

Data Insight

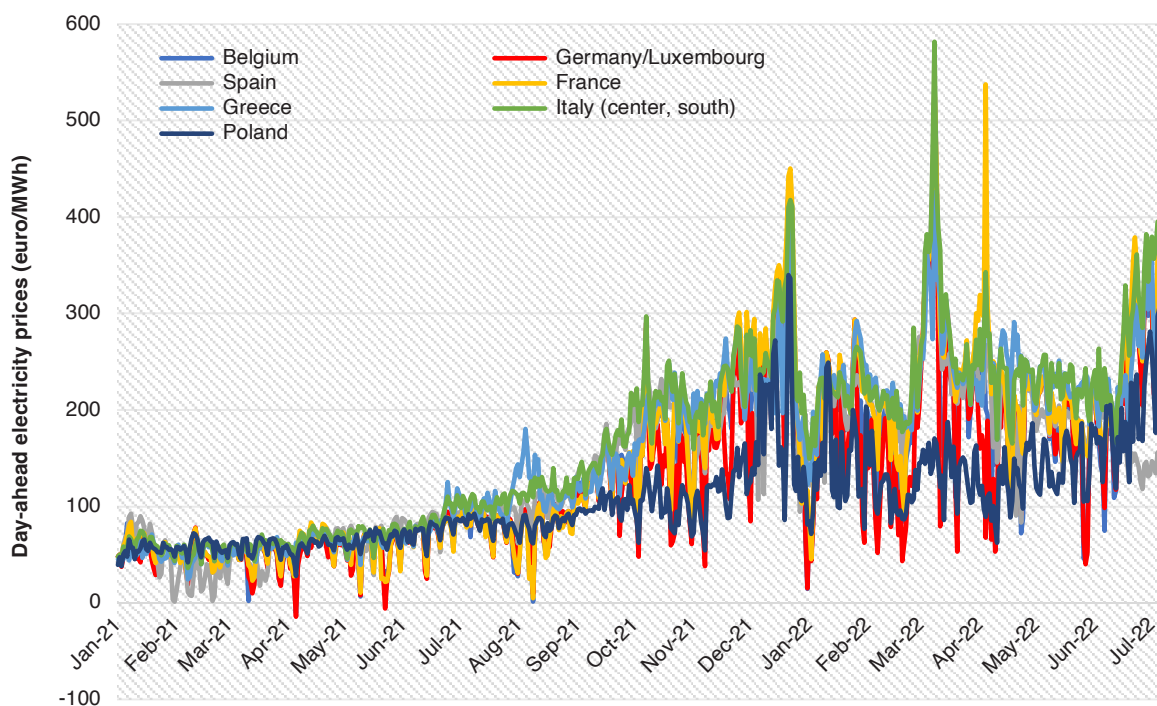
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The Crisis in Electricity Prices in Europe: Context and Key Insights

The cost of electric power in Europe is soaring. After a steady rise in 2021, prices spiked in the first half of 2022 following the post-COVID-19 economic recovery. Day-ahead wholesale electricity prices increased more than threefold on average in 2021 compared to 2020, reaching an average of €194 per megawatt-hour (MWh) in the fourth quarter (Q4) of 2021 (European Commission 2022b). The daily standard deviation of day-ahead electricity prices more than doubled on average in 2021 compared to 2020 (FFE 2022; Petitet and Belaïd 2021). At the start of July 2022, electricity prices were heading toward their 2021 peak. They are expected to reach new highs based on current market dynamics. Here, we discuss the drivers and implications of current European electricity prices.

Figure 1 displays daily average day-ahead electricity prices from January 2021 to July 2022 for selected European Union (EU) member states (Belgium, France, Italy, Germany, Greece, Poland, and Spain). Table 1 and Figure 2 show the electricity prices between January 2021 and July 2022, and the distribution of daily average day-ahead prices by country, respectively.

Figure 1. Daily average day-ahead prices in selected European countries from January 2021 to July 5, 2022.



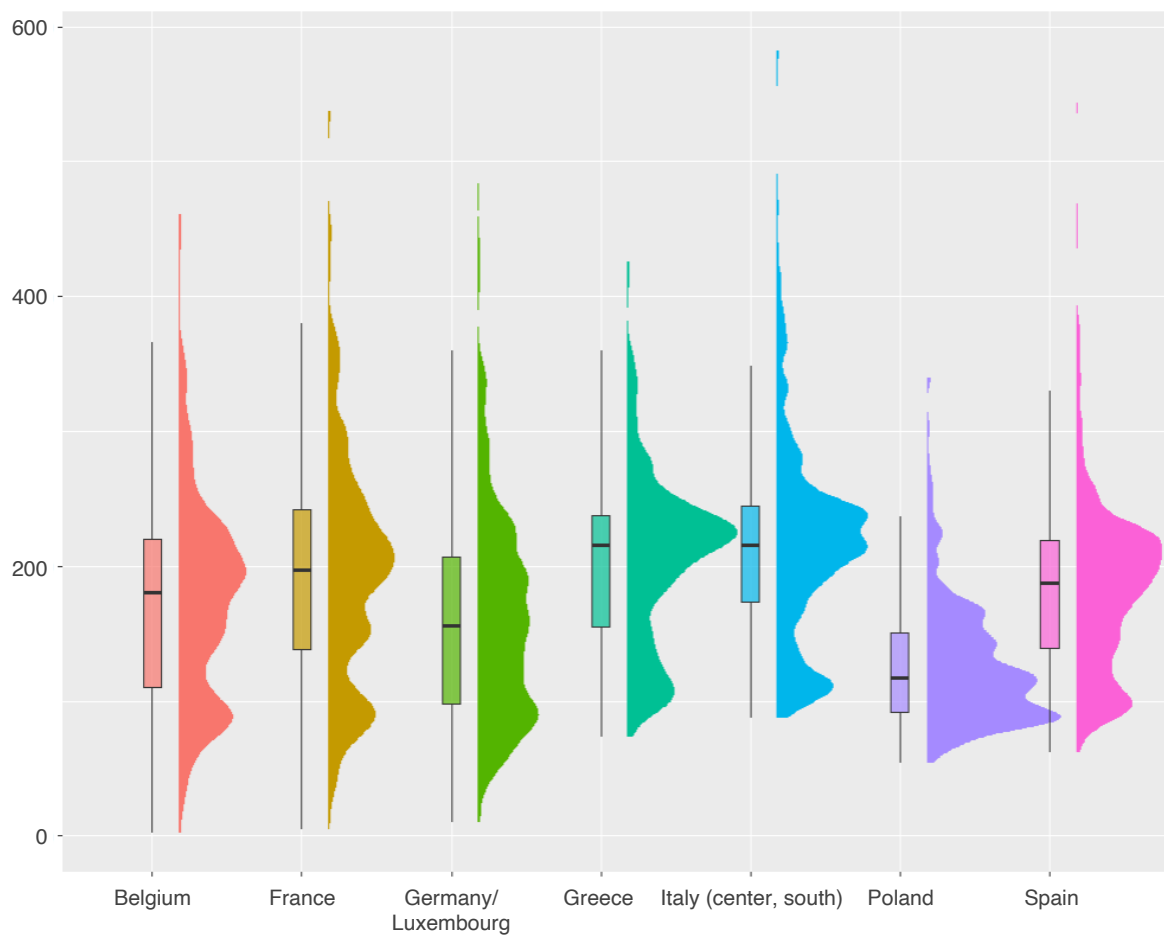
Source. Authors' calculation using ENSTOE (2022).

Table 1. Descriptive statistics over the last 12 months.

Country	N	Mean	SD	Median	Min	Max	Range
Belgium	370	176.11	78.07	180.06	1.79	460.61	458.82
Germany/Luxembourg	370	162.11	78.05	156.23	9.57	483.39	473.81
Spain	370	184.06	65.20	187.66	61.50	543.56	482.06
France	370	194.35	86.59	197.11	4.95	537.73	532.78
Greece	370	203.76	63.21	215.95	72.94	425.67	352.73
Italy (center, south)	370	215.29	72.72	215.77	87.28	581.70	494.41
Poland	370	127.48	47.14	117.10	54.37	339.82	285.46

Source: Authors' calculation using ENSTOE (2022).

Figure 2. Distribution of daily average day-ahead prices by country.

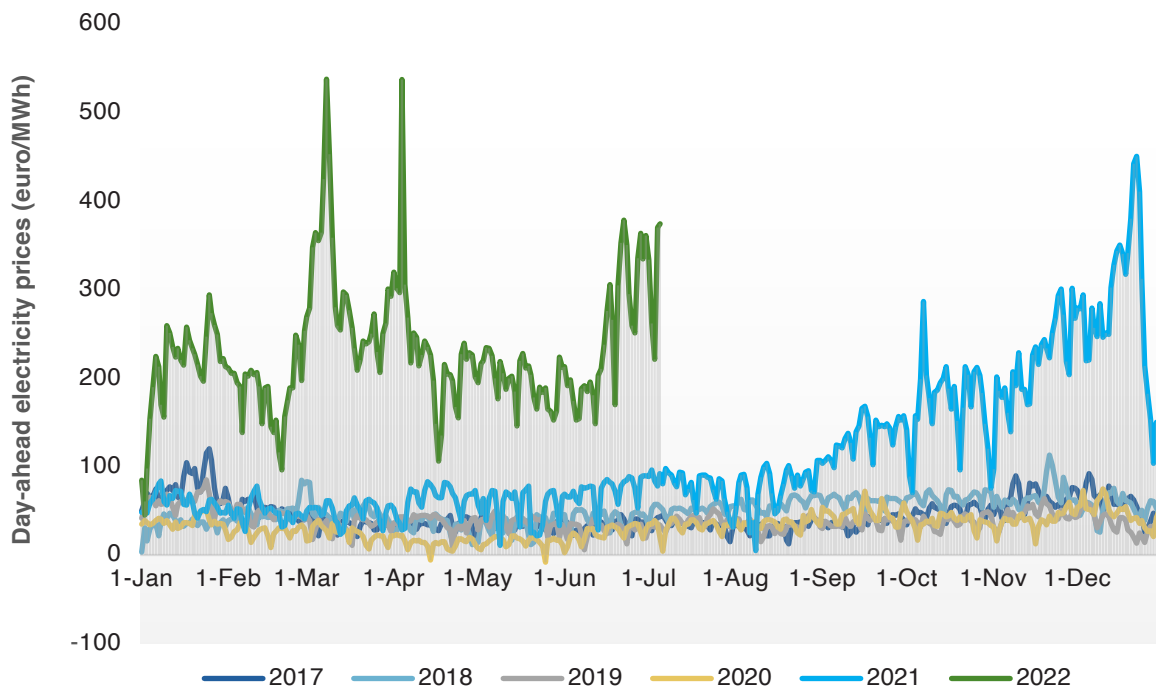


Source: Authors' calculation using ENSTOE (2022).

Key Features of the European Power Market

- The EU power sector was structured as a regulated monopoly until approximately three decades ago. Within each country, one or more vertically integrated utilities oversaw electricity generation, transmission, distribution, and supply (K.U. Leuven Energy Institute 2015). However, aiming at building a European integrated, internal, market for electricity, the EU has gradually opened this sector to competition through a series of legislative packages (e.g., in 1996, 2003, and 2009).
- An integrated electricity market is widely assumed to be the most cost-effective solution for EU member states to maintain affordable and secure energy supplies. The European electricity market has gradually evolved since 2009 to accommodate integration and technological changes. In particular, the Clean Energy for All Europeans package adopted in 2019 updated the EU's energy market guidelines and introduced new rules (European Commission 2022a) to expand renewable energy sources from 25% to 50% of the total energy mix by 2030.
- Because of interconnected transmission systems and integrated power exchanges, day-ahead electricity prices are highly correlated across Central Europe and follow similar daily and annual patterns, with prices diverging when interconnections reach their limits.
- The seasonality of European electricity demand dictates day-ahead wholesale price patterns. These are characterized by relatively low summer prices and high winter prices. Figure 3 illustrates historical spot electricity prices in France.

Figure 3. France's daily average day-ahead electricity prices from January 2021 to July 5, 2022.



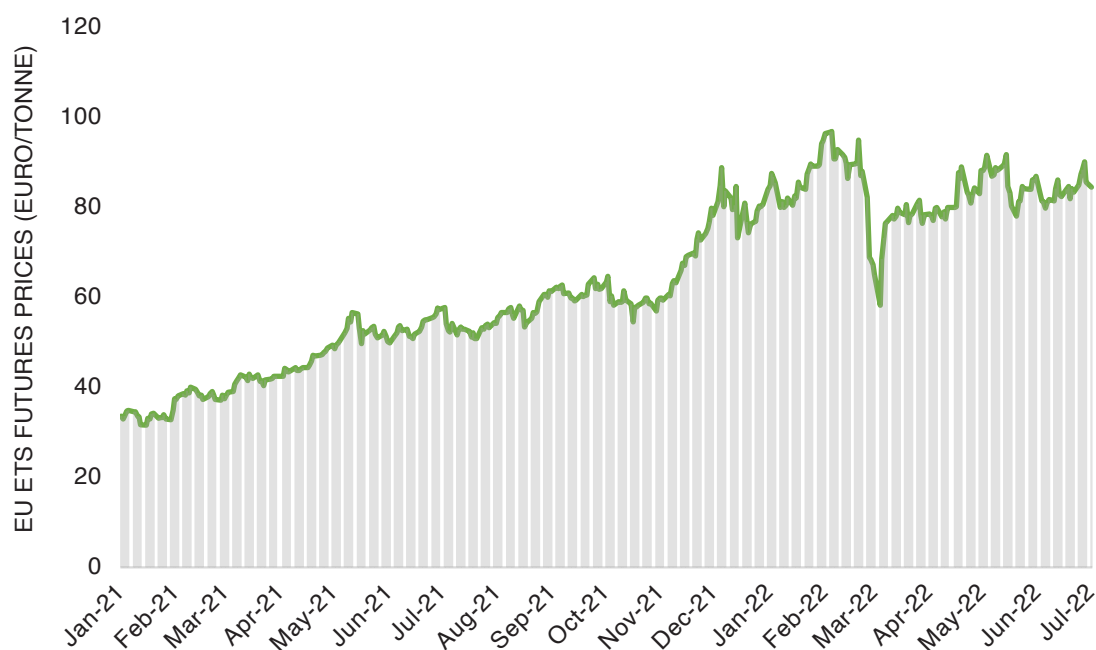
Source: Authors' calculation using ENSTOE (2022).

Key Insights

- Electricity prices have increased steadily since the second half of 2021 and have reached unexpected levels under an unprecedented confluence of geopolitics events. The conflict in Ukraine has added further complications to already uncertain prospects for the global economic recovery following the COVID-19 pandemic.
- EU wholesale electricity prices surged in 2021, with most countries reaching all-time highs in December. The situation was exacerbated in February 2022 by the start of the Russia–Ukraine war, resulting in a new price boom in March 2022 (Figure 1) driven by a tight gas market amid ongoing geopolitical tensions. However, differing gas dependency levels and cross-border interconnections lead to differences in price dynamics across countries.
- This surge in energy prices has immediate economic implications, including significant increases in inflation rates. The Eurozone’s annual inflation rate reached 5% in December 2021 and was predicted to climb to 8.6% by June 2022. It actually reached 8.9% in July 2022 (Eurostat 2022).
- Record high electricity prices may spill over into the longstanding energy poverty phenomenon, linked to high energy costs, low incomes, and energy-inefficient housing (Belaïd 2021, 2022). In this context, many households are experiencing significant electricity bill increases, exacerbated by current tariffs in EU member states.
- Various drivers are behind this surge in electricity prices. The prominent driving factor is high gas prices, which have increased owing to the conflict in Ukraine and subsequent move away from Russian gas by EU customers. This has created a shortage in gas supplies as EU countries seek to find alternative sources. Prices for Dutch Title Transfer Facility (TTF) Gas (a European benchmark) doubled to €160/MWh in January 2022. The strong correlation between gas and electricity prices is attributable to the fact that in the day-ahead power reference market, the price is set by the marginal unit, which is usually natural gas in many member states.
- The sharp increases in electricity prices have also been fueled by significant increases in the price of carbon credits, notably from the second half of 2021, due to rising fossil fuel prices and the projected accelerated transition to green energy (Figure 4).
- The European carbon dioxide (CO₂) price (EU Emissions Trading System allowances) almost tripled between January 2021 and February 2022 (Figure 3), from roughly €30 per tonne of CO₂ (e/tCO₂) to 96.7 e/tCO₂. This drove up the wholesale electricity price, as electricity generators had to purchase CO₂ allowances to offset their emissions. The CO₂ price has remained high since then and was being traded in the range of €83 – €87 e/tCO₂ at the beginning of July 2022.
- High carbon prices are mainly being driven by the disclosure of the European Commission’s new ambitious climate policy, including reforms to limit the number of available carbon emission permits. Other factors include the stressed gas market and expectations of a tighter gas supply in Europe (Belaïd and Petitet 2022).
- Furthermore, the EU power crisis has been exacerbated by reduced nuclear power generation in France. The state-owned Electricité de France SA recently announced that, due to extended maintenance for five reactors, its nuclear power generation forecast for 2022 had been downgraded from 330 terawatt-hours (TWh) to 300 TWh, a drop of more than 30% from a decade ago (De Beaupuy 2022; EDF 2022).

- In response to the unprecedented and sustained high electricity prices, several European countries (Spain, France, Italy, and Germany) have announced measures to mitigate the effects of high energy prices on end users. In parallel, the European Commission outlined several actions, in line with existing EU regulations, to cushion the shock of high prices on end users' bills, ranging from tax reductions to direct income support (European Commission 2021). Other countries, including the United Kingdom and France, are also considering nationalizing their utilities.
- To compensate for gas supply shortages, several countries are ramping up the use of coal for electricity generation (Germany, Austria, the Netherlands, and Italy), in addition to developing liquefied natural gas importing facilities.
- Further measures by the European Commission include recommendations for accelerating the energy transition from fossil fuels through the accelerated deployment of renewables and higher energy efficiency.
- In May 2022, the EU published its REPowerEU plan in response to ongoing strains in the energy market amplified by the Ukraine-Russia conflict (EUR-Lex 2022). To complement the European Commission's 2021 toolbox on energy prices, the REPowerEU plan proposed additional measures to diversify supplies, save energy, accelerate fossil fuel substitution, and support the integrated planning and resourcing of national and cross-border infrastructures as well as energy projects and reforms.
- REPowerEU recognizes energy efficiency as the ultimate cost-effective means of conserving energy and lowering bills for both households and businesses. Accordingly, the proposal calls for an upgrade to the ambition of the Commission's 2021 proposal for the EU energy efficiency target. This would ensure a 13% (rather than 9%) cut in energy consumption by 2030 relative to the 2020 baseline projections (EUR-Lex 2022).

Figure 4. EU ETS futures prices traded from January 2021 to July 5, 2022.



Source: Authors' calculation using ENSTOE (2022).

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