



### **Executive Summary**



<sup>a</sup>Generation refers to the net power generation of the power plants, considering the production by pumping recently disclosed by REN. Pumping production is not accounted for in the percentage of production from renewable sources. Source: REN; Analysis APREN.

\* Includes fuel oil, diesel, the non-biodegradable fraction of urban solid waste and other waste.



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\* Includes fuel oil, diesel, the non-biodegradable fraction of urban solid waste and other waste.
Source: REN, Analysis APREN



### Monthly analysis in Portugal: February



Between February 1 and 28, 2023, renewable incorporation was 64.9 %, with a total of 4,348 GWh produced. The increase of 14.1 % compared to February 2022 is mainly due to the increase in hydro and wind production, which contributed 1,181 GWh and 1,176 GWh to production in February compared to 212 GWh and 892 GWh, respectively, in the same period last year.



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#### Indicators of the electricity sector (in comparison to February 2022)



## Monthly analysis in Portugal: February

Load diagram for the month of February 2023



Source: REN, Analysis APREN



### Renewable Electricity Europe

In this analysis, only the main countries of the different European markets were considered in order to obtain a representative picture of comparison.

Between January 1 and February 28, 2023, Portugal was the third country with the highest renewable incorporation in electricity generation, behind Norway and Denmark, which obtained 99.0% and 78.8% from RES, respectively. From 1 to 28 February, Portugal moved to fourth place in the countries considered, with the largest renewable incorporation in Europe.



Renewable incorporation in the accumulated generation of electricity (Jan-Feb) and monthly (Feb). Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN

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Accumulated February





### Market price setting Portugal

Between January 1 and February 28, hydro was the market price setting technology that recorded the most hours, with 611 non-consecutive hours, followed by renewables, cogeneration and waste with 362 hours, and thermal generation combined cycle with 196 hours.

### **Accumulated January-February**



Number of market price setting hours of the three main market setting technologies (Jan-2023 to Feb-2023). Source: OMIE, Analysis APREN

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Percentage distribution of the number of market price setting hours of the various technologies, in a total of 672 hours (Feb). Source: OMIE, Analysis APREN



### **Electricity Market** Portugal

Between January 1 and February 28, the average hourly price recorded in MIBEL in Portugal was €100.1/MWh<sup>c</sup>, representing a decrease by half compared to the same period last year.

In the same period, 393 non-consecutive hours were recorded in which renewable generation was sufficient to supply electricity consumption in mainland Portugal, with an average hourly price in the MIBEL of €58.1/MWh. From the February 1<sup>st</sup> to 28<sup>th</sup>, renewable generation was sufficient to supply consumption for 65 non-consecutive hours.



#### **Accumulated January-February**



Number of market price setting hours of the three main market setting technologies (Feb-2021 to Feb-2023). Source: OMIE, Analysis APREN

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—MIBEL Price [€/MWh]

€/MWh



## **Electricity Market**

#### Iberian gas price limit mechanism

Since June 15, 2022, when the Iberian natural gas price limit mechanism came into operation, until February 28, the mechanism generated savings of €38.9/MWh<sup>c</sup>, which amounted to a reduction of 17.5% in the average hourly price at MIBEL.

The savings due to the price limit of natural gas, corresponding to the difference between the price without the mechanism and the price with the compensation to be paid to natural gas plants, reached a maximum value of €157.2/MWh<sup>c</sup>, and a minimum of €0/MWh<sup>c</sup>. In total, 129.1 of the 190.2 TWh produced, were subject to the consumer adjustment mechanism in the Iberian Peninsula.



<sup>c</sup> Arithmetic average hourly prices Source: OMIE, Analysis APREN







### Renewable Electricity Europe

During the month of February 2023, there was a minimum hourly price at MIBEL in Portugal of  $\in 17.7$ /MWh for four hours, in which the market setting was due to renewables, cogeneration and waste. The maximum hourly price reached  $\in 189.7 \in$ /MWh, where the market set with hydro.

Regarding prices in Europe, it should be noted that the average values were similar to those of the previous month, with the exception of Portugal and Spain, where they increased. Maximum prices decreased compared to the previous month, and minimum prices increased.



Source: ENTSO-E, OMIE, Analysis APREN





### **Future Electricity Market**

The evolution of the average future hourly price is calculated based on the contracts for the purchase and sale of electricity<sup>d</sup>.

The map on the right displays the price values for the next month (March) and for the next year. In both cases, MIBEL has the lowest values, while the French and German markets have the highest.

MIBEL also has the lowest figures by 2030, coming from the Iberian gas price limit mechanism by June next year, and from investment in renewable production.



d Values updated in 2<sup>nd</sup> March.

Source: OMIP, EEX, Analysis APREN





### International trade Europe

Between January 1 and February 28, 2023, the electricity system of Mainland Portugal recorded electricity imports equivalent to 1,027 GWh and exports of 1,090 GWh, with Portugal being an exporter with a balance of 63 GWh.

### Main Interconnection Indicators PT-ES

	PT-ES		ES-PT	
Usage	<b>23.9</b> % (Jan-Feb)	<b>21.8</b> % (Feb)	<b>10.3</b> % (Jan-Feb)	<b>22.0</b> % (Feb)
	PT-ES		ES-PT	
Congestion	<b>0.0</b> % (Jan-Feb)	<b>0.0</b> % (Feb)	<b>0.0</b> % (Jan-Feb)	<b>0.0</b> % (Feb)
	PT-ES		MIBEL-FR	
Markets split	<b>3.0</b> % (Jan-Feb)	<b>3.4</b> % (Feb)	<b>72.5</b> % (Jan-Feb)	62.8% (Feb)

Source: ENTSO-E, OMIE, Analysis APREN





# International trade: February

### Diagram of imports and exports in Portugal



Source: REN, Analysis APREN



### **Power sector emissions**

Between January 1 February 28, 2023, specific emissions reached 72.9 gCO<sub>2</sub>eq/kWh, while the total emissions from the power sector reached 0.7 MtCO<sub>2</sub>eq

The European Emissions Trading System (EU-ETS) recorded an average price of  $\in$  86.1 /tCO<sub>2</sub> <sup>c</sup>, a reduction compared to the same period in 2022.





<sup>c</sup> Arithmetic average hourly prices Source: OMIE, WorldBank,

Source: REN, DGEG, ERSE, Analysis APREN



### Simulation of price formation without SRP

### **Renewables have avoided:**

The indicators below identify the savings achieved between January 1 and February 28, 2023, due to the contribution Special Regime Production (SRP).

This study is conducted for SRP and includes all installed power of fossil cogeneration. Given that the capacity equivalent to this technology within the SRP is quite residual and that the other technologies are renewable, the figures are very close to the real savings generated by renewables.



**€128.4/MWh** Accumulated savings (Jan-Feb)

€99.9/MWh Montlhy savings (Feb)



€1271.8 M Accumulated savings (jan-fev)

€434.2 M Montlhy savings (Feb)

Source: OMIE, Analysis APREN.





### **Environmental Service**

The figures below identify the savings achieved between January 1 and February 28, 2023, in natural gas,  $CO_2$  emissions and  $CO_2$  emission allowances resulting from the renewable incorporation in electricity generation.

This analysis assumes that, in the absence of renewables, production would be ensured primarily by natural gas, followed by imported electricity.

### Renewables have avoided: :

€403 M **Imported Natural Gas** (Jan-Feb)

€140 M

**Imported Natural Gas** (Feb)

€350 M **Imported Electricity** (Jan-Feb)

€199 M

**Imported Electricity** (Feb)

SendeCO2, WorldBank, DGEG, ERSE, Analysis APREN estimate of the savings in imported natural gas, the price of natural gas in Europe indicated in the WorldBank has been considered. te 2: For the estimation of savings in imported electricity, the average price on the MIBEL market has been considered.

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**1.8 MtCo<sub>2</sub>eq** CO<sub>2</sub> emissions (Jan-Feb)

**0.7 MtCo<sub>2</sub>eq** CO<sub>2</sub> emissions (Feb)

€115 M CO<sub>2</sub> allowances (Jan-Feb)

€45 M CO<sub>2</sub> allowances (Feb)







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