

November

# BULLETIN

2021

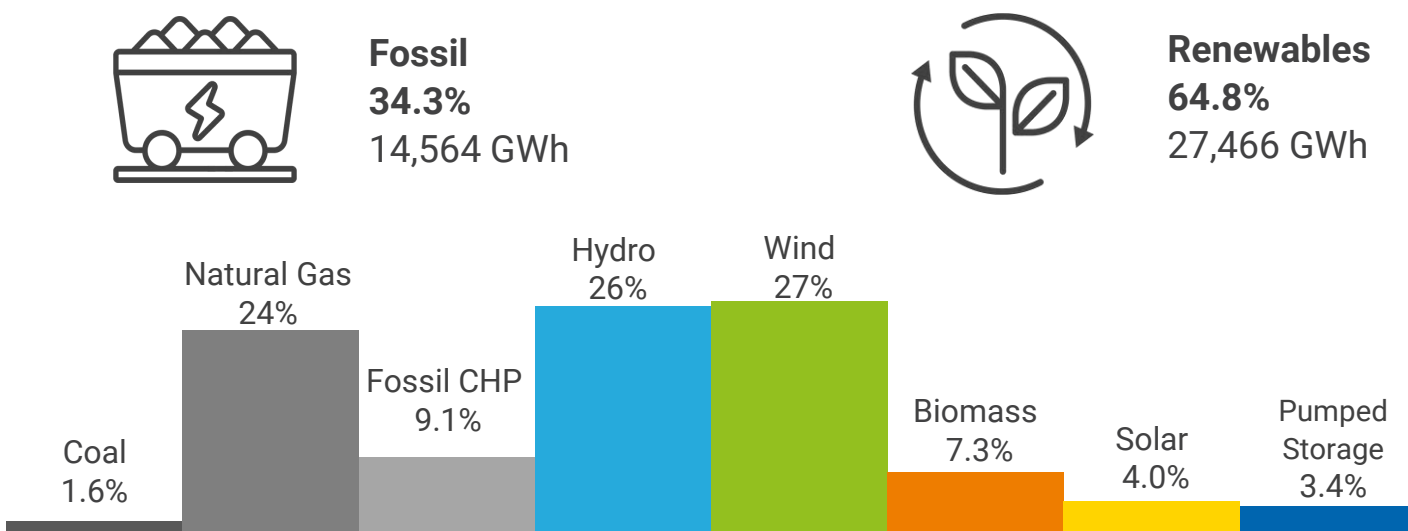
Renewable Electricity



APREN Associação de Energias Renováveis

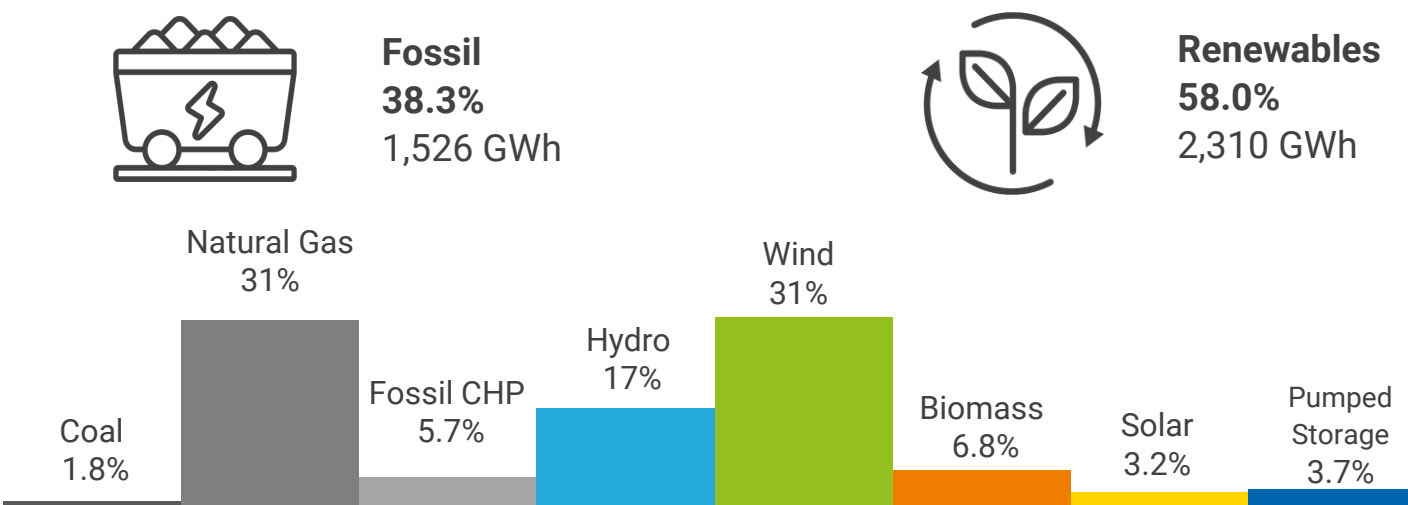
# Executive Summary

## Accumulated Generation – November 2021 (Jan-Nov)



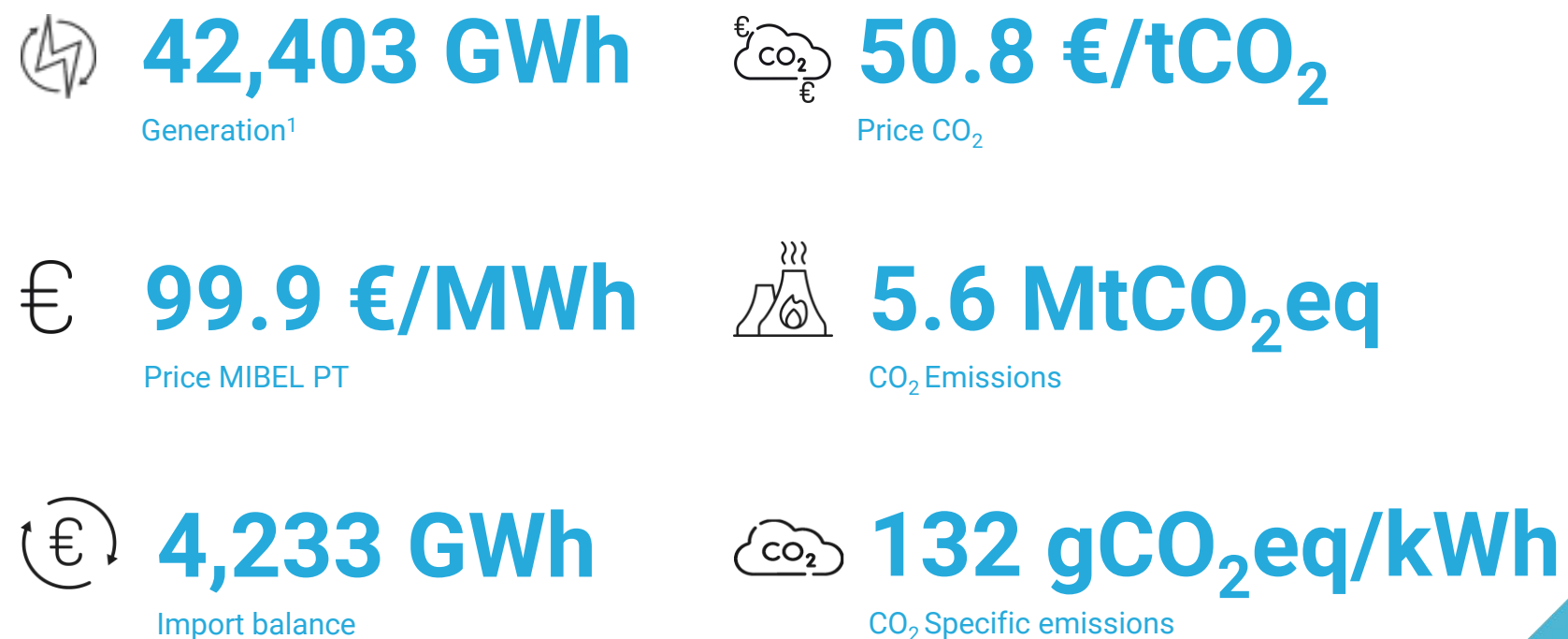
Source: REN, Analysis APREN

## Generation - November 2021



Source: REN, Analysis APREN

## Electricity sector indicators (accumulated Jan-Nov)



<sup>1</sup> Generation refers to the net production of power plants, considering the production through pumped storage recently released by REN. Pumped storage is not included in the percentage of production from renewable energy sources.

Source: REN, Analysis APREN

# Electricity Generation: Mainland Portugal

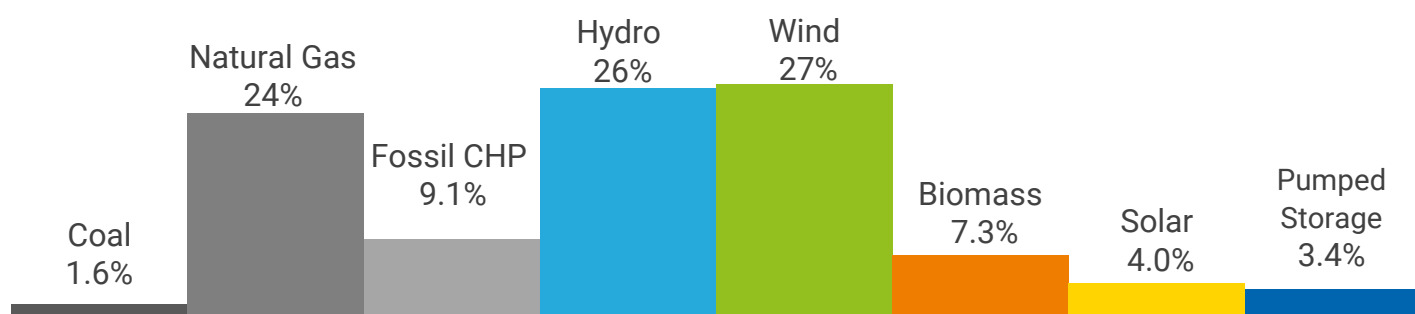
## Accumulated November 2021 (Jan-Nov)



**Fossil**  
34.3%  
14,564 GWh



**Renewables**  
64.8%  
27,466 GWh



Source: REN, Analysis APREN

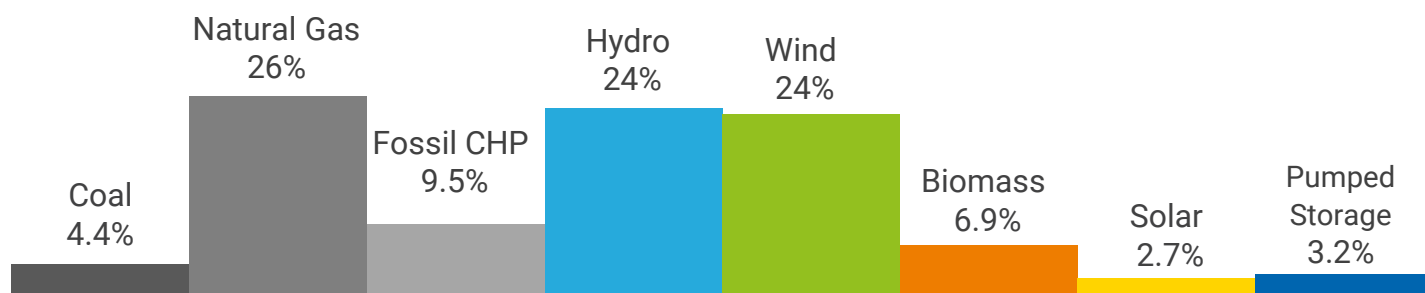
## Accumulated November 2020 (Jan-Nov)



**Fossil**  
39.8%  
19,098 GWh



**Renewables**  
57.2%  
25,558 GWh



Source: REN, Analysis APREN

## Mais indicators



**42,403 GWh**  
Generation<sup>1</sup>



5.3 %  
compared to Nov 2020



**0.97**  
Wind Index



**64.8 %**  
Renewable incorporation



7.5 %  
compared to Nov 2020



**1.01**  
Hydro Index



**46,636 GWh**  
Consumption<sup>2</sup>



1.3 %  
compared to Nov 2020



**1.03**  
Solar Index

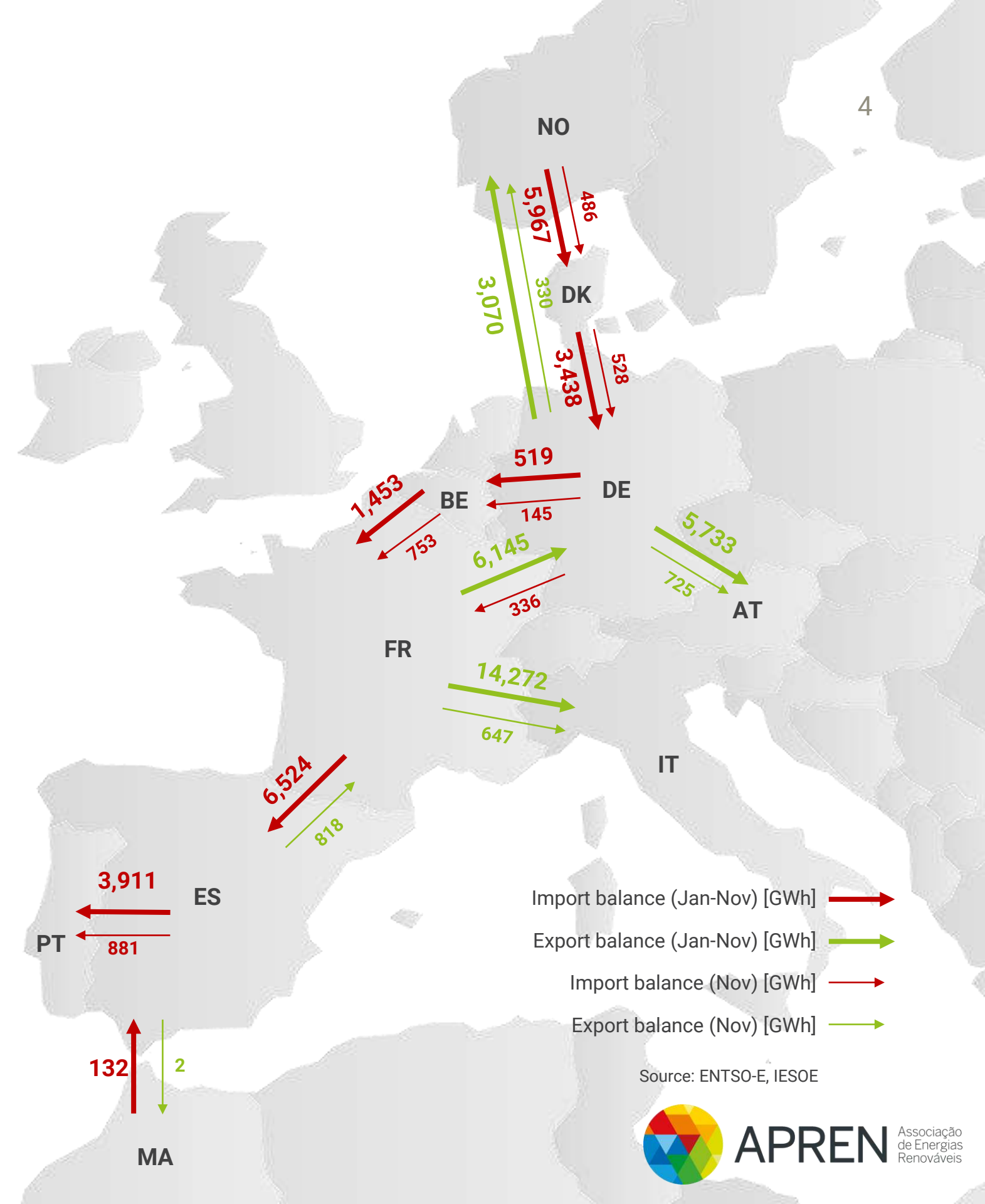
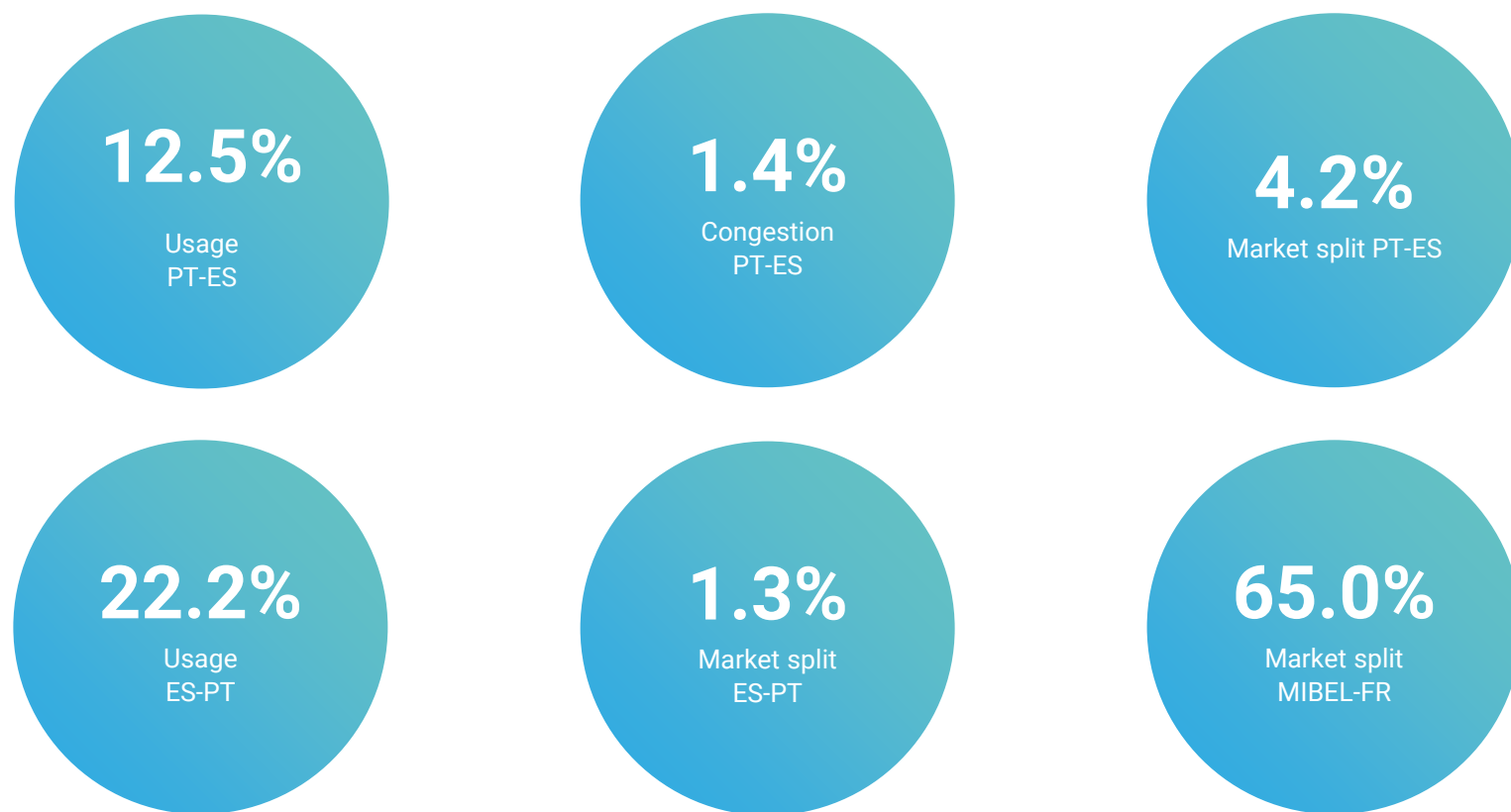
<sup>2</sup> Consumption refers to the net production of power plants, bearing in mind the import-export balance.  
Source: REN, Analysis APREN

# International Trade

Between 1 January and 30 November 2021, Portugal's electricity system recorded electricity imports equivalent to 8,090 GWh and exports of 3,857 GWh, with Portugal being an importer with a balance of 4,233 GWh.

Source: REN, Analysis APREN

## Main interconnection indicators PT-ES



Source: ENTSO-E, IESOE

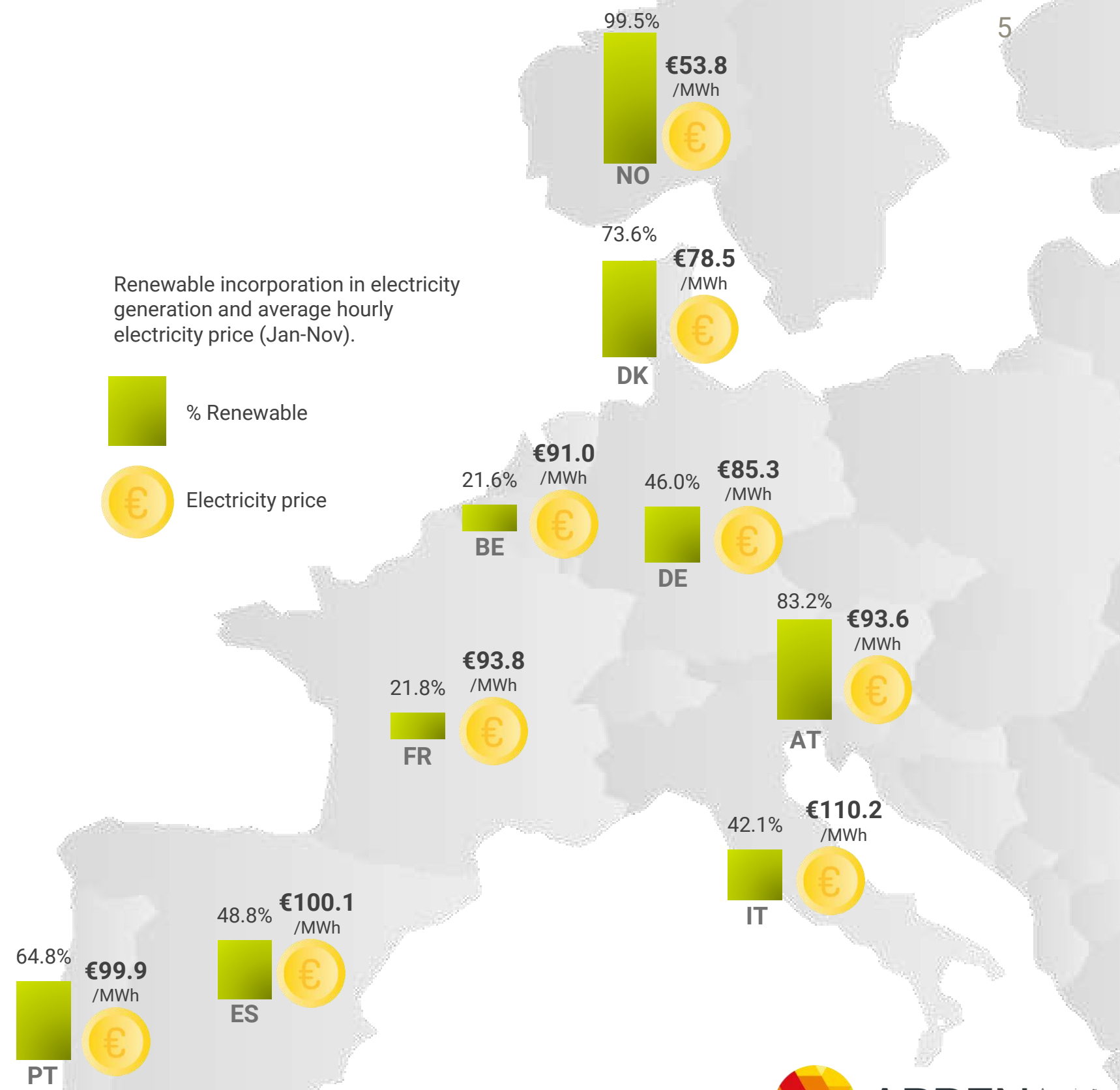
# Accumulated Electricity Market - Europe

Between January 1 and November 30, 2021, there was an hourly average price on the Iberian Electricity Market (MIBEL) in Portugal of € 99.9/MWh<sup>3</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> allowances market and the rise in natural gas prices. 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 %, 83.2 % and 73.6 %, respectively, from RES.

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

<sup>3</sup> Arithmetic average of hourly prices

Source: ENTSO-E, OMIE, Analysis APREN



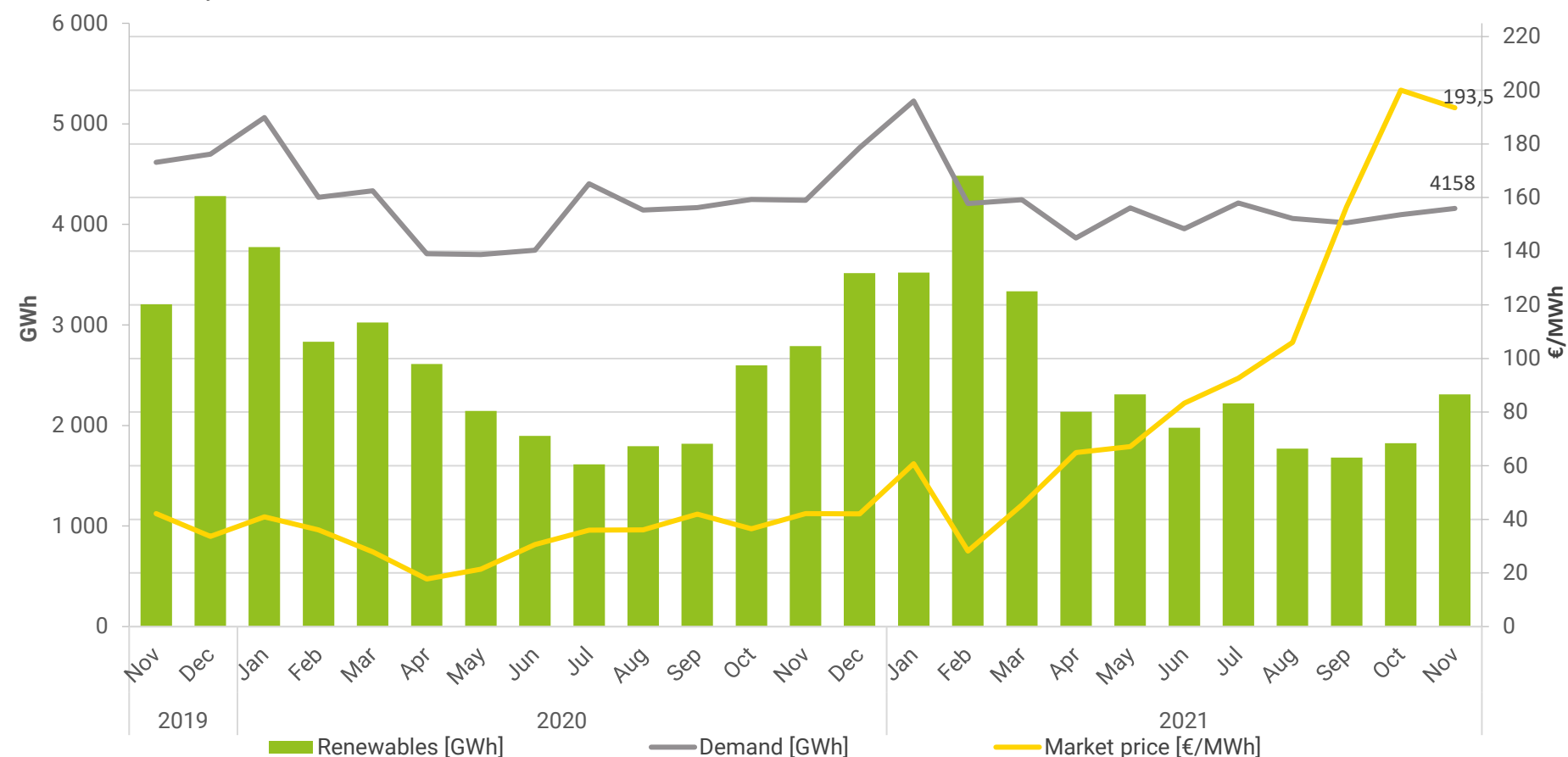
Source: REN, Fraunhofer, REE, Terna, National Grid, ENTSO-E, Analysis APREN

# Accumulated Electricity Market - Portugal

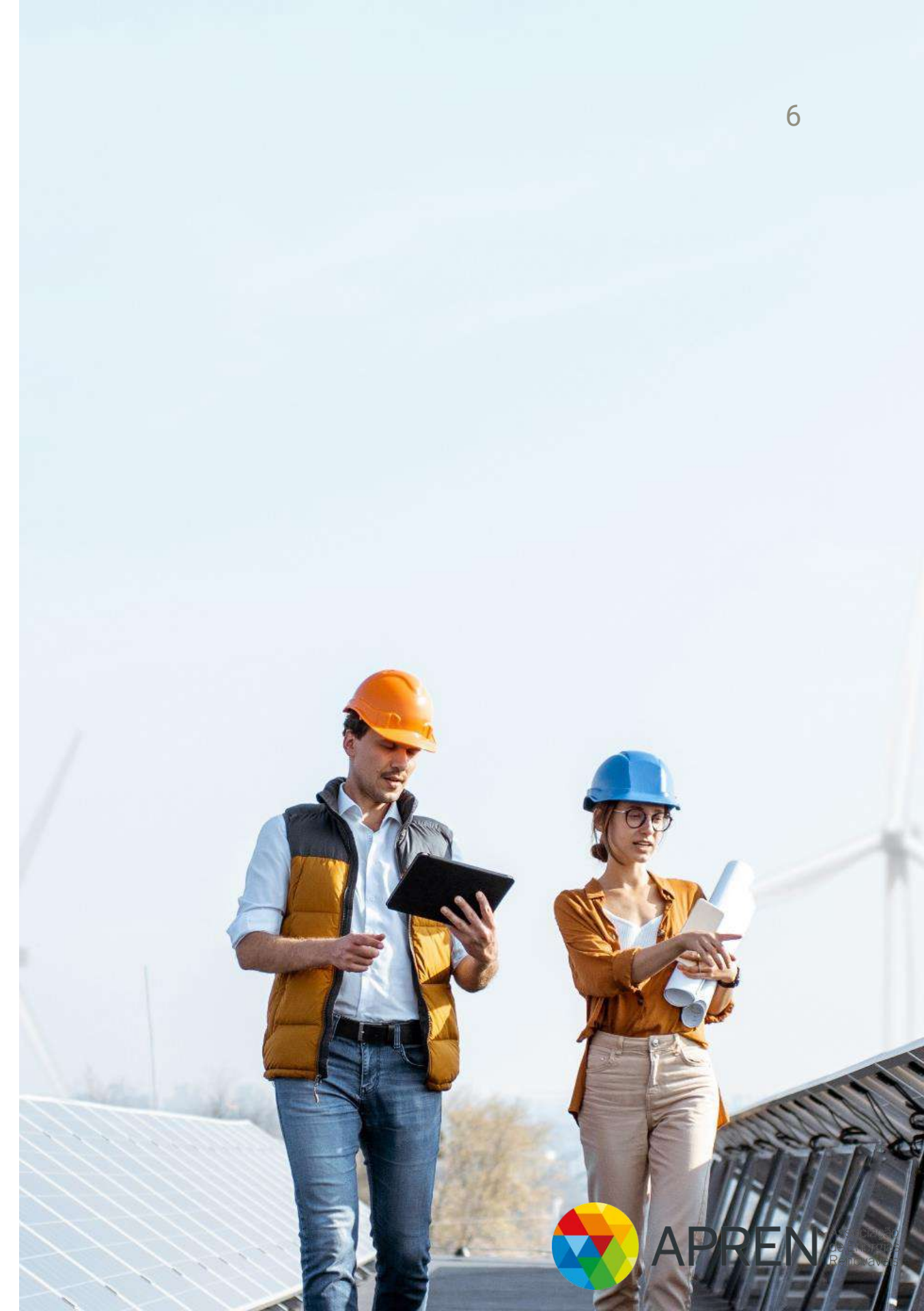
Between January 1 and November 30, 2021, the average hourly price registered in the MIBEL in Portugal (€ 99.85/MWh<sup>3</sup>) represents an increase of more than double compared to the same period last year.

In the same period, 1,063 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 € 37.1/MWh.

<sup>3</sup> Arithmetic average of hourly prices  
Source: OMIE, Analysis APREN



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

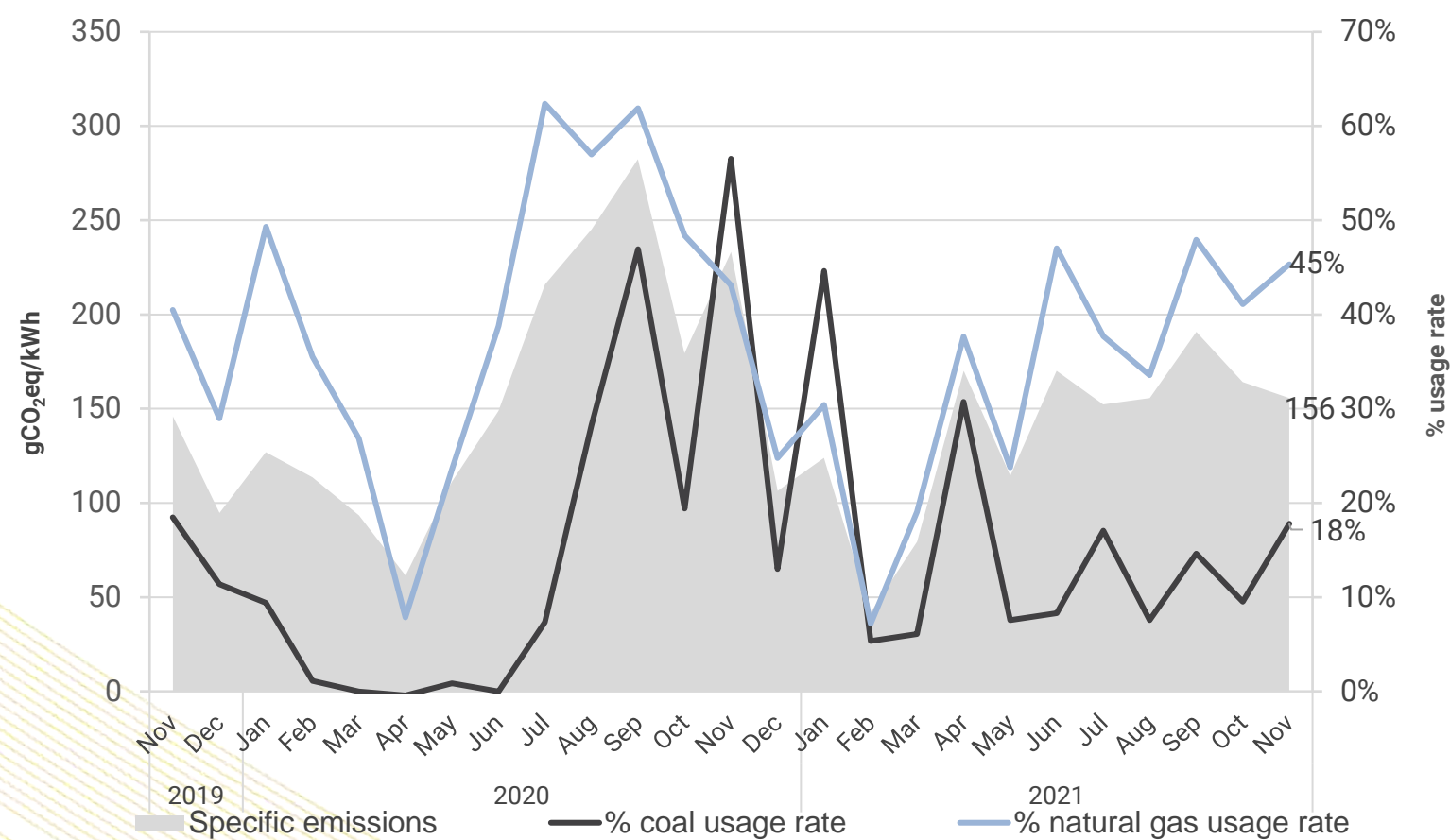


# Power Sector Emissions

Between January 1 and November 30, 2021, specific emissions reached a total of 132 gCO<sub>2</sub>eq/kWh, while the total emissions from the electricity-producing sector reached 5,6 MtCO<sub>2</sub>eq, of which 0.6 MtCO<sub>2</sub>eq correspond to the month of November.

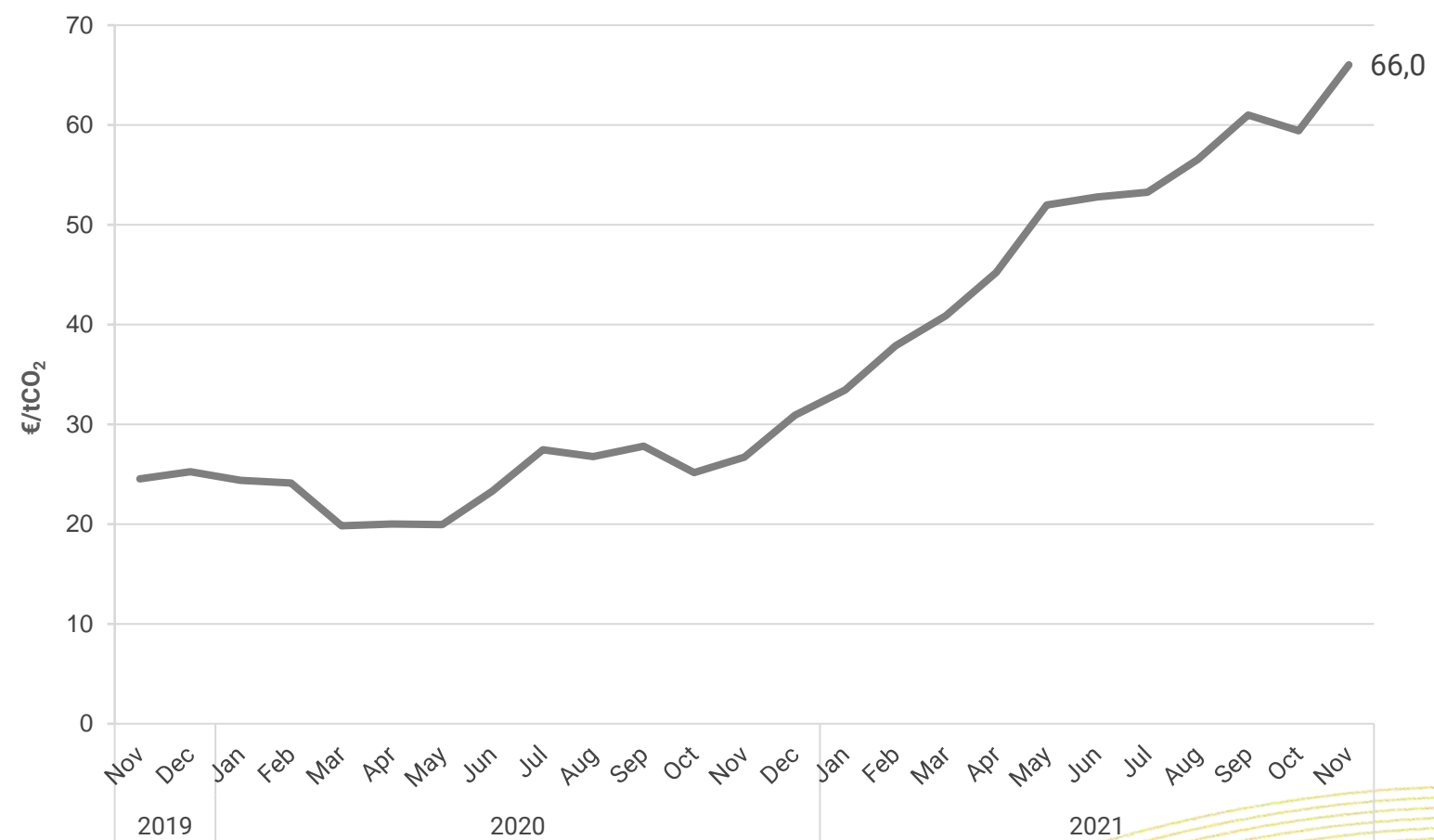
Since the beginning of the year, the European Emissions Trading System (EU-ETS) has recorded an average price of € 50.8/tCO<sub>2</sub>, increasing by more than the double compared to the same period in 2020.

Source: SendeCO2



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

Source: REN, DGEG, ERSE, Analysis APREN



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

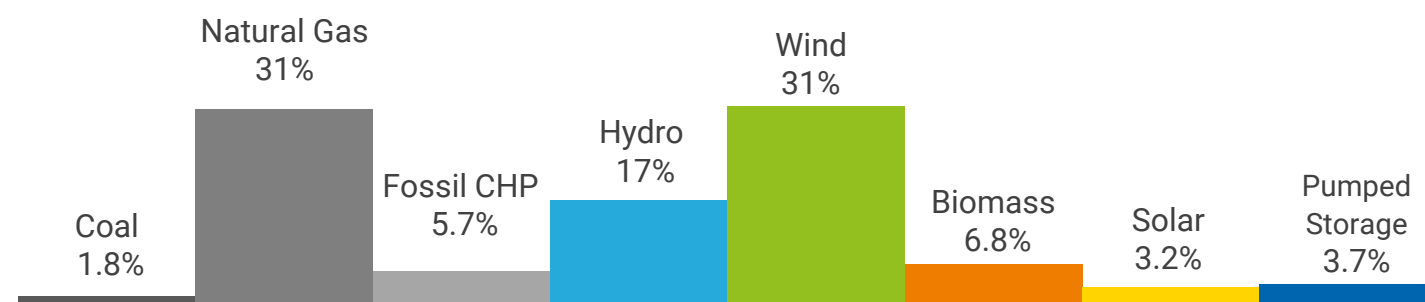
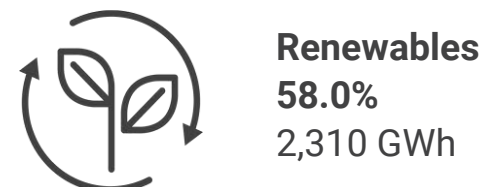
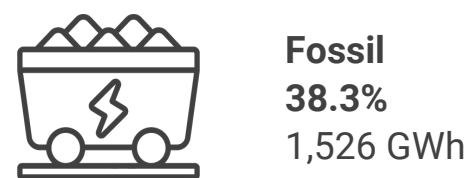
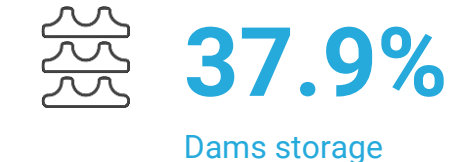
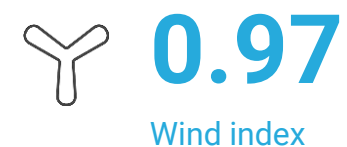
# Monthly analysis in Portugal: November

In November, renewable electricity generation accounted for 58.0 % of the total electricity generated in Mainland Portugal (3,985 GWh).

As for the November international trade, Mainland Portugal was an importer, recording a balance of 322 GWh, having reversed the export behaviour observed in November 2020 (700 GWh).

Source: REN, Analysis APREN

## Electricity sector indicators



Source: REN, Analysis APREN

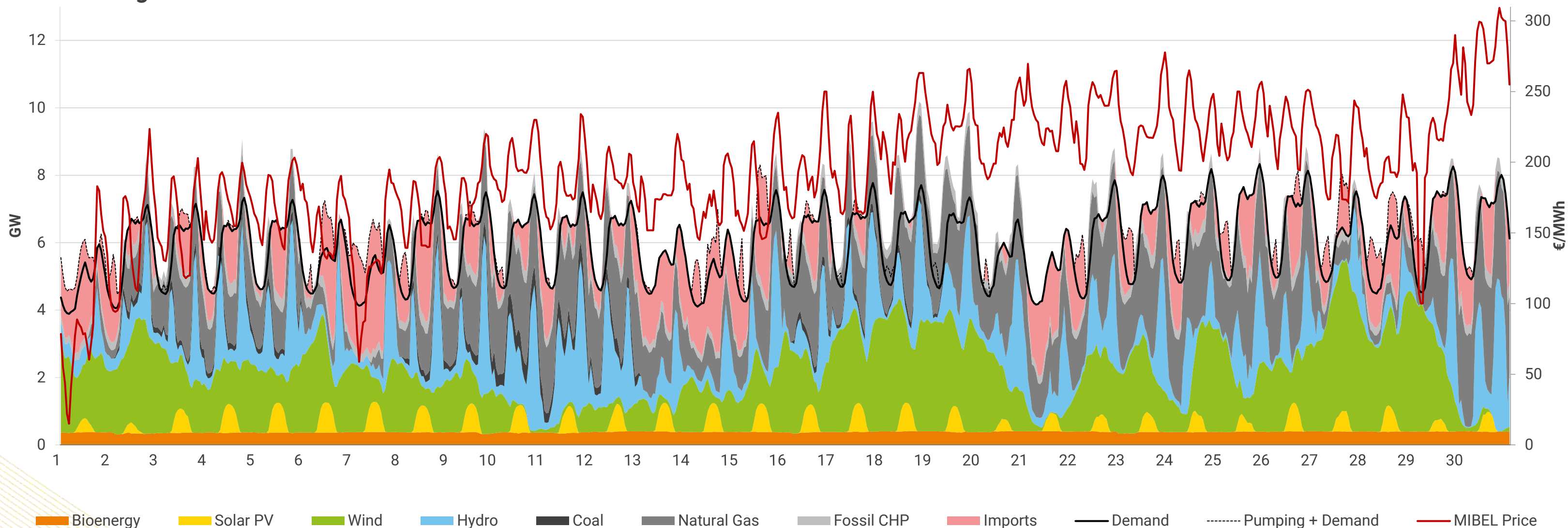
<sup>2</sup> Consumption refers to the net production of power plants, considering the import-export balance.

Source: REN, Analysis APREN



# Monthly analysis in Portugal: November

## Load diagram from the month of November 2021



Source: REN, Analysis APREN

# Monthly Market Analysis: November

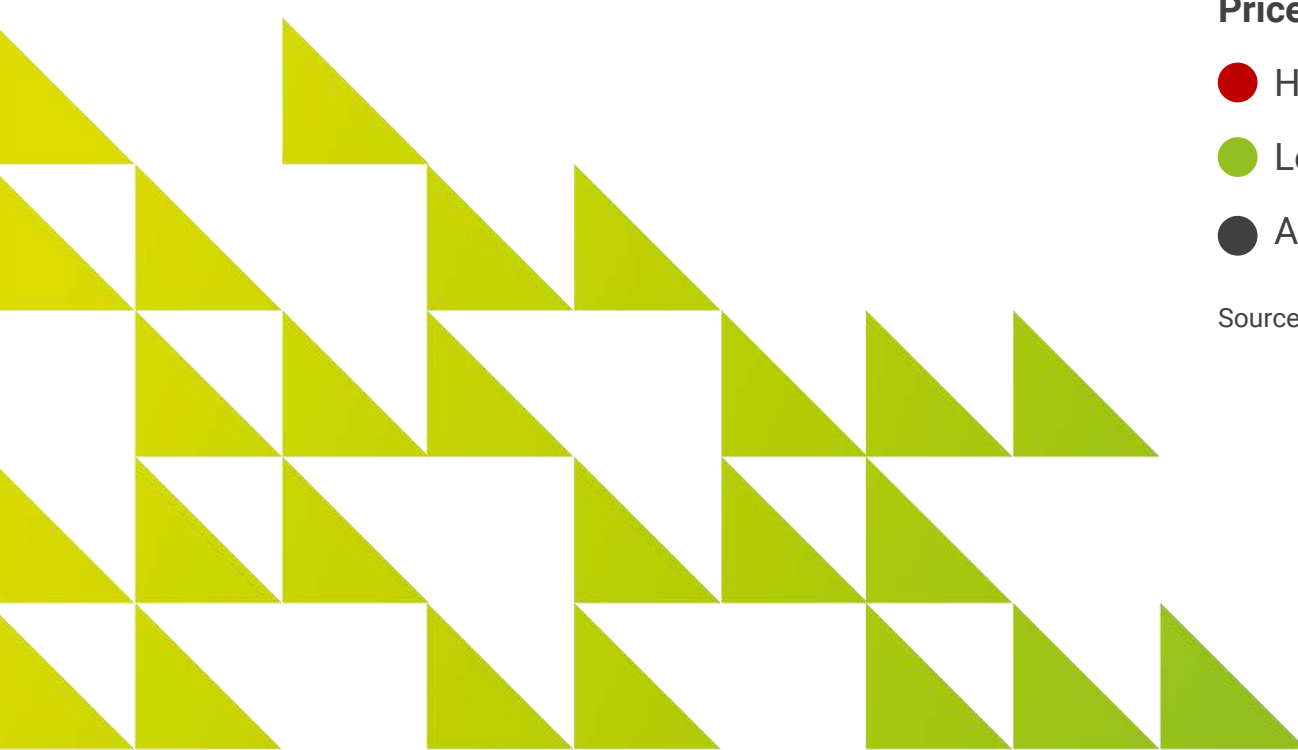
## Electricity market in Europe

During the month of November 2021, there was an hourly average price on MIBEL in Portugal of € 193.50/MWh, which represents a four times higher increase in the price registered in November 2020. In Portugal, there was a minimum hourly price on the MIBEL of €15.00/MWh.

Of the countries shown on the right, the lowest price verified was € 1.45/MWh in Denmark. The highest hourly maximum price was recorded in Belgium, Denmark, France, Germany, Austria and Italy, having reached € 421.87/MWh.

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

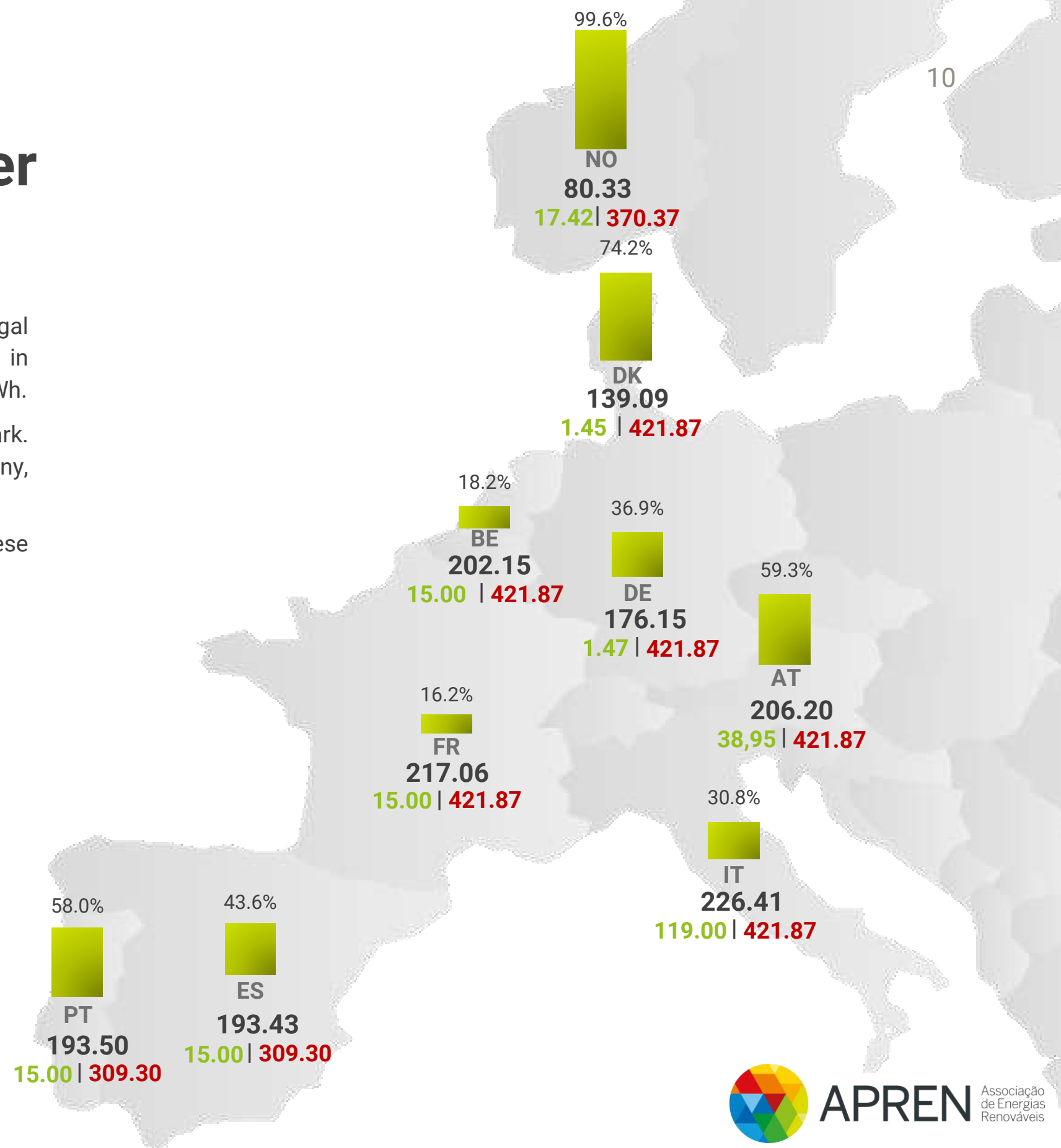
Source: ENTSO-E, IESOE, Analysis APREN



### Prices €/MWh

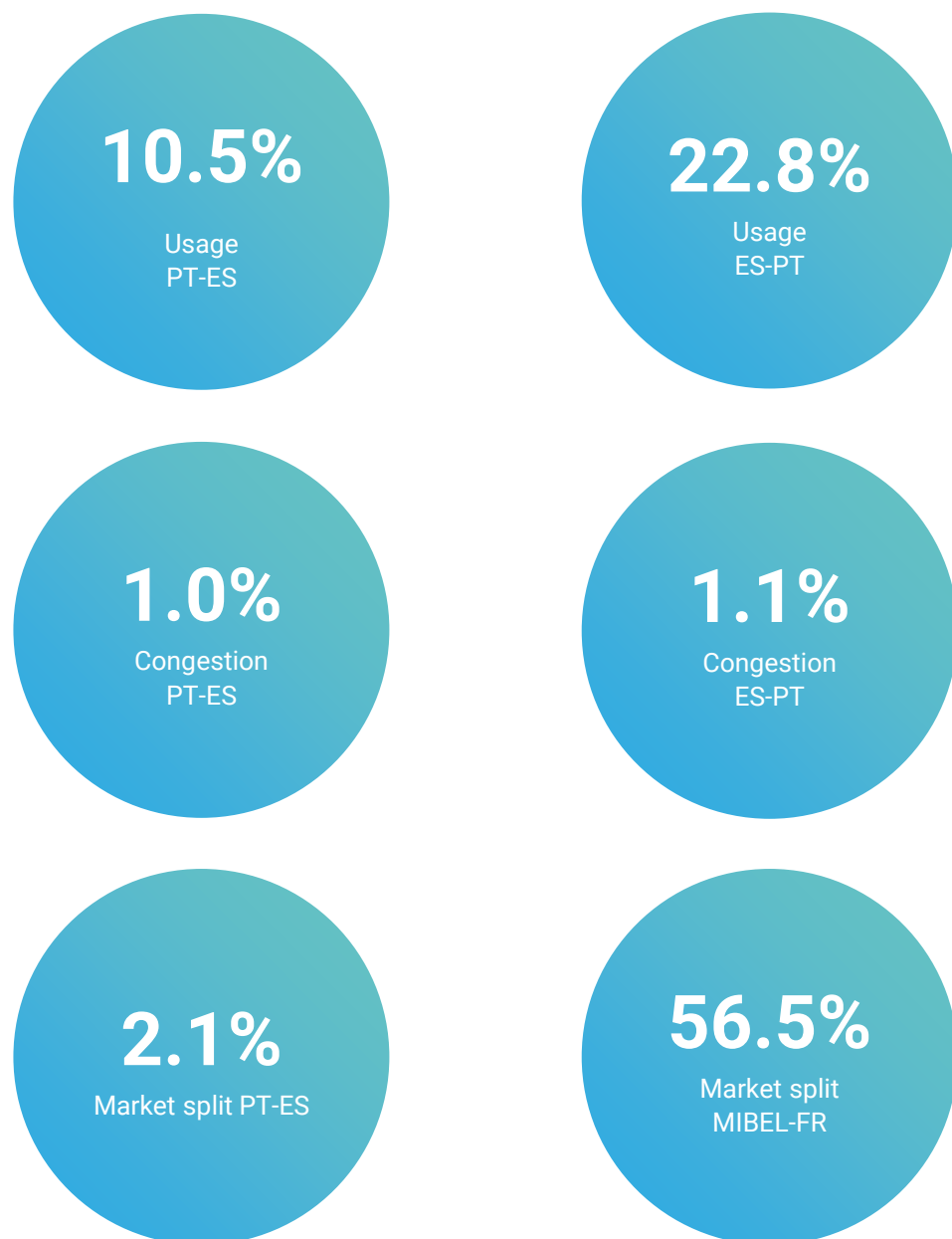
- Highest
- Lowest
- Average

Source: ENTSO-E, IESOE



# Monthly market analysis: November

## Electricity market in Portugal



# Environmental Service

The indicators below identify the savings achieved between January 1 and November 30, 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...

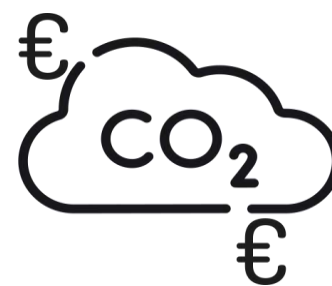


**€ 1,567 M**

Imported fossil fuels (Jan-Nov)

**€ 248 M**

Imported fossil fuels (Nov)

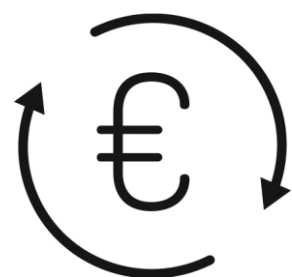


**10.8 MtCO<sub>2</sub>eq**

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

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

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



**€ 312 M**

Imported electricity (Jan-Nov)

**€ 104**

Imported electricity (Nov)



**€ 500 M**

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

**€ 56 M**

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

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

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

## Fossil fuels

On November 16, the European Commission (EC) launched an [exchange program](#), named “ExchangeEU”, for European regions producing coal, lignite, peat and oil shale, known as “coal+ regions”, with the aim of helping them achieve a fair energy transition.

## Projects of common interest

On November 19, the EC [adopted](#) the [fifth list of energy Projects of Common Interest \(PCIs\)](#). These are key cross-border energy infrastructure projects for building a more integrated and resilient EU internal energy market and pursuing our energy and climate goals.

## Union renewable development platform (URDP)

On November 29, the EC [launched](#) a new [tool](#) to facilitate statistical transfers of renewable energy between the EU. The European renewable energy development platform ([URDP](#)) provides an overview of the excess, or surplus, of statistics across the 27 EU countries and it features a ‘matching mechanism’, which shows options for potential agreements for statistical transfers and the associated conditions, such as volumes and price.

## Hydrogen

On November 30, the *European Clean Hydrogen Alliance* [announced](#) a pipeline of projects that European industry is undertaking to roll out the European hydrogen economy on a large scale.

Also on November 30, the EC President, Ursula von der Leyen, [stated](#) that green hydrogen may cost less than €1.8/kg by 2030.

# National Policy and Regulation

## EU-ETS

On November 2, the [Ordinance No. 231/2021](#) was published, which alters the [Ordinance No. 203/2021](#), establishing an indirect cost aid measure for installations covered by the European Emissions Trading System (EU-ETS), pursuant to [Decree-Law No. 12/2020](#). The changes were at the level of the eligibility conditions and also of the transitional regime.

## Increase in energy prices

On November 2, the [Regulation No. 951/2021](#) was published by the Energy Services Regulatory Entity (ERSE), which approves exceptional measures under the National Electricity System (NES) and the National Gas System.

## Regulatory Reserve Band Market

The [Directive No. 14/2021](#) was published on the 3<sup>rd</sup> of November, by ERSE, creating the Regulatory Reserve Band market by the transmission system operator (TSO). This market replaces the Interruptibility Service and contributes to ensuring regularity and stability in the supply of electricity in the NES.

Following the Directive No. 14/2021, ERSE published on the 19<sup>th</sup> of November the [Directive No. 16/2021](#), that approves the implementation of the Regulatory Reserve Band Market.

## Environmental Fund

On the 9<sup>th</sup> of November, the [Dispatch No. 10977-B/2021](#) was published, amending the [Dispatch No. 1897/2021](#), where the Environmental Fund budget for 2021 was approved.

# National Policy and Regulation

## Floating solar pv

On November 16, the [Decree-Law No. 98/2021](#) was published, which unifies the procedures to produce electricity from the conversion of solar energy by floating photovoltaic electro-producing plants to be installed in reservoirs.

On November 26, the [Dispatch No. 11740-B/2021](#) was published, allowing the competitive procedure for the allocation of injection capacity reserve at connection points to the Public Service Electricity Network (PSEN) for electricity from the conversion of solar energy by floating photovoltaic electro-producing centers to be installed in reservoirs.

## European Barometer



### Projects of common interest

The EC has adopted the fifth list of projects of common interest in the field of energy, composed of cross-border energy infrastructure projects that are key to creating a more integrated and resilient EU internal energy market and to achieve the Union's energy and climate objectives.



### Increase on energy prices

The EC has published a Communication on energy prices in order to address the exceptional increase in global energy prices, which is expected to last through the winter, and help Europe's citizens and businesses.



### Renewable Energy Development Platform

The EC has launched a new tool to facilitate statistical transfers of renewable energy between EU countries. This platform provides an overview of excess, or surplus, of statistics across the 27 EU countries and it features a 'matching mechanism', which shows options for potential agreements for statistical transfers and the associated conditions, such as volumes and price.

## National Barometer



### Clawback

Dispatch No. 9975/2021 was published, setting out the parameter corresponding to the impact of the measures and out-of-market events recorded under the EU on the formation of average electricity prices on the wholesale market in Portugal, to be applied between 1 October and 31 December 2021.



### Exemption from Costs of General Economic Interest

Dispatch No. 10376/2021 has been published on the conditions for exemption from charges corresponding to Costs of General Economic Interest on network access tariffs determined by ERSE.



### Floating solar pv

Decree-Law No. 98/2021 was published, which unifies procedures for electricity production by floating photovoltaic electro-producing centers to be installed in reservoirs. Subsequently, Dispatch No. 11740-B/2021 was published, opening the competitive procedure for the allocation of injection capacity reserve at PSEN connection points.



### Regulatory Reserve Band Market

Directive No 14/2021 was published by ERSE, which creates the Regulatory Reserve Band market by the TSO. Following this publication, ERSE published Directive No 16/2021, approving the implementation of the Regulatory Reserve Band Market.



### Agreements with the Distribution Network Operator

The list with the final classification of the Agreements with the DSO was published.



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