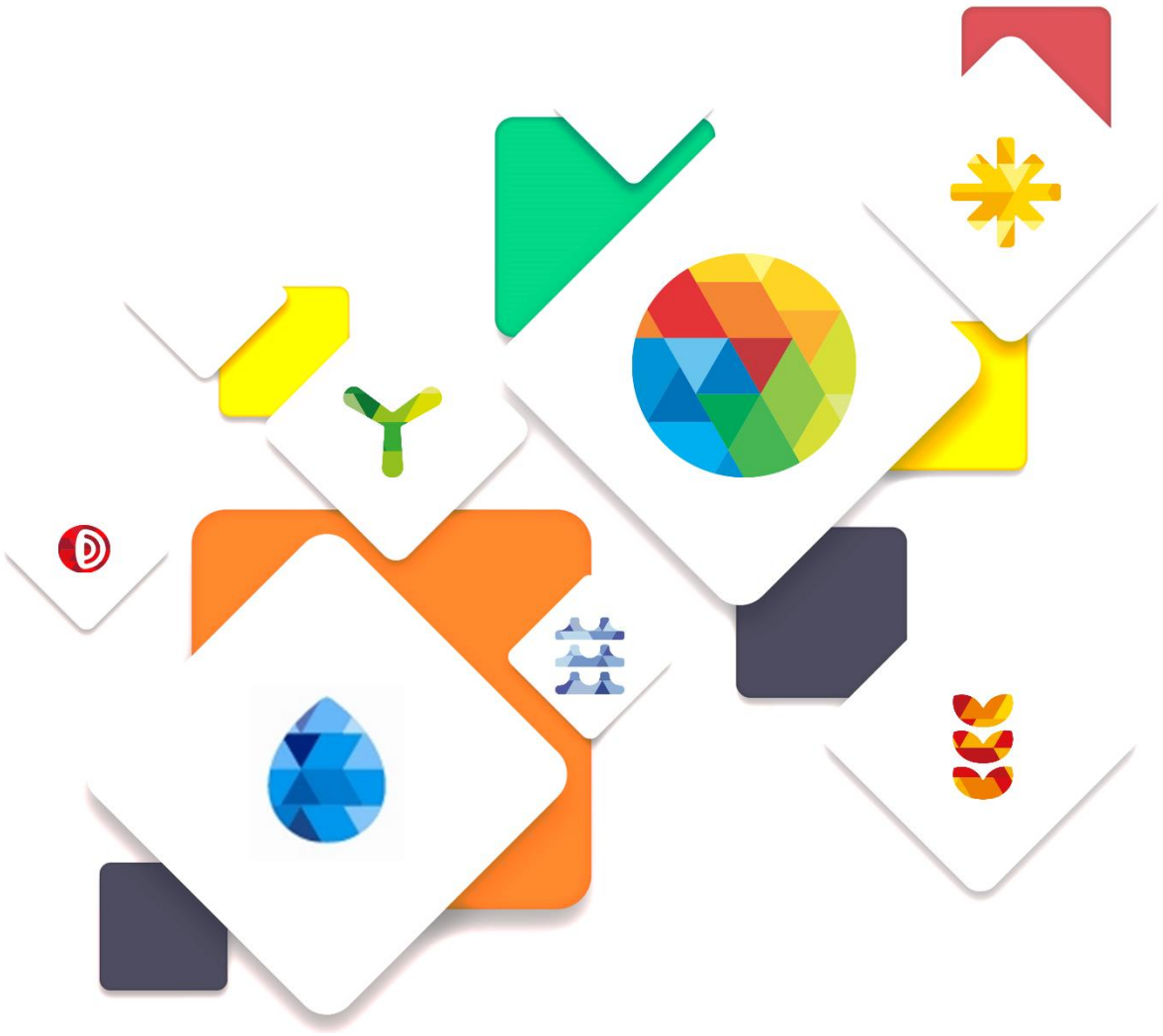
APREN Associação de Energias Renováveis



REPORT

RENEWABLE ELECTRICITY IN PORTUGAL

Monthly Edition

February 2017

RENEWABLE ELECTRICITY IN THE PORTUGUESE MAINLAND

February was characterized by an increase in the wind and hydro resources, when compared to January. Accordingly, the last month's wind index and the hydroelectric energy capability factor raised to 1.08 and 0.92, respectively.

Thus, the renewable electricity sources, 2,720 GWh, accounted for 65 % of electricity consumption [1] of Portuguese mainland, 4,156 GWh.

In addition, during February the renewable production was enough to supply the mainland demand for 45 hours (fig. 1). The longest consecutive period is the timeframe between 9:45 pm of 4th of February and 3:45 pm of 5th of February.

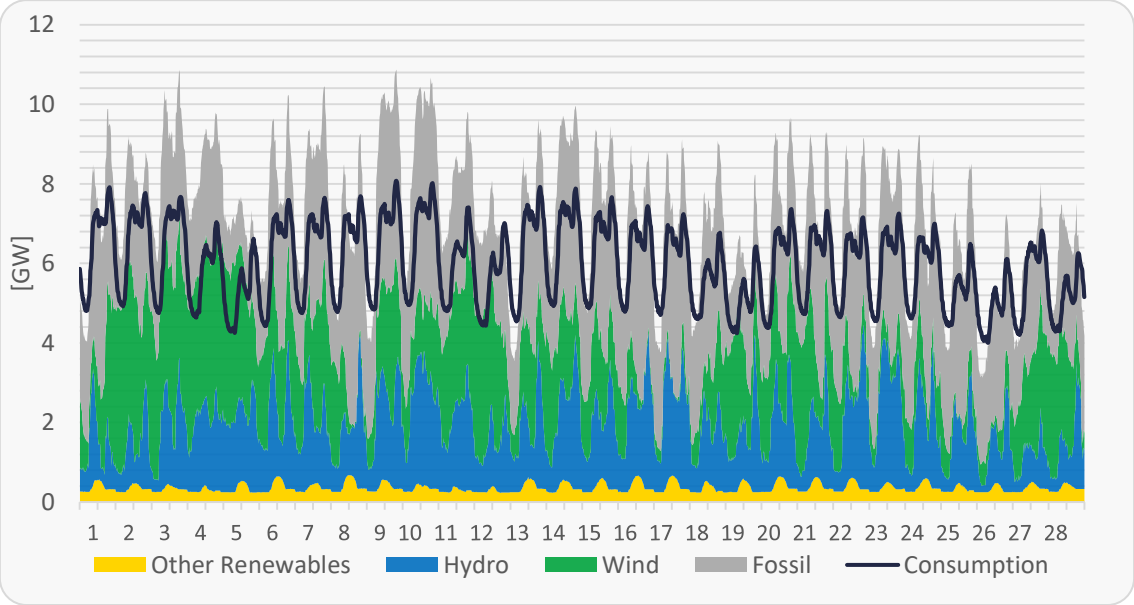


Figure 1: Load Diagram of Portugal Mainland (February of 2017)

Source: REN; APREN's Analysis

By analysing the Portuguese mainland electricity load diagram of last month, it is shown that the Portuguese energy production mix supplied not only the demand but also allowed a net export balance of 640 GWh.

[1] This consumption value refers to the power plant's electricity generation for final consumption (grid losses and pumped hydroelectric energy storage consumptions are added up to this value.)

In cumulative terms, in the first two months of the year, the renewable electricity production provided 5,152 GWh (fig. 2). The division was as follows: wind (2,474 GWh), hydro (2,099 GWh), bioenergy (487 GWh) and solar (92 GWh).

By its turn, the fossil power generation provided 4,801 GWh throughout coal power plants (2,195 GWh), natural gas power plants (1,859 GWh) and fossil cogeneration (747 GWh).

The analysis of the electricity exchanges shows that until the end of February the exports (1,345 GWh) widely exceeded the imports (456 GWh). This means that Portugal had a positive export net balance of 889 GWh.

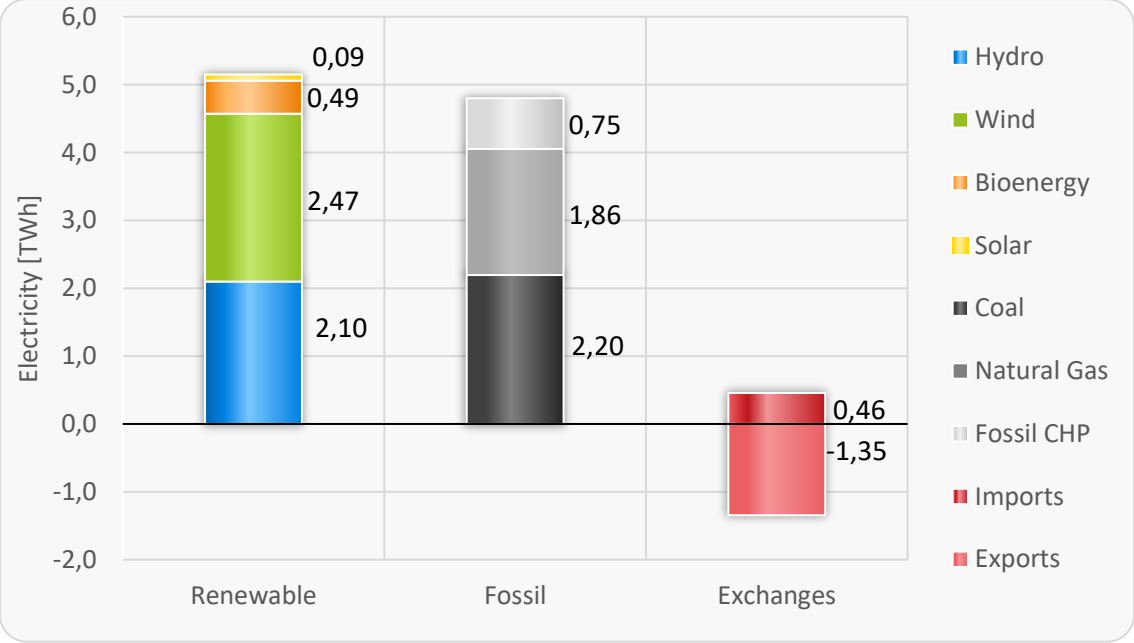


Figure 2: Electricity generation sources and international exchanges in Portugal Mainland (January and February of 2017)

Source: REN; APREN's Analysis

The analysis of the renewable electricity generation of January and February (fig. 3), within the context of the last two years displays the low annual variability of wind, bioenergy and solar technologies.

This stability displays a high production persistence of these technologies and the possibility of creating reliable production scenarios in a long-term range.

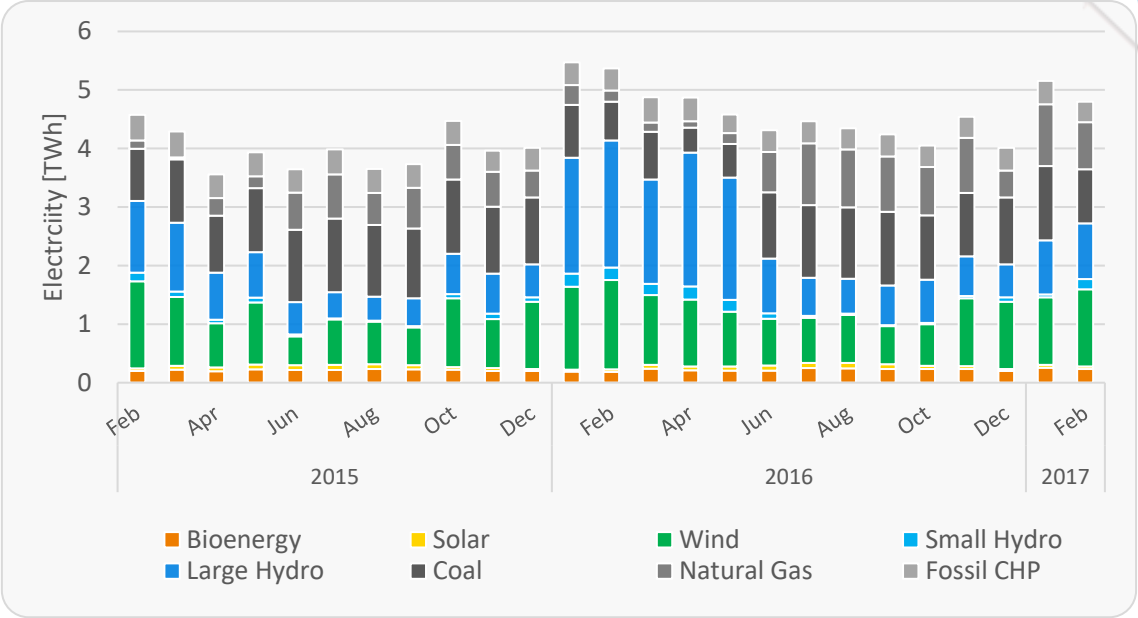


Figure 3: Distribution of the electricity generation by source (February of 2015 until February of 2017)

Source: REN; APREN's Analysis

The last two years' renewable electricity generation scrutiny displays that the drop of the renewable production leads to an increase of the fossil production.

In this timeframe, the electricity produced due to fossil thermal power plants was responsible for more than 33 million tons of CO_2.

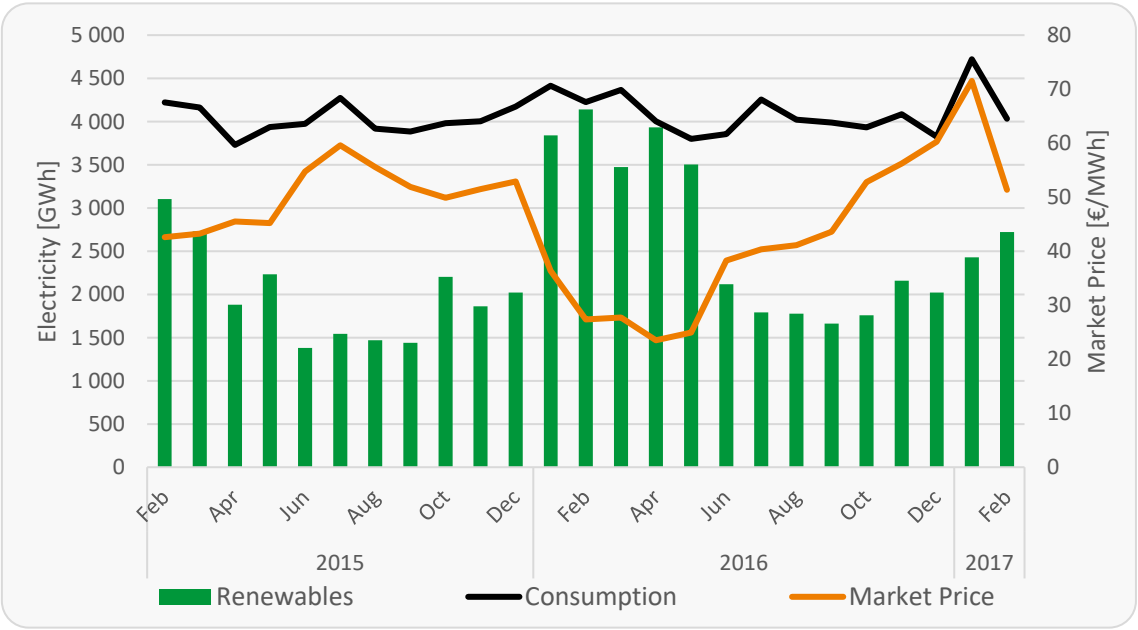


Figure 4: Correlation between the renewable electricity production and the wholesale electricity price (February of 2015 until February of 2017)

Source: REN; APREN's Analysis

The negative correlation between **the electricity spot market price and the renewable production in the past two years** is shown in figure 4.

In February of 2017, the increase of the electricity produced by renewable technologies combined with the start of operation of some French nuclear reactors, that were stopped in last months, and combined with mild temperatures that led to a reduction of the Portuguese mainland electricity consumption, contributed to the reduction of the average electricity spot market price to 51.39 €/MWh. This price contrasts with the value of January (71.52 €/MWh) when the renewable share was only 50 % of the electricity consumption.

Nevertheless, it is important to notice that the current prices of the electricity spot market don't pay back the fixed and variable costs of any electricity generation technologies, whether they use fossil or renewable sources. This implies the need to rethink the future design of the electricity market.

The current market was designed for a centralized electricity system with large thermal generation units and high marginal costs, therefore being inappropriate for an electricity system composed of distributed generating units with low marginal costs.

For this reason and following the recent publication of the European Commission's "Clean Energy for All Europeans" proposal for the 2020-2030 timeframe, it is essential to foster discussions regarding a new market design. A future revision of the electricity market design should adopt a more egalitarian regime between different electricity generation technologies.

SUMMARY

February of 2016 was characterized by an increase in the availability of wind and hydro resources, which contributed to a bigger monthly share of the renewable electricity sources in the Portuguese Mainland Electricity consumption mix (65 %).

In addition, the renewable electricity share led to a decrease around 28 % of the average spot market price, when compared to January, that was 51.39 €/MWh.

Information available in:

APREN | Communication and Technical Departments

Av. Sidónio Pais, nº 18 R/C Esq. 1050-215 Lisboa, Portugal

Tel. (+351) 213 151 621 | www.apren.pt