NOTA
DE PRENSA

Press Office

Tel.: +34 91 213 11 02
Fax: +34 91 213 90 95
prensa@endesa.es

endesa.com

A FAULT DETECTION SYSTEM FOR WIND TURBINES CAN SAVE UP TO 95% OF THE REPAIR COST

- *A predictive vibration analysis system implemented by Endesa remotely controls information from 1,400 wind turbines, 600 of which are located in the company's wind farms in Spain.*
- *The detection of a single fault can lead to savings in the cost of repairing the main components of over EUR 100,000 per machine.*
- *Automation and machine learning are key factors, as the system has the capacity to process up to 100,000 records a second.*
- *The analysis system can be extrapolated to any wind turbine model.*

Madrid, XX XXX 2018 – As part of its digitalisation process, Endesa has implemented a predictive analysis maintenance system for its wind turbines based on a study of the vibrations in the machinery.

The analysis system, which is deployed from the Monitoring&Diagnostic Room of Enel Green Power Spain, Endesa's renewables generation division, remotely monitors the status of over 1,400 wind turbines from Madrid by analysing the vibrations of the machines; 600 of these wind turbines belong to Endesa's renewables generation asset base in Spain, and the remainder to Enel Green Power facilities in Mexico, Chile, Italy, Greece and Romania, among other countries.

This is a predictive analysis to prevent breakdowns in the main components, as it allows faults to be detected early, even months in advance, which makes it easier to schedule repairs, reduce costs and stop the machinery from becoming unavailable, thereby improving efficiency. The model, which was launched in 2016 and is currently managed by five people, has been made possible thanks to:

- The *Internet of Things*, which enables data to be transferred from remote and inaccessible locations, using data devices that are at times sited at over 60 metres in height in the wind turbine nacelle, to centralised servers in the “cloud”.

- *Machine learning,* whereby the systems learn the usual behaviour pattern of the machines and alarms are activated when any deviation from this behaviour is detected.

- The systematic generation of knowledge relating to the most common faults based on analysts' experience.

Machine learning in particular is a significant advance because as the data are high frequency vibrations (100,000 records a second), monitoring must be automated to the furthest possible extent, with reliable alarms. The predictive analysis system enables savings of between 15% and 95% of the repair cost of the main components to be made during the life of the wind turbine. The detection of a single fault can lead to savings of over Euros 100,000 per machine.

Today, all of the company's wind turbines that are less than five years old have integrated Condition Monitoring Systems, which allow their status to be monitored. The main advances are being made in regard to centralised and remote data access capacity, in addition to the analysis and management of the information. As data from different wind turbine models across the world are recorded, predictive analyses can be made in any wind farm. Additionally, based on the know-how acquired in the study of the machines, information can be shared with manufacturers so that improvements can be applied to the models and the learning curve so that more accurate forecasts can be made.

These initiatives are one more example of Endesa's commitment to process digitalisation, in line with the strategy pursued by the Enel Group to which it belongs. As part of this digitalisation process, cutting-edge technologies are being deployed to enable the digital transformation of industrial assets and customer relations, while improving the company's digital capacity. In addition to efficient management of cybersecurity risks, and a substantial improvement in processes and further cost savings.

Enel Green Power España, the renewables subsidiary of Endesa, currently manages more than 1,815 MW of capacity in Spain following the recent addition to its generation mix of five wind farms acquired from Gestinver (132 MW). Of this total capacity, 1,749 MW derive from wind power, 43 MW from mini-hydro and 14 MW from other renewable sources.

Endesa Press Office
T: 912 131 102
www.endesa.com