

August

Special edition  
1<sup>st</sup> Semester Azores and Madeira

# BULLETIN

2021

Renewable Electricity



APREN Associação de Energias Renováveis

# Executive Summary

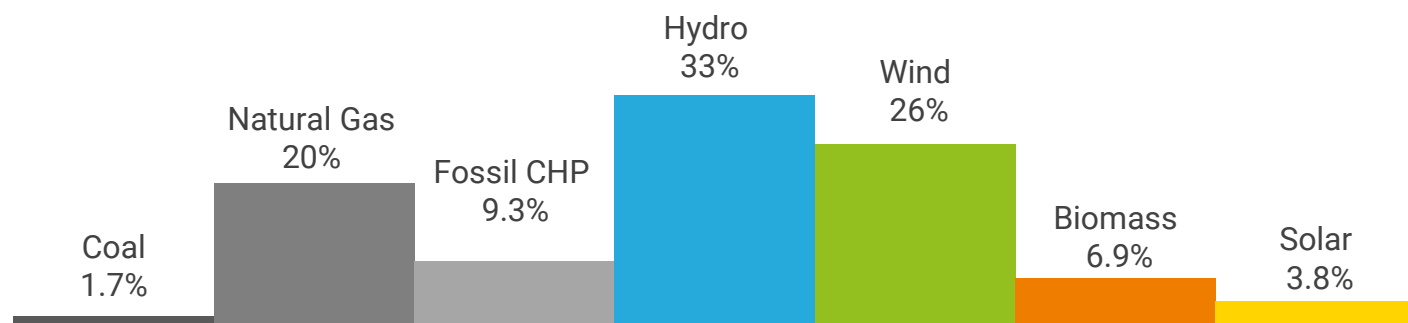
## Accumulated August 2021 (Jan-Aug)



**Fossil**  
31.2%  
9,858 GWh



**Renewables**  
68.8%  
21,737 GWh



Source: REN, Analysis APREN

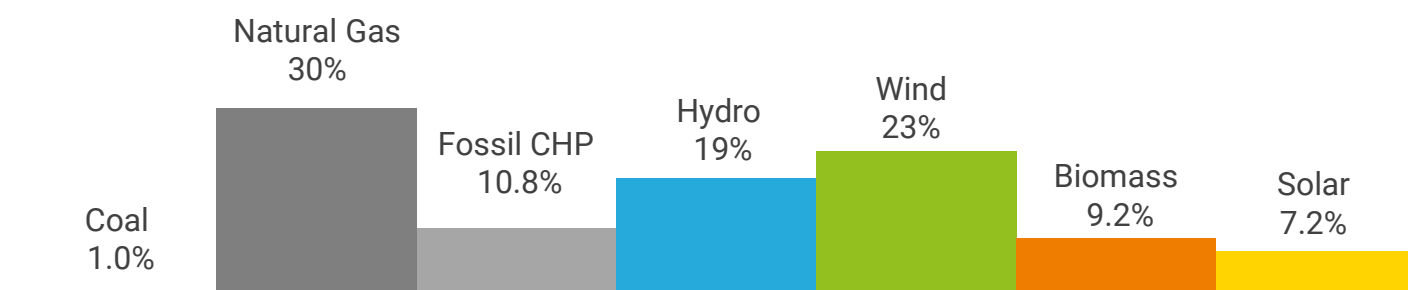
## August 2021



**Fossil**  
41.7%  
1,266 GWh



**Renewables**  
58.3%  
1,769 GWh

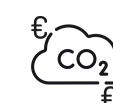


Source: REN, Analysis APREN

## Electricity sector indicators (accumulated Jan-Aug)



**31,595 GWh**  
Generation



**€ 46.5/tCO<sub>2</sub>**  
CO<sub>2</sub> Price



**€ 68.5/MWh**  
Price MIBEL PT



**3.8 MtCO<sub>2</sub>eq**  
CO<sub>2</sub> Emissions



**2,341 GWh**  
Import balance



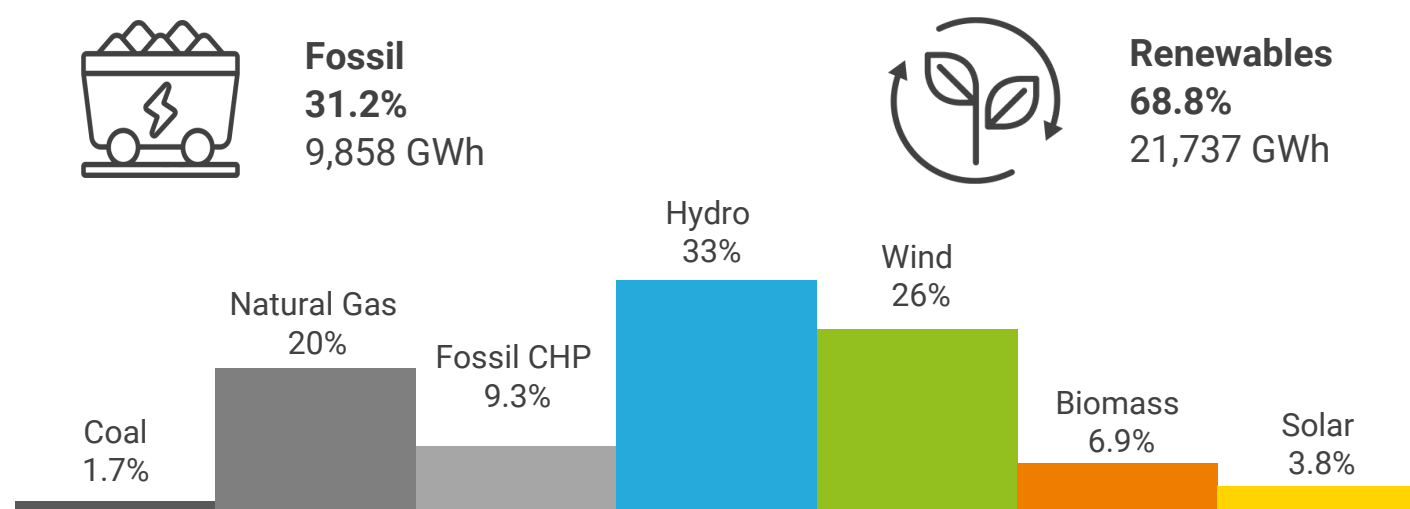
**121 gCO<sub>2</sub>eq/kWh**  
CO<sub>2</sub> Specific emissions





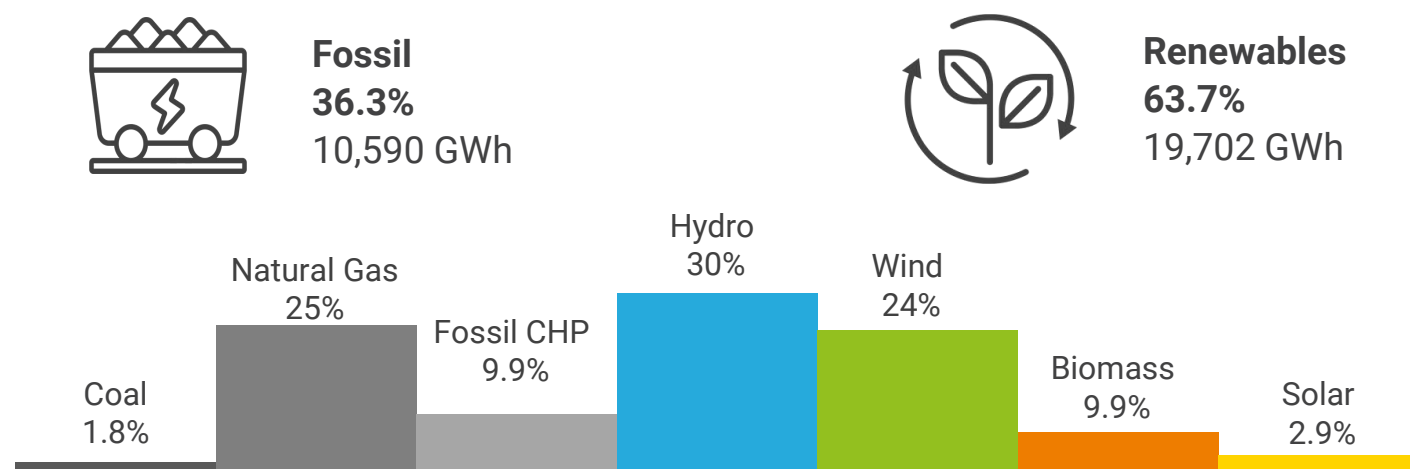
# Electricity Generation: Mainland Portugal

## Accumulated August 2021 (Jan-Aug)



Source: REN, Analysis APREN

## Accumulated August 2021 (Jan-Aug)



Source: REN, Analysis APREN

## Main indicators



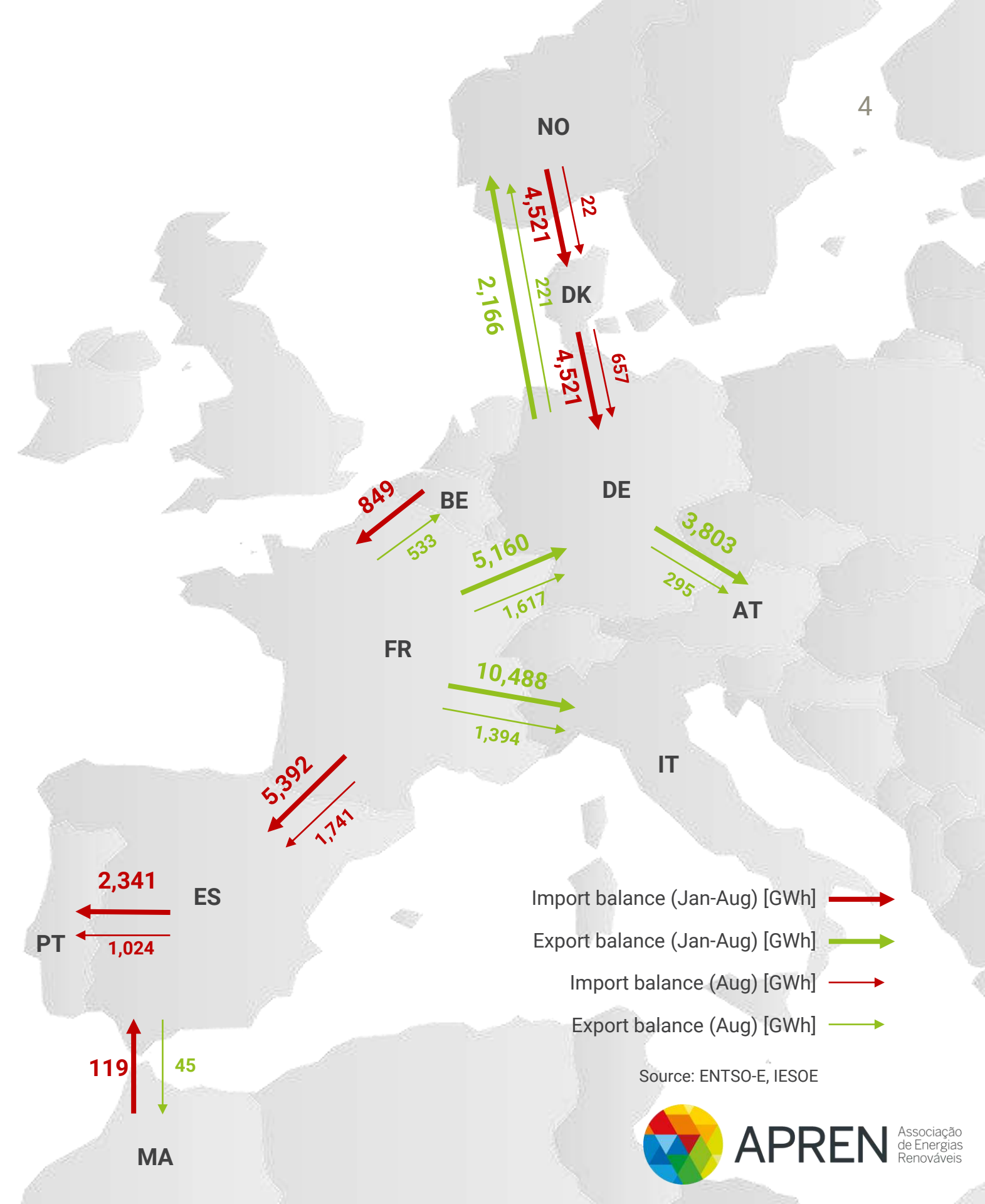
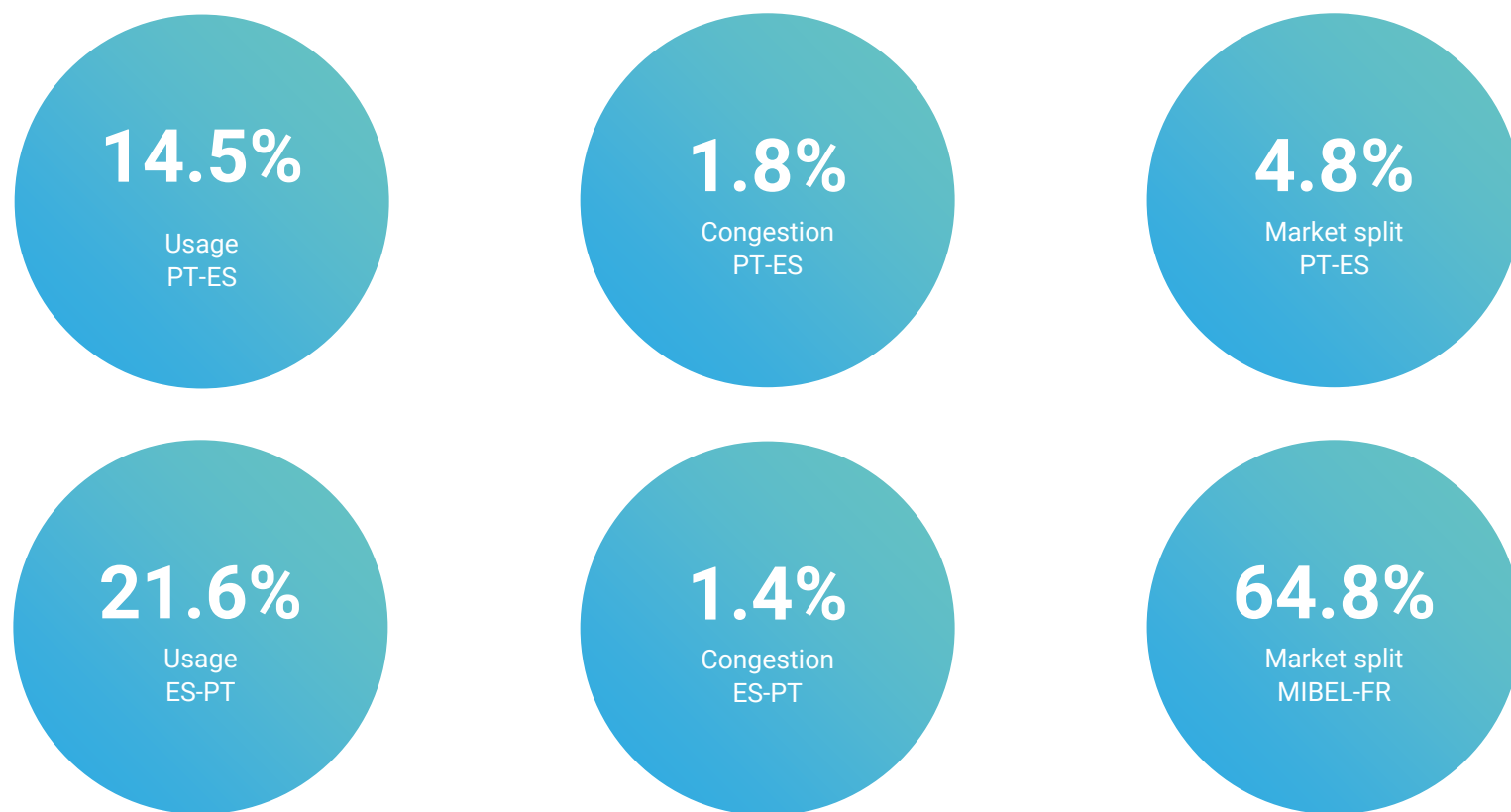
<sup>1</sup>Consumption refers to the net production of power plants, bearing in mind the import-export balance.  
Source: REN, Analysis APREN

# International Trade

Between January 1 and August 31, 2021, the electricity system of Mainland Portugal registered electricity imports equivalent to 5,556 GWh and exports of 3,215 GWh, with Portugal being an importer with a balance of 2,341 GWh.

Source: REN, Analysis APREN

## Main interconnection indicators PT-ES



Source: ENTSO-E, IESOE

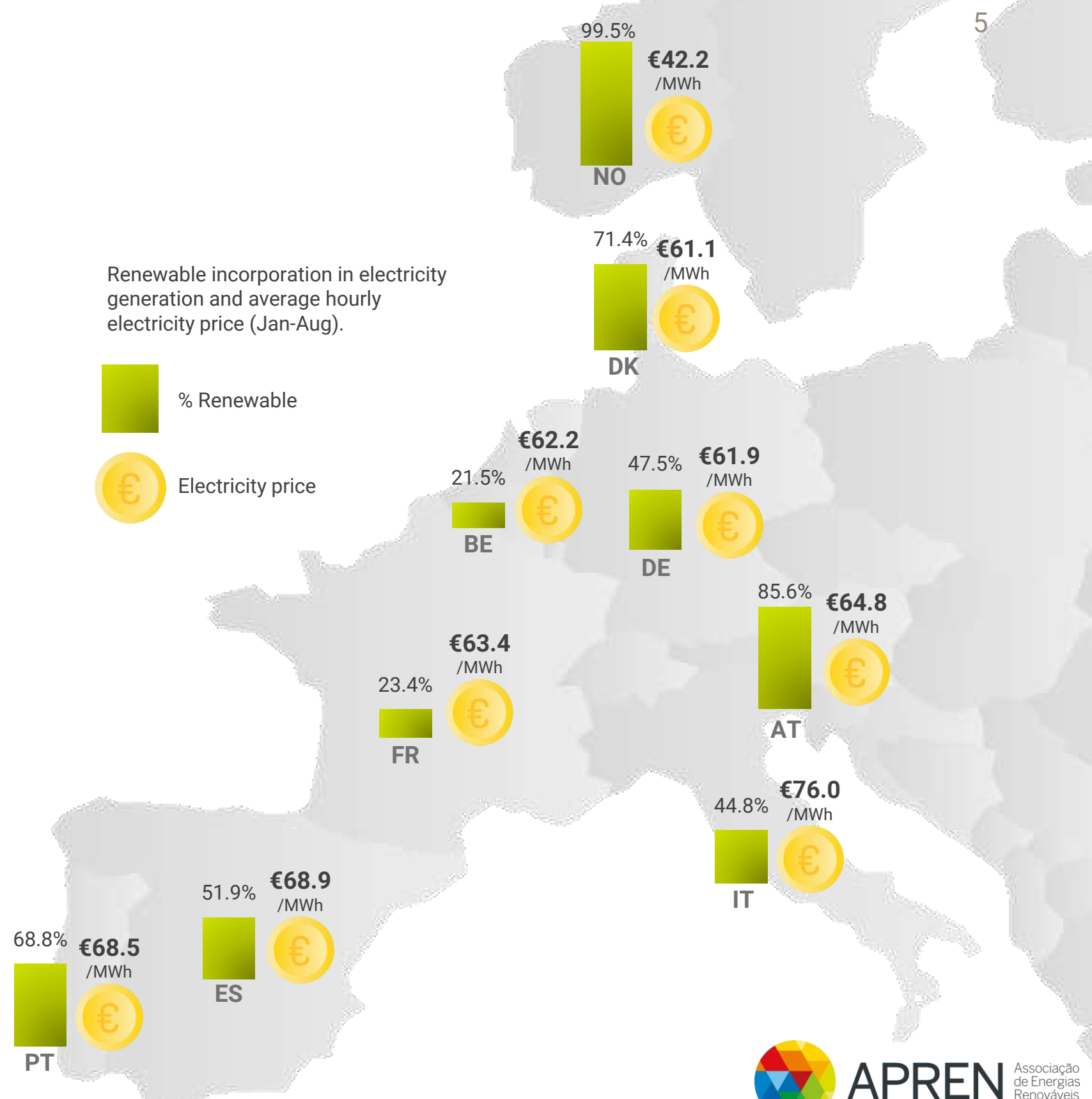
# Accumulated Electricity Market - Europe

Between January 1 and August 31, 2021, there was an hourly average price on the Iberian Electricity Market (MIBEL) in Portugal of € 68.53/MWh<sup>2</sup>. Despite the high renewable incorporation in Portugal, the price of electricity in the Iberian spot market has been on the rise, as a result of the upward trend in the price of emission allowances in the European CO<sub>2</sub> allowance market and the rise in the price of natural gas. It is in this scenario that Portugal registered the third highest average electricity price, compared to the other countries shown on the right. Portugal was the fourth country with the largest renewable incorporation in electricity generation, behind Norway, Austria and Denmark, which obtained 99.5 %, 85.6 % e 72.5 %, respectively, from RES.

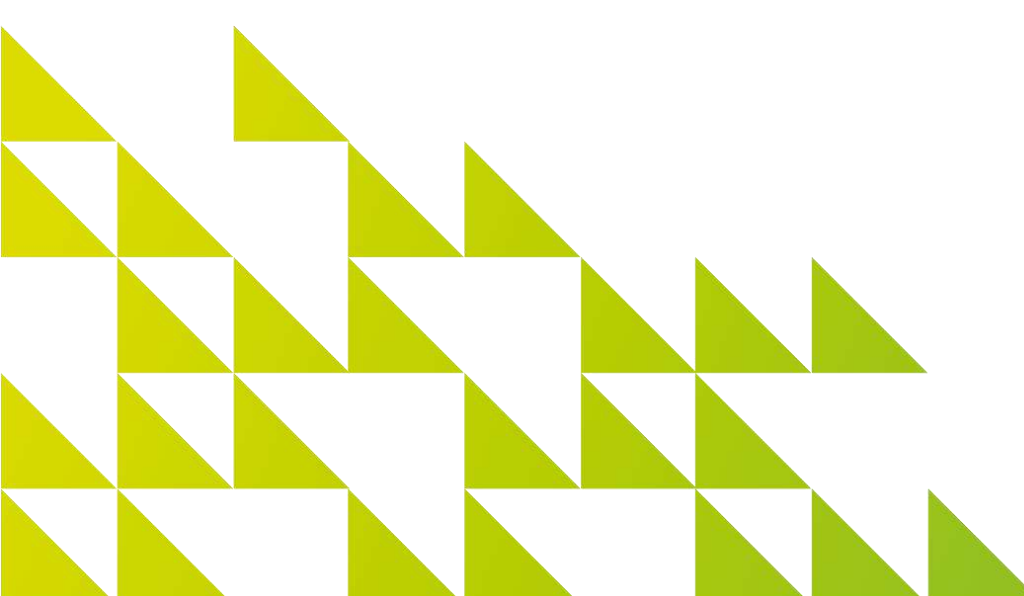
This analysis only took into account the main European markets, in order to have a representative panorama of comparison.

<sup>2</sup>Arithmetic average of hourly prices

Source: ENTSO-E, OMIE, Analysis APREN



Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN



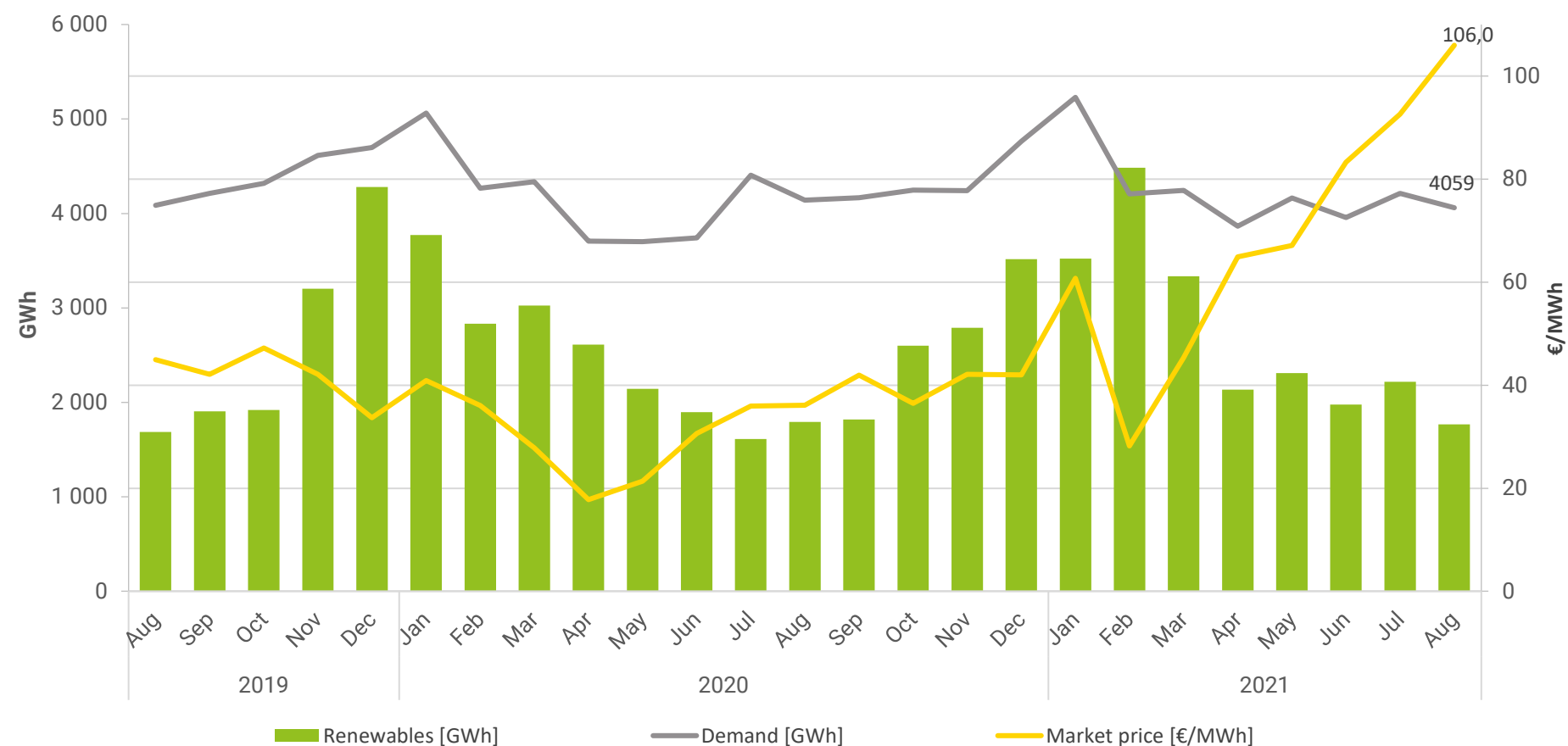


# Accumulated Electricity Market - Portugal

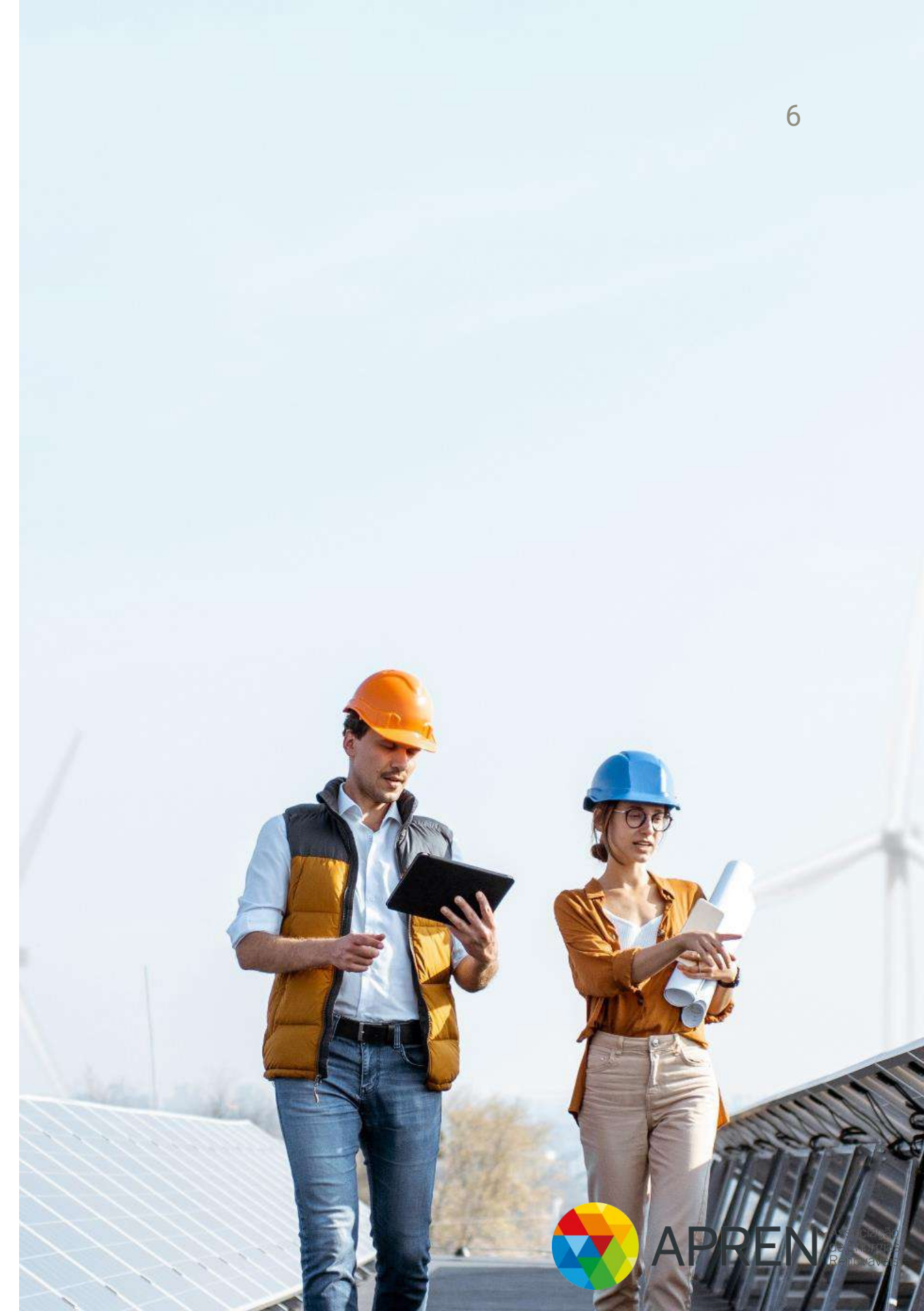
Between January 1 and August 31, 2021, the average hourly price registered in the MIBEL in Portugal (€ 68.5/MWh<sup>2</sup>) represents an increase more than double compared to the same period last year.

In the same period, 1,022 non-consecutive hours were recorded, in which renewable generation was sufficient to supply the electricity demand of Mainland Portugal, with an average hourly price on MIBEL of € 36.29/MWh.

<sup>2</sup>Arithmetic average of hourly prices  
Source: OMIE, Analysis APREN



Market price, electricity consumption and renewable generation (Aug-2019 to Aug-2021).  
Source: OMIE, REN, Analysis APREN



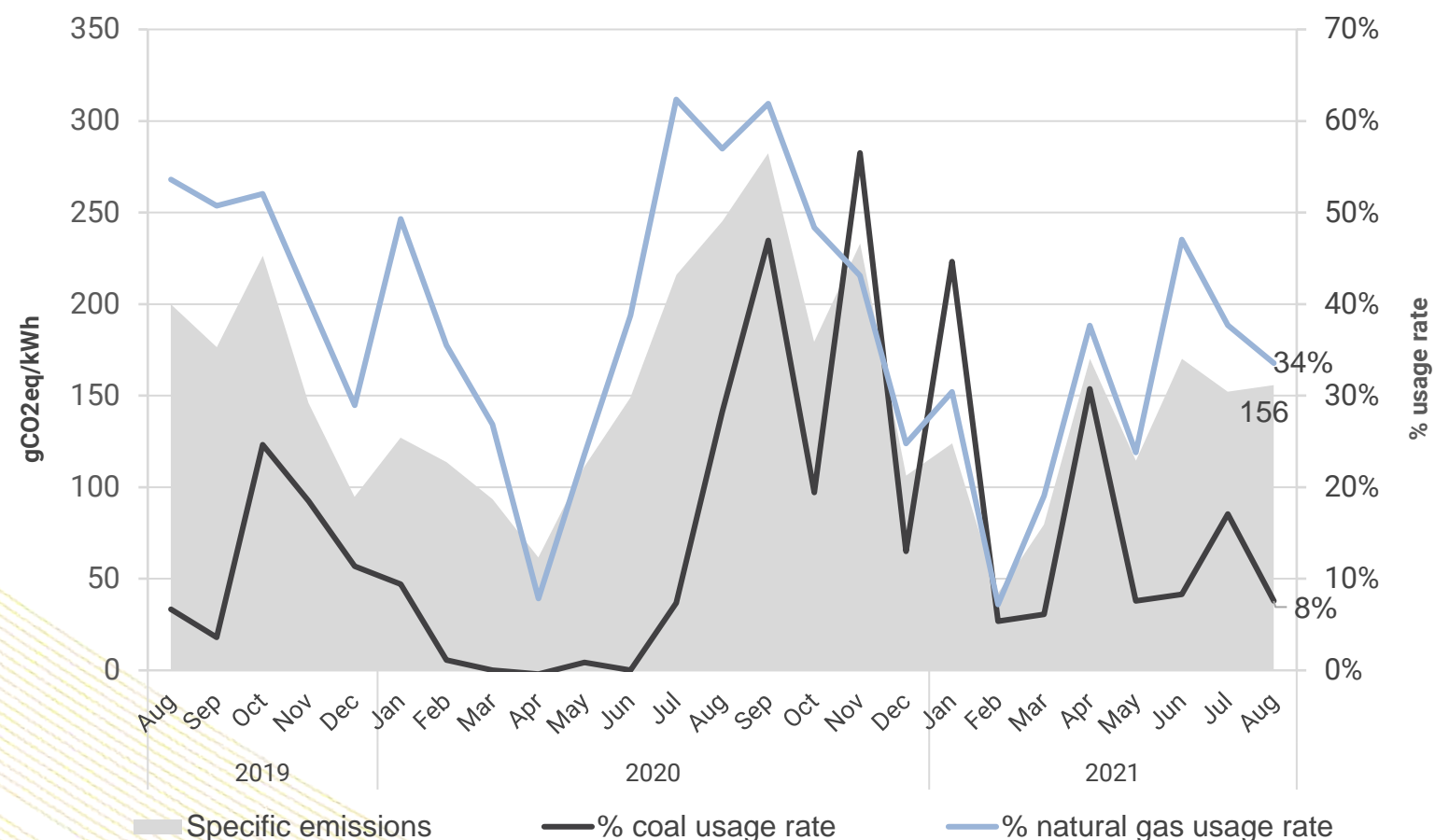
# Power Sector Emissions

Between January 1 and August 31, 2021, specific emissions reached a total of 121 gCO<sub>2</sub>eq/kWh, while the total emissions from the electricity-producing sector reached 3.8 MtCO<sub>2</sub>eq, of which 0.5 MtCO<sub>2</sub>eq correspond to the month of August.

Since the beginning of the year, the European Emissions Trading System (EU-ETS) has recorded an average price of € 46.5/tCO<sub>2</sub>, which represents an increase of 100 % compared to the same period of 2020. This month was registered the highest average price ever (€ 56.5/tCO<sub>2</sub>), nearly the double of the price from August 2020.

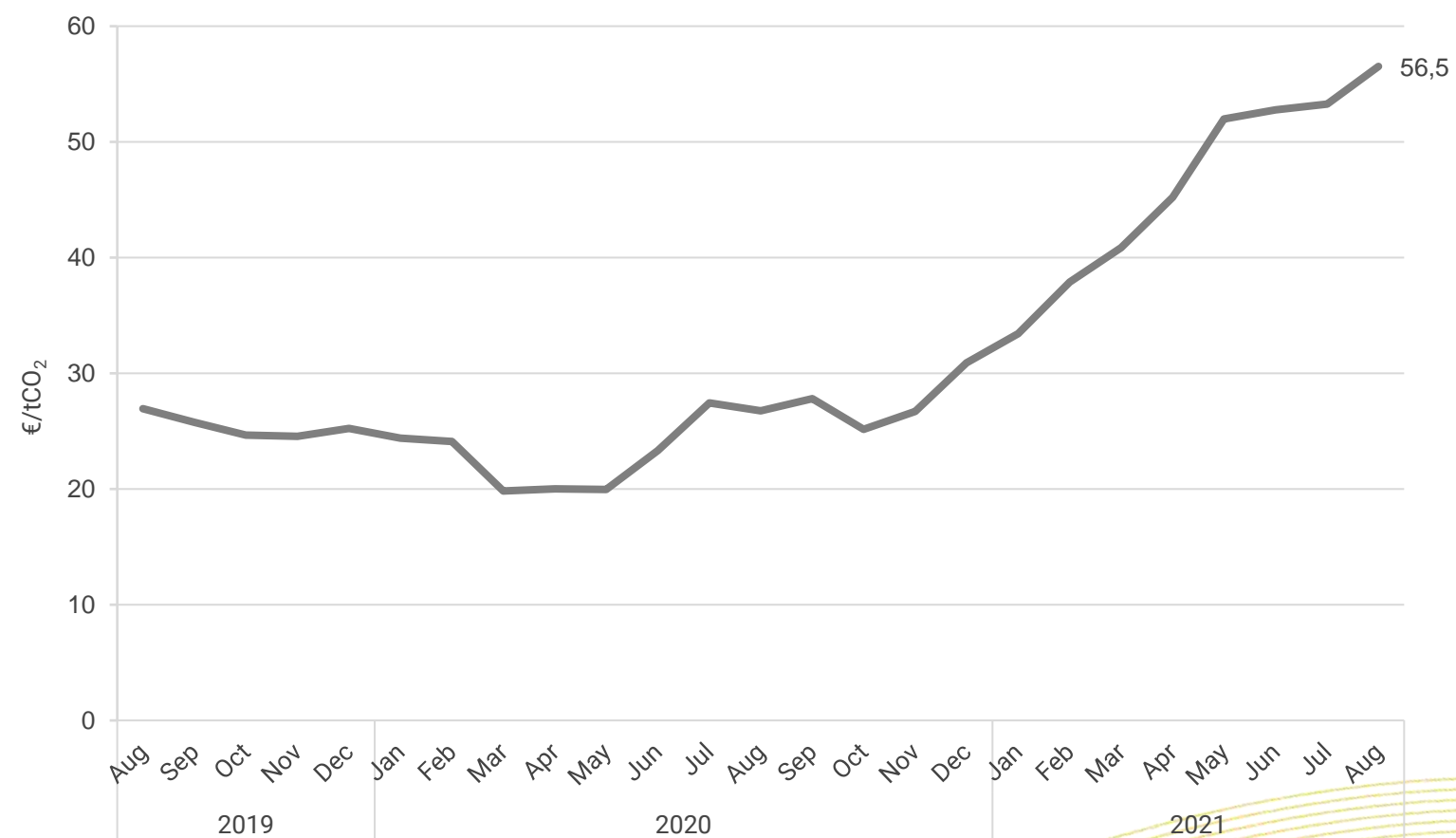


Source: SendeCO2



Specific emissions from the electricity sector in mainland Portugal, % use of coal and natural gas power plants from Aug-2019 to Aug-2021.

Source: REN, DGEG, ERSE, Analysis APREN



CO<sub>2</sub> allowances price from Aug-2019 to Aug-2021. Source: SendeCO2.

# Monthly analysis in Portugal: August

In August, the generation of renewable electricity represented 58.3 % of the total electricity generated in Mainland Portugal (3,035 GWh). It should be noted that the production of photovoltaic solar electricity this month reached, once again, an all-time high of 218 GWh.

Regarding international trade in August, it should be noted that Mainland Portugal was an importer, registering a balance of 1,024 GWh, having increased about five times compared to the import balance verified in August 2020 (192 GWh), due to the reduced import balance during the first months of the pandemic.

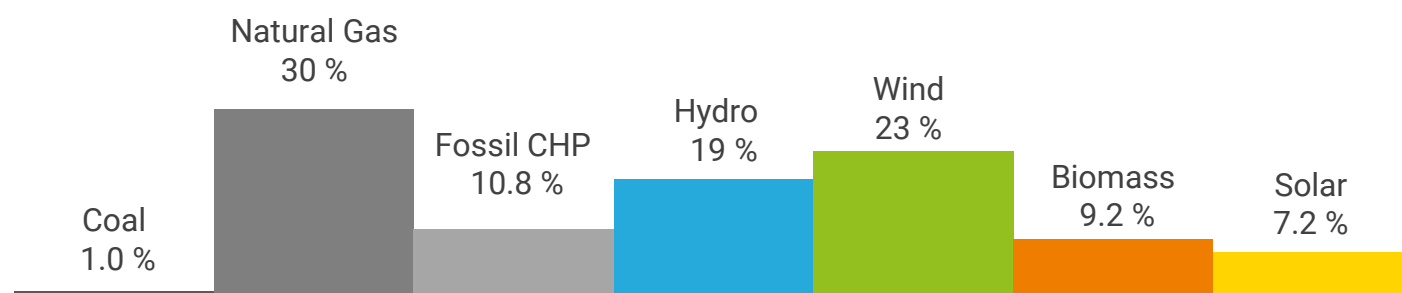
Source: REN, Analysis APREN



**Fossil**  
41.7 %  
1,266 GWh



**Renewables**  
58.3 %  
1,769 GWh



Source: REN, Analysis APREN

## Electricity sector indicators



**3,035 GWh**

Total generation



23.1 %  
compared to Aug 2020



**58.3 %**

Renewable incorporation



13.3 %  
compared to Aug 2020



**4,059 GWh**

Consumption <sup>1</sup>

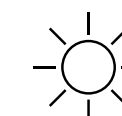


2.0 %  
compared to Aug 2020



**0.83**

Wind index



**1.07**

Solar index



**1.64**

Hydraulicity index



**56.0 %**

Dams storage

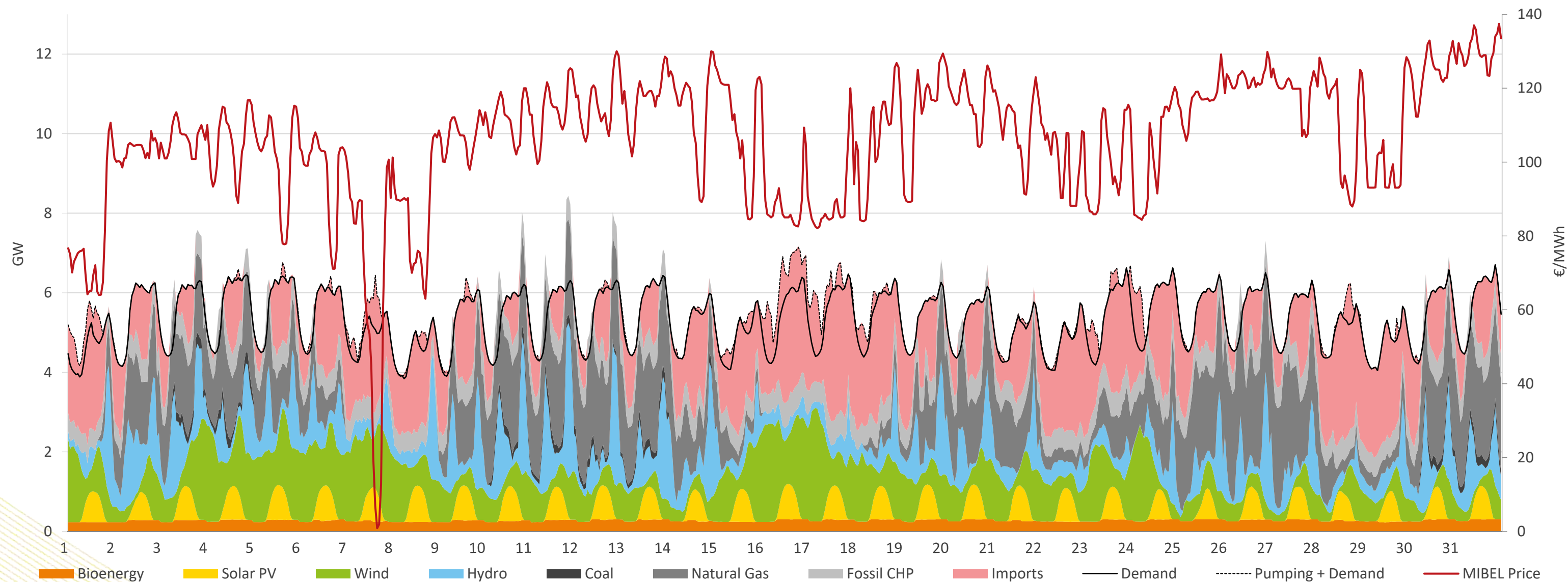
<sup>1</sup>Consumption refers to the net production of power plants, considering the import-export balance.

Source: REN, Analysis APREN



# Monthly analysis in Portugal: August

## Load diagram from the month of August 2021



Source: REN, Analysis APREN

# Monthly Market Analysis: August

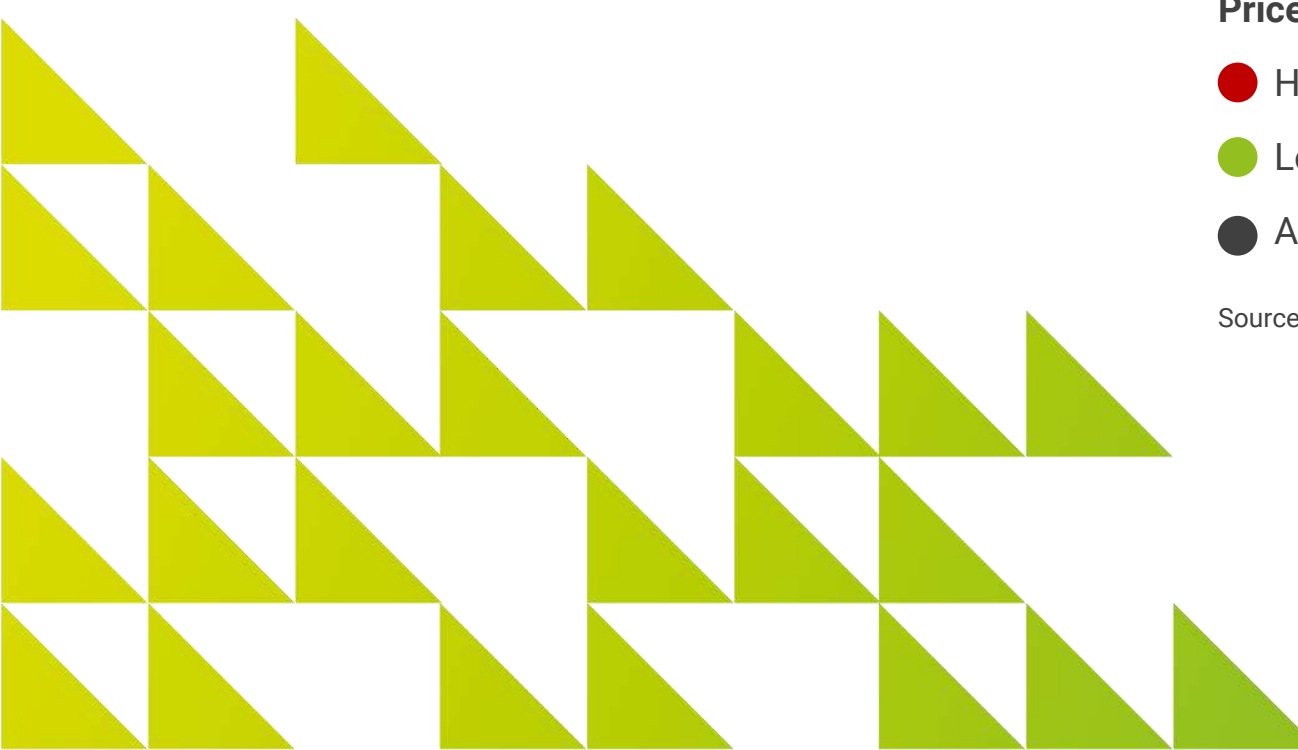
## Electricity market in Europe

During the month of August 2021, there was an hourly average price on MIBEL in Portugal of € 105.99/MWh, which represents almost the triple of the price verified in August 2020. In Portugal and Spain there was a minimum hourly price on the MIBEL of € 0.90/MWh.

Of the countries shown on the right, the lowest price verified was -€ 70.00/MWh in Belgium, France, Germany and Austria also had a negative hourly minimum price. The highest hourly maximum price was recorded in Italy, reaching € 150.00/MWh.

This analysis only took into account European countries with influence in the Portuguese market.

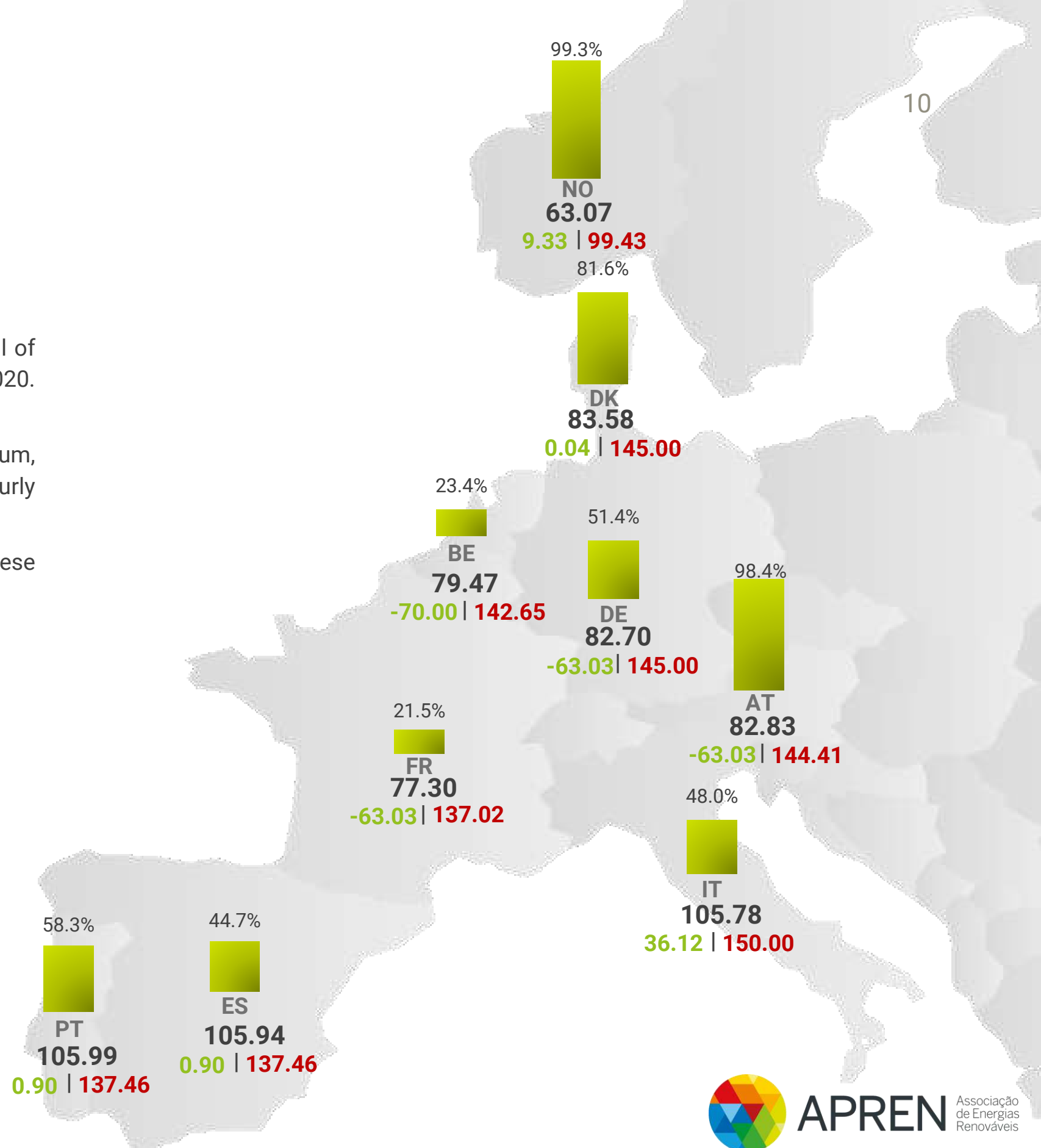
Source: ENTSO-E, IESOE, Analysis APREN



### Prices in €/MWh

- Highest
- Lowest
- Average

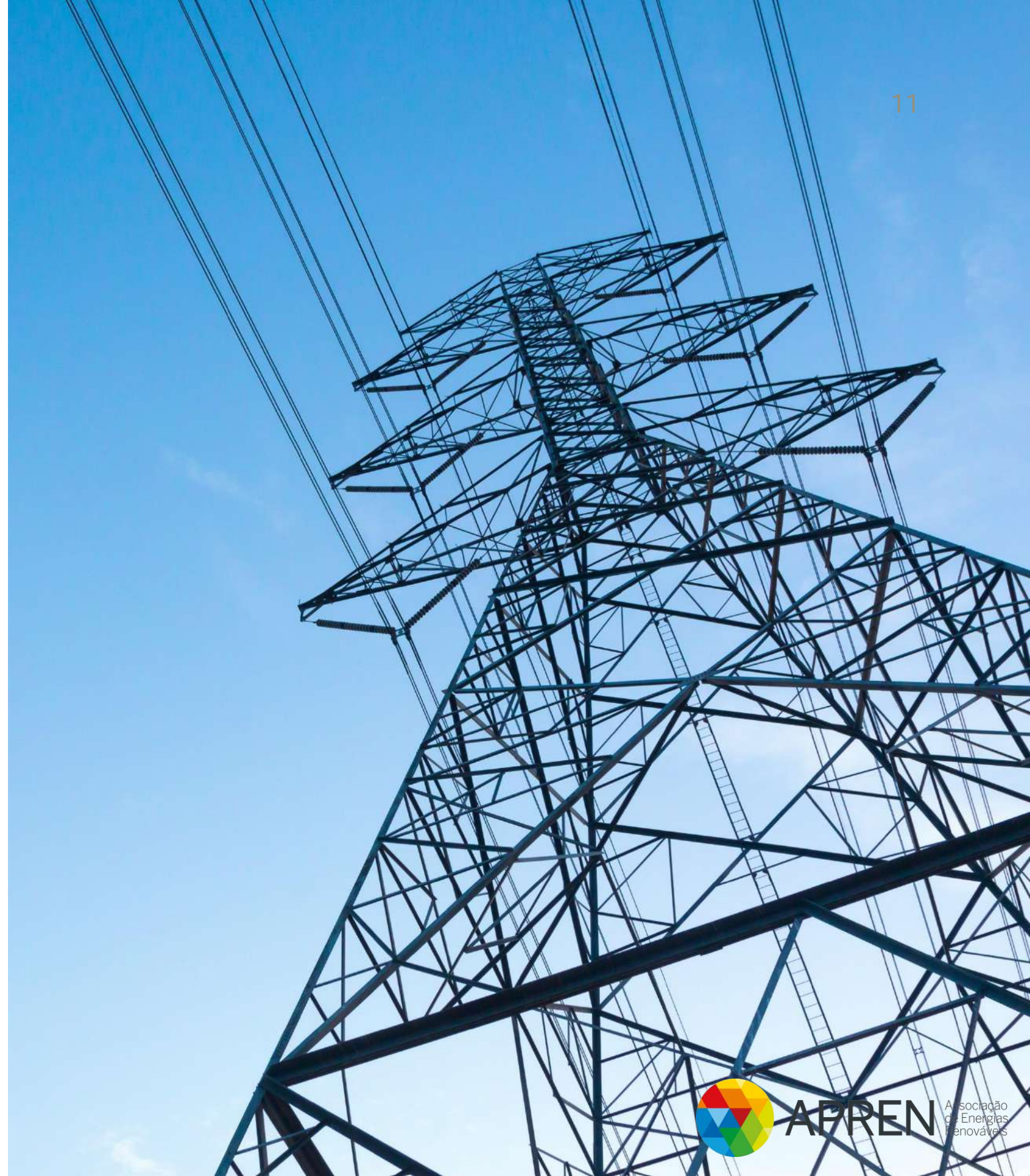
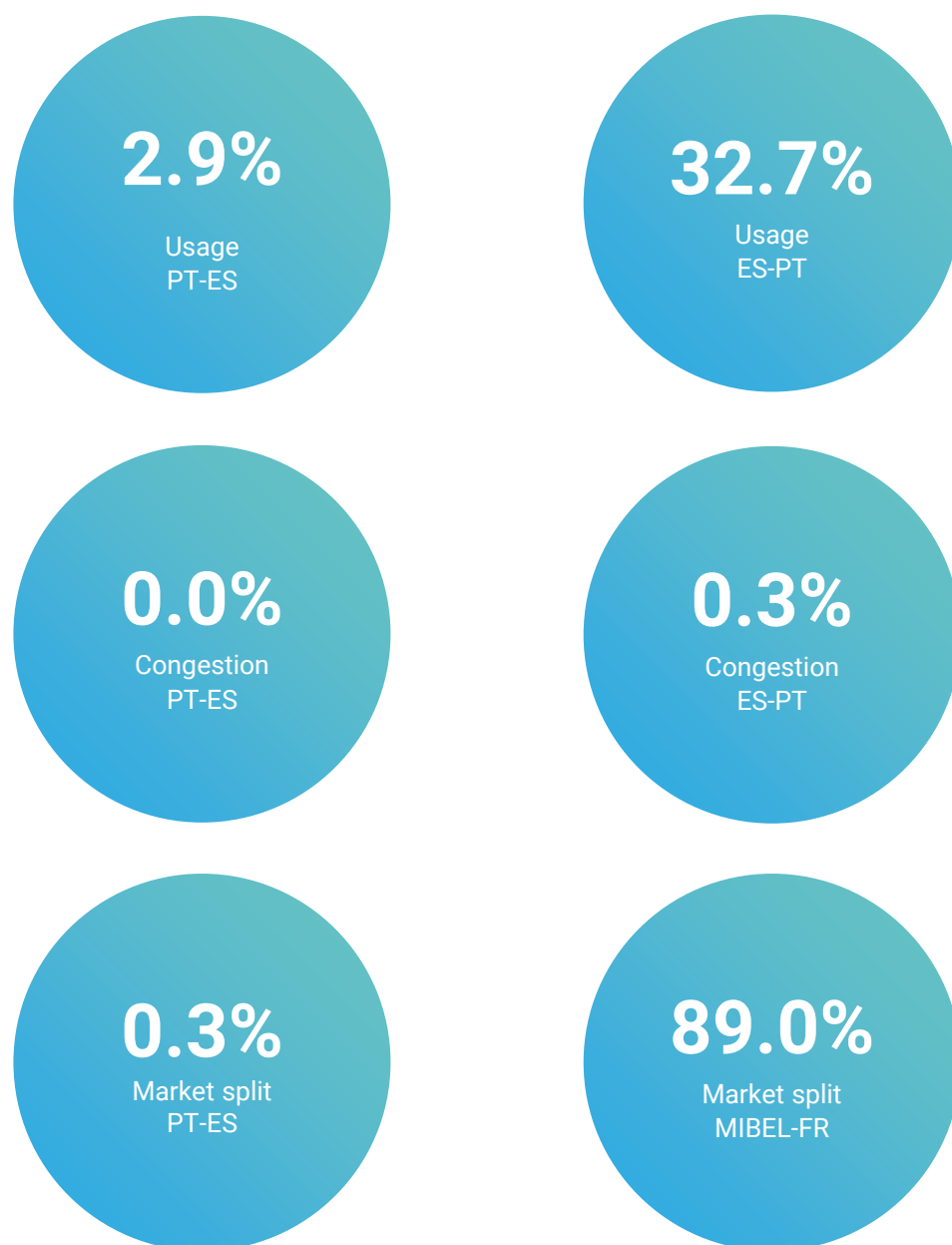
Source: ENTSO-E, IESOE





# Monthly market analysis: August

Electricity market in Portugal





# Environmental Service

The indicators below identify the savings achieved between January 1 and August 31, 2021, in fossil fuels, CO<sub>2</sub> emissions and CO<sub>2</sub> emission allowances, resulting from the incorporation of renewable electricity generation.

This analysis is based on the assumption that, in the absence of renewables, production would be ensured firstly by natural gas, followed by coal and finally the use of imports.

## Renewables have avoided ...

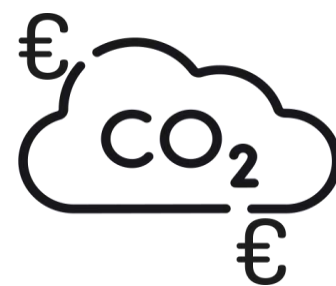


**€826 M**

Imported fossil fuels (Jan-Aug)

**€159 M**

Imported fossil fuels (Aug)

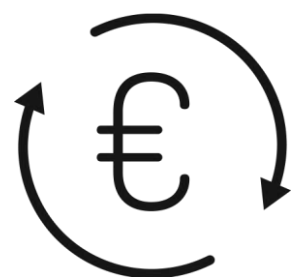


**8.3 MtCO<sub>2</sub>eq**

CO<sub>2</sub> emissions (Jan-Aug)

**0.7 MtCO<sub>2</sub>eq**

CO<sub>2</sub> emissions (Aug)



**€209 M**

Imported electricity (Jan-Aug)

**€0**

Imported electricity (Aug)



**€349 M**

CO<sub>2</sub> allowances (Jan-Aug)

**€49 M**

CO<sub>2</sub> allowances (Aug)

Source: REN, SendeCO<sub>2</sub>, WorldBank, DGEG, ERSE, APREN Analysis.

Note1: To estimate savings on imported fossil fuels, coal prices until November 2019 were considered, due to unavailability of data.

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

# European Policy and Regulation

## European Electricity Network

On August 13 ENTSO-E published its [Annual report](#) with a description of ENTSO-E's activities related to the implementation of legal mandates in seven main areas: System Operation; Marketplace; System development; Transparency Regulations; Research, Development and Innovation; Cybersecurity, Interoperability and Data; and the TSO-DSO partnership and demand-side flexibility.



# National Policy and Regulation

## Forest Biomass

On August 4, the [Regional Legislative Decree No. 20/2021/M](#) was published, establishing the regime for the installation and operation of forest biomass plants in the Autonomous Region of Madeira.

## Previous registration of UPPs

It was published on August 12, the [Clarification](#) on the need to consult entities outside the DGEG to carry out the prior registration of installations producing electricity from renewable energy sources, up to 1 MW and intended for the total sale of energy to the grid.

## Budget for the Environmental Fund

On August 16, the [Dispatch No. 8068/2021](#) was published, which amends the Dispatch No. 1897/2021, of February 15, which approves the budget of the Environmental Fund for the year 2021.

## Draft contracts for the purchase and sale of energy from UPPs

On August 18, DGEG approved the drafts proposed by SU Eletricidade, a last resort supplier (CUR), regarding contracts for the purchase and sale of electricity from Small Production Units (UPP). The contract drafts are differentiated depending on whether the producer is the [facility owner](#) or a [third party](#).



# National Policy and Regulation

## Tariff Regulation of the Electric Sector

On the 23<sup>rd</sup> of August, ERSE published the [Regulation No. 785/2021](#), which approves the Tariff Regulation of the electricity sector and revokes the Regulation No. 619/2017, of December 18, amended by Regulations Nos. 76/2019, of January 18, and 496/2020, of May 26.

## Support Program for More Sustainable Buildings

On August 28, [Ordinance No. 345/2021](#) was published, which authorizes the Environmental Fund to share the burden relating to the cooperation contract signed with the Energy Agency, on 19 November 2020, concerning the execution of the Support Program for More Sustainable Buildings.

## European Barometer



### **Fit for 55**

The EC has launched the “Fit for 55” legislative package, designed to achieve the new European climate ambition of reducing GHG emissions by 55 % by 2030, compared to 1990.



### **Next Generation EU**

The EC has approved Portugal's recovery and resilience plan worth € 16.6 billion, with the Commission having concluded that the Portuguese plan intends to apply 38 % of its total allocation to measures to support climate objectives.



### **New Climate Change Adaptation Strategy**

EU environment ministers endorsed the EU's new climate change adaptation strategy, which sets a vision by 2050 to make Europe resilient and fully adapted to its inevitable impacts.



### **European Power Network**

ENTSO-E has published the Annual Report with a description of activities related to the implementation of legal mandates in seven main areas.

## National Barometer



### **Budget for the Environmental Fund**

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### **Remuneration to wind power plants**

Dispatch No. 6304/2021 was published, which regularizes the compensation made between 2013 and 2020 and the remuneration owed to wind power plants covered by Decree-Law No. 35/2013, of 28 February.



### **Hybrid plants**

Dispatch No. 13/DG/2021 was published by DGEG, which establishes the technical rules for the implementation of hybrid plants associated with photovoltaic solar plants arising from competitive procedures.

# Electricity generation: Azores

## Accumulated June 2021 (Jan-Jun)

The Autonomous Region of the Azores (RAA), during the first half of 2021, presented a mix of electricity production with a predominance of fossil energy sources, with RES contributing 42.9 %.

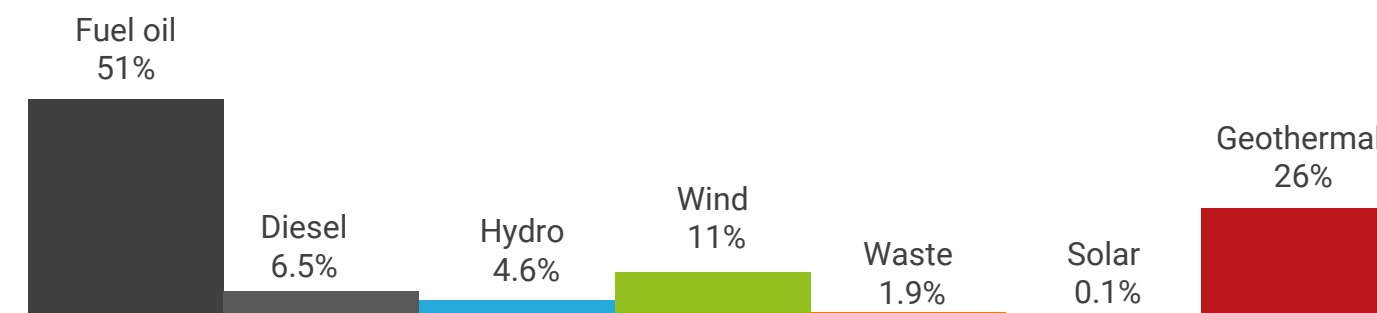
The renewable technology with the greatest weight in the mix was geothermal with 26 %, 1 % more than in the first half of 2020.

Source: EDA, Analysis APREN

## Electricity sector indicators



Source: REN, Analysis APREN



Source: EDA, Analysis APREN



# Electricity generation: Madeira

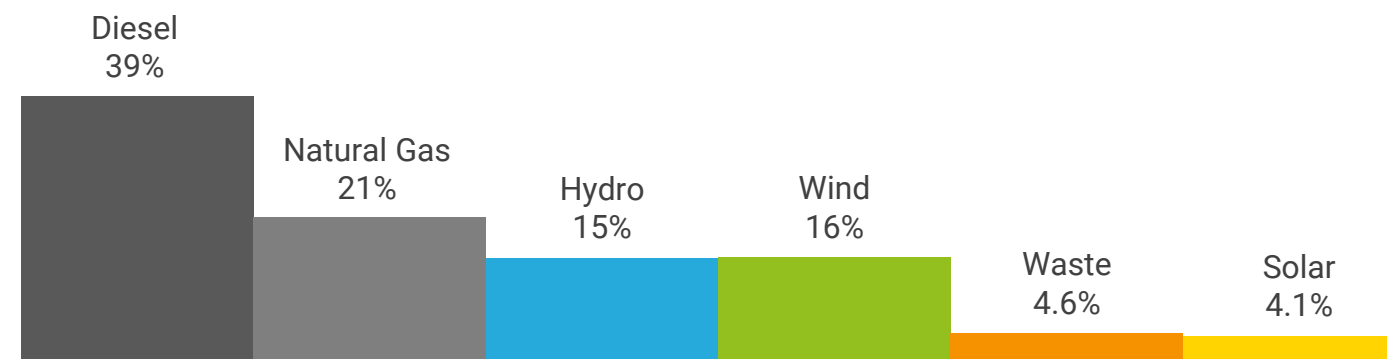
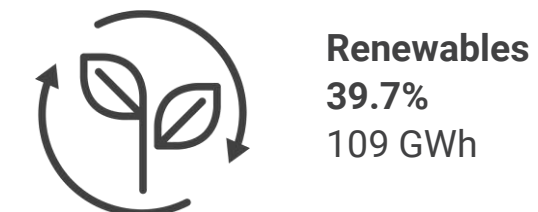
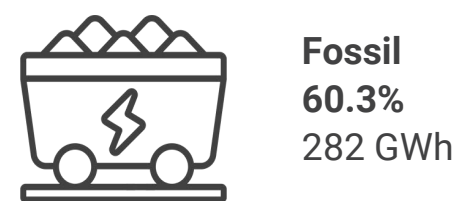
## Accumulated June 2021 (Jan-Jun)

The Autonomous Region of Madeira (RAM), during the first half of 2021, presented an electricity production mix with a predominance of fossil energy sources, with RES contributing 39.7%, which represents a significant increase compared to the 27.8% of the same period of the previous year.

The renewable technology with the greatest weight in the mix was wind with 16%, 5% more than in the first half of 2020.

Source: EDA, Analysis APREN

## Electricity sector indicators



Fonte: EEM, Análise APREN

Source: REN, Analysis APREN

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