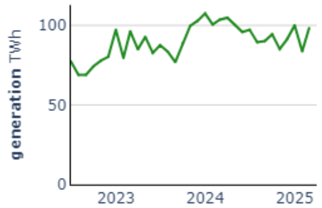
RES generation



Fossil fuel generation

227 TWh

▲33 TWh

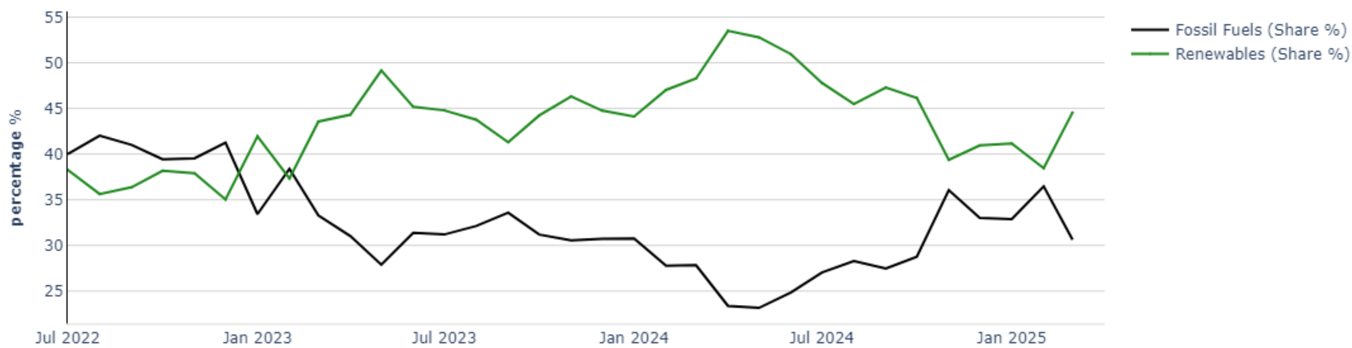


RES generation

282 TWh

▼−30 TWh

Electricity Generation of Fossil Fuels vs Renewables: Quarterly Average and Y-o-Y Change



Average Generation Share of Fossil Fuels

33 %

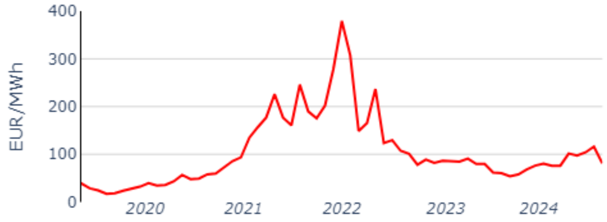
▲5 pp.

Average Generation Share of Renewables

41 %

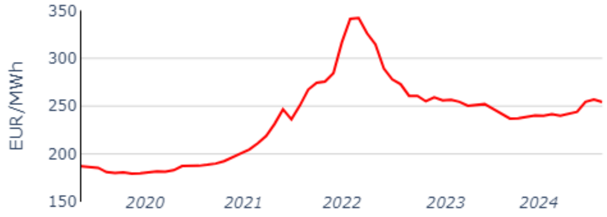
▼−5 pp.

Prices in Q1 2025 and year-on-year comparison



Wholesale prices
100 €/MWh

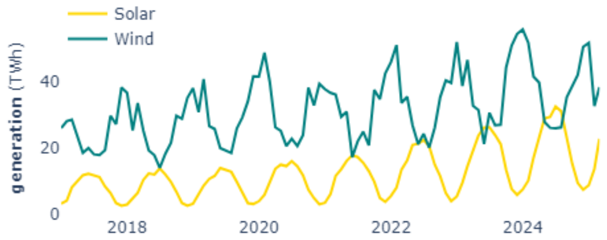
Change y-o-y
49%
▲33 €/MWh



Retail prices
256 €/MWh

Change y-o-y
3 %
▲7 €/MWh

Renewable energy generation and year-on-year comparison



Renewable energy generation: -10 %

Hydro
91 TWh
▼−16 TWh

Solar
45 TWh
▲10 TWh

Wind onshore
107 TWh
▼−22 TWh

Wind offshore
15 TWh
▼−4 TWh

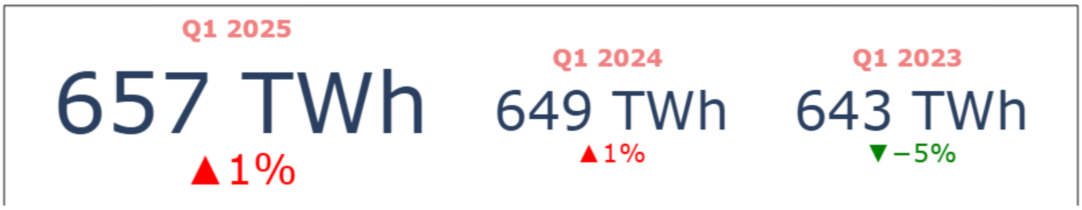
HIGHLIGHTS OF THE REPORT

- **The first quarter of 2025 was marked by higher gas prices, lower wind and hydro generation (despite a remarkable quarter for solar generation), and a moderate increase in demand, which contributed to a rise in electricity prices.** However, **prices started to decrease in the spring,** thanks to higher renewables output and lower gas prices, indicating a positive trajectory for the upcoming months.
- **The European Power Benchmark averaged 100 €/MWh in Q1 2025, 49% higher than in Q1 2024, but 38% lower than in Q1 2023**. Prices ranged from a quarterly average of 49 €/MWh in Finland to 145 €/MWh in Ireland. The largest year-on-year price increases were recorded in Portugal (+93%) and Spain (+92%), where prices had been rather low in Q1 2024. Prices rose significantly also in Slovenia (+91%). In contrast, price drops were registered only in Finland (-32%) and Sweden (-9%).
- **Electricity consumption in the EU rose only slightly (+1%) compared with Q1 2024**. On the national level, eighteen Member States, saw an increase in electricity consumption, while the remaining countries were stagnant or experienced a decline. Despite this modest increase, demand levels for Q1 2025 were still below the pre-crisis average (-6%, compared to the 2015-2019 range).
- **The share of renewables declined to 41% in Q1 2025** (from 46% in Q1 2024), while **the share of fossil fuels rose to 33%** (from 28% in Q1 2024).
- **Solar generation rose to a new record high for a first quarter, reaching 45 TWh (+30%). However, other renewable generation technologies experienced significant declines.** Wind onshore generation declined by 17% (-22 TWh) and wind offshore fell by 22% (-4 TWh). Hydropower output also decreased by 15% (-16 TWh), albeit from high levels in Q1 2024.
- **Fossil fuel quarterly generation increased by 33 TWh (+17%) in Q1 2025**, due to declining generation from renewables and a moderate increase in demand. In total, coal-fired generation rose by 15% (+11 TWh), whereas less CO2-intensive gas generation increased even stronger by 23% (+21 TWh). Nuclear output rose by 4% (+6 TWh) in Q1 2025.
- **Carbon prices in Q1 2025 fluctuated between 65-80 €/tCO_2, peaking above 80 €/tCO_2 in February before declining to prices slightly above 65 €/tCO_2. The quarterly average was 73 €/tCO_2, 23% higher than in Q1 2024.** Emission allowances prices trended upwards until February, then declined for the rest of Q1 2025, mirroring gas market developments. Higher gas prices led to gas-to-coal fuel switching in Q1 2025, making gas-fired generation less profitable than coal-fired generation in the reference quarter.
- **Retail electricity prices for households in EU capital cities rose marginally by 3% in Q1 2025 (255 €/MWh)**. This increase is driven by a rise in energy taxes and network charges, which offset a slight decrease in the energy component. Additionally, there was significant variation between Member States with several seeing double-digit percentage increases (e.g. Austria, Luxembourg, Poland) and others seeing large decreases in retail prices due to lower energy costs (e.g. Slovenia, Ireland, Finland).
- **A record high for the first quarter of over 620 thousand new electric vehicles (EVs) were sold in Q1 2025 in the passenger car segment in the EU,** a yearly increase of 15% compared with Q1 2024. This translates into a 21% EV share in the EU passenger car market, which is lower than the EV market share in China (32%), but more than two times the market share registered in the United States (9%). The largest share of new EV sales was recorded in Denmark, where 60% of all cars sold in Q1 2025 were EVs. Moreover, in Sweden and Finland more than half of all passenger cars sold could be plugged (56% and 53%, respectively).
- **The number of hours with negative wholesale prices in Q1 2025 (814) was 103% higher than in Q1 2024**. This represented an increase of 0.6 pp in the share of trading hours with negative prices in the total number of trading hours (1.1%). March saw the occurrence of negative prices booming, registering a record number of 756 hours with negative prices, despite a slow start in January and February. Sweden led European countries with the highest occurrence of negative prices in Q1 2025. The increasing occurrence of negative prices signals the need for short term storage and flexibility, increased interconnectivity, and incentives for demand-side response.

Methodological Note: The rapid changes in gas and electricity markets happening through the energy transition as well as the significant restructuring of the EU's energy supply following the energy crisis, call for reviewing the Quarterly Reports of the European Electricity and Gas Markets so as to make them best fit for purpose. The aim is to ensure a more timely publication, modernise presentation, increase data transparency and an easier access to the data used to produce the reports. All this should increase usability for readers. The process of the review is planned to be carried out gradually attending the feedback we receive on it. As the Commission advances with its review, the quarterly reports will progressively reflect the methodological, technical, and editing changes as well as the comments received from stakeholders.

Electricity market fundamentals

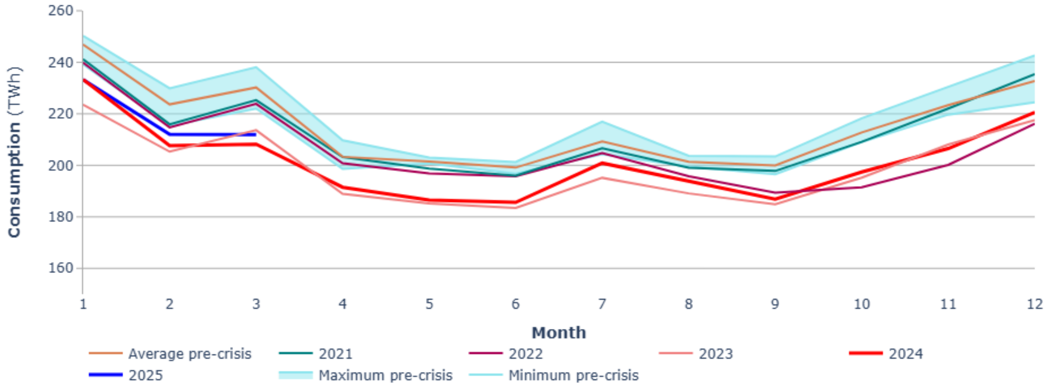
1.1 Demand side factors



Electricity consumption *in Q1 2025, Q1 2024 and Q1 2023*

- In Q1 2025, the total electricity consumption in the EU grew by 1% compared with last year's levels, and it was 2% higher than in Q1 2023. Demand levels for Q1 2025 were still below the pre-crisis average (6%) (2015-2019 period).

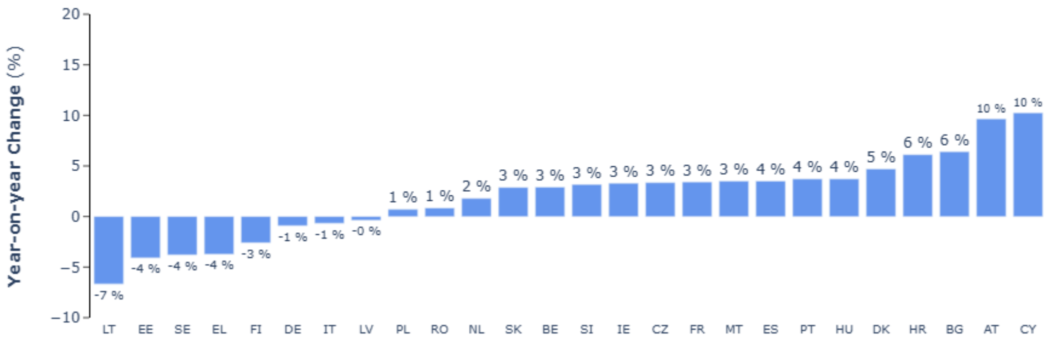
Figure 1 – Monthly EU consumption of electricity



Source: Eurostat

- **Figure 2** sums up changes in electricity consumption over Q1 2025, compared to Q1 2024. During the reference quarter, EU electricity consumption rose in eighteen Member States. The largest increases were registered in Cyprus and Austria (+10%), followed by Bulgaria and Croatia (+6%), while Lithuania (-7%), Estonia (-4%), and Sweden (-4%) reported reductions.

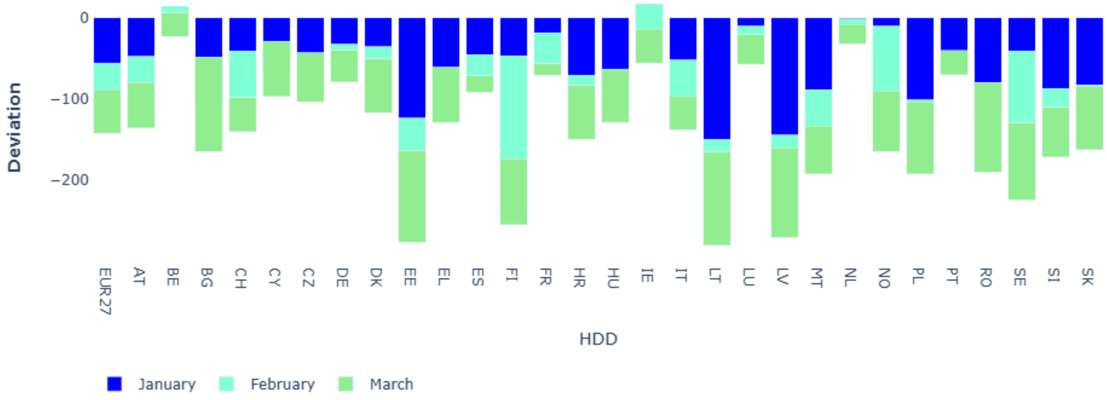
Figure 2 – Yearly changes in electricity consumption by Member State in Q1 2025 compared with Q1 2024



Source: Eurostat

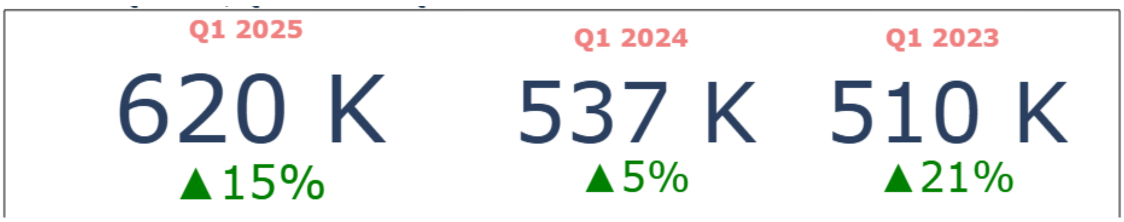
- **Figure 3** illustrates the monthly deviation of actual Heating Degree Days (HDDs) from the long-term average (a period between 1979 and the last completed calendar year) in Q1 2025. EU-wide, the reference quarter was warmer than the historical range. January and March were particularly warmer than the historical average, followed by February. Overall, Q1 2025 registered –142 HDDs below the long-term average. Most of the European countries registered warmer-than-average temperatures during the quarter.

Figure 3 - Deviation of actual heating days from the long-term average in January-March 2025



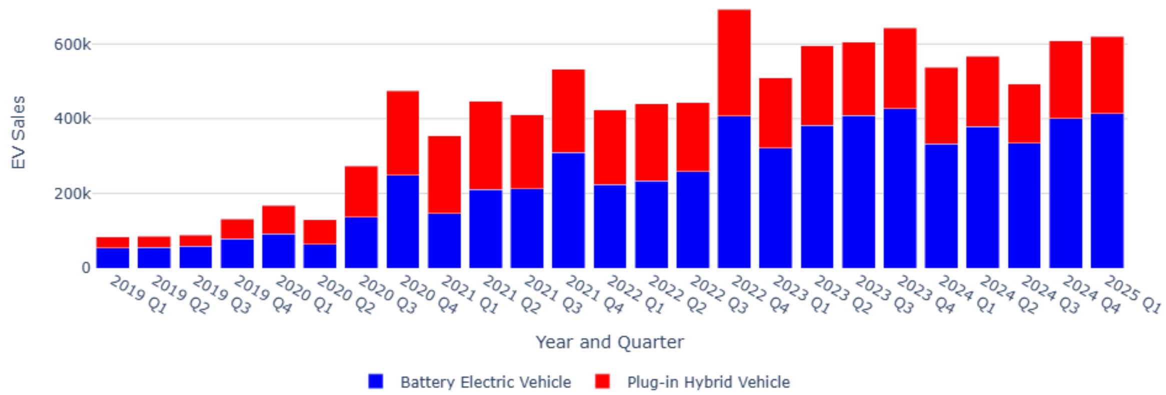
Source: JRC. The colder the weather, the higher the number of HDDs. The warmer the weather, the higher the number of CDDs

- **Figure 4** shows that over 620,000 new EVs (battery electric vehicles and plug-in hybrids) were registered in the EU in Q1 2025 (+15% compared with Q1 2024). This figure represents the highest first-quarter total on record, as well as the third-highest quarterly figure overall. It translates into a 21% market share which is lower than the EV market share in China (32%), but more than two times the market share registered in the United States (9%). The increase was driven by an uptake in battery electric vehicles sales (+24% year-on-year; more than 413,000 units sold) while demand for plug-in hybrid vehicles improved only moderately (+1% year-on-year to; close to 208,000 units sold). Hybrid electric vehicles (not chargeable) sales amounted to close to 965,000, registering an all-time high in quarterly sales and an increase of 21% compared with Q1 2024.



EVs sold in Q1 2025, Q1 2024 and Q1 2023

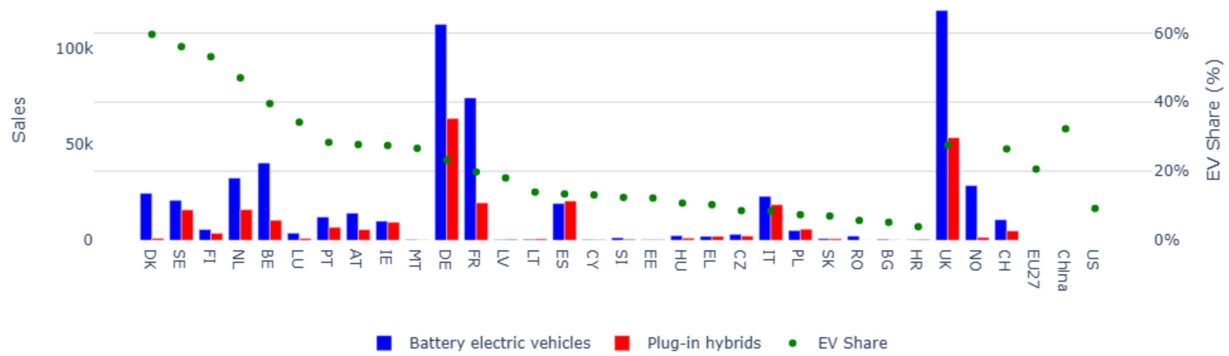
Figure 4 – Quarterly EV sales in the EU



Source: ACEA

- The largest share of new EV sales was recorded Denmark, where 60% of all cars sold in Q1 2025 were EVs. Denmark, as well as Sweden (56%) and Finland (53%), were among the markets where more than half of all passenger cars sold were Battery electric or Plug-in hybrid vehicles. Germany retained the position of the largest individual market in the EU (more than 176,000 EV sales in Q1 2025) followed by France, where sales amounted to more than 94,000 new EVs in the reference quarter.

Figure 5 – Electrically chargeable passenger vehicle (EV) sales in selected countries in Q1 2025



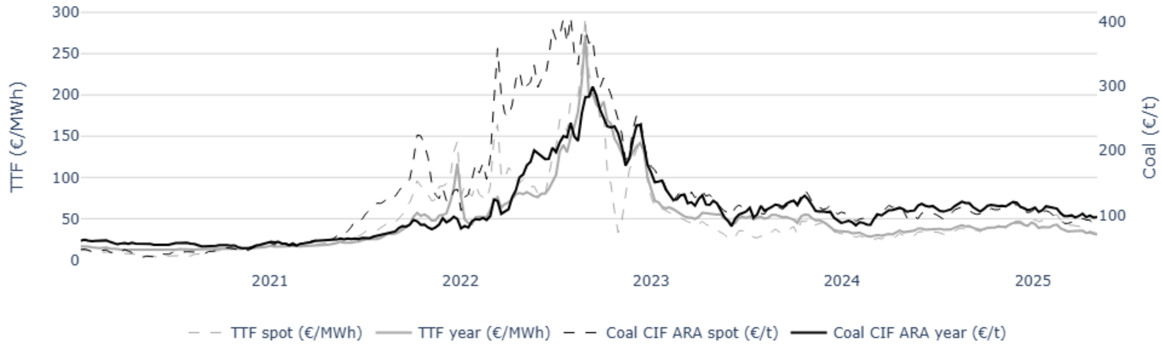
Source: ACEA, CPCA, US BEA, ANL

1.2 Supply side factors

- **Figure 6** reports on developments in European coal and gas prices. Although spot and forward gas prices initially rose, they declined for most of Q1 2025, reversing the upward trend observed during the second half of 2024. In Q1 2025, spot gas prices averaged 47 €/MWh, 71% lower than in Q1 2024 (and 9% higher than in Q4 2024). TTF spot prices remained at premium to TTF forward contracts (year ahead) during most of Q1 2025, indicating that markets expect a price decline in the future. Year-ahead prices averaged 38 €/MWh in Q1 2025, 22% higher than in Q1 2024 and 9% lower than in Q4 2024.

- Thermal coal spot prices, represented by the CIF ARA contract, fell slightly to 96 €/t in Q1 2025 (from 98 €/t recorded in Q1 2025). The year-ahead CIF ARA contract rose to 105 €/t in Q1 2025 (from 92 €/t observed in Q1 2024). Coal prices roughly followed a downward trend through the quarter.

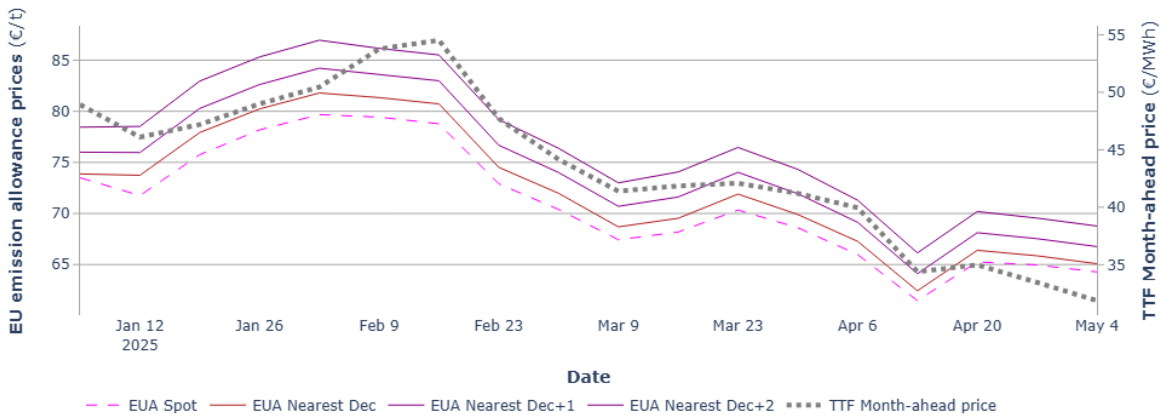
Figure 6 – Weekly evolution of spot and year-ahead coal and gas prices



Source: S&P Global Platts

- The European market for emission allowances, exhibited an upward trend until early February, after which it declined throughout the remainder of Q1 2025, broadly mirroring developments in the TTF market for gas (**Figure 7**).

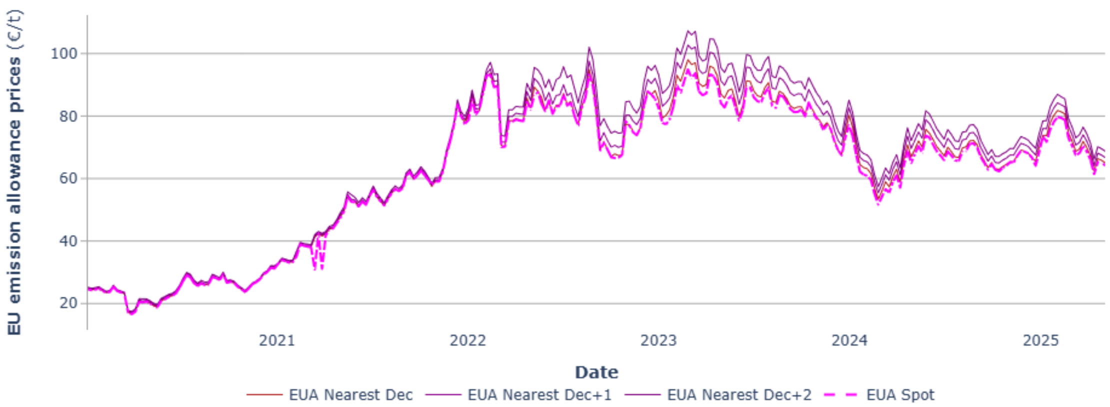
Figure 7 - Evolution of EU emission allowance spot and future prices and TTF month-ahead prices in 2025



Source: S&P Global Platts

- Spot prices, shown fluctuated between 65-80 €/tCO2, peaking above 80 €/tCO2 in February before declining to prices slightly above 65 €/tCO2. The average spot price of CO_2 in Q1 2025 (73 €/tCO_2) was 23% higher than in Q1 2024.

Figure 8 – Evolution of EU emission allowance spot and future prices from 2020



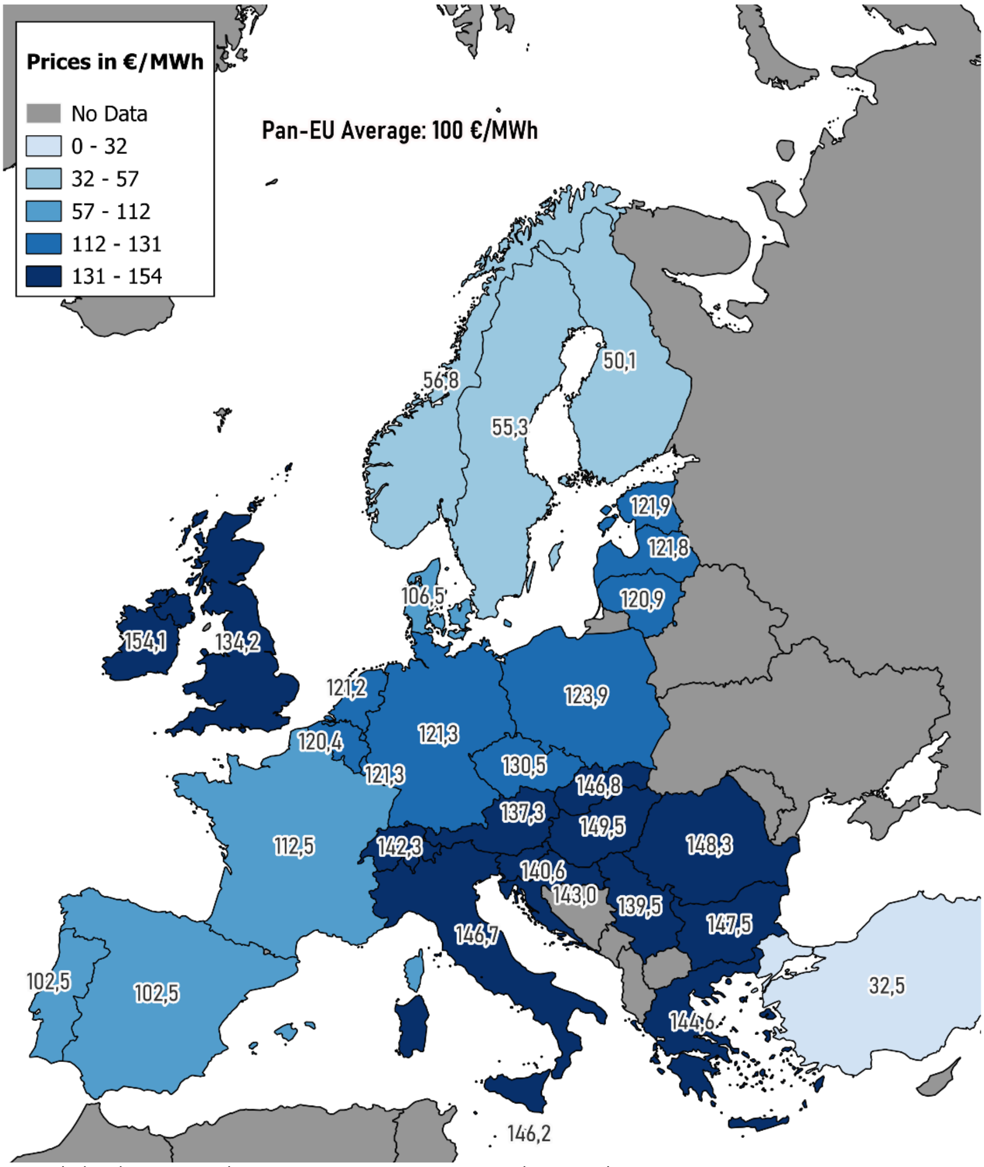
Source: S&P Global Platts

European wholesale markets

1.3 European wholesale electricity markets and their international comparison

- The map below (**Figure 9**) shows the average day-ahead wholesale electricity prices in Europe in Q1 2025. Average day-ahead wholesale electricity prices in Europe were 49% higher than in Q1 2024 and 38% lower than in Q1 2023. Higher gas prices and generation as well as lower wind and hydro generation (despite a remarkable quarter for solar generation), and moderate increase in electricity demand, contributed to the rise in prices. Although prices were high in the first quarter of 2025, the second quarter has seen a significant decrease so far.
- The European Power Benchmark averaged 100 €/MWh in Q1 2025. Prices ranged from a quarterly average of 49 €/MWh in Finland to 145 €/MWh in Ireland. On a yearly basis, price changes in EU markets ranged from -32% to +93%. The largest year-on-year price increases were recorded in Portugal (+93%), Spain (+92%) and Slovenia (+91%). In the Iberian Peninsula, however, the surge is measured against an exceptionally low Q1 2024 baseline. In contrast, price drops were registered only in Finland (-32%) and Sweden (-9%).

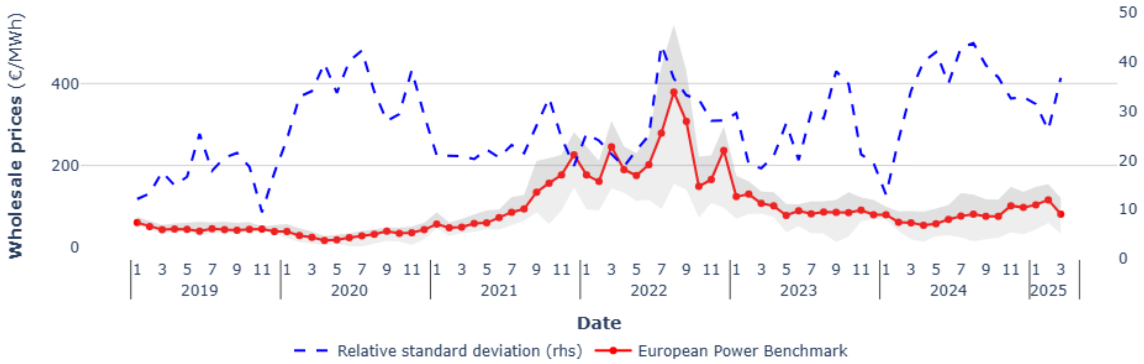
Figure 9 – Comparison of average wholesale baseload electricity prices, Q1 2025



Source: European wholesale power exchanges, government agencies and intermediaries

- **Figure 10** shows the lowest and highest regional prices in Europe represented by the two boundary lines of the shaded area, the weighted EU average of these regional markets (European Power Benchmark), as well as the relative standard deviation of regional prices. The relative standard deviation metric shows in Q1 2025 a drop in February only to rise again in March. The **Annex** provides graphics of the monthly and daily evolution of regional prices in Europe.

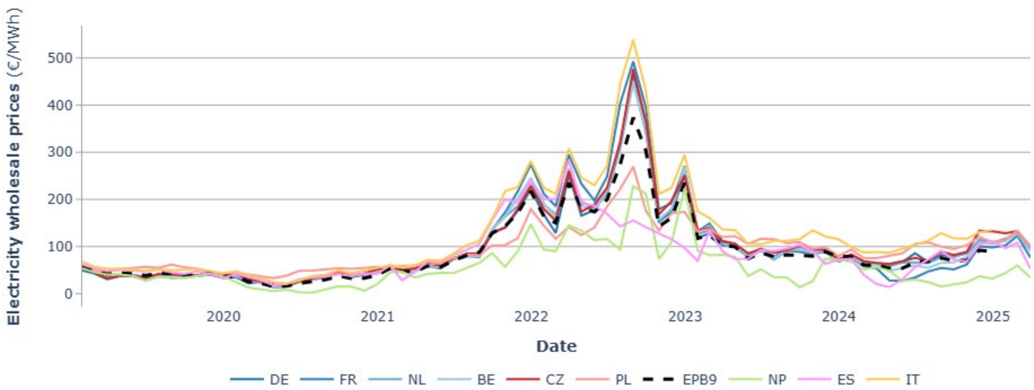
Figure 10 - The evolution of the lowest and the highest regional wholesale electricity prices in the European day-ahead markets and the relative standard deviation of the regional prices



Source: S&P Global Platts, European power exchanges. The shaded area delineates the spectrum of prices across European regions.

- **Figure 11** presents the evolution of weekly average electricity wholesale prices in nine selected European markets. Germany, France and the Netherlands average prices in Q1 2025 were at 112, 101 and 111 €/MWh, respectively, from 68, 63 and 69 €/MWh in Q1 2024. German prices rose by 67% year-on-year, due to higher gas prices and atypically low wind generation. Italy registered an average quarterly price in Q1 2025 of 138 €/MWh, the highest of the nine selected markets. Prices rose by 50% compared with Q1 2024 prices. Spanish prices were at 86 €/MWh, rising by 92% year-on-year in Q1 2025, measured against exceptionally low prices in Q1 2024.
- At 46 €/MWh, prices in Northern Europe remained lower than on the continent in Q1 2025, registering a year-on-year fall by 21%. In particular, Sweden maintained its position as a significant net electricity exporter, supported by an increase in wind generation.
- Central Eastern Europe markets prices were slightly above those in Central Western Europe, with prices at 116 and 120 €/MWh in average in Q1 2025 in Poland and Czechia, respectively. However, these two markets also registered yearly prices increases compared to Q1 2024 (+42% and +66% respectively).

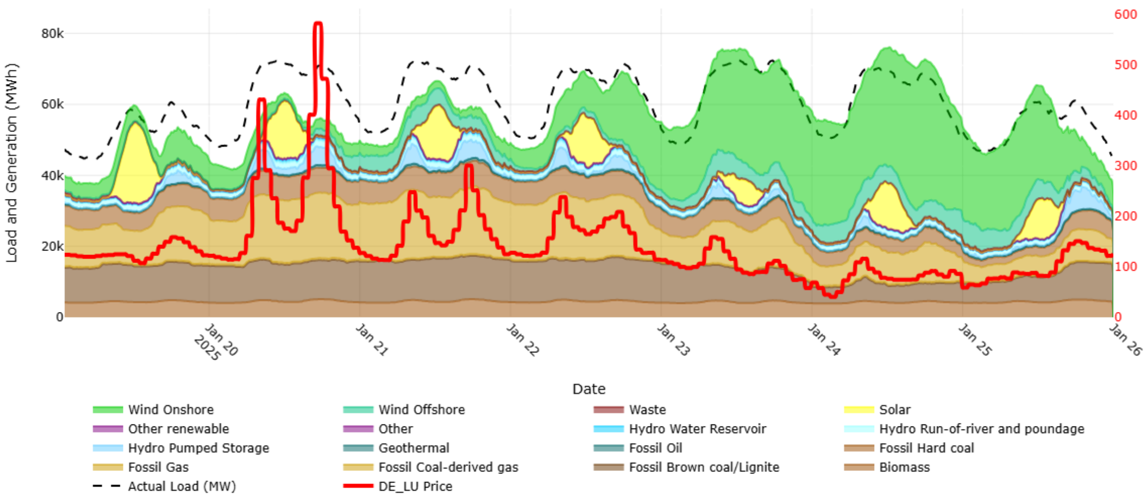
Figure 11 – Weekly average electricity wholesale prices in nine selected European markets



Source: S&P Global Platts, European power exchanges, ENER

- **Figure 12** shows the impact of a *Dunkelflaute* event in Germany on 20 January 2025. A *Dunkelflaute* (also known as a *dark doldrum*) refers to a period of low wind or solar generation. During this period, wind generation dropped below seasonal average, causing day-ahead prices to surge above 500 €/MWh. The lack of wind, combined with a high demand due to cold weather, led to increased reliance on fossil fuels. However, when wind output rebounded later that week, prices decreased, reducing the need for fossil fuel generation.

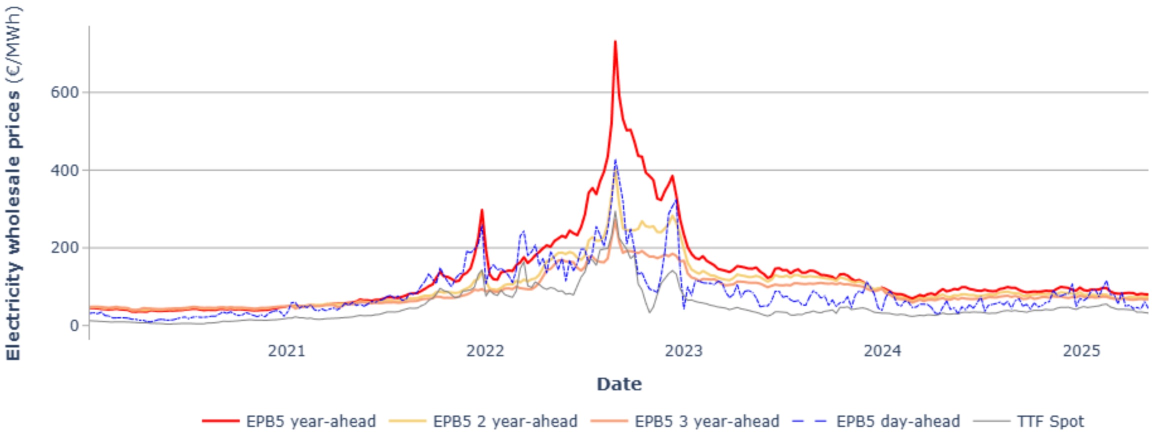
Figure 12 – Evolution of wholesale price, load and generation in Germany during 19 to 25 January 2025



Source: ENER based on ENTSO-E

- **Figure 13** shows the strong influence of gas prices (TTF) on future electricity prices during the energy crisis, where every unit change in gas price resulted in roughly twice the change in electricity price.
- In Q1 2025, the average electricity year-ahead, two-year ahead and three-year ahead contracts were 89 €/MWh, 75 €/MWh and 71 €/MWh, respectively. The premium of the weekly median between the year-ahead contract and the spot price averaged 8 €/MWh during Q1 2025.

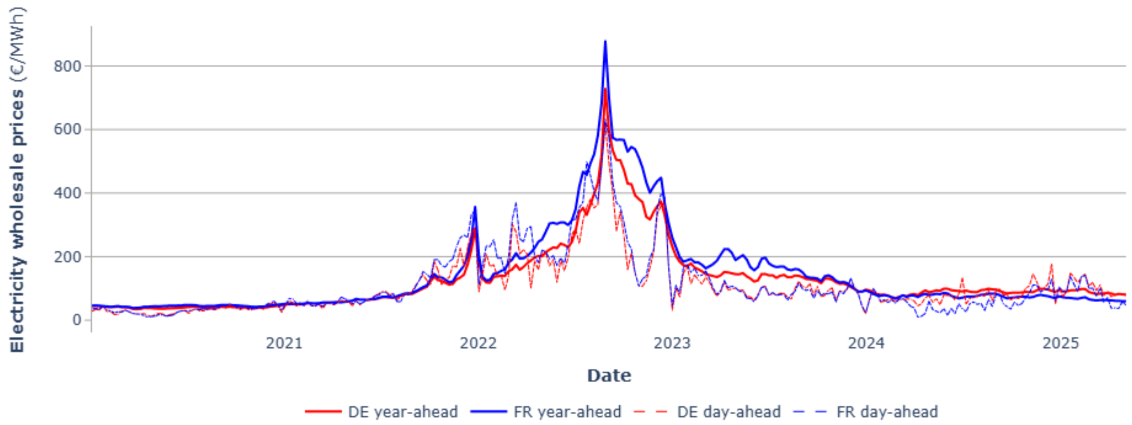
Figure 13 – Weekly futures baseload prices – weighted average of selected European markets



Source: S&P Global Platts.

- **Figure 14** shows the evolution of year-ahead contracts of Germany and France, together with their equivalent spot (day-ahead) prices. In Q1 2025, the German contract averaged 88 €/MWh, 23 €/MWh above France's 65 €/MWh, representing a 12 EUR/MWh year-on-year increase in the premium.

Figure 14 – Weekly German and French year-ahead contracts



Source: S&P Global Platts.

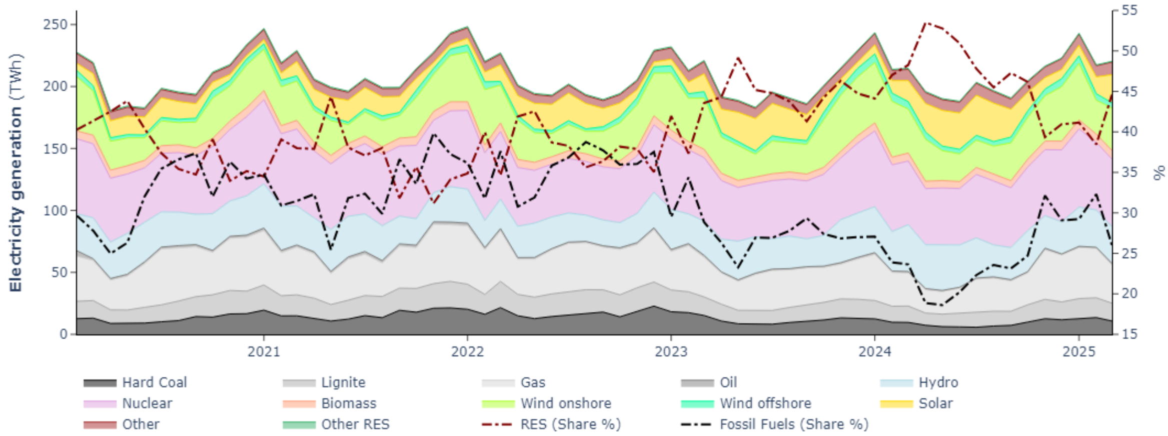
1.4 Electricity mix in the EU

Oil	Hard Coal	Lignite	Gas	RES	Nuclear
3 TWh	37 TWh	46 TWh	112 TWh	282 TWh	172 TWh
▼−15%	▲16%	▲13%	▲23%	▼−10%	▲4%

Electricity generation in Q1 2025 compared to Q1 2024. Source: ENTSO-E

- **Figure 15** shows the monthly evolution of the electricity mix in the EU. In Q1 2025, RES generation declined to 282 TWh (-10% compared with Q1 2024) constituting 41% of the electricity mix (down from 46% in Q1 2024). February 2025 in particular saw very weak RES generation, with the lowest RES share (39%) since February 2023 (37%), despite an underlying increase in installed RES capacity.
- Correspondingly, the share of the electricity produced from fossil fuels increased from 28% (Q1 2024) to 33% (Q1 2025). The year-on-year comparison shows increases in lignite (+13%), hard coal (+16%) and gas (+23%). In contrast, oil was the only fossil fuel to decline (-15%). The share of electricity produced through nuclear remained roughly stable at 25%.

Figure 15 – Monthly electricity generation mix in the EU

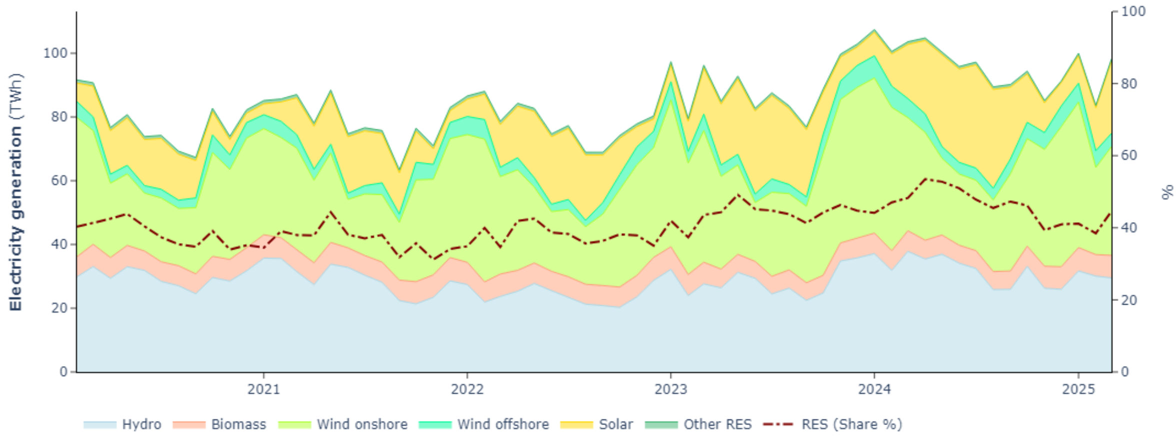


Source: ENTSO-E. Fossil fuel share calculation covers power generation from hard coal, lignite, gas, oil and others. Data for Ireland missing. Data for Italy comes from Terna.

- **Figure 16** depicts the evolution of monthly renewable energy generation in the EU, alongside its share in the electricity generation mix. The decline in the share of RES generation in Q1 2025 compared to Q1 2024 (41% and 46%, respectively) was driven by significant decreases in generation from hydropower (-15%), wind onshore (- 17%) and particularly wind offshore (-22%). While the drop in hydro generation mostly reflects a return to normal levels after an exceptionally strong year 2024, the decline in wind generation is largely due to unusually low average wind speeds across the continent. In contrast, solar continued its ascent, with generation up 10 TWh (+30%) year-on-year. This was caused by particularly high solar irradiation levels for the season combined with a significant increase in installed capacity compared to the last year.

Wind Onshore	Wind Offshore	Solar	Hydro	Biomass
107 TWh	15 TWh	45 TWh	91 TWh	21 TWh
▼−17%	▼−22%	▲30%	▼−15%	▲11%

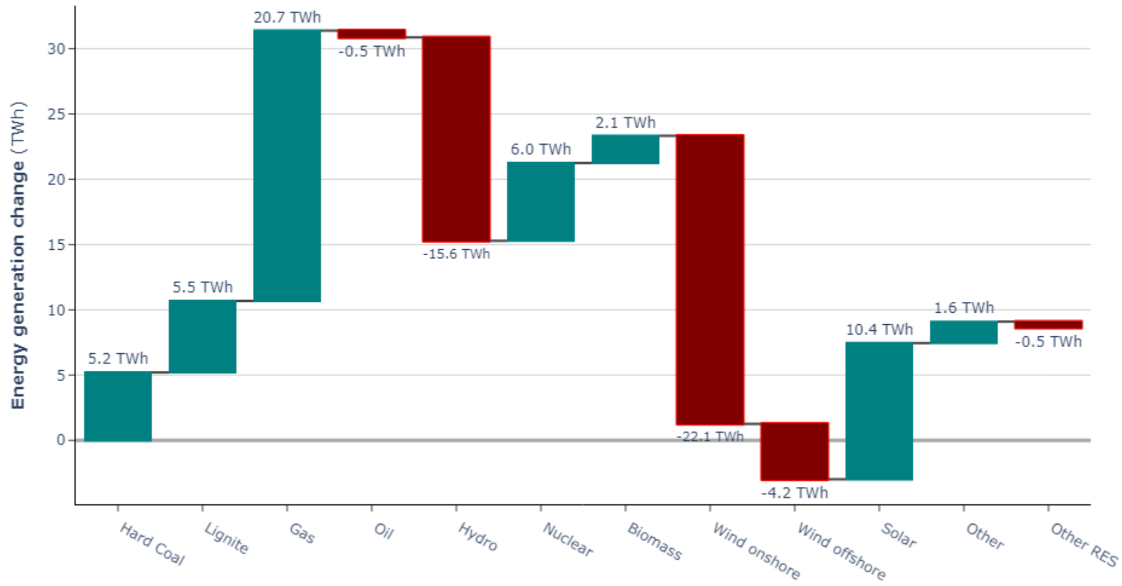
Figure 16 - Monthly renewable generation in the EU and the share of renewables in the power mix



Source: ENTSO-E. Data represent net generation.

- **Figure 17** visualises changes in the EU27 electricity generation in Q1 2025 compared with Q1 2024. The largest decreases were observed for hydro (-16 TWh) and wind energy (-27 TWh for onshore and offshore combined). These decreases in low-carbon generation were partially offset by nuclear (+6 TWh) and solar (+10 TWh). However, considering the significant drop in hydro and wind generation as well as increased electricity demand, hard coal (+ 5 TWh), lignite (+6 TWh) and especially gas (+21 TWh) filled the remaining gap in electricity generation.

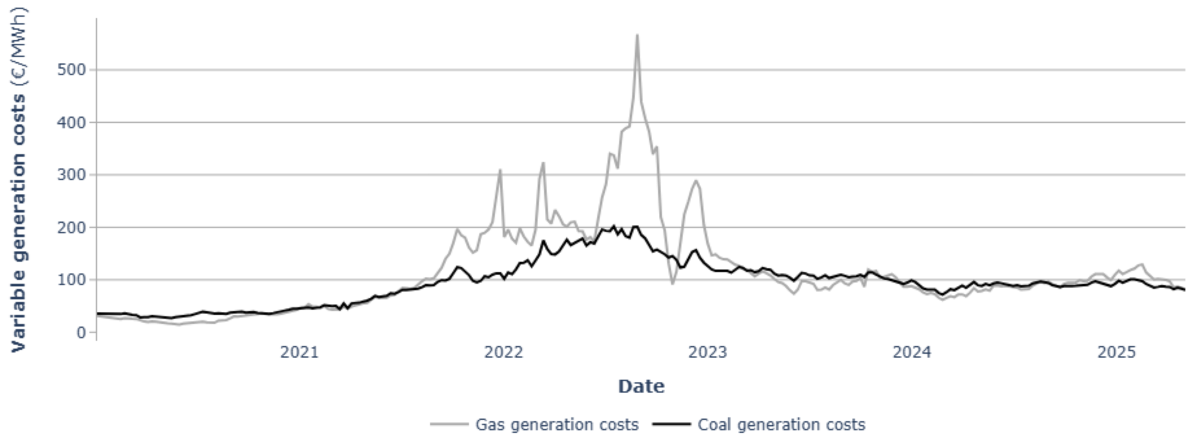
Figure 17 - Changes in power generation in the EU between Q1 2025 and Q1 2024



Source: ENTSO-E.

- **Figure 18** shows the impact of gas prices on estimated gas and coal-fired generation variable costs for estimated average power plants (fuel and emission allowances costs). Despite relatively elevated carbon prices, higher gas prices in the first quarter of 2025 led to gas-to-coal fuel switching in most of the first quarter of 2025. As a result, gas-fired generation became less profitable than coal-fired generation in Q1 2025. However, the profitability gap between gas and coal began to narrow in Q2 2024, driven by a decrease in gas prices.

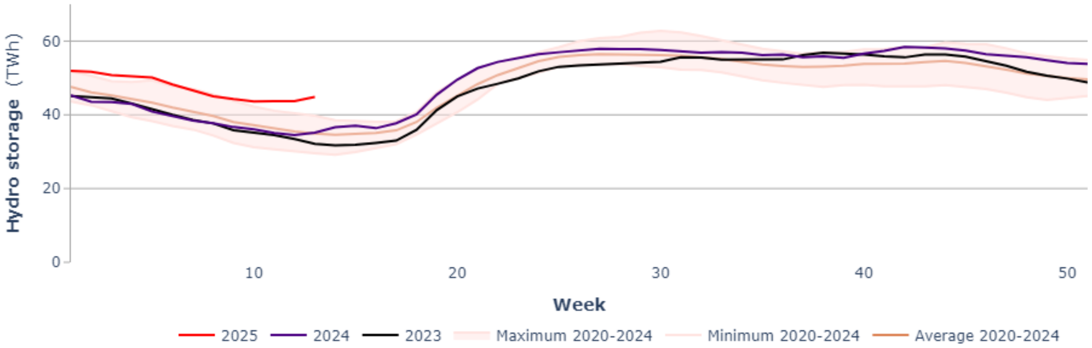
Figure 18 - Estimated variable generation costs of coal- and gas-fired power plants.



Source: S&P Platts, ENER.
Note: Thermal efficiency values used for coal- and gas-fired plants were 41% and 55% respectively. Emissions intensity values used were 0.85 and 0.37 tCO2e/MWh respectively for coal- and gas-fired generation.

- **Figure 19** shows the filling levels of hydro reservoirs in the reported markets until the end of Q1 2025. Despite already strong levels in 2024, hydropower reservoirs saw a massive increase (+27% compared with end of Q1 2024 levels). Driven by strong filling levels in the Nordics and the Iberian Peninsula, reservoir levels have consistently exceeded the weekly maximum observed in any of the past five years (2020–2024).

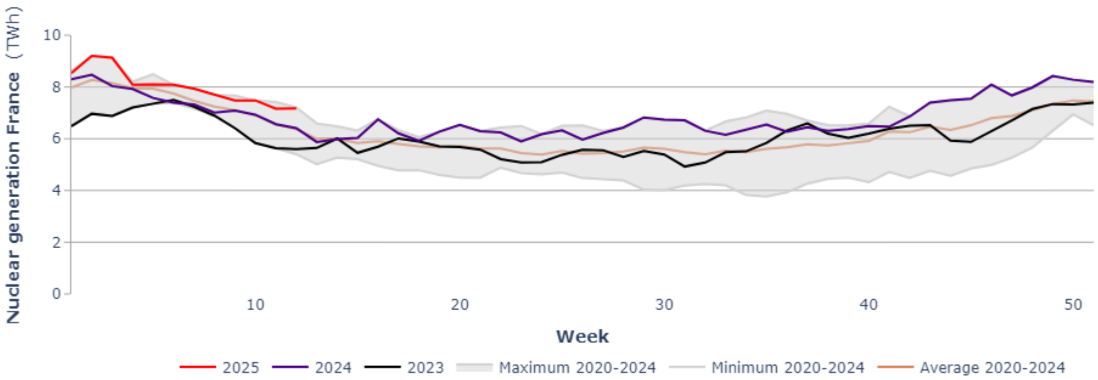
Figure 19 - Aggregated EU hydropower reservoirs – weekly



Source: ENTSO-E. Aggregated hydropower reservoirs for Austria, Bulgaria, Spain, Finland, France, Greece, Hungary, Italy, Lithuania, Latvia, Portugal, Romania and Sweden.

- As shown in **Figure 20,** French nuclear output amounted to 101 TWh in Q1 2025 and was up by 5% compared to Q1 2024 (96 TWh). This was the highest nuclear output in a first quarter since 2020 and shows a continuing recovery from the historically low output in Q1 2023 (85 TWh).

Figure 20 - Weekly nuclear electricity generation in France



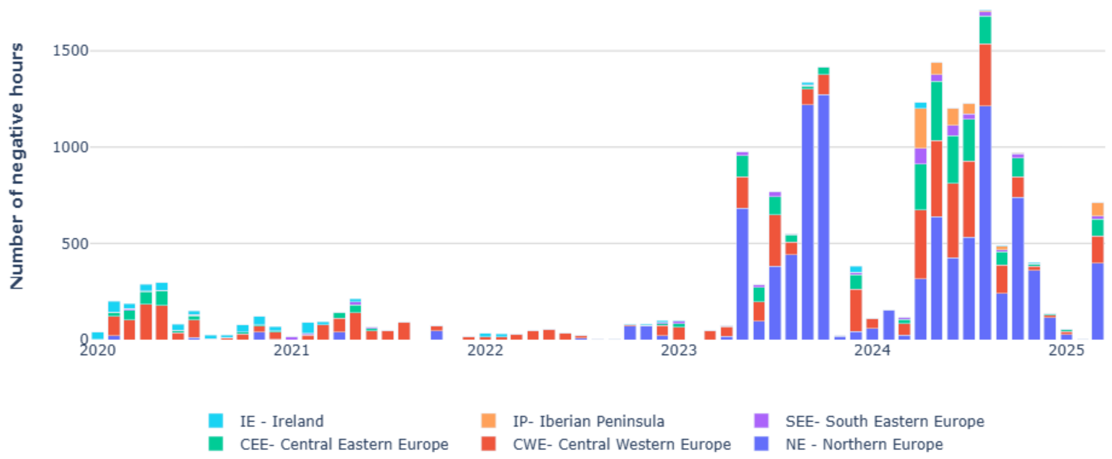
Source: ENTSO-E

Negative hours in Europe in Q1 2025, Q1 2024 and Q1 2023

- **Figure 21** shows the monthly frequency of the occurrence of negative hourly wholesale electricity prices in selected European markets. In Q1 2025, the number of occurrences of negative hours reached a new record of 814 for a first quarter in European markets, compared with 400 in Q1 2024 (+103%). Despite a slow start in January and February, March saw the occurrence of negative prices booming, registering a record number of 756 hours with negative prices. This represented an increase of 0.6 pp in the share of trading hours with negative prices in the total number of trading hours (1.1%).

- Negative hourly prices generally occur when electricity demand is lower than expected and when variable renewable energy generation is abundant, combined with large and relatively inflexible baseload electricity generation (e.g. nuclear or lignite). In such cases, conventional power plants offer their output for a negative price to avoid switching the unit off and having to go through the costly and high-maintenance operation of restarting the facility when they want to enter the market again.

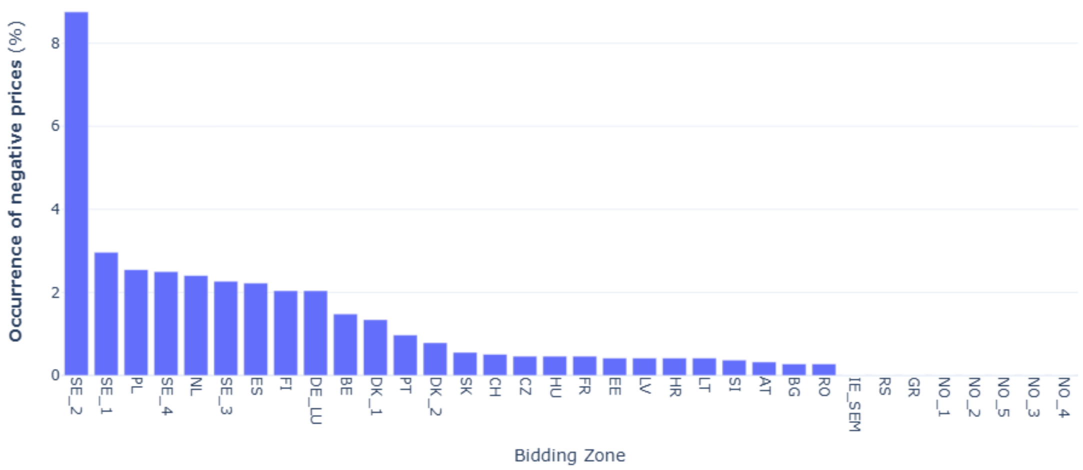
Figure 21 - Number of negative hourly wholesale prices on selected day-ahead trading platforms in Europe



Source: ENTSO-E.

- **Figure 22** illustrates the percentage of occurrence of negative prices in European bidding zones in Q1 2025. Notably, Sweden leads the ranking, with SE_2 (9% of trading hours) and SE_1 (3%) contributing to its top position. The next on the list are PL and SE_4, each with 3% occurrence of negative prices, followed by NL with 2%. The higher occurrence of negative prices in Northern Europe can be attributed to strong supply fundamentals, including increasing wind generation.

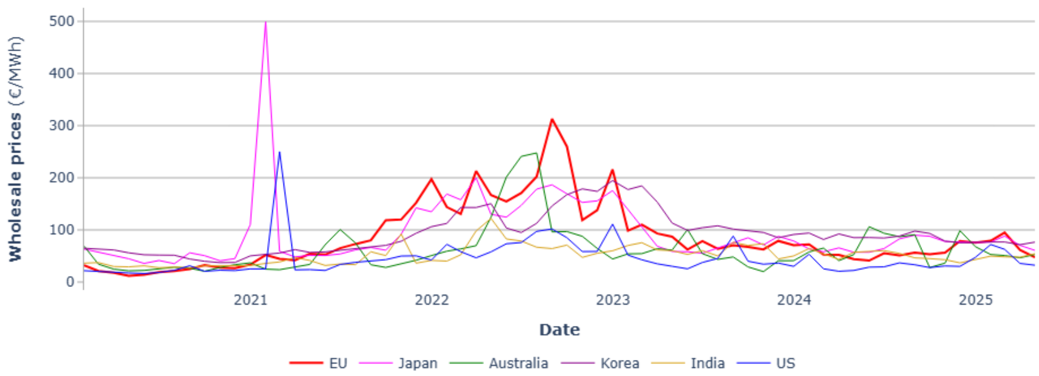
Figure 22 - Percentage of negative prices on selected day-ahead trading platforms in Europe



Source: ENER based on ENTSO-E.

- **Figure 23** compares price developments in wholesale electricity markets of selected major economies. Q1 2025 saw a degree of heterogeneity in power price development across markets.
- In the U.S., wholesale electricity prices in selected regional markets saw year-on-year changes ranging from -15% (CAISO) to +133% (ISONE) in Q1 2025. Prices fell in the selected markets in March. In Q1 2025, the US average price of selected markets was 72% higher than in Q1 2024, influenced by higher gas prices and increased use of thermal generation capacity.
- In Japan, prices rose by 26% year-on-year in Q1 2025. Japan relies heavily on fossil-fuel power generation, and as one of the three most important global LNG buyers was affected by rising gas prices. Conversely, prices in Korea fell by 16% during the quarter.
- In Australia, wholesale electricity prices fell by 8% year-on-year in Q1 2025. Prices in India registered a year-on-year fall of 11% in the reference quarter.

Figure 23 - Monthly average wholesale electricity prices in international markets (D-A markets)



Source: European Power Benchmark based on S&P Global Platts and ENTSO-E Transparency Platform, JPEX (Japan), AEMO (Australia), and the arithmetic average of selected PJM West, ERCOT, MISO Illinois, CAISO, NYISO Hudson Valley and ISONE Internal regional wholesale hubs in the United States.

1.5 Traded volumes and cross border flows

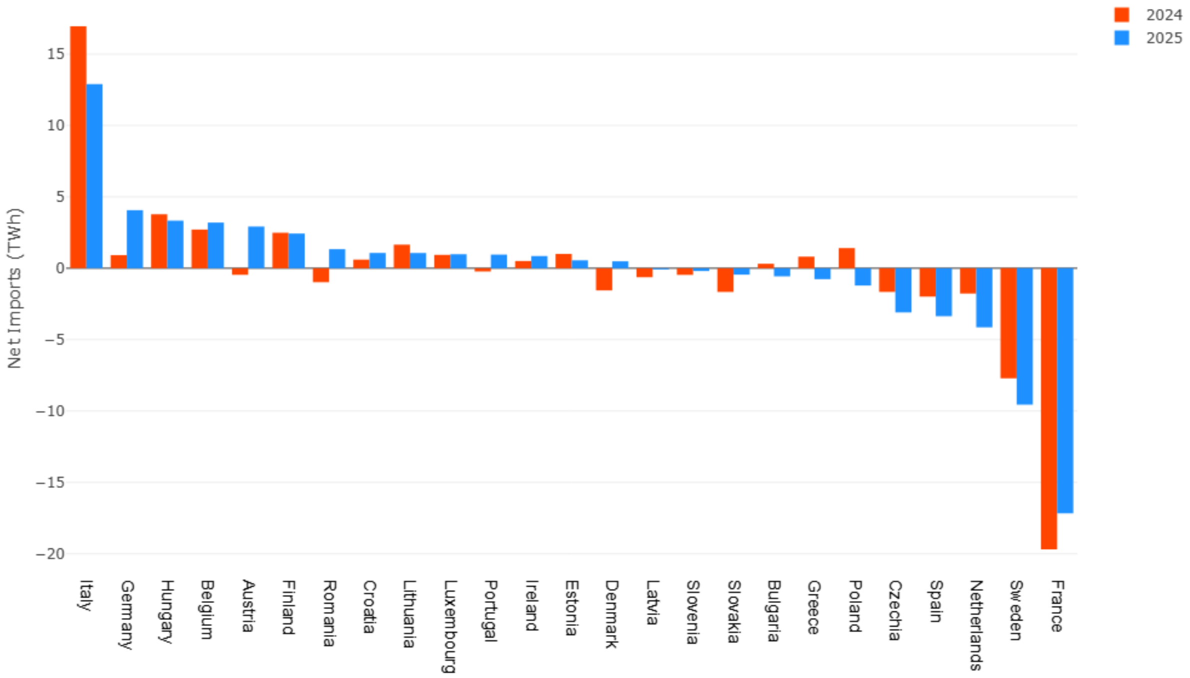
- **Figure 24** shows annual changes of traded volumes of electricity in the main European markets in Q1 2025, including exchange-executed trade and over-the-counter (OTC) trade. Selected markets and regions witnessed a year-on-year improvement in trading activity. The increase in total traded volumes between Q1 2025 and Q1 2024 (+27%) reflects the improvement in trading activity in the electricity sector, which was supported by a surge in exchange-traded volumes (+65%). Activity grew slightly in both OTC cleared contracts (+3%) and OTC bilateral (+5%).
- In Q1 2025, Germany was by far the largest and most liquid European market, as total volume (2 159 TWh) was equivalent to 64% of the total traded volumes under observation.
- The biggest year-on-year increases were seen in France (+41%), Germany (+32%) and Italy (+27%). Conversely, Switzerland and Belgium saw decreases of –41% and –10%, respectively, in their total traded volumes compared to Q1 2024.

Figure 24 - Annual change in traded volume of electricity on the most liquid European markets

Source: Trayport, London Energy Brokers Association (LEBA) and DG ENER computations

- **Figure 25** compares net balances of scheduled electricity flows among EU Member States in Q1 2025 and Q1 2024. France kept its position as the net exporter in the EU (17 TWh) in Q1 2025, even though net exports were 13% lower than in Q1 2024. Sweden was the second largest net exporter (10 TWh) improving its net position with volumes 24% higher than the same quarter in 2024.
- The largest EU net importer was Italy (13 TWh), improving its net position by 24% (i.e. it had lower net imports than in Q1 2024). Germany followed, with 4 TWh of net imports, becoming the second-largest net importer in Q1 2025.

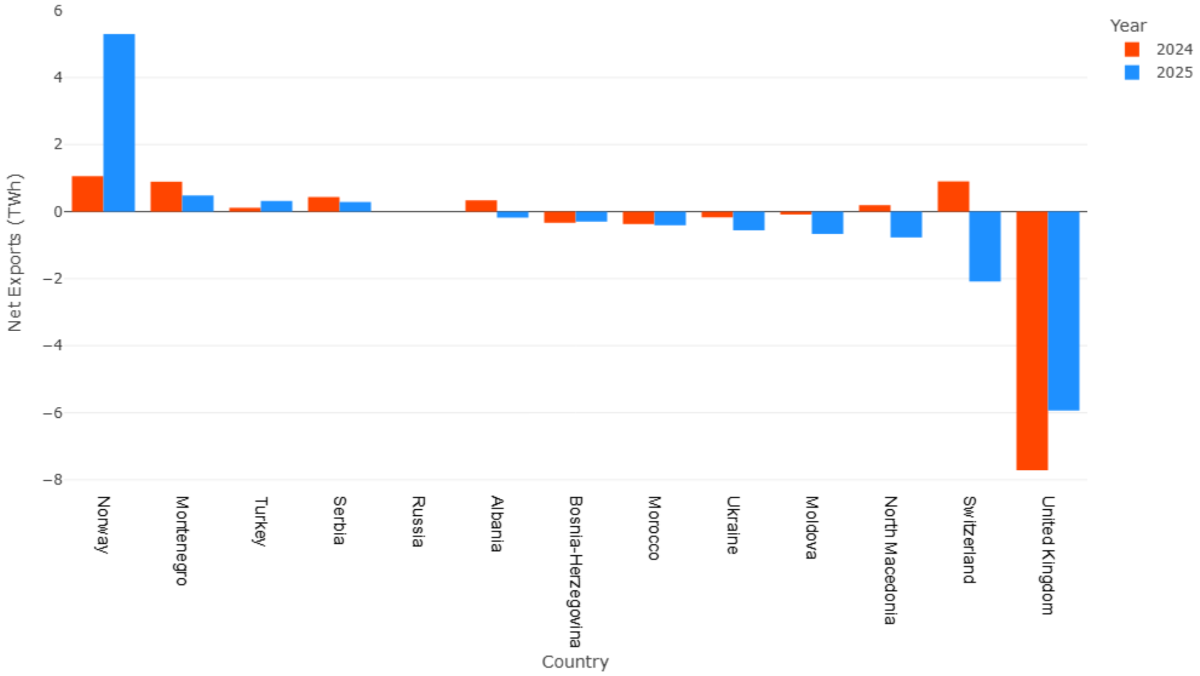
Figure 25 – Member States' net scheduled commercial export/import positions within the EU in Q1 2025 and Q1 2024



Source: Scheduled Commercial flows ENTSO-E via Fraunhofer, TSOs

- **Figure 26** shows netted electricity exchanges with EU neighbours in Q1 2025. Great Britain reduced its import dependency from the EU, by registering 6 TWh of net imports in Q1 2025 (-23%). Meanwhile, Switzerland changed from being net exporter, into a net importer from the EU at 2 TWh. Norway was the largest net exporter to the EU (5 TWh).
- Net exports from the EU to Ukraine amounted to 0.6 TWh in Q1 2025, an increase from Q1 2024 (0.2 TWh). Commercial exchanges of electricity between Continental Europe and Ukraine/Moldova started in 2022, after the successful synchronisation of the power systems. Since then, the TSOs of Continental Europe have regularly increased the capacity available for trading.

Figure 26 – Extra-EU electricity commercial scheduled exchanges in Q1 2025 and Q1 2024 – netted



Source: Scheduled Commercial Flows ENTSO-E via Fraunhofer, TSOs. Positive values indicate net flows into the EU.

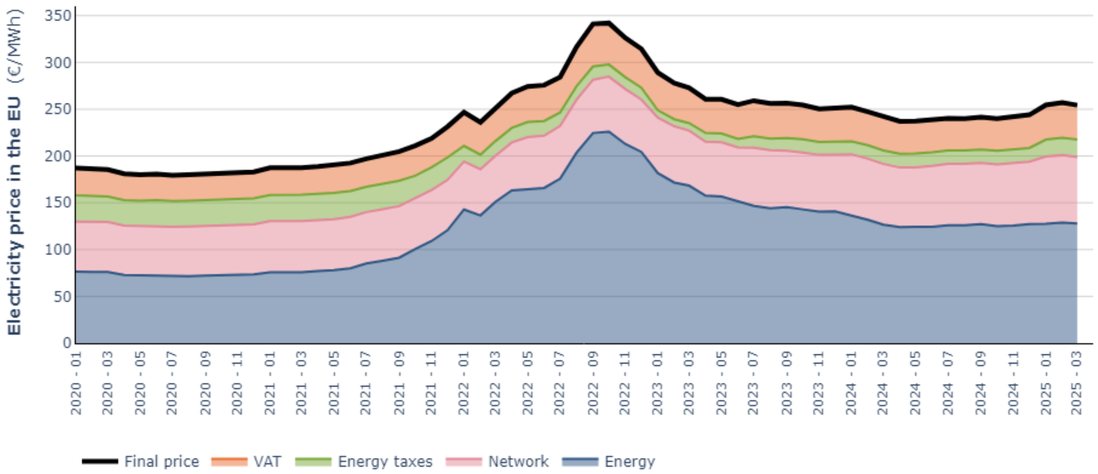
Retail markets

1.6 Retail electricity markets in the EU

Retail electricity prices in Q1 2025, Q1 2024, and Q1 2023

- Retail prices increased slightly (+3%) in Q1 2025 compared to Q1 2024, despite the energy component decreasing compared to last year's quarter. Member States are phasing out some of the crisis measures, revoking the reductions on VAT and other excise taxes. Therefore, the share of energy taxes in the final price increased by two percentage points. An increase of similar magnitude can also be seen for the share of network charges. **Figure 27** shows the monthly evolution of the EU average residential retail electricity prices over the last few years. The increase in average retail electricity prices for household costumers in EU capital cities can be attributed to a jump between December 2024 and January 2025 with prices remaining stable since.

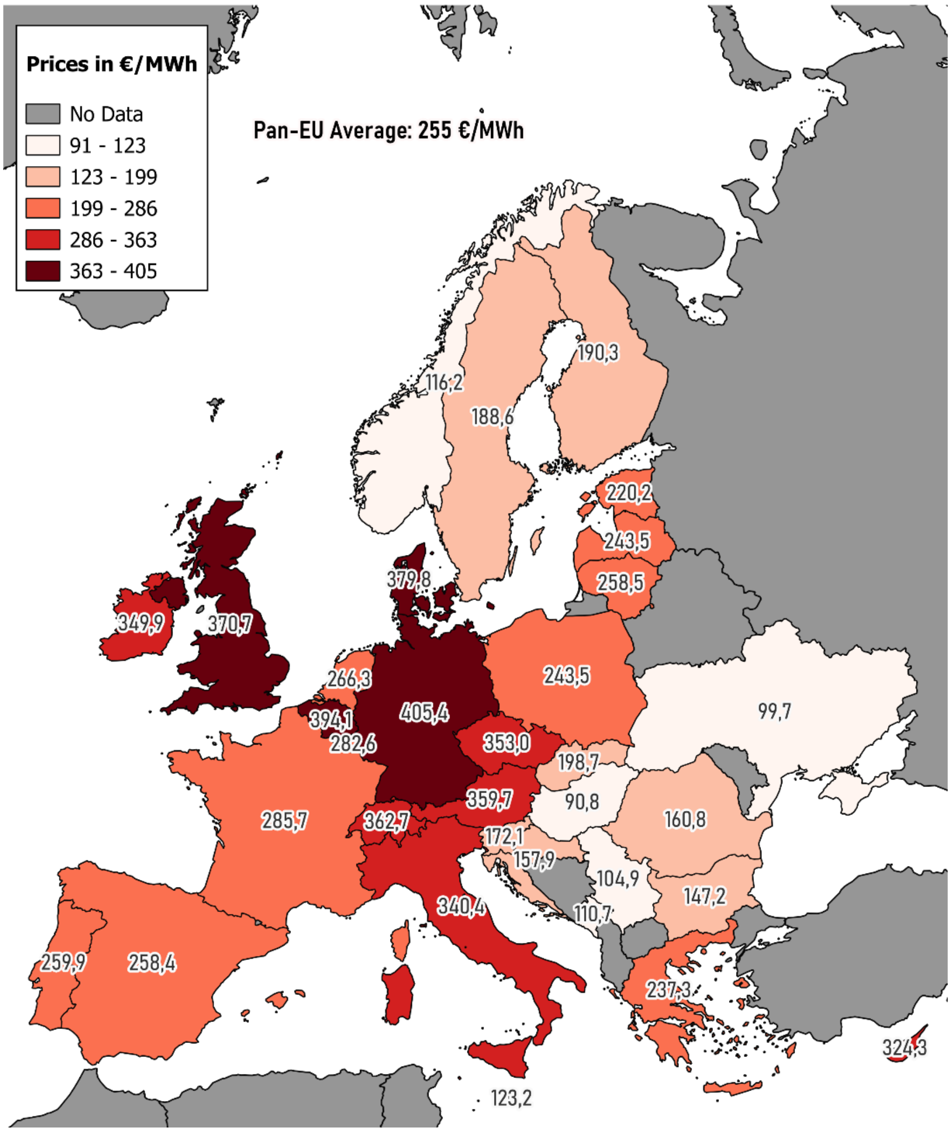
Figure 27 – Monthly average electricity price in the EU, paid by typical household customers



Source: VaasaETT

- **Figure 28** shows the average yearly electricity prices paid by households in capital cities in EU Member States and other European countries with typical annual consumption.

Figure 28 –Average household retail electricity prices in European capitals, Q1 2025



Source: VaasaETT

- **Figure 29** shows retail electricity prices for representative household consumers in European capital cities, and their composition divided into four categories (energy, network charges, energy taxes and the value added tax). In Q1 2025, the highest average prices were observed in Germany, Belgium and Denmark (405, 394 and 380 €/MWh, respectively). The lowest prices were recorded in Hungary, Malta and Bulgaria (90, 123 and 147 €/MWh), all countries with particularly low energy taxation for household consumers.
- In Q1 2025, the share of the energy component (including margin) was, on average, 50%, a decrease of almost 4 percentage points compared to Q1 2024. Meanwhile, the network and tax component of the final price increased by roughly 2 percentage points each.

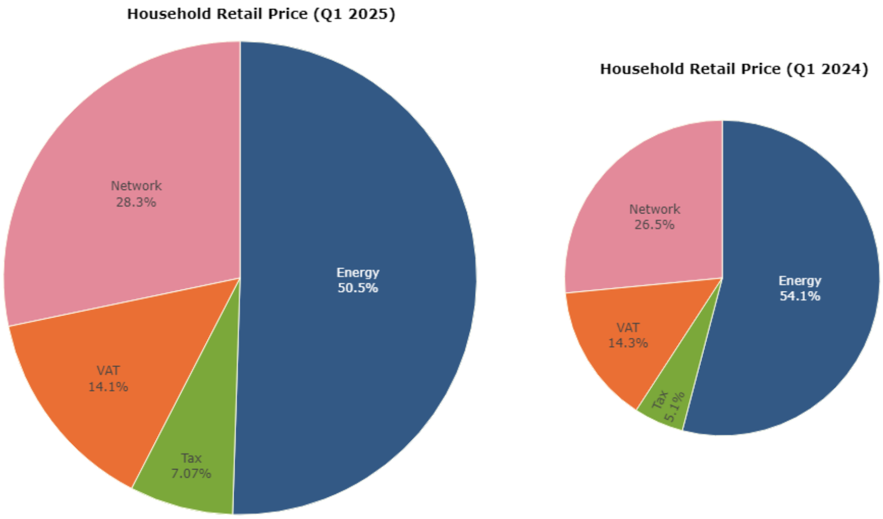
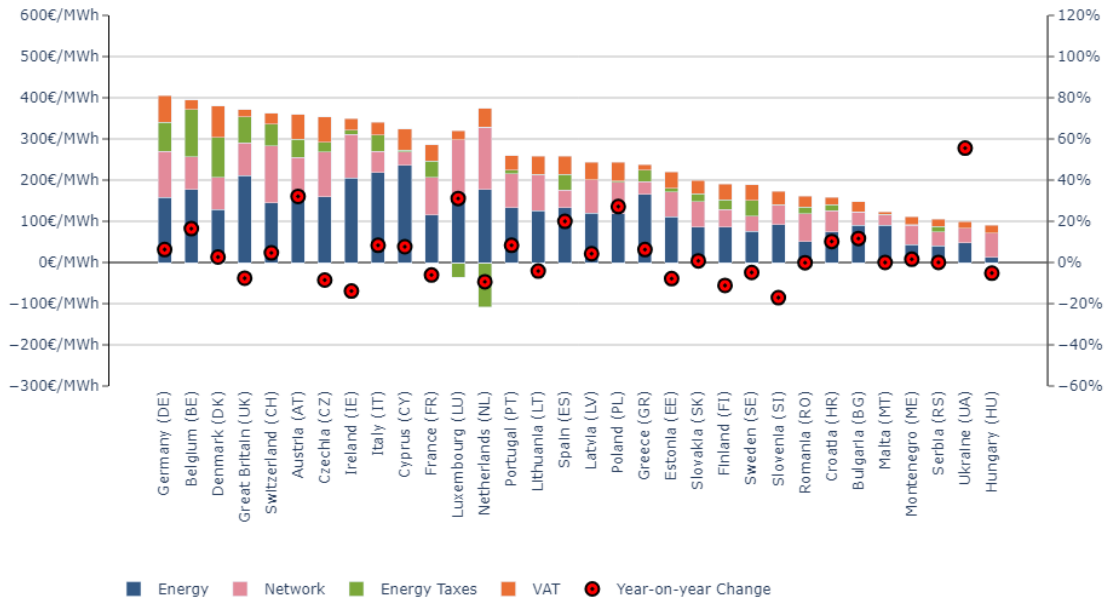


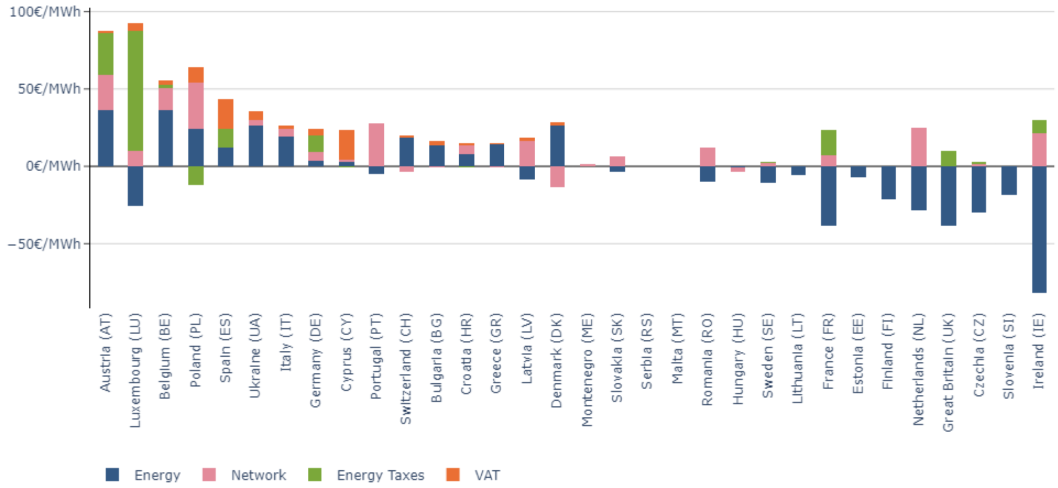
Figure 29 – The Household Energy Price Index (HEPI) in European Countries, Q1 2025



Source: VaasaETT

- Compared to Q1 2024, the largest price decrease in relative terms were observed in Slovenia (-17%), Ireland (-14%) and Finland (-11%). Conversely, Austria (+32%), Luxembourg (+31%) and Poland (27%) saw steeply rising household prices, driven by a combination of increasing grid fees and a larger energy component. Additionally, Luxembourg phased out its energy price cap in January 2025, resulting in steep price hikes. As shown in **Figure 30**, household price developments across Europe are heterogenous as likewise many countries saw significant decreases in the energy price component and thereby lower household prices.

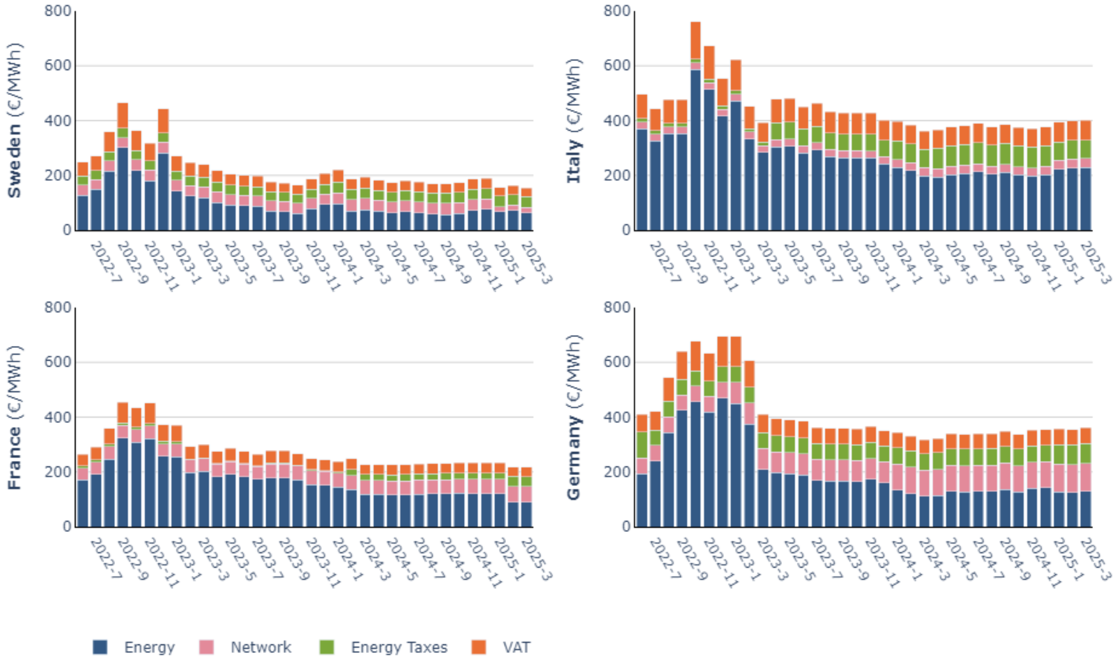
Figure 30 – Year-on-year change in electricity prices by cost components in European Countries comparing Q1 2024 and Q1 2025



Source: VaasaETT

- **Figure 31** shows industrial SMEs (IB Band) electricity prices for selected Member States across the years. End user prices in Italy were at 400 €/MWh, which is more than in Germany (360 €/MWh), France (217 €/MWh) and Sweden (154 €/MWh). While prices in Italy and Germany rose slightly compared to previous quarters, prices in Sweden and France remain on a downward trajectory.

Figure 31 –Industrial retail prices for SMEs in selected EU countries



Source: VaasaETT

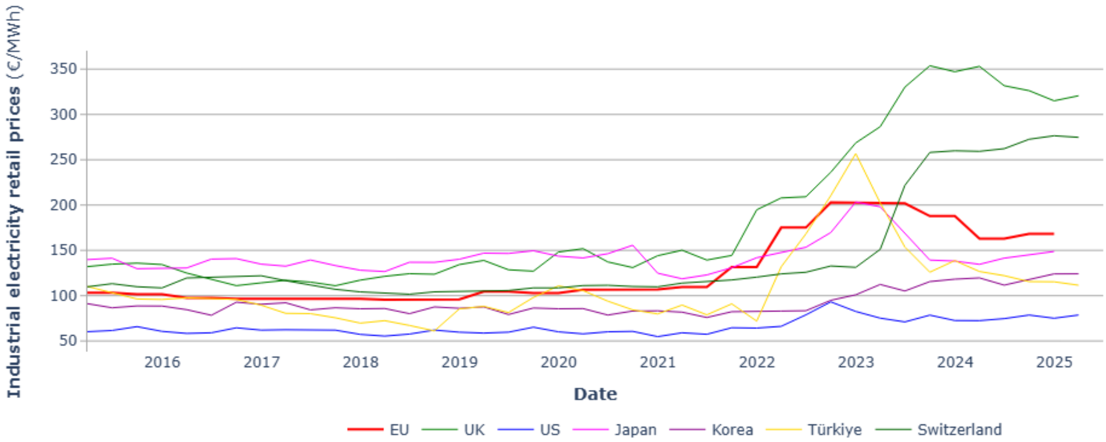
1.7 International comparison of retail electricity prices

- **Figure 32** displays retail prices paid by industrial consumers in the EU[1] and in its major trading partners. According to the latest available data, electricity prices for industrial users in the EU registered a year-on-year decrease in the

[1] The EU average is reported biennially in the Eurostat database. The prices in the quarter reflect electricity non-household retail prices from 2H 2024 for the ID band.

second half of 2024 compared to the second half of 2023 (-10%), signalling an improvement of electricity prices at industrial level following the impact of the energy crisis. In Q1 2025, the US (+8%) registered a year-on-year increase in prices, while remaining significantly lower than in the EU. In Q1 2024, the United Kingdom (-10%) registered a year-on-year decrease in prices. Conversely, prices in Korea rose (+4%) but only by a small margin.

Figure 32 – Retail electricity prices paid by industrial customers in the EU and its main trading partners



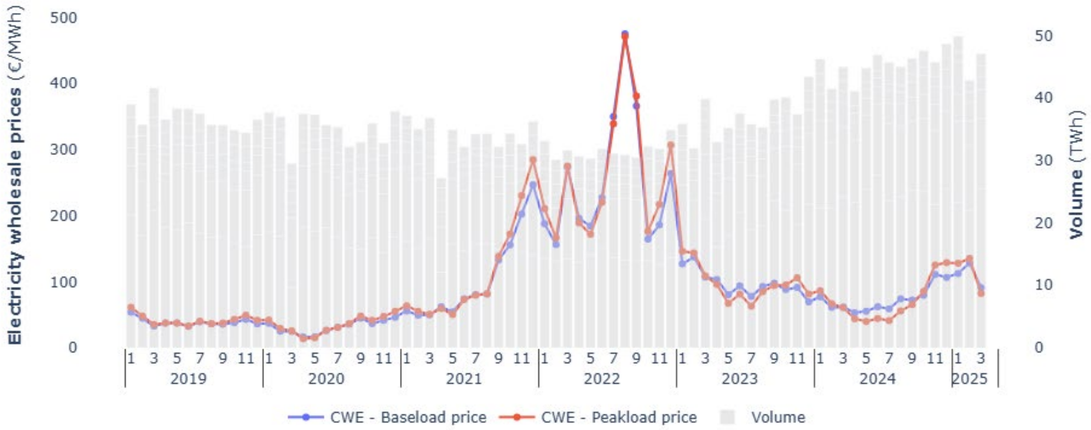
Source: Eurostat, EIA, DESNZ, IEA, DG ENER computations. Industrial prices in the EU are represented by the ID consumption band for the purposes of international comparison.

Annex

Regional wholesale markets

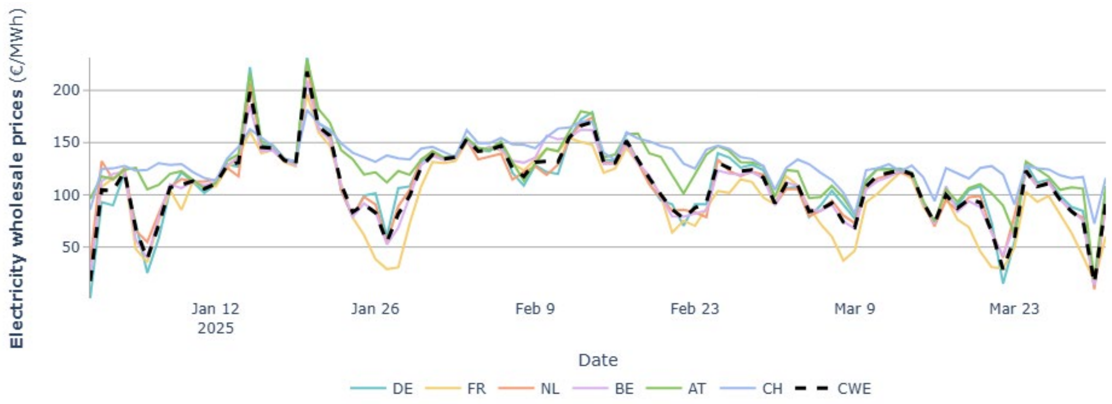
1.8 Central Western Europe (Austria, Belgium, France, Germany, Luxembourg, the Netherlands, Switzerland)

Figure 33 – Monthly exchange traded volumes of day-ahead contracts and monthly average prices in Central Western Europe



Source: S&P Global Platts, ENTSO-E, EPEX.

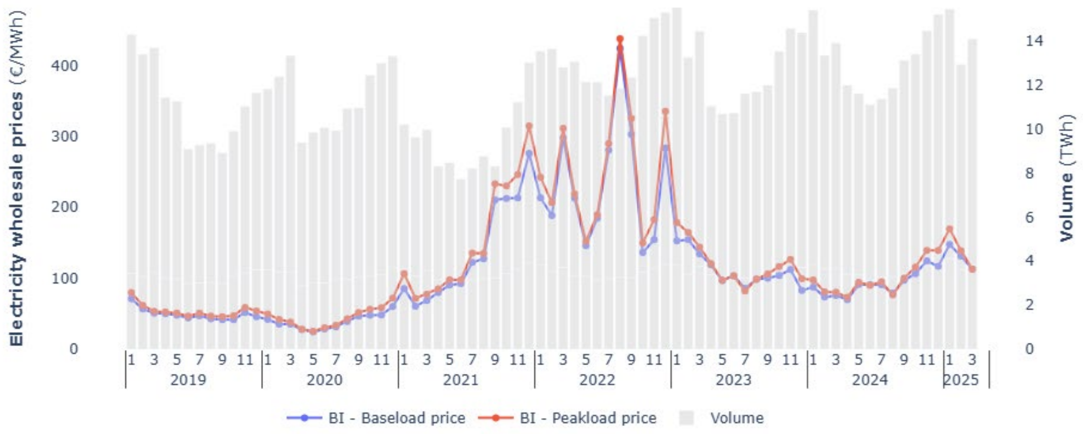
Figure 34 – Daily average power prices on the day-ahead market in the CWE region



Source: S&P Platts, ENTSO-E, EPEX

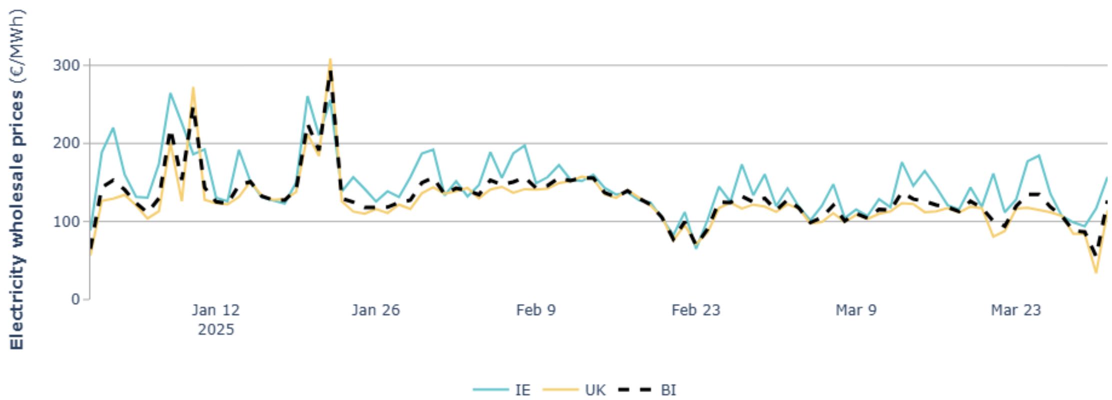
1.9 British Isles (GB, Ireland)

Figure 35 – Monthly exchange traded volumes of day-ahead contracts and monthly average prices in Great Britain and Ireland



Source: Nord Pool N2EX, SEMO, Utility Regulator

Figure 36 – Daily average electricity prices on the day-ahead market in Great Britain and Ireland



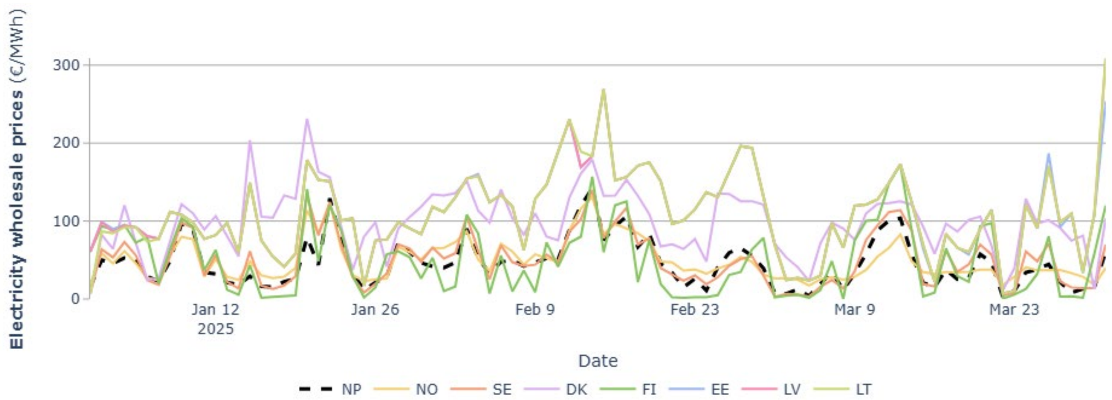
Source: Nord Pool N2EX, SEMO

1.10 Northern Europe (Denmark, Estonia, Finland, Latvia, Lithuania, Sweden, Norway)

Figure 37 – Monthly electricity exchange traded volumes and the average day-ahead wholesale prices in Northern Europe

Source: S&P Global Platts, Nord Pool spot market

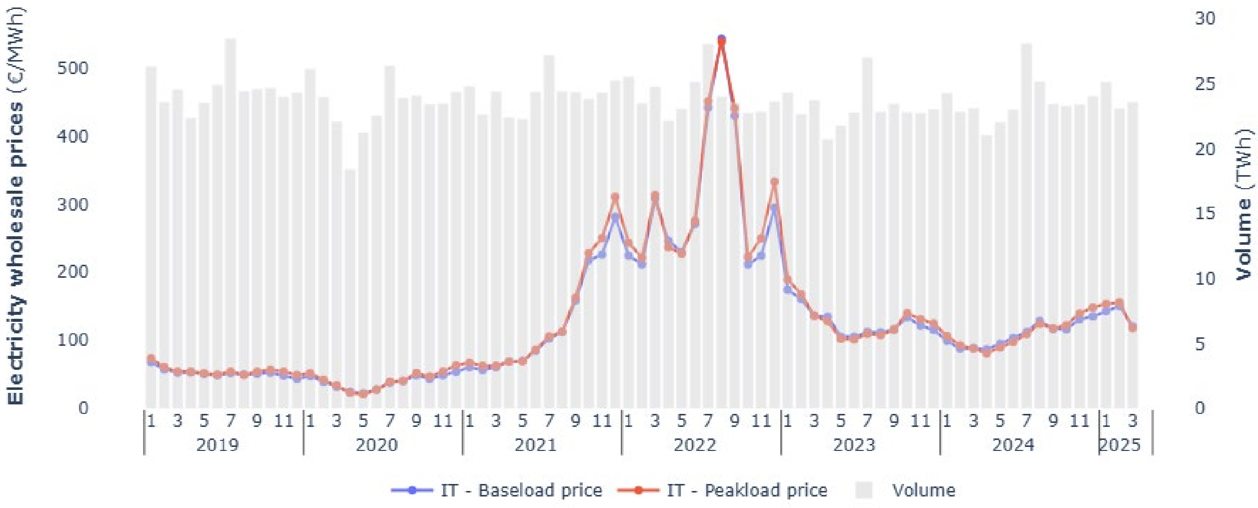
Figure 38 – Daily average regional prices and the system price on the day-ahead market in the Nordic region



Source: S&P Global Platts, Nord Pool spot market

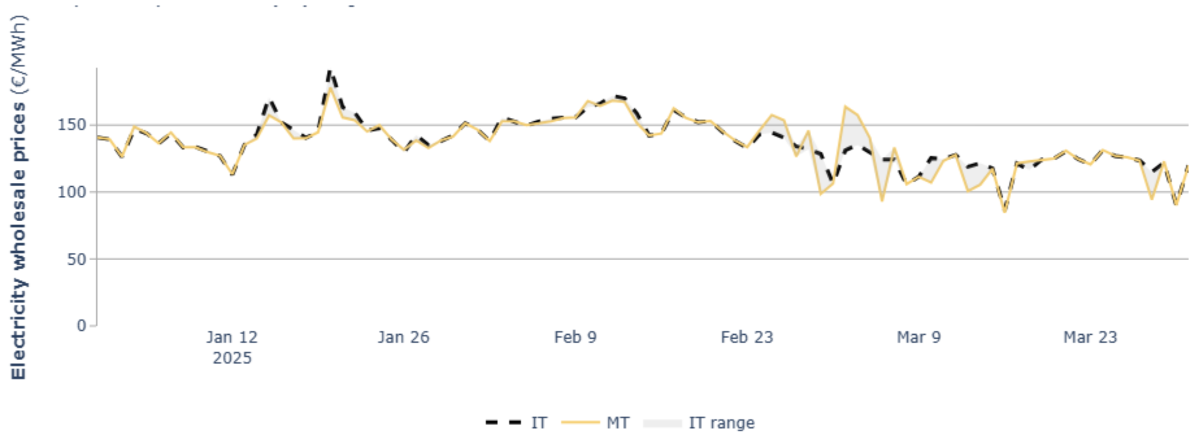
1.11 Apennine Peninsula (Italy, Malta)

Figure 39 – Monthly electricity exchange traded volumes and average day-ahead wholesale prices in Italy



Source: GME (IPEX)

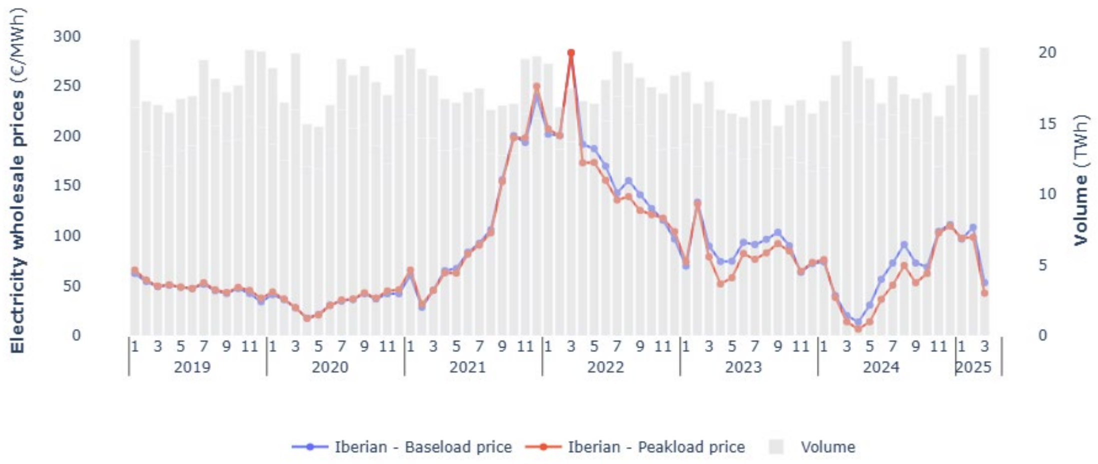
Figure 40 – Daily average electricity prices in the Italian day-ahead market, within the range of different area prices



Source: GME (IPEX)

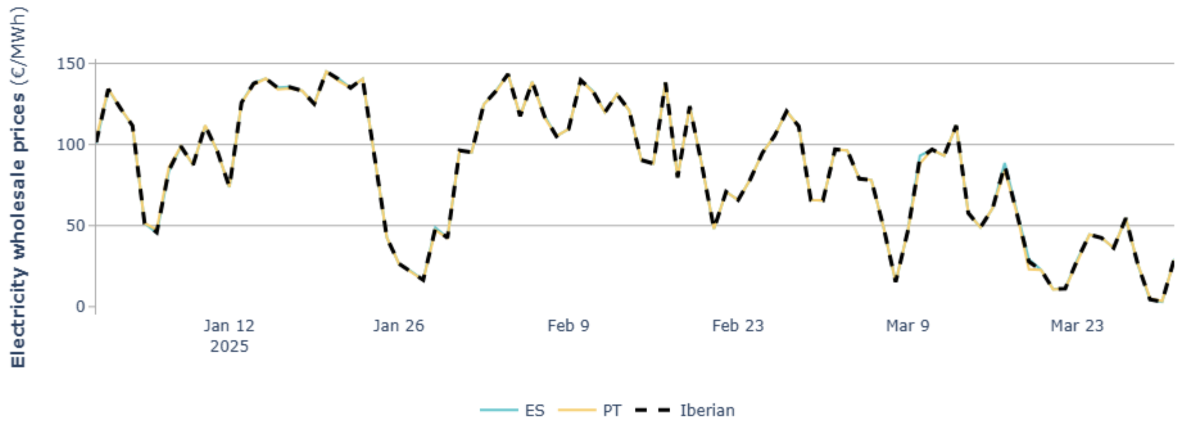
1.12 Iberian Peninsula (Spain and Portugal)

Figure 41 – Monthly electricity exchange traded volumes and average day-ahead prices in the Iberian Peninsula



Source: S&P Global Platts, OMEL, DGEG

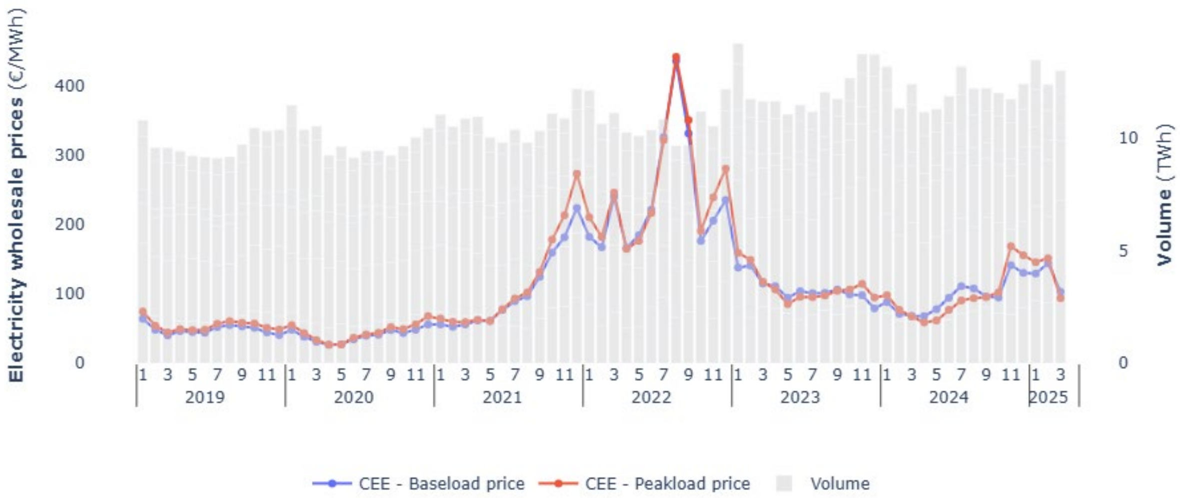
Figure 42 – Daily average electricity prices on the day-ahead market in the Iberian Peninsula



Source: S&P Global Platts, OMEL, DGEG

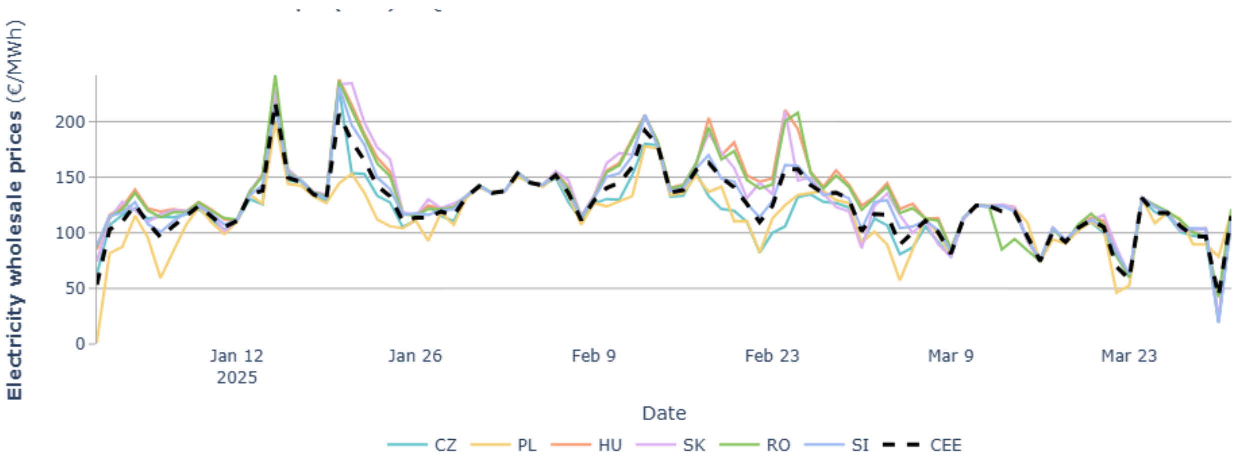
1.13 Central Eastern Europe (Czechia, Hungary, Poland, Romania, Slovakia, Slovenia)

Figure 43 – Monthly electricity exchange traded volumes and average day-ahead prices in Central Eastern Europe (CEE)



Source: Regional power exchanges, Central and Eastern Europe (CEE), CEE: CZ, HU, RO, PL, SK, SI

Figure 44 – Daily average power prices on the day-ahead market in the CEE region



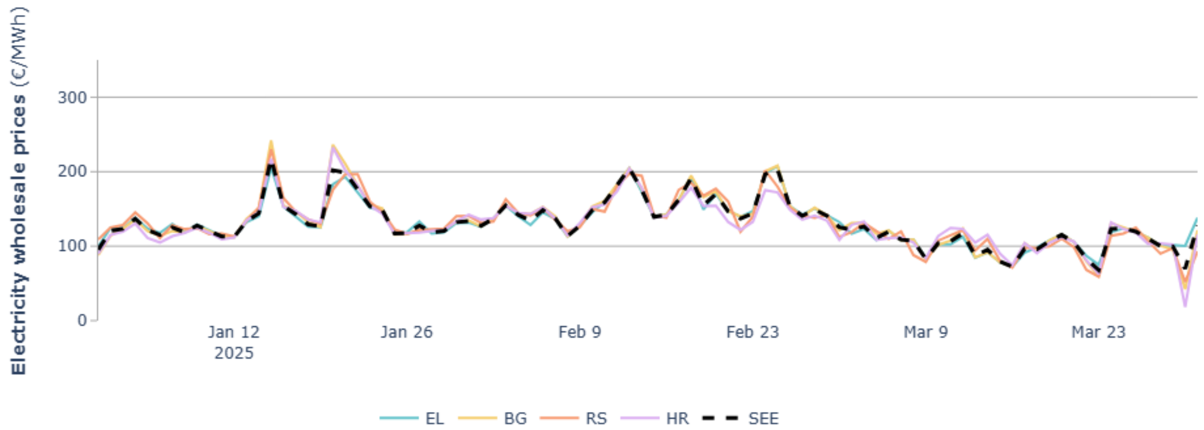
Source: Regional power exchanges

1.14 South-Eastern Europe (Bulgaria, Croatia, Greece and Serbia)

Figure 45 – Monthly traded volumes and baseload prices in South-Eastern Europe (SEE)

Source: ENTSO-E, IBEX, LAGIE, CROPEX, SEEPEX

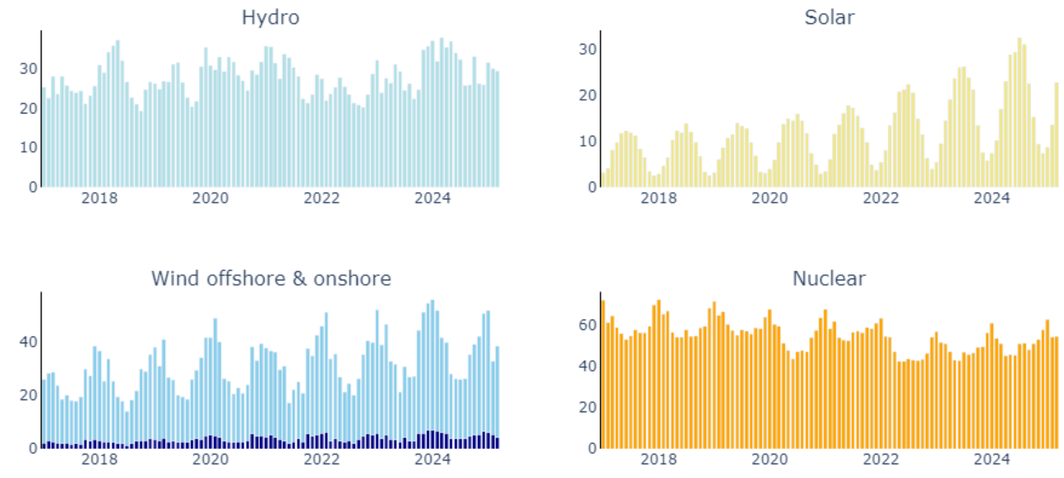
Figure 46 – Daily average power prices on the day-ahead market in Bulgaria, Croatia, Greece and Serbia



Source: ENTSO-E, IBEX, LAGIE, SEEPEX, CROPEX

1.15 **Electricity generation**

Figure 47 - Monthly renewable generation in the EU (TWh)



Source: ENTSO-E. Data represent net generation

Glossary

Backwardation occurs when the closer-to-maturity contract is priced higher than the contract which matures at a later stage.

Contango: A situation of contango arises in the when the closer to maturity contract has a lower price than the contract which is longer to maturity on the forward curve.

Emission allowances' spot prices are defined as prices for an allowance traded on the secondary market and with a date of delivery in the nearest December.

European Power Benchmark (EPB9) is a replacement of the former Platt's PEP index discontinued at the end of 2016, computed as weighted average of nine representative European markets' (Belgium, Czechia, France, Italy, Germany, Netherlands, Spain, the United Kingdom and the Nord Pool system price) day-ahead contracts.

EP5 is a consumption-weighted baseload benchmark of five most advanced markets offering a 3-year visibility into the future Markets included in the benchmark are France, Germany, the Netherlands, Spain and Nord Pool. Prices are weighted according to the consumption levels in individual markets. Forward prices are rolled over towards the end of each year, meaning that the year-ahead benchmark in 2021 shows the price for 2022; and the year-ahead curve in 2022, in turn, shows baseload prices for delivery in 2023.

Flow against price differentials (FAPDs): By combining hourly price and flow data, FAPDs are designed to give a measure of the consistency of economic decisions of market participants in the context of close to real time operation of electrical systems.
With the closure of the day-ahead markets (D-1), the prices for each hourly slot of day D are known by market participants. Based on the information from the power exchanges of two neighbouring areas, market participants can establish hourly price differentials. Later in D-1, market participants also nominate commercial schedules for day D. An event named 'flow against price differentials' (FAPD) occurs when commercial nominations for cross border capacities are such that power is set to flow from a higher price area to a lower price area. The FAPD chart in this quarterly report provides detailed information on adverse flows, presenting the ratio of the number of hours with adverse flows to the number of total trading hours in a quarter.

Relative standard deviation is the ratio of standard deviation (measuring the dispersion within a statistical set of values from the mean) and the mean (statistical average) of the given set of values. It measures in percentage how the data points of the dataset are close to the mean (the higher is the standard deviation, the higher is the dispersion). Relative standard deviation enables to compare the dispersion of values of different magnitudes, as by dividing the standard deviation by the average the impact of absolute values is eliminated, making possible the comparison of different time series on a single chart.

Retail prices paid by households include all taxes, levies, fees and charges. Prices paid by industrial customers exclude VAT and recoverable taxes. Monthly retail electricity prices are estimated by using Harmonised Consumer Price Indices (HICP) based on bi-annual retail energy price data from Eurostat.

Tariff deficit expresses the difference between the price (called a tariff) that a *regulated utility*, such as an electricity producer is allowed to charge and its generation cost per unit.