

Innovation in the grid

Red Eléctrica digitalises the Balearic Islands' transmission grid with cutting-edge technology

These real-time line monitoring devices are designed to maximise grid usage and integrate a greater share of renewable energy sources

Red Eléctrica has installed these devices on the Lluçmajor-Son Orlandis, Eivissa-Bossa, and Eivissa-Sant Antoni lines.

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Red Eléctrica, the Redeia subsidiary responsible for electricity transmission and system operation in Spain, has begun installing DLR (Dynamic Line Rating) devices on key lines of the Balearic Islands' transmission grid. This advanced digitalisation technology aims to maximise the usage of existing transmission lines, improve supply reliability, and facilitate the integration of a greater share of renewable energy generation.

So far, devices have been installed on the 66kV overhead line between the Eivissa and Bossa sub-stations (where 7 weather stations and 19 sensors have been installed); on the 66kV line between the Eivissa and Sant Antoni sub-stations (with 8 weather stations and 20 sensors), and on the mixed 66kV (overhead-underground) line between the Son Orlandis and Lluçmajor sub-stations (with 4 weather stations and 16 sensors).

DLR systems consist of sensors and weather stations that collect real-time data on transmission line parameters and environmental conditions. They also leverage advanced IoT (Internet of Things) communication systems and AI-powered calculation algorithms. This information allows for precise real-time estimation of the lines' transmission capacity to optimise their use.

For example, data obtained can help determine whether to adjust a line's power flow based on high ambient temperatures or whether to maximise usage under favourable conditions. In fact, this technological solution allows Red Eléctrica to boost the capacity of some overhead lines by **as much as 30%** under optimal conditions.

This approach allows for the transmission of higher volumes of electricity to improve supply reliability and integrate a greater share of renewable energies, without the need to develop new infrastructure. The deployment of this technology maximises grid usage without altering the layout, modifying transmission towers, or changing any other line components.

The installation of these DLR devices, authorised for operation by the Government of the Balearic Islands, is part of the company's commitment to modernising and digitalising the transmission grid assets. It is also part of the initiatives Red Eléctrica is implementing under the current Electrical Planning.

The company has deployed more than 750 DLR devices nationwide. This technology is one of the solutions recommended by the European Commission's Grid Action Plan to improve grid efficiency.