circe
CENTRO DE INVESTIGACIÓN DE RECURSOS Y CONSUMOS ENERGÉTICOS

TECHNOLOGICAL SERVICE

Power Curve Test

CIRCE is specialized in the execution of power curve tests in wind turbines, with MEASNET and ENAC accreditation according to IEC 61400-12-1 through its Electrical Metrology Laboratory. In addition, CIRCE actively participates in wind turbine standardization committees.

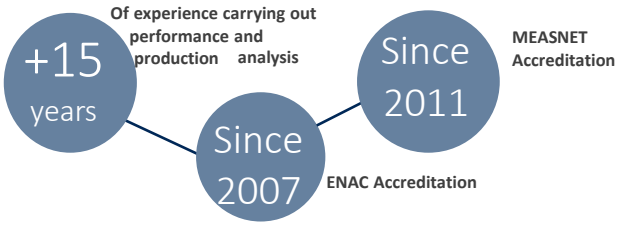
The correct adaptation of the behavior of a wind turbine to the specific conditions of each site remains one of the points of greatest impact in the economic modeling of a wind farm. To minimize the associated risk, it is advisable to carry out a test of the power curve in one or more of the wind turbines that make up the park, in such a way that the real behavior of the machine is characterized in its location, subject to the orographic conditions and that will suffer throughout its useful life. This test must be carried out by an independent and accredited body according to recognized standards.

The measured power curve will also allow you to estimate your annual energy production, AEP, much more accurately. In addition, this information allows establishing a comparison with other turbines, in order to identify possible discrepancies that may exist between the energy delivered by different machines.

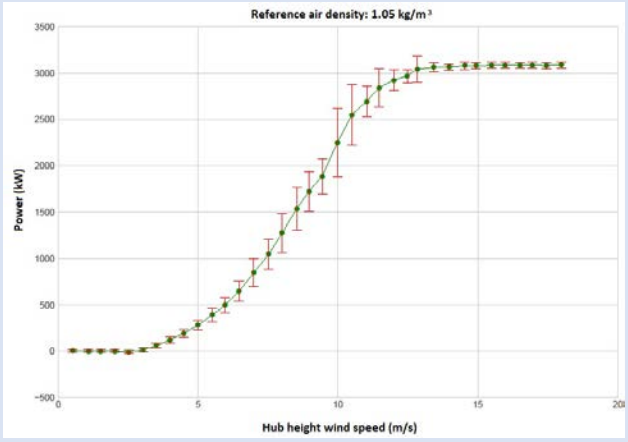
Service offer

- ✓ Consultancy prior to making decisions about which machine should be subjected to the test.
- ✓ Optimal location of the reference weather station.
- ✓ Site calibration tests.
- ✓ Analysis of the quality of the information collected during the data collection period.
- ✓ Collection and processing of data and preparation of final report.
- ✓ Power curve test according to IEC / UNE-EN 61400-12-1 and IEC 61400-12-2 standard with gondola anemometry.
- ✓ Follow-up post-test through the extrapolation of results analysis

KEY FIGURES



"CIRCE through the LME-CIRCE provides from one of the 15 laboratories in the world that have the MEASNET accreditation to perform the power curve test. "



- The power curve of a wind turbine relates the electrical power delivered with the speed of the incident wind. It also shows the estimated uncertainties over the entire operating range -

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Benefits

1. It allows to verify compliance with the contractual guarantee agreement with the manufacturer, in terms of power curve and guaranteed annual energy.
2. Characterization of the real behavior of the wind turbine (especially at the beginning of the useful life).
3. Reference for the periodic control of the operation of wind turbines (anomalies detection).

"CIRCE has a work procedure according to the latest IEC 61400-12-1: 2017 Wind energy generation system. Part 12-1: Power performance measurements of electricity producing wind turbines "

Who is targeted and what benefit is obtained?

- Owners and promoters of renewable generation facilities that wish to take an active part in the operation of their plants.
- Warranty by the manufacturer.
- Obtaining financing formulas.
- Deep knowledge of the operation of the park.

Tools

Own software developed in R environment, for the processing of registered information.

This software is able to synchronize the information and has the specific algorithms for the data processing and filtering of the curve according to MEASNET procedure and IEC 61400-12-1 standard.

Work references

CIRCE has the satisfaction of numerous international clients who have improved the performance of their renewable generation assets thanks to the post-test monitoring of diagnosis and monitoring of parks. Some of them are:

Other studies

EVOLUTION OF WIND RESOURCE

- Parameters of wind resource: Intensity of Turbulence, changes of direction with height (wind veer), extreme values, inflow angle, vertical profile, production estimate, uncertainties, comparative study of estimated production with real, etc.

OTHER TESTS IN FIELD

- Testing of network quality tests according to UNE-EN 50160: 2011 and UNE-EN 61000-4-30: 2009
- Registration and characterization

DIAGNOSIS AND IMPROVEMENT OF PERFORMANCE

- It allows to know at all times the operation of the plant, optimizing the response time to loss of performance or occurrence of failures.

R & D

- Reliability models of wind turbines based on real operating conditions
- Predictive maintenance algorithms
- Optimal management O & M according to weather conditions, electric market
- Obtaining the power curve of wind turbines in operation through SCADA systems and the characterization of the wind resource with remote measurement equipment (LIDAR) and / or traditional measurements (meteorological towers, gondola anemometry)

ACCREDITATIONS:

- MEASNET accreditation for power curve tests and site calibration (previous evaluation of the need thereof) in complex terrain.
- ENAC accreditation for power curve tests according to IEC 61400-12-1 standard and IEC 61400-12-2 standard with gondola anemometry.
- ENAC accreditation for measuring network quality parameters in wind turbines according to standards UNE-EN 50160 and UNE-EN 61400-4-30.

CONTACT

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