

## RENEWABLE **ELECTRICITY** BULLETIN

OCTOBER 2024

PORTUGAL NEEDS **OUR ENERGY** 



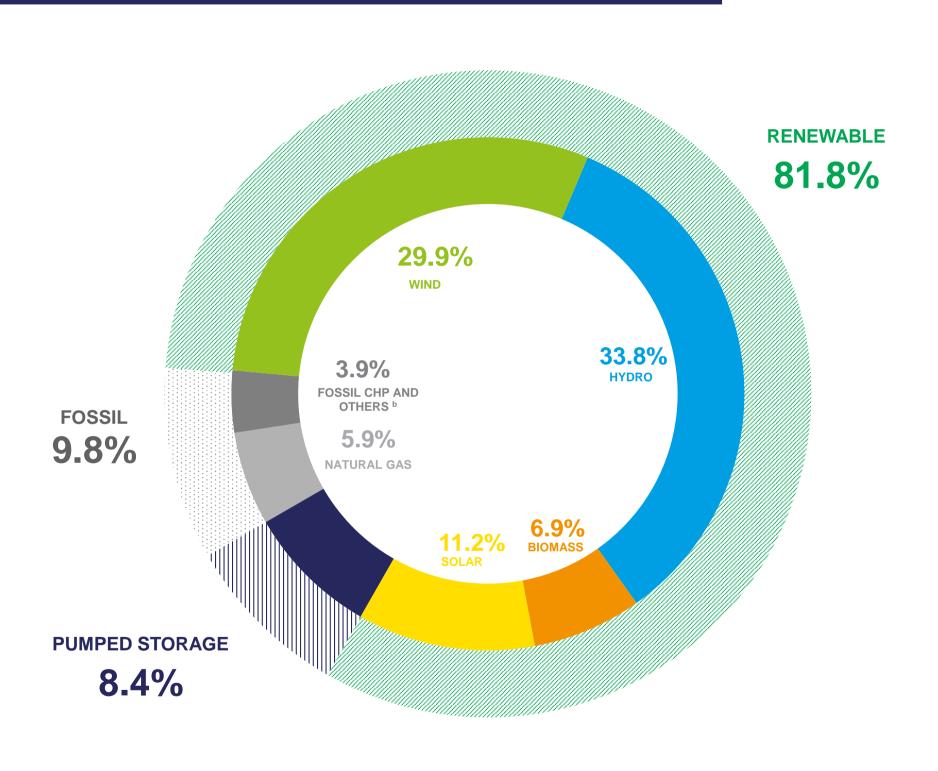








### **EXECUTIVE SUMMARY GENERATION (JAN-OCT)**



WIND 11,420 GWh SOLAR **4,300**gwh **FOSSIL CHP** AND OTHERS<sup>b</sup> 1,507 GWh

**BIOMASS HYDRO** 12,907 gwh 2,648 gWh NATURAL GAS **PUMPED** STORAGE 3,194 GWh **2,253** GWh

**MAIN INDICATORS** (JAN-OCT)

**GWh** 38,229 **Generation**<sup>a</sup>

€/ MWh 54.5 **MIBEL PT Price** 

€/ tCO<sub>2</sub> 63.6 CO<sub>2</sub> Price

MtCO<sub>2</sub> - eq 1.33 CO<sub>2</sub> Emissions

**GWh** 8,141 **Import Balance** 

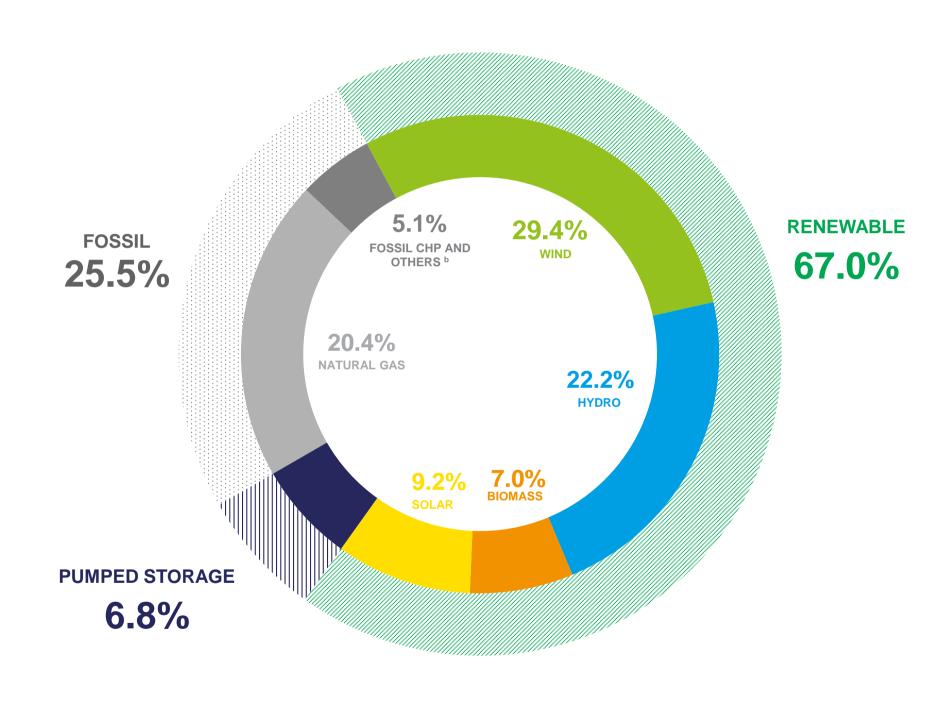
gCO<sub>2</sub> eq/kWh 38.6 CO<sub>2</sub> Specific Emissions

b Includes fuel oil, diesel, the non-biodegradable fraction of MSW and new waste

a Generation refers to the net energy generation of the power stations, taking into account the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources

## **EXECUTIVE SUMMARY**

#### **OCTOBER ACCUMULATED GENERATION 2023**



## **MAIN INDICATORS COMPARED TO**

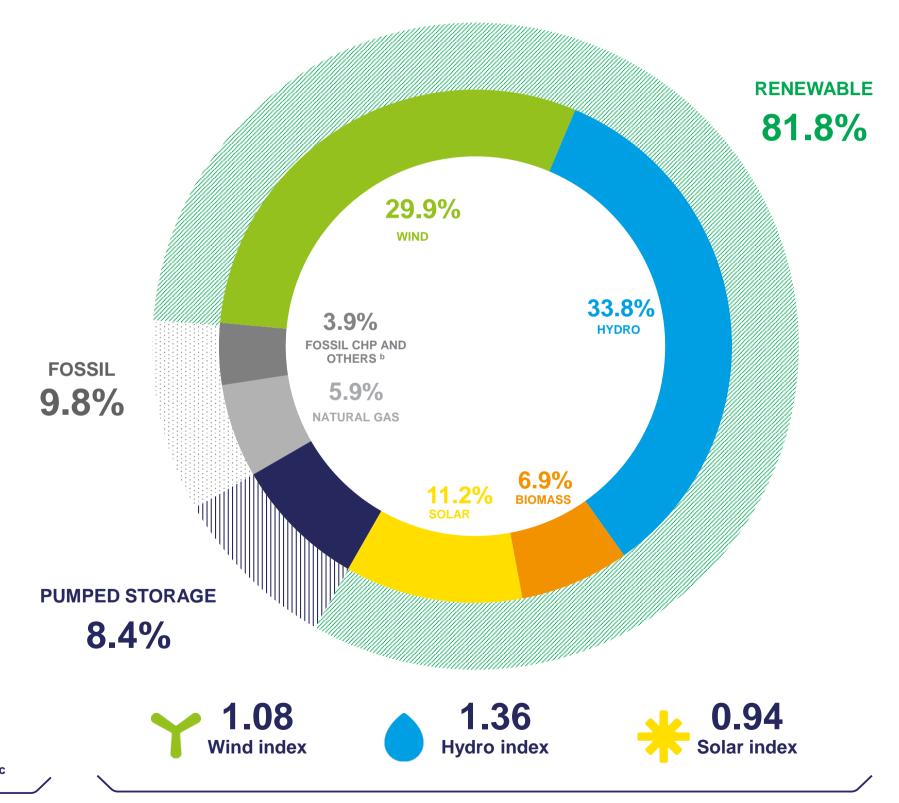
**OCTOBER 2023** 



14.0p.p. Incorporation

**GWh** 1,8% Consumption<sup>c</sup>

### **OCTOBER ACCUMULATED GENERATION 2024**



<sup>&</sup>lt;sup>a</sup> Generation refers to the net energy generation of the power stations, taking into account the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources. Source: RÉN, APREN Analysis

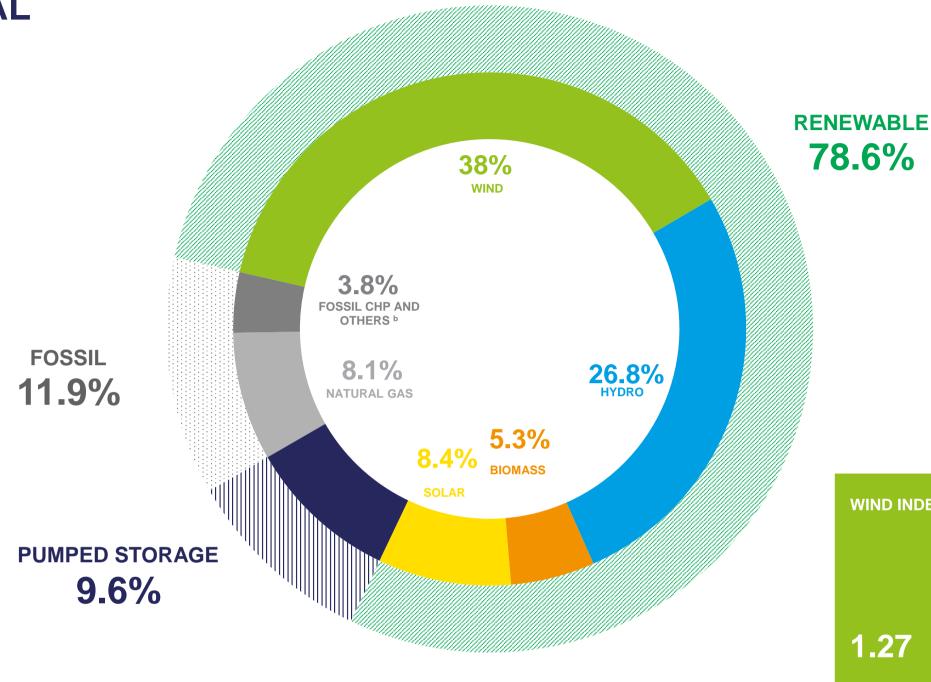


### **MONTHLY ANALYSIS IN PORTUGAL OCTOBER**

Between 1 and 31 of October 2024, renewable incorporation was 78.6%, making up 2,959 GWh of the 3,766 GWh produced in the month under review.

The amount of energy generated compared to October 2023 is similar, mainly due to a reduction in fossil production from 18.8% to 11.9%, catalysed by a reduction in natural gas fossil production from 15.6% to 8.1%.

In October 2024, imports totalled 22.9% of electricity consumption in mainland Portugal.



## **ELECTRICITY SECTOR'S** INDICATORS (IN COMPARISON WITH OCTOBER 2023)

**GWh** 3,766 **Generation**<sup>a</sup>

1.4%

**GWh** 4,301 **Consumption**<sup>c</sup> 2.8%

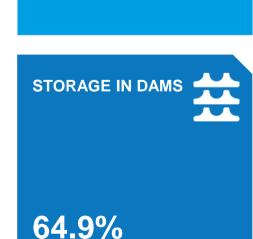
78.6 Renewable incorporation 4.8 p.p.



SOLAR INDEX 0.77

**WIND INDEX** 

1.27



**HYDRO INDEX** 

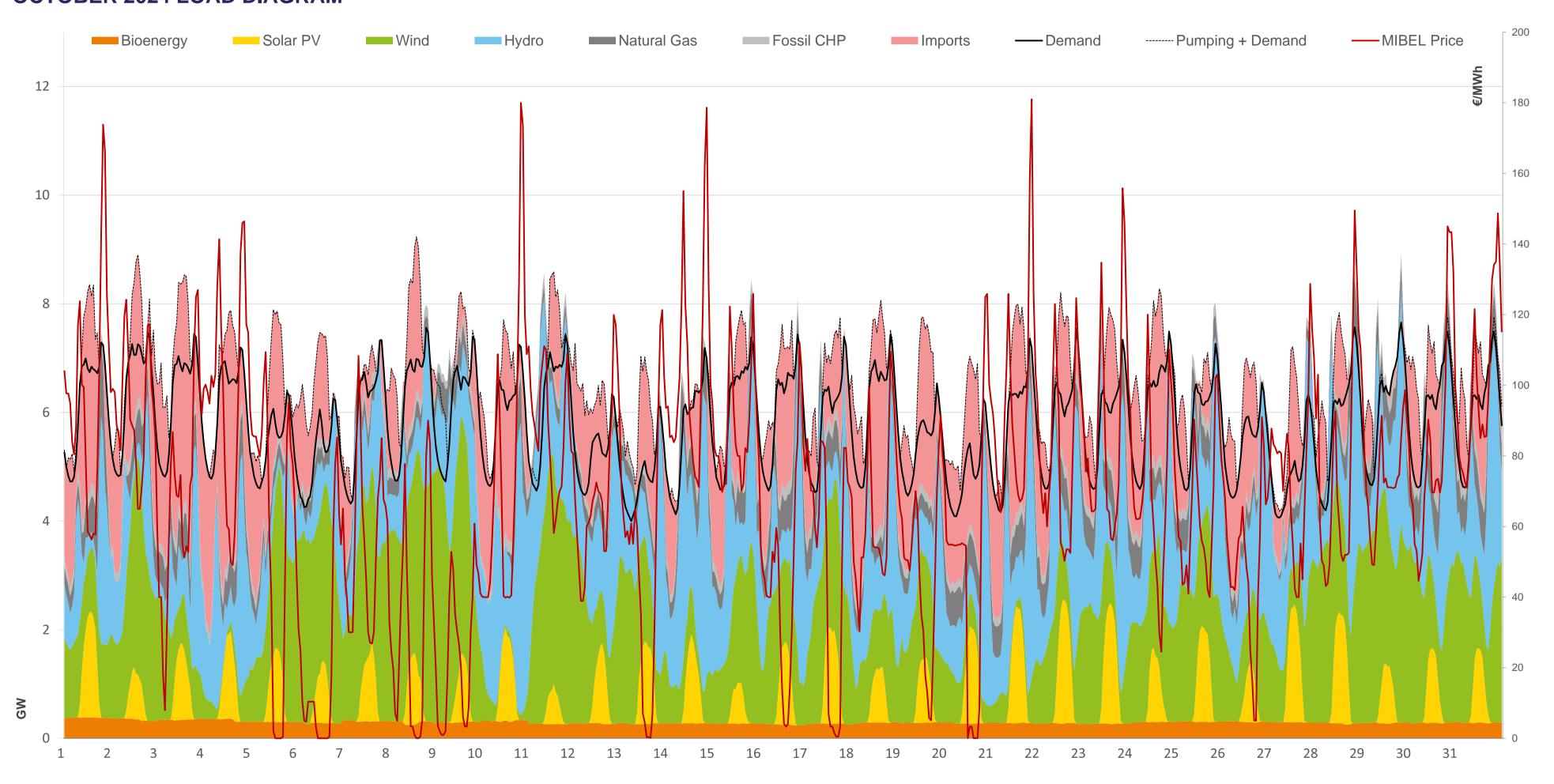
1.76

<sup>&</sup>lt;sup>a</sup> Generation refers to the net energy generation of the power stations, taking into account the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources.

Dincludes fueloil, diesel, the non-biodegradable fraction of MSW and new waste

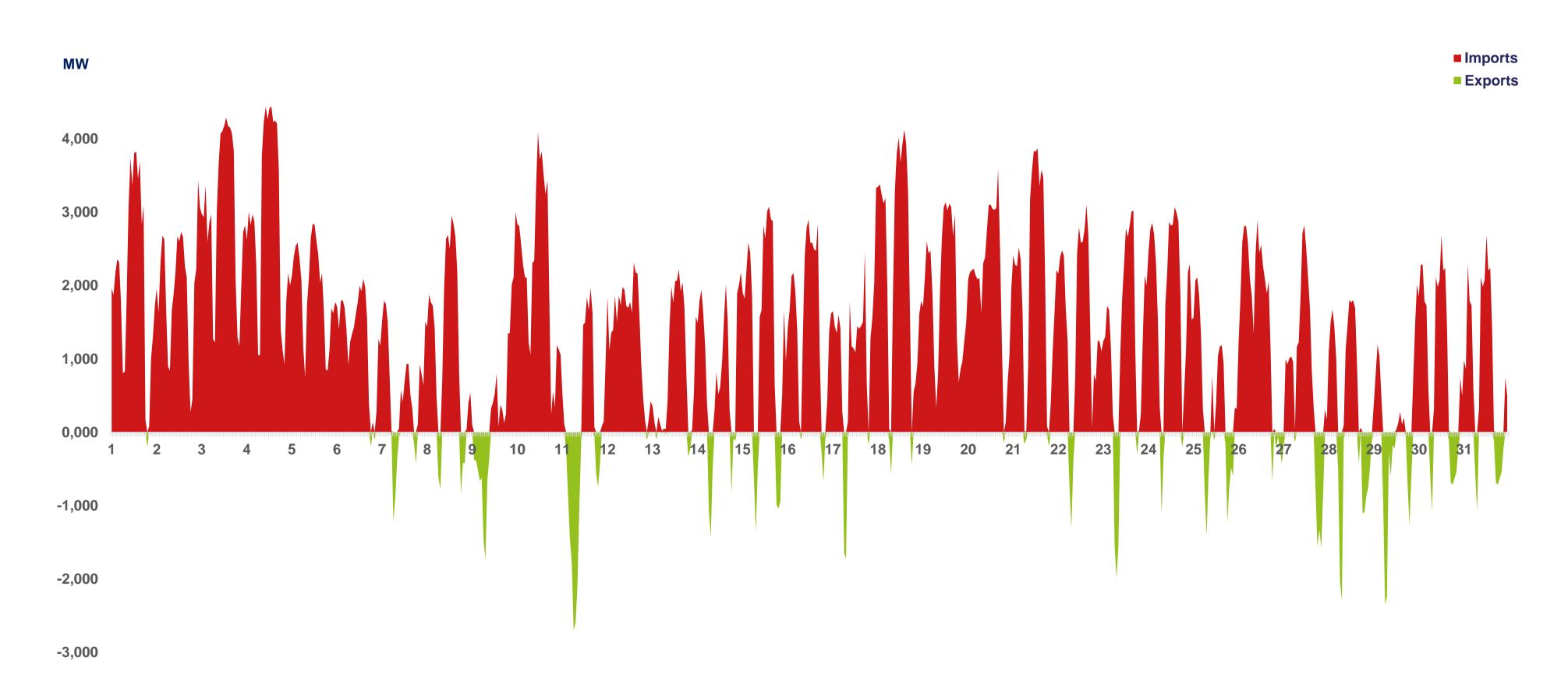
<sup>&</sup>lt;sup>c</sup> Consumption refers to the net generation of energy by power stations, taking into account the import-export balance Source: REN, APREN Analysis

### **MONTHLY ANALISYS IN PORTUGAL: OCTOBER 2024 LOAD DIAGRAM**



## APREN Associação de Energias Renaváveis

# MONTHLY ANALYSIS IN PORTUGAL: DIAGRAM OF IMPORTS AND EXPORTS IN PORTUGAL



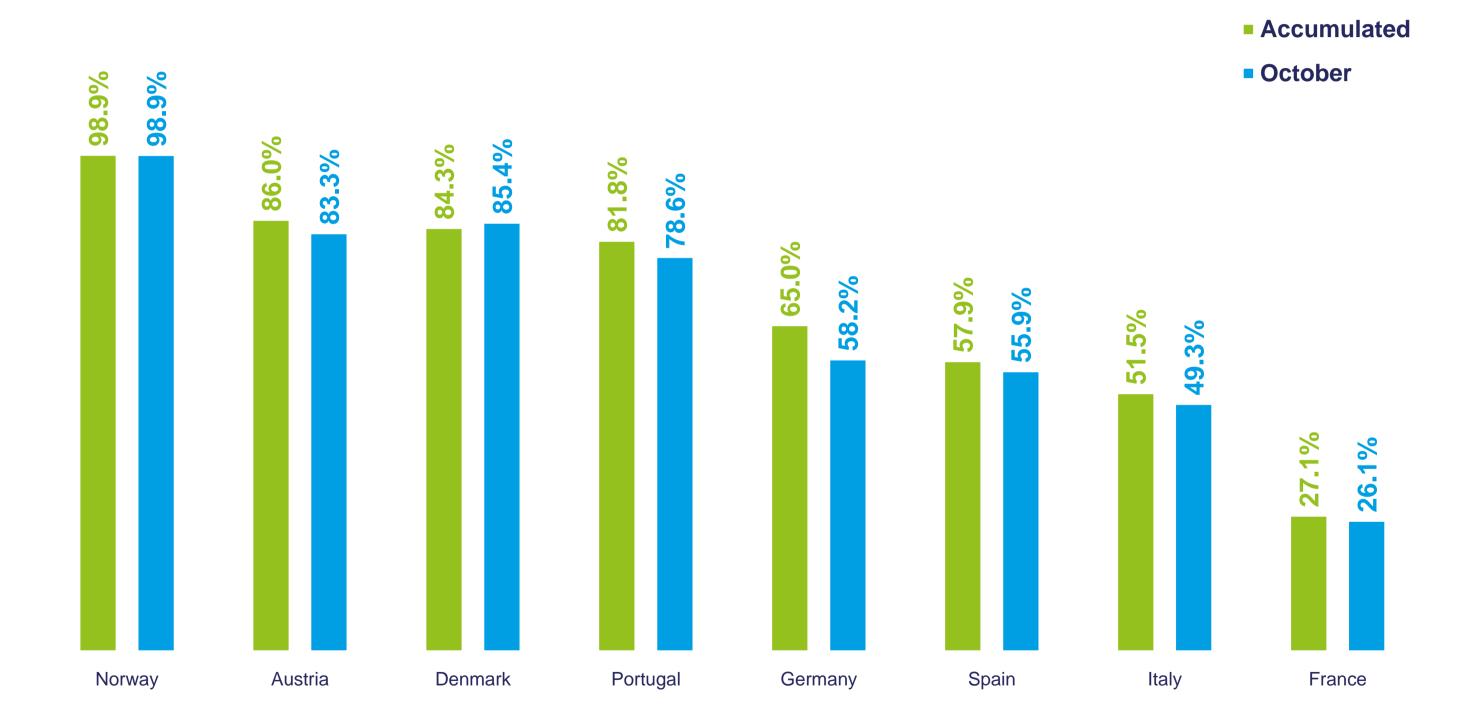


## RENEWABLE ELECTRICITY EUROPE

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

Between 1 January and 31 October 2024, Portugal was the fourth country with the highest share of renewable energy in electricity generation, with 81.8%, figuring behind Norway, Austria and Denmark, which respectively achieved 98.9%, 86.0% and 84.3%.

From 1 to 31 October, Portugal came fourth in the countries considered with the highest renewable incorporation in Europe, having reached 78.6%.











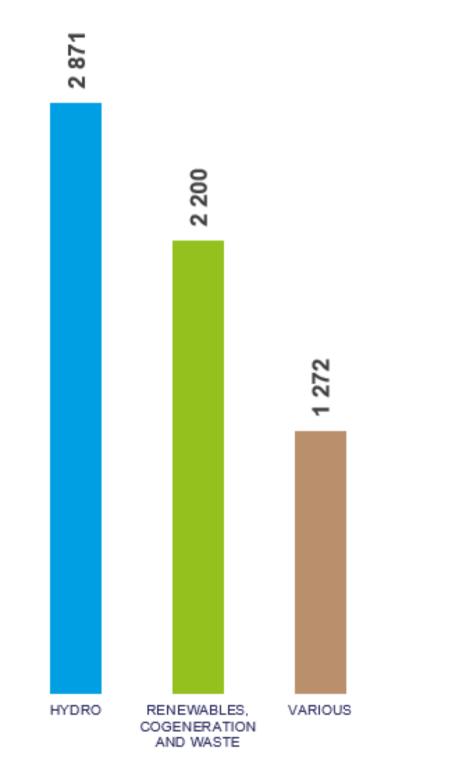




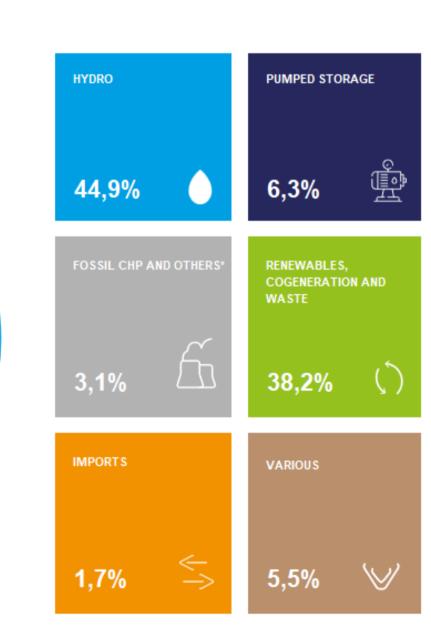
## MARKET PRICE SETTING PORTUGAL

Between 1 January and 31 October, the technology that closed the market with the most hours was hydro, with 2,871 non-consecutive hours, followed by renewables, cogeneration and waste with 2,200 hours, and various technologies with 1,272 hours.

### **ACCUMULATED OCTOBER 2024**



#### OCTOBER 2024



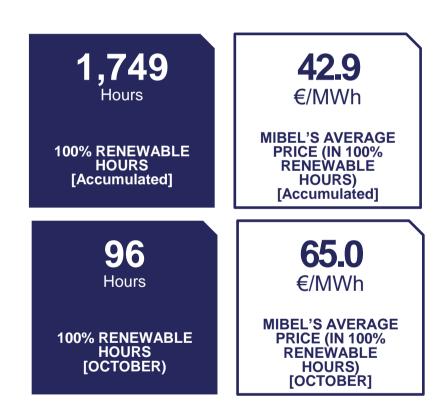
Number of market closing hours (accumulated) for the three main closing technologies (Oct).

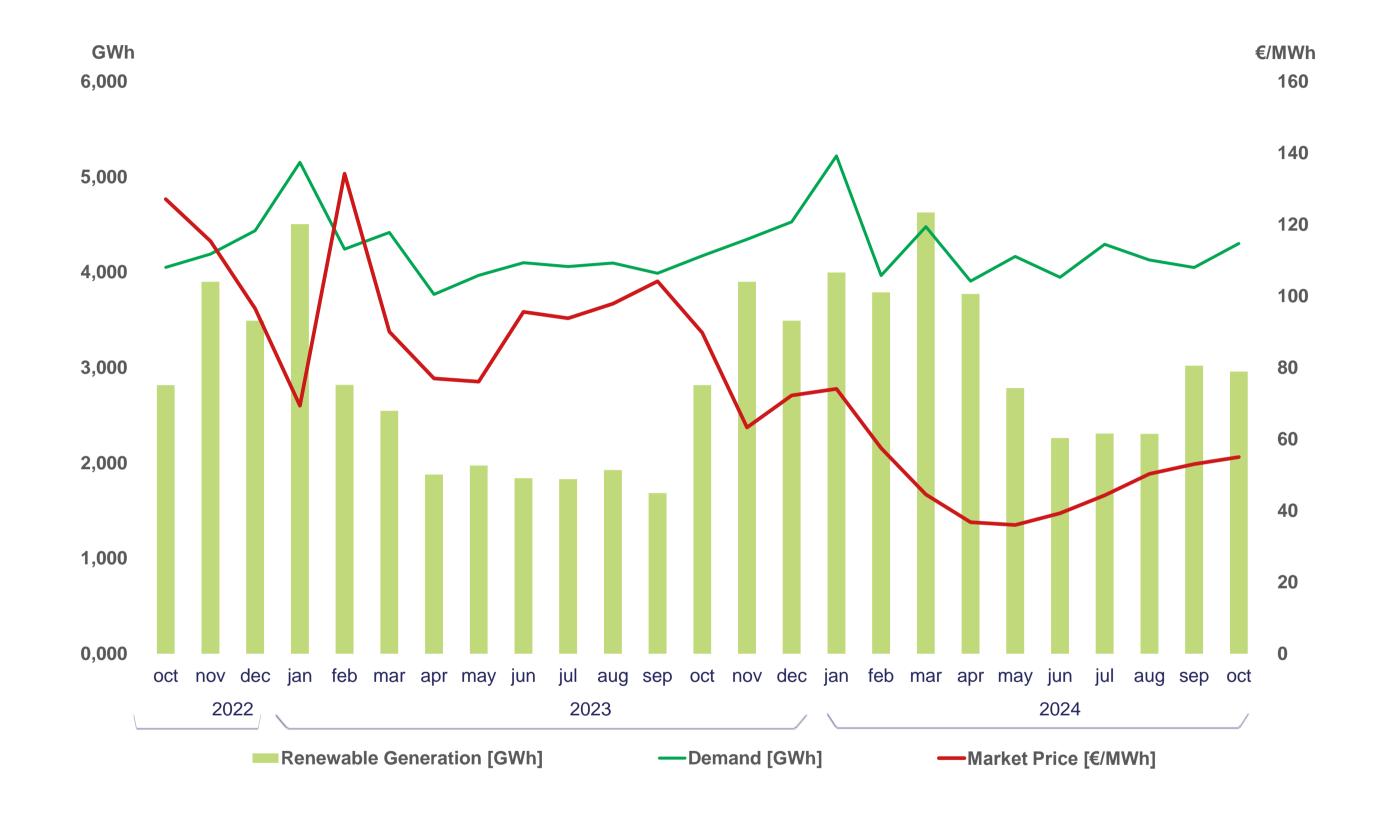
**Source:** OMIE, APREN Analysis



## ELECTRICITY MARKET PORTUGAL

Between 1 January and 31 October, the average hourly price recorded in MIBEL in Portugal (54.5 €/MWh<sup>d</sup>) represents a 41% reduction compared to the same period last year. In the same period, there were 1,749 non-consecutive hours in which renewable generation was sufficient to supply mainland Portugal's electricity consumption, with an average hourly price in MIBEL of 42.9 €/MWh.



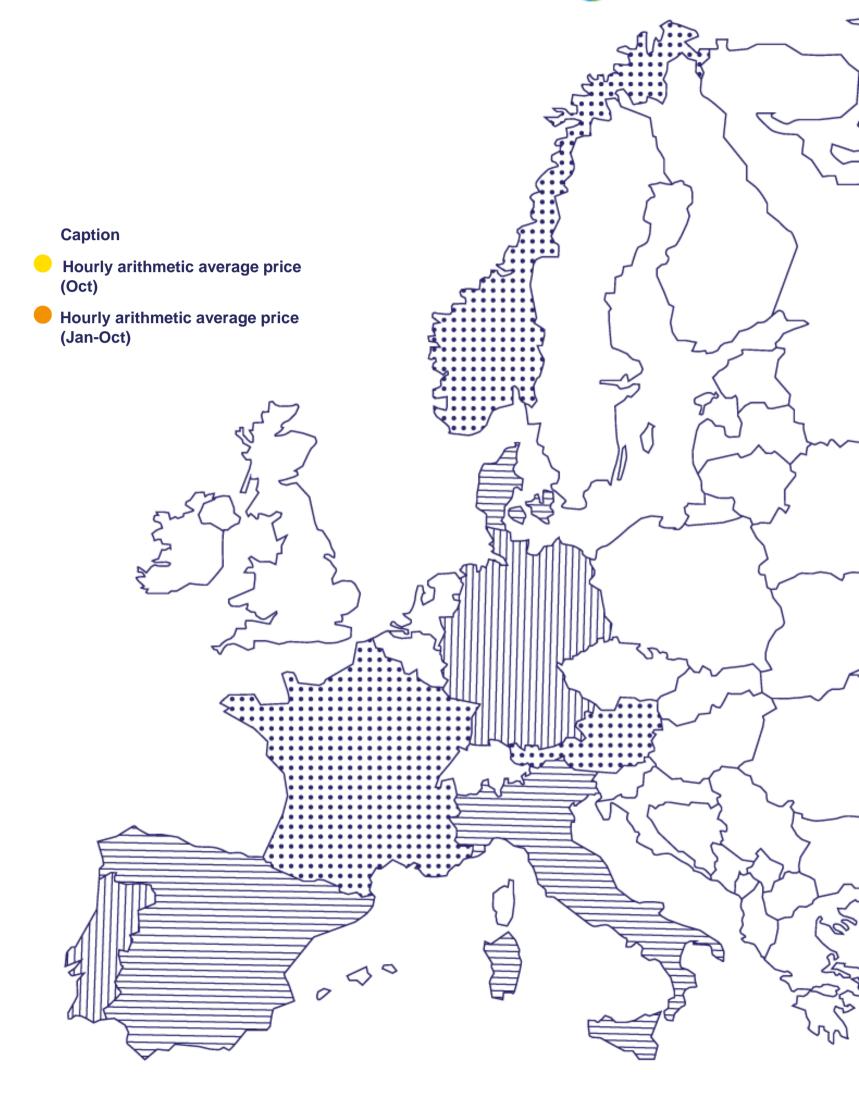


### RENEWABLE ELECTRICITY **EUROPE**

During the month of October 2024, there was a minimum hourly price in MIBEL in Portugal of -0.01 €/MWh, where the market was closed mainly by Hydro and Renewables, Cogeneration and Waste. The maximum hourly price was 181.00 €/MWh, where the market was closed by Renewables, Cogeneration and Waste.

MINIMUM PRICES (OCT)		MAXIMU (OCT)	MAXIMUM PRICES (OCT)	
1º Germany	€/MWh -15.69	1º Denmark Germany	€/MWh 285.80	
2º	€/MWh	2º	€/MWh	
Austria	-12.16	Austria	<b>269.73</b>	
3º	€/MWh	Portugal	€/MWh	
France	-2.01	Spain	181.0	

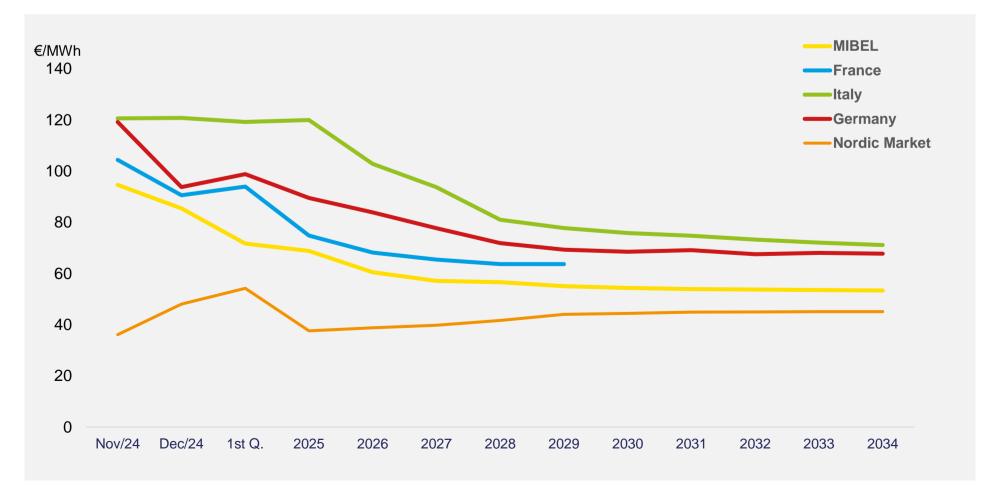
Portugal €/MWh	69.4	54.5
Spain €/MWh	68.5	54.1
France €/MWh	62.1	49.8
Italy* €/MWh	-	-
Germany €/MWh	86.1	72.0
Austria €/MWh	85.6	71.8
Denmark €/MWh	76.3	66.1
Norway* €/MWh	-	-



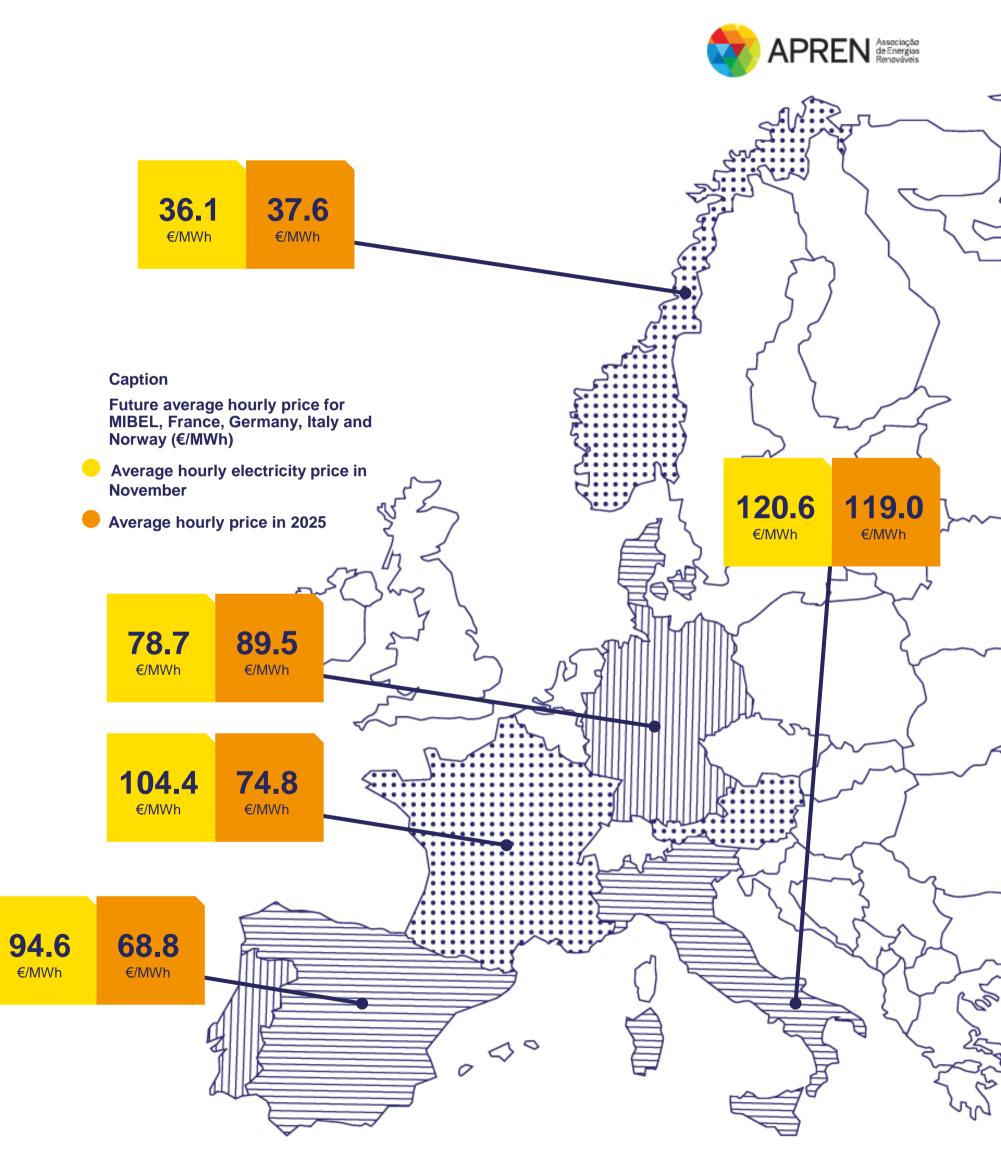
### **ELECTRICITY MARKET FUTURES**

The evolution of the average hourly future price shown is calculated on the basis of electricity purchase and sale contracts. The map on the right shows the price values for next month (November) and next year. For next month, MIBEL is the second market with the lowest values, while for next year it is the Nordic Market that has the lowest values.

MIBEL has the second lowest values until 2034, due to investment in renewable production.



<sup>&</sup>lt;sup>e v</sup>alues updated as of 7th of November. **Source**: OMIP, EEX, APREN Analysis



## APREN Associação de Energias Renováveis

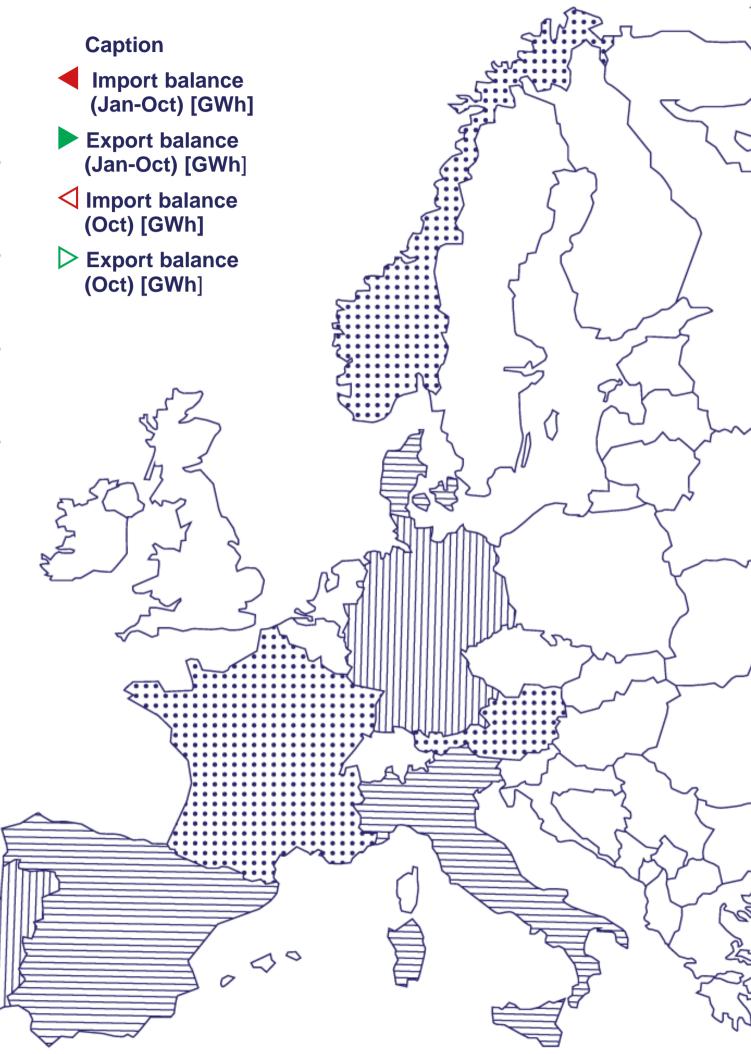
# INTERNATIONAL EXCHANGES EUROPE

Between 1 January and 31 October 2024, mainland Portugal's electricity system registered electricity imports equivalent to 12,181 GWh and exports of 4,040 GWh, with Portugal being an importer with a balance of 8,141 GWh.



## MAIN INDICATORS FOR PT-ES INTERCONNECTION

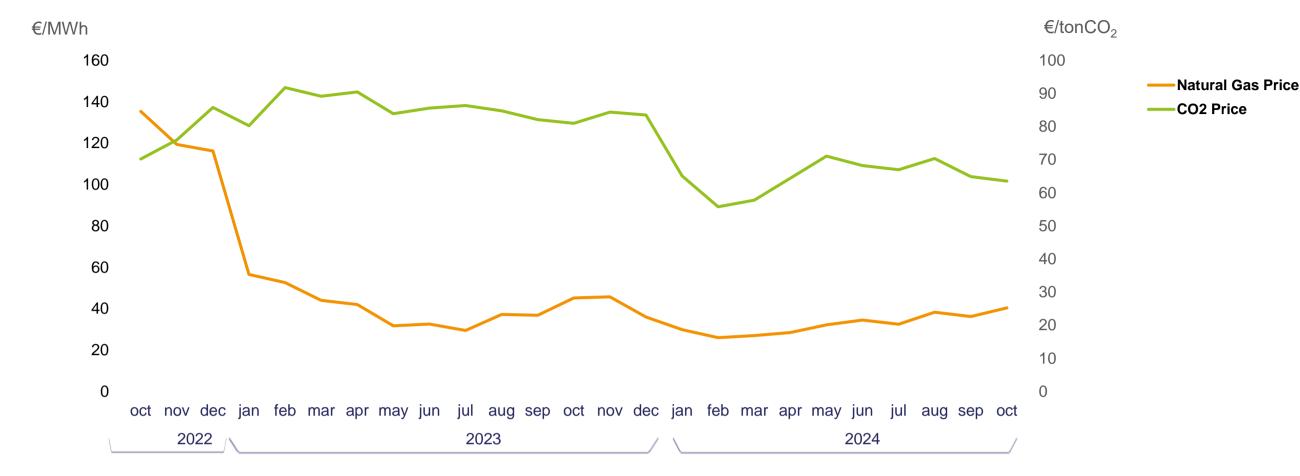




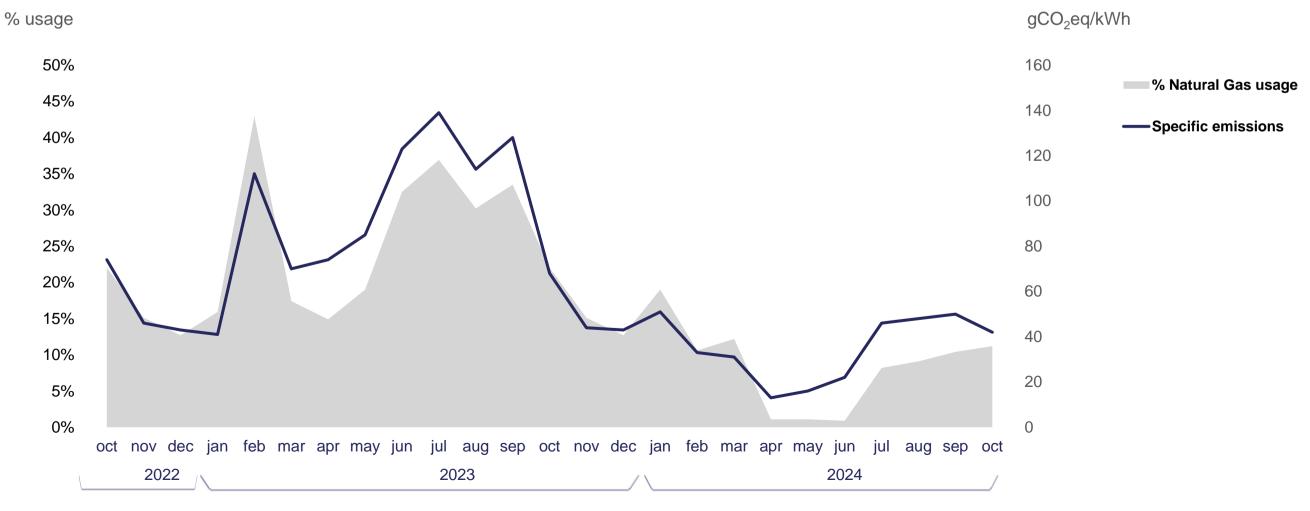
## POWER PRODUCTION **EMISSIONS**

Between 1 January and 31 October 2024, specific emissions reached 34.8 gCO2eq/kWh, giving total emissions from the electricity generation sector of 1.33 MtCO2eq. The European CO2 Emissions Trading Scheme (ETS) recorded a price of 64.8 €/tCO2d, a reduction of 24.2 per cent compared to the same period in 2023..





Price of CO2 allowances in the EU ETS and price of natural gas in Europe (Oct-2022 to Oct-2024). Source: SendeCO2, WorldBank.



Specific emissions from the electricity sector in mainland Portugal, % use of coal and natural gas power stations (Oct-2022 to Oct-2024). Source: REN, DGEG, ERSE, APREN Analysis

d arithmetic average of hourly prices Source: OMIE, WorldBank.

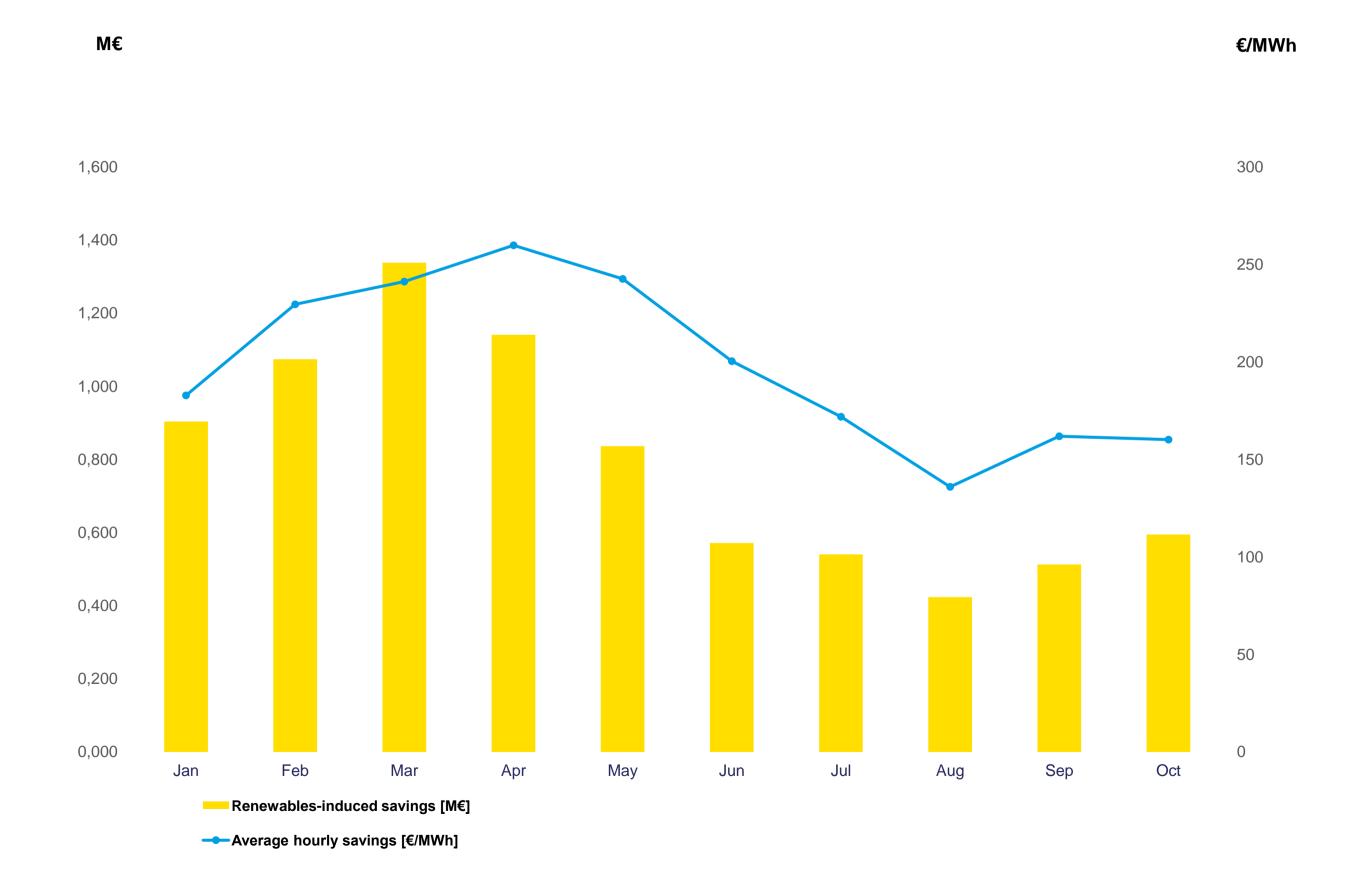
## SIMULATION OF PRICE **FORMATION WITHOUT SRP**

#### **RENEWABLES AVOIDED:**

The indicators below identify the savings achieved by the merit order between 1 January and 31 October 2024 by the contribution of special regime production (PRE). This study is carried out for PRE, which includes all installed fossil cogeneration power. Bearing in mind that the capacity equivalent to this technology within PRE is residual and that the other technologies are renewable, the figures are close to the real savings generated by renewables..

198.8 €/MWh AVERAGE HOURLY SAVINGS (Jan-Oct)

7,922 M€ CUMULATIVE SAVINGS (Jan-Oct)



## APREN Associaçã de Energia Renovávei

## ENVIRONMENTAL SERVICE RENEWABLES AVOIDED:

The indicators below identify the savings achieved between 1 January and 31 October 2024 in natural gas, CO2 emissions and CO2 emission allowances, as a result of incorporating renewables into electricity generation. This analysis is based on the assumption that, in the absence of renewables, production would be ensured primarily by natural gas, followed by the use of imports..





Source: OMIE, APREN Analysis.



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