APREN Associação de Energias Renováveis

PORTUGUESE RENEWABLE ELECTRICITY REPORT

DECEMBER 2019

RENEWABLE ELECTRICITY
IN MAINLAND PORTUGAL

DECEMBER 2019

EXECUTIVE SUMMARY

- In December, a **new renewable energy milestone** was achieved: a consecutive period of 5 days and a half where renewable electricity production was enough to meet demand needs in Mainland Portugal. This milestone occurred between the 18th and 23rd.
- **The share of coal generation** from the two coal-fired powerplants - Sines and Pego – over the electricity demand in Portugal **sank by 76 % in 2019**, with the TSO, REN, mentioning it as the "lowest share of coal since the full commissioning of the Sines powerplant in 1989".
- In 2019, renewable energy sources generated 27.3 TWh of electricity, contributing with **56.0 % of the total electricity generation**. In December, renewable incorporation was 77.2 %.
- Year to date, Portugal imported 7.0 TWh of electricity and exported 3.6 TWh resulting in an **import balance of 3.4 TWh.**
- This year, the **average daily market price at MIBEL was 47.9 €/MWh**, much lower than the previous year, of 57.4 €/MWh.
- **The electricity sector was responsible for the emission of about 10.4 million tonnes of CO_2**, which translates into an average specific emission of approximately 213 grams of CO_2 emitted for each kWh of electricity generated.

ILUSTRATIVE SUMMARY: ELECTRICITY GENERATION IN 2019

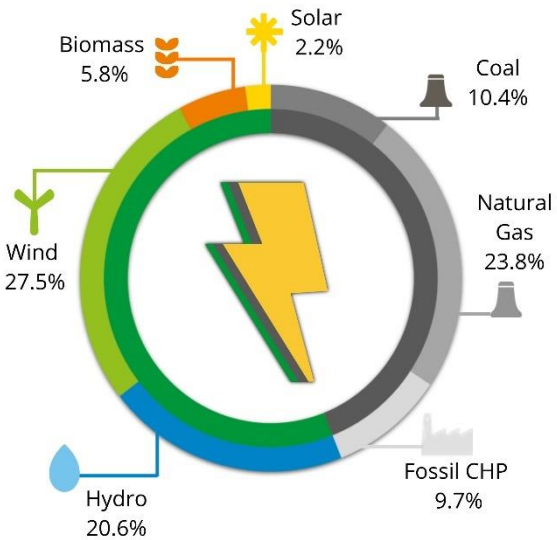
Cumulative values from january to December 2019

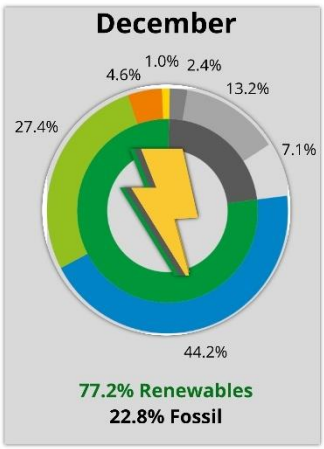
27.3 TWh **Renewables - 56.0%**
21.4 TWh **Fossil - 44.0%**

10.4 Mt of emissions
Price for CO_2 allowances:
24.8 €/t

MIBEL Price
47.9 €/MWh

3 640 GWh exported
7 035 GWh imported





ELECTRICITY GENERATION IN MAINLAND PORTUGAL

2019 recorded a 56.0 % incorporation share of renewable energy sources (RES) in the overall electricity generation (48.8 TWh) in Mainland Portugal, through the generation of 27.3 TWh of electricity. Fossil fuels accounted for the remaining 44.0 %, by generating 21.4 TWh.

Breaking down the electricity generation energy source, we see a greater contribution from wind powerplants, which accounted for 27.5 % of the total electricity generation, by generating 12.3 TWh. Hydro powerplants had a less representative contribution of 20.6 % (10.0 TWh). These results reflect the wind and hydro productivity levels, with cumulative values of 1.07 and 0.81, respectively.

There was an increase in the electricity generation by solar PV, which represented 2.2 % and generated 1.1 TWh, already showing the impact of new solar PV installed capacity in 2019[1] (90 MW of centralized capacity and 21 MW of distributed capacity).

Compared to 2018, It was achieved a 3.1 % increase in the renewables share in the overall electricity generation. Nevertheless, there was a decrease in the amount of electricity generated by renewable powerplants, by 6.8 %. In fact, there was a significant reduction of 24.9 % in the hydroelectricity generation, due to a scarce hydro resource during much of the calendar year 2019, which was partly remedied during December.

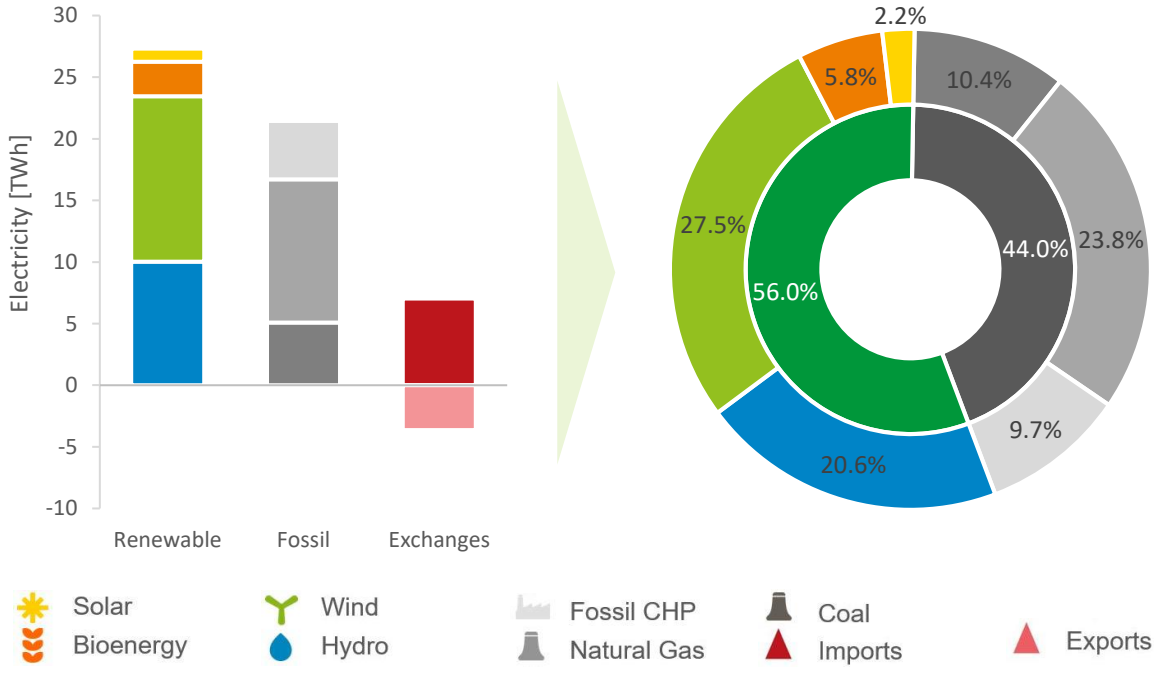


Figure 1. Electricity generation by energy source in Mainland Portugal (Jan-Dec 2019).

Source: REN, APREN's analysis

[1] Available until November 2019. DGEG, Estatísticas Rápidas.

The electricity demand was 52.2 TWh[2], a 1.1 % reduction compared to 2018 (0.2 % when accounting corrections on temperature and number of working days).

In Mainland Portugal, the discrepancy between electricity demand and generation results from an import balance of 3.4 TWh, reflecting the balance between importation of 7.0 TWh and exportation of 3.6 TWh.

This scenario of high external dependency marked the year 2019 and was essentially the result of the start-up of Morocco's Safi coal-fired powerplant in December 2018. This powerplant, as it is not subject to the environmental policies of the European Union, is exempted from the payment of CO_2 emission allowances, thus generating cheaper electricity, which leads to a reversal in the import-export flow through the Spain-Morocco interconnection.

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

ELECTRICITY MARKET

During 2019, there was an average daily market price in the Iberian Electricity Market (MIBEL) of 47.9 €/MWh[3], which represents a very significant reduction of 15.9 % compared to 2018. This reduction is mainly derived from the atypical daily market prices registered during 2018 in all European markets, strongly influenced by a shortage of several nuclear powerplants in France.

In the last two months of 2019, there was a significant decrease in the market prices at MIBEL, reaching an average daily market price of 33.7 €/MWh during December. Figure 2 fairly reflects this reduction, coupled with a very significant increase in the renewable electricity generation, which was driven by favorable weather conditions. In this context, we recall the November 22nd, when an historical maximum daily electricity generation of 103.1 GWh from wind powerplants in Mainland Portugal.

During 2019, a total of non-consecutive 447 hours was recorded during which renewable electricity generation was enough to supply the electricity demand in Mainland Portugal, with an average MIBEL price of 27.5 €/MWh. This turns evident the positive impact of renewables on the market price constitution when incorporated in large scale in the electricity system.

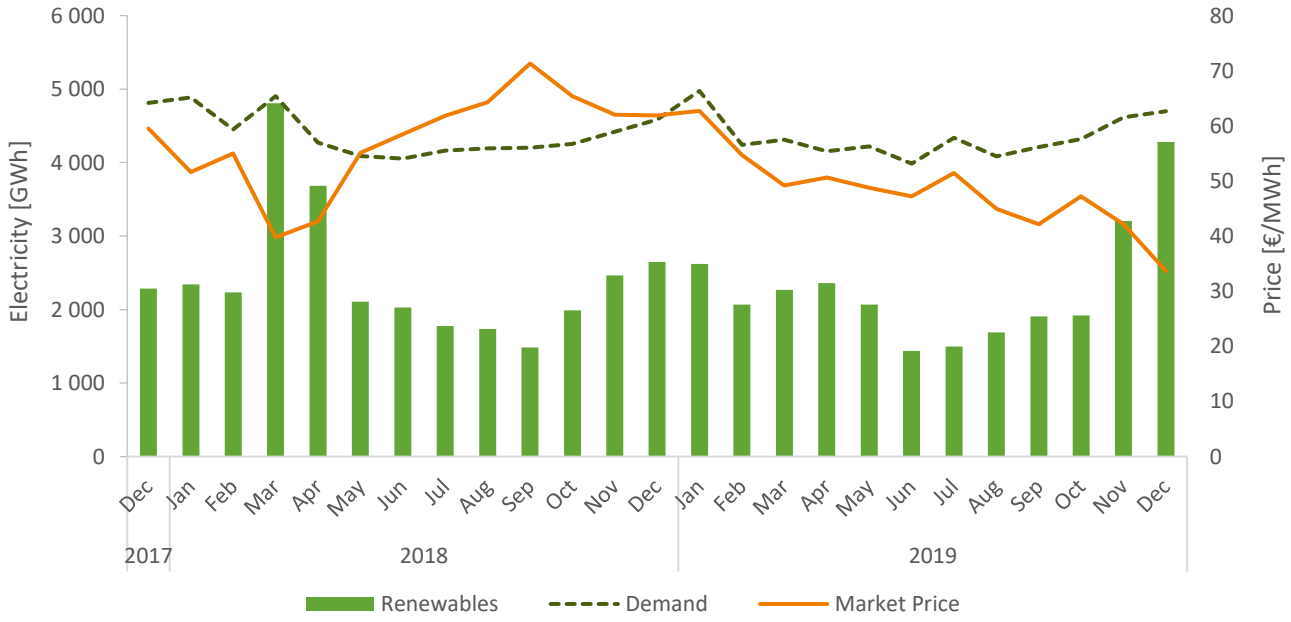


Figure 2. Renewable electricity production, Wholesale electricity market price and Electricity demand (Dec-2017 to Dec-2019).
Source: OMIE, REN, APREN analysis

[3] Simple arithmetic average of the daily electricity prices between January and December 2019. Source: OMIE

POWER SECTOR SPECIFIC EMISSIONS

Compared with 2018, 2019 registered a significant increase of 56.4 % in the price of CO_2 allowances within the EU Emissions Trading System (EU-ETS), with an average value of 24.8 €/tCO_2[4].

A monthly analysis of the EU-ETS points to an average daily price of 25.2 €/tCO_2 in December, an 8.6 % increase since the beginning of the year. The EU-ETS price evolution, represented in Figure 3, is clear when comparing 2019 to 2017 values, since in December 2017 there was an average price of 7.5 €/tCO_2, less 70.2 %.

This trend resulted from the revision of the EU-ETS in April 2018 in which has redefined the emission limit values downwards to minimize the emissions, thus making it possible to meet the European targets for 2030. In the electricity sector, 2019 recorded a cumulative value of 10.4 Mt of CO_2 emissions, reflecting an average specific emission of 213 gCO_2/kWh. This amount represents a 31.5 % reduction compared to 2017 and is essentially a result from a 54.2 % drop in the electricity generation by national coal-fired powerplants, which had the lowest utilization rate of only 36.3 %. The share of coal generation from the two powerplants - Sines and Pego – over the electricity demand in Portugal sank by 76 % in 2019, with the TSO, REN, mentioning it as the "lowest share of coal since the full commissioning of the Sines powerplant in 1989".

The renewable incorporation in the electricity generation in Mainland Portugal has resulted in numerous benefits for the society, economy and environment, including:

- A 743 M€ savings on fossil fuel imports;
- 15.0 Mt of avoided CO_2 emissions;
- A 374 M€ savings in CO_2 emission allowances.

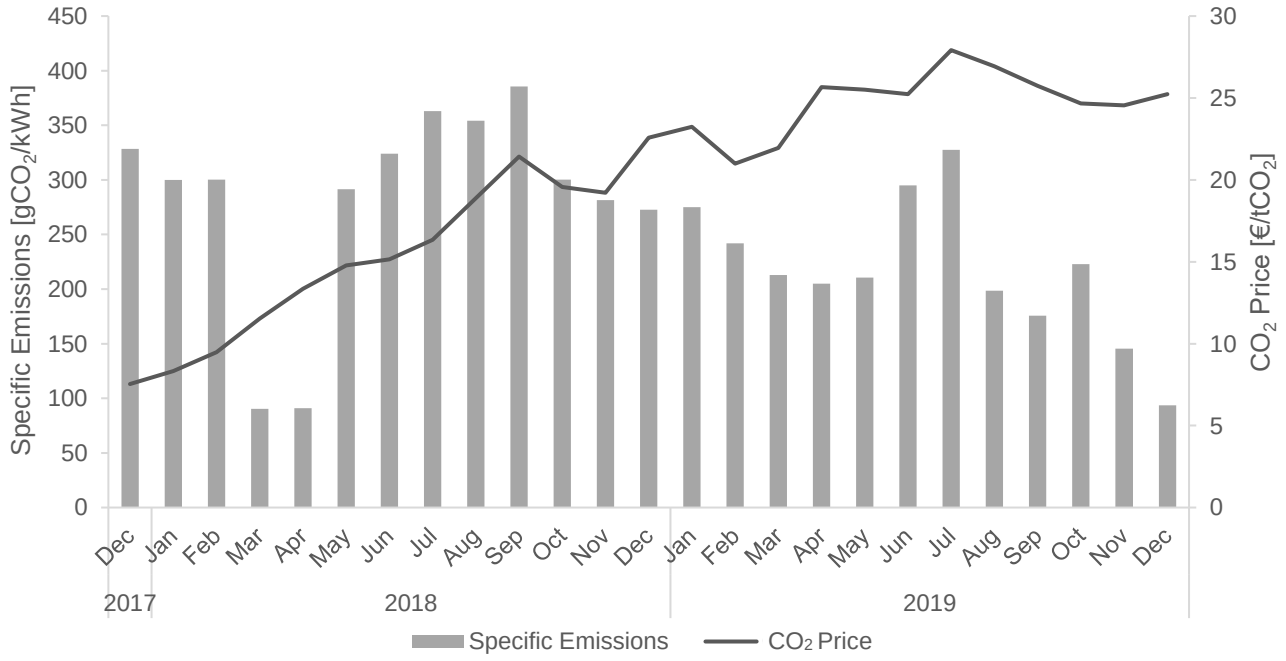


Figure 3. Specific emissions resultant from the power sector's activity in Mainland Portugal and CO_2 allowances price (Dec-2017 to Dec-2019).

Source: REN, APREN analysis

[4] ERSE, Labelling of Electricity

LOAD DIAGRAM FOR DECEMBER

December recorded very significant levels of renewable generation, with a renewable share of 77.2 %, through the electricity generation of 4 280 GWh.

This result reflects the above average wind and hydro producibility levels, with monthly indexes of 1.13 and 1.77, respectively.

In contrast to the serious drought scenario that has hit the entire national territory during most of 2019, December was atypical for opposing reasons, with national hydro powerplants generating 44.2 % of the total electricity generated throughout the Mainland.

In fact, during this month, Portugal set the record for 100 % renewable demand, as on the 18th started a continuous period of 131 hours (5 days and a half), where renewable generation was enough to cover the demand supply. In overall, 331 hours of 100 % renewable demand were recorded in December, with an average daily market price of 24.3 €/MWh. These major milestones demonstrate the high resilience of the national electricity system, when facing high levels of renewable incorporation.

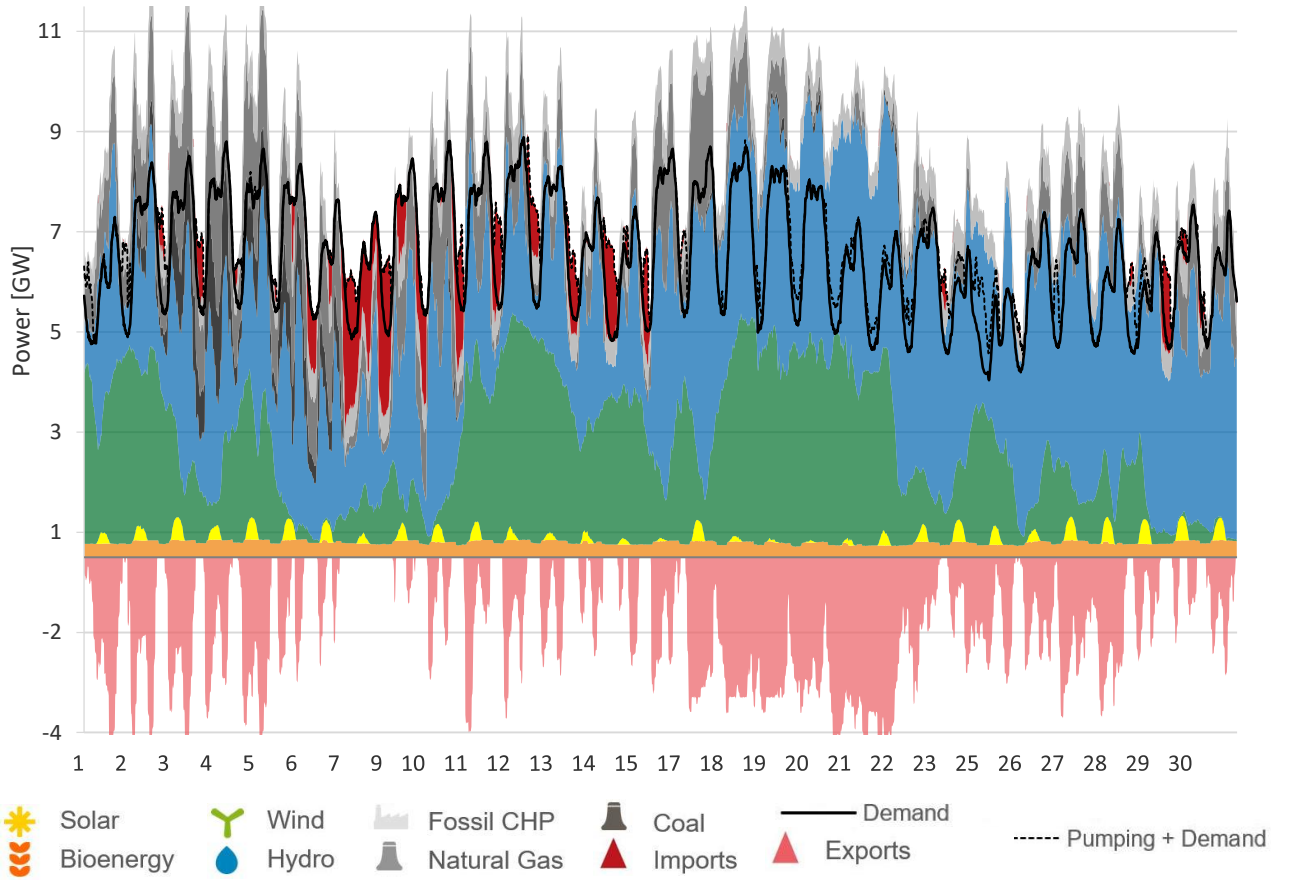


Figure 4. Load Diagram for Mainland Portugal (Dec-2019).

Source: REN, APREN analysis

FINAL REMARKS

2019 was a full year in developments on the renewable electricity sector after an extensive period of stagnation.

It was marked by the publication of several key legislative documents to ensure the transposition of the Clean Energy Package (CEP) for all Europeans, published in 2016 by the European Commission (EC).

These developments include the publication of the Decree-Law (DL) Nº. 76/2019, which changes the legal regime applicable to the exercise of electricity generation, transmission, distribution and trading activities and the organization of the electricity markets. This document aims to adapt the current legal framework, to:

- Enable the adoption of competitive procedures (capacity auctions) for the allocation of production permits;
- Optimize the administrative procedures and avoid unnecessary burdens on stakeholders by reversing the production permitting procedure, making it necessary to secure, at first hand, the capacity reserve in the Public Service Electricity Network (RESP).
- Allow for the permitting of hybrid projects (with different energy sources) to existing powerplants;

In June, the Carbon Neutrality Roadmap for 2050 was approved, outlining the long-term national commitment and strategy towards the country's carbon neutrality in 2050. In line with it, the National Energy and Climate Plan for 2030 (NECP 2030) was drawn, which has already been submitted to the EC, sets very ambitious targets for Portugal, out of which APREN highlights:

- 47 % renewable share in the gross final energy demand;
- 80 % renewable share in electricity;
- 38 % renewable share in heating and cooling;
- 20 % renewable share in transport.

In July, it took place the solar PV capacity auction, in which 1 292 MW were awarded, that resulted in record-breaking tariffs throughout Europe and the World. This procedure defined two options for the remuneration scheme: 1) the guaranteed remuneration scheme, which resulted in an average tariff of 20.4 €/MWh and; 2) the system contribution scheme, which resulted in an average contribution of 21.4 €/MWh.

In October, the DL n. º 162/2019 was published, repealing and replacing the current DL n. º 153/2014, which establishes the legal regime applicable to the electricity generation for self-consumption, giving special attention to consumers as active market agents. This DL also introduces new entities such as energy communities and collective self-consumers.

In December, after the European Parliament had declared a state of climate emergency, the new EC chaired by Ursula Von der Leyen, published a communication with the proposal for the European Green Deal, which includes the revision of the GHG reduction target to 55 % by 2030[5]. It is therefore imperative to re-evaluate the path set in the Member States NECPs to see if they are aligned with the new European climate ambition.

[5] Emission reduction target compared to 1990 values.

On December the 31st, Portugal submitted the final version of the NECP 2030, which sets out the main strategic lines and measures to comply with the CEP guidelines.

More recently, on January 2nd, the Energy Secretary of State published a Dispatch clarifying the scope of the regulatory mechanism balance competition in the wholesale electricity market in Portugal ("clawback"), established by the DL nº. 74/2013. This Dispatch ensures the exemption from the "clawback" payment for producers with Power Purchase Agreements (PPAs), who do not profit from the variation on the MIBEL daily market prices. APREN underscores the importance of this exemption which has been actively defending with the administrative bodies and the Energy Secretary of State.

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.

NECP 2030 submission to the EC

The NECP 2030 has already been submitted to the EC, within the deadline (until December 31st, 2019).

Dispatch from State Secretariat exempts the "clawback" to producers with PPAs

Published on January 2nd, the Dispatch clarifies the clawback scope, whereby producers who have signed PPAs, which do not benefit from the MIBEL daily market price variation, are exempted from paying this fee. "

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:

APREN | Communication and Technical Departments

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