

## The Iberian electricity market and the price rally in Spain

The energy crisis in Europe has led to a sharp rally in prices, which has been particularly pronounced in Spain. Indeed, in Q4 2021 the wholesale price of electricity in the Iberian market was over three times higher than in Q4 2018, a year in which the peak electricity prices for the period 2010-2020 were recorded (see first chart). In this article, we analyse the consequences of the current energy crisis for electricity prices and shed some light on how it will effect electricity bills in Spain. To do this, we need to understand the structure of the wholesale and retail electricity markets.

### The wholesale electricity market

Wholesale electricity markets connect the supply from electricity generating companies with the demand from distribution companies. Thus, their price reflects the costs of production and provides an important indication of the conditions of the electricity market.<sup>1</sup> Given the relative inelasticity of electricity demand, today's high prices mainly reflect strong supply-side pressure, which has led to historic spikes in energy prices in the international markets.<sup>2</sup>

In the EU, the wholesale markets operate on an auction basis using a marginal price structure. That is, in each hourly tranche, the price of the last unit of electricity that is purchased to cover the demand determines the market equilibrium price at which all generating companies are paid. This market structure means that, in order to meet demand in the wholesale market, lower-cost technologies are the first in. Nuclear power plants essentially have a constant supply at a very low marginal cost, while wind and photovoltaic energies (also with very low costs) have a variable supply throughout the day. The last tranches of demand are often met by more expensive technologies, such as combined cycle power plants, which use gas as their main source of energy, or hydraulic energy, which offers flexibility in its degree of usage thanks to its storage capacity through reservoirs (see second chart).

By remunerating all energies at the highest price, those with lower variable costs can benefit from high prices, which acts as an incentive for investment in renewable energies. In particular, combined cycle power plants are generally the technology used in the Iberian market to meet the marginal demand, as it is an energy source with higher variable costs and greater flexibility in its supply. This «marginal dependence» means that the wholesale price of electricity is mainly determined by the two key factors in the cost of combined-cycle energy production: natural gas and the price of EU CO<sub>2</sub> emissions allowances. Since the beginning of the year, the price of gas has increased almost tenfold in the European markets, while the price of emissions allowances has tripled to €80/tonne of CO<sub>2</sub> at the end of 2021. Thus, the rally in the wholesale price can be largely explained by the surge in prices in these two markets.

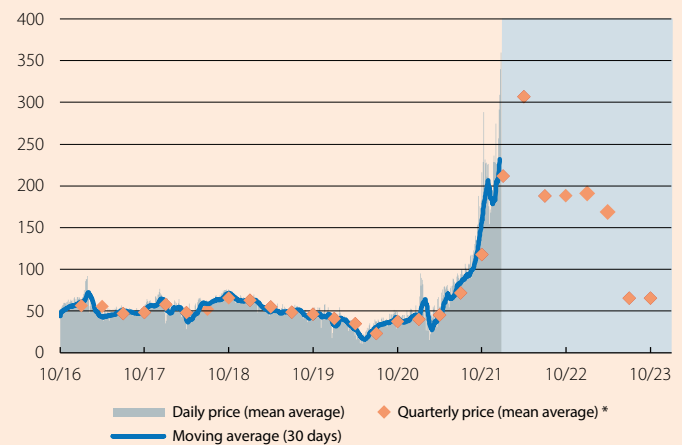
But if the structure of the wholesale market and the prices of the key production inputs are common, why then have the price increases for the end consumer been different between EU countries, and so pronounced in the case of Spain? On the one hand, the energy mix is different from country to country: Germany is relatively more dependent on coal (24%, compared to 2% in Spain); in France, nuclear power covers a higher percentage of electricity production (67%, compared to 22% in Spain), and in Italy gas is the dominant source for electricity production (46%, compared to 26% in Spain). In Spain and Portugal, meanwhile, renewable energies play a much more important role in the energy mix (43% and 59%, respectively), although the marginal source of energy generally comes from combined cycle plants. This is not the case in other European economies, as different energy mixes result in different dominant marginal energy sources.

1. This is not the only transaction channel between electricity distribution and generation companies. On the one hand, some large companies are both generators and distributors of electricity. On the other hand, electricity distributors (or even companies with high electricity needs) can enter into bilateral, generally long-term contracts with generators, known as Power Purchase Agreements (PPAs).

2. See the article «[The energy crisis in Europe](#)» in this same Dossier.

### Electricity prices in the Iberian Electricity Market (MIBEL)

(€/MWh)



**Note:** \* The quarterly price forecasts from Q1 2022 onwards are drawn from the prices quoted for quarterly electricity futures contracts for the Iberian market as of 16 December 2021.

**Source:** CaixaBank Research, based on data from the Iberian Energy Market Operator (comprising Polo Español, or OMIE, and Pólo Português, or OMIP).

On the other hand, the transmission of wholesale prices to end consumers depends on the structure of the retail market.

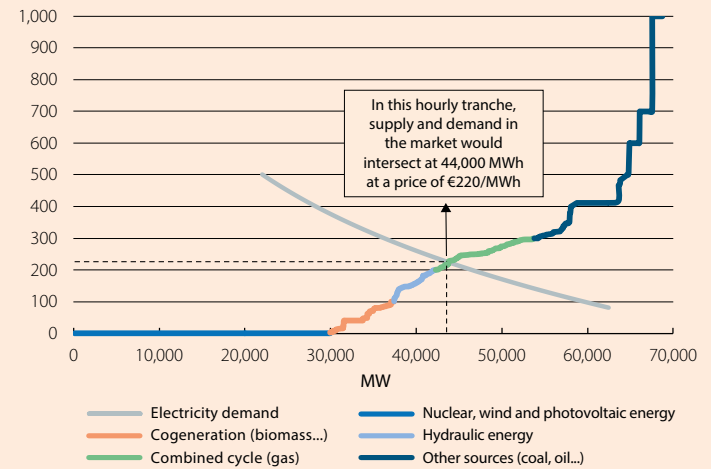
**The retail electricity market in Spain and Portugal**

Although Spain and Portugal share the same wholesale market, electricity prices according to HICP data published by Eurostat for Spanish consumers were 46.7% higher in November 2021 compared to the same period in 2020, while in Portugal they rose by only 2.6%.<sup>3</sup> This discrepancy can be explained by differences in the structure of the retail market in the two countries.

Firstly, the distribution of consumers between the regulated market (in which the price formation is different in each country) and the free market (where prices tend to be very stable for the consumer) is very different: in Portugal, over 80% of households are on free-market tariffs, while in Spain this is the case for only 60% of customers and the other 40% are on regulated-market tariffs.

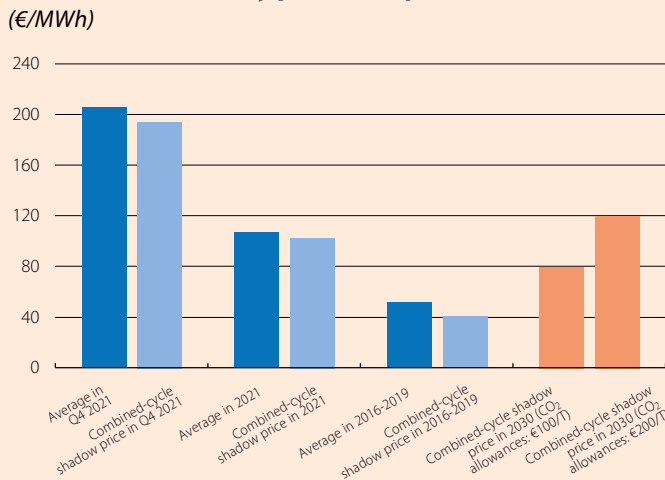
Secondly, the regulated market functions differently in Spain and Portugal. In Portugal, the regulated price is defined each

**Electricity supply and demand curves in the wholesale market (€/MWh)**



**Note:** The example given in this chart is based on real electricity supply and demand curves in the Iberian wholesale market (OMIE), but it is for illustrative purposes only. **Source:** CaixaBank Research.

**Wholesale electricity prices in Spain (€/MWh)**



**Note:** The combined-cycle shadow price is estimated based on an approximation of the variable cost (VC) of generating electricity from this energy source (VC = 1.85 x natural gas price + 0.4 x emissions allowances price). The shadow price range in 2030 assumes that the price of natural gas will return to its historical average, in line with prices in the TTF futures market. **Source:** CaixaBank Research, based on data from OMIE and Bloomberg.

albeit at a more moderate rate. All this leads us to believe that the wholesale price will remain above €200/MWh in the coming months, but after the winter it should begin to fall back down, reaching around €100/MWh in the medium term (see third chart). Nevertheless, uncertainty remains very high. It is very difficult to predict how the geopolitical conflict between Europe and Russia will develop, and we have seen that this has a direct impact on the cost of energy.

*Luís Pinheiro de Matos and Ricard Murillo Gili*

year by the market regulator (although there can be quarterly revisions, if wholesale prices deviate from the regulator’s forecasts). In Spain, however, the regulated price, which is known as the voluntary price for small consumers (or PVPC in Spanish), fluctuates daily depending on the wholesale price. As a result, the transmission of wholesale-market prices to end consumers, and consequently to inflation, is much more instant in Spain than in other countries such as Portugal. In this context, one of the proposed reforms of the electricity market in Spain to limit this dependence involves reducing the frequency with which the PVPC price is adjusted, as well as tethering it to a wider range of indicators.<sup>4</sup>

**How much will it cost to switch on the lights this year?**

As mentioned earlier, for 2022 the supply-side pressures are expected to ease over the course of the year, primarily due to the normalisation of gas prices, as indicated by the future prices quoted in the financial markets. On the other hand, the shock observed in the emissions allowances market is likely to persist, and given the EU’s increased climate ambitions for the coming years, the price of these allowances is likely to continue to rise,

3. For comparative purposes, over the same period electricity prices in France rose by 3.3%, while in Germany they rose by 3.1% and in Italy, by 33.2%. In the article «[Electricity prices are sky high, but what about household bills?](#)» in this same Dossier we use internal CaixaBank data to analyse the change in the payment of electric bills for customers residing in Spain.  
 4. Another important factor is differences in taxation between countries. For example, a significant portion of the electricity bill in Spain is made up of so-called «tolls» and «charges», as well as taxes. In recent months, the government has sought to reduce the relative weight of these components in the electricity bill.