2025

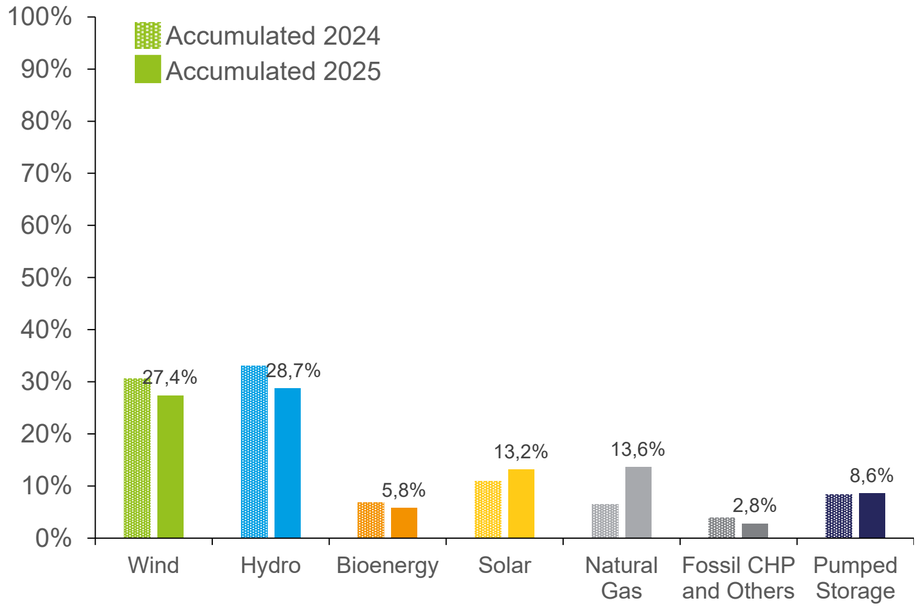
RENEWABLE ELECTRICITY BULLETIN

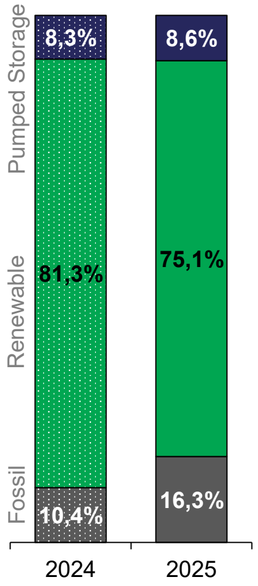
NOVEMBER
2025

PORTUGAL NEEDS
OUR ENERGY

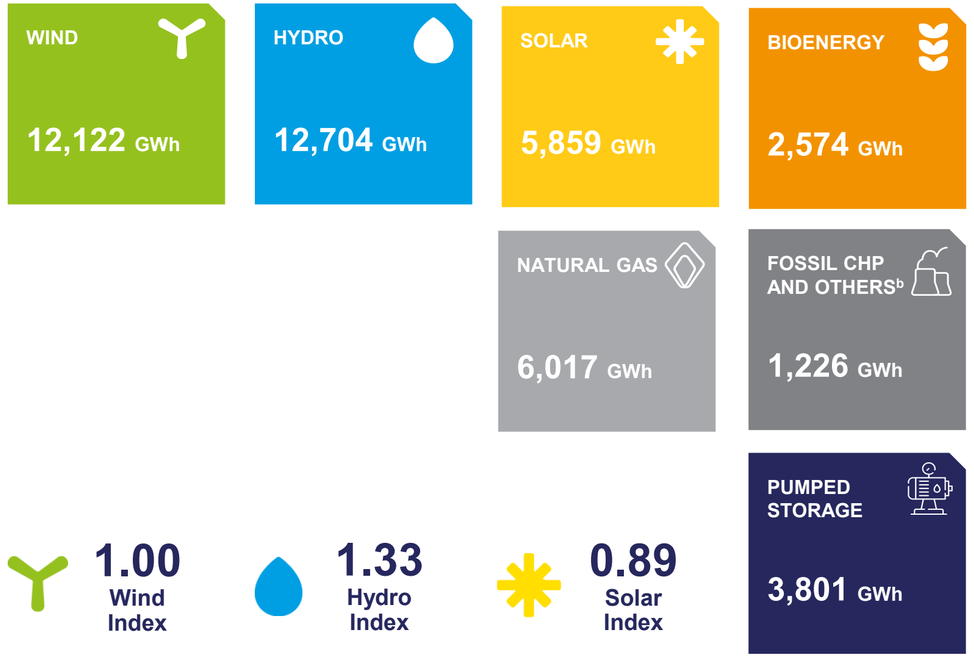
APREN Associação de Energias Renováveis

EXECUTIVE SUMMARY
CUMULATIVE GENERATION NOVEMBER 2025





MAIN INDICATORS



COMPARING TO THE SAME PERIOD IN 2024

GWh	%	GWh	GWh	€/MWh	€/tCO$_2$	MtCO$_2$-eq	gCO$_2$-eq/kWh
△ 5,1% 44,303 Generation[a]	▽ 6,3 p.p. 75.1 Renewable Incorporation in Generation	△ 2.9% 48,076 Consumption[c]	▽ 4.4% 8,549 Net Imports	65.0 MIBEL PT Price	73.0 CO$_2$ Price	2.63 CO$_2$ Emissions	59.4 CO$_2$ Specific Emissions

a Generation refers to the net energy generation of the power stations, considering the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources.
b Includes fuel oil, diesel, the non-biodegradable fraction of MSW and new waste.
c Consumption refers to the net generation of energy by power stations, considering the import-export balance.
Source: REN, APREN Analysis

MONTHLY ANALYSIS IN MAINLAND PORTUGAL

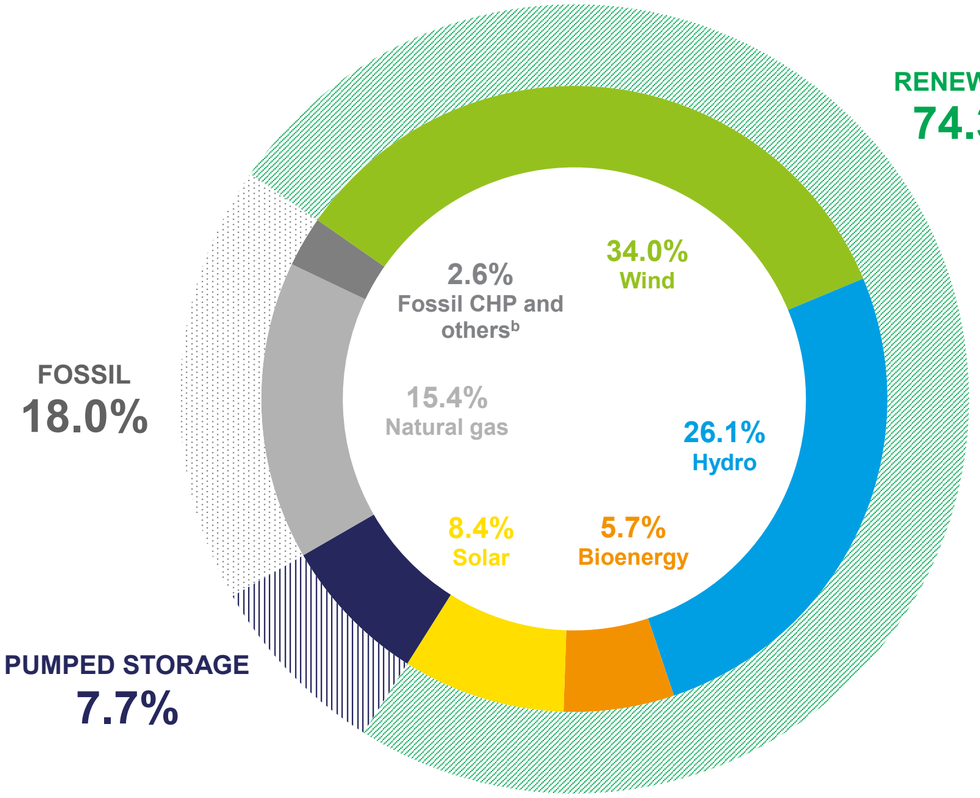
NOVEMBER 2025

Between 1st and 30th of November 2025, the **renewable incorporation** equalled 74.3%, making up 3,081 GWh of the 4,147 GWh produced in the month under review.

Compared to November 2024, there was an 8.1% increase in national electricity production. This was mainly due to an increase of 106 GWh in hydro production, 81 GWh in solar production and 157 GWh in natural gas production.

In November 2025, **imports** totalled 22.1% of the electricity consumption in mainland Portugal.

There wasn't any curtailment of production recorded in October.



MAIN INDICATORS COMPARING TO NOVEMBER 2024

GWh	GWh	%
4,147	**4,552**	**74.3**
Generation[a]	Consumption[c]	Renewable incorporation
△ 8.1%	▽ 6.6%	▽ 2.2 p.p.

WIND INDEX **1.03**

HYDRO INDEX **1.33**

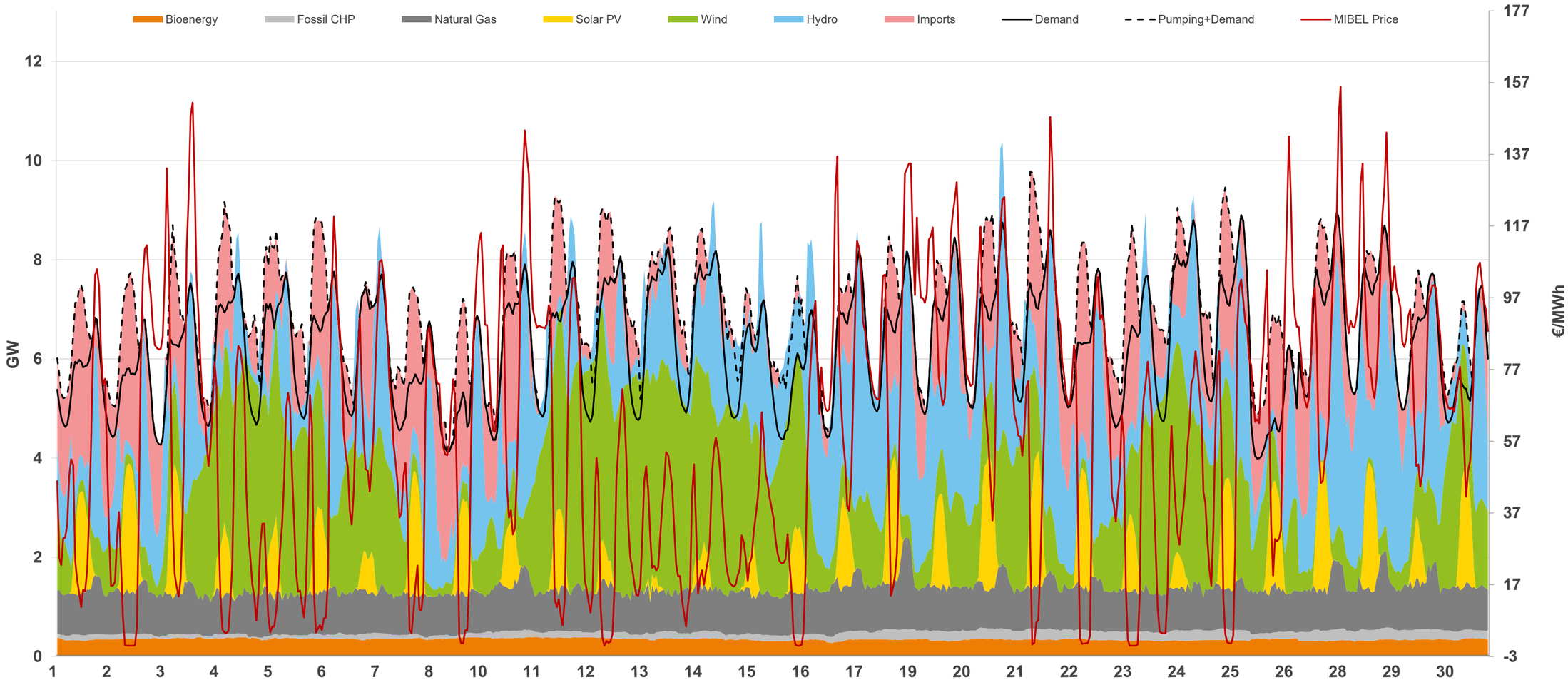
STORAGE IN DAMS **71.4%**

SOLAR INDEX **0.86**

a Generation refers to the net energy generation of the power stations, considering the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources.
b Includes fuel oil, diesel, the non-biodegradable fraction of MSW and new waste.
c Consumption refers to the net generation of energy by power stations, considering the import-export balance.
Source: REN, APREN Analysis

MONTHLY ANALYSIS IN MAINLAND PORTUGAL

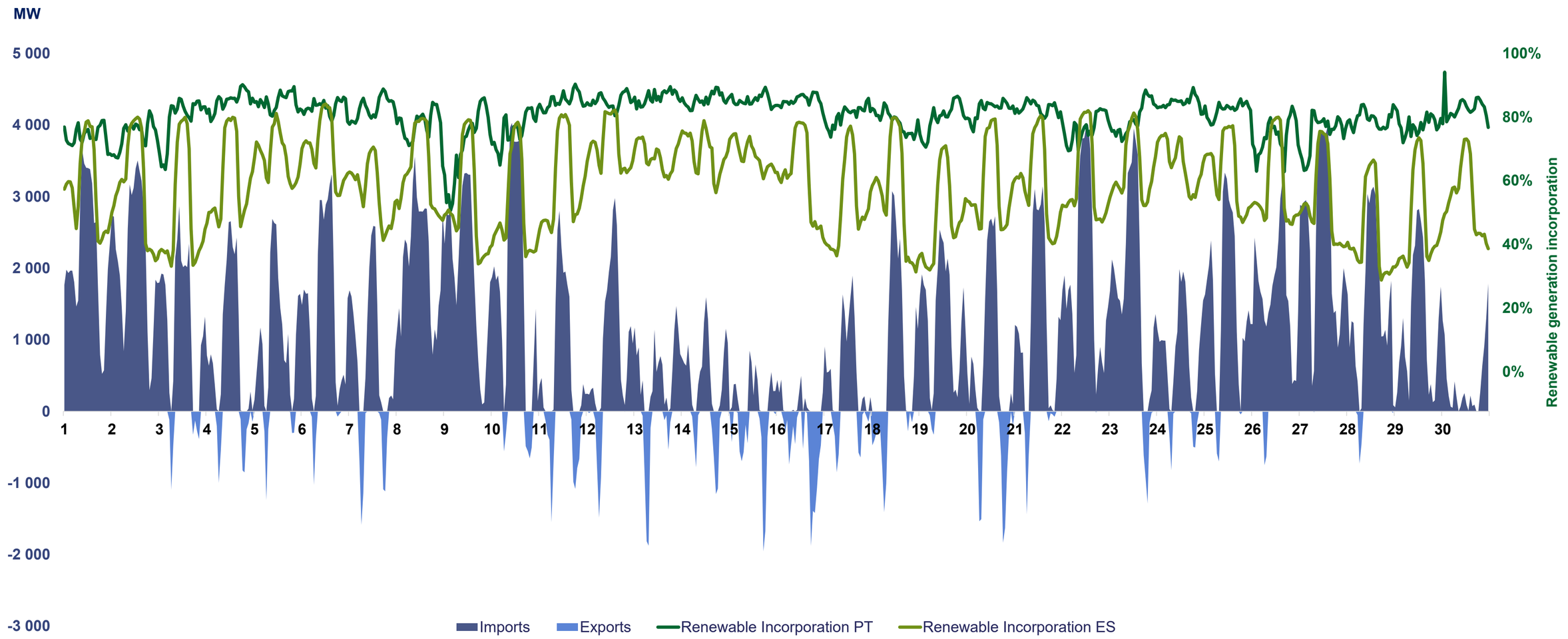
LOAD DIAGRAM FOR NOVEMBER 2025



Source: REN, OMIE, APREN Analysis

MONTHLY ANALYSIS IN MAINLAND PORTUGAL

IMPORTS AND EXPORTS DIAGRAM



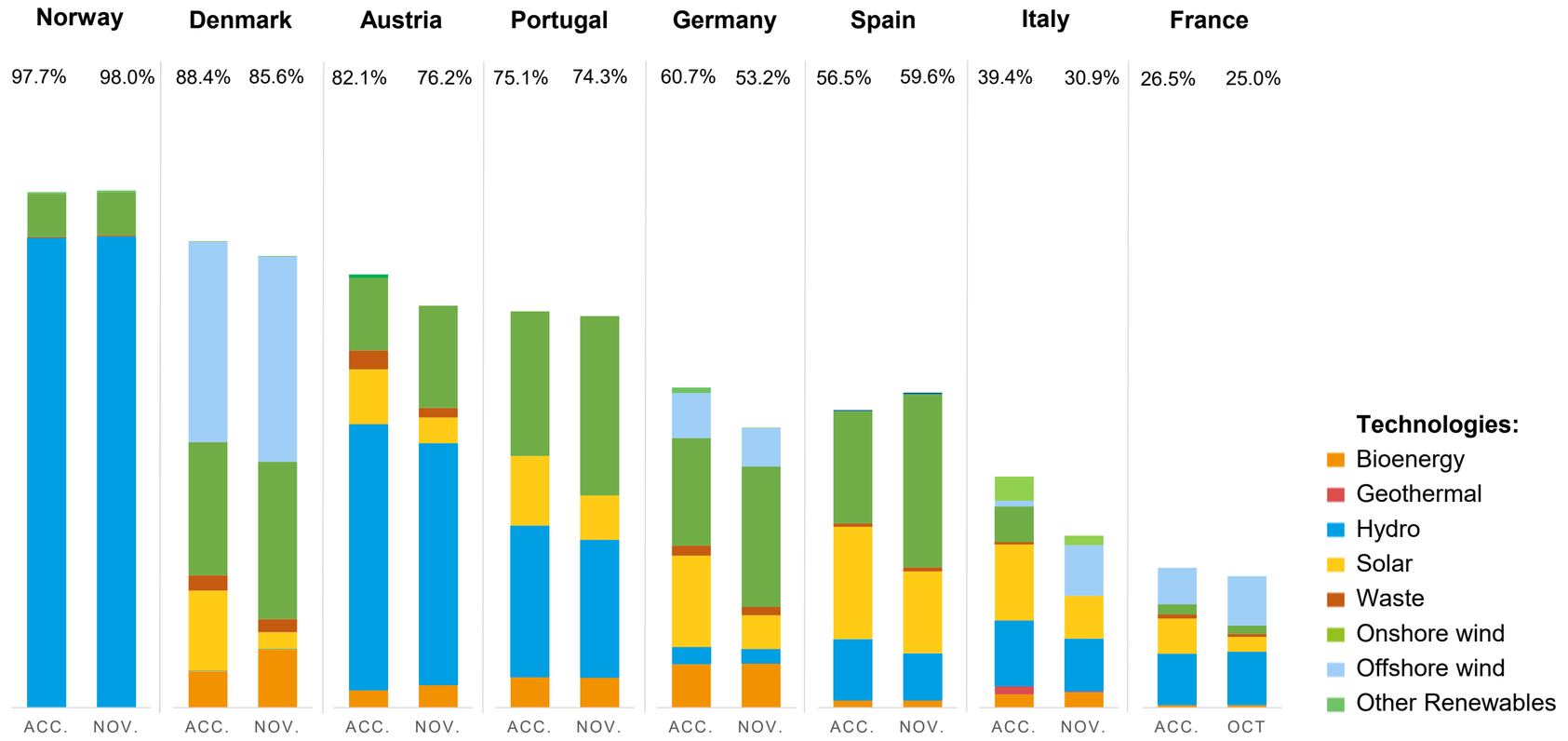
Source: REN, APREN Analysis

RENEWABLE ELECTRICITY
EUROPE

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

Between 1st of January and 30th of November 2025, Portugal was the fourth country with the highest **share of renewable energy in electricity generation**, with 75.1%, behind Norway, Denmark and Austria, which achieved 97.7%, 88.4% and 82.1%, respectively.

The renewable technologies with the largest share of the European electricity generation mix this month were hydro, onshore wind and solar.



Renewable incorporation in cumulative (1 Jan - 31 Nov) and monthly (Nov) electricity generation.
Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, APREN Analysis.

ELECTRICITY MARKET
PORTUGAL

Between January 1st and 30th of November, the average hourly price recorded on **MIBEL in Portugal** (65.0 €/MWh[d]) represents an increase of 10.2% compared to the same period last year.

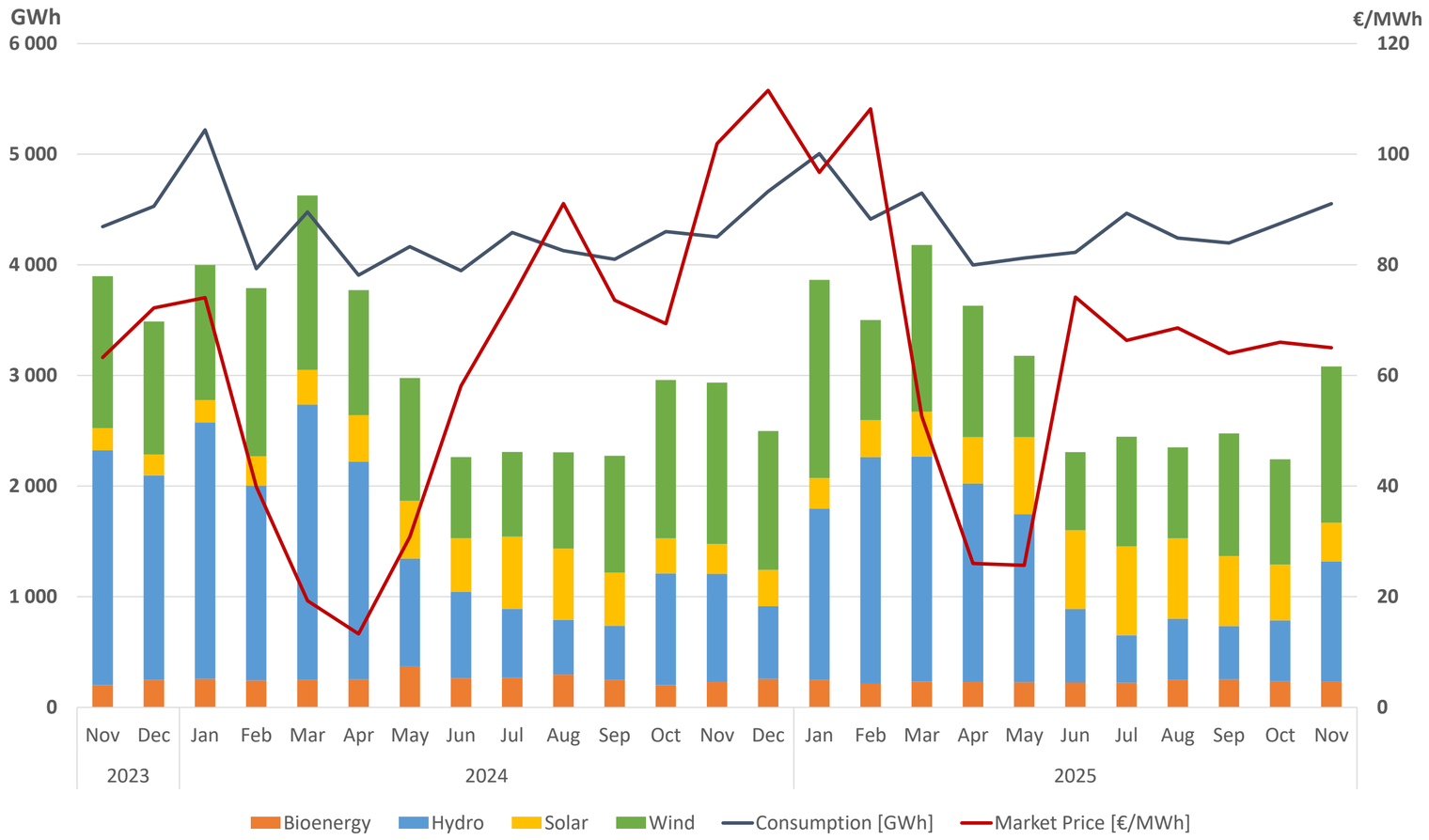
In the same period, there were 1,339 non-consecutive hours in which renewable generation was sufficient to supply mainland Portugal's electricity consumption, with an average hourly price in MIBEL of 39.7 €/MWh.

1,339
Hours
100% RENEWABLE HOURS [Accumulated]

72.8
€/MWh
MIBEL'S AVERAGE PRICE (IN 100% RENEWABLE HOURS) [Accumulated]

72
Hours
100% RENEWABLE HOURS [November]

39.7
€/MWh
MIBEL'S AVERAGE PRICE (IN 100% RENEWABLE HOURS) [November]



[d] arithmetic average of MIBEL prices.
Source: OMIE

Electricity market analysis, renewable generation, consumption and market price (Nov-2023 to Nov-2025)
Source: OMIE, APREN analysis

RENEWABLE ELECTRICITY
EUROPE

During the month of November 2025, there was **a minimum hourly price in MIBEL** in Portugal of 0 €/MWh*.

The maximum hourly price was 155.9 €/MWh*.

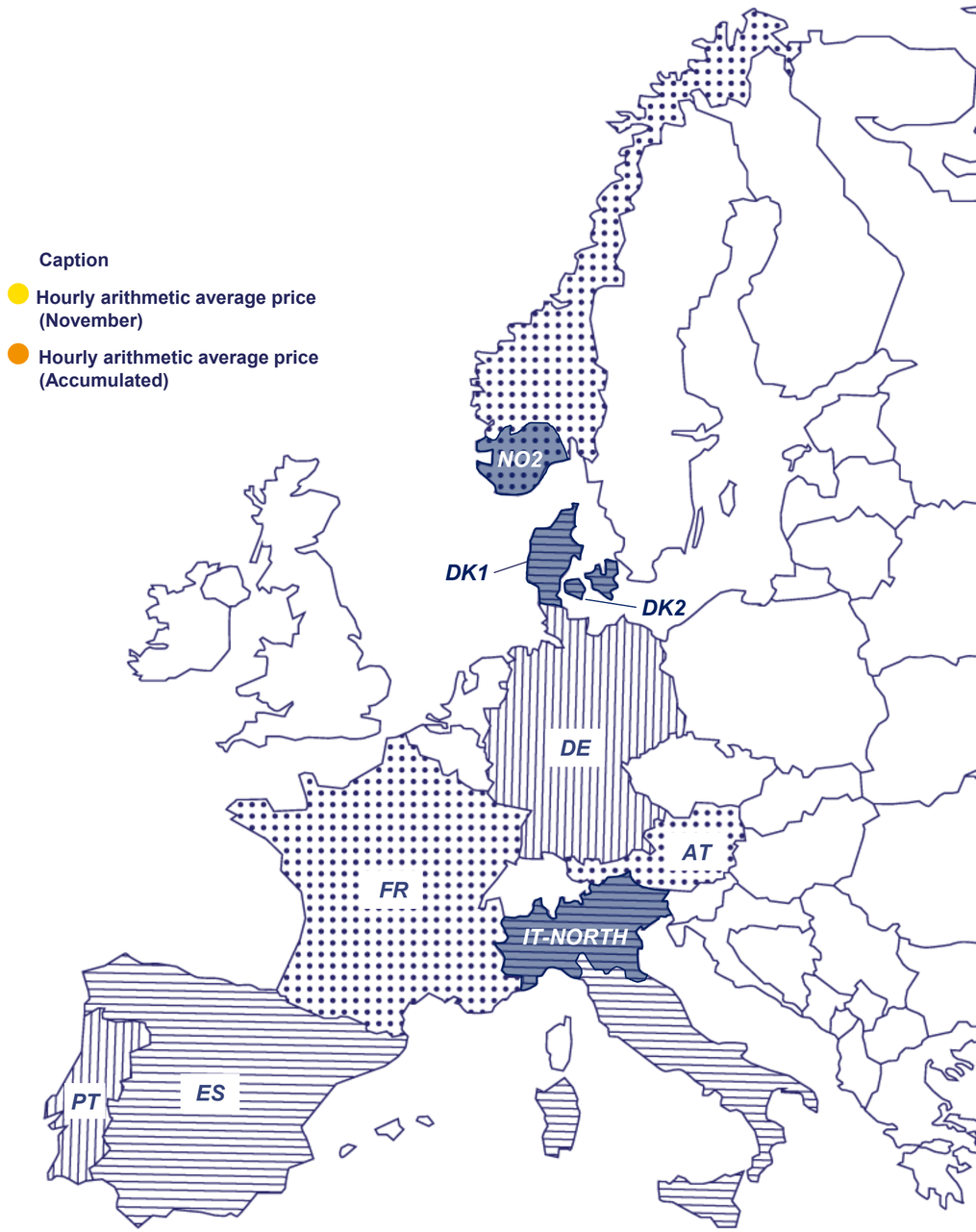
▽ MINIMUM PRICES (NOV)

		€/MWh
1º	Spain	-0.3
2º	France Portugal	0.0
3º	Denmark^{DK1}	4.3

△ MAXIMUM PRICES (NOV)

		€/MWh
1º	Germany	386.9
2º	Denmark^{DK2}	376.3
3º	Denmark^{DK1}	374.9

Portugal €/MWh	59.1	65.0
Spain €/MWh	58.7	64.1
France €/MWh	59.1	60.3
Italy$^{IT-NORD}$ €/MWh	118.3	116.2
Germany €/MWh	103.0	89.1
Austria €/MWh	116.6	97.2
Denmark^{DK1} €/MWh	92.9	81.0
Denmark^{DK2} €/MWh	93.7	82.5
Norway^{NO2} €/MWh	80.0	66.5



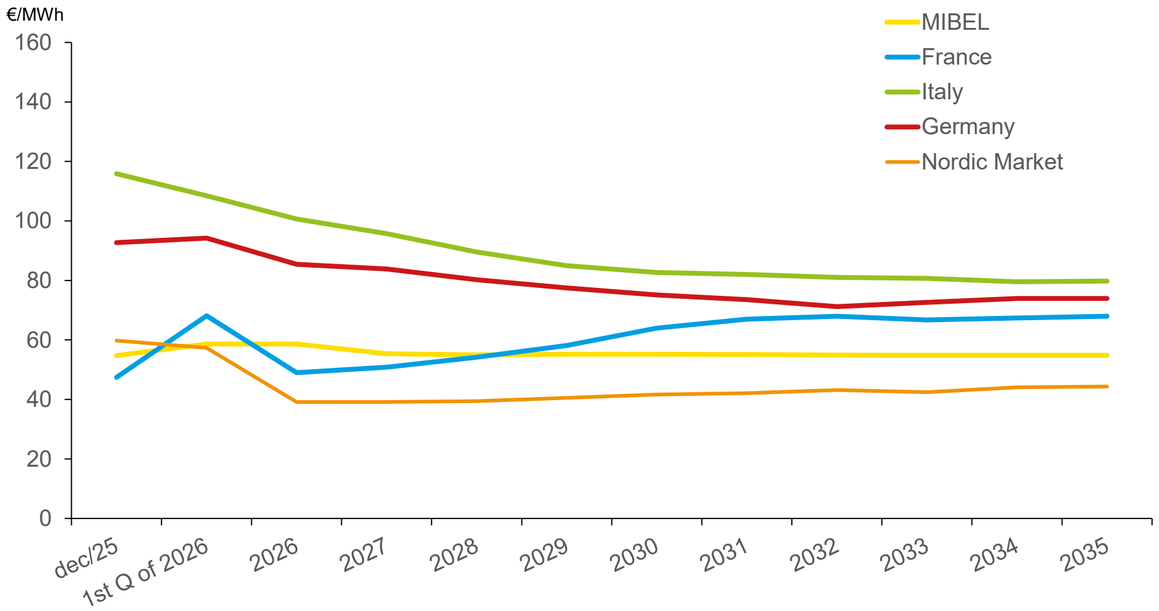
Source: ENTSO-E. OMIE, APREN Analysis
Note: given recent changes in the data reporting format by the ENTSO-E platform, the price values presented correspond to the bidding zones, when applicable. As such, in the case of Italy, Denmark and Norway only the bidding zones with interconnection with neighbouring countries were considered.
* Due to the unavailability of information on the OMIE platform, it is currently not possible to provide data regarding market closing technologies.

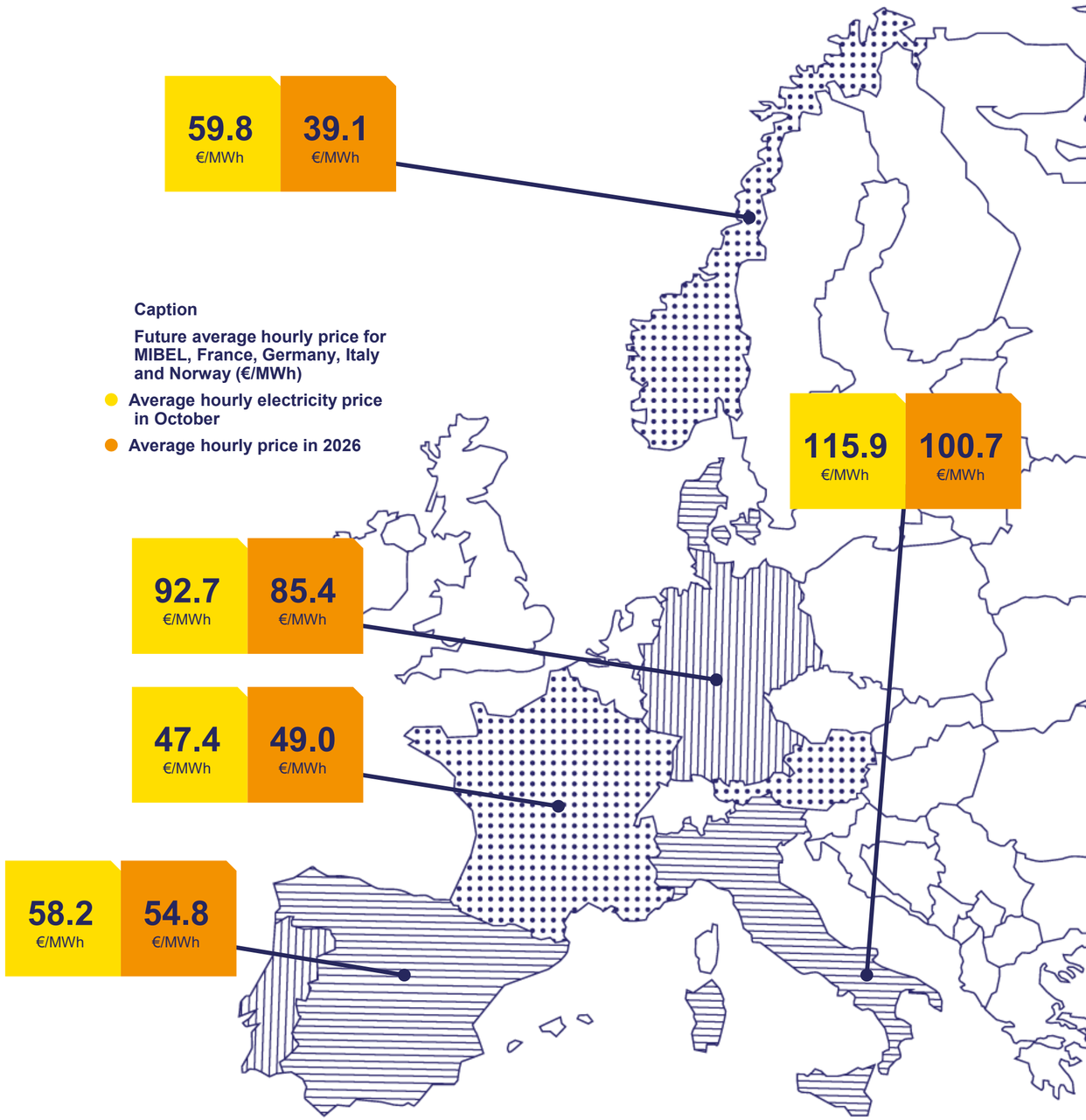
ELECTRICITY MARKET FUTURES

In the European futures market panorama, example is provided for the **average hourly price** values for next month (December) and next year (2026), according to the records for a specific day[e].

At the time of collection, in December 2025, MIBEL will be the third lowest electricity futures market. From a long-term perspective, and according to the data for the selected day[e], MIBEL will have the second lowest values **until 2035**, due to investment in renewable production.

The evolution of the average hourly future price shown is calculated based on electricity purchase and sale contracts. However, it should be emphasized that the respective volumes traded represent very low quantities when compared to the countries' consumption.





[e] values updated as of 3rd of December.

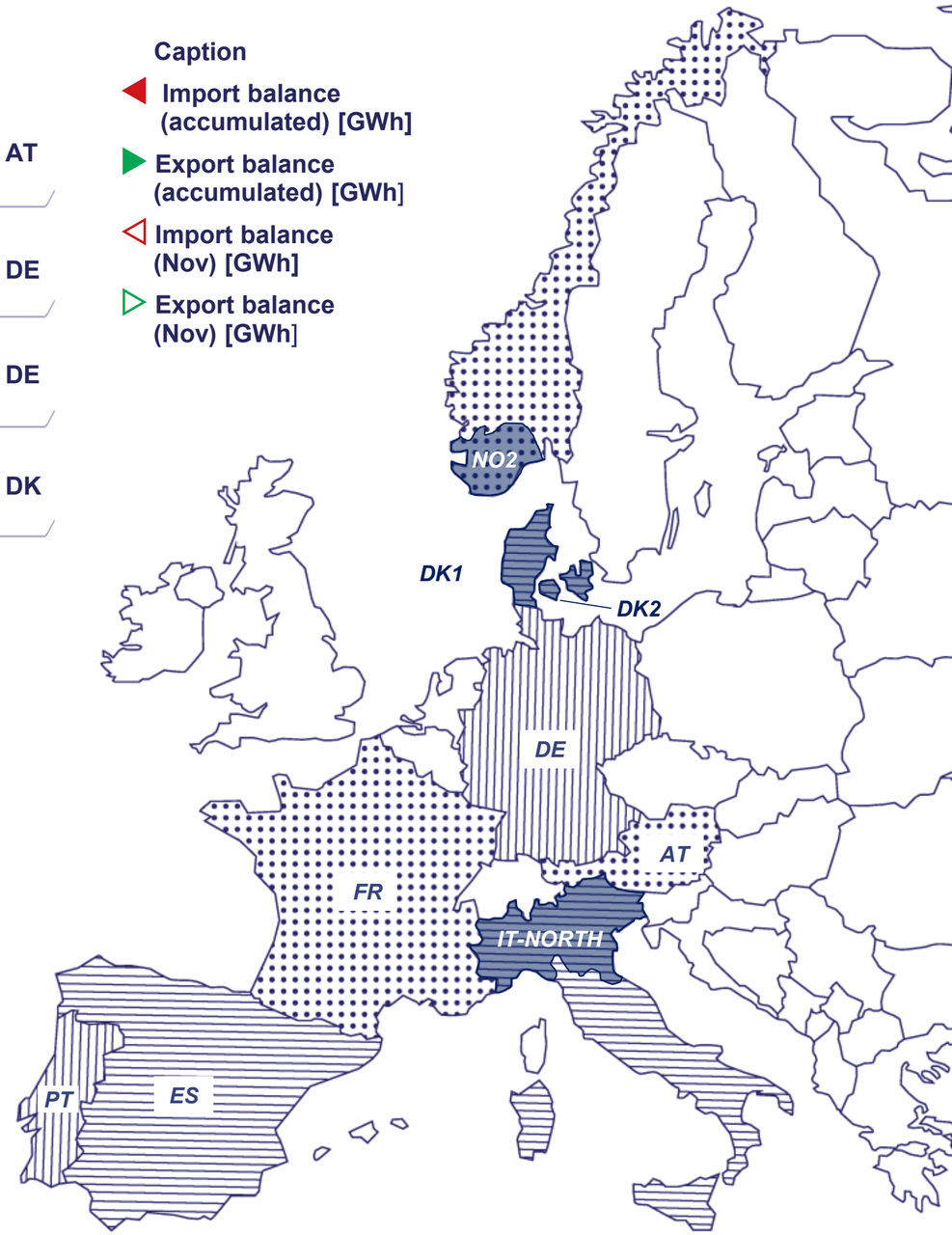
Source: OMIP, EEX, APREN Analysis

INTERNATIONAL TRADES
EUROPE

Between 1st of January and 30th of November 2025, the electricity system in mainland Portugal recorded **electricity imports** equivalent to 12,369 GWh and **exports** of 3,820 GWh.

Up until this month, Portugal was characterized as an electricity **importer**, with a **balance** of 8,549 GWh.

PT	8,549	820	ES	DE	6,562	1,268	AT
ES	3,382	316	MA	DK	6,614	937	DE
FR	384	39	ES	NO	6,179	808	DE
IT	22,162	2,367	FR	NO	6,360	552	DK
DE	17,577	2,288	FR				



MAIN INDICATOR FOR PT-ES INTERCONNECTION

usage	3.5% (Nov)	PT-ES	8.6% (Jan-Nov)	36.6% (Nov)	ES-PT	39.5% (Jan-Nov)
congestion	0.0% (Nov)	PT-ES	0.8% (Jan-Nov)	3.3% (Nov)	ES-PT	9.1% (Jan-Nov)
market split	5.1% (Nov)	PT-ES	20.8% (Jan-Nov)	60.8% (Nov)	MIBEL-FR	68.7% (Jan-Nov)

Source: ENTSO-E, OMIE, APREN Analysis
Note: given recent changes in the data reporting format by the ENTSO-E platform, the price values presented correspond to the bidding zones, when applicable. As such, in the case of Italy, Denmark and Norway only the bidding zones with interconnection with neighbouring countries were considered.

POWER PRODUCTION EMISSIONS

Between 1st of January and 30th of November 2025, **specific emissions** reached 59.4 gCO_2-eq/kWh, giving total emissions from the electricity generation sector of 2.63 $MtCO_2$-eq.

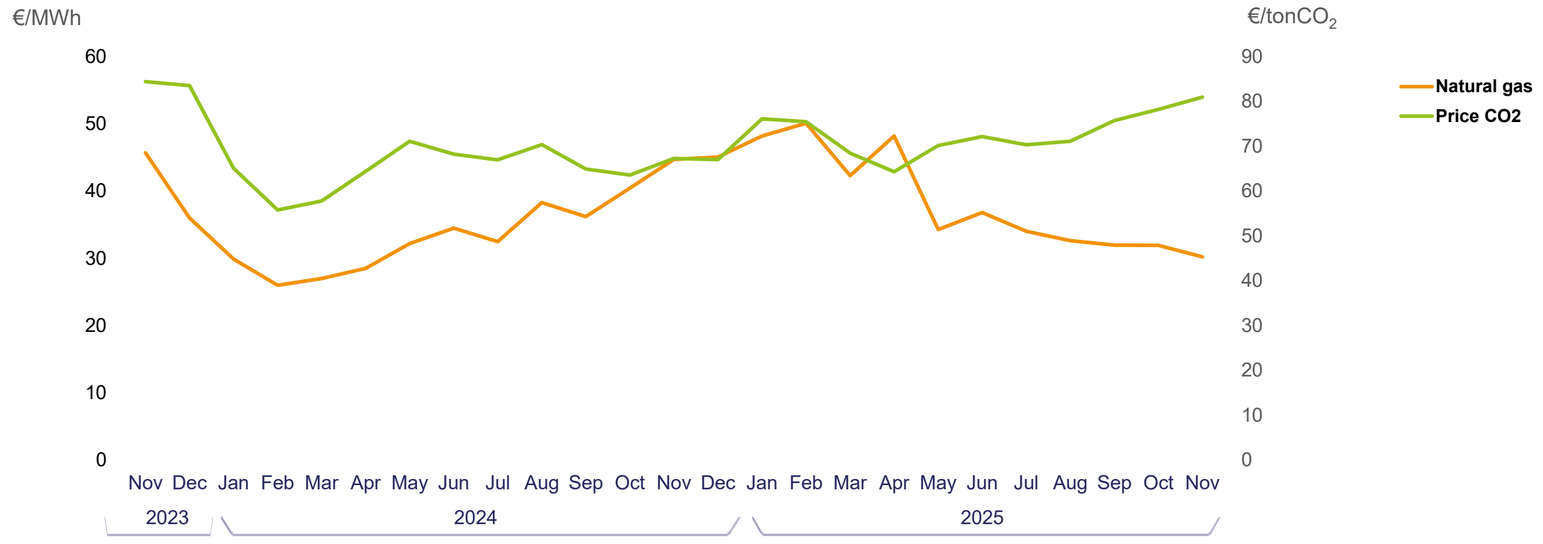
The **European CO_2 Emissions Trading Scheme (ETS)** recorded a price of 73.0 €/tCO_2[d], which represents an increase of 12.2% compared to the same period in 2024.

2.63
$MtCO_2eq$
SECTOR'S EMISSIONS

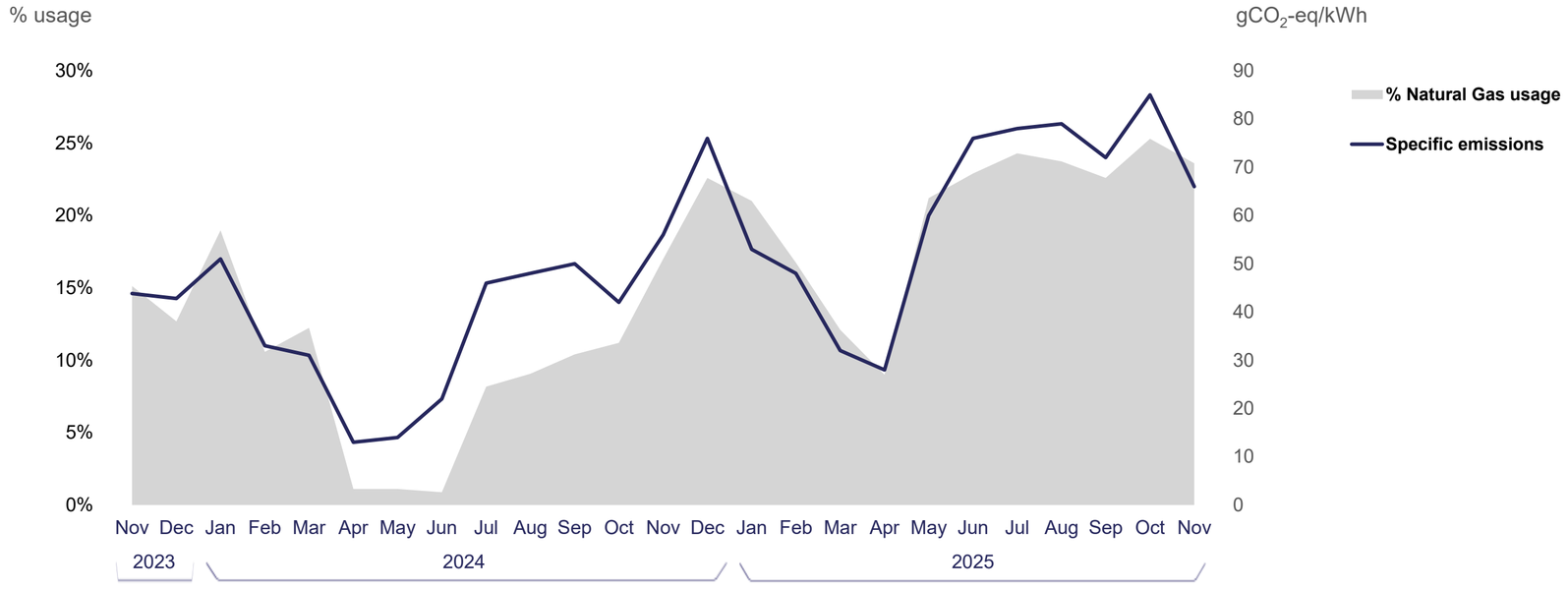
41.4
%
▼
COMPARED TO NOV 2024 [Accumulated]

73.0
€/tCO_2
AVERAGE ALLOWANCE PRICE

12.2
%
▲
COMPARED TO NOV 2024 [Accumulated]



Price of CO_2 allowances in the ETS and price of natural gas in Europe (Nov-2023 to Nov-2025).
Source: SendeCO2, WorldBank, REN



Specific emissions from the electricity sector in mainland Portugal, % use of coal and natural gas power stations (Nov-2023 to Nov-2025).
Source: REN, DGEG, ERSE, APREN Analysis

[d] Arithmetic mean of the hourly prices
Source: OMIE, MIBGAS.

SIMULATION OF PRICE FORMATION WITHOUT SPECIAL REGIME PRODUCTION (PRE)

RENEWABLES HAVE AVOIDED:

The indicators below identify the savings achieved by the **Order of Merit** between the 1st of January and the 30th of November of 2025 given the contribution of special regime production (PRE).

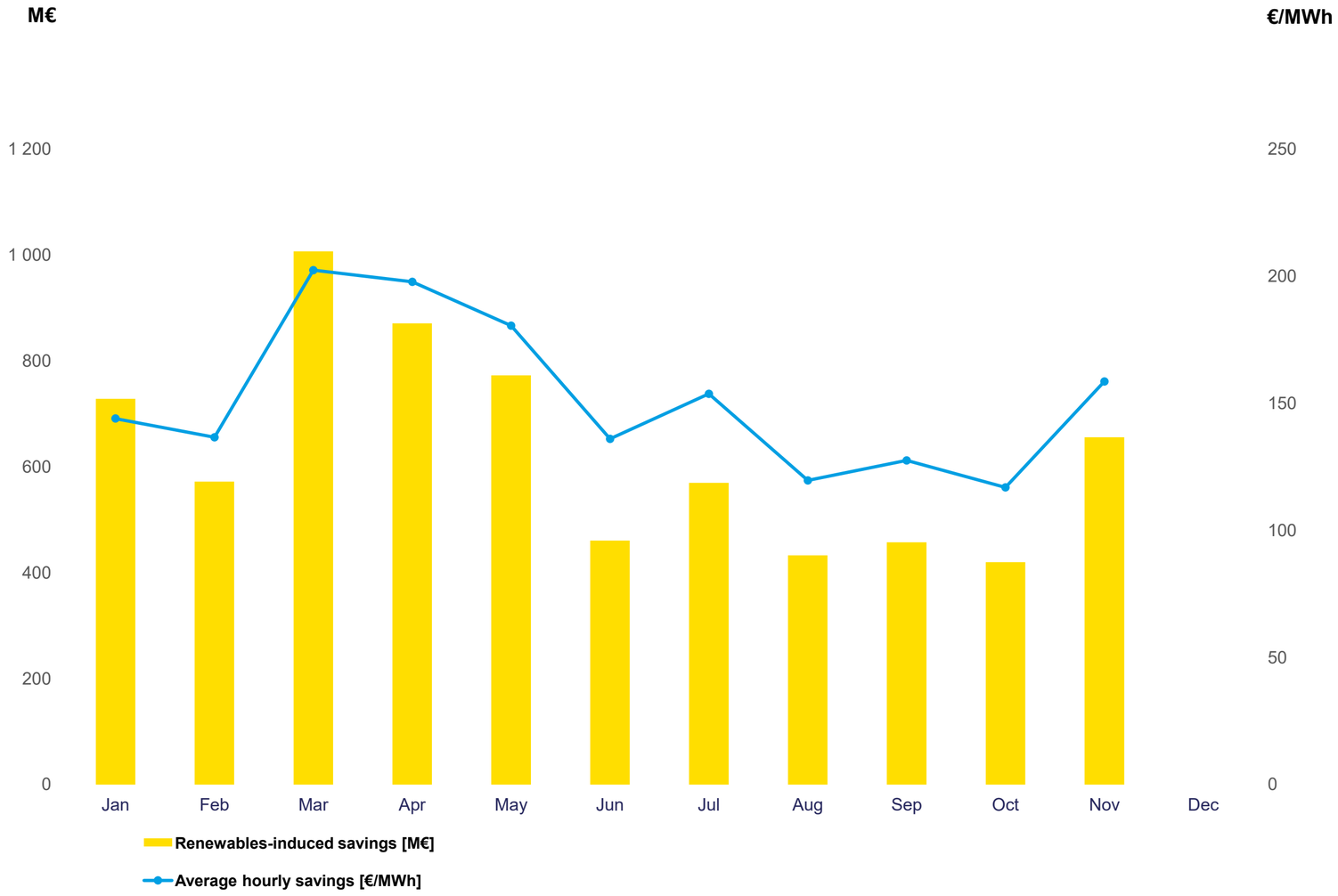
This study is carried out for PRE, which includes all installed fossil cogeneration power. Considering that the capacity equivalent to this technology within PRE is residual and that the other technologies are renewable, the figures are close to the real savings generated by renewables.

152.2
€/MWh

AVERAGE HOURLY SAVINGS (Accumulated)

6,950
M€

CUMULATIVE SAVINGS (Accumulated)



Disclaimer: This analysis is carried out using a program developed by APREN, based on the Deloitte calculation method.

ENVIRONMENTAL SERVICE

RENEWABLES AVOIDED:

The indicators below identify the **savings** achieved between the 1st of January and the 30th of November of 2025 in natural gas, CO_2 emissions and CO_2 emission allowances, because of incorporating renewables into electricity generation.

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

61 M€ — NATURAL GAS IMPORTS (Oct)

68 M€ — ELECTRICITY IMPORTS (Oct)

0.9 $Mtco_2eq$ — CO_2 EMISSIONS (Oct)

61 M€ — CO_2 ALLOWANCES (Oct)

811 M€ — NATURAL GAS IMPORTS (Accumulated)

766 M€ — ELECTRICITY IMPORTS (Accumulated)

9.8 $Mtco_2eq$ — CO_2 EMISSIONS (Accumulated)

640 M€ — CO_2 ALLOWANCES (Accumulated)

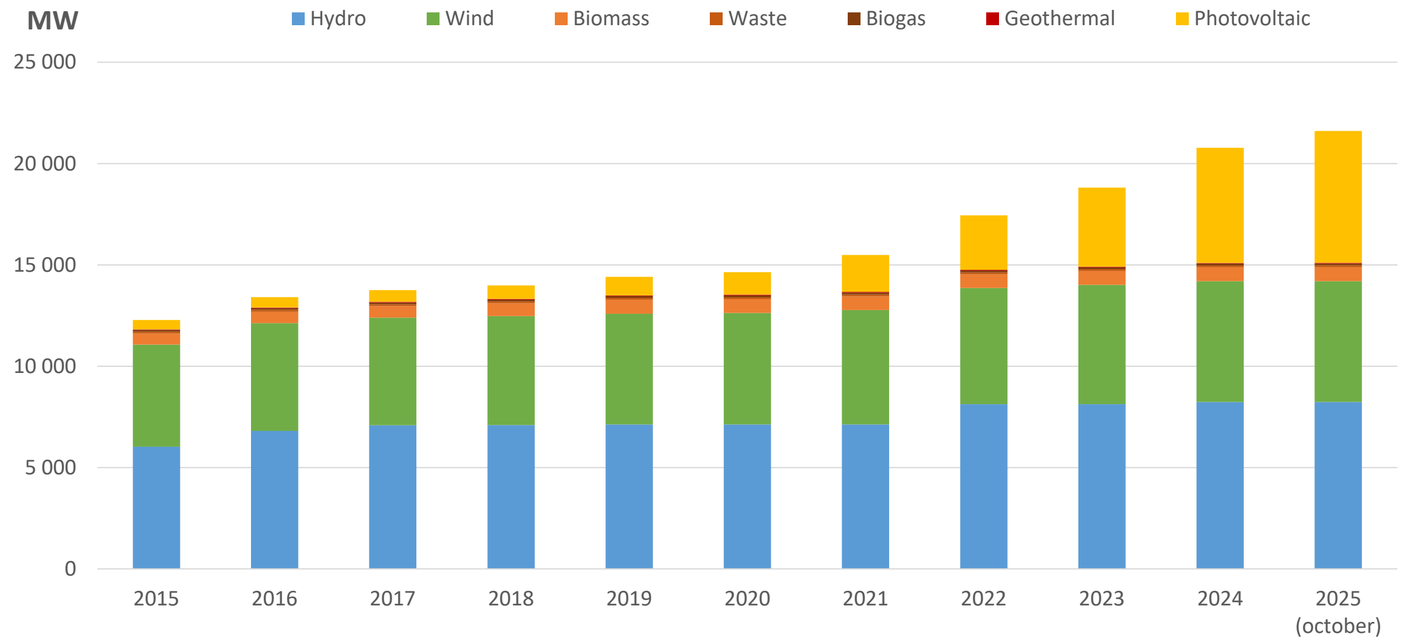
Source: OMIE, APREN Analysis

RENEWABLE INSTALLED CAPACITY
PORTUGAL

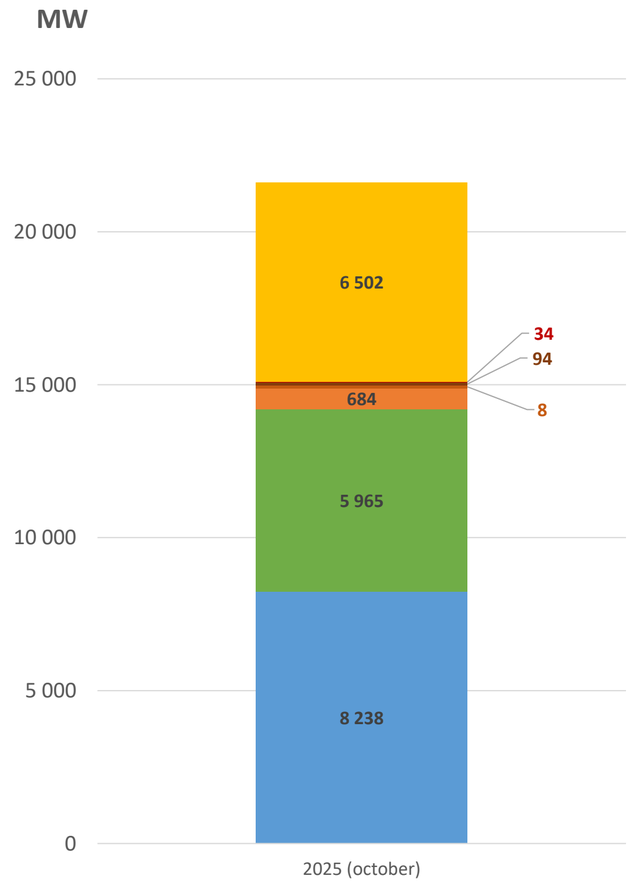
From 2015 to 2025 (October), installed renewable capacity increased by 9,323 MW, representing growth of 75.9%.

From December 2024 to October 2025, installed capacity increased by 828 MW, especially solar photovoltaic technology, which grew by 379 MW in the centralized component and 447 MW in the decentralized component.

At the end of October 2025, renewable capacity accounted for around 78.8% of total installed capacity in Portugal.



OCTOBER 2025



Source: DGEG, APREN Analysis
Nota: information available at the source with one month of delay to the month under analysis.

2025

APREN
DEPARTAMENTO TÉCNICO E COMUNICAÇÃO

Av. da República 59 – 2º andar
1050–189 Lisboa
(+351) 213 151 621

apren@apren.pt
apren.pt

APREN Associação de Energias Renováveis