

**20
22**

BULLETIN
RENEWABLE ELECTRICITY

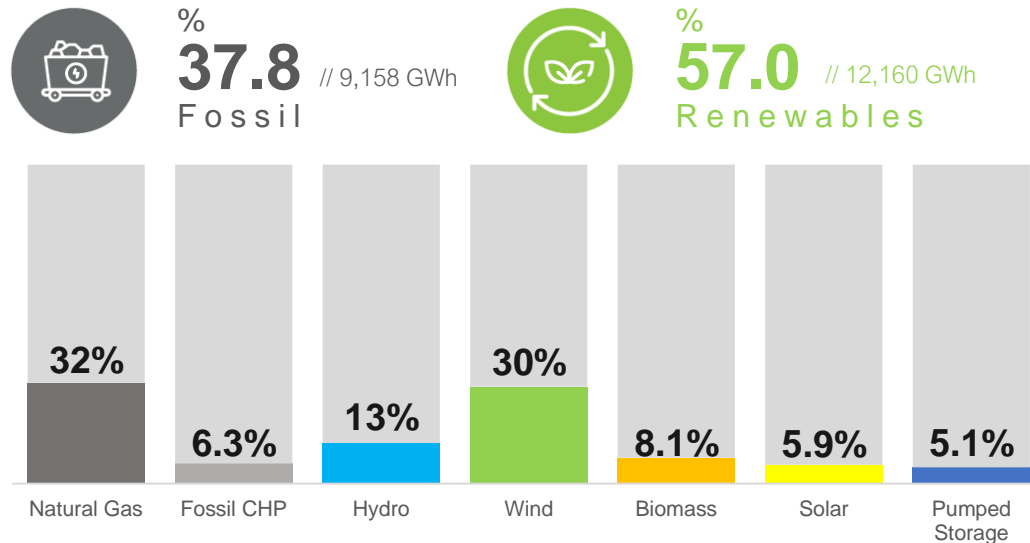
**Portugal precisa
da nossa energia!**

Portugal needs our energy!

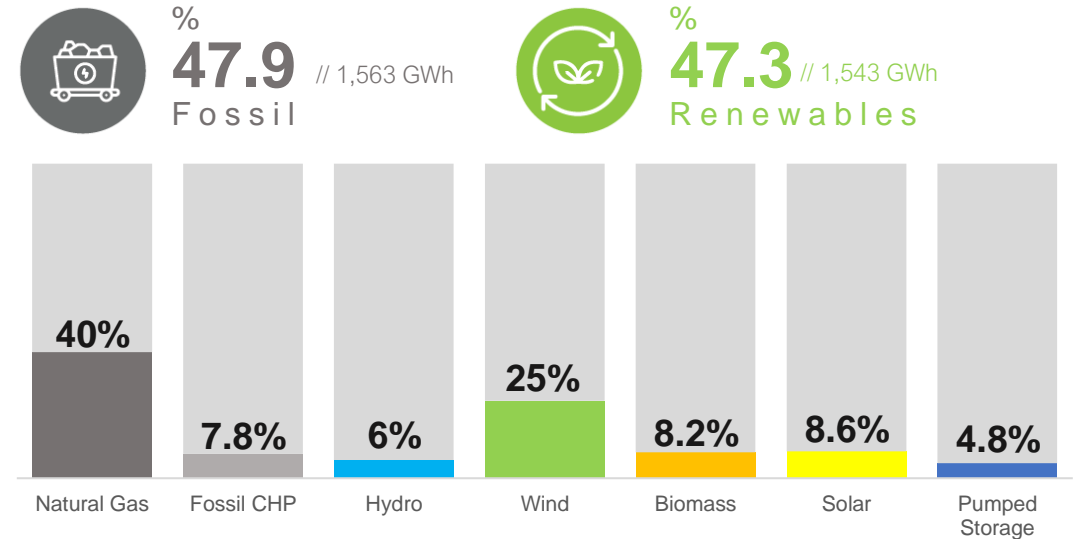


Executive Summary

ACCUMULATED GENERATION (Jan-Jun)



MONTHLY GENERATION (Jun)



ELECTRICITY SECTOR INDICATORS (Jan-Jun)



¹ '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

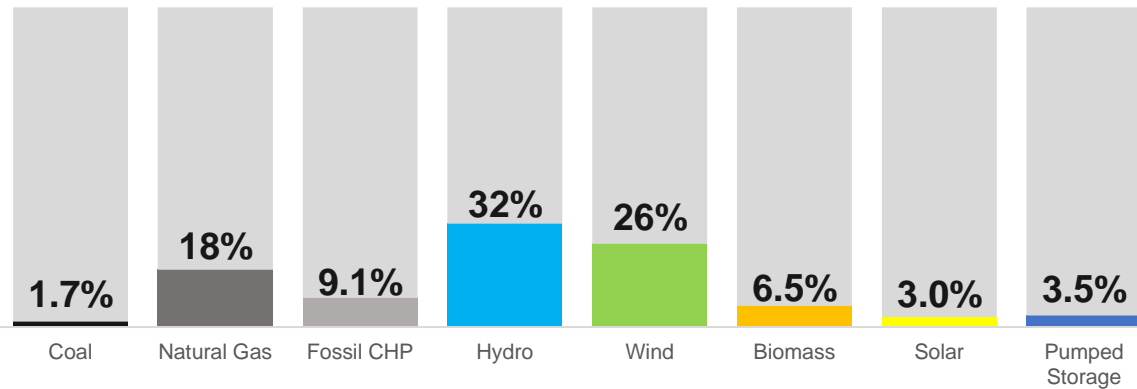
ACCUMULATED JUNE 2021 (Jan-Jun)



%
28.7 // 8,023 GWh
Fossil



%
67.8 // 16,886 GWh
Renewables



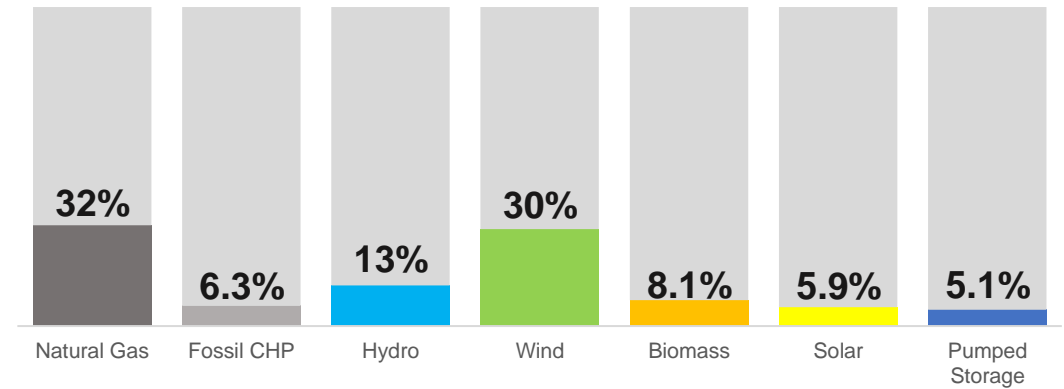
ACCUMULATED JUNE 2022 (Jan-Jun)



%
37.8 // 9,158 GWh
Fossil



%
57.0 // 12,160 GWh
Renewables



MAIN INDICATORS



GWh
21,318
Generation¹



%
57.0
Renewable
incorporation



GWh
24,658
Consumption²



0.95
Wind index



0.34
Hydro index



1.11
Solar index

▼ **16.8%**

in comparison to June 2021

▼ **10.7%**

in comparison to June 2021

▲ **0.5%**

in comparison to June 2021

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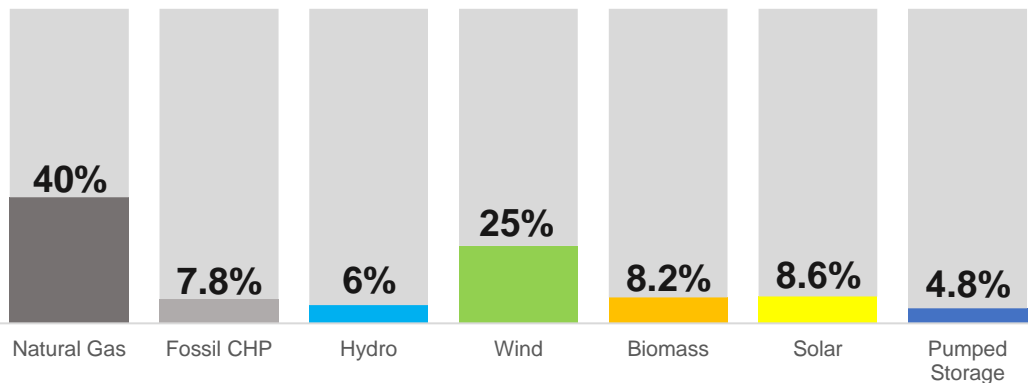
² Consumption refers to the liquid generation of power of the plants, considering the import-export balance.

Monthly analysis in Portugal: June

From June 1 to June 30, 2022, the renewable incorporation was 47.3%, with a total of 3,264 GWh produced. The decrease of 4,6% compared to June 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 reached minimum values compared to the same period in the last 10 years, which contributed to an increase in production from fossil sources.

Source: REN, Analysis APREN



Source: REN, Analysis APREN

INDICATORS OF THE ELECTRICITY SECTOR



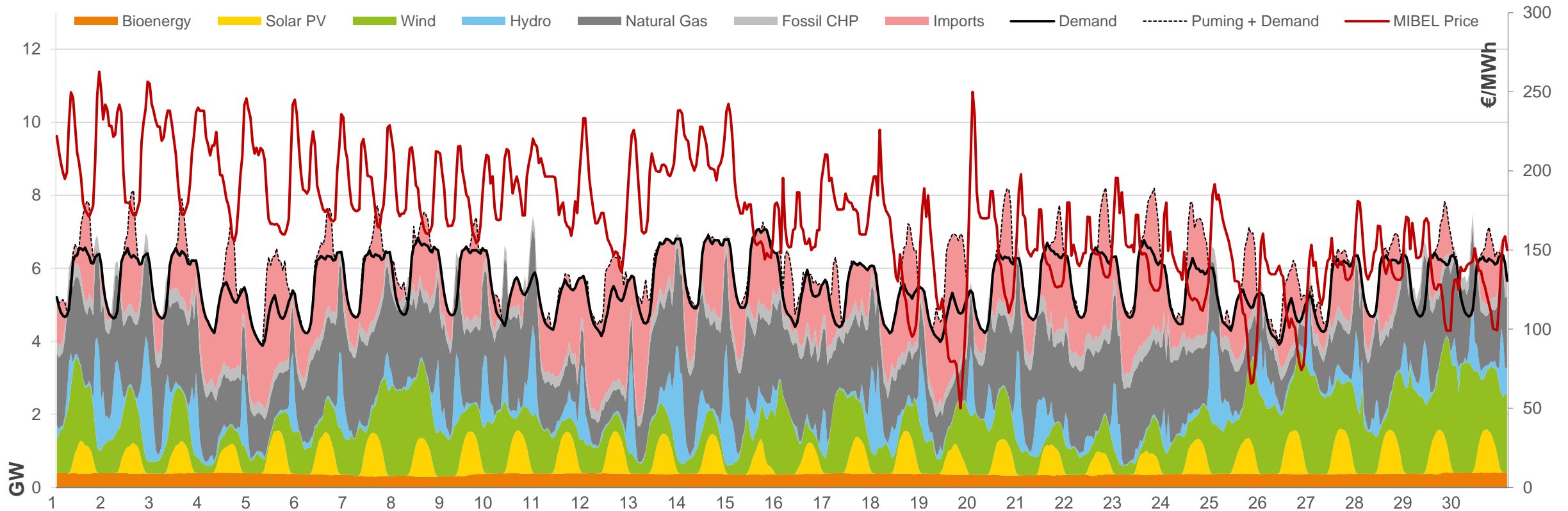
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Source: REN, Analysis APREN

Monthly analysis in Portugal: June

Load diagram for the month of June 2022



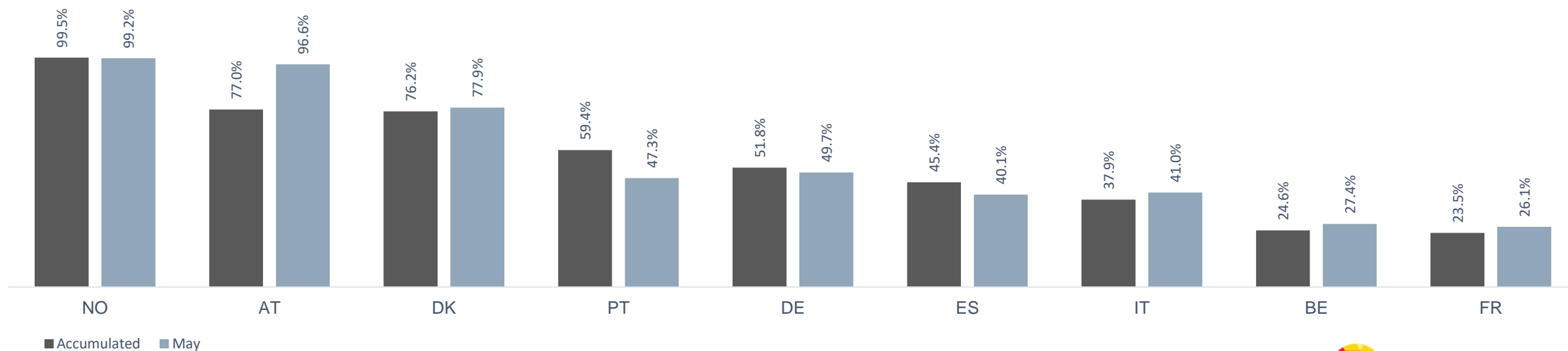
Source: REN, Analysis APREN

Renewable Electricity Europe

Between January 1 and June 30, 2022, Portugal was the fourth country with the highest renewable incorporation in electricity generation, behind Norway, Austria and Denmark, which achieved 99.5%, 77.0% and 76.2%, respectively, from RES. From June 1 to June 30, Portugal decreased its renewable incorporation by 9.0% compared to May, ranking fifth in the countries with the highest renewable incorporation in Europe.

This analysis only took the main European markets into account, in order to have a representative term of comparison.

Source: OMIE, Analysis APREN



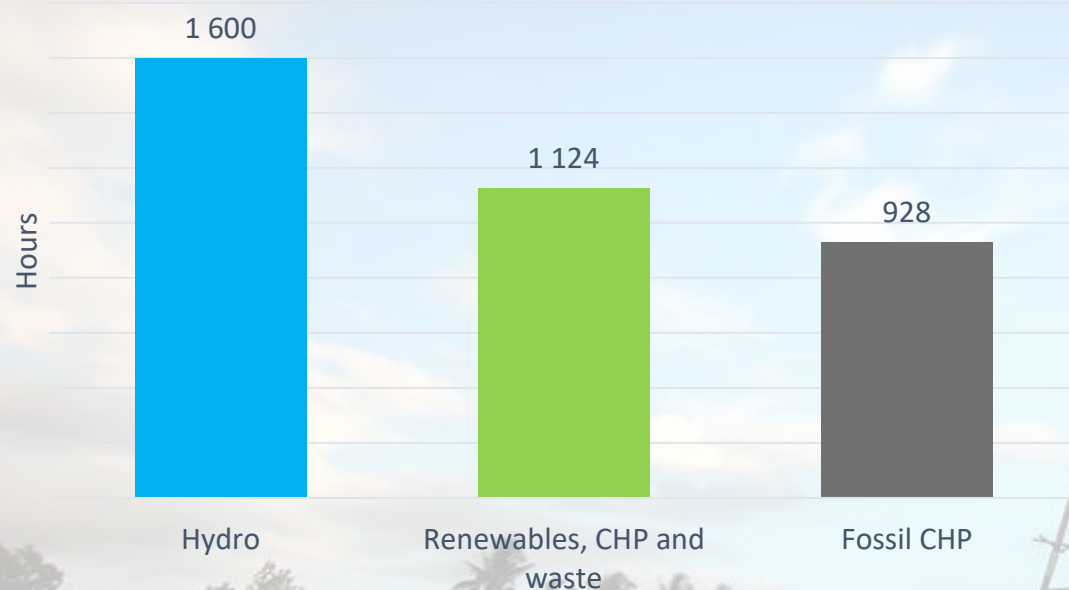
Renewable incorporation in the generation of accumulated electricity (Jan-Jun) and monthly (Jun).
Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN

Market Price Setting: Portugal

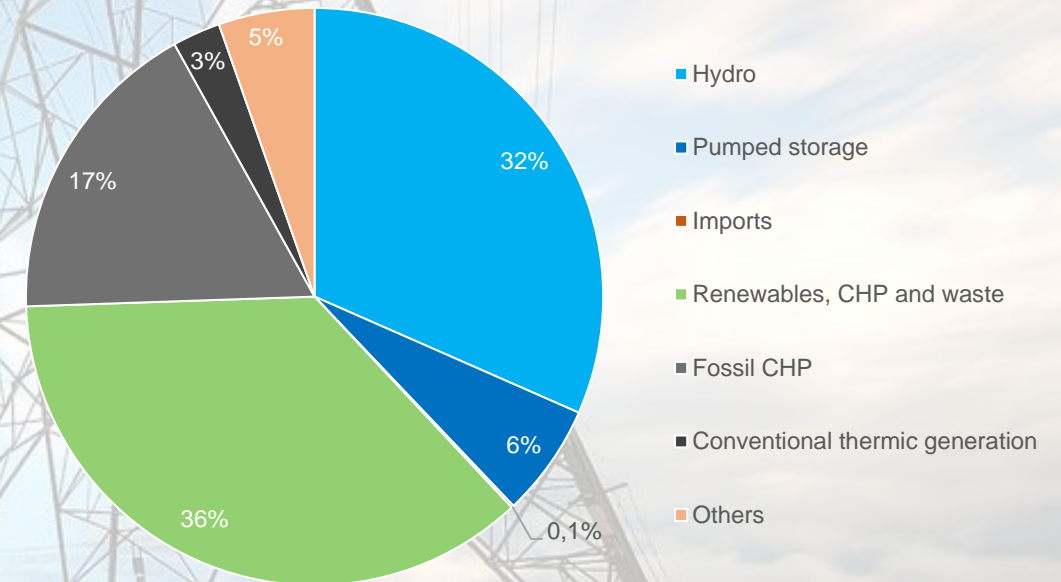
Between January 1 and June 30, hydro was the market price setting technology that recorded the most hours, with 1,600 non-consecutive hours, followed by cogeneration and waste with 1,124 hours and thermal generation combined cycle with 928 hours.

ACCUMULATED JAN-JUN

JUNE 2022



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



Percentage distribution of the number of market price setting hours of the various technologies, totaling 744 hours (June).
Source: OMIE, Analysis APREN

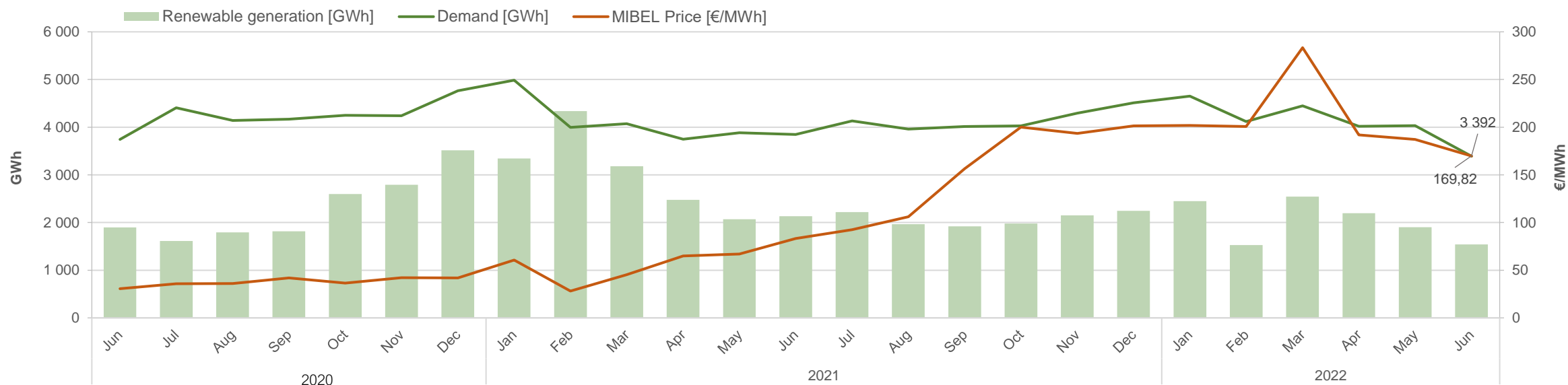
Electricity Market Portugal

Between January 1 and June 30, the average hourly price recorded in MIBEL in Portugal (206.2 €/MWh³) represents an increase of more than four times compared to the same period last year.

In the same period, 57 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 €151.5/MWh. From June 1 to June 30, one non-consecutive hour was recorded, with an average hourly price in MIBEL of €143.0/MWh.

Also, it is worth noticing the reduction in electricity price in June, influenced by the cap set to the price of natural gas.

³Arithmetic average hourly prices
Source: OMIE, Analysis APREN



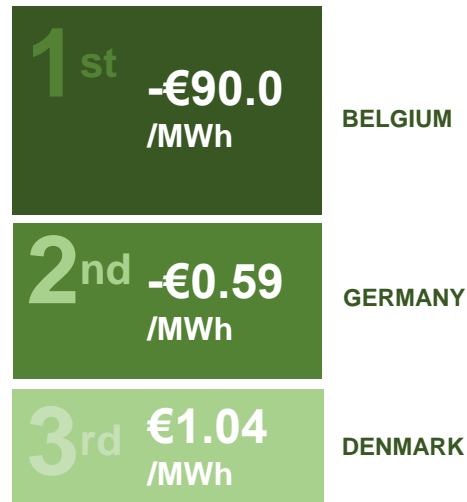
Market price, electricity consumption and renewable generation (June 2020 to June 2022).
Source: OMIE, REN, Analysis APREN

Electricity Market: Europe

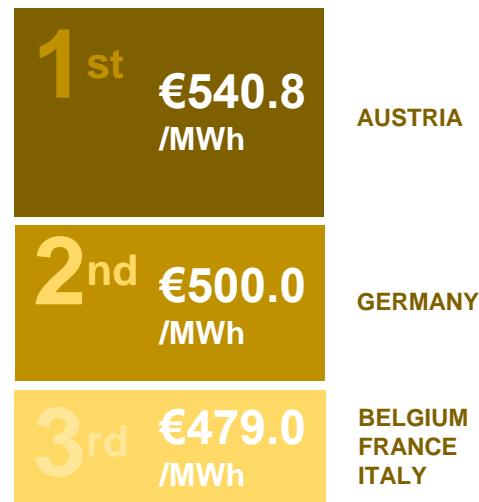
During the month of June 2022, there was a minimum hourly price at MIBEL in Portugal of €50/MWh³, for an hour in which the market price setting was due to thermal generation combined cycle. The maximum hourly price reached €262.6/MWh, where market price setting was hydro.

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.

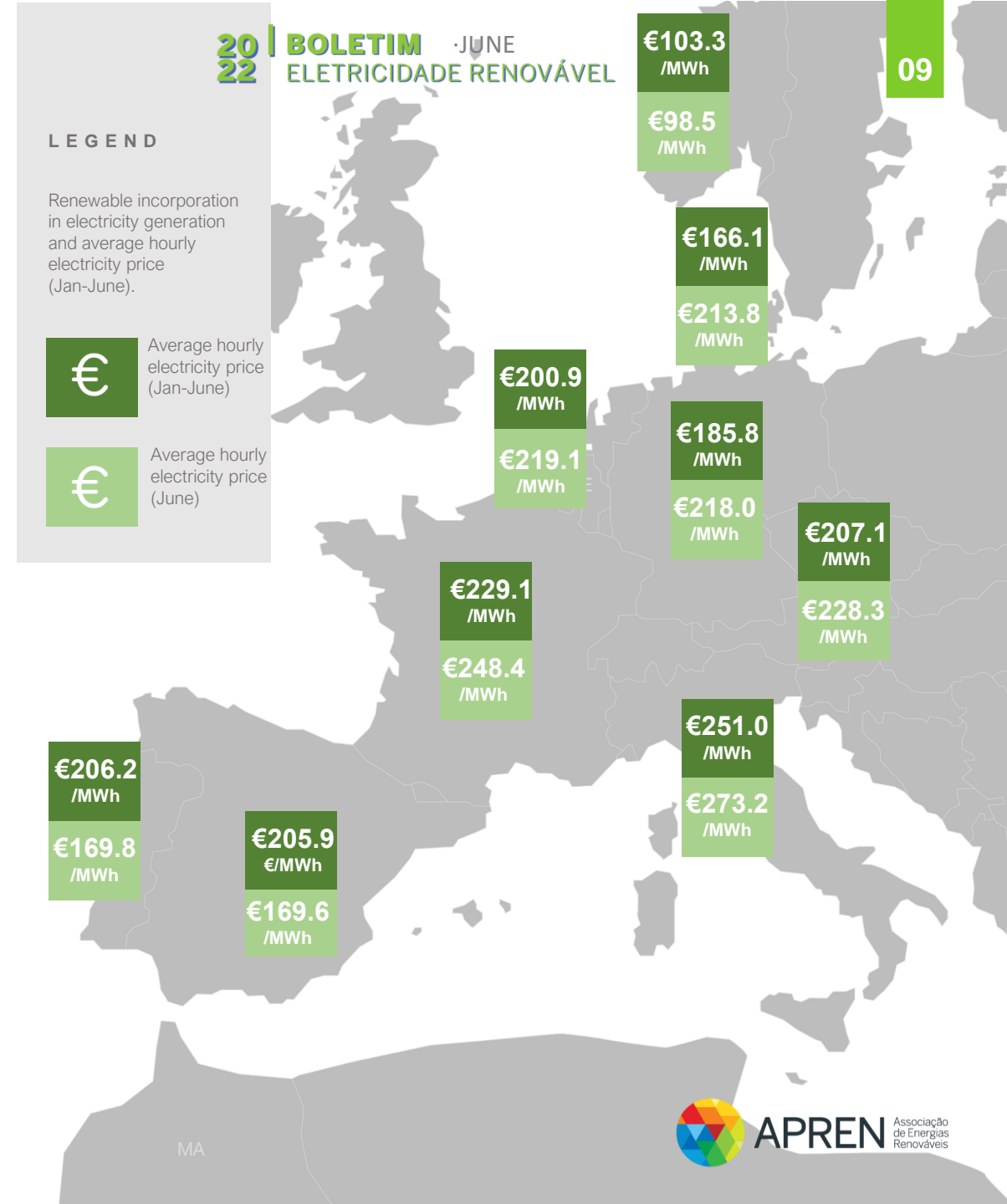
PRICES MINIMUM (Jun)



PRICES MAXIMUM (Jun)



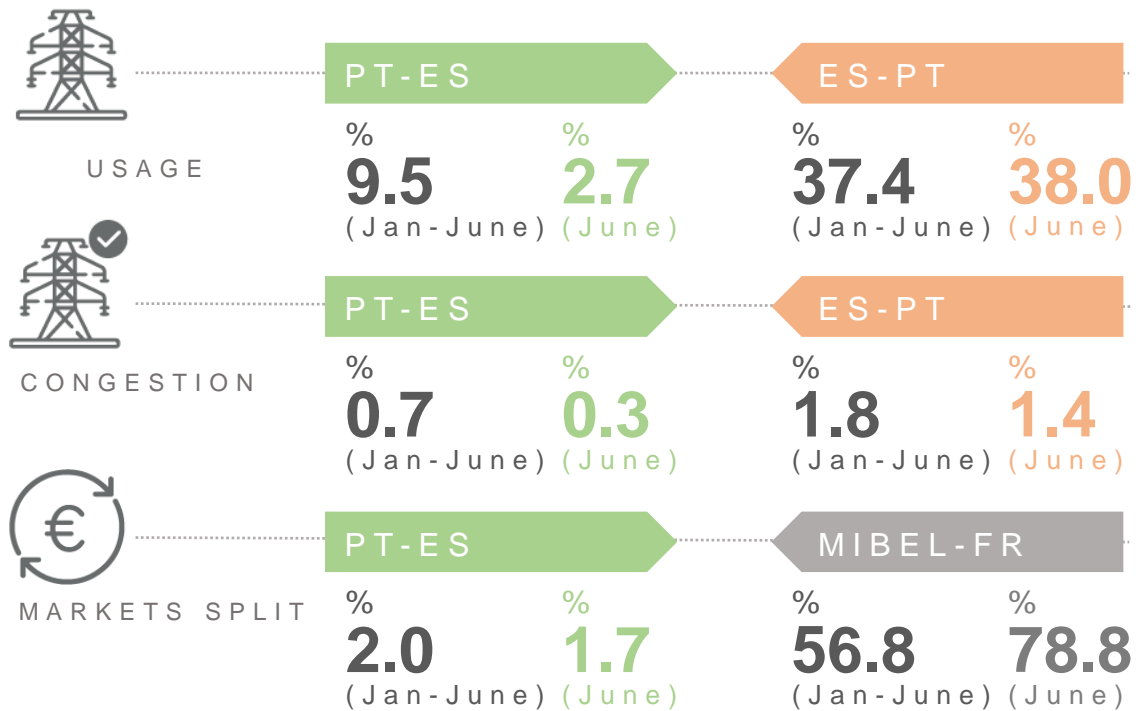
³Arithmetic average hourly prices
Source: ENTSO-E, OMIE, Analysis APREN



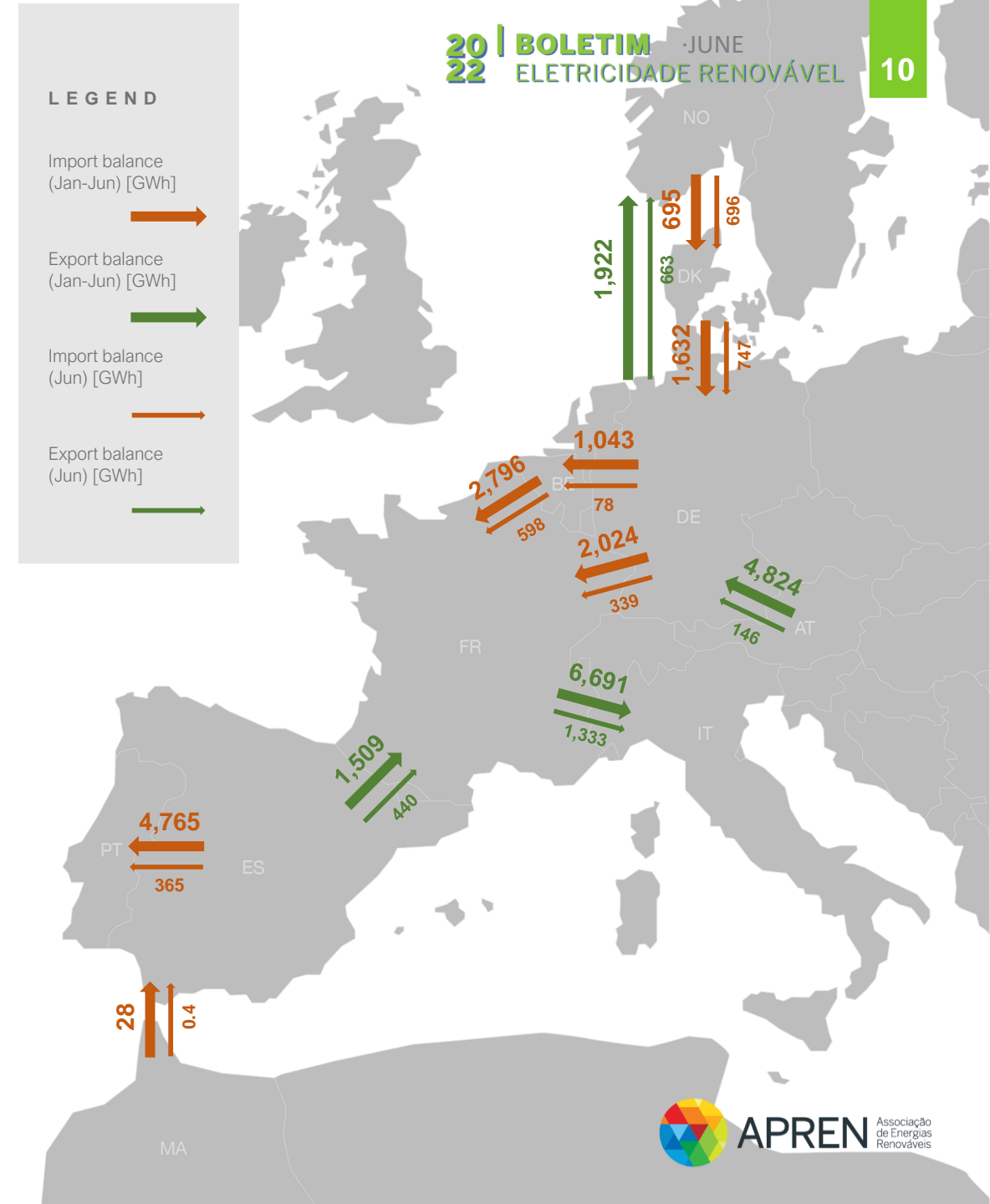
International Trade

Between January 1 and June 30, 2022, the electricity system of Mainland Portugal recorded electricity imports equivalent to 5,992 GWh and exports of 1,227 GWh, with Portugal being an importer with a balance of 4,765 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 June 30, 2022, 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 generated.



€206.6/MWh
Accumulated savings (Jan-Jun)

€198.6/MWh
Monthly savings (Jun)



€4,418 M
Accumulated savings (Jan-Jun)

€644 M
Monthly savings (Jun)

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

Power sector emissions

Between January 1 and June 30, 2022, specific emissions reached 138 gCO₂eq/kWh, while the total emissions from the electro-producing sector reached 2,9 MtCO₂eq.

The European Emissions Trading System (EU-ETS) recorded an average price of €83.4/tCO₂³, doubling the increase compared to the same period in 2021.

³ Arithmetic average hourly prices
Source: OMIE, Analysis APREN

SECTOR EMISSIONS

2.9

MtCO₂eq

▼ **18.0%**

In comparison to Jun 2021

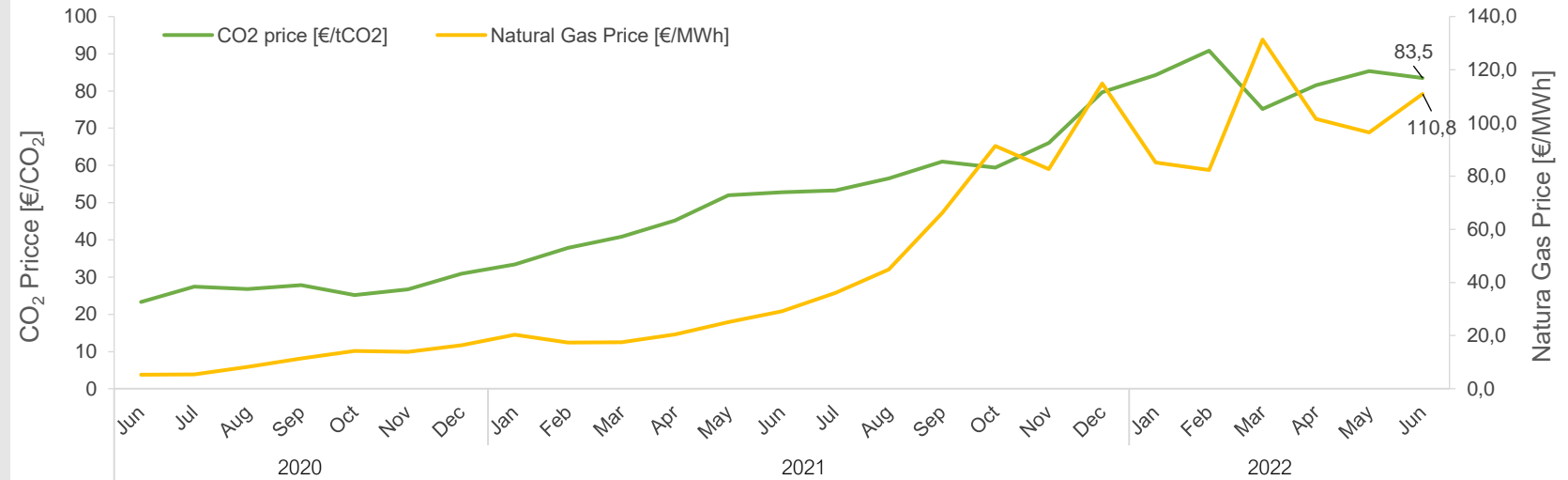
ALLOWANCES AVERAGE PRICE

83.4

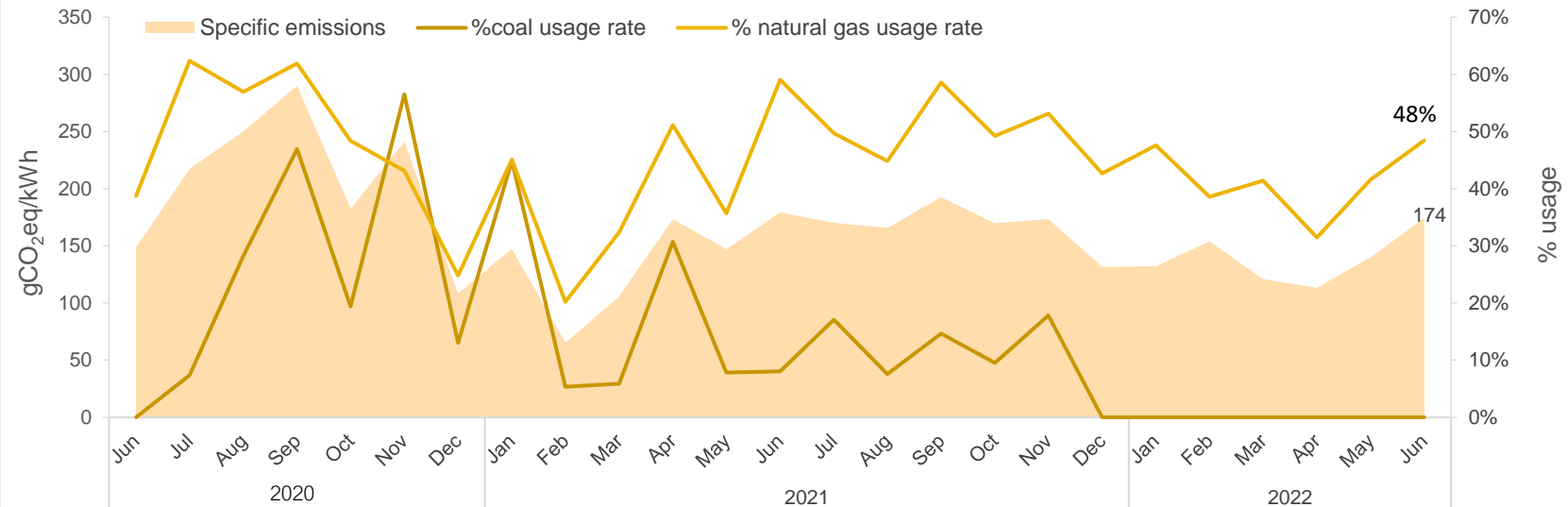
€/tCO₂

▲ **90.9%**

In comparison to Jun 2021



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



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

Environmental Service

The indicators on the right identify the savings reached between January 1 and June 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:



€1,902 M

Imported natural gas (Jan-Jun)

€301 M

Imported natural gas (Jun)



3.9 MtCO₂eq

CO₂ emissions (Jan-Jun)

0.5 MtCO₂eq

CO₂ emissions (Jun)



€624 M

Imported electricity (Jan-Jun)

€31 M

Imported electricity (Jun)



€289 M

CO₂ allowances (Jan-Jun)

€42 M

CO₂ allowances (Jun)

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

Trans-European energy infrastructure

On May 30, the European Parliament and the Council published the [Regulation \(EU\) 2022/869](#), concerning the trans-European energy infrastructure.

State aid

On June 8, the European Commission [approved](#) a €8.400 M measure for Portugal and Spain aimed at reducing the whole sale electricity prices in the Iberian market.

Permitting

On June 13, the European Commission [joined](#) several countries in a workshop to discuss the permitting processes of renewable energy projects, with the aim of simplifying and accelerating these processes.

Electricity production in 2021

Eurostat published the [data](#) concerning electricity production in Europe in 2021, where fossil fuels were the main source, unlike in 2020, where renewable sources had surpassed fossils.

National Barometer

Production Unit for Self-Consumption

On June 2, [Dispatch No. 15/2022](#) was published, setting the technical rules and procedures for the correct design and conduct of inspections applicable to collective electrical installations associated with Production Units for Self-Consumption (PUSC).

Electricity production costs

On June 21, [Directive No. 13-A/2022](#) was published, approving the implementation of the exceptional mechanism for adjusting electricity production costs.

Natural gas tariffs and prices

On June 28, [Directive No. 15/2022](#) was published, approving gas tariffs and prices for the year 2022-2023.

Add-on rate on CO₂ emissions

On June 30, [Ordinance No. 167-A/2022](#) was published, suspending the update of the add-on rate of the addition on CO₂ emissions, until August 31, 2022.



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