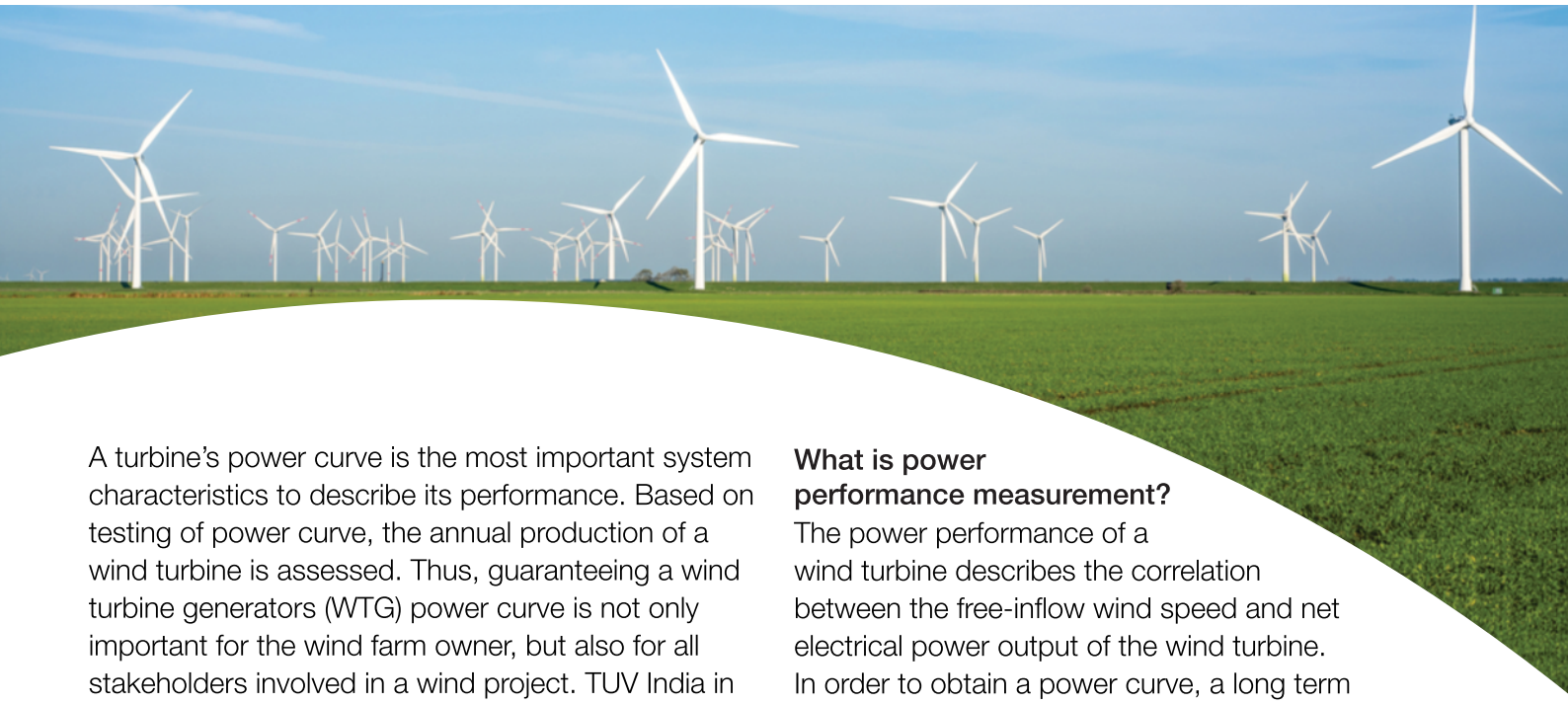
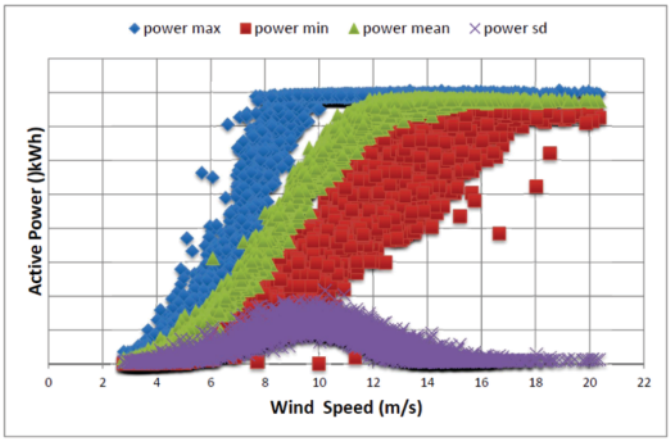
Wind Turbine Power Performance Test



A turbine's power curve is the most important system characteristics to describe its performance. Based on testing of power curve, the annual production of a wind turbine is assessed. Thus, guaranteeing a wind turbine generators (WTG) power curve is not only important for the wind farm owner, but also for all stakeholders involved in a wind project. TUV India in association with windtest grevenbroich gmbh (member of the Measnet body) will carried out WTG Power Performance Test.



What is power performance measurement?

The power performance of a wind turbine describes the correlation between the free-inflow wind speed and net electrical power output of the wind turbine.
In order to obtain a power curve, a long term measurement at the actual wind turbine in the field is undertaken. Data is collected from various sensors inside the wind turbine as well as from a meteorological mast. It is important that the mast is positioned at an undisturbed location. The measured power curve is determined by collecting simultaneous measurements of wind speed and power output. As a second result, the theoretical Annual Energy Production (AEP) is obtained by applying the power curve to a reference wind speed distribution. The determination of a turbine's power performance is conducted according to a reference standard of IEC 61400-12.

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Importance of WT Power Performance Test

- Regulatory compliance
- Characterize actual turbine performance in site specific condition
- To update energy yield forecasts and investigate shortfalls
- Turbine performance verification and optimization (Asset Risk Management)
- As-built baseline and life-cycle monitoring
- Warranty verification
- To identify the underperformance wind turbine

Methodology

For the accredited measurement of your power performance, TUV India offers you the following services:

- **Site inspection and site calibration:**

Our engineers appraise and evaluate the terrain in which the measurement of the wind turbine is to be carried out in accordance with the requirements of IEC 61400-12. A measurement concept is developed on the basis of the local situation, a wind measuring mast and measurement technology selected, configured and installed. The measurement period as well as validation and evaluation of the data are followed by the standard-compliant measurement of the power curve.

- **Prototype measurement:**

The power performance of your prototype is measured in accordance with international guidelines and standards like IEC 61400-12-1, IEC 61400-12-2, IEC 61400-12-3.

- **Subsequent power performance measurement:**

On the basis of or in accordance with international guidelines, the performance of WTG's is measured in an existing wind farm. Here, the measurement concept is drawn up after an inspection of the site in close consultation with the customer. This includes the installation of the wind measuring mast with sensors and performance measurement system and data evaluation. We offer this service with remote sensing systems such as SoDAR or LiDAR systems as a supplement for wind measurement masts.

Benefits to Customers

- **For Manufacturers** - Validate the WTG power performance in a standard compliant measurement
- **For Operators & Investors** - Reliable calculation of the annual energy yield and cost-effectiveness of a wind farm project
- **For Owners** - Guaranteed performance designated by the manufacturer; results can be used for any claims or negotiations with the manufacturer

Customers

- Wind Project Developers
- Independent Power Producers
- Bankers
- EPC Contractor

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