

Weekly Summary

Economics of Climate Change

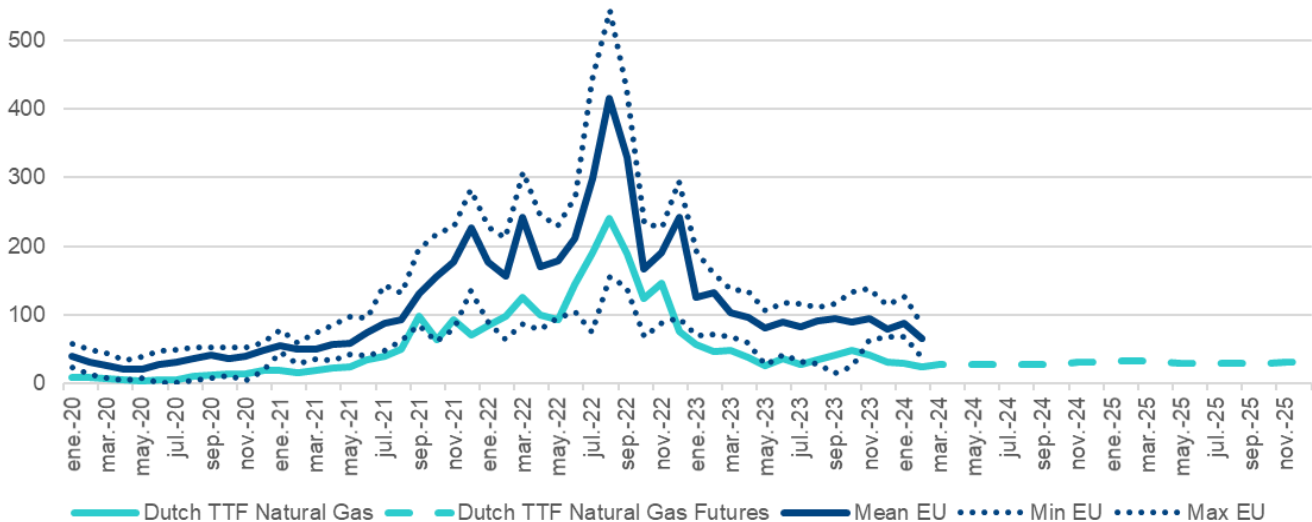
March 22, 2024

Stabilizing Skies: Europe's Wholesale Electricity Prices Find Calm After the Storm

The significant decrease in electricity prices in European wholesale markets is primarily due to the disappearance of negative supply shocks and reduced demand pressures. The penetration of renewable energies, where Spain holds a comparative advantage, will require time to make a lasting impact on prices, awaiting advancements in storage solutions that can more effectively manage demand's marginal peaks.

Wholesale electricity prices have stabilized in Europe in 2024, at average levels ranging between 40 and 70 EUR/MWh, far from the high and more volatile prices of 2023 and, above all, 2022 (**Figure 1**). The escalation of gas prices, which began with the post-Pandemic recovery and was exacerbated by the Russian invasion of Ukraine, pushed electricity prices in Europe to historic highs over the past three years, exceeding 540 EUR/MWh in August 2022. As per the Dutch TTF, the benchmark for natural gas prices across Europe, futures are currently near 30 EUR/MWh.¹ **This indicates an expected stabilization of prices in the near future.**

Figure 1. **EU WHOLESALE ELECTRICITY AND GAS (DUTCH TTF) PRICES (EUR/MWH). SPOT MARKETS. 2020-2024. FUTURES UNTIL DEC, 25**

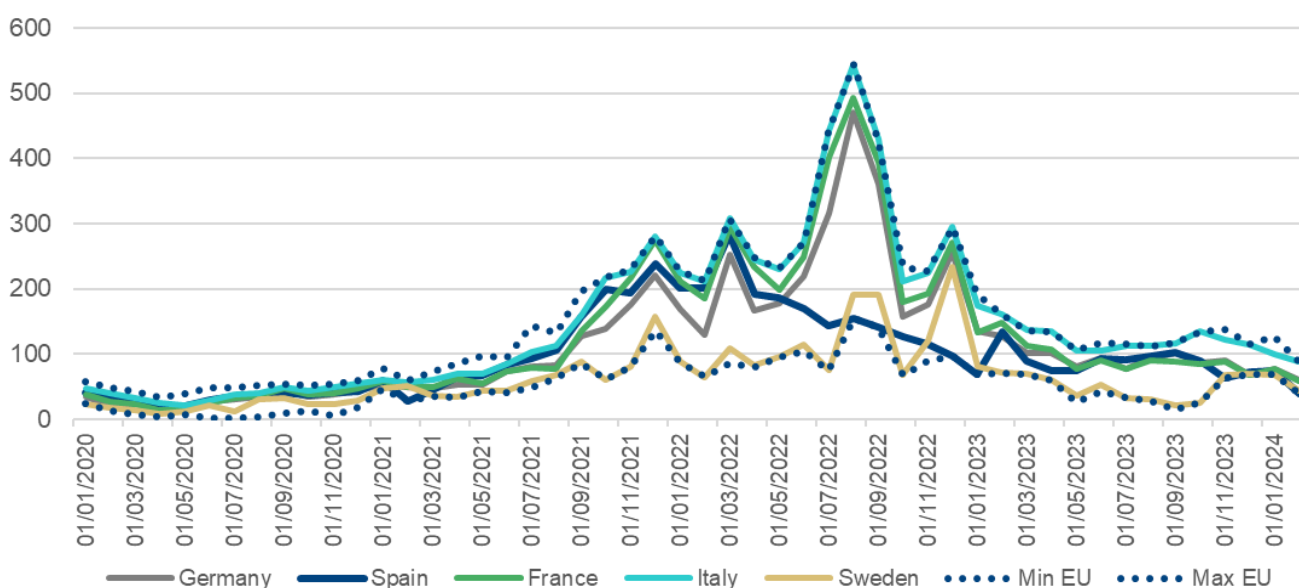


Source: BBVA Research with [EMBER](#) data.

1: The relationship between gas and electricity prices is determined by the presence of combined cycle plants in electricity generation, which use gas as an input, and their role as a marginal technology during hours when renewables or cleaner technologies do not satisfy the entirety of the demand.

The decline in electricity prices is underpinned by market fundamentals: reduced gas prices, tempered demand, and increased production from renewable and hydroelectric sources. Throughout the early months of 2024, nearly every European nation reported a decrease in their wholesale electricity market prices, with reductions ranging from 30% to 70% compared to the previous year. Notably, **Spain recorded the EU's lowest price in February at 40 EUR/MWh**, a 70% decrease from February 2023 and the lowest in the past three years. This follows the price surge in 2021 and 2022, during which prices approached 300 EUR/MWh.

Figure 2. **EU WHOLESale ELECTRICITY PRICES (EUR/MWh). SPOT MARKETS. 2020-2024**



Source: BBVA Research with EMBER data.

Thanks to demand reduction and higher renewables (solar and wind specially) combined with a recovered hydro and enhanced nuclear production, European countries have been able to decrease fossil fuel output, registering a fall in electricity prices. Lower demand from industrial sectors, due to high energy prices and interest rates, together with an increase in self-consumption and milder than average temperatures, are mainly responsible for the reduction in electricity demand. On the other hand, **the share of wind and solar in the EU's electricity mix remains close to 28% in 2024**, almost 3 points higher than that of the beginning of 2023, while the share of electricity powered by fossil fuels fell 7 points to reach 33%. Meanwhile, **nuclear and hydro generation** contributed 25% and 14%, respectively, to the total electricity mix. **Lower gas prices** have also helped reduce electricity prices, amplifying the impact on the wholesale electricity markets. On average, between 1.7-2 MWh of gas are needed to produce one MWh of electricity.

Figure 3. **EU. MONTHLY ELECTRICITY MIX. TWH PRODUCED BY TECHNOLOGY. 2020-2024**

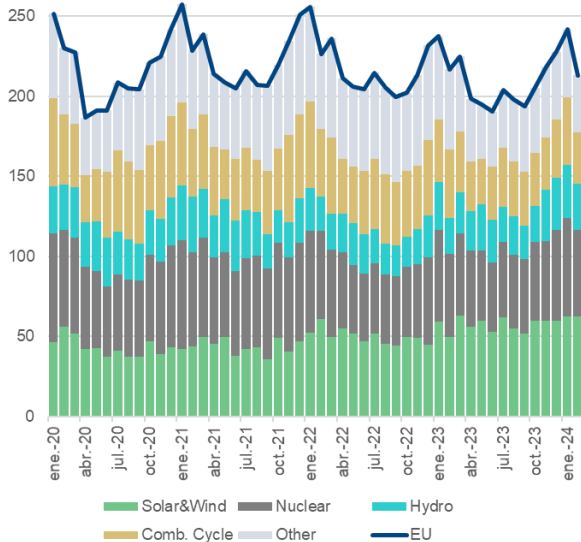
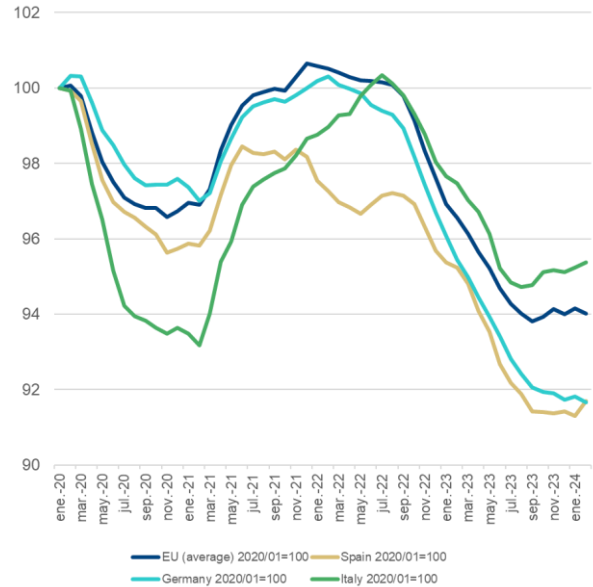


Figure 4. **EU. MONTHLY WHOLESALE ELECTRICITY DEMAND. 2020/01=100. 2020-2024. 12 MONTH M.A.**



Source: BBVA Research with EMBER data. EU demand is the average demand of all EU countries (not a weighted demand).

In Spain, the situation is similar to that of Europe, as shown in Figures 4-7, with the anomaly of the "Iberian exception", a regulatory measure adopted in mid-2022 and extended until the end of 2023 (see Box 1).

Box 1. Iberian exception

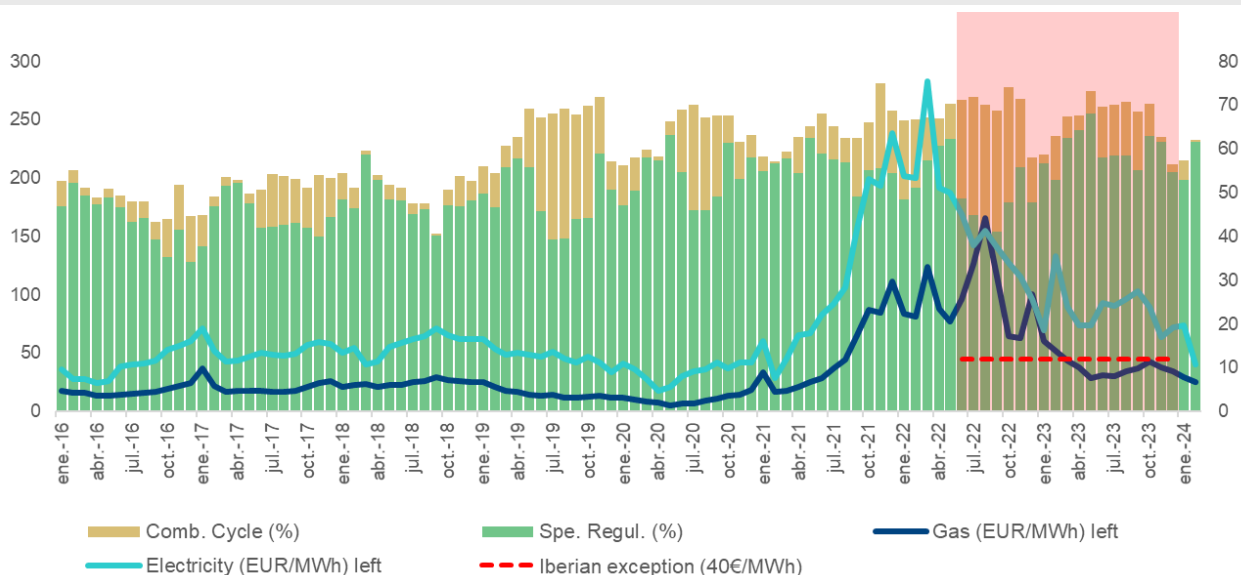
By "**Iberian exception**," we refer to the authorization granted by the European Commission to the Spanish and Portuguese governments, allowing them to subsidize the generation of power plants using gas to reduce the wholesale electricity market price. This was a measure the government called a "gas price cap," a term widely adopted despite not actually capping (limiting) the gas price, but rather subsidizing gas consumption. Thus, while a true "gas price cap" would reduce the profits of gas companies by limiting the price at which they sell gas, the so-called "gas price cap" approved by the government resulted in increased natural gas demand and higher profits for these companies.

The European Commission authorized the subsidy payment to power plants from June, 2022 until December 31, 2023, thus ending this measure at the beginning of 2024. This measure decoupled gas and electricity prices in the wholesale market when the gas price exceeded €40 per MWh (**Figure 5**). Although initially intended to lower the wholesale market price, **this measure had a counterproductive effect on the retail market price.** To compensate combined cycle plants and subsidize part of the exports, it ended up being detrimental for Spanish retail consumers with variable prices.²

²: As explained in published articles ([here](#), [here](#), and [here](#)). For a review of the "Iberian exception" also see BBVA Research's "[The "Iberian exception", short term gains at the expense of long-term costs](#)"

Apart from the "Iberian exception", Spanish wholesale electricity prices have decreased for reasons largely aligned with those affecting Europe. These factors are a mix of structural changes and temporary reversals of negative shocks. A structural factor is the consistent growth in the production capacity of solar and wind power. Due to their near-zero marginal costs, these renewable sources are progressively lowering electricity prices daily. Note that the share of wind and solar in Spain's electricity mix (approximately 55-60%) is much higher than the average share in Europe (see **Figure 3**). However, the primary driver behind the recent price decline is the significant drop in gas prices (Mibgas). This decrease is partly due to a slowdown in activities, especially in the manufacturing sector, prompted by higher interest rates, and also because of eased supply concerns and pressures.

Figure 5. **SPAIN. GAS (MIBGAS) AND ELECTRICITY PRICES (EUR/MWH, LEFT) AND SPECIAL REGULATION (RENEWABLES, NO HYDRO) AND COMBINED CYCLES SHARE IN THE ELECTRICITY MIX (% , RIGHT). 2016-2024**



The graph uses a red shaded area to visually depict the duration of the Iberian exception's activation. This shaded portion marks the timeframe within which specific measures were in effect. Additionally, a distinct red line is plotted across the graph to denote the trigger price level (40€/MWh). The renewable energy technologies under Spain's special regime (Spe. Reg.) include photovoltaic solar, thermoelectric, wind, and geothermal energy.
Source: BBVA Research with OMIE data.

Additionally, **a decrease in electricity demand**, spurred by the economic slowdown and an ongoing trend towards greater energy efficiency, has played a role in shaping the market. This shift has resulted in combined cycle power plants reducing their share in the electricity mix as marginal technologies, dropping from 24.6% in February 2023 to only 3.7% in 2024, as illustrated in **Figures 6 and 7**. Lastly, the **resurgence of hydroelectric** power in Spain, enabled by a partial recovery from drought conditions (excluding the Mediterranean region), has occasionally displaced combined cycle power plants as marginal technologies. This development is also depicted in **Figures 6 and 7**.

Even though Spain's adoption of renewable electricity exceeds the European average, a significant link with gas prices persists, with gas often determining the marginal cost of electricity. This observation, however, does not undermine the benefits of a greener electricity mix. With approximately 60% of its electricity derived from renewables, Spain enjoys a reduced dependency on non-renewable ("brown") electricity production, shielding it comparably better from supply shocks or mandatory demand cuts. Furthermore, during periods of low demand, like the current one, renewables often step in as the marginal technology, substantially lowering electricity

costs (see Figure 7). Nevertheless, an upsurge in electricity demand linked to manufacturing growth from the third quarter onwards will possibly lead gas to resume its role in determining marginal prices. Despite this, **Spain is progressively approaching a pivotal moment where renewable sources are poised to dominate the energy mix for the majority of the time, significantly cutting the average cost of electricity.**

Figure 6. **SPAIN. MONTHLY ELECTRICITY MIX. GWH PRODUCED BY TECHNOLOGY. 2020-2024**

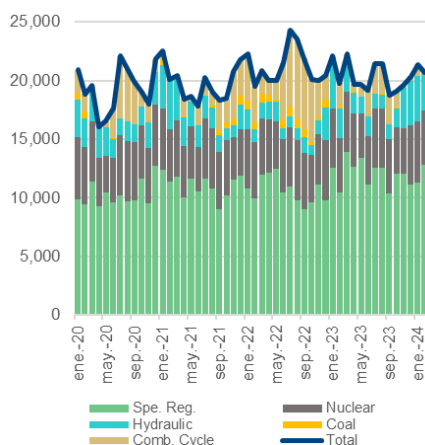


Figure 7. **SPAIN. MARGINAL CLOSING TECHNOLOGIES. ELECTRICITY MARKET. PERCENTAGE IN HOURS (*)**

	2023		
	TCC	HI	RE
January	7.7%	44.6%	45.7%
February	24.6%	50.4%	17.0%
March	9.4%	38.0%	50.8%
	2024		
	TCC	HI	RE
January	10.9%	56.6%	31.6%
February	3.7%	53.6%	46.1%
March	7.2%	53.7%	55.9%

(*) There is double accounting in some hours because OMIE reports more than one closing technology at some hours. Therefore, the percentages can be higher than 100%, but they give us an estimated picture of how they have evolved. TCC (Combined cycles), HI (Hydraulic) and RE (Renewables). Spe. The renewable energy technologies under Spain's special regime (Spe. Reg.) include photovoltaic solar, thermoelectric, wind, and geothermal energy. Source: BBVA Research with OMIE data.

In summary, wholesale electricity prices in Europe have decreased due to a combination of factors, most notably the drop in gas prices and the moderation of demand. While it's true that renewable energy sources continue to grow, with their impact becoming increasingly significant, much of the price reduction is attributable to a lower marginal price explained by cheaper gas and increased output from hydroelectric and nuclear plants.

In the coming years, with gas prices stabilizing in Europe as gas futures point out (Figure 1), we expect wholesale electricity prices to remain close to 2024 prices, with gradual improvements due to renewables and temporary spikes due to geopolitical tensions. However, this decline in wholesale prices may not necessarily translate to a comparable decrease in retail electricity prices, where other factors come into play. Specifically, in Spain, certain policies implemented by the Government in 2022, aimed at reducing electricity costs for consumers, are scheduled to be revoked in 2024³. This reversal is expected to significantly influence retail electricity prices. This and other aspects will be analyzed in an upcoming weekly update.

3: For example: VAT electricity changed from 5% to 10% in January 2024, and to 21% in March; IEE (Special Electricity Tax) will increase progressively during 2024, from 0.5% to 3.8%; and IVPEE (Electric Production Tax) increases from 0% to 3.5% in the first quarter, to 5.25% in the second and to 7% in the last quarter of 2024.

Highlights of the Week

- **Global | Climate graphic of the week: Oceans set heat records for more than 365 days in a row.** Scientists alarmed about consistent off-the-charts increase in sea temperatures since March 2023.
- **Global | The oil industry. The long goodbye.** For 50 years the story of oil has been one of matching supply with increasing demand. The next 50 years will be different.
- **USA | US gives carmakers more time to meet aggressive emissions targets.** By 2032, automakers must reduce the GHG from light-duty vehicles by almost 50% and medium-duty vehicles by 44% compared with 2026. The administration is giving carmakers an extra three years to meet the targets than initially suggested.
- **USA | A New Surge in Power Use Is Threatening U.S. Climate Goals.** A boom in data centers and factories is straining electric grids and propping up fossil fuels.
- **China | China's recalibration of energy efficiency target could increase emissions, put climate goal at risk, analysts say.** China has set a target of reducing 'energy intensity' by 2.5 per cent this year to reach its 2025 goal of cutting it by 13.5 per cent. The 2.5 per cent energy intensity reduction aim could allow emissions to increase by up to 2.4 per cent this year, if the GDP growth is on target, climate expert says.

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