



RED ELÉCTRICA DE ESPAÑA



CECREE

CONTROL CENTRE OF RENEWABLE ENERGIES

CECRE: CONTROL CENTRE

Red Eléctrica, as operator of the power system, has started up a control centre of renewable energies (CECRE), a worldwide pioneering initiative to monitor and control these energy resources.



The history of wind energy in Spain is a very successful one.

Over recent years wind power generation in our country has experienced an extraordinary growth, which has led to this energy source taking on an increasingly significant role in the coverage of the power demand.

This fact, together with the unique properties associated with wind power management that may affect the secure operation of the power system, has encouraged Red Eléctrica to create a control centre of renewable energies (CECRE). Below are some of the most outstanding features:

- The high number of wind power producers which exist in the power system (more than 500 farms) make the exchange in real time between the generators and the system operator more difficult.
- Wind power production only occurs when the wind blows. This uncontrollability makes management more complicated as it is extremely difficult to determine in advance precisely how much wind energy will be produced.

In addition, due to its variability, it does not offer any guarantee of power, which means that an additional power reserve from other generation sources is required to cover a reduction in wind power production.

- There are some types of wind turbines which instantly disconnect when a 'voltage dip' occurs (a sudden drop in voltage) thus causing a sudden loss in wind power generation.

One of CECRE's features is the ability to anticipate possible incidents in the system due to sudden losses in wind power generation.

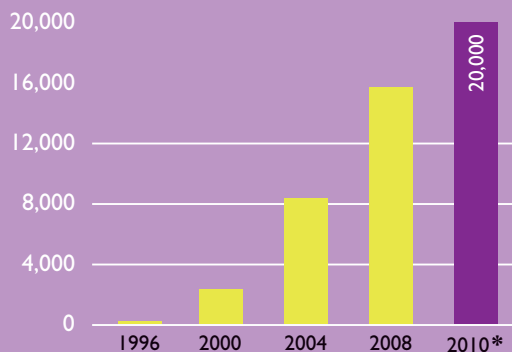
Therefore, diagnoses and assessments are carried out in real time due to the effects that hypothetical voltage dips would have on the system. This is done in order to foresee the operating measures that should be applied in each case, so that the system returns to a secure state.

CECRE allows the maximum amount of production from renewable energy sources, especially wind energy, to be integrated into the power system under secure conditions.



OF RENEWABLE ENERGIES

The development of the installed wind power in Spain (MW)



* Forecast of the Renewable Energy Plan

CECRE is an operation unit integrated into the Electrical Control Centre (CECOEL). The generation of the renewable energy producers, which have been set up in our country are managed and controlled by CECRE.

In addition, this centre is the sole interlocutor in real time between CECOEL and each one of the authorised generation control centres, to which the wind farms are connected.

Its main function is to supervise and control of the renewable energy generators, mainly wind power. It also articulates the integration of its production to the power system in a way compatible with its security. Therefore:

- The information is collected from the production units, which in turn is needed for real time operations. Measurements, such as active and reactive power, voltage, connectivity, temperature and wind speed, are taken from wind farms every 12 seconds.
- Based on this information, wind power production that may be input into the power system at any given time is calculated. This is done depending on the characteristics of the generators and the own state of the system.
- The calculation is performed with a breakdown by each individual wind farm and an aggregation for each transmission grid node. It is sent to the generation control centres, which in turn communicate it to the producers as they have to modify the power consignment supplied to the grid.

With CECRE, Spain has become the first country worldwide to have a control centre for all their wind farms of over 10 MW.



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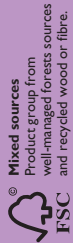


*Our challenge is to build a grid
of electrical infrastructures that is
compatible with the environment
and which makes it possible to develop
renewable energies.*



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