



Site Evaluation

Benefit to the Customer

Yield Report

In addition to the necessary extensive experience of the expert, substantiated knowledge of a site's wind potential, topographical conditions and the performance curve of a wind energy system (WES) form the basis of a bankable and strong yield report.

The yield report is the second step in the process of planning a wind park or planning an individual WES. While the 1st step consists of identifying a possible WES site and entering into preliminary agreements to secure the site, the 2nd step focusses on the long-term 100% annual energy yield.

The yield report is designed to help in evaluating the wind conditions of a site in relation to the wind energy usage. The prevailing wind conditions of the potential site must be evaluated and the energy yield of the wind park configurations or individual WES must be projected according to the "Technische Richtlinie für Windenergieanlagen, Teil 6" (Technical Directive for Wind Energy Systems, part 6): "Bestimmung von Windpotenzial und Energieerträgen" (Determination of the performance curve and standardised energy yields) /2/, Revision 6, as amended on 2007-09-10 (TR6). The annual energy yield is determined drawing on wind potential measurements using wind measuring towers and/or SODAR measurements. Only Germany frequently relies on older wind measurements taken at a measuring height of only 10 m over 5 – 15 measuring years.

Our reports identify important parameters for investors and banks, such as probabilities of achievement, individual and total uncertainties, losses (grid, maintenance, ice, sound reduction).

We operate according to the latest standards and use both CFD software (WindSim) and proven software tools such as WASp and WindPro. Access to new information sources like on-line satellite data for the application of the long-term reference

Within the scope of our membership of MEASNET we co-operate in the creation of an international directive for the preparation of yield reports and participate in intercomparison programmes for quality assurance and improvement.

Frimmersdorfer Str. 73a
D-41517 Grevenbroich
Tel.: +49 (0) 2181 – 22 78-0
Fax: +49 (0) 2181 – 22 78-11
Info@windtest-nrw.de
www.windtest-nrw.de



„Measure-correlate-predict“ is part of the daily work.

Within the scope of our membership of MEASNET we cooperate in the creation of an international directive for the preparation of yield reports and participate in intercomparison programmes for quality assurance and improvement.

Implementation

One approach to determine the annual energy production (AEP) is the so-called "Wind Atlas Method".

The basis of the Wind Atlas Method is a mathematical Model, according to which the wind conditions of a site are determined, among others by examining surface roughness, ground levels (orography) and obstacles in the surroundings of the examined site. These examinations are based on topographical maps and data of individual obstacles obtained on site. If the frequency distributions of the wind speeds and the characteristics of the bottom boundary layer of the region are known due to a suitable reference station (e.g. Atlas stations), the average annual wind speed at any height can be calculated. Prerequisite of this analysis of site wind conditions is the conversion of data from a suitable wind measuring station. The data of the wind measuring stations are converted taking into account the roughness, orography and individual obstacles in the measuring point's vicinity as raw data, which the measuring station supplies with incident flows unaffected by the wind. These raw data give information on the frequency and direction distribution and the energy density of the wind across the entire wind rose. The computer programme processes the measuring station's raw data with the digitised ambient conditions of the site into a new data set that represents the wind conditions of the site to be examined (reference station). The result comprises both the average annual wind speed M and the parameters A (scaling factor) and k (form parameter) describing the Weibull distribu-

Frimmersdorfer Str. 73a
D-41517 Grevenbroich
Tel.: +49 (0) 2181 – 22 78-0
Fax: +49 (0) 2181 – 22 78-11
Info@windtest-nrw.de
www.windtest-nrw.de

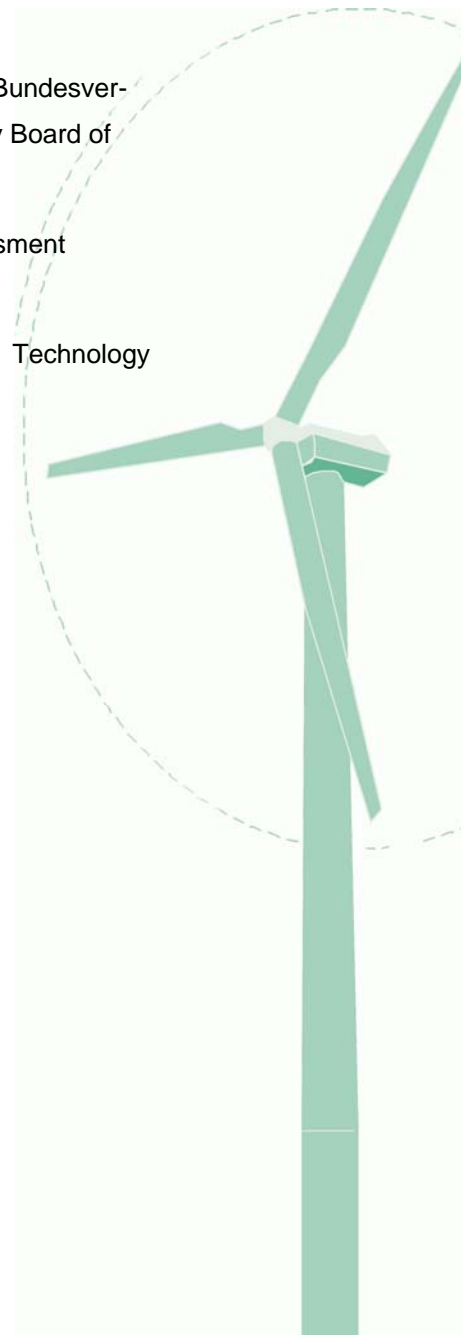


tion.

Using the wind potential of the examined site and a performance characteristic of the WES specified by the customer, the expected annual energy yields are determined.

Our Competence

- Accredited according to ISO 17025 for yield reports.
- Co-operation in the Fachausschuss Windpotential (Technical Committee for Wind Potential) of the Fördergesellschaft Windenergie e.V. (Federation of German Wind Power)
- Co-operation in the Windgutachterbeirat des Bundesverband Windenergie e.V. (Wind Expert Advisory Board of the German Federation for Wind Energy)
- Co-operation in the Expert Group "Site assessment MEASNET".
- Co-operation in the European Wind Energy Technology Platform, TP Wind I



Frimmersdorfer Str. 73a
D-41517 Grevenbroich
Tel.: +49 (0) 2181 – 22 78-0
Fax: +49 (0) 2181 – 22 78-11
Info@windtest-nrw.de
www.windtest-nrw.de