Your challenges
Developers, banks, institutional investors and turbine manufacturers require an accurate assessment of the viability of their wind projects to support investment decisions. Wind turbine type, rotor diameter, hub height, local wind speeds as well as wind direction and wind shear will all impact the success of a project. It is essential to determine where the wind resources exist, understand their characteristics and validate their quality. A lack of risk assessment for these crucial parameters may hinder smooth operation and result in low energy production.

What is resource analysis?
Wind resource analysis and energy assessments are crucial to determine the yield capabilities for a wind energy project. The available potential is based on meteorological parameters, while the yield is determined from technical parameters such as the WTG type and wind farm design.

How can we help your business?
Having undertaken hundreds of successful wind measurements throughout the world, TÜV SÜD offers the certainty and technical expertise required for your wind projects. Our global team of experts provides a detailed understanding of the variations in wind energy to facilitate decision-making, whether at site identification, through a formal financial close or late in the lifetime of an operational project. Our experts carry out site assessment, assess wind turbine suitability and help to optimise wind farm layout to ensure optimum utilisation of wind resources.

Our services
- Standardised wind measurements
  TÜV SÜD provides professional preparation, installation, maintenance, supervision and dismantling of your wind measurement system. Our experts support you with qualified monitoring of wind measurement using systems that include met masts up to 140m,
LIDAR remote sensing devices and regular data retrieval via GSM. We prepare monthly interim reports and a bankable wind measurement report, presented clearly in tabular and graphic form. Our solution also enables rapid and smooth data sharing with third parties.

- **Wind resource assessments**
  Our experts perform on-site inspection and record input data with high-precision instruments including laser measurement and GPS. We assess site conditions using topographical maps, satellite data, comparative calculations with existing wind farms in the vicinity, long-term meteorological measurements, data collected at ground stations worldwide and geostrophic wind data to ensure reliability and minimise uncertainty. Our experience covers modelling with WASP, CFD calculations with WindSim and OpenFoam as well as high-resolution wind mapping. We are up to date on current standards (BWE, IEC, IEA, Measnet, FGW, etc.) and directives. Our clients receive results in tabular and graphic form, including graphic illustrations of transgression probabilities. We also provide site wind climate analysis, advanced wind park layout design, full assessment of site wind regime for manufacturer’s structural integrity analysis, and optimised wind farm layout with respect to energy yield, site suitability, noise, shadow and infrastructure parameters.

- **Energy calculation**
  TÜV SÜD offers detailed energy yield analysis and energy loss estimation services. We can determine detailed wind farm production losses such as wind farm wakes, electrical losses, availability factors, icing losses or site conditions.

- **Site suitability analysis**
  We calculate turbulence intensity for any given layout, determine the wind zone as per DIBt and IEC (IEC 61400-1 ed. 2 and 3), identify the site-specific mean wind speed and Weibull Distribution and calculate extreme wind speeds (1-year and 50-year mean of both extreme wind speeds and wind gusts). Our analysis of the results takes into account site-specific turbulence and extreme wind measurements, the worldwide data pool collated at ground stations and the theoretical estimate of turbulence and extreme wind based on meteorological data in the vicinity. We determine wind shear, inflow angle and air density for a full compliance assessment. TÜV SÜD also offers an independent statement of compliance in cooperation with WTG manufacturers to ensure site suitability.

**Your business benefits**

- **Understand risks and gain certainty** — by performing a detailed assessment of site characteristics and conditions from the early stage of a project to ensure the reliability of wind parameters.
- **Increase asset value** — by partnering with a globally renowned third-party service provider.
- **Achieve profitable investment** — by optimising wind farms to achieve long-term profitability with a high return on equity.
- **Benefit from one-stop solutions** — with a vast range of experience, that enables us to support your project from feasibility to operation.

**Why choose TÜV SÜD?**

TÜV SÜD is widely known as an independent third-party solutions provider that offers impartial and reliable reports. We provide you with world-class expertise that includes in-depth familiarity with international directives and regulations. Our global presence allows us to work around the world on your behalf, delivering services locally while maintaining a consistent level of premium quality. We have wind specialists from a variety of different engineering disciplines, with decades of accumulated experience in international public, private and joint-sector projects. Our broad portfolio in wind expertise covers all stages of the project lifecycle including in-depth knowledge in technical, environmental and financial areas.

**Choose certainty. Add value.**

TÜV SÜD is a premium quality, safety and sustainability solutions provider that specialises in testing, inspection, auditing, certification, training and assessment services. Represented in over 800 locations worldwide, we hold accreditations in Europe, the Americas, the Middle East, Asia and Africa. By delivering objective solutions to our customers, we add tangible value to businesses, consumers and the environment.

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**Related services**

TÜV SÜD provides the following related services:

- Due diligence
- Project delivery