



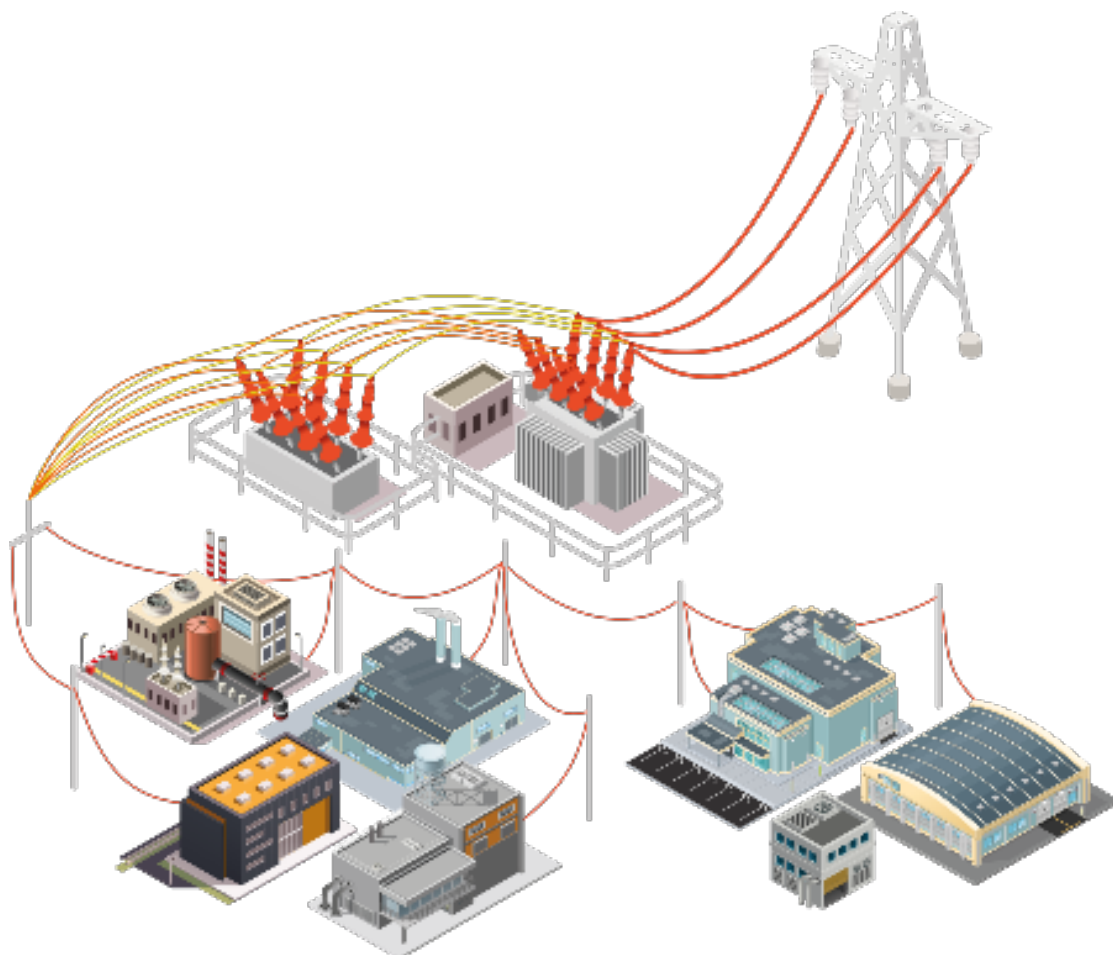
Energy market report

April 2024



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Energy market report



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The analysis

The electricity for April, at €13.67/MWh, marks its lowest price since records began



Juan Antonio Martínez & Leo Gago
Grupo ASE Analysts

- » An extraordinary increase of 168% in hydroelectric generation sinks the price of electricity on the peninsula.
- » Nearly half of the hours in April in Spain recorded “zero” prices due to an excess of renewable supply, despite the nuclear park operating at 69%.
- » Gas and electricity markets relaxed in the last fortnight of April, but uncertainty remains.
- » Analysis: the recovery of daily market prices (POOL) will come in May.

The daily price of April in the Spanish wholesale electricity market (POOL) has closed at €13.67/MWh, breaking the April 2020 price record (€17.65/MWh), back then during full lockdown. It’s down by 32.67% compared to March and is 81.5% cheaper than a year ago (€73.73/MWh).

Electricity daily market price (OMIE)

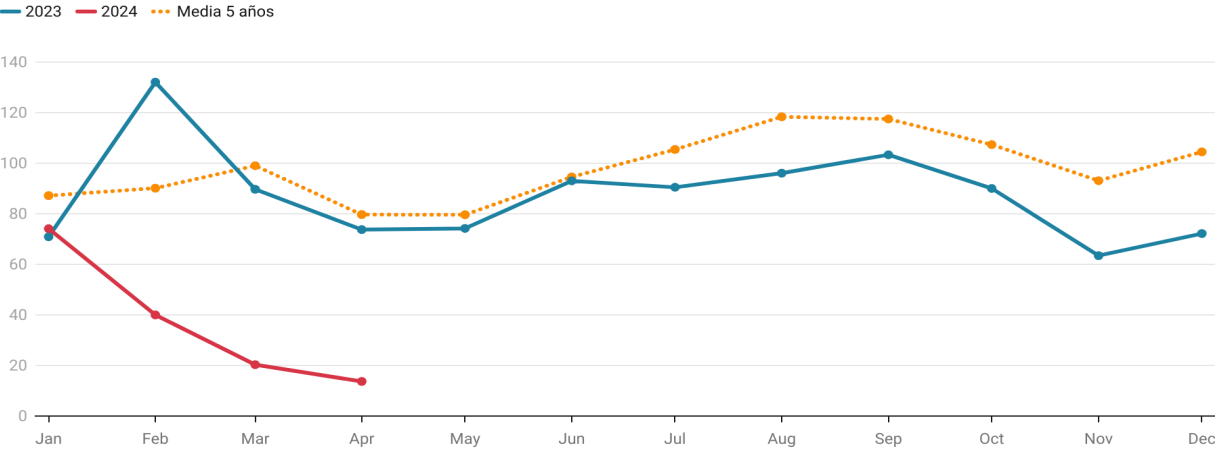


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The Spanish price increases its differential compared to Europe

The major European economies have also seen a decrease in their electricity prices in April, as a result of their hydro and wind production being above average and facing weak electrical demand. The average prices of the main electricity markets in Europe closed at an average of €57.96/MWh. After Spain, France recorded the lowest price (€28.23/MWh) and Italy the highest (€86.90/MWh).

From January to April 2024, the average price in Europe stands at €71.37/MWh, 92.8% higher than in Spain (€37.02/MWh).

Electricity daily market price in April 2024 for major European economies (€/MWh)

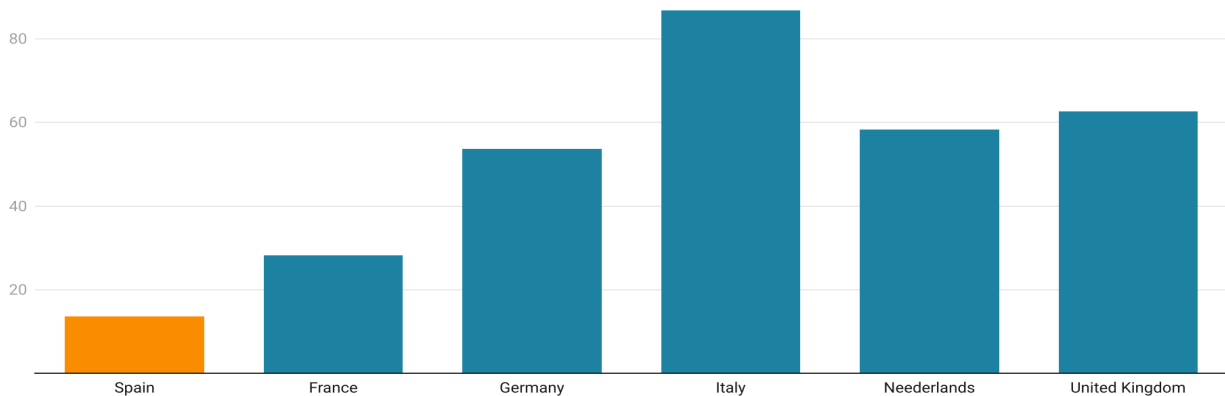


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An extraordinary increase of 168% in hydroelectric generation plunges the price of electricity

As we have been explaining in our recent reports, the determining factor behind the plummeting prices that occurred during March and April has been the extraordinary increase in hydroelectric generation.

This spring, Spain has experienced a significant increase in the amount of energy stored in its hydroelectric reservoirs. It peaked in mid-April at 15,367 hm³, representing 87% of its total maximum capacity. This put pressure on reservoirs in the northern basins, nearing their safety levels, to release water.

Currently, the energy available in the reservoirs stands at 10 TW. This figure is 30% higher than a year ago and 17.5% higher than the five-year average. Therefore, it is expected to result in a reduced need for generation from gas combined cycle plants heading into the summer.

Stored hydraulic energy (hm³) in reservoirs

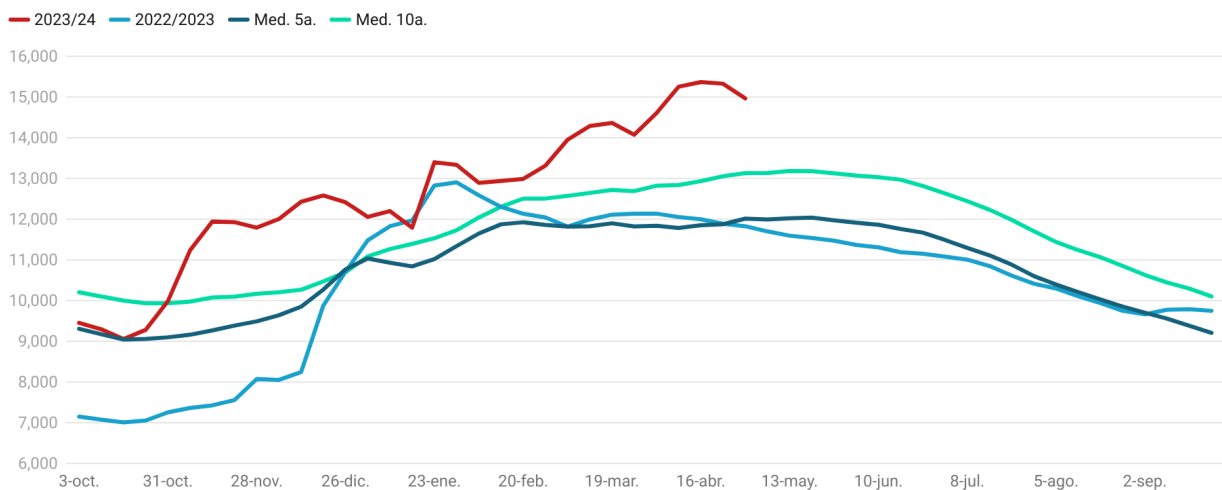


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Hydroelectric production in April was 168% higher than last year and 32% higher than the five-year average. The need to release large amounts of water has forced hydroelectric power plants to offer in the daily auction (POOL) at zero and negative prices in order to match energy and compete against the prices of wind, solar, and nuclear power.

This is an extraordinary situation because it is normal for hydroelectric generation to offer at very high prices, close to those of combined cycles, given its ability to regulate its production (reservoirs), which allows it to profit from its production during peak price hours.

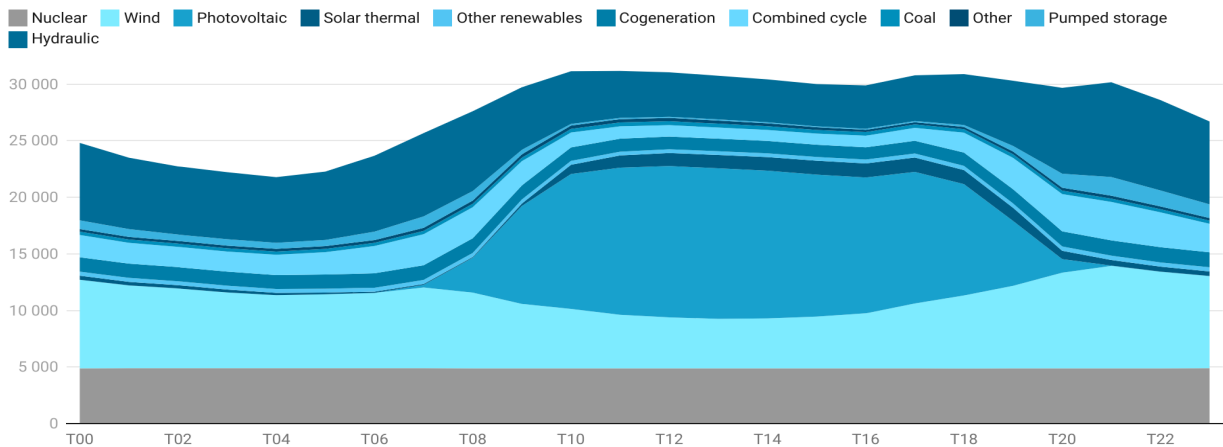
Why do some plants offer at negative prices?

Generation plants that have fixed short- or long-term prices (PPAs) are required to match prices in the daily market (POOL) in order to receive payment for the energy they have contracted through bilateral agreements. The same applies to renewable plants that are under a subsidy regime, although they have a limit on their offers at \$0/MWh. That is, they cannot offer at negative prices.

To better understand, let's look at an example. Many photovoltaic plants have PPAs with marketers or industrial consumers, through "pay as produced" profile contracts, in which the payment for energy is linked to the injection of the plant's production into the electrical system (because producer and consumer are not physically connected). If the plant does not want to be "left out" of the matching process, it will have to offer very low prices to enter the system and thus produce during the day and receive payment. Since hydroelectric production with zero offers surged in April, many solar and wind plants (unsubsidized) that wanted to receive payment for their bilateral contracts were forced to offer at negative prices to avoid being left out of the matching process.

Negative prices have mainly occurred during sunny hours, when photovoltaic generation contributes up to 40% of the mix, resulting in a huge amount of supply and strong competition among plants to avoid being left out.

Hourly mix



In April, the daily market (POOL) recorded 107 hours with negative prices (between -0.1 and -1.5 €/MWh), practically 15% of the hours. There were also "zero" prices for 156 hours, accounting for 21.7% of the total. During hours with negative prices, hydroelectric power was present in 77% of the hours, non-regulable renewables (wind and solar) in 99.1%, and nuclear power in 4.7%. During hours with "zero" prices, hydroelectric power matched in 98.7%, non-regulable renewables in 100%, and nuclear power in 96.8%. These are extraordinary figures we had never seen before.

The nuclear park operated at 69% of its capacity

The nuclear park operated at only 69% of its capacity during this month, due to scheduled shutdowns and its limited ability to reduce production in the face of renewable oversupply. Currently, Almaraz II has been shut down for refueling since March 30 and will not be back online until May 6. Meanwhile, Vandellós was disconnected on April 27 (1 GW) for refueling and will not return to the system until June 3.

Nuclear production (MWh)

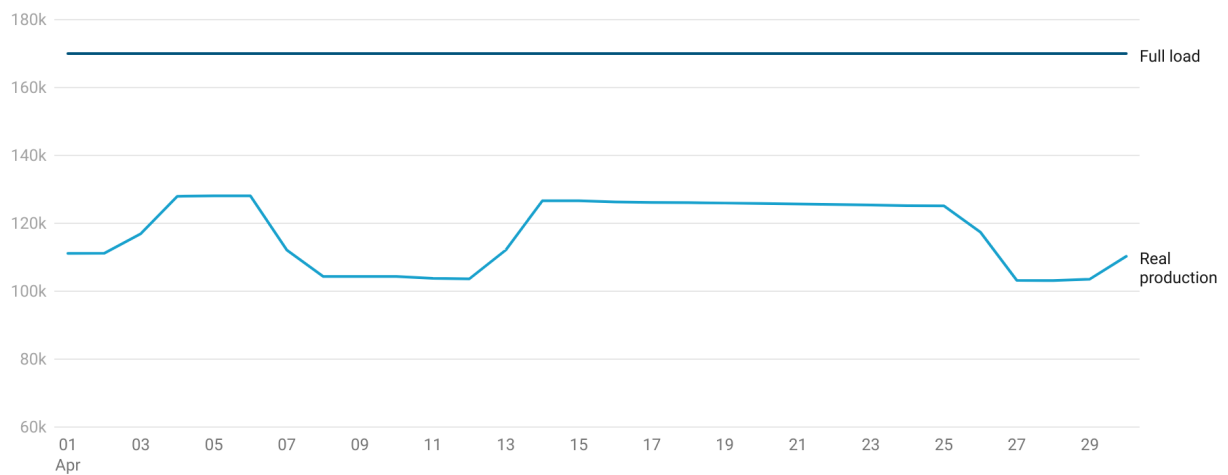
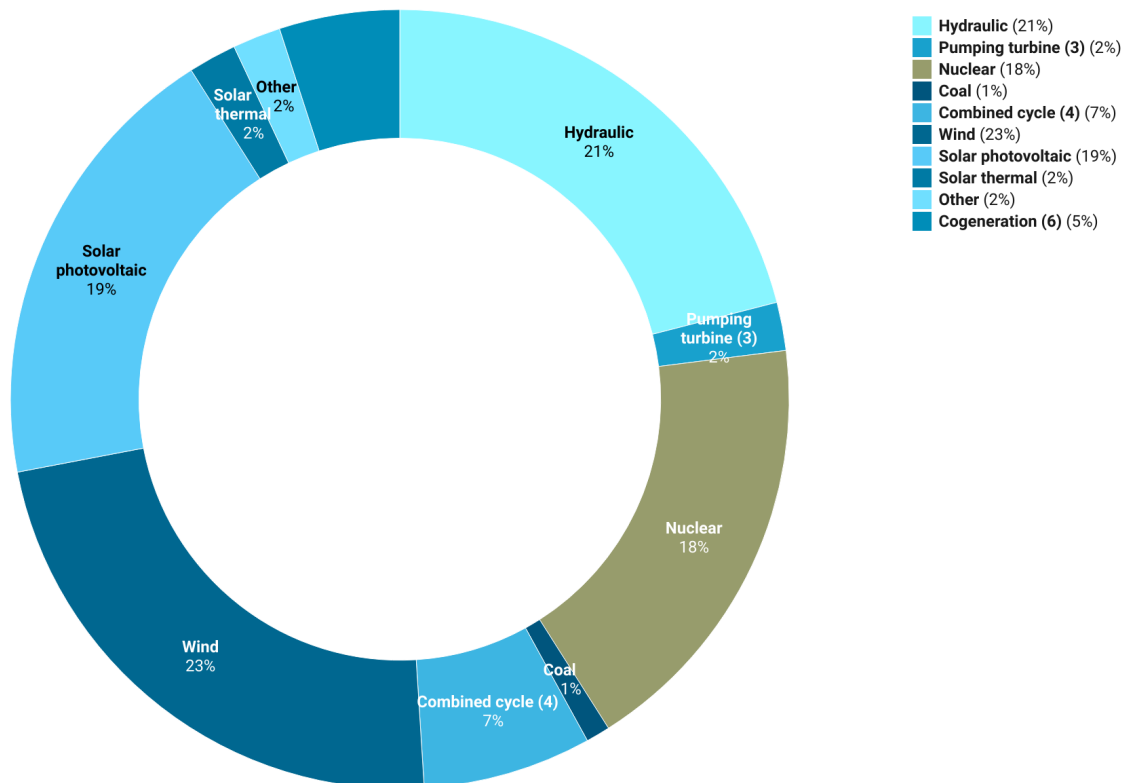


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Renewables covered 67.3% of the mix

In April, generation in Spain decreased by 3%, despite a 7% increase in demand, due to a 48.5% decrease in exports.

This month, renewable generation covered 67.3% of the mix, very close to its record of 67.7% (established last month). The extraordinary increase in hydroelectric generation (+168.5% compared to last year) has been what, like in March, has boosted the presence of renewables in the mix.



Photovoltaic production increased by 4.5%, while wind production decreased by 5.2%. Gas combined cycle plants have been sidelined by renewables and have reduced their production by 42.5% compared to last year, reducing their contribution to the mix to only 6.9%.

Electric demand rises by 7% in April

Electric demand has experienced a significant growth of 7%. The effect of Easter, which last year fell in April, has had a strong impact on this increase.

It is worth noting that the actual demand data from REE show a higher increase during peak hours of the system, of over 10%. Conversely, during solar radiation hours, the rise was more moderate, at 4%. This is due to the effect of industrial and domestic photovoltaic self-consumption.

Hourly demand variation - April 2024/23

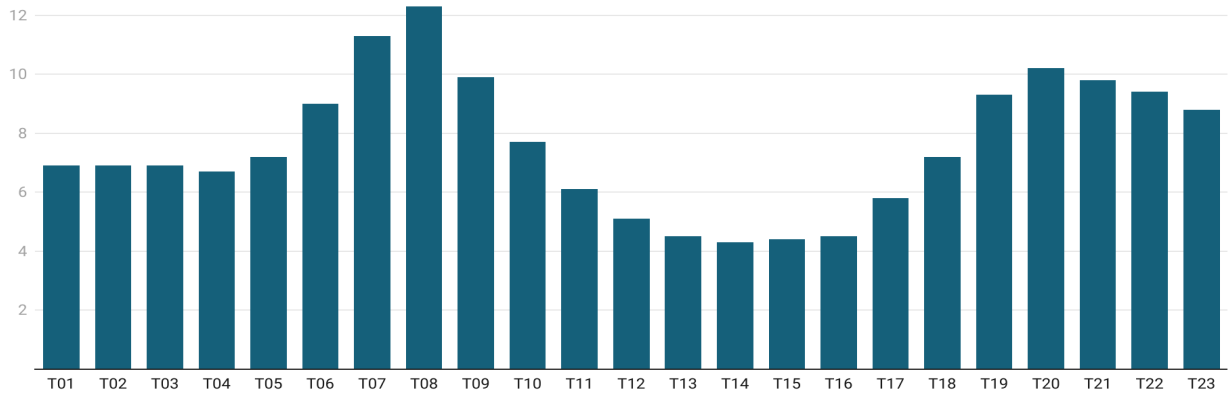


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The reduction of geopolitical tensions and weak demand halt the escalation of gas prices in the second half of April

A certain relaxation of geopolitical tensions, expectations of warmer weather, and weak demand weighed on gas prices in Europe during the last week of April. However, breakdowns detected in the North American liquefied natural gas (LNG) facility of Freeport and another LNG facility in Hammerfest (Norway), along with the fact that maintenance of the Norwegian pipeline has exceeded the planned duration, provided some support to gas prices and prevented a larger decline.

SPOT MIBGAS & TTF €/MWh

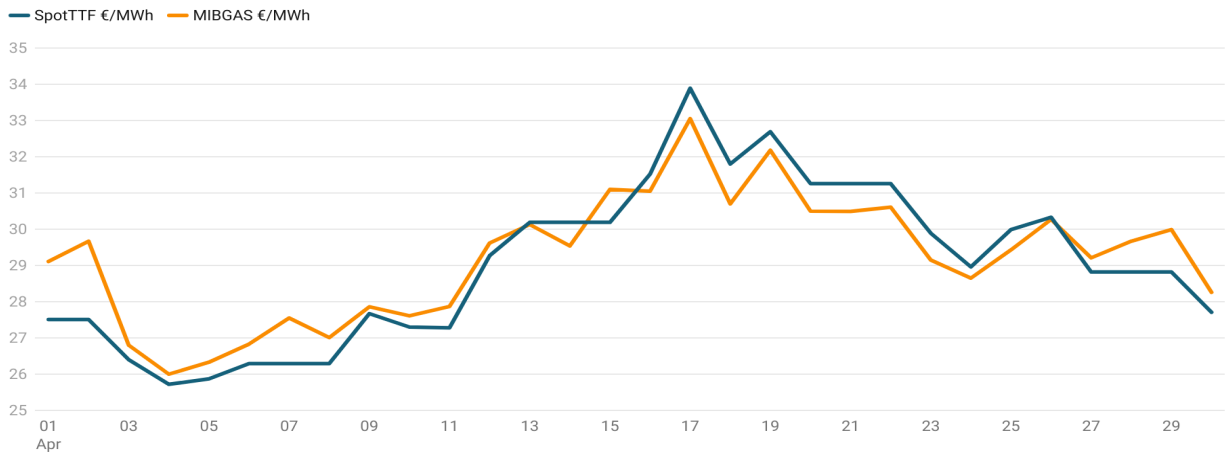


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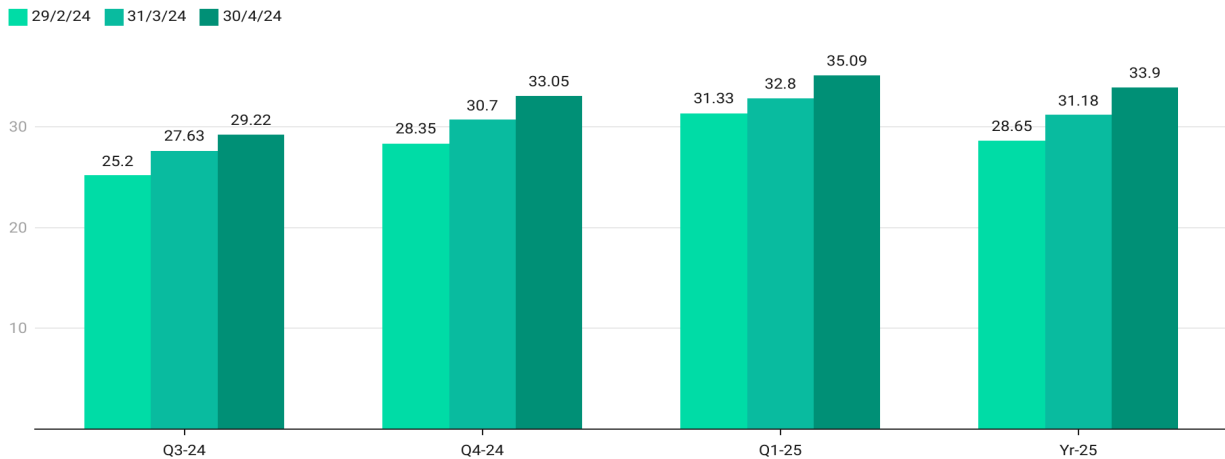
In any case, in April, the Dutch daily gas market (TTF), which is a reference in Europe, closed with an average price of €29.03/MWh, up by 8.6% compared to last month because in the first half of April it had been boosted by the escalation of geopolitical tensions and the increase in LNG prices in Asia.

The Spanish MIBGAS market averaged €29.21/MWh in April and also showed an increase, following the trend of other European markets.

Gas futures prices continue their upward trend

Despite bearish fundamentals, based on forecasts of warmer temperatures, steady imports, and high gas stocks, which are at 62.32% of their capacity (3 points higher than a year ago), gas futures markets showed increases during April.

TTF futures curve (€/MWh)

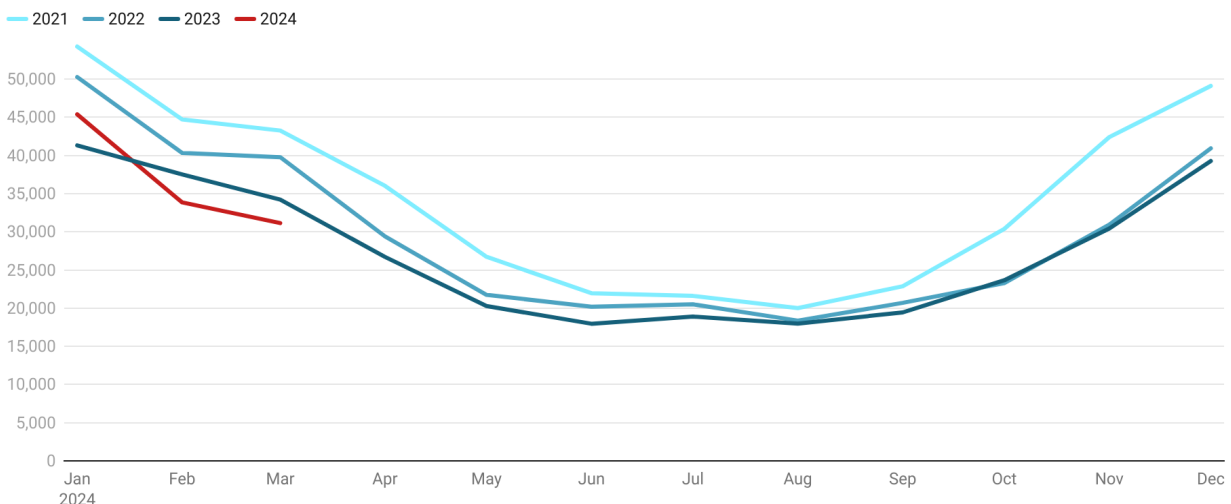


These markets have been experiencing a rebound since late February. The Cal-25 price currently trades at €33.80/MWh, after an increase of 8.72% in April.

Gas demand in Europe closes the first quarter with a 2.4% decrease compared to 2023

During March, gas demand across the EU and Great Britain was 22% below its 2017-2021 average and was 9% lower than last year. High gas prices and mild weather conditions continue to restrain the increase in consumption.

EU-27 gas demand (million cubic metres)



Regarding the first quarter of 2024, it closes with a slight decrease of 2.4% compared to the previous year, but a significant 22.4% decrease when compared to the 2017-2021 average. When analyzing gas consumption in the three main sectors, the reduction is very similar:

- 1. Industrial demand** was 22% below its 2017-2021 average. However, in recent months, it has shown some recovery, with a 3% increase compared to the previous year. The speed at which industrial gas demand can recover, if gas prices continue to trend downwards, remains uncertain due to very weak macroeconomic expectations.
- 2. Residential and commercial demand** was 23% below the 2017-2021 average. Europe has experienced a second consecutive relatively mild winter. This, combined with public awareness campaigns and high prices, has led to a greater-than-expected reduction in demand in European households.
- 3. Demand for power generation** was 20% below the 2017-2021 average, due to high renewable production and an improvement in nuclear power in France.

Looking ahead, the recovery of gas demand remains a key issue for the markets. Despite the downward trend that began in late 2023, prices remain very high compared to historical ranges and act as a natural brake on demand recovery, also supported by mild weather.

Gas imports into Europe decreased by 13% in April due to a 29.5% drop in LNG arrivals

European imports have decreased by 13% in April compared to last year and by 9.8% in relation to the first four months. Compared to 2022, this reduction reaches 20%. However, despite this decline, the market has remained well supplied due to the decrease in demand and the high level of reserves.

Norway has become the largest pipeline supply source, accounting for 40% of total European imports and an increase of 2% compared to last year. LNG imports currently account for 38% and Russian gas imports for 10.6%.

Europe gas imports

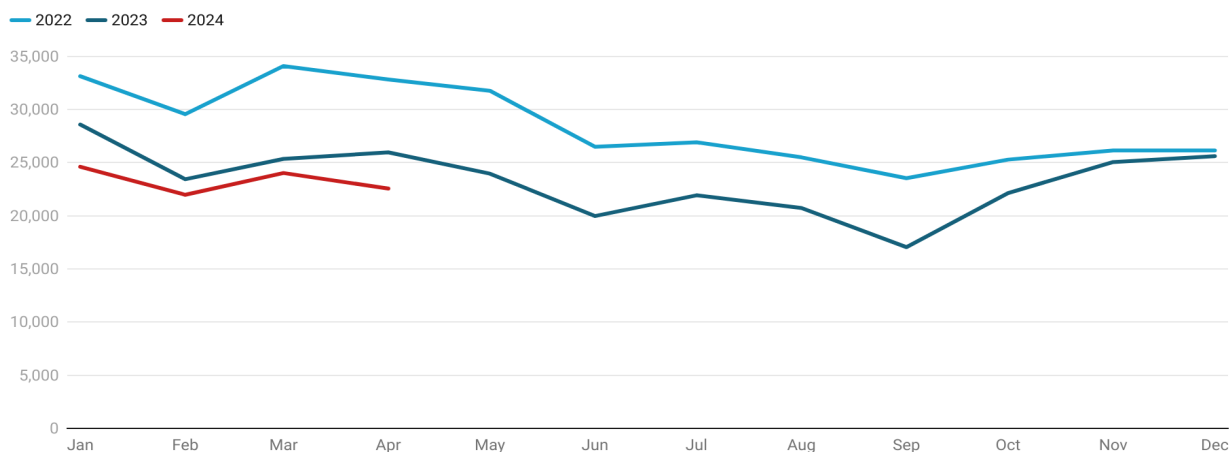
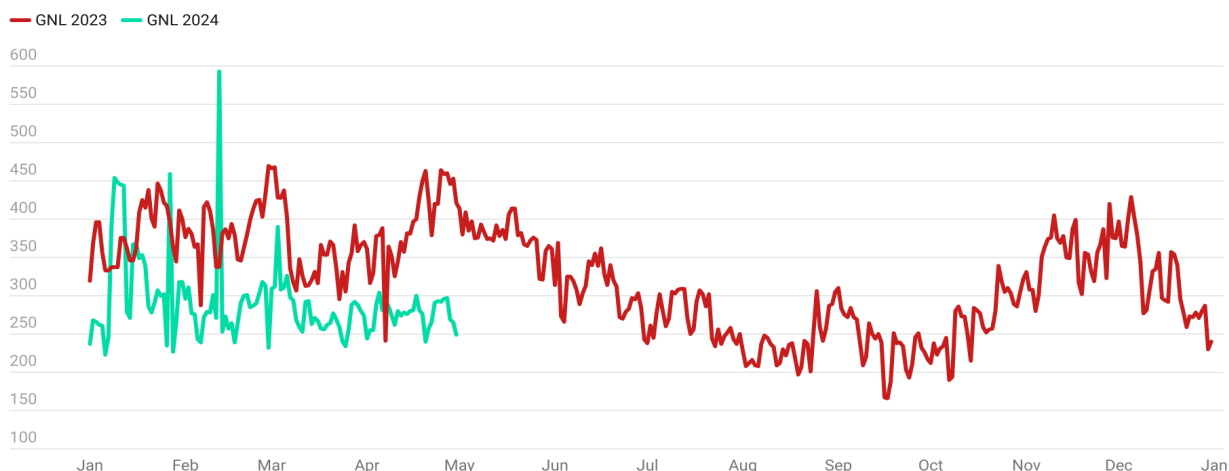


Chart: Europe ASE | Created with Datawrapper

After the experience of 2023 without Russian gas, buyers seem to have understood that Europe doesn't really need as much LNG. This is being noticed in fewer shipments arriving. They have decreased by 29.5% in April and so far in 2024, they have seen a decline of 24.4%.

Part of this decrease in LNG imports, despite the decrease in its price, is also due to a forecast of lower demand heading into the summer. Since this year the maintenance program from May to June of the Norwegian pipeline will be less intense compared to last year, it will allow for an early accumulation of reserves in Europe during the summer.

Europe LNG imports (mcm)



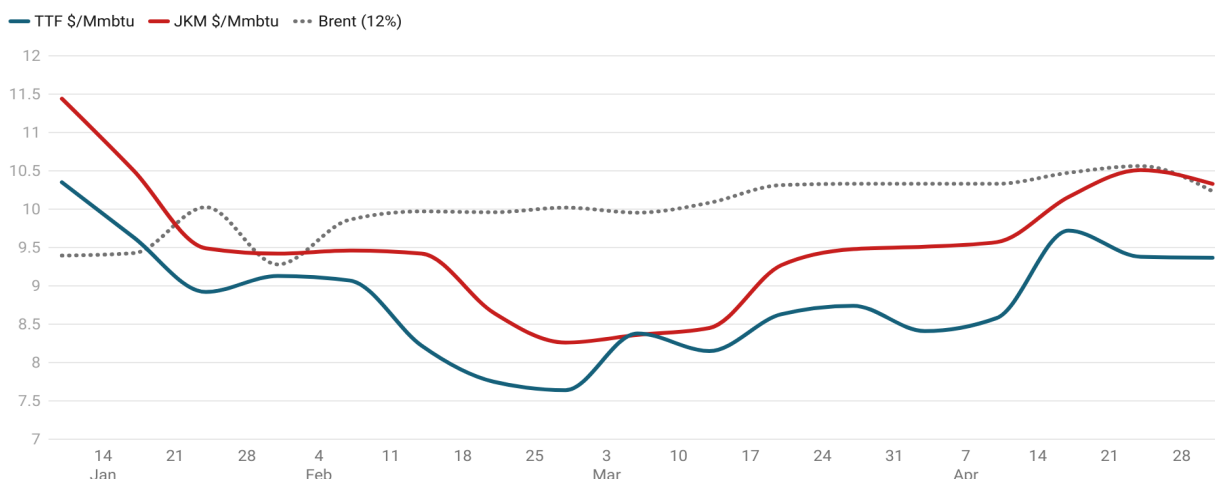
The price of LNG in Asia remains high and keeps shipments away from Europe

Spot LNG in East Asia has remained above \$10/MMbtu for the past three weeks and maintains a premium of over \$1/MMbtu compared to the TTF to attract shipments and keep them away from Europe.

Asian gas spot prices have remained strong due to expectations of a tighter market in the coming months due to the conflict in the Middle East and its impact on oil prices. Also, due to the failures at the Freeport LNG plant (United States) and scheduled shutdowns in Norway.

However, prices have softened in the last week, possibly because many Asian buyers are returning to oil-indexed contracts when spot LNG prices rise above \$10/MMbtu, as is happening now.

GNL Price (\$/MMbtu)



The declines in feed gas for liquefied natural gas (LNG) in the United States could indicate less production and exports

Although deliveries of natural gas to LNG export plants in the United States increased by 4.9% compared to the previous week (reaching an average of 11.5 Bcf/d), they remain 11.4% below their 12-month average (13 Bcf/d), which may anticipate a drop in exports.

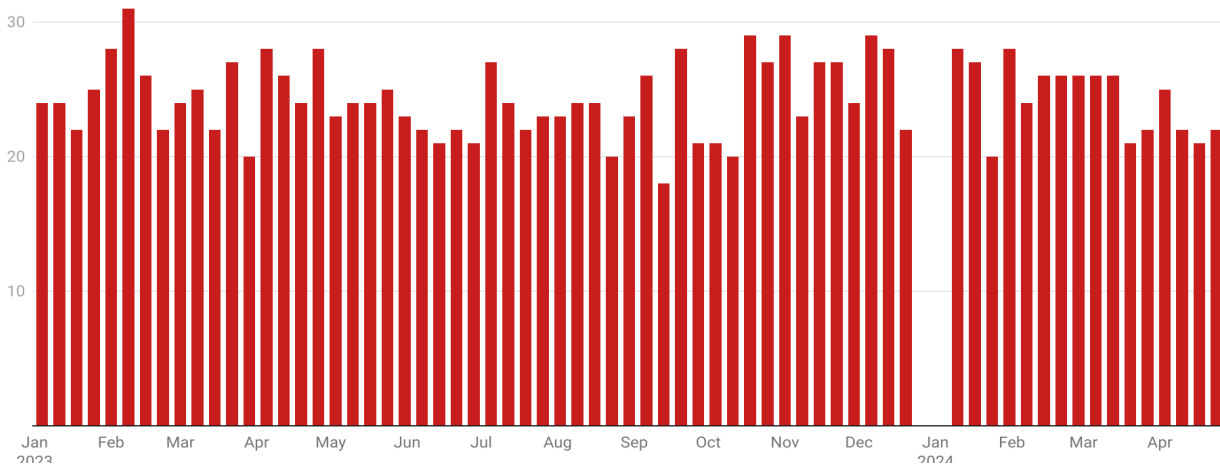
In recent weeks, LNG vessel departures from the United States have slowed to an average of 22 shipments, two fewer than their 12-month average.

Dry gas input at US LNG terminals for export (Bcf/d)



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LNG vessels departing from the US



The decline in LNG exports from the United States is related to some unexpected shutdowns at its liquefaction plants. On March 20, Freeport LNG confirmed that it had shut down Train 2 liquefaction unit and announced the imminent withdrawal of Train 1 for inspection. The company plans for both units to resume operation during May.

Electricity futures prices in Spain have slightly rebounded but maintain a high discount premium compared to the rest of Europe

Prices for electricity products in the Spanish futures market (OMIP) have maintained a slight upward trend. As in the rest of the European markets, prices in Spain have been driven by increases in gas and CO2 emissions during April. The Q3-24 rises by 5.5% to €69.70/MWh and the Yr-25 advances by 8.2% to €62/MWh. Despite this, prices in Spain have increased the discount premium over the German reference market to €15/MWh for the remainder of 2024. For the Yr-25, this premium rises to €27/MWh.

Electricity futures curve (€/MWh)

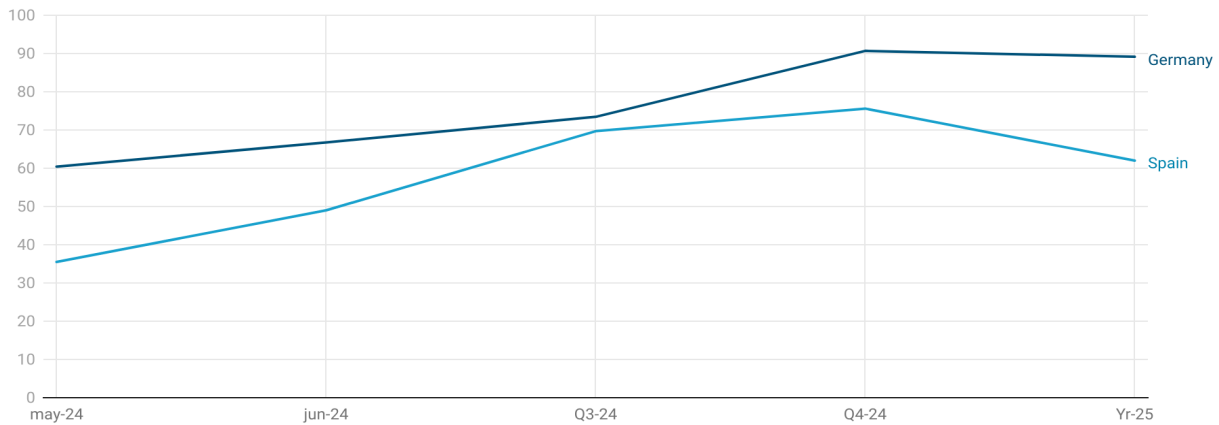


Chart: Grupo ASE - Created with Datawrapper

North American LNG exports have decreased in the second half of March, with the departure of 22 cargoes weekly. Gas deliveries to export terminals have also decreased to 12.9 Bcf/d.

Grupo ASE analysis

Market daily price recovery is expected in May

The forecast that hydroelectric and wind production will moderate anticipates a strong price surge in electricity in Spain for the month of May compared to previous months:

- Hydroelectric production will decrease considerably in May, with a projected daily production of 75 GWh, compared to 159 GWh in March and 137 GWh in April.
- The forecast for wind generation for the upcoming week also points downwards, with a daily production of 140 GWh, compared to the averages of April (152 GWh) and March (195 GWh).
- As for photovoltaic expectations, there is a slight increase to 155 GWh/day in May, compared to 145 GWh/day in April.

Average daily hydraulic generation (GWh/d)

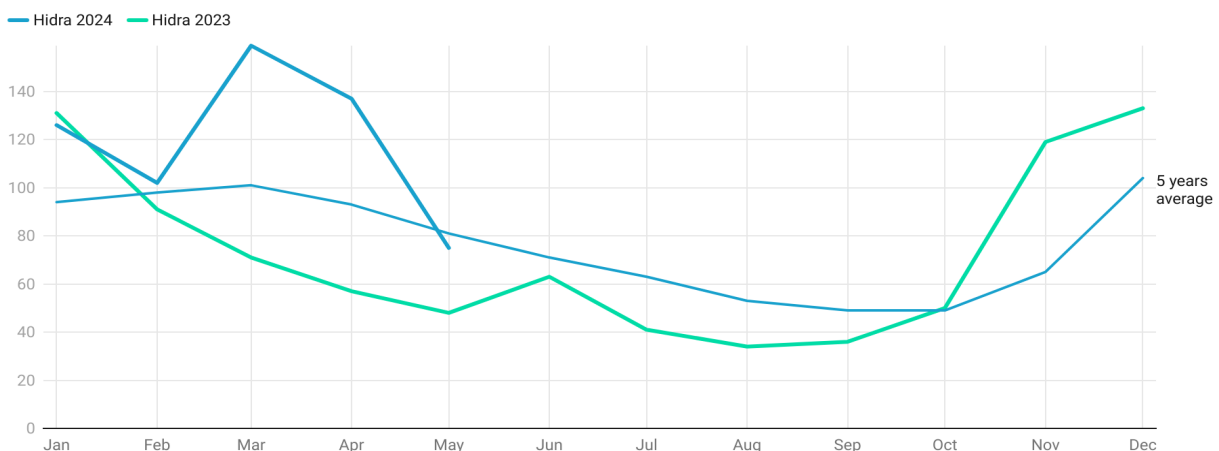


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Regarding nuclear power plants, Almaraz II will be back online on May 6, and we will transition to a stable production of 140 GWh/day, higher than the average of 117 GWh/day in April.

On the other hand, the demand forecast for May is 590 GWh, 11 GWh/day more than in April.

In summary, the significant reduction in hydroelectric generation in May will cause hydroelectric plants to stop offering at zero and negative prices, as has been the case in March and April. Additionally, it will allow gas combined cycle plants to return to the power system and once again set prices during peak hours at values of 70-90 €/MWh.

Prices during radiation hours will remain depressed, although we expect them to move away from "zero" prices as a general rule on weekdays. Our forecast is that prices may fluctuate between €40-60/MWh on average in May, depending on weather conditions.

Regarding the evolution of futures markets, they are torn between bearish fundamentals (low energy demand, high expectations of renewable generation, high gas reserves, and comfortable gas supply) and the bullish threat posed by commodity market volatility, geopolitical tensions, and the evolution of the CO2 emissions market.



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We are the electricity sector company that champions the economic interests and rights of industrial consumers. We declare our independence, in basing our efforts on knowledge and technology.



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