



20
22

BOLETIM
ELETRICIDADE RENOVÁVEL

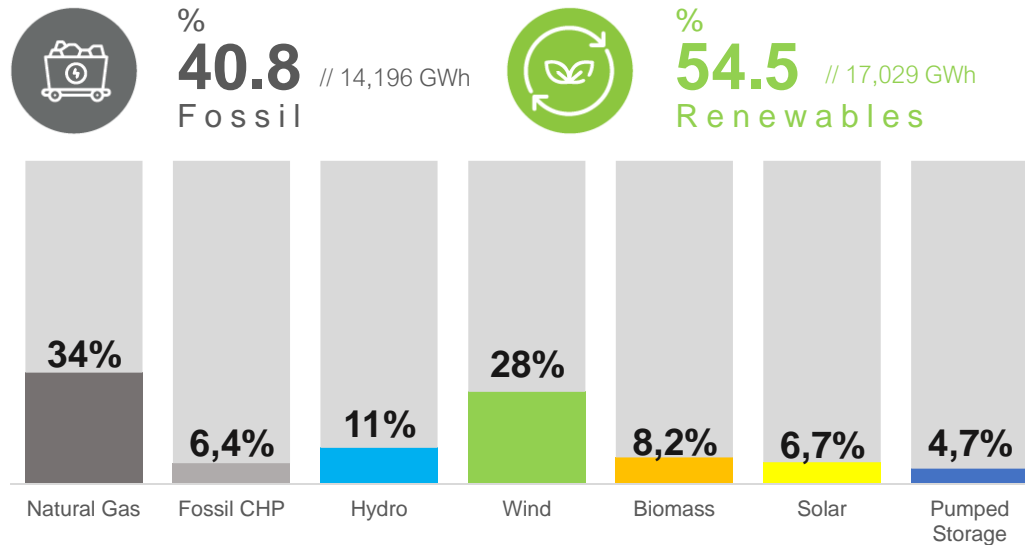
**Portugal precisa
da nossa energia!**

Portugal needs our energy!

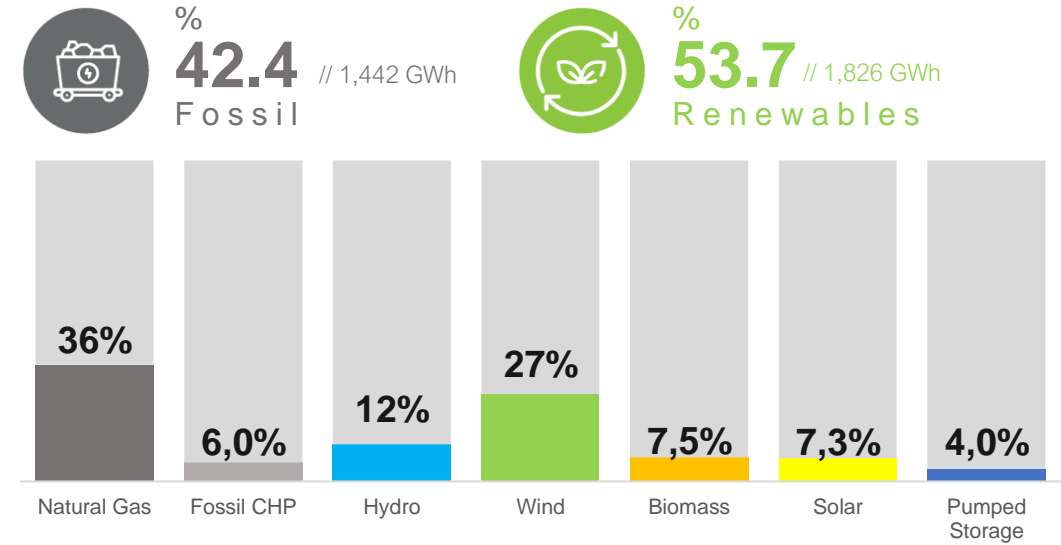


Executive Summary

ACCUMULATED GENERATION (Jan-Sep)



MONTHLY GENERATION (Sep)



ELECTRICITY SECTOR INDICATORS (Jan-Sep)



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

Electricity Generation: Mainland Portugal

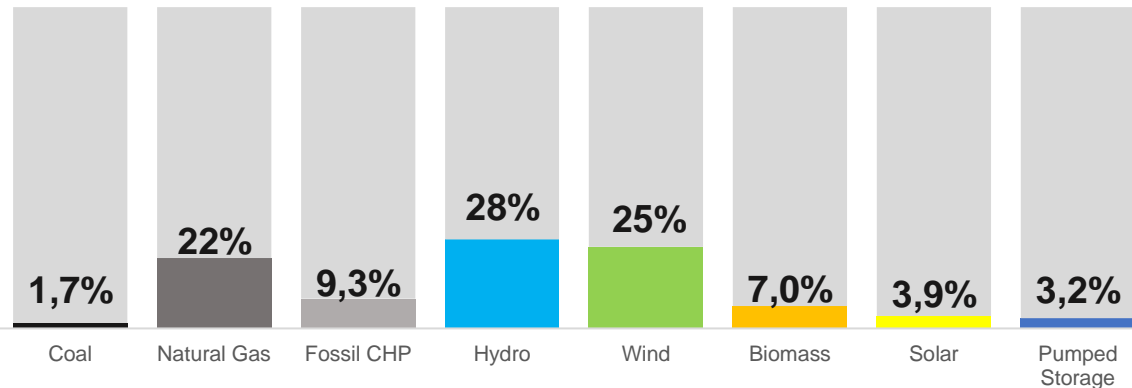
ACCUMULATED SEPTEMBER 2021 (Jan-Sep)



%
32.9 // 12,629 GWh
Fossil



%
63.9 // 22,396 GWh
Renewables



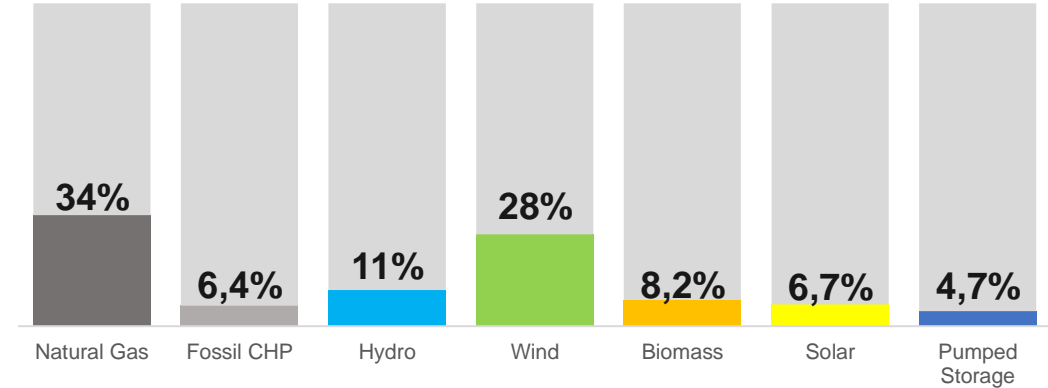
ACCUMULATED SEPTEMBER 2022 (Jan-Sep)



%
40.8 // 14,196 GWh
Fossil



%
54.5 // 17,029 GWh
Renewables



MAIN INDICATORS



GWh
31,225
Generation^a



%
54.5
Renewable
incorporation



GWh
37,705
Consumption^b



0.96
Wind index



0.37
Hydro index



1.10
Solar index

▼ **9.4%**

in comparison to Sep 2021

▼ **12.2%**

in comparison to Sep 2021

▲ **2.8%**

in comparison to Sep 2021

^a Generation refers to the net power generation of the plants, considering the pumping production recently disclosed by REN. Pumping production is not accounted for in the percentage of production from renewable sources.

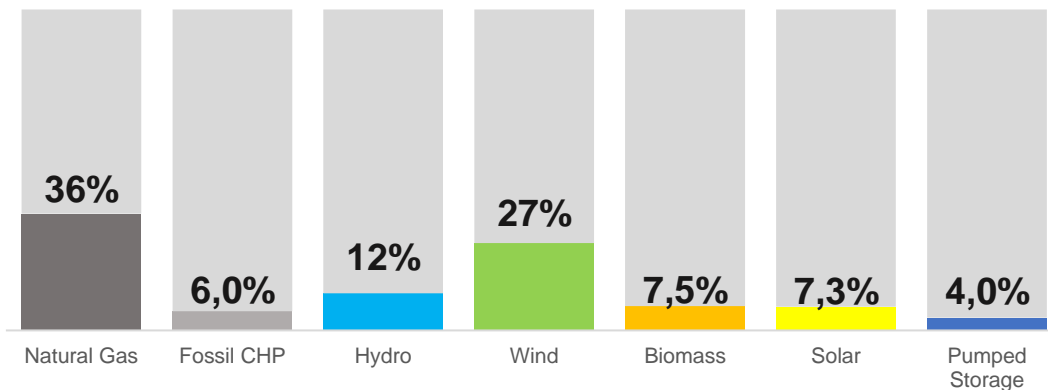
^b Consumption refers to the liquid generation of power of the plants, considering the import-export balance.
Source: REN, Analysis APREN

Monthly analysis in Portugal: September

Between September 1 and 30, 2022, renewable incorporation was 46.8%, totaling 3,403 GWh produced. The decrease of 10.4% compared to September 2021 is mainly due to the decrease in the hydro index, resulting in a sharp decrease in hydro production.

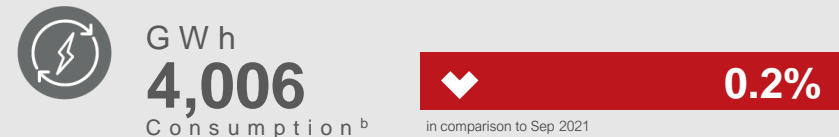
It should also be noted that hydro production and the maximum percentage of storage in dams have increased in comparison with the previous months. However, the values are low when compared to the same period in the last 10 years.

Source: REN, Analysis APREN



Source: REN, Analysis APREN

INDICATORS OF THE ELECTRICITY SECTOR



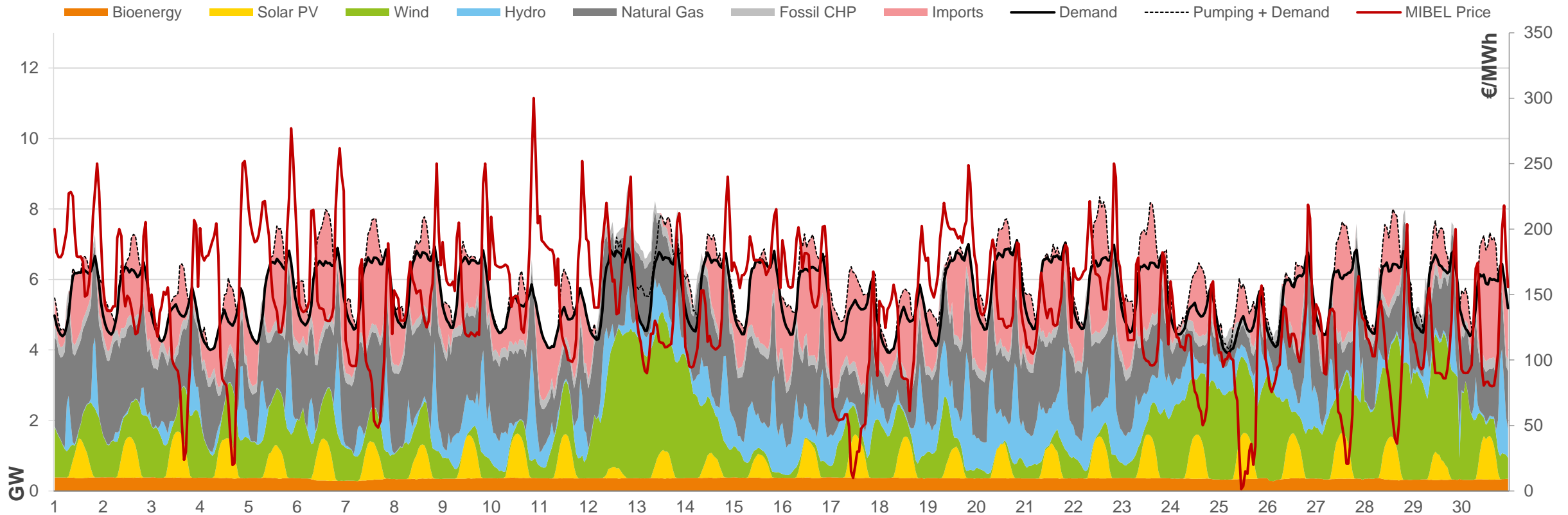
^a 'Generation' refers to the net power generation of the plants, considering the pumping production recently disclosed by REN. Pumping production is not accounted for in the percentage of production from renewable sources.

^b 'Consumption' refers to the liquid generation of power of the plants, considering the import-export balance.

Source: REN, Analysis APREN

Monthly Analysis in Portugal: September

Load diagram for the month of September 2022



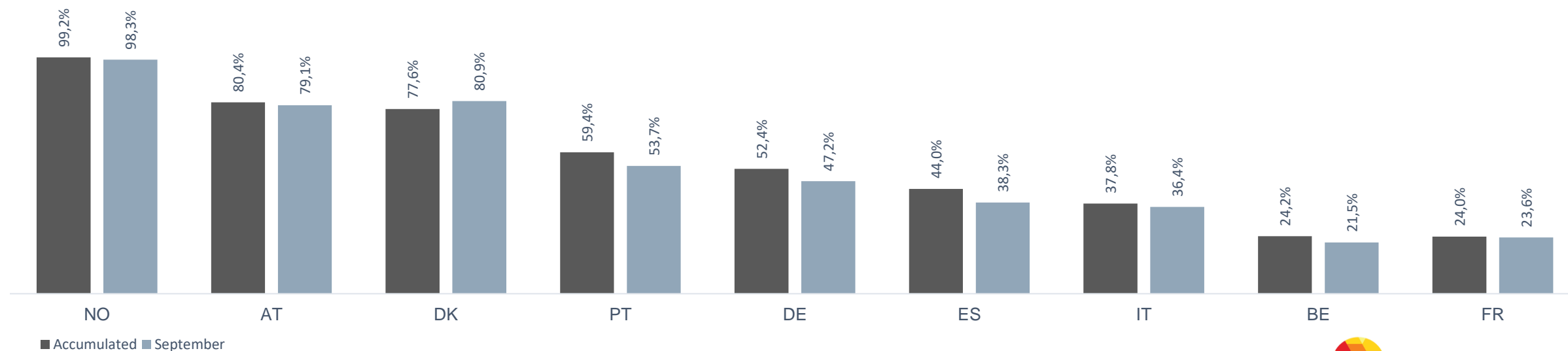
Source: REN, Analysis APREN

Renewable Electricity Europe

In the present analysis, only the main countries from the different European markets were considered, in order to have a representative framework of comparison.

Between January 1 and September 30, 2022, Portugal was the fourth country with the highest renewable incorporation in electricity generation, behind Norway, Austria and Denmark, which obtained 99.2%, 80.4% and 77.6%, respectively, from RES. From September 1 to 30, Portugal maintained the same renewable incorporation compared to August, placing fourth in the analyzed countries with the largest renewable incorporation in Europe.

Source: OMIE, Analysis APREN



■ Accumulated ■ September

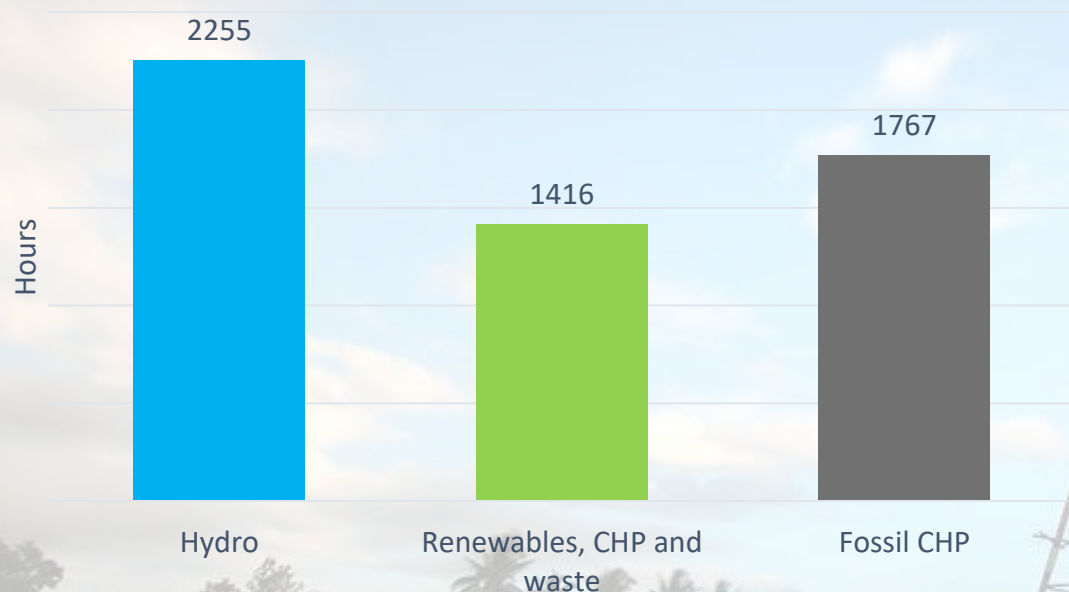
Renewable incorporation in accumulated electricity generation (Jan-Sep) and monthly electricity (Sep).
Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN

Market Price Setting: Portugal

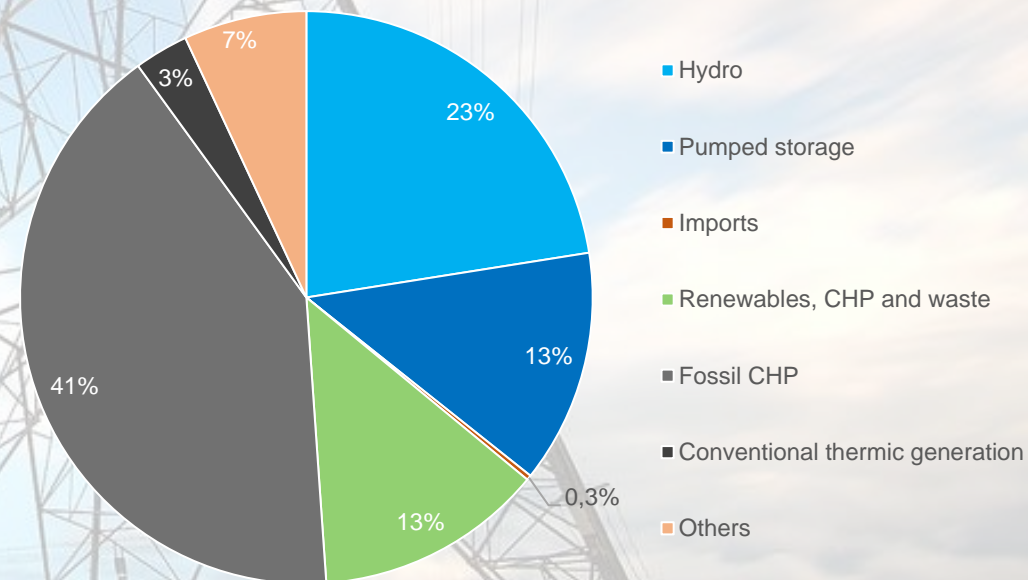
Between January 1 and September 30, hydro was the market price setting technology that recorded the most hours, with 2,255 non-consecutive hours, followed by thermal generation combined cycle with 1,767 hours and by renewables, cogeneration and waste with 1,416 hours.

ACCUMULATED JAN-AUG

SEPTEMBER 2022



Number of market price setting hours of the three main technologies (Jan-2022 - Sep-2022).
Source: OMIE, Analysis APREN



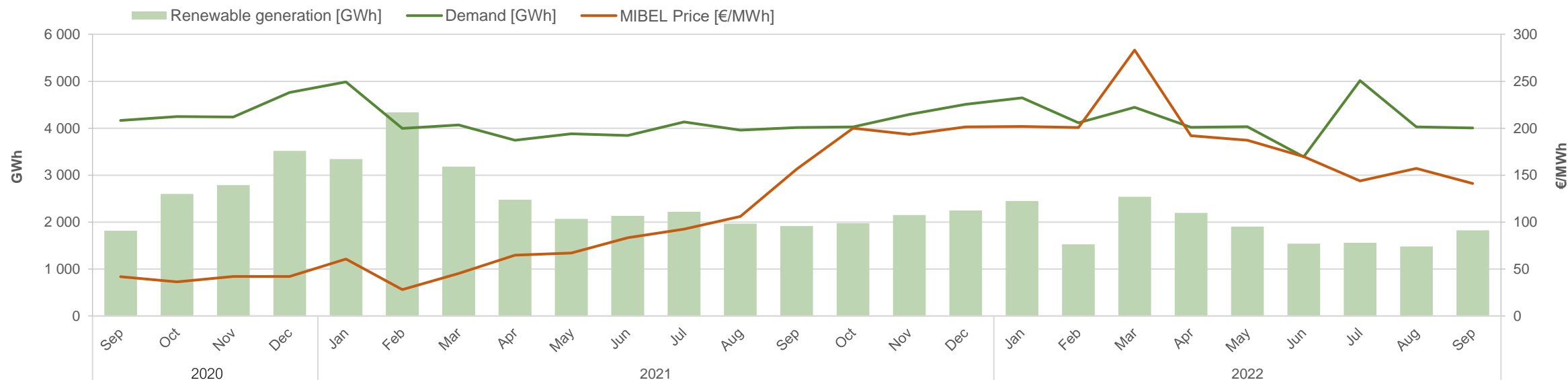
Percentage distribution of the number of market price setting hours of the various technologies, totaling 720 hours (Sep).
Source: OMIE, Analysis APREN

Electricity Market Portugal

Between January 1 and September 30, the average hourly price recorded in MIBEL in Portugal (186.4 €/MWh^o) represents an increase of more than three times compared to the same period last year.

In the same period, 58 non-consecutive hours were recorded, in which renewable generation was sufficient to supply the electricity consumption in mainland Portugal, with an average hourly price in MIBEL of €151.3/MWh. From September 1 to 30, renewable generation was not sufficient to supply consumption for on consecutive hour.

^oArithmetic average hourly prices
Source: OMIE, Analysis APREN



Market price, electricity consumption and renewable generation (Sep 2020 to Sep 2022).
Source: OMIE, REN, Analysis APREN

Electricity Market

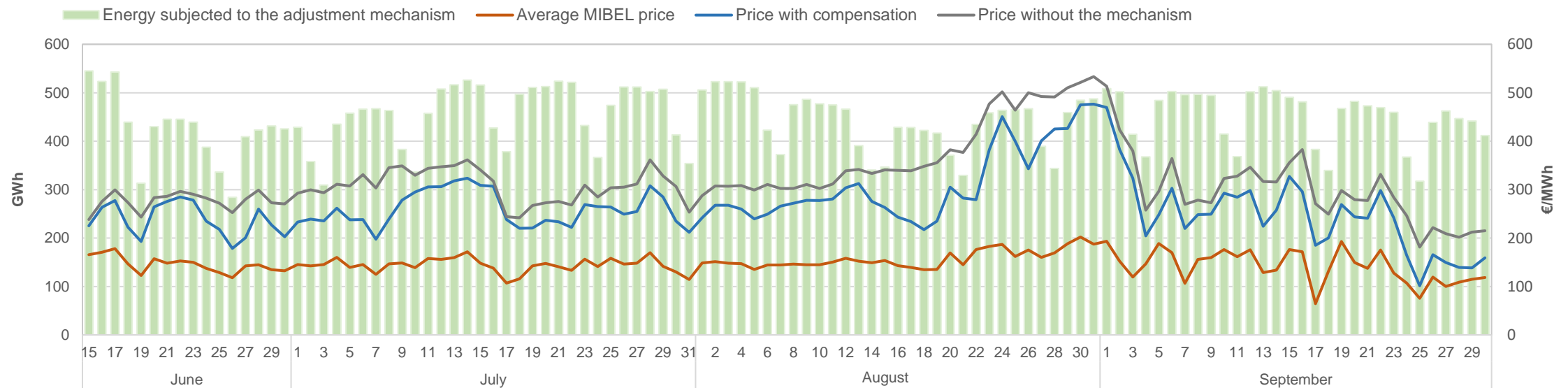
Iberian gas price limit mechanism

The Iberian natural gas price limit mechanism came into force on June 15. Since then and September 30, the mechanism generated savings of €53.9/MWh^c, which amounted to a 16.8% reduction in the average hourly price in MIBEL.

The savings due to the limit on the price of natural gas, corresponding to the difference between the price without the mechanism and the price with the compensation payable to natural gas plants, reached a maximum value of €157.2/MWh^c, and a minimum of €5.62/MWh^c.

In total, 48.1 of the 92.9 TWh produced were subject to the consumer adjustment mechanism in the Iberian Peninsula.

^c Arithmetic average hourly prices
Source: OMIE, Analysis APREN



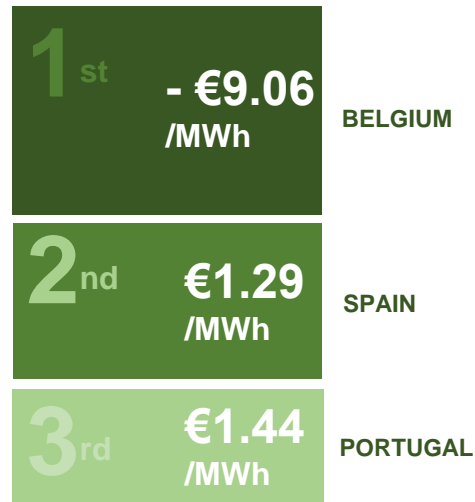
Market price, with and without natural gas price limit mechanism.
Source: OMIE, Analysis APREN.

Electricity Market: Europe

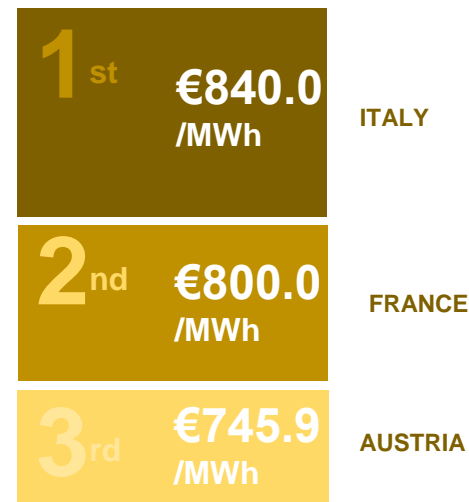
During the month of September 2022, there was a minimum hourly price at MIBEL in Portugal of €1.44/MWh^c, for an hour in which the market price setting was due to thermal generation combined cycle. The maximum hourly price reached €300.00/MWh^c, where market price setting was hydro, due to the reversal of the import-for-export flow in this time period.

Concerning the prices in Europe, it should be noted that the average values increased in comparison to the previous month, as well as minimum and maximum prices.

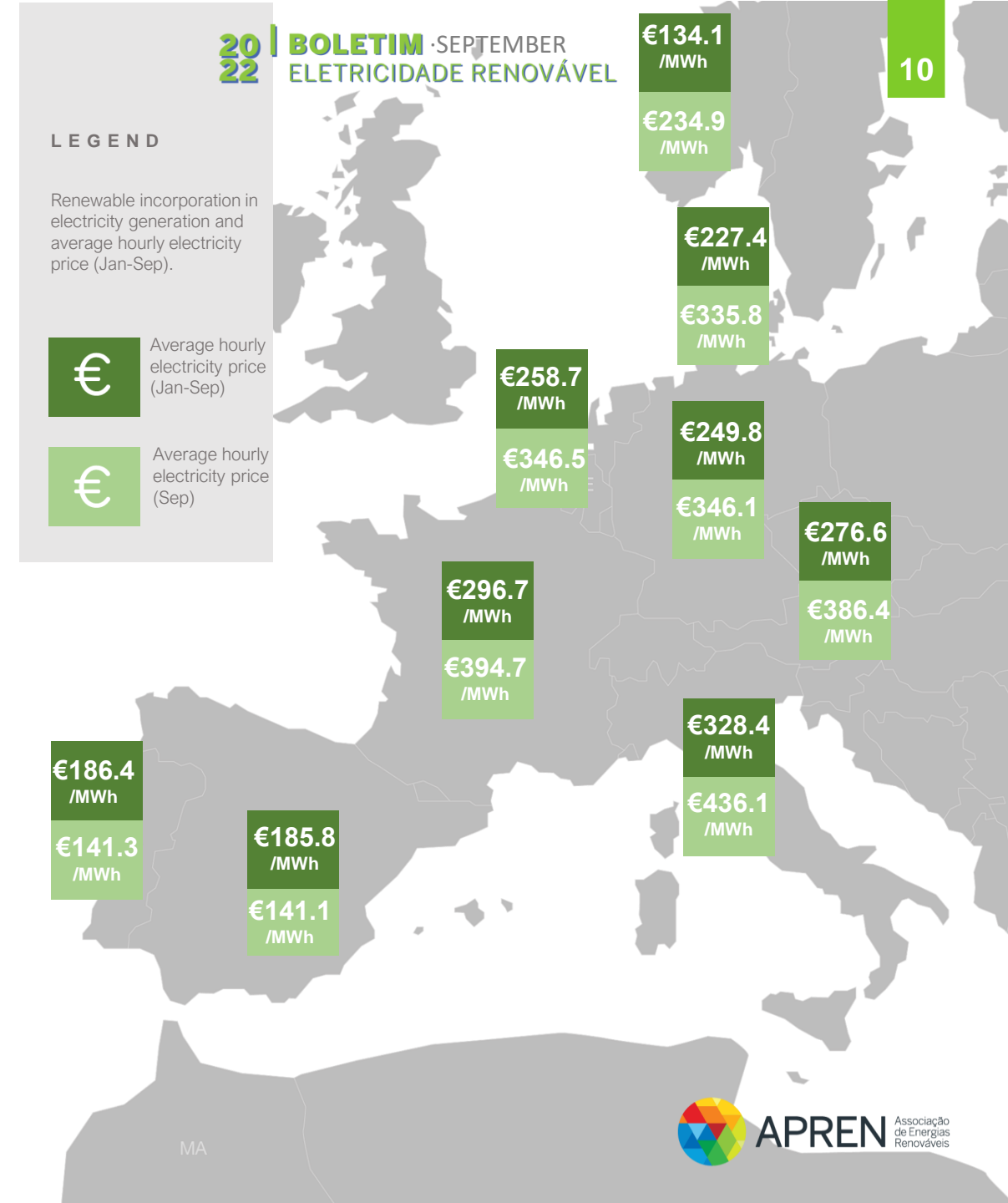
PRICES MINIMUM (Sep)



PRICES MAXIMUM (Sep)



^c Arithmetic average hourly prices
Source: ENTSO-E, OMIE, Analysis APREN



Future Electricity Market

The evolution of the average future hourly price shown here, is calculated on the basis of the contracts for the purchase and sale of electricity^d.

The map on the right shows the price values for the next month (September) and for next year. In both cases, MIBEL has the lowest values, while the French market has the highest ones.

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

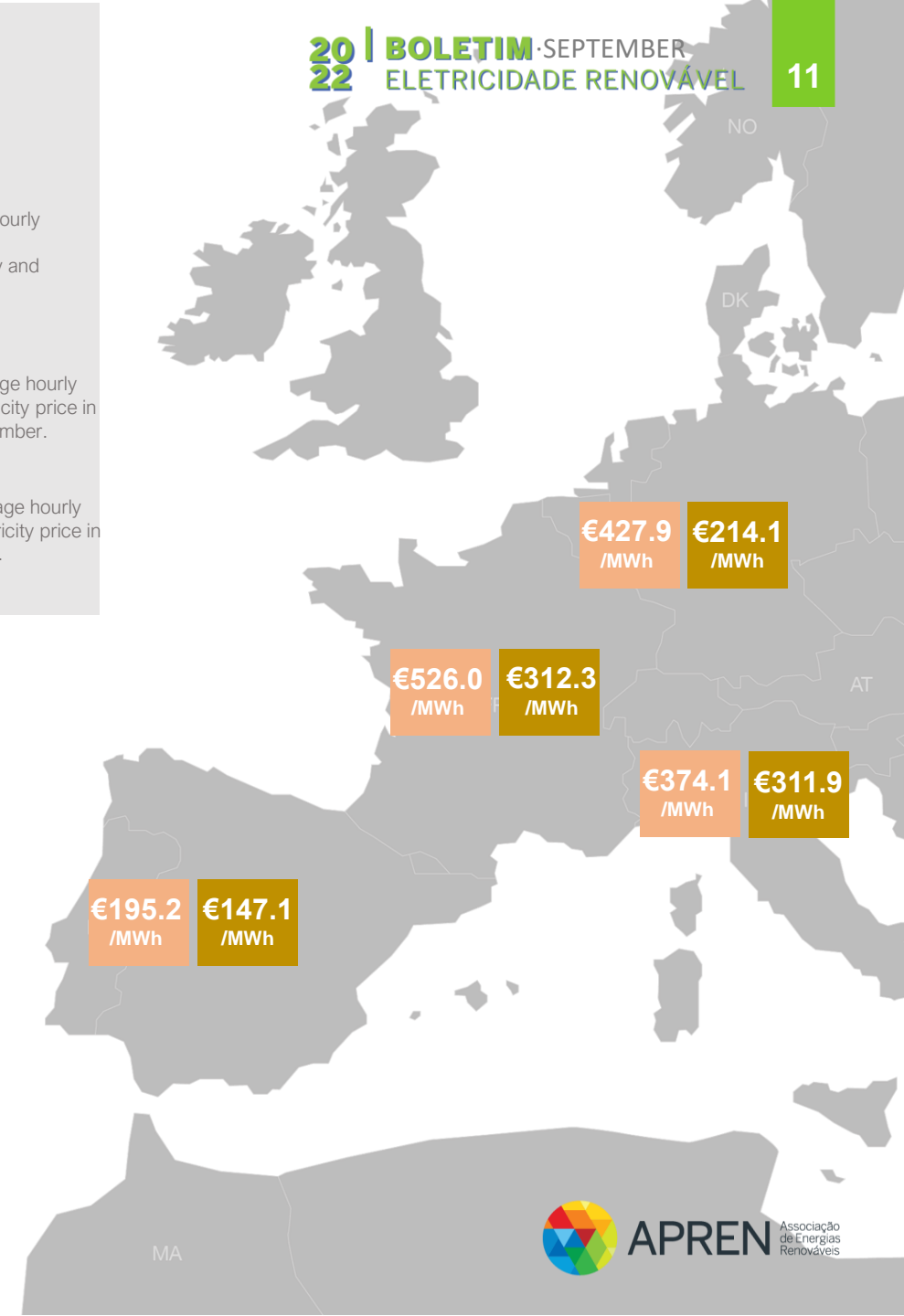
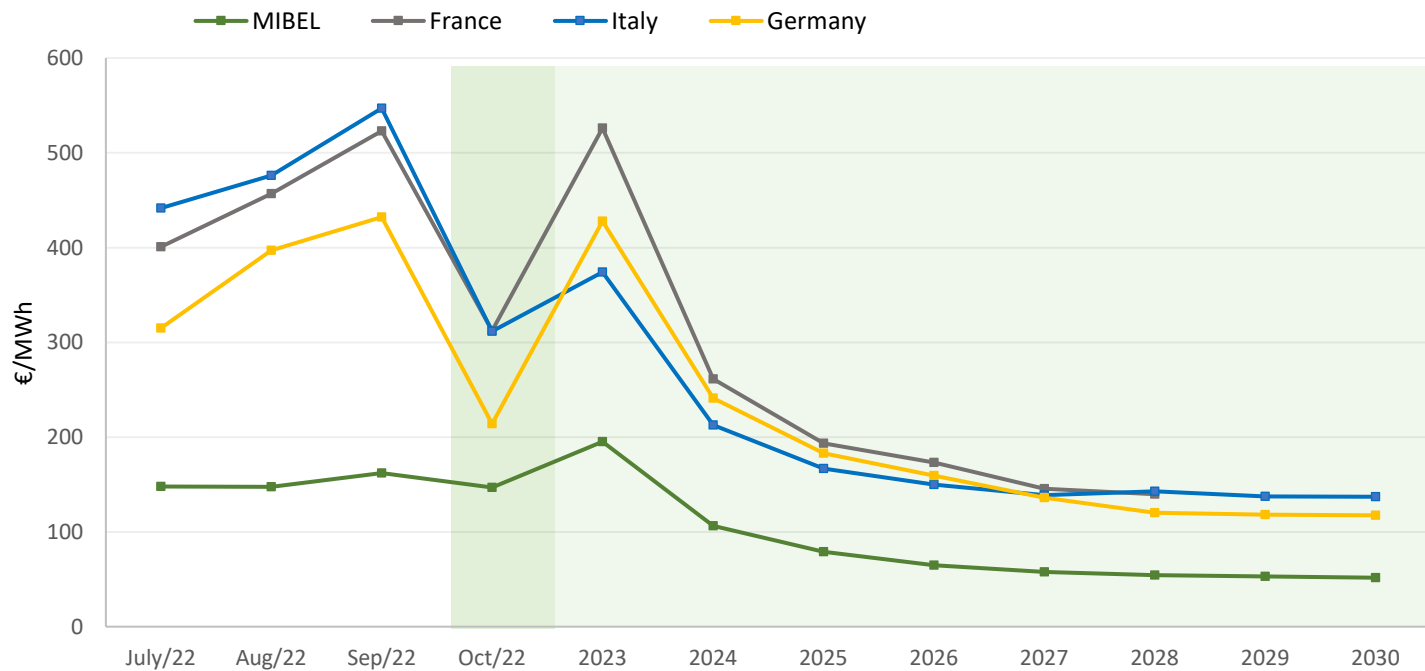
^d Values updated on September 2.
Source: OMI, EEX, Analysis APREN

LEGEND

Future average hourly price in MIBEL, France, Germany and Italy (€/MWh).

€ Average hourly electricity price in September.

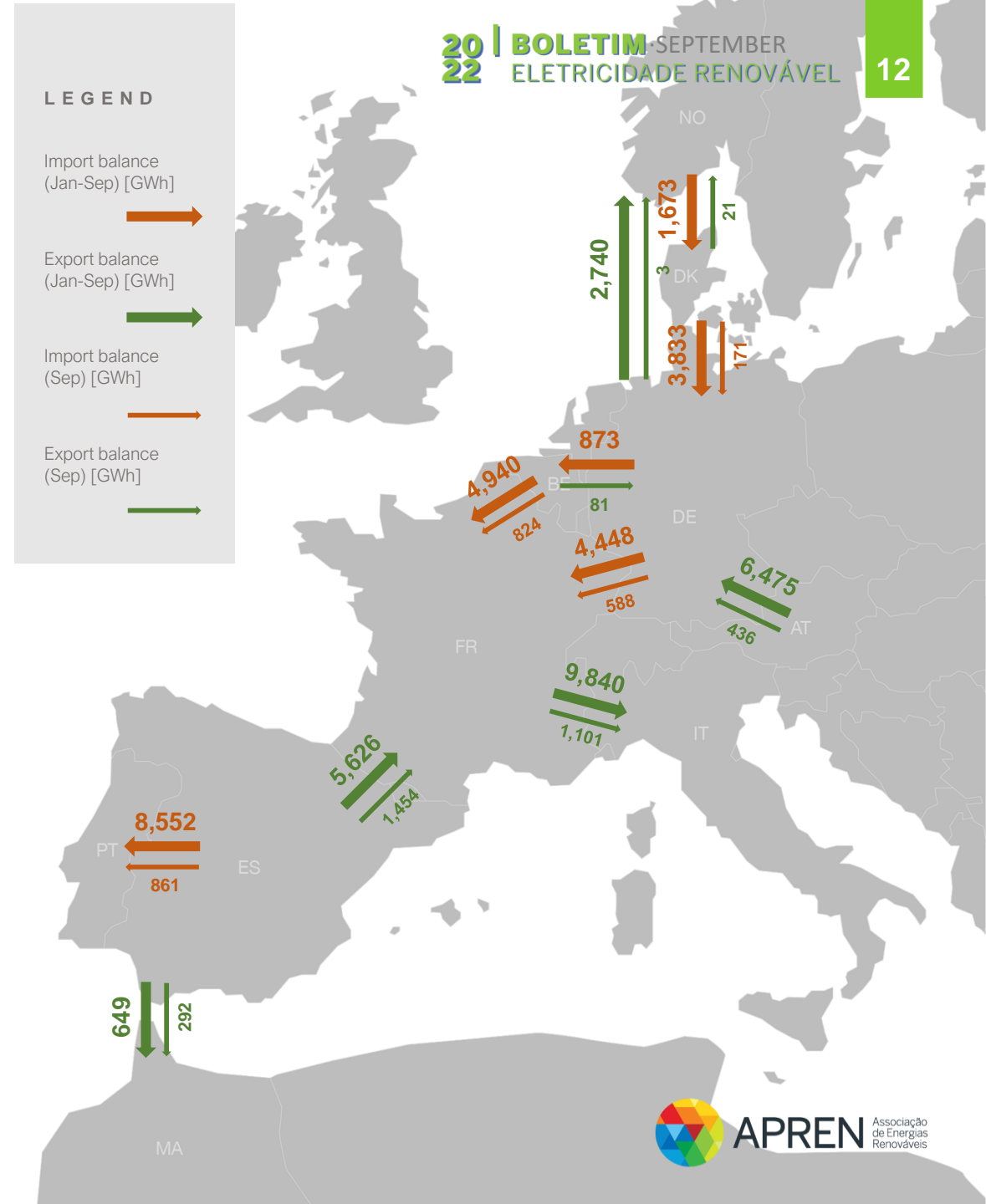
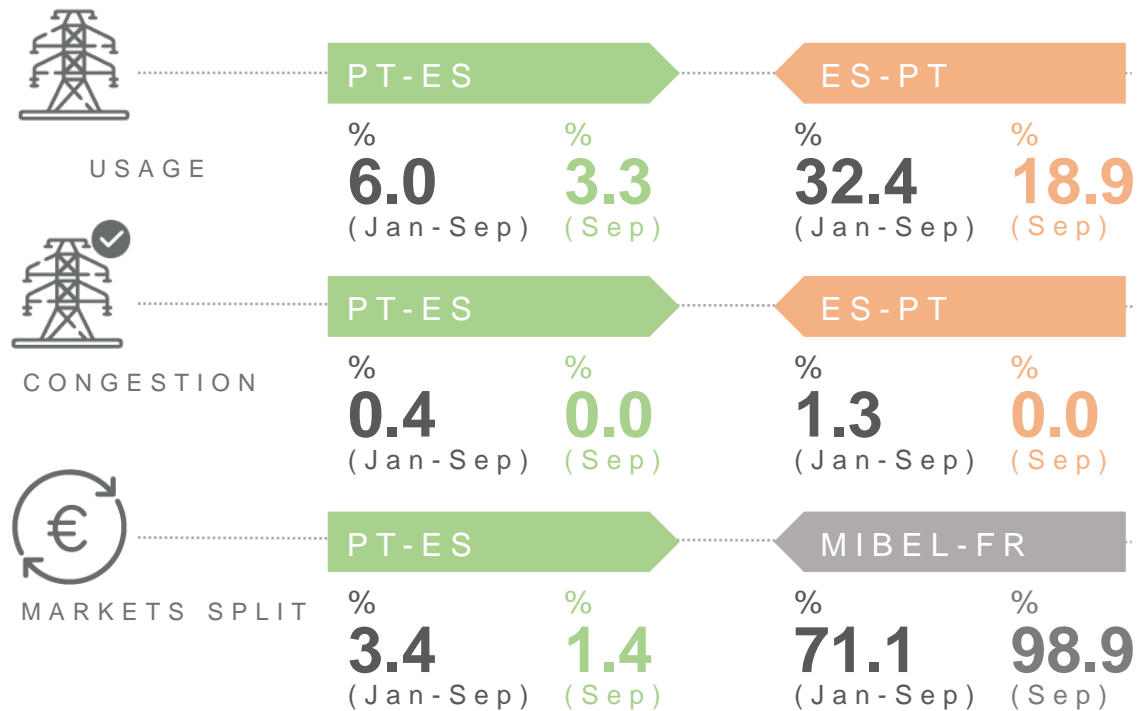
€ Average hourly electricity price in 2023.



International Trade

Between January 1 and September 30, 2022, the electricity system of Mainland Portugal recorded electricity imports equivalent to 10,127 GWh and exports of 1,575 GWh, with Portugal being an importer with a balance of 8,552 GWh.

MAIN INTERCONNECTION INDICATORS PT-ES



Source: REN, Analysis APREN.

Simulation of price formation without SRP

SRP ESTIMATED SAVINGS

The indicators on the right identify the savings achieved between January 1 and September 30, by the contribution of production under special regime (SRP).

This is a study for SRP, which includes all installed capacity 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 that renewables have generated.



€205.0/MWh
Accumulated savings (Jan-Sep)

€217.4/MWh
Monthly savings (Sep)



€6,422 M
Accumulated savings (Jan-Sep)

€738 M
Monthly savings (Sep)

Note: This analysis is prepared using a program developed by APREN, based on Deloitte's calculation method.

Note: This analysis uses a program developed by APREN, based on Deloitte's calculation method.

Power sector emissions

Between January 1 and September 30, 2022, specific emissions reached 148 gCO₂eq/kWh, while the total emissions from the electro-producing sector reached 4,6 MtCO₂eq. The European Emissions Trading System (EU-ETS) recorded an average price of €82.1/tCO₂. It is a sharp increase compared to the same period in 2021.

° Arithmetic average hourly prices.
Source: OMIE, Analysis APREN

SECTOR EMISSIONS

4.6

MtCO₂eq

▼ **17.0%**

in comparison to Sep 2021

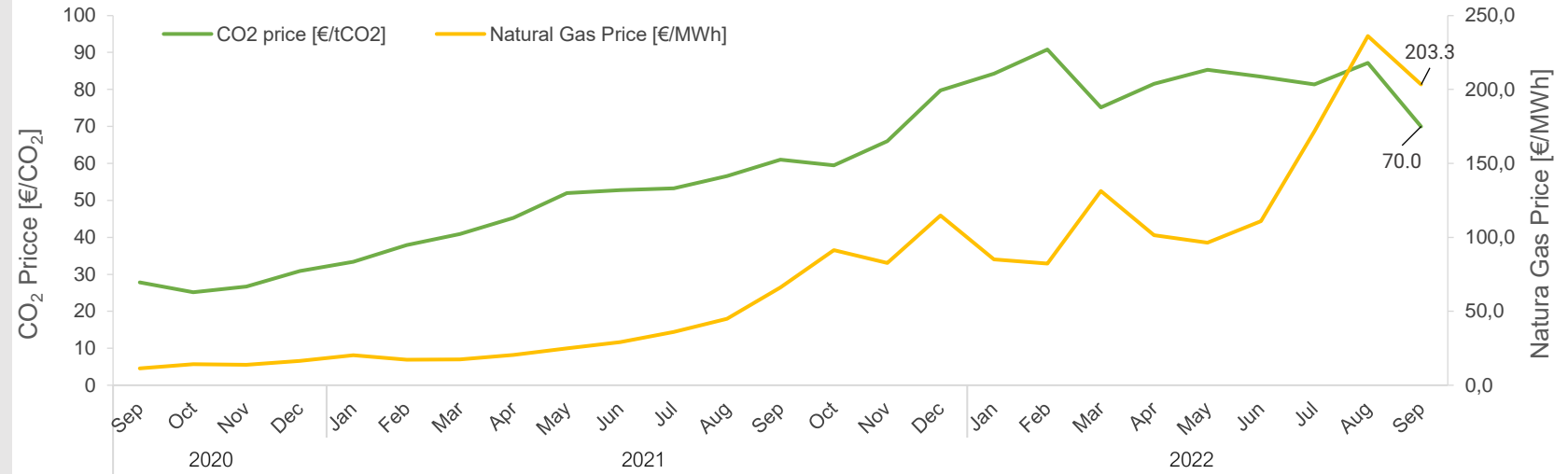
ALLOWANCES AVERAGE PRICE

€82.1

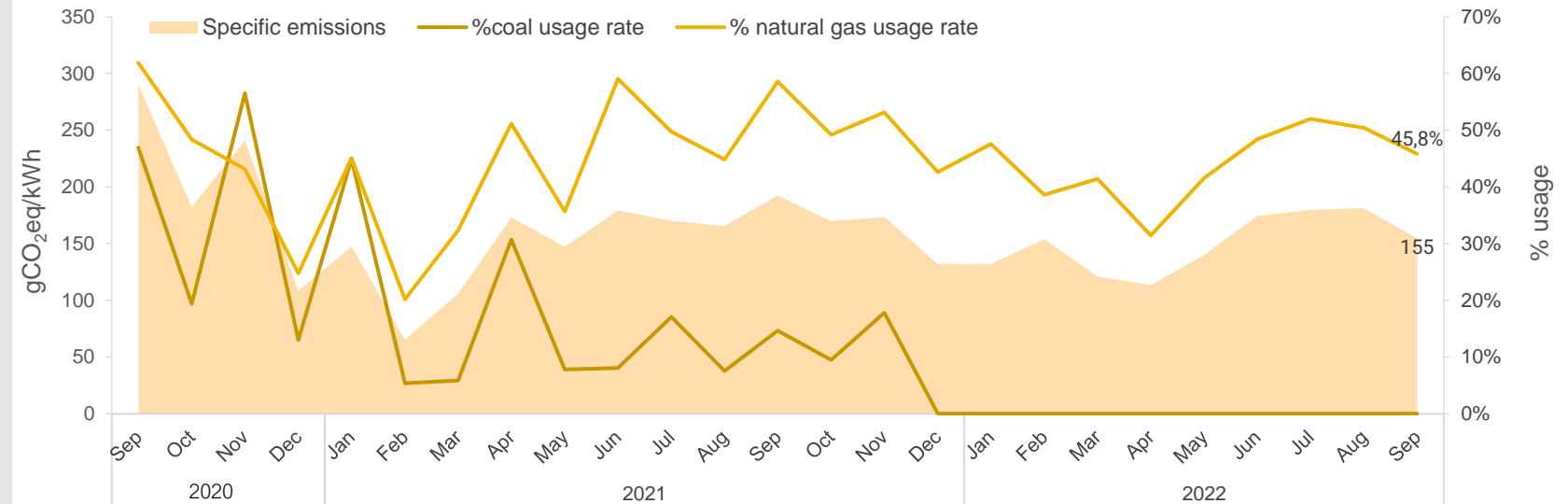
/tCO₂

▲ **71.4%**

in comparison to Sep 2021



CO₂ allowances price at EU-ETS and natural gas price in Europe (Sep-2020 to Sep-2022).
Source: SendeCO₂, WorldBank.



Market price, electricity consumption and renewable generation (Sep-2020 to Sep-2022).
Source: OMIE, REN, Analysis APREN

Environmental Service

The indicators on the right identify the savings reached between January 1 and September 30, 2022, in natural gas, CO₂ emissions and CO₂ emission allowances, resulting from renewable incorporation into electricity generation.

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

Renewables avoided:



€3.604 M

Imported natural gas (Jan-Sep)

€581 M

Imported natural gas (Sep)



5.6 MtCO₂eq

CO₂ emissions (Jan-Sep)

0.6 MtCO₂eq

CO₂ emissions (Sep)



€723 M

Imported electricity (Jan-Sep)

€56 M

Imported electricity (Sep)



€412 M

CO₂ allowances (Jan-Sep)

€37 M

CO₂ allowances (Sep)

Source: REN, REE, SendeCO2, WorldBank, DGEG, ERSE, Analysis APREN.

Note1: For the estimate of the savings in imported natural gas, the price of natural gas in Europe indicated in the WorldBank has been considered.

Note2: For the estimation of savings in imported electricity, the average price on the MIBEL market has been considered.

European Barometer

Renewable incorporation

On September 14, the European Parliament [voted in favour](#) of the 45% goal for renewable incorporation in the EU's energy mix by 2030, according to the established in the RED III second revision.

Emergency intervention to high energy prices

On September 14, the European Commission published the [first version](#) of the measures for the emergency intervention to the energy market, as a response to the high energy prices.

Forced labour on the European Union market

On September 14, the European Commission presented a [proposal](#) that prohibit products made with forced labour on the EU market.

Climate target for 2030

The European Union is [planning](#) to increase each country contribution to the climate target established in the Paris agreement, which is in accordance with the Fit-for-55 plan.

National Barometer

Regulated tariffs regime to the natural gas market

On September 6, the [Decree-Law No.57-B/2022](#) was published, that allows the return of final clientes with annual consumptions of natural gas lower or equal to 10,000 m³, to the regulated tariffs regime for the natural gas.

Specific Regulation in the Domain of Sustainability and Efficiency in the Use of Resources

On September 20, the [Ordinance No. 240/2022](#) was published, which represents the eleventh change to the Specific Regulation in the Domain of Sustainability and Efficiency in the Use of Resources, approved by the Ordinance No. 57-B/2015, on February 27.

Environmental fund 2022

On September 21, the [Dispatch No. 11334-A/2022](#) was published, amending the wording of the tables contained in paragraphs 1 to 6 of the Dispatch N°. 3143-B/2022, of March 11, within the scope of the roles for the allocation, management, monitoring and execution of the respective revenues and support to be granted by the Environmental fund for 2022.

Working Group for offshore power plants

On September 23, the [Dispatch No. 11404/2022](#) was published, creating the working group for planning and operationalization of power plants based on offshore renewable energy.

Energy supply safety

On September 27, the [Resolution No. 82/2022](#) of the Council of Ministers was published, which defines preventive measures to deal with the current situation and possible future disruptions, to ensure the security of energy supply.

Land owned by the concessionaire of the national transmission network

On September 29, the Ordinance No. 248/2022 was published, which regulates the model for the transfer of ownership and possession of land from the concessionair entity of the National Electricity Transmission Network regardind the power plants supplying the public service electricity network.



APREN | Departamento Técnico e Comunicação

Avenida da República,
59 - 2º andar
1050-189 Lisboa

[+351] 213 151 621
apren@apren.pt

www.apren.pt



APREN Associação
de Energias
Renováveis