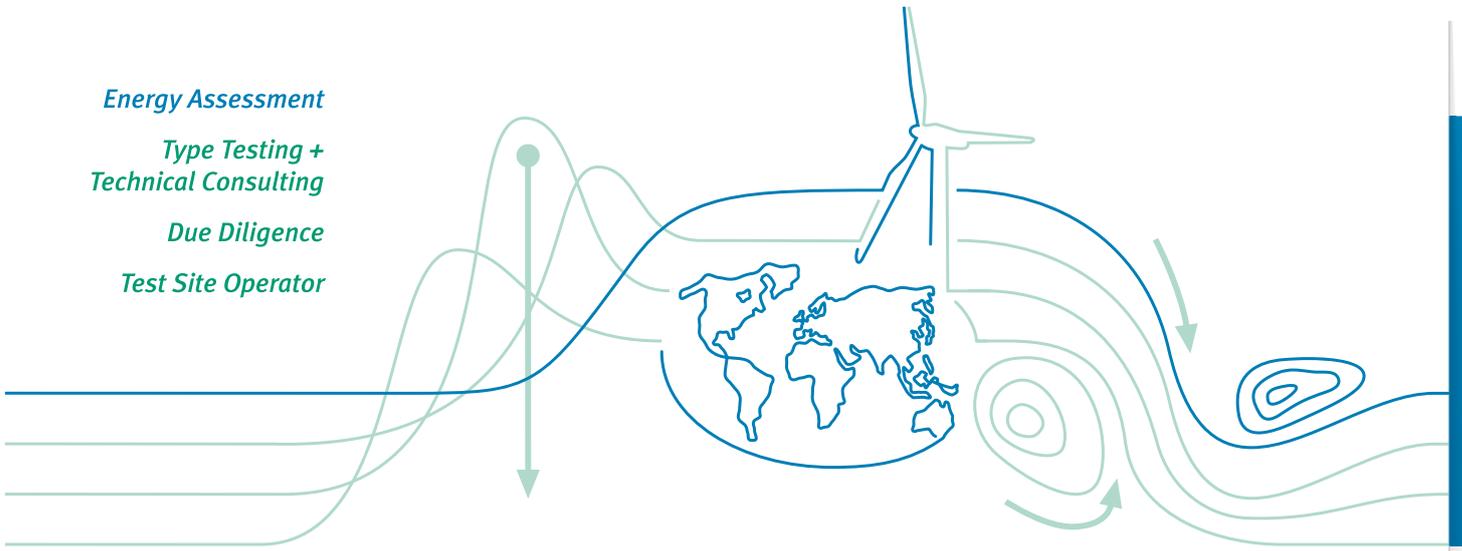


Energy Assessment

Type Testing +
Technical Consulting

Due Diligence

Test Site Operator



Yield Report

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

The department Energy Assessment of windtest grevenbroich gmbh (wtg) offers all kinds of accredited evaluations and assessments for planned wind farm projects according to national and international standards.

Customer benefits

The yield report is the second step in the process of planning a wind farm or planning an individual WT. While the first step consists of identifying a possible WT site and entering into preliminary agreements to secure the site, the second step focuses 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 farm configurations or individual WT must be projected according to the applicable technical guidelines. The annual energy yield is determined drawing on wind potential measurements using wind measuring masts and/or SoDAR/LiDAR measurements. Our reports identify important parameters for investors and banks, such as probabilities of occurrence, individual and total uncertainties and losses (grid, maintenance, ice, sound or bat related reductions).

We operate according to the latest standards and use CFD software (O.F. Wind, WindSim) and proven software tools such as WAsP and WindPRO. Reanalysis data (MERRA, NCAR, VORTEX etc.) is used as independent long-term reference.

Basic implementation

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

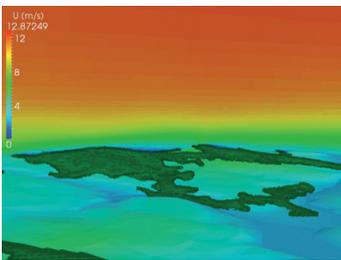
It is a mathematical model, according to which the wind conditions of a site are determined, among others by examining surface roughness, ground levels (orography) and obstacles in the surroundings of the examined site. These analyses are based on topographical maps and data of individual obstacles obtained 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 station), the average annual wind speed at other height can be calculated. Prerequisite of this analysis of site wind conditions is the existence 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. 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 program processes the measuring station's raw data with the digitized ambient conditions of the site into a new data set that represents the wind conditions of the site to be examined.

Using the wind potential of the specific site and the power performance of the WT specified by the customer, the expected annual energy yields are determined.

Competence

wtg is a consultant accredited in accordance with DIN EN ISO/IEC 17025 and offers all necessary services regarding the evaluation of wind measurements and energy yield prognoses based on national and international standards.



Furthermore, our specialists are members of several national and international working committees like

- Technical committee for wind potential of the Federation of German Wind Power (FGW)
- Expert group "Site assessment MEASNET"
- Wind expert advisory board of the German Federation for Wind Energy (BWE)
- Active member in the Expert Group "Site assessment MEASNET".
- European Wind Energy Technology Platform TP Wind I
- Active members of several test groups for newly developed software (e.g. CFD-prognosis tool O.F. Wind) as well as participants in round-robin tests for quality assurance and improvement

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