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BULLETIN
RENEWABLE ELECTRICITY

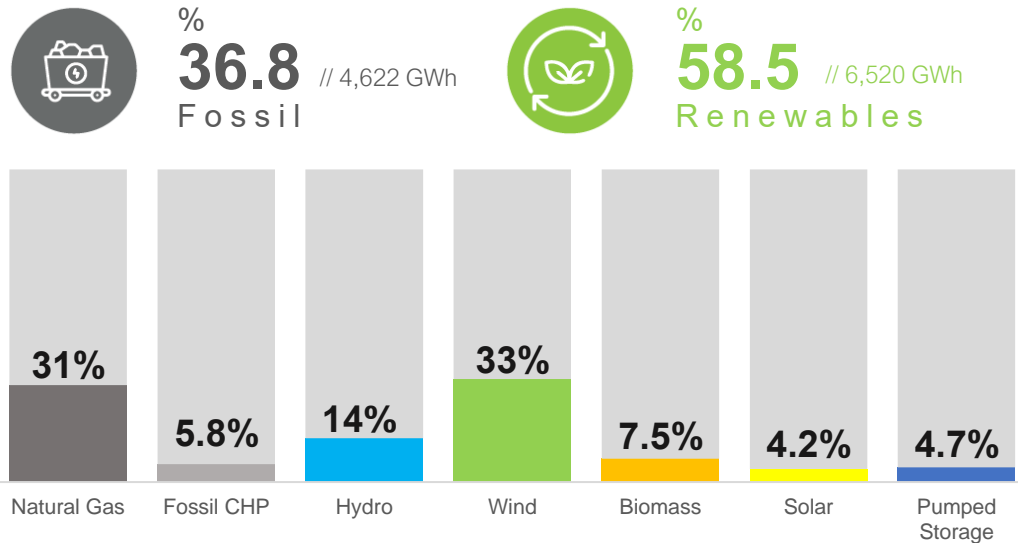
**Portugal precisa
da nossa energia!**

Portugal needs our energy!

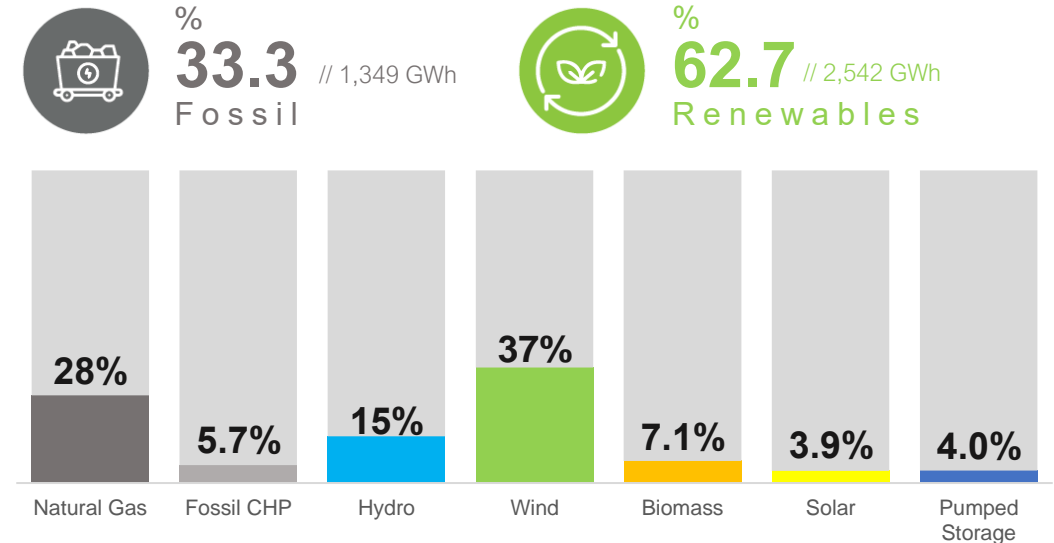


Executive Summary

ACCUMULATED GENERATION (Jan-Mar)



MONTHLY GENERATION (Mar)



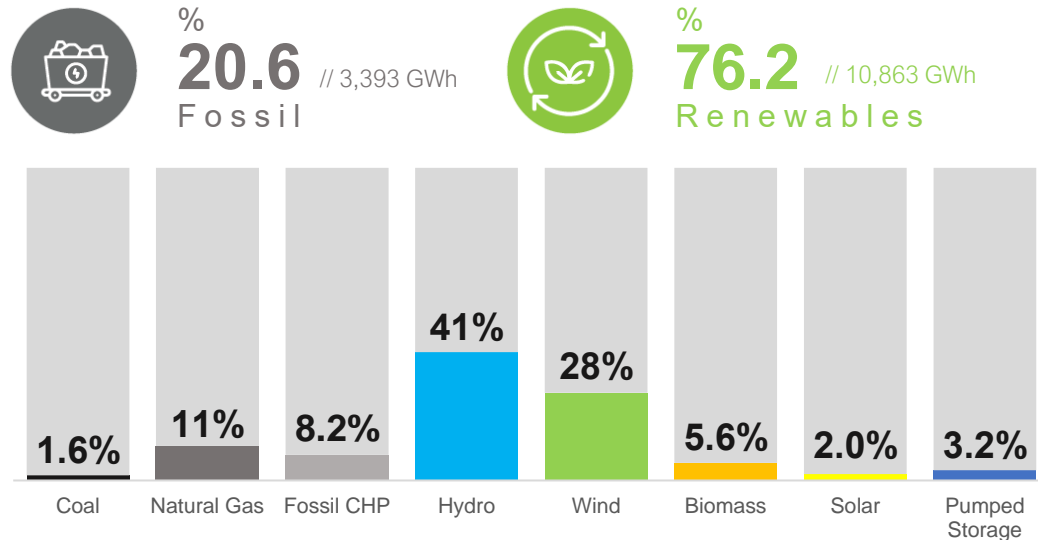
ELECTRICITY SECTOR INDICATORS (Jan-Mar)



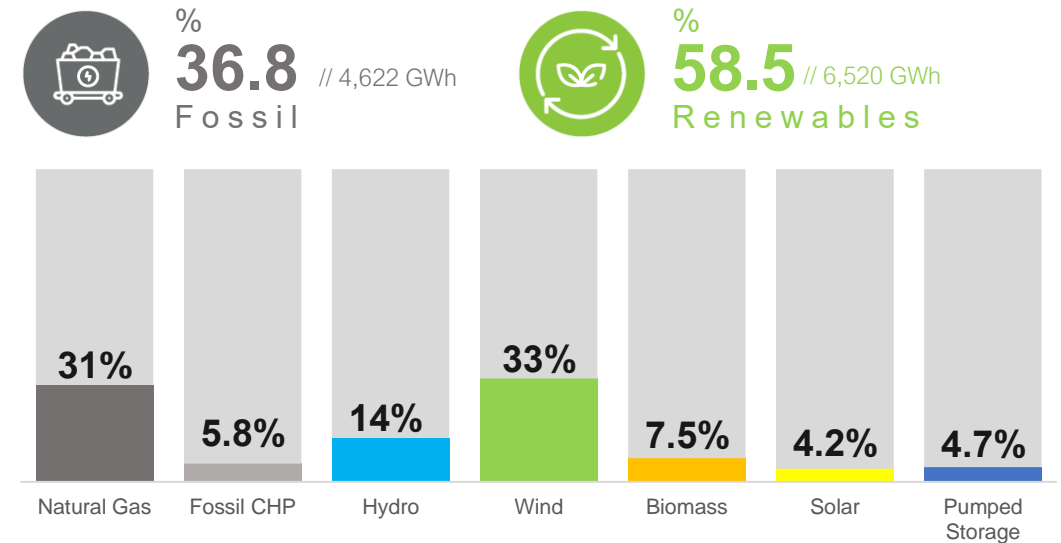
¹ Generation refers to the net power generation of the plants, considering the pumping production recently disclosed by REN. Pumping production is not accounted for in the percentage of production from renewable sources
Source: REN, Anlysays APREN

Electricity Generation: Mainland Portugal

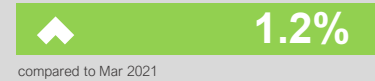
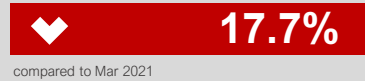
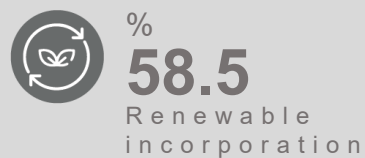
ACCUMULATED MARCH 2021 (Jan-Mar)



ACCUMULATED MARCH 2022 (Jan-Mar)



MAIN INDICATORS

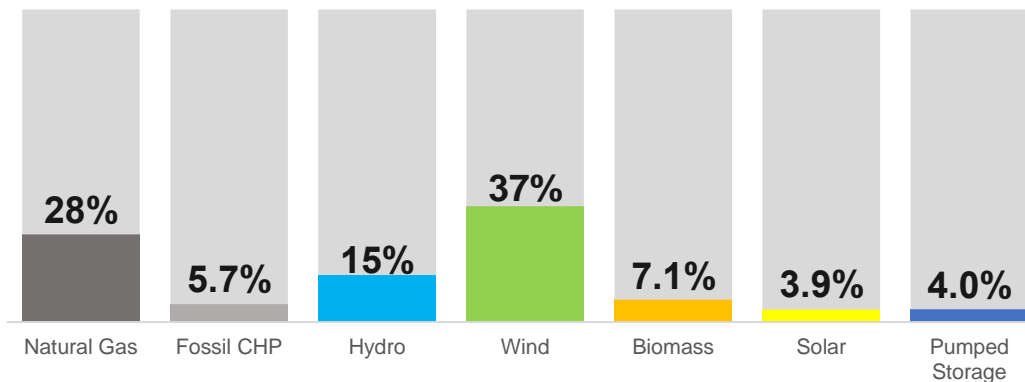


² Consumption refers to the net production of power plants, bearing in mind the import-export balance
Source: REN, Analysis APREN

Monthly analysis in Portugal: March

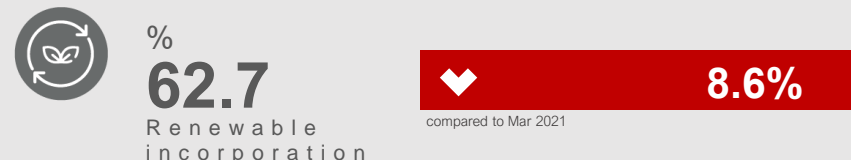
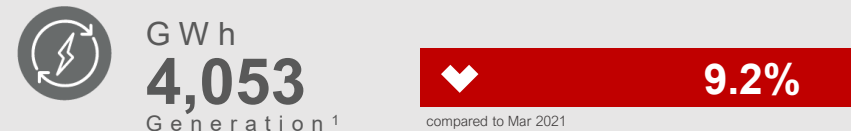
From 1 to 31 March 2022, renewable incorporation was 62.7%, with 2,542 GWh produced. The reduction of 8.6% compared to March 2021 was mainly due to the low hydraulicity rate, caused by drought and suspension of electricity production in dams, even though activity has already resumed (although not fully) in March.

Source: REN, Analysis APREN



Source: REN, Analysis APREN

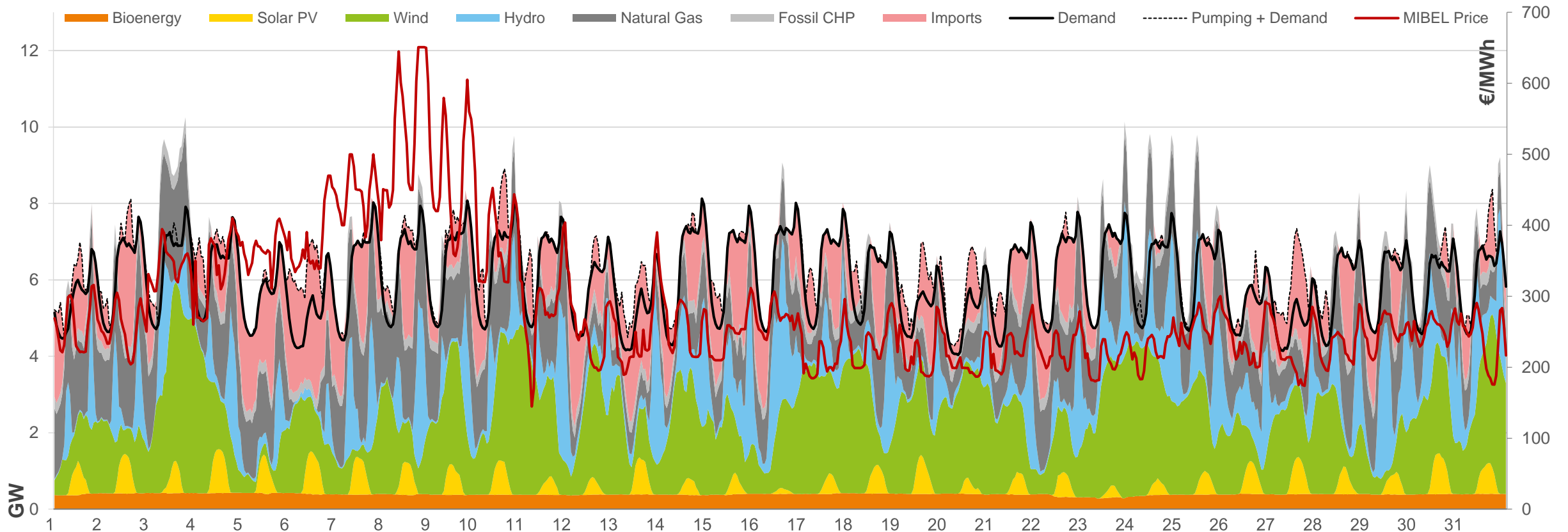
ELECTRICITY SECTOR INDICATORS



Source: REN, Analysis APREN

Monthly analysis in Portugal: March

Load diagram for the month of March 2022



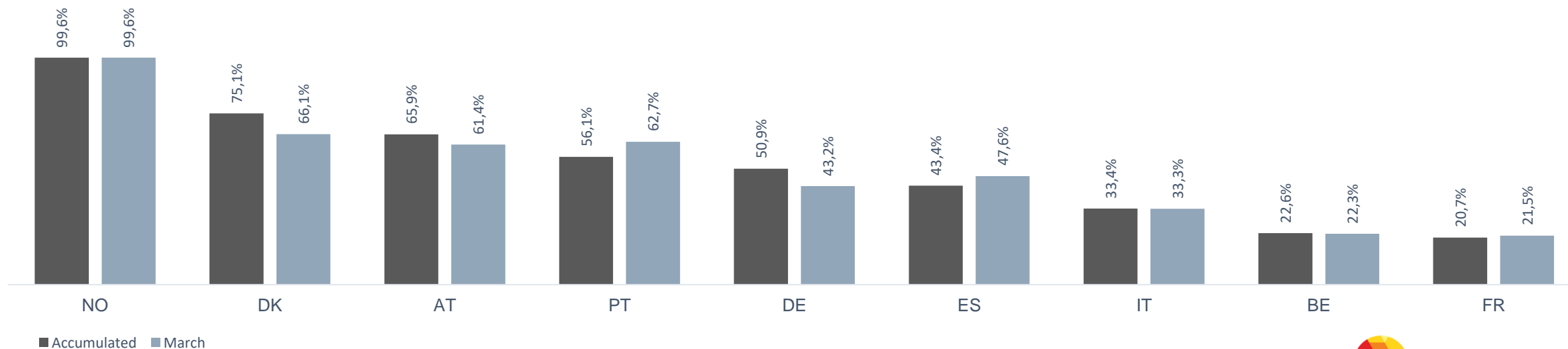
Source: REN, Analysis APREN

Renewable Electricity Europe

Between January 1 and March 31, 2022, Portugal was the fourth country with the highest incorporation of renewable energy in electricity generation, behind Norway, Denmark and Austria, which obtained 99.6%, 75.1% and 65.9%, respectively, from RES. From March 1 to March 31, Portugal increased renewable incorporation by 11.8% compared to February, leading to third place in the countries with the highest renewable incorporation in Europe.

In this analysis, only the main European markets were considered, to have a representative comparison panorama.

³Arithmetic average hourly prices
Source: OMIE, Analysis APREN

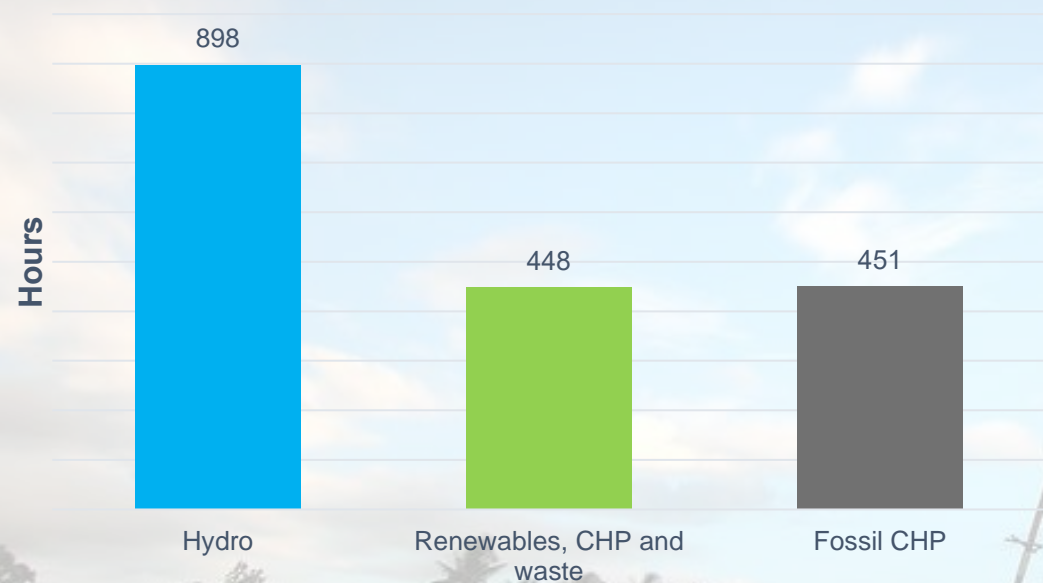


Renewable incorporation in accumulated electricity generation (Jan-Feb) and monthly electricity (Feb).
Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN

Market Price Setting : Portugal

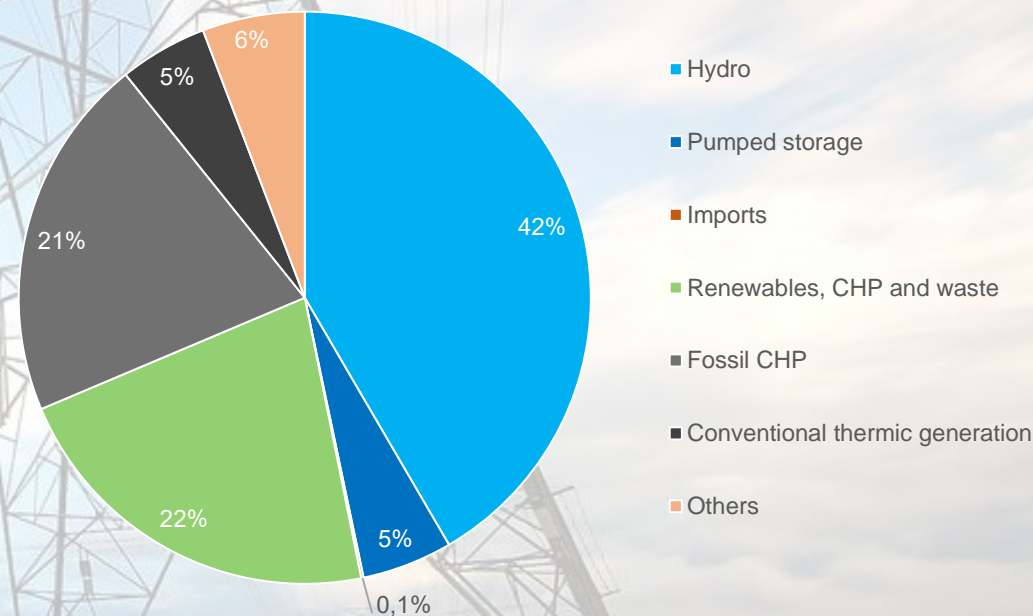
Between January 1 and March 31, it was verified that the closing technology of the market that registered the highest number of hours was hydro with 898 non-consecutive hours, followed by combined cycle thermal generation with 451 hours and renewables, cogeneration and waste with 448 hours.

ACCUMULATED JAN-MAR



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

MARCH 2022



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

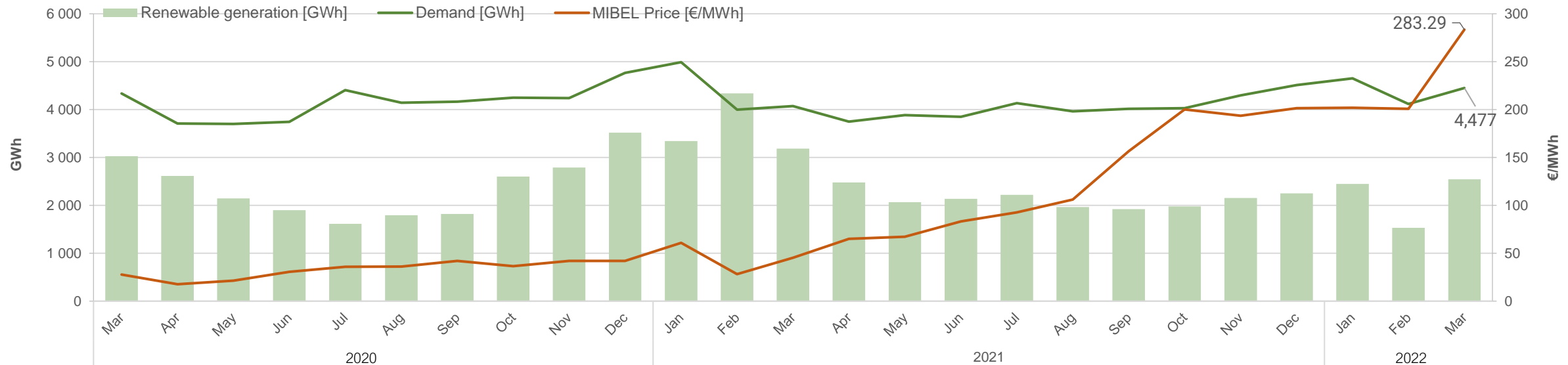
Electricity Market Portugal

Between January 1 and March 31, the average hourly price recorded in MIBEL in Portugal (229.5 €/MWh³) represented an increase of more than four times compared to the same period last year.

In the same period, 12 non-consecutive hours were recorded in which renewable generation was sufficient to supply the electricity consumption of Mainland Portugal, with an average hourly price in the MIBEL of €177.68/MWh.

During March, renewables were not able to supply an entire hour of electricity consumption.

³Arithmetic average hourly prices
Source: OMIE, Analysis APREN



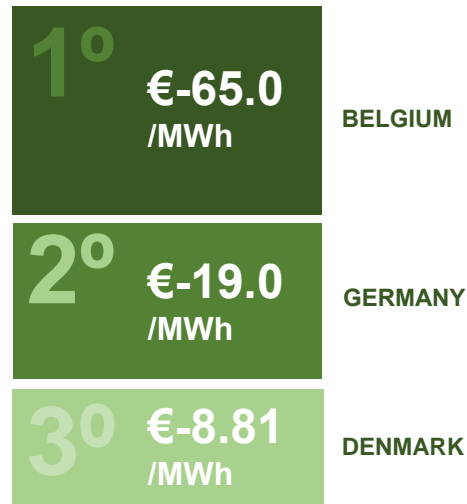
Market price, electricity consumption and renewable generation (Feb 2020 to Feb 2022).
Source: OMIE, REN, Analysis APREN

Electricity Market: Europe

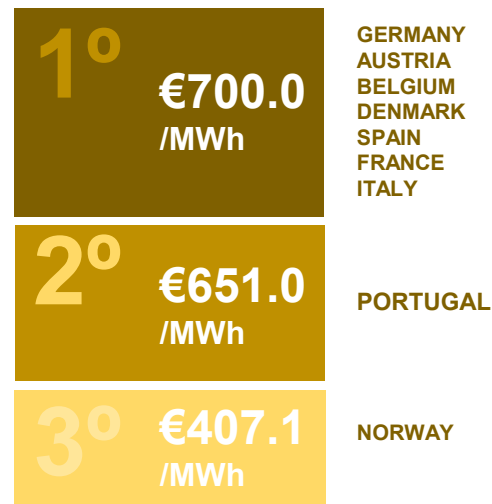
During March 2022, there was a minimum hourly price at MIBEL in Portugal of €144.8/MWh³, for an hour, in which market setting was due to renewable technologies, CHP and waste. The maximum hourly price reached 651.0 €/MWh³, where the market price setting depended on hydro.

Regarding prices in Europe, it should be noted that all values increased compared to the previous month, with several countries reaching a maximum value of 700.0€/MWh³, which contributed to all countries having registered an average monthly price above the value of the accumulated year.

PRICES MINIMUM (Mar)



PRICES MAXIMUM (Mar)



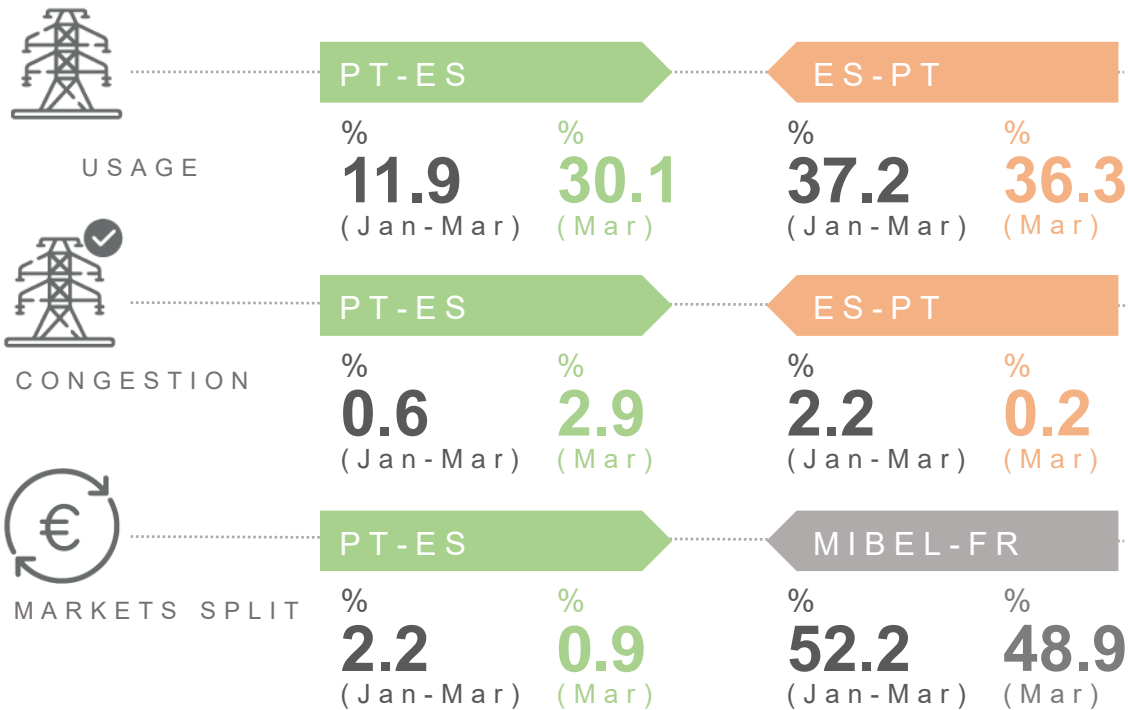
³ Arithmetic average hourly prices
Source: ENTSO-E, OMIE, Analysis APREN



International Trade

Between January 1 and March 31, 2022, the electricity system of Mainland Portugal recorded electricity imports equivalent to 3,344 GWh and exports of 610 GWh, with Portugal being an importer with a balance of 2,734 GWh.

MAIN INDICATORS OF INTERCONNECTION PT-ES



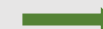
Source: REN, Analysis APREN.

LEGEND

Import balance (Jan-Mar) [GWh]



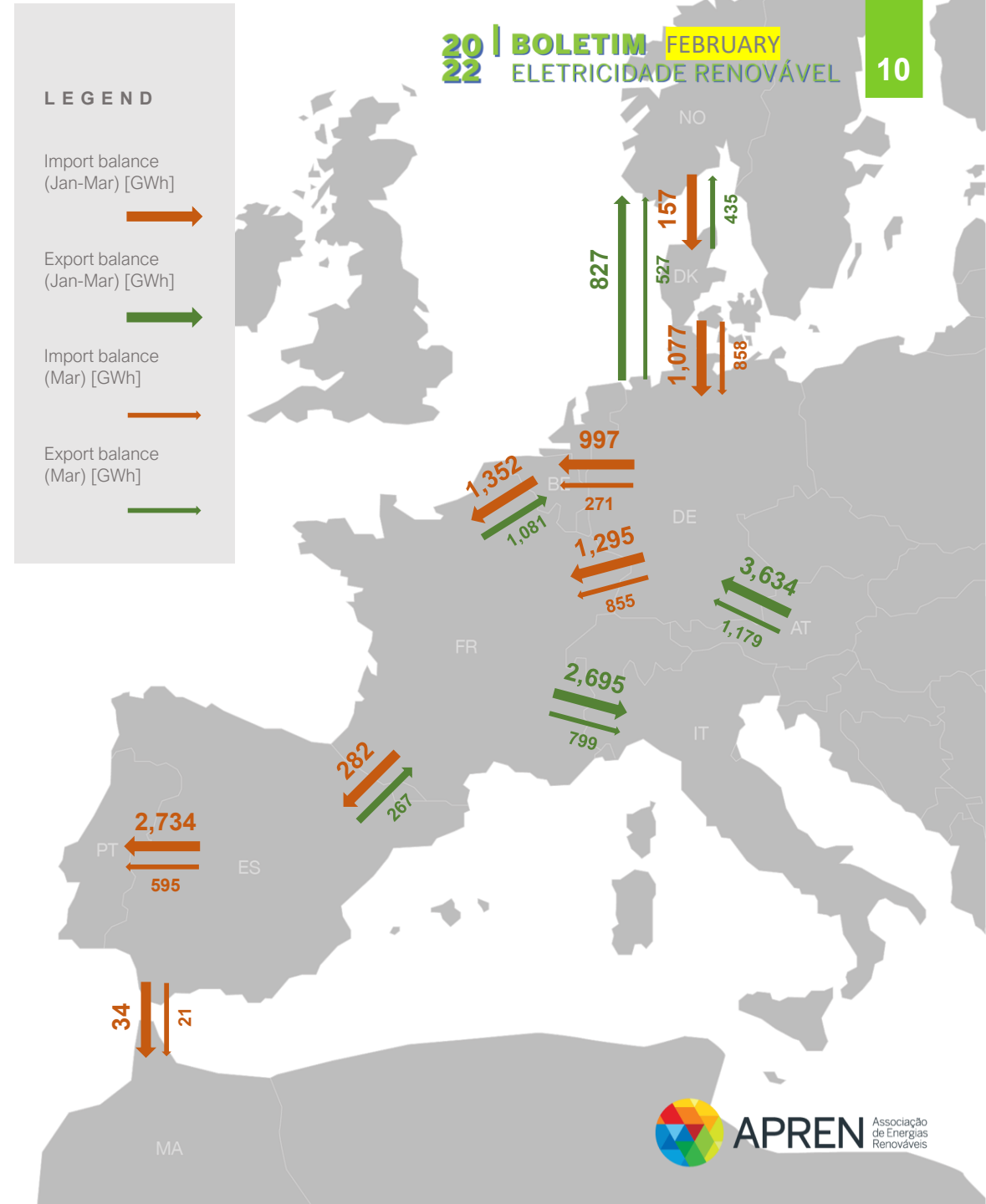
Export balance (Jan-Mar) [GWh]



Import balance (Mar) [GWh]



Export balance (Mar) [GWh]



Power sector emissions

Between January 1 and March 31, specific emissions reached 134 gCO₂eq/kWh, while the total emissions from the electro-producing sector reached 1.5 MtCO₂eq. The European Emissions Trading System (EU-ETS) recorded an average price of €87.5/tCO₂, increasing by more than double compared to the same period in 2021.

Source: SendeCO₂,REN, Analysis APREN.

SECTOR EMISSIONS

1.5

MtCO₂eq

▼ **5.5%**

compared to Mar 2021

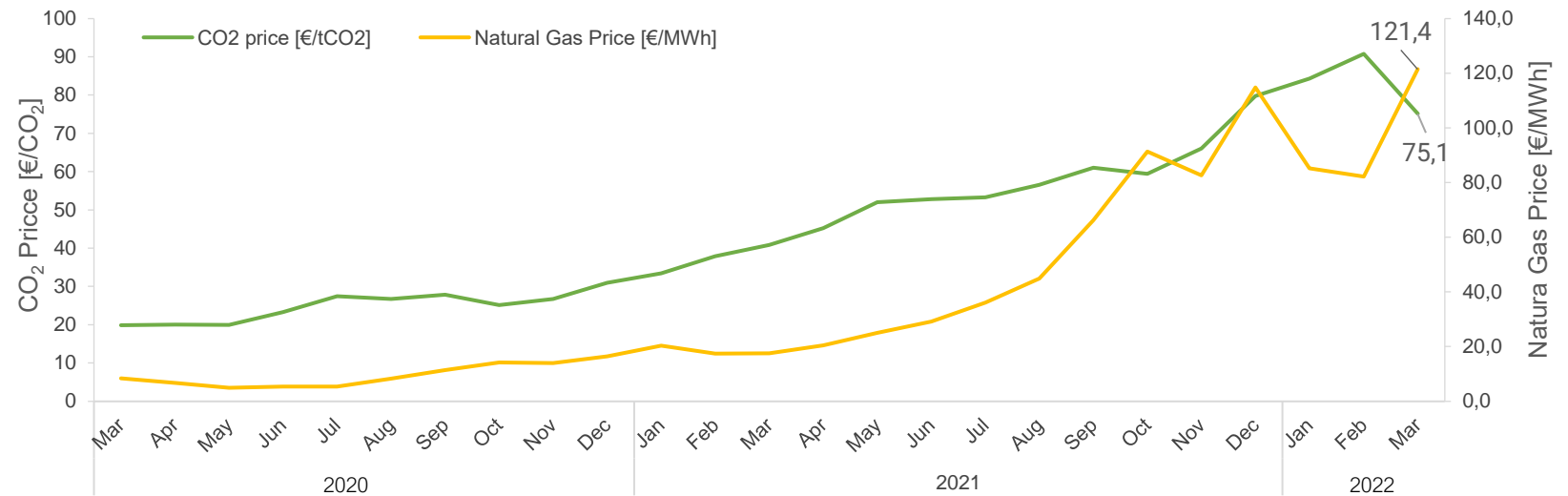
ALLOWANCES AVERAGE PRICE

€83.4

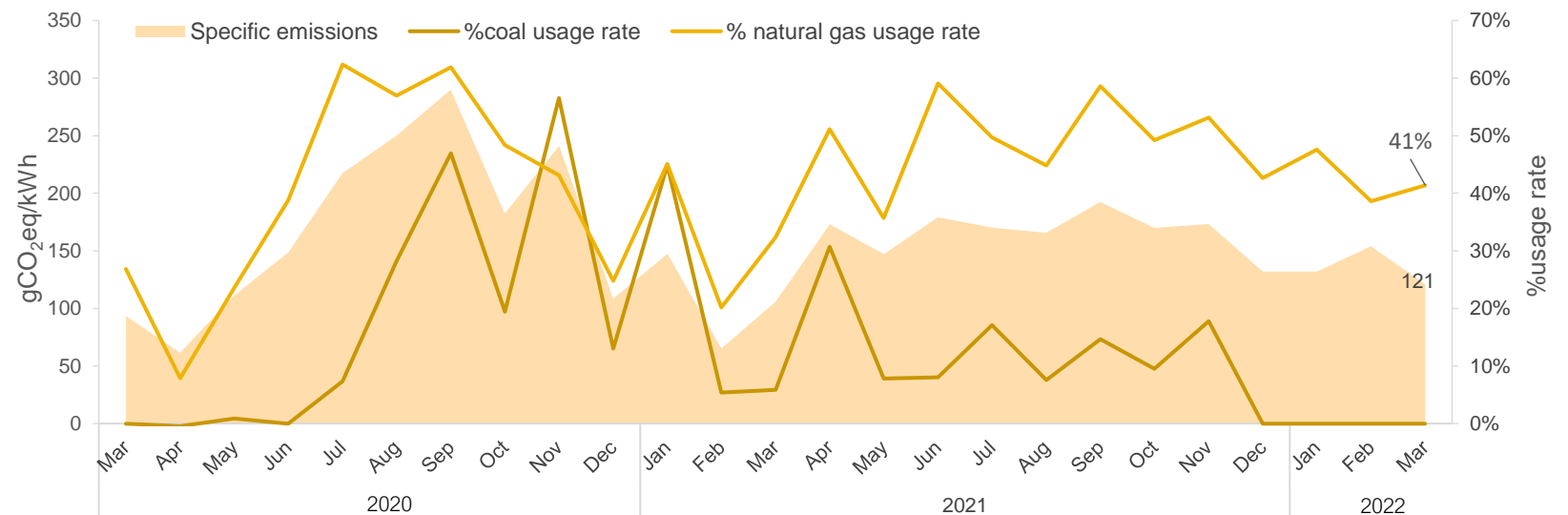
/tCO₂

▲ **123%**

compared to Mar 2021



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



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

Environmental Service

The indicators on the side identify the savings achieved between January 1 and March 31, 2022, in natural gas, CO₂ emissions and CO₂ emission allowances, resulting from renewable incorporation into electricity generation.

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

Renewables have avoided:



€886 M

Imported Natural Gas (Jan-Mar)

€398 M

Imported Natural Gas (Mar)



2.0 MtCO₂eq

CO₂ emissions (Jan-Mar)

0.7 MtCO₂eq

CO₂ emissions (Mar)



€421 M

Imported electricity (Jan-Mar)

€207 M

Imported electricity (Mar)



€140 M

CO₂ allowances (Jan-Mar)

€46 M

CO₂ allowances (Mar)

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

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

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

European Barometer

REPowerEU

The European Commission has proposed an [outline of a plan](#) to make Europe independent of Russian fossil fuels before 2030, starting with gas, considering Russia's invasion of Ukraine, in which a goal of 45% renewable incorporation is set by 2030.

Energy Efficiency Directive

The European Parliament's Committee on the Environment, Public Health and Food Safety (EP ENVI) has published its amendments ([111-335](#), [236-560](#) e [561-791](#)) to the draft opinion on the recast of the Energy Efficiency Directive. The amendments add thermal storage and demand side management through storage.

Energy efficiency

According to Euroactiv, the European Commission [is reviewing the economic assumptions](#) on which the energy and climate package of laws presented last year was based, saying that sky-high gas prices fueled by the war in Ukraine have strengthened the case for more ambitious energy efficiency targets.

Recovery and Resilience Facility (RRF)

The European Commission has endorsed a [positive preliminary](#) assessment of Portugal's payment request for €1.16 billion, of which €553.44 million of grants and €609 million of loans under the Recovery and Resilience Facility (RRF)

Batterys – Storage

The Council of the European Union reached a [general approach](#) on the battery regulation, following the position of the parliament adopted in the plenary session. In its position, the Council stressed the need to better define the conditions for battery recycling, outlining differentiated treatment for various types of batteries and components.

Energy provisioning

The European Commission has presented a [legislative proposal](#) introducing a minimum gas storage obligation of 80% for the coming winter to ensure security of energy supply, rising to 90% for the following years.

European Energy Security

With the events in Ukraine, the United States and the European Commission are establishing a [joint Task Force on Energy Security](#) to define the parameters of this cooperation and to execute its implementation.

State aid

The European Commission has [adopted a Temporary Crisis Framework](#) to enable Member States to use the flexibility foreseen under State aid rules to support the economy in the context of Russia's invasion of Ukraine.

National Barometer

Pego auction

On March 11, the [Act and the Revised Preliminary Report](#) of the competitive procedure for the Allocation of Reserve Injection Capacity in the Public Service Electric Network were published.

Private Lines of Service

It was published on March 11 [the rectification of the Dispatch](#) on Private Service Lines (5/DG/2022), concerning the definition of specific procedures for licensing interconnection infrastructures, of private service, initially published on 02/22/2022.

Statute of the Electro-intensive

On March 14, [Ordinance No. 112/2022](#) was published, which regulates the Statute of the Electro-intensive Customer, taking into account Decree-Law No. 15/2022, of January 14.

Environmental Fund's budget

On March 14th, [Dispatch 3143-B/2022](#) was published, approving the Environmental Fund's budget for 2022.

Applicability of the EIA legal regime

A joint [APA/DGEG dispatch](#) was published on March 15th, announcing the applicability of the EIA legal regime to small production units with solar energy as their primary source.

Anticipation of the execution of the NRP

The Council of Ministers has defined the [anticipation of the execution of the NRP](#) (National Resilience Plan) from 2030 to 2026.

Coal Power Plants

Due to the increase in the price of natural gas and the shortage in hydroelectric production, [the DGEG and REN have studied](#) the possibility of reopening the Sines and Pego plants, however, the Government guarantees that the plants are not necessary.

Energy Dependency

Despite the increase in renewable production, Portugal is still [11th in the European ranking of energy dependence](#) (composed of 27 countries), due to the existing fossil production.

Rate of the addition on CO2 emissions

[Ordinance 118/2022](#) was published on March 23, suspending the update of the rate of the addition on CO2 emissions until June 30, 2022.

Floating solar Auction

The deadline for submitting applications for the [floating solar auction](#), to be held on April 4, ended on March 2. The Government will auction 263 MW of solar capacity, spread over seven hydroelectric power plants, and will have 12 bidders.

Extraordinary auction - SRP

[The announcement](#) of the extraordinary auction for the placement of energy acquired by the Supplier of Last Resort from special regime producers was published on March 28.



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