



APREN Associação
de Energias
Renováveis

PORTUGUESE RENEWABLE ELECTRICITY REPORT

OCTOBER 2019



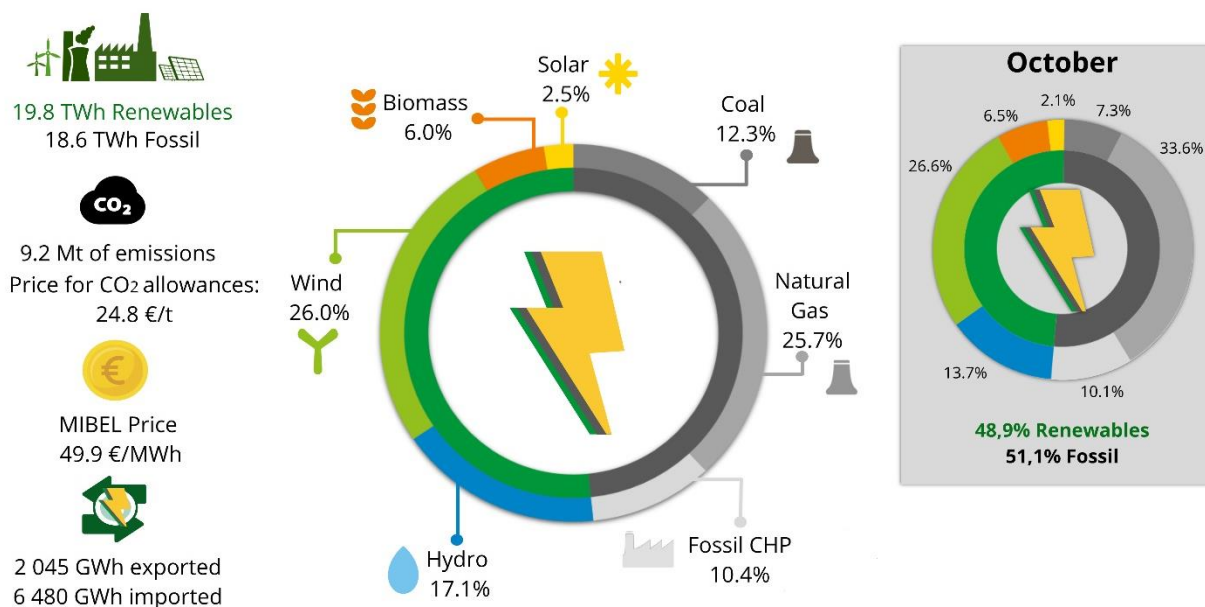
RENEWABLE ELECTRICITY IN MAINLAND PORTUGAL

OCTOBER 2019

EXECUTIVE SUMMARY

- Between January and October 2019, renewable energy sources generated 19.8 TWh of electricity, **contributing to 51.6 % of the production mix.**
- Portugal imported 6 480 GWh of electricity and exported 2 045 GWh between January and October, resulting in an **import balance of 4 435 GWh.**
- During this period, the average **daily market price at MIBEL was 49.9 €/MWh.**
- **The power sector emitted approximately 9.2 million tons of CO₂,** which translates in an average specific emission of 239 grams of CO₂ for each kWh of electricity generated.

ILLUSTRATIVE SUMMARY: ELECTRICITY PRODUCTION IN 2019



ELECTRICITY GENERATION IN MAINLAND PORTUGAL

The period between January and October 2019 registered a 51.6 % (19.8 TWh) share of renewable energy sources (RES) in the electricity generation mix for Mainland Portugal (Figure 1). During this period, a total of 38.4 TWh of electricity was generated, out of which 48.4 % (18.6 TWh) were derived from fossil fuels.

This RES share is 18.0 % lower if compared to the same period of 2018, essentially due to low hydro productivity, that in terms of yearly cumulative hydro productivity index reached only 0.60. In this period, hydropower plants produced 6.6 TWh, which is about half the total electricity produced by the same powerplants in the homologous period of 2018 (11.3 TWh).

Despite the unfavorable weather conditions, renewable power plants under special regime (PRE), which includes small hydro, wind, solar PV and bioenergy (biomass, biogas and urban solid waste), produced a total of 13.9 TWh of electricity from January to October 2019, slightly increasing its production by 0.9 % in a year to year basis. Taking into consideration the PRE overall electricity production, wind powerplants stood out, accounting for 26.0 % (10.0 TWh), that reflects an average wind productivity index of 1.00. Also, worth mentioning is the 2.5 % contribution from solar PV (946 MWh), which represents a 29.6 % increase over the equivalent period of the previous year.

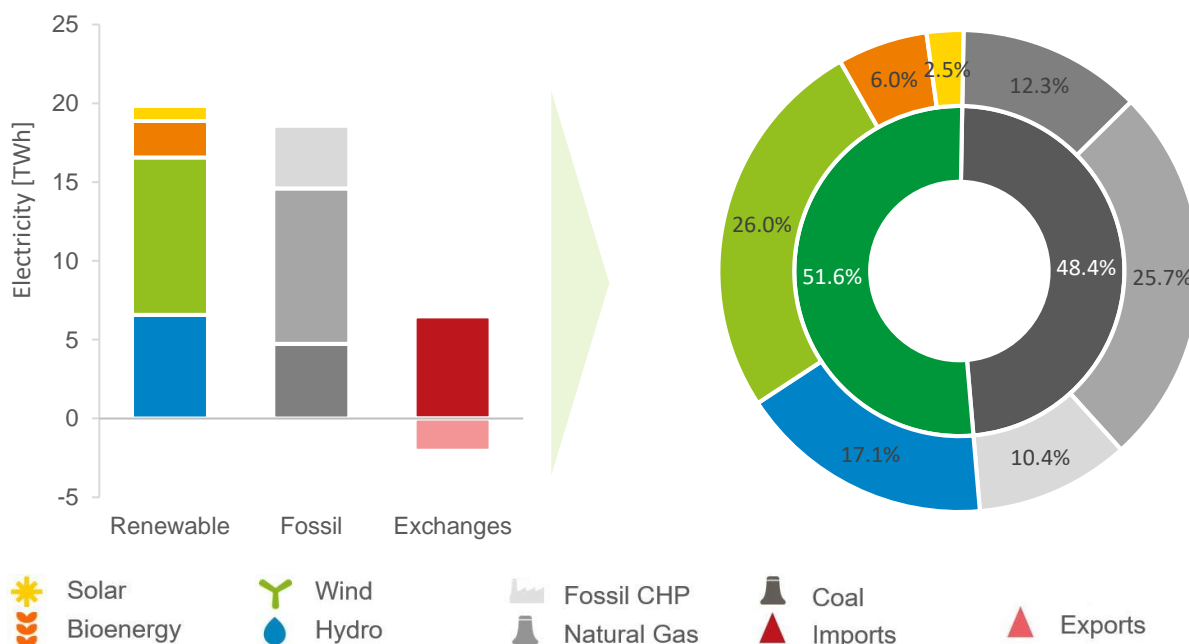


Figure 1. Electricity production by energy source in Mainland Portugal (Oct-2019).

Source: REN, APREN's analysis



Regarding the electricity demand in Mainland Portugal, in the period between January and October, it registered 42.8 TWh¹, a 1.7 % reduction compared to the real values for the same period of 2018 (0.8 % when considering the corrections for temperature and number of working days).

Regarding the international trade, this period registered an import balance of 4 435 GWh, as a result from electricity imports of 6 480 GWh and exports of 2 045 GWh.

This importing pattern induced in a significant use of the interconnection capacity ES-PT, which has recorded, since the beginning of the year, an average utilization rate of 34 %, with a congestion rate of 7% for the period between January and October.

As already stated in previous versions of the monthly APREN's Renewable Electricity Report, this importing trend from Mainland Portugal may be related to factors such as:

(a) The competitive balancing tax applied to generation that, since September this year started also covering solar PV and wind powerplants with capacity above 5 MW operating under market regime. This tax has been fixed at 4.18 €/MWh - almost 10 % of the average MIBEL daily market price for electricity.

(b) The continuous Spanish importation trend, through the Morocco-Spain interconnection, of cheaper electricity from the Moroccan Safi coal powerplant.

c) According to the Commodities Report from ERSE, for the third quarter of 2019, the natural gas price within the Iberian Gas Market (MIBGAS), which is quite volatile and has been higher than the cost of natural gas purchased by the last resort trader (CUR) in Portugal, has reversed this price trend since February this year, now priced at a lower value than the achieved by the CUR in Portugal.

¹ Power plants' total electricity generation for consumption, not considering the import-export balance and grid losses.



ELECTRICITY MARKET

Between January and October 2019, the Iberian daily electricity market (MIBEL) recorded an average price of 49.9 €/MWh², which represents a 11.7 % decrease over the same period of 2018.

October registered an average daily market price of 47.2 €/MWh, a 24.7% reduction compared to January, 62.7 €/MWh.

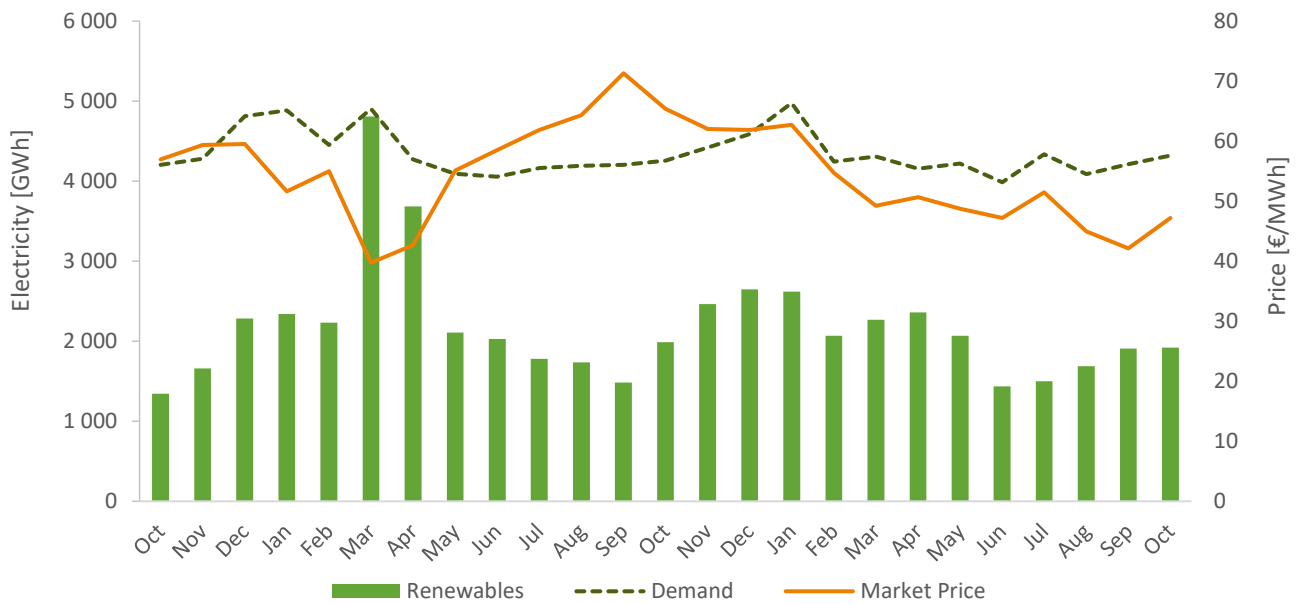


Figure 2. Renewable electricity production, Wholesale electricity market price and Electricity demand (Oct-2017 to Oct-2019).

Source: OMIE, REN, APREN's analysis

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



POWER SECTOR SPECIFIC EMISSIONS

In the Jan-Oct period, the Portuguese power sector emitted a total of 9.2 MtCO₂, which is translated, in specific emissions, in 239 grams of CO₂ for each kWh of electricity produced³. The power sector was also responsible for emitting 213 tN₂O and 118 tCH₄, that altogether have an equivalent GHG emission effect of approximately 0.06 MtCO₂⁴.

Also as a result from the RES penetration in the electricity production mix for Mainland Portugal, during this period (Jan-Oct 2019), the following benefits were provided: 11 MtCO₂ emissions; 529 M€ in fossil fuel imports; 272 M€ in CO₂ allowances under European CO₂ Allowances Trading System (EU-ETS).

On October, 0.87 Mt of CO₂ emissions were recorded, which is a significantly lower value than the one for October 2018 (1.23 MtCO₂), mainly as a result from a low utilization rate of coal powerplants - 71.4 % in October 2018 versus 23.1 % in October 2019 -, which emit approximately three times the CO₂ mass compared to natural gas combined cycle powerplants.

The CO₂ allowances under the EU-ETS were priced at 24,8 €/tCO₂ for the period between January and October 2019, which is 66.5 % over the value for same period of 2018. In October, the average price stood at 24.7 €/tCO₂.

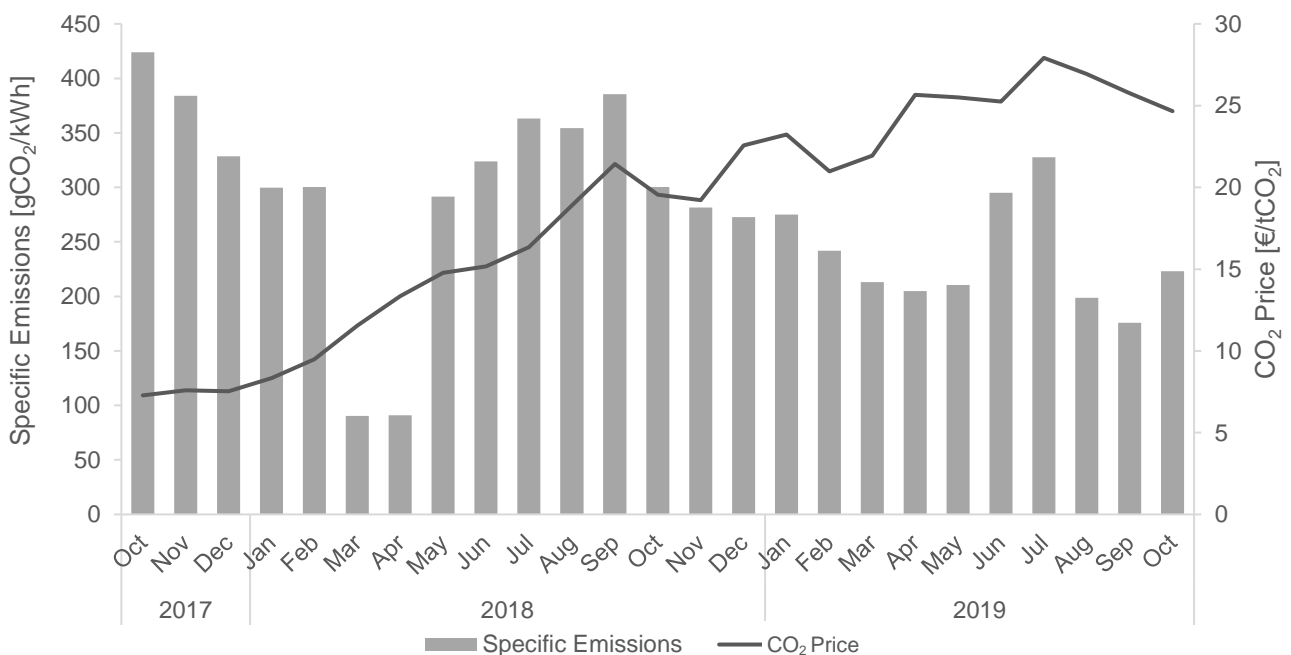


Figure 3. Specific emissions resultant from the power sector's activity in Mainland Portugal and CO₂ allowances price (Oct-2017 to Oct-2019).

Source: REN, APREN's analysis

³ ERSE, Labelling of Electricity

⁴ APA, National Inventory of Atmospheric Emissions (INERPA)



LOAD DIAGRAM FOR OCTOBER

The load diagram for October (Figure 4) reflects an almost equitable distribution between RES (48.9 % of the electricity production, 1 919 GWh) and fossil fuel powerplants (51.1 %, 2 003 GWh). Wind stands out from the other RES technologies, posing a 26.6 % representativity (1 042 GWh) in the production mix, with a wind productivity index of 1.03.

As for hydropower, a 13.7 % (539 GWh) portion of the overall production was achieved. This value represents a low hydro productivity index, of only

0.47, though reflecting the current drought that is now striking Mainland Portugal. In fact, the Climate Report by the Portuguese Institute for Sea and Atmosphere (IPMA) indicates that about 36% of the territory remained under a severe and extreme drought by the end of October.

As it is now a recurring fact in 2019, October continues recording high electricity imports (425 GWh), against electricity exports of only 278 GWh, resulting in a 151 GWh import balance.

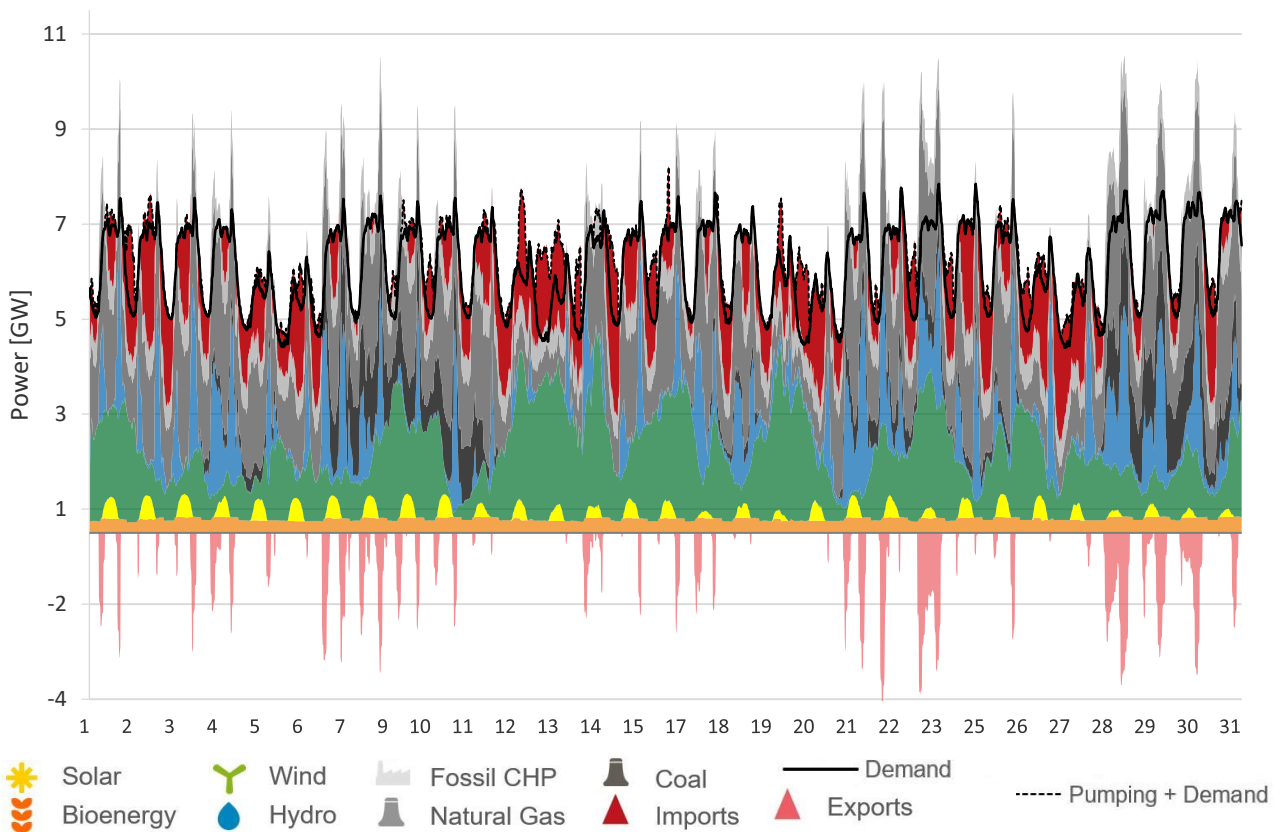


Figure 4. Load Diagram for Mainland Portugal (Oct-2019).

Source: REN, APREN's analysis



FINAL REMARKS

On October 23rd, DGEG published, through the Dispatch n.º 43/2019 from the Director General, the new operational rules for the electronic platform and for the registration procedure of small renewable electricity production units (SPU), uniquely intended for selling electricity to the public service power grid, and with an installed capacity up to 1 MW, which are now covered by Decree-Law n.º 76/2019. The new SPU registration platform is now operational.

On October 25th the Decree-Law (DL) n.º 162/2019 was published on the Official Gazette, repealing and replacing the current DL n.º 153/2014, which established the legal regime applicable for electricity self-consumption, that was in need for an update, in order to be fully compliant with the new European requirements set out under the Clean Energy

Package for all Europeans, specifically regarding the Directive (EU) 2018/2001 of the European Parliament and the Council, from December 11th 2018, concerning the promotion of renewable energy use, and highlighting the consumer role as an active market agent and introducing new entities such as energy communities and collective self-consumers. Despite its clear alignment with the objectives of the European Commission and the decarbonisation objective set for Portugal, this DL refers to Technical Regulations (Technical and Quality Regulations and Inspection and Certification Regulations) that are yet to be published, and to tariffs that are still to be defined by ERSE, factors that hinder the practical applicability of the DL, and that should be swiftly implemented.



REGULATORY AND LEGISLATIVE HIGHLIGHTS ON THE POWER SECTOR



Roadmap for Carbon Neutrality Approved

On July 1st, the Council of Ministers Resolution n^o. 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 n^o. 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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