Solar Energy South Africa

Wind measurement during wind power generation period

Overview

How often are wind turbine output data collected?

Wind turbine output data is for turbine R80721 sited at La Haute Borne, France and recorded every 10 min over the 5-year period from January 2013–December 2017. Fig. 12 provides a more in-depth analysis of the probability of a lower power limit being breached.

How is wind energy assessed?

The assessment of wind energy requires data collection and the use of analytical methods and techniques to estimate the availability of winds for a wind turbine over its lifetime 7.

How many wind data are collected?

After removing some abnormal and unreasonable data such as the missing data by sensor fault, measurement error data and low temporal resolution data, a total of 47,084 wind data are collected. The statistical description of wind speed, its direction and wind power data for 1.8 MW wind turbine are shown in Table 1.

How long should a wind resource averaging be?

In wind energy, the general practice in assessing the wind resource of a site is to employ a 10-min averaging to measured wind data. However, small wind turbines (SWTs) with rotor diameters <15 m will have a shorter response time scale; thus, an averaging time window of 10 min is too long for accurate wind resource assessments.

How long can a wind turbine generate power?

Since the measurement was conducted for a 1-year period, the length of the duration curve is 8760 h. However, the total duration for which the wind turbine could have generated significant power is 457 h with 10-min averaged wind speeds and 675 h with 30-s averaged wind speeds.

How to determine wind conditions for wind energy purposes?

In the following, the necessary elements for determining the wind conditions for wind energy purposes will be described: The local meteorological elements, the climatological data, the topographic data, the meteorological models, and the tools that finally enable the users to calculate what is described above under the seven items.

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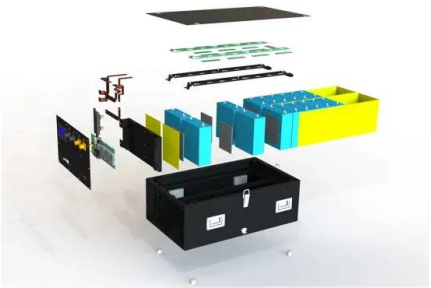
Dynamic thrust and power measurement for a scaled floating wind ...

The power curve reflects the electrical output of the wind turbine at different wind speeds, serving as a crucial basis for evaluating its power generation capacity. Measurement and analysis of ...

Effect of averaging time windows on wind resource ...

In this study, we conducted a measurement campaign for a period of 1 year at a fairly low wind speed site, and we used the measured data to investigate the effect of the averaging window width on wind resource ...



Reconstruction of Near-Surface Hourly Wind Speed Data Sets During ...

It is well known that wind energy over the world, especially in China, has grown very fast in the past two decades with a rapidly increasing fraction of electricity generation (Cannon et al., ...

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