APREN Associação de Energias Renováveis

# PORTUGUESE RENEWABLE ELECTRICITY REPORT

NOVEMBER 2019

# RENEWABLE ELECTRICITY
## IN MAINLAND PORTUGAL

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## EXECUTIVE SUMMARY

- Between January and November 2019**, renewable energy sources** generated 23.0 TWh of electricity, **contributing with 53.3 % of the total electricity generation**. In November, the renewables share was 66.6 %.

- In annual cumulative terms and up to November, Portugal imported 6 830 GWh of electricity and exported 2 593 GWh resulting in an **import balance of 4 435 GWh. In November, an export balance of 198 GWh was recorded**, lower than the previous year's figure of 238 GWh.

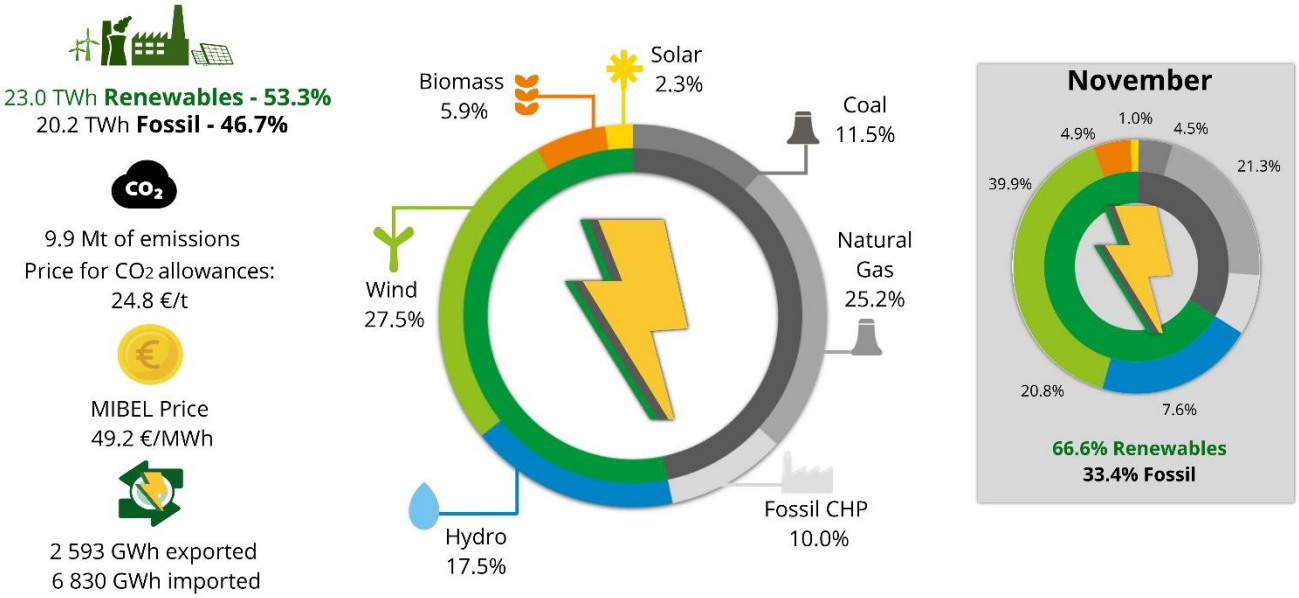
- In this period **the average daily MIBEL market price was 49.2 €/MWh,** much lower than the previous year, of 57.0 €/MWh.

- **The electricity sector emitted about 9.9 million tonnes of $CO_2$**, which translates into an average specific emission of approximately 229 grams of $CO_2$ emitted per each kWh of electricity generated.

- **On November 22nd** Portugal recorded its **maximum historical value of wind generation 103.1 GWh.** The former was 102.5 GWh, achieved this year on February 1st.

## ILUSTRATIVE SUMMARY: ELECTRICITY GENERATION IN 2019

**Cumulative values from january to november 2019**



## ELECTRICITY GENERATION IN MAINLAND PORTUGAL

**Since the beginning of the year, renewable energy sources (RES) accounted for 53.3 %** of the total electricity generation (Figure 1) in Mainland Portugal, by generating 23.0 TWh of electricity, out of 43.2 TWh. Between January and November, renewable electricity generation was significantly lower (13.6 %) in comparison to last year's figure (26.7 GWh). Fossil fuel energy sources accounted for the remaining 20.2 GWh, representing a 46.7 % share.

Breaking down the cumulative electricity generation by renewable source for the period between January and November 2019 and comparing it to the values achieved in 2018, it was recorded:

- very low hydro productivity levels, with a cumulative index of only 0.65 and an electricity generation of 7.6 TWh (37.4 % lower than last year's).
- a slightly higher wind producibility index of 1.06 (6.0% over last year's) and an electricity generation of 11.9 TWh.
- bioenergy accounted for 5.9 % (2.6 TWh).
- solar PV accounted for 2.3 % (996 GWh), a significant increase of 28.8 % in comparison to 2018.

For this period, the electricity demand was 47.5 TWh[1], reflecting a slight reduction of 1.5 % compared to 2018 (0.5 % when considering temperature and number of working days effect corrections).

Regarding the international trade, the period between January and November accounted for 6 830 GWh of electricity imports and 2 593 GWh of electricity exports, resulting in **an import balance of 4 237 GWh.**

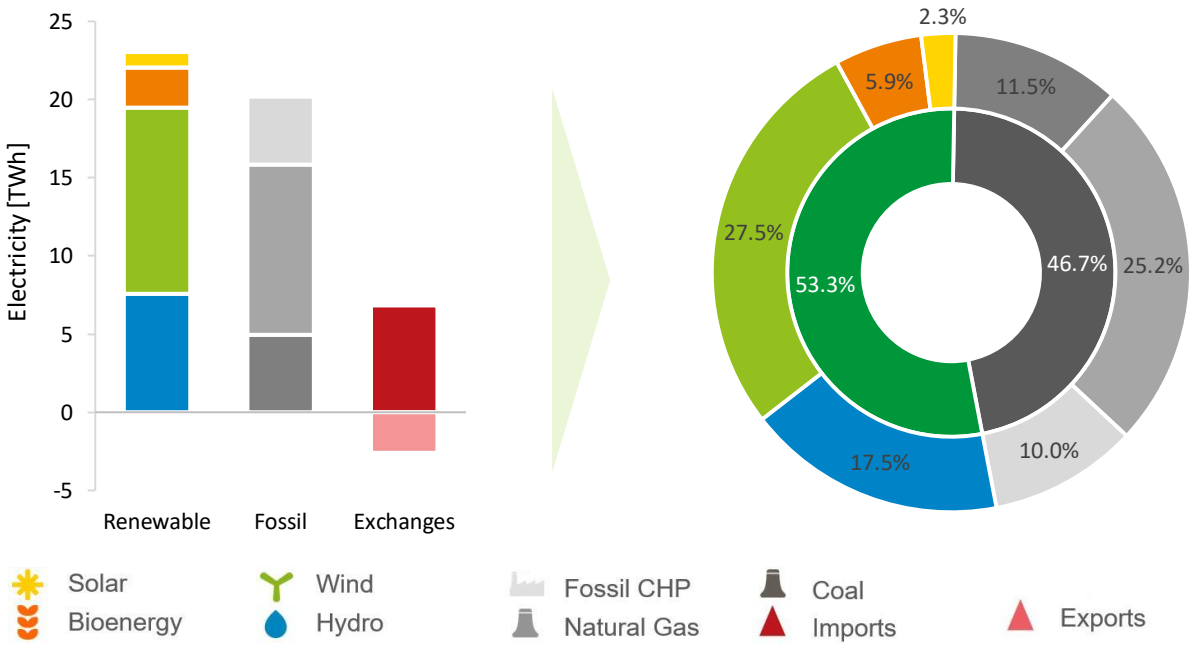



**Figure 1.** Electricity production by energy source in Mainland Portugal (Jan-Nov 2019).
Source: REN, APREN's analysis

[1] Consumption referred to the powerplants' net power generation, considering the import-export balance.

## ELECTRICITY MARKET

Between January and November 2019, the **average electricity daily market price** in the Iberian Electricity Market (MIBEL) **was 49.2 €/MWh**[2], which is 13.8 % lower than the same period of 2018.

As for November, the average daily market price was 42.1 €/MWh, much lower (by 32.1 %) than the average price registered for November 2018 (62.0 €/MWh). This difference was driven not only by the significant renewable generation (Figure 2) in November 2019 comparing with November 2018 but also because in 2018 the OMIE price was influenced by a higher price in the Central European market due to a shortage of several nuclear powerplants in France.

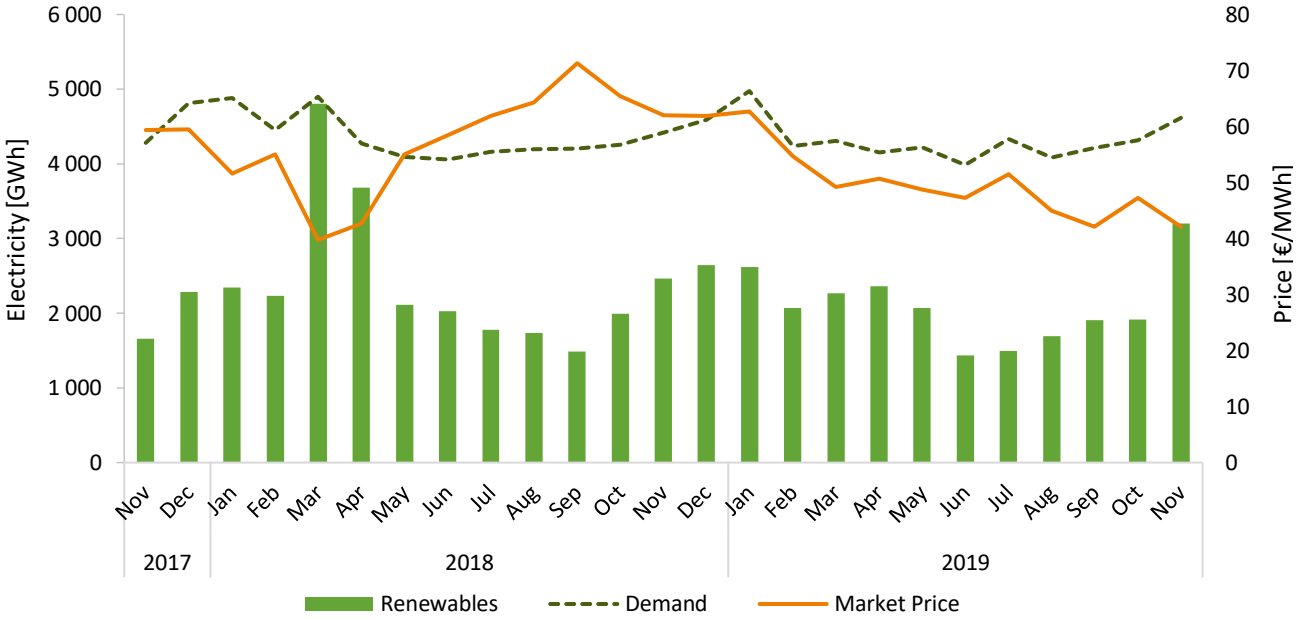



**Figure 2.** Renewable electricity production, Wholesale electricity market price and Electricity demand (Nov-2017 to Nov-2019).
Source: OMIE, REN, APREN's analysis

[2] Simple arithmetic average of the hourly electricity prices between January and November 2019. Source: OMIE

## POWER SECTOR SPECIFIC EMISSIONS

Between January and November, **9.9 Mt $CO_2$ were emitted by the electricity sector,** recording specific emissions of 229 g $CO_2$/kWh[3].

During this period, the $CO_2$ allowances price in the European Emissions Trading System (EU- ETS) was 24.8 €/t$CO_2$.

In November, the average price for $CO_2$ allowances in the EU-ETS was 24.6 €/t$CO_2$, an increase of 27.7% over the price registered in November last year.

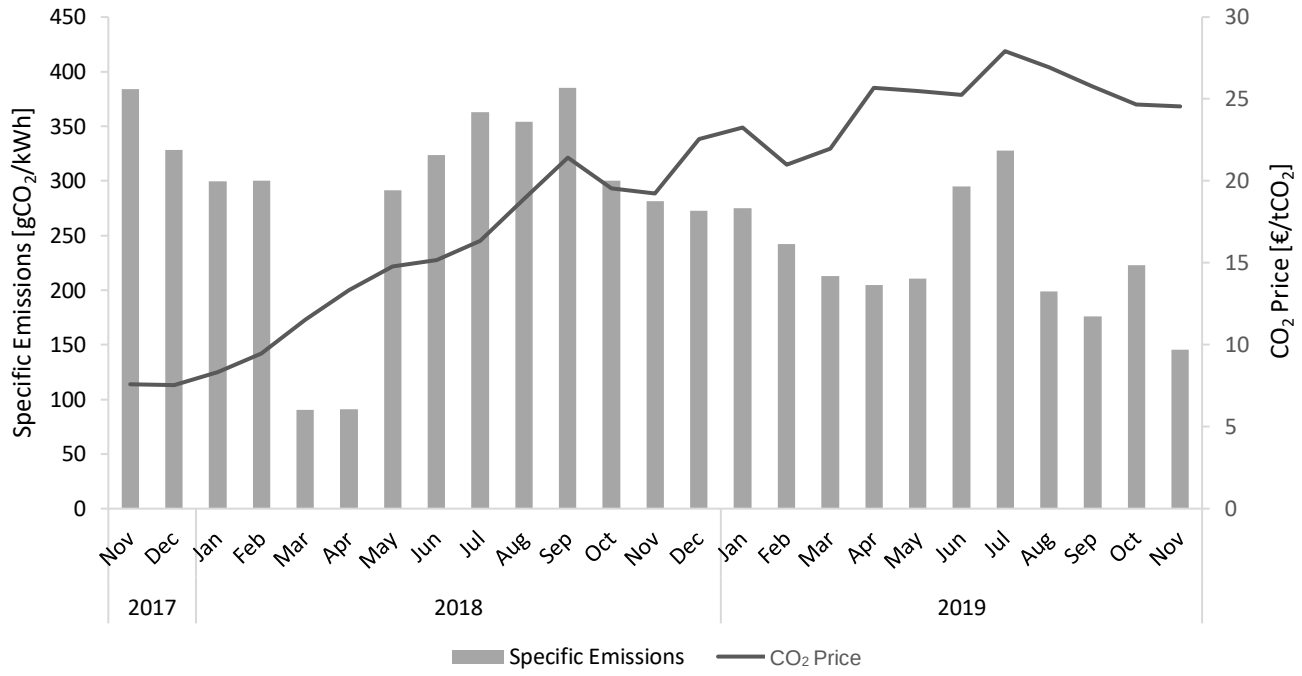



**Figure 3.** Specific emissions resultant from the power sector's activity in Mainland Portugal and $CO_2$ allowances price (Nov-2017 to Nov-2019).

Source: REN, APREN's analysis

[3] ERSE, Labelling of Electricity

## LOAD DIAGRAM FOR NOVEMBER

November started with significant wind productivity levels, due to favourable weather conditions, namely marked by weather depressions and cold fronts occurring in the vicinity of the Iberian Peninsula. The Amelie depression, which crossed the Bay of Biscay between November 2nd to 4th, triggered intensive winds throughout the Iberian Peninsula. In Mainland Portugal, its greatest impacts were felt in the North and Centre regions, especially in the highlands, where wind gusts of 90 km/h were recorded. The effect of this depression led to high levels of wind power share, which allowed Portugal to be, for three days in a row (November 1st, 2nd and 3rd), in first place in the European ranking countries for wind. In fact, on the 3rd, wind represented around 74 % of Mainland Portugal's electricity demand, the highest daily share recorded in November.

Between November 21st and 22nd, there was a further rise in wind power generation in Mainland Portugal, due to another weather depression near the Bay of Biscay. This depression led to a **national historical maximum wind generation, with a daily value of 103.1 GWh on the 22nd**.

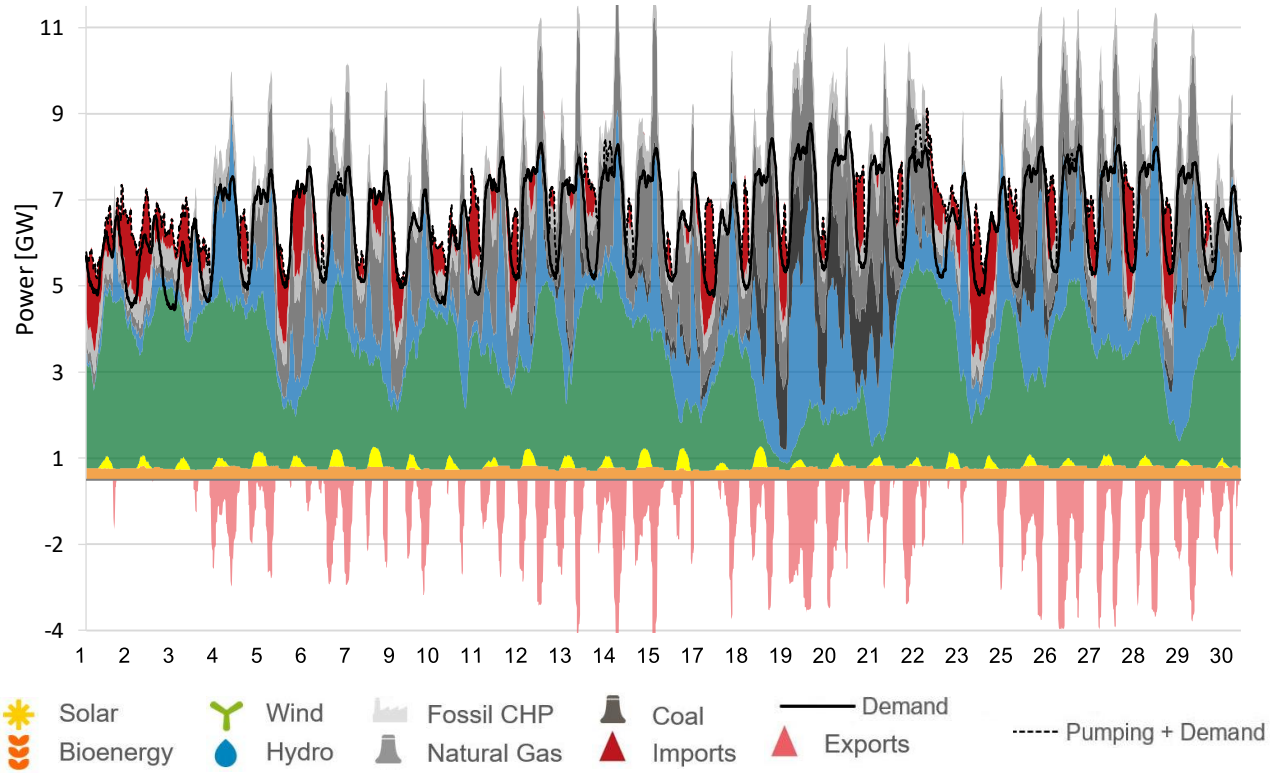



**Figure 4.** Load Diagram for Mainland Portugal (Nov-2019).
Source: REN, APREN's analysis

**November registered 64 hours where renewable electricity generation was enough to meet the Mainland's demand**, with an **average wholesale electricity market price, for these hours, of 35.1 €/MWh**, significantly lower than the average daily market price from January to November, of 49.2 €/MWh.

As renewables make offers in the wholesale electricity market at near-zero prices, due to their merit order, the most periods with high renewables share are verified the more the market price decreases. Evidence of this impact is shown in Figure 5, representing the average hourly prices in Portugal, France and Germany, and displaying a significant drop in MIBEL prices between November the 3rd and the 5th , with minimum prices recorded in around 6-8 €/MWh, especially on the 4th and 5th, when prices in Portugal were much lower than in other European markets.

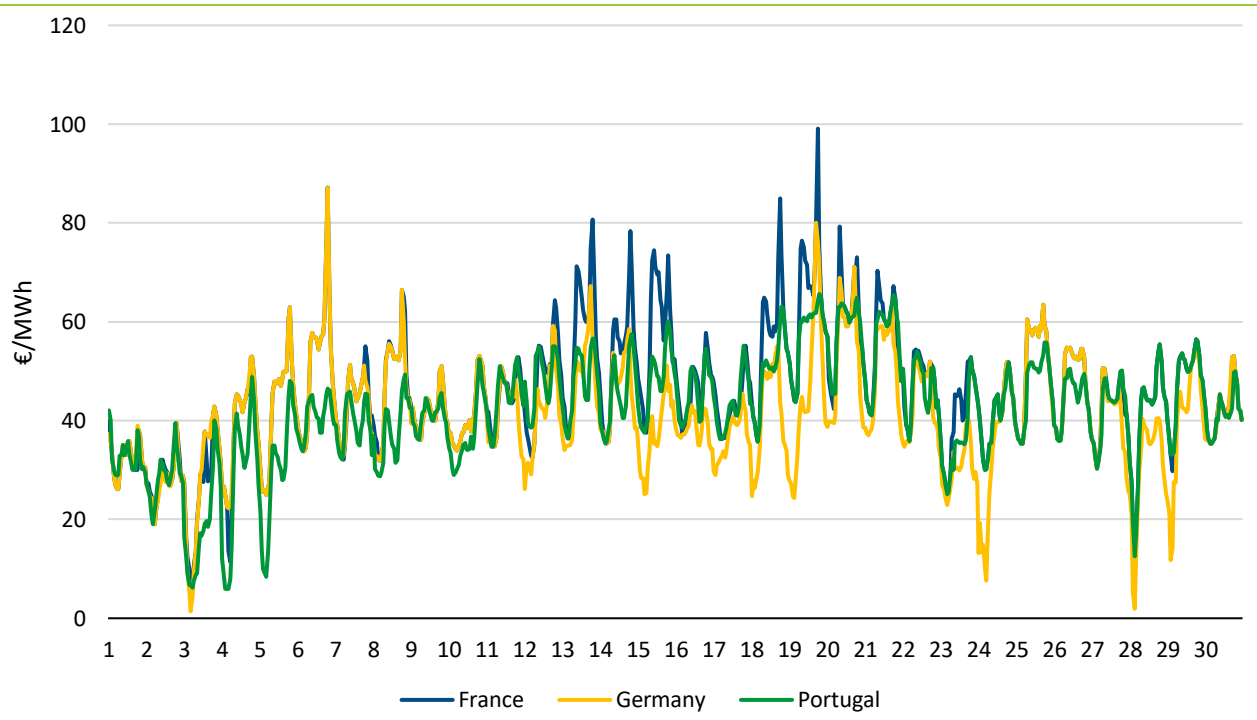



**Figure 1.** Hourly electricity market price in Portugal, France and Germany (nov-2019).
Source: ENTSO-E.

This price difference between MIBEL and the rest of Europe led to a strong export trend that saturated the ES-FR interconnection capacity for a total of 148 hours throughout November (Figure 6). In the opposite side, electricity imports from Spain reached its maximum capacity only during 1.7 % of the time.

Throughout this analysis, it is easily demonstrated the importance of interconnections between the Iberian Peninsula and the European market, which will be increasingly necessary the higher the variable renewables share in the total electricity generation.

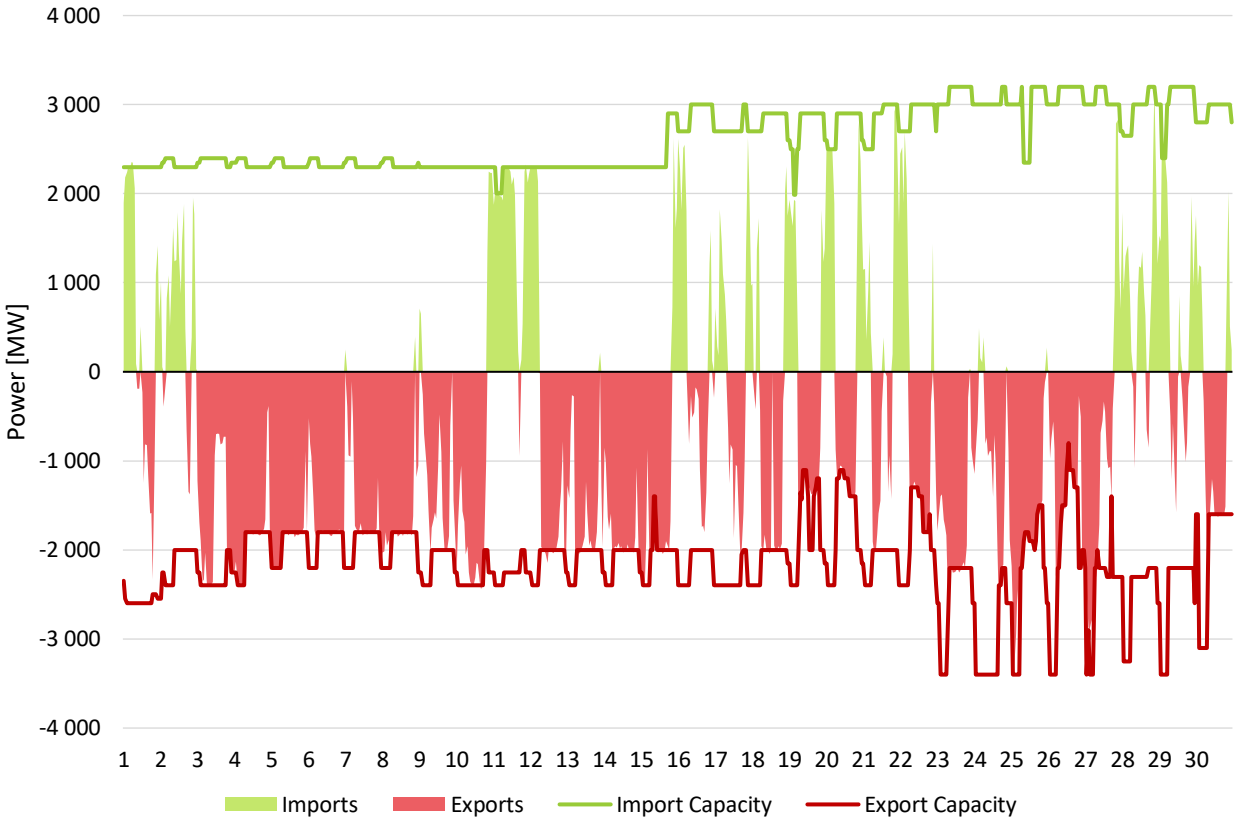



**Figure 2.** Electricity Imports and Exports between ES-FR and interconnection capacities (nov-2019).
Source: ENTSO-E, IESOE.

## FINAL REMARKS

On November 28th, on the same day that the Portugal Renewable Summit 2019 took place, the European Parliament declared Climate Emergency, as a result of the impetus given by the new European Commission, chaired by Ursula Von der Leyen, who advocates for a more ambitious GHG emissions reduction compromise for 2030. From this scenario of greater climate ambition and having set the goal for carbon neutrality by 2050, it was voted in the European Parliament, a new emissions reduction target for the European Union of at least 55% by 2030 compared to 1990 values, a target that was previously set at 40 %. This scenario, if proclaimed by the Commission and the European Council, will have direct repercussions on the National Energy and Climate Plans, whose previously proposed targets (in the end of 2018) will need to be revised by the Member States.

**Roadmap for Carbon Neutrality Approved**

On July 1st, the Council of Ministers Resolution nº. 107/2019 was published on the Official Gazette, approving the Roadmap for Carbon Neutrality 2050 (RNC 2050).

**New platform for SPU registry is now operational**

The operating rules for the new platform were published by DGEG through the Dispatch nº. 43/2019.

**Decree-Law n. º 162/2019 for renewable self-consumption was published**

It partially transposes the Directive (EU) 2018/2001 and introduces new entities such as energy communities and collective self-consumers. However, the Technical Regulations (Technical and Quality Regulations and the Inspection and Certification Regulations), which are vital for the practical applicability of the DL, are yet to be published.

**Guarantees of Origin still not operational**

Although the "Guarantees of Origin Issuing Authority Procedures Manual" has already been published, the Guarantees of Origin issuing system is not yet operational.

**Regulatory mechanism to balance competition in wholesale electricity market in Portugal**

Renewable power plants (solar and wind) with a capacity exceeding 5 MW and which are only under market remuneration regime are now covered by this mechanism.

*Information available in:*

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