2024

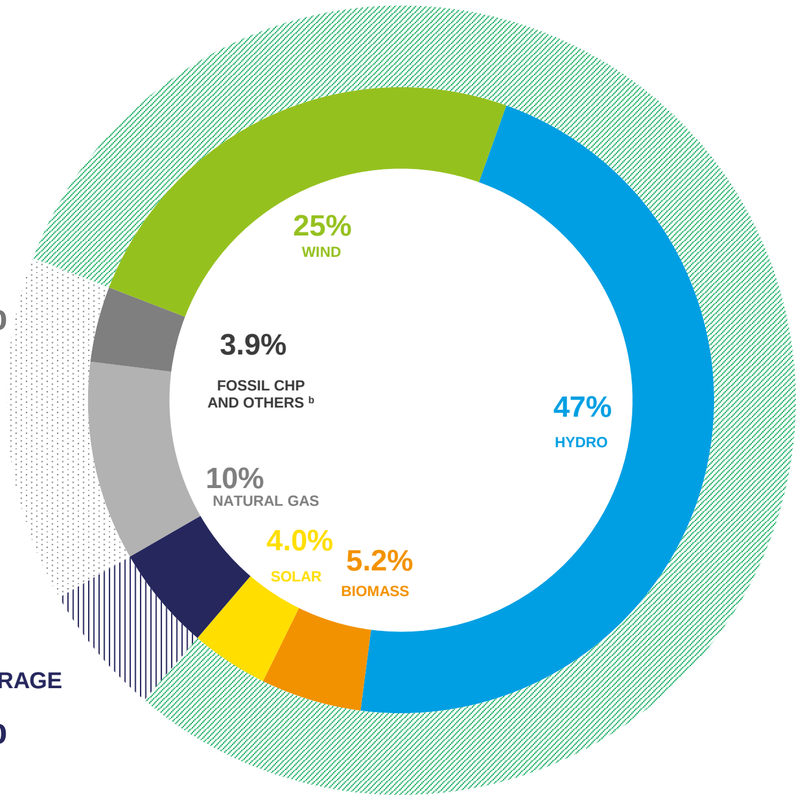
BOLETIM ELETRICIDADE RENOVÁVEL

JANUARY
2024

PORTUGAL PRECISA
DA NOSSA ENERGIA.

APREN Associação de Energias Renováveis

EXECUTIVE SUMMARY
GENERATION (JAN)



RENEWABLE
80.4%

WIND	1,221 GWh	HYDRO	2,319 GWh
BIOMASS	257 GWh	SOLAR	201 GWh
PUMPED STORAGE	269 GWh	NATURAL GAS	512 GWh
FOSSIL CHP AND OTHERS[b]	192 GWh		

MAIN INDICATORS (JAN)

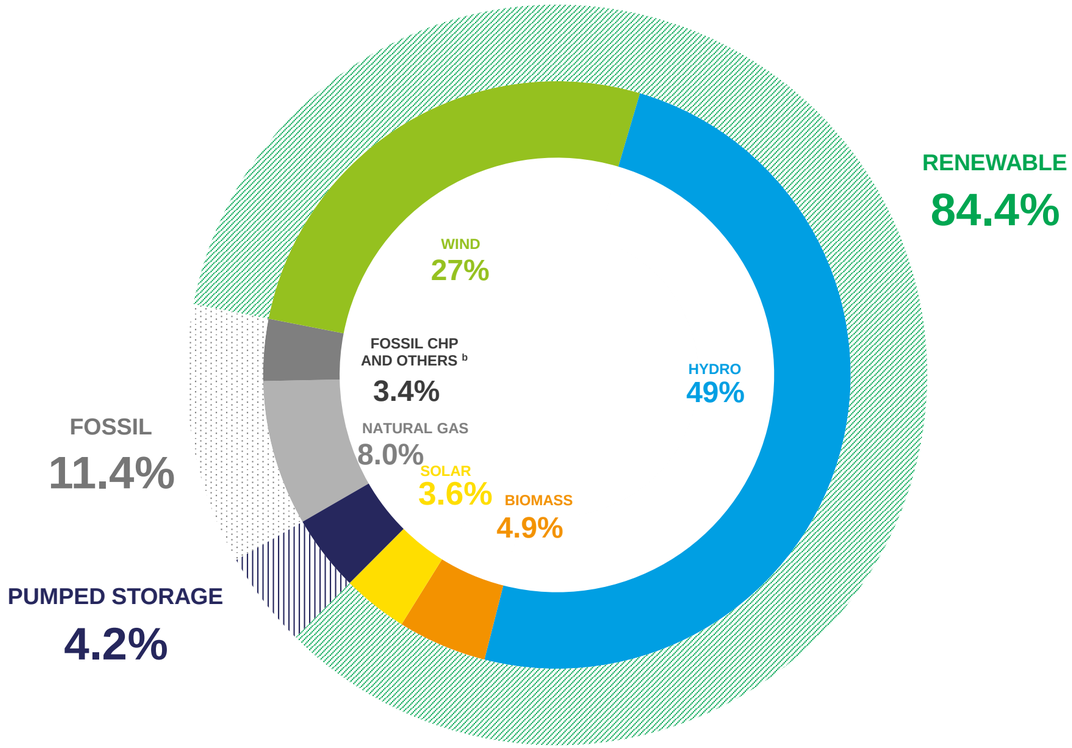
GWh	€/ MWh	€/ tCO_2	$MtCO_2$ - eq	GWh	gCO_2 eq/kWh
4,972	74.1	65.1	0.3	248	50.9
Generation[a]	MIBEL PT Price	CO_2 Price	CO_2 Emissions	Import Balance	CO_2 Specific Emissions

[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.
Source: REN, APREN Analysis

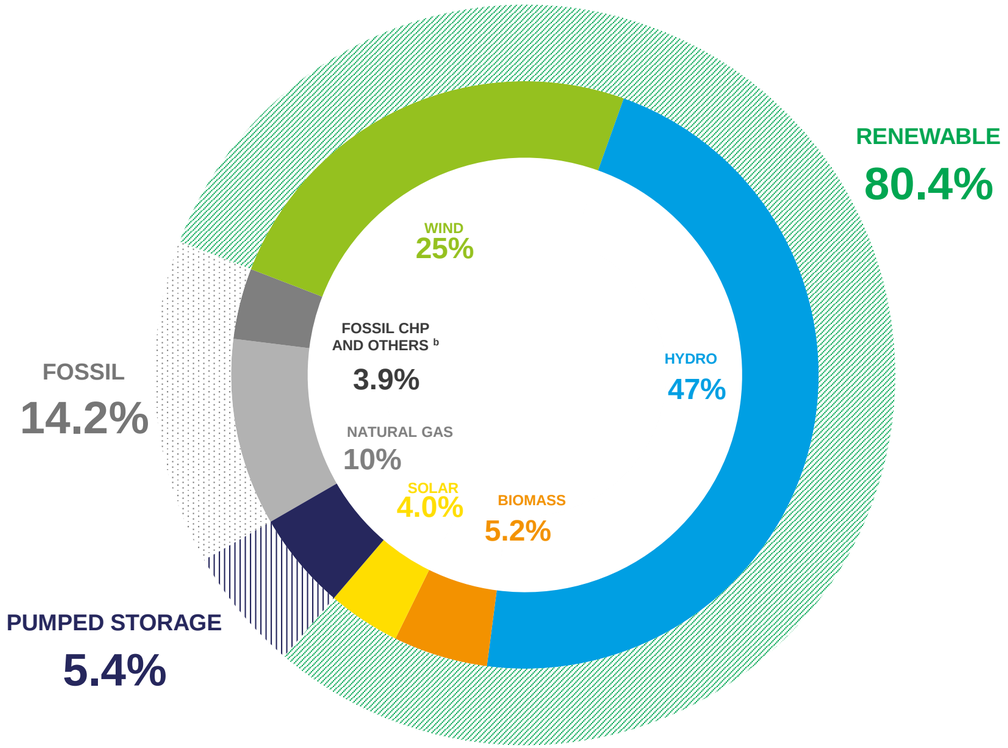
[b] Includes fuel oil, diesel, the non-biodegradable fraction of MSW and new waste

EXECUTIVE SUMMARY

JANUARY'S GENERATION 2023



JANUARY'S GENERATION 2024



MAIN INDICATORS COMPARED WITH JANUARY 2023

▼ 7.4%	GWh 4,972 Generation[a]	▼ 4.0%	% 80.4 Incorporation
▲ 1.5%	GWh 5,220 Consumption[c]		

0.88	Wind index	1.30	Hydro index	0.85	Solar index

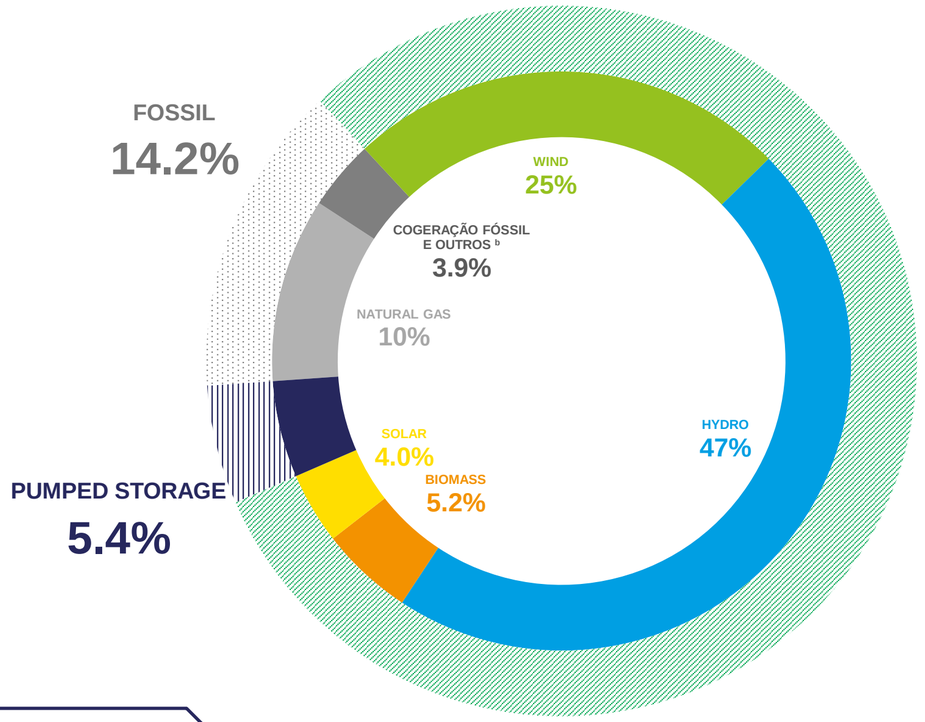
[a] Generation refers to the net energy generation of the power stations, taking into account the pumping production recently disclosed by REN. Production from pumping is not included in the percentage of production from renewable sources.
Source: REN, APREN Analysis

[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, taking into account the import-export balance.
Source: REN, APREN Analysis

MONTHLY ANALYSIS IN PORTUGAL
JANUARY

Between 1st and 31st January 2024, renewable incorporation was 80.4%, with a total of 3,998 GWh produced. The 4.0% reduction compared to January 2023 is due to a substantial reduction in wind and hydro power production, the most notable being the first one, which saw a reduction of 11.3%, producing 1,415 GWh in January 2023 compared to 1,221 GWh in January 2024.



ELECTRICITY SECTOR INDICATORS (COMPARED TO JANUARY 2023)

GWh
4,972
Generation [a]
▼ 7.4%

GWh
5,220
Consumption [c]
▲ 1.5%

%
80.4
Renewable incorporation
▼ 4.0%

Wind index
0.88

Hydro index
1.30

Solar index
0.85

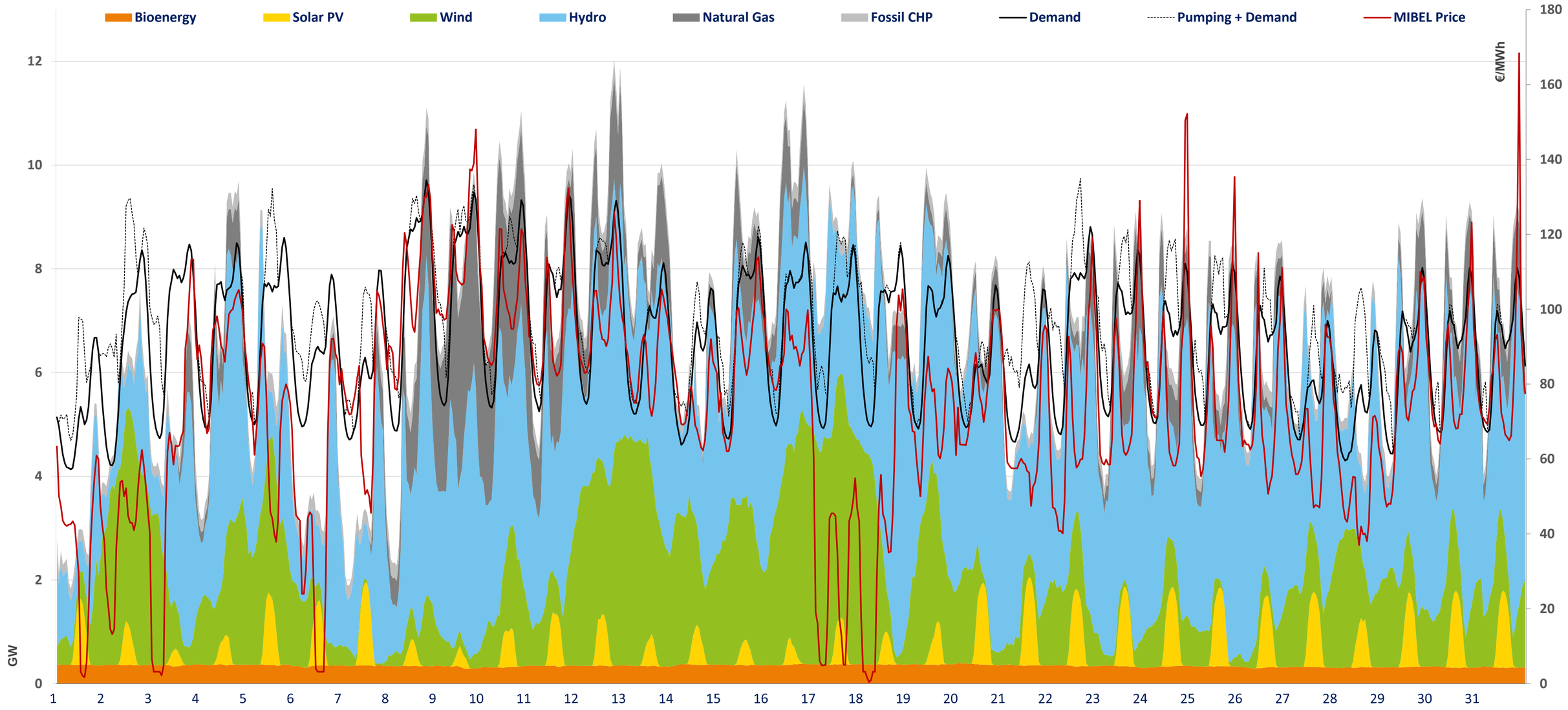
Storage in dams
79.7%

[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.
Source: REN, APREN Analysis

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

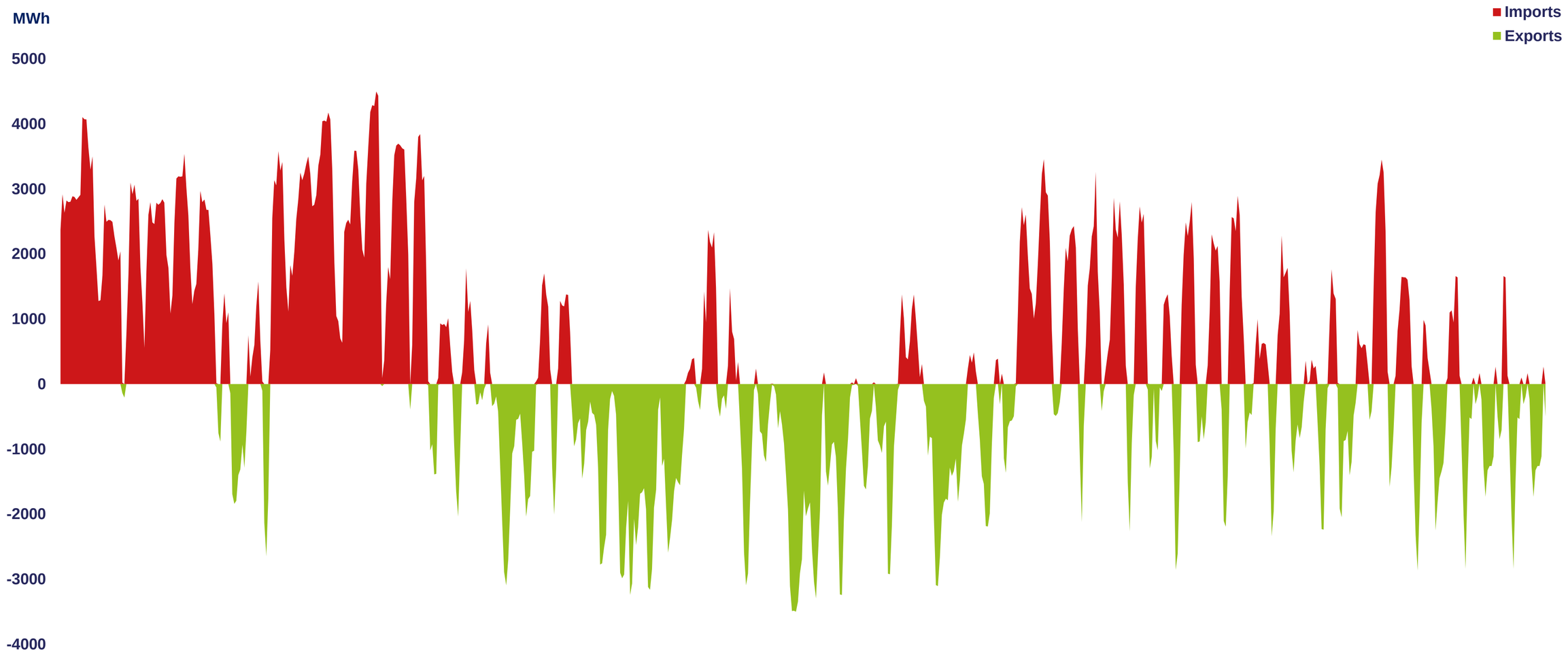
[c] Consumption refers to the net generation of energy by power stations, taking into account the import-export balance.
Source: REN, APREN Analysis

MONTHLY ANALYSIS IN PORTUGAL:
JANUARY 2024 LOAD DIAGRAM



MONTHLY ANALYSIS IN PORTUGAL:

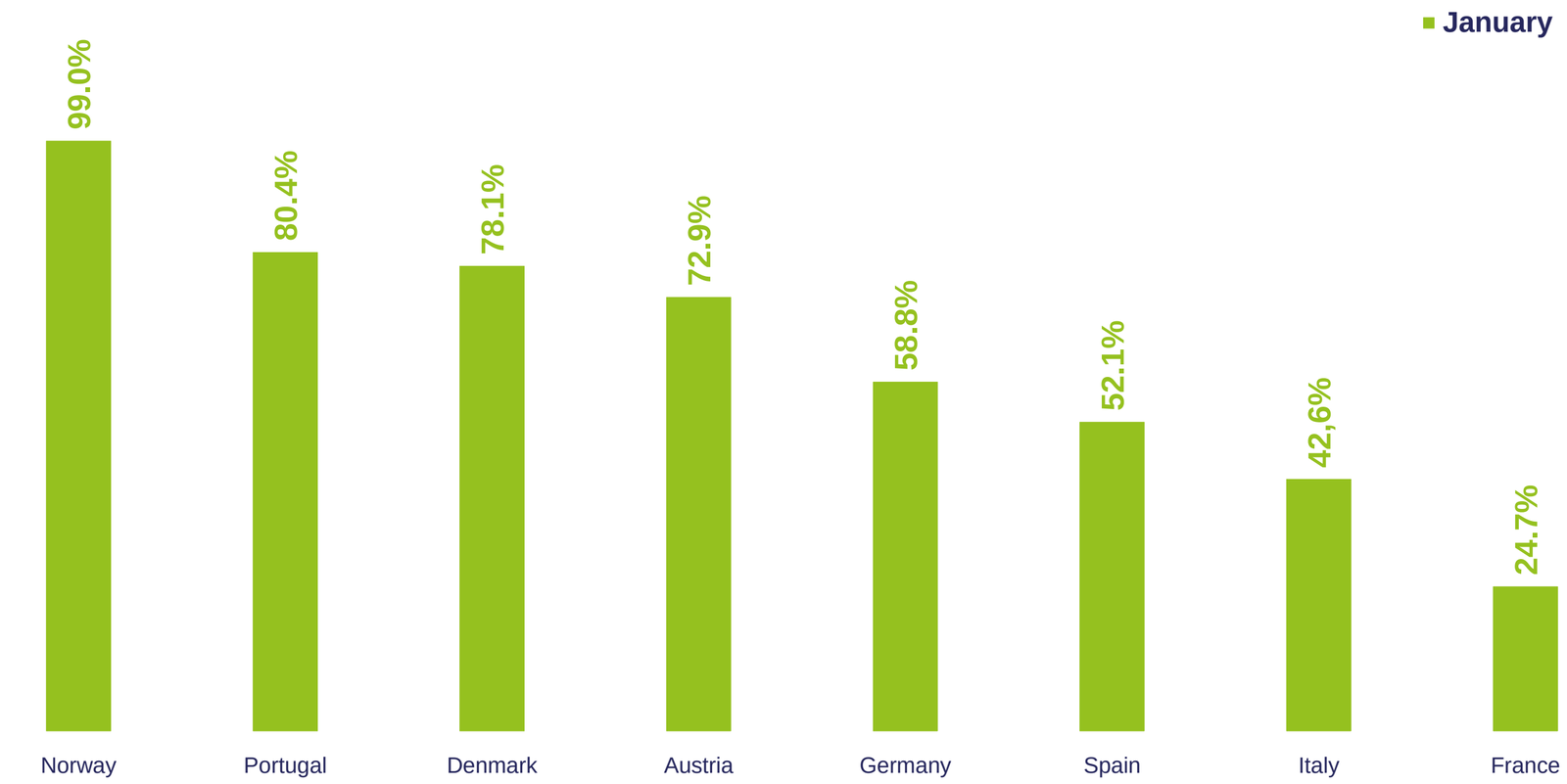
DIAGRAM OF IMPORTS AND EXPORTS IN PORTUGAL



RENEWABLE ELECTRICITY
EUROPA

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

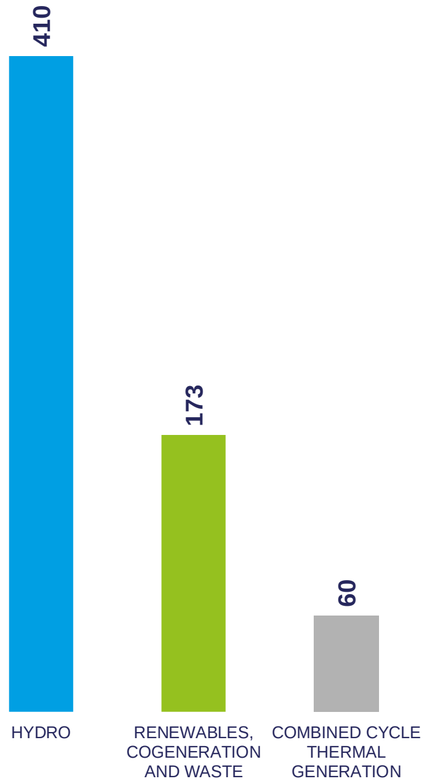
Between 1 and 31 January 2024, Portugal was the country with the second highest share of renewable energy in electricity generation, behind Norway, which obtained 99.0% from RES.



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

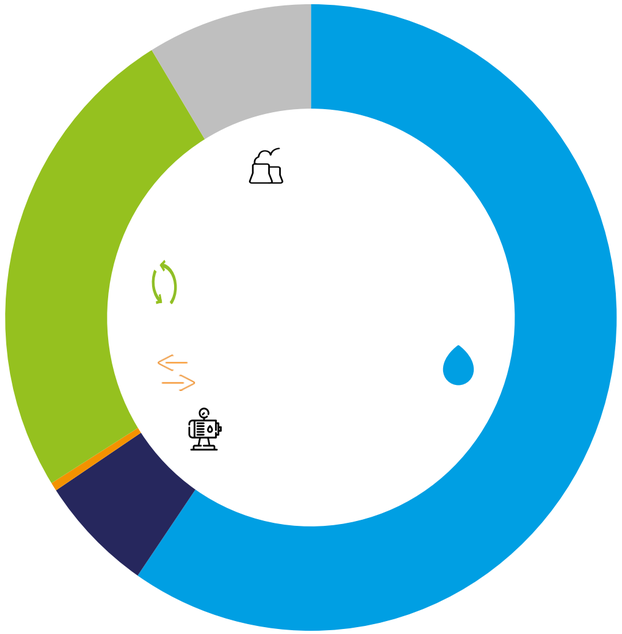
MARKET PRICE SETTING
PORTUGAL

Between 1 and 31 January, the technology that closed the market for the most hours was hydro, with 410 non-consecutive hours, followed by renewables, cogeneration and waste with 173 hours, and combined cycle thermal generation with 60 hours.



Number of market closing hours for the three main closing technologies (Jan).
Source: OMIE, APREN Analysis

JANUARY 2024



HYDRO 60%

PUMPED STORAGE 6,1%

FOSSIL CHP AND OTHERS* 8,7%

RENEWABLES, COGENERATION AND WASTE 25%

IMPORTS 0,4%

Percentage distribution of the number of hours of market closure for the various technologies, totalling 744 hours (Jan).
Source: OMIE, APREN Analysis

ELECTRICITY MARKET
PORTUGAL

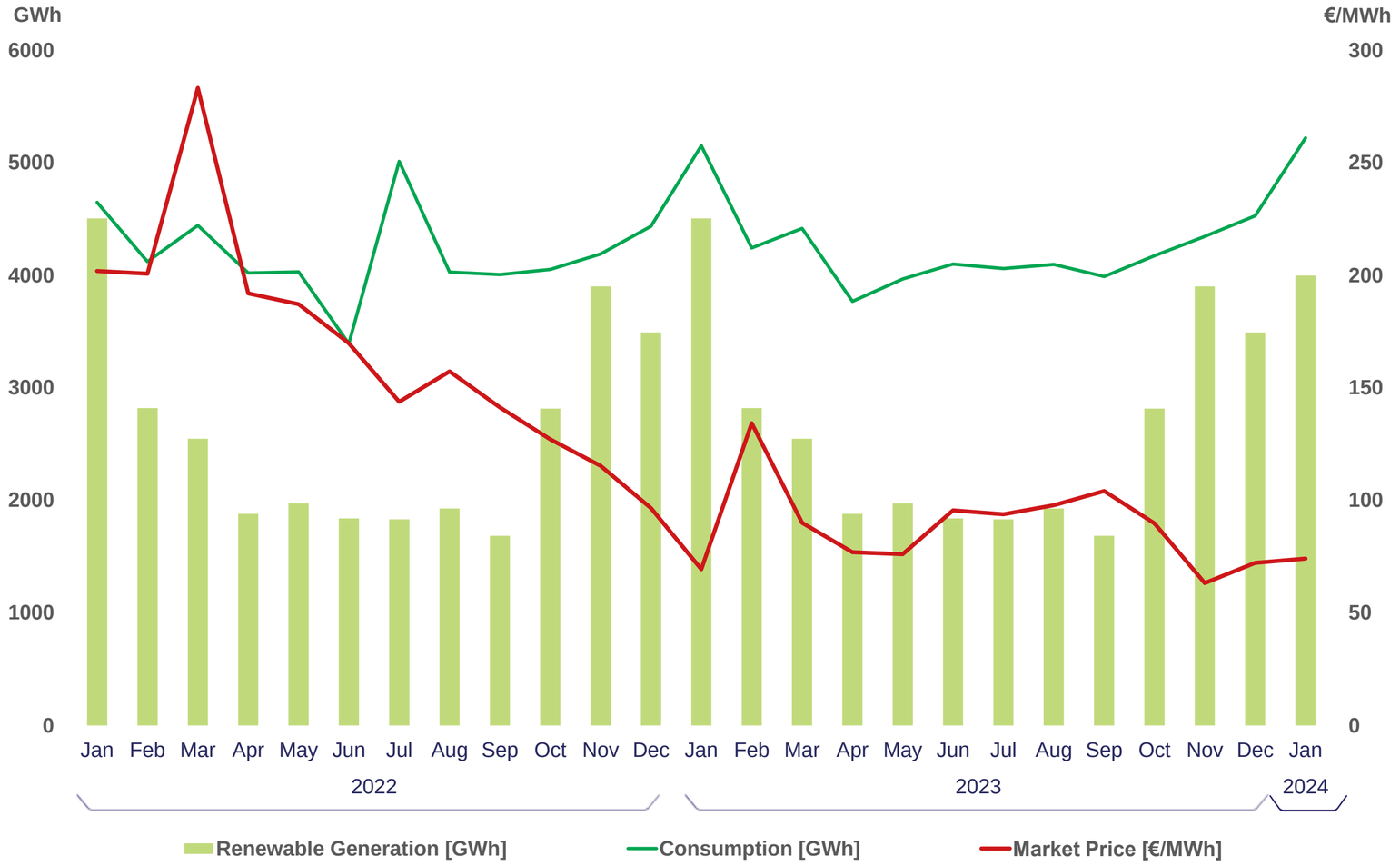
Between 1 and 31 January, the average hourly price recorded on MIBEL in Portugal (74.1 €/MWh) represented an increase of 6.8% compared to the same period last year. In the same period, 225 non-consecutive hours were recorded in which renewable generation was sufficient to supply mainland Portugal's electricity consumption, with an average hourly price in MIBEL of 68.38 €/MWh.

225
Hours

100% RENEWABLE HOURS

68.4
€/MWh

MIBEL'S AVERAGE PRICE (IN 100% RENEWABLE HOURS)



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

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

RENEWABLE ELECTRICITY
EUROPE

During the month of January 2024, there was a minimum hourly price in MIBEL in Portugal of 0.42 €/MWh, where the market closed with Renewables, Cogeneration and Waste. The maximum hourly price was 168.35 €/MWh, where the market closed with Combined Cycle Thermal Cogeneration.

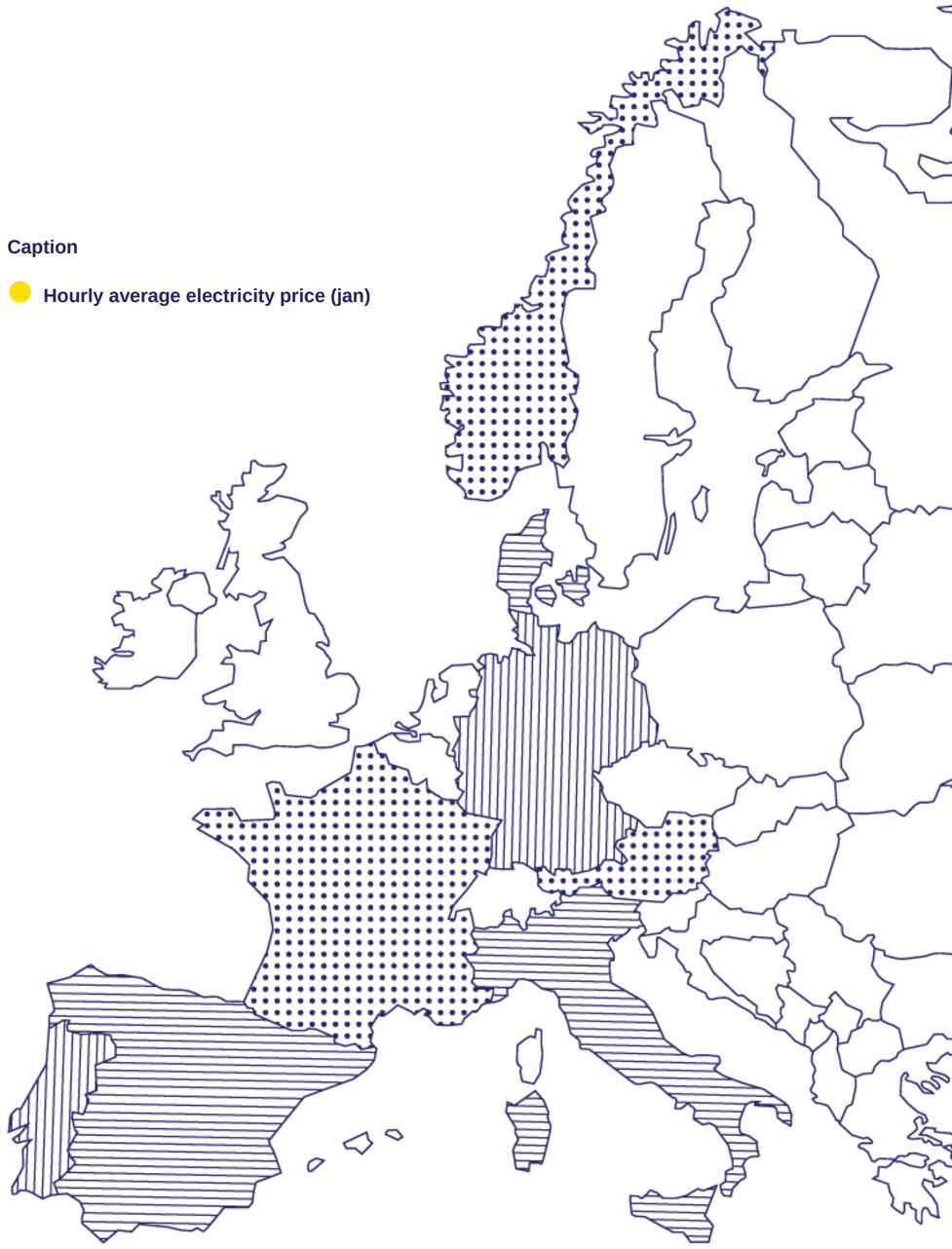
MINIMUM PRICES (JAN)

		€/MWh
1º	Germany	-4,84
2º	France	-0,05
3º	Austria	-0,01

MAXIMUM PRICES (JAN)

		€/MWh
1º	Norway	348,46
2º	Denmark	316,82
3º	France	260,95

	€/MWh
Portugal	73,1
Spain	74,1
France	76,6
Italy	99,3
Germany	76,6
Austria	81,3
Denmark	76,5
Norway	66,6

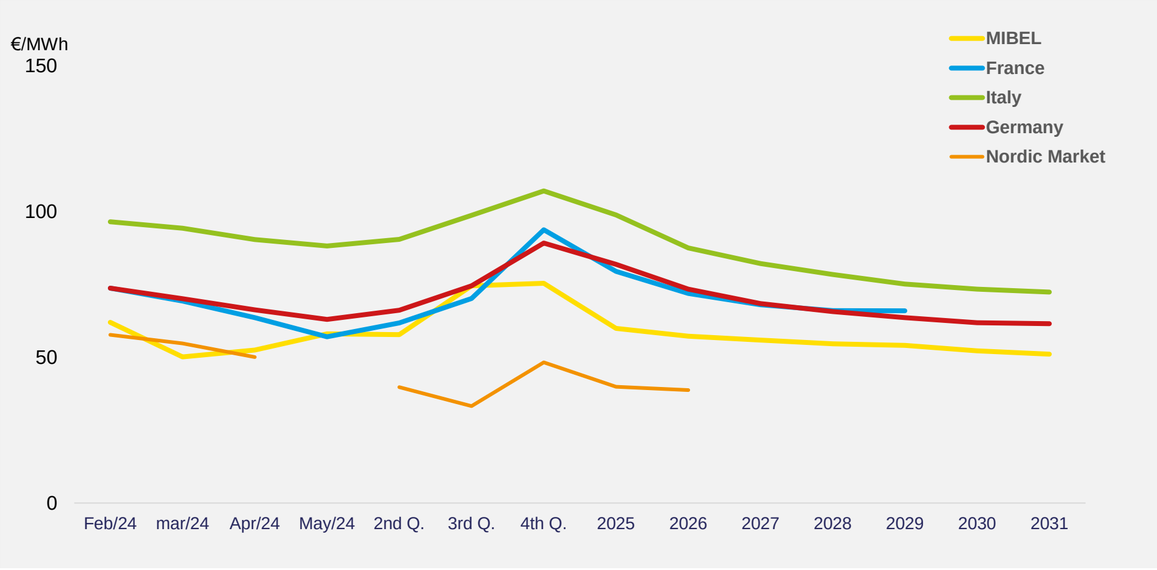


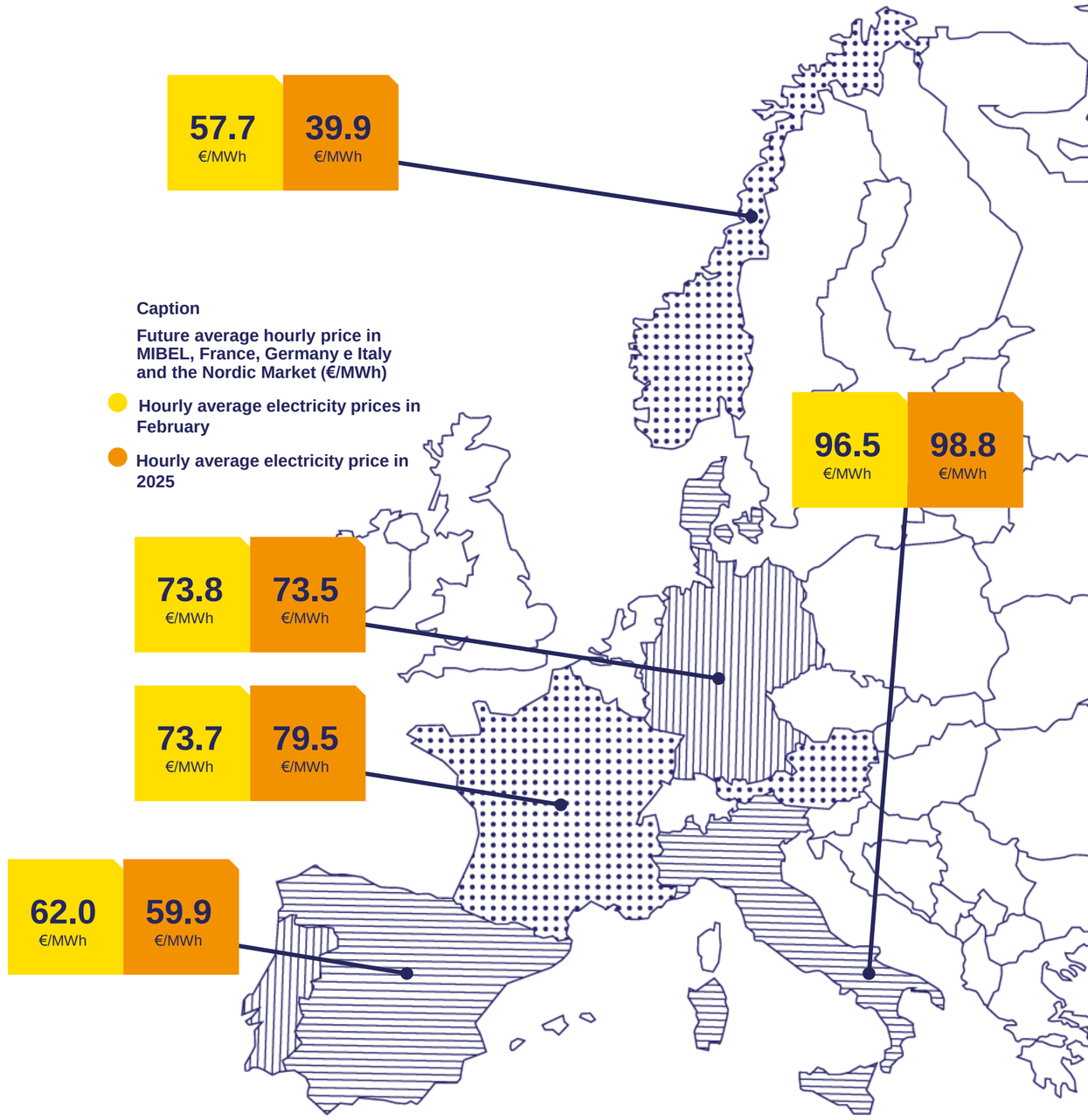
Source: ENTSO-E, OMIE, APREN Analysis

ELECTRICITY MARKET FUTURES

The evolution of the average hourly future price shown is calculated on the basis of electricity[e] purchase and sale contracts. The map on the right shows the price values for next month (February) and next year. In both cases, MIBEL and the Nordic Market have the lowest values, while the Italian market has the highest values in the analysis carried out.

MIBEL has the lowest values until 2031, due to investment in renewable production.





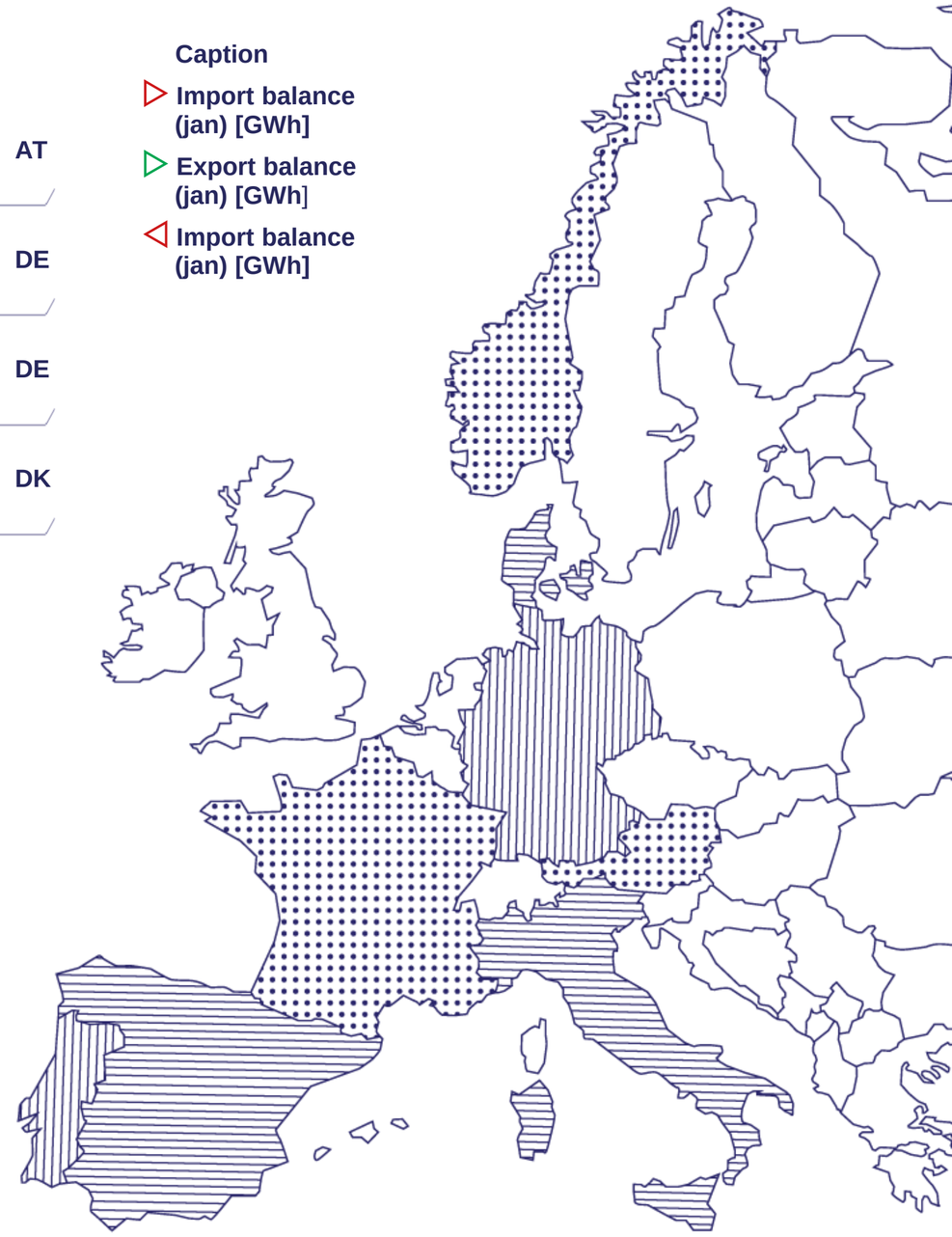
e Updated values in 8th of February.

Source: OMIP, EEX, APREN Analysis

INTERNATIONAL EXCHANGES
EUROPE

Between 1 and 31 January 2024, mainland Portugal's electricity system registered electricity imports equivalent to 770 GWh and exports of 522 GWh, with Portugal being an importer with a balance of 248 GWh.

PT	249 ◁	ES	DE	525 ▷	AT
ES	76 ▷	MA	DK	226 ◁	DE
ES	559 ▷	FR	NO	169 ▷	DE
FR	1 658 ▷	IT	NO	90 ▷	DK
FR	1 424 ▷	DE			



MAIN INDICATORS OF PT-ES INTECONNECTION

Usage	35.2% (jan) PT-ES	42.1% (jan) ES-PT
Congestion	5.3% (jan) PT-ES	4.9% (jan) ES-PT
Market Separation	4.8% (jan) PT-ES	56.6% (jan) MIBEL-FR

Source: ENTSO-E, OMIE, APREN Analysis

POWER SECTOR EMISSIONS

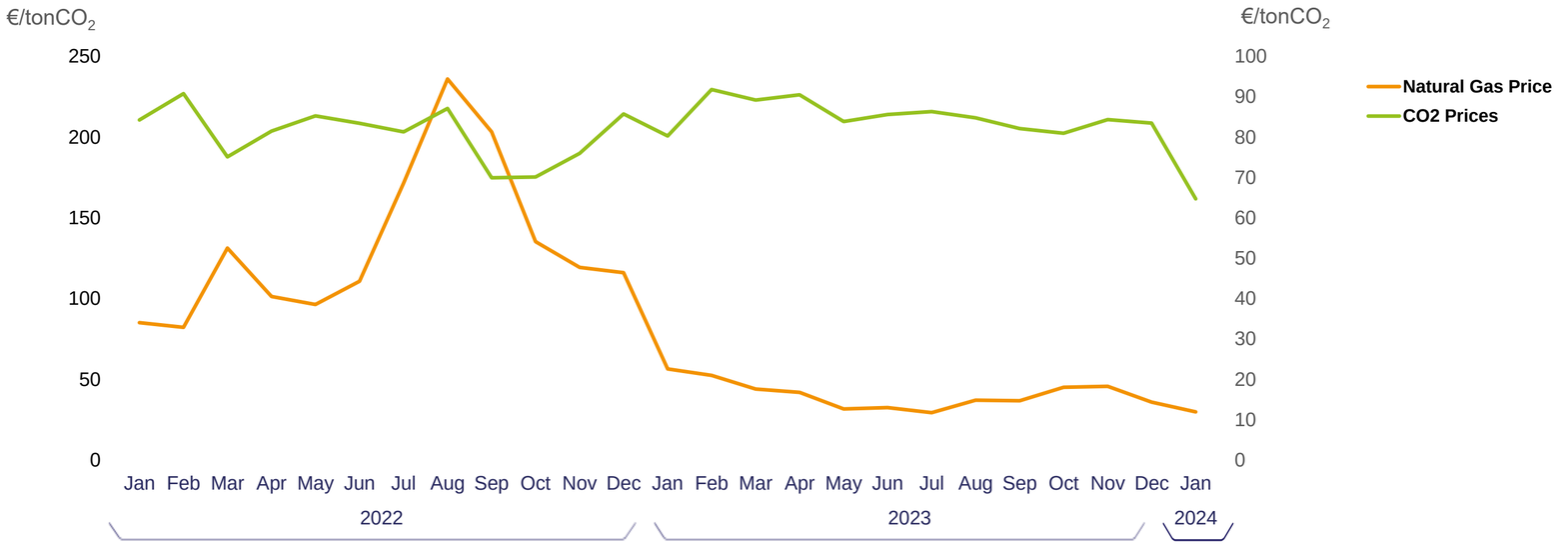
Between 1 and 31 January 2024, specific emissions reached 50.9 gCO_2eq/kWh, making total emissions from the electricity generation sector 0.3 $MtCO_2eq$. The European CO_2 Emissions Trading Scheme (ETS) recorded a price of 65.1 €/tCO_2[d], a reduction of 19.4% compared to the same period in 2023

0.3
$MTOCO_2eq$
SECTOR EMISSIONS

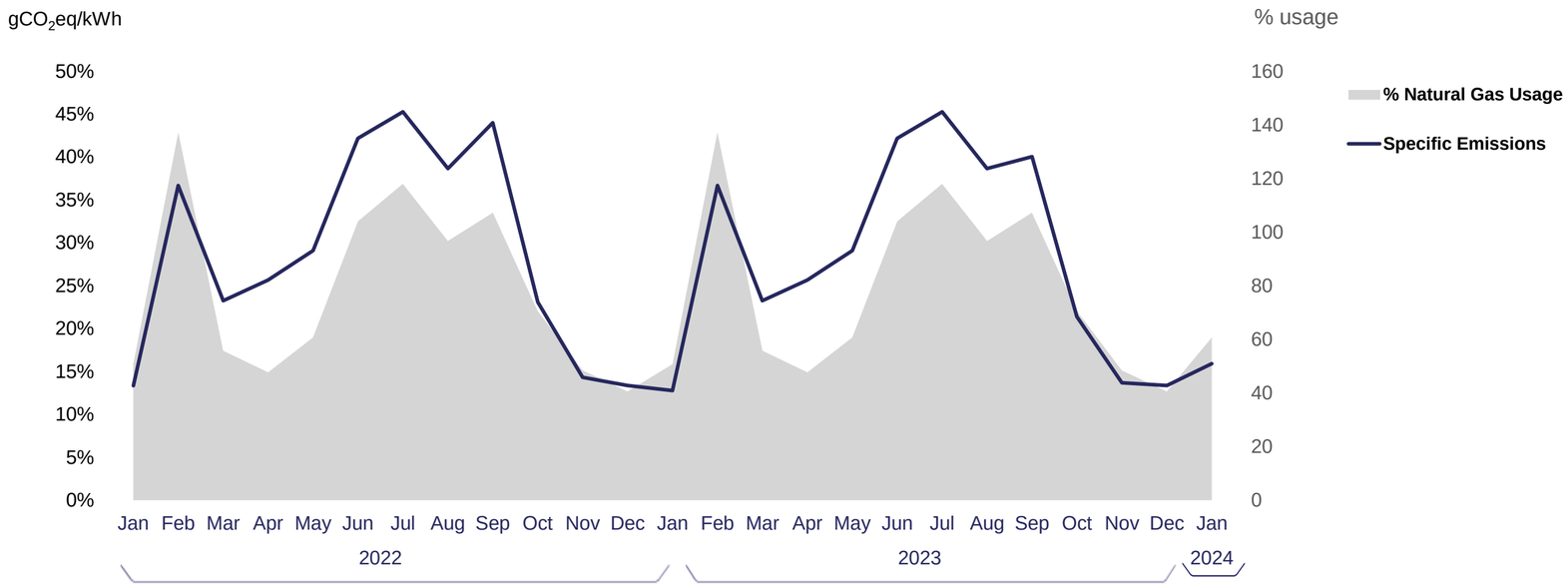
65.1
€/tCO_2
AVERAGE LICENCES PRICES

16
%
▲
IN COMPARISON TO JAN 2023

19
%
▼
IN COMPARISON TO JAN 2023



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



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

[d]arithmetic average of MIBEL's prices.
Source: OMIE, WorldBank.

SIMULATION OF PRICE FORMATION WITHOUT SRP

RENEWABLES HAVE AVOIDED:

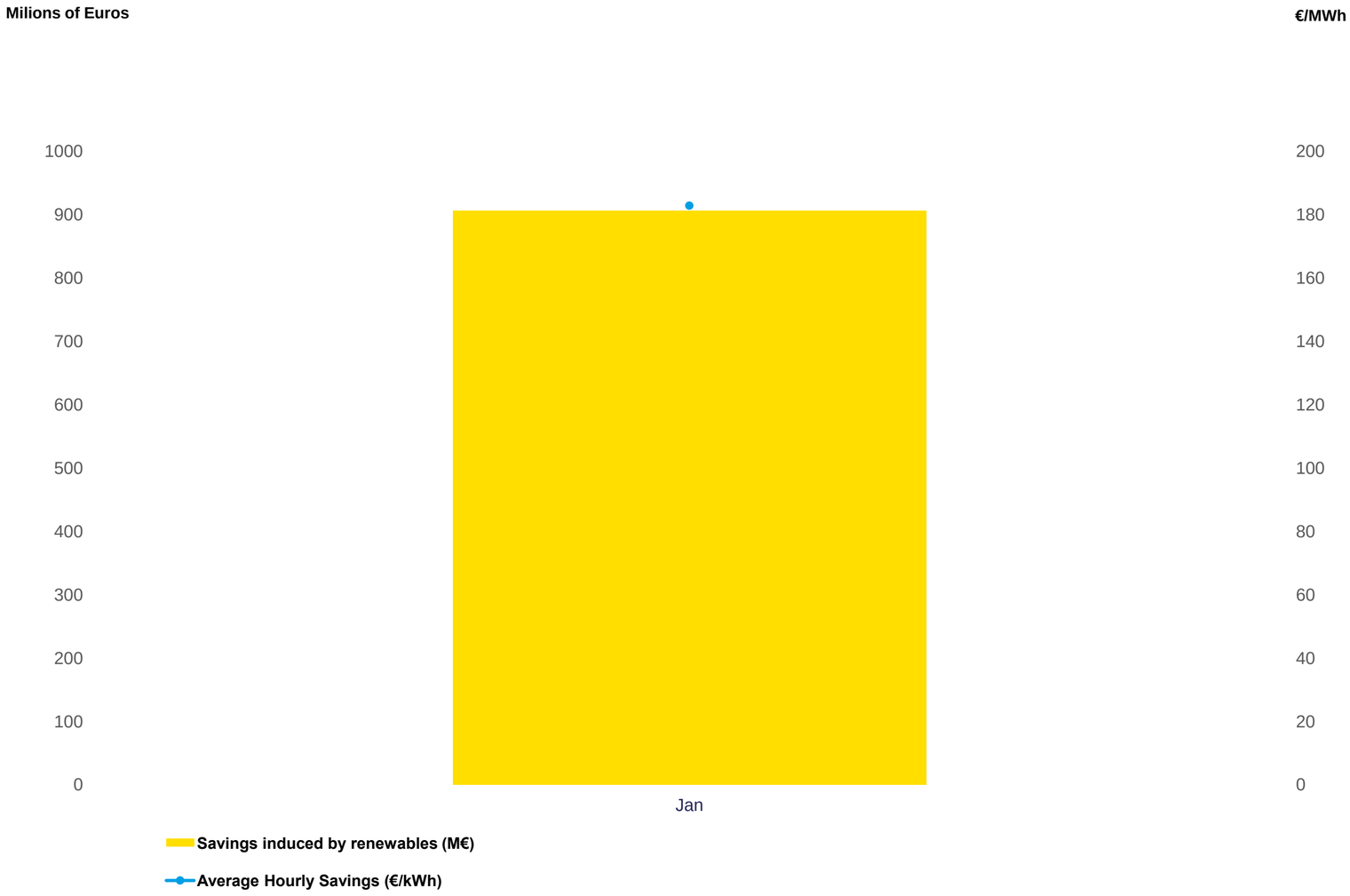
The indicators below identify the savings achieved by the merit order between 1 and 31 January 2024 by the contribution of special regime production (SRP). This study is carried out for SRP, which includes all installed fossil cogeneration power. Bearing in mind that the capacity equivalent to this technology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

182.9
€/MWh

AVERAGE HOURLY SAVING (jan)

906.2
M€

CUMULATIVE SAVINGS (jan)



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

ENVIRONMENTAL SERVICE
RENEWABLES HAVE AVOIDED:

The indicators below identify the savings achieved between 1 and 31 January 2024 in natural gas, CO_2 emissions and CO_2 emission allowances, resulting from 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.

134
M€
IMPORTED NATURAL GAS
(jan)

130
M€
IMPORTED ELECTRICITY
(jan)

1.0
$Mtco_2eq$
CO_2 EMISSIONS
(jan)

53.9
M€
CO_2 ALLOWANCES
(jan)

Source: REN, REE, SendeCO2, WorldBank, DGEG, ERSE, APREN Analysis.
Disclaimer1: To estimate savings on imported natural gas, the WorldBank price for natural gas in Europe was used.
Disclaimer2: The average price on the MIBEL market was used to estimate savings on imported electricity.

2024

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