



Industrie Service

**Choose certainty.  
Add value.**

## Electricity-Network Design by TÜV SÜD – Optimal Grid Connection for Your Plants.

When it comes to connecting wind power plants to the power grid, many aspects such as the connection conditions, must be taken into consideration. However, while as a matter of principle the network operator will define the applying conditions and certain network ratings which must be complied with, the developers and operators of wind farms must focus on profitability. Therefore a wind farm's cable system should be optimised as early as possible in the design stage as losses occurring in its cables will not be reimbursed.

TÜV SÜD's wind energy experts will assist you with achieving this goal. We help you to ensure the safety and cost-effectiveness of your turbines from the very beginning. Our experts review the network connection conditions with regard to an efficient oper-

ation of your wind turbines. We also provide a wide range of services, including the calculation and design of wind-farm cable systems to keep the expected annual power losses to a minimum.

As a leading international provider of engineering and test services, we offer unparalleled interdisciplinary engineering know-how and an ideal technical infrastructure for realising your assignments and projects.

TÜV SÜD's wind energy experts assist you with long-standing experience and outstanding familiarity with all relevant directives and standards.

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[www.tuev-sued.com/windenergy](http://www.tuev-sued.com/windenergy)

## Choose a Powerful Partner for the Design of Your Power Grid: TÜV SÜD

### TÜV SÜD Services

- Analysis of grid connection conditions
- Verification of compliance with the applicable network ratings:
  - Load capacity of cables and transformers
  - Voltage fluctuations of any kind
  - Increase in short-circuit rating and short-circuit current
  - Rapid voltage fluctuations causing flicker (long-term flicker)
  - Harmonics and sub-harmonics
  - Interference with audio frequency ripple control systems
- Analysis of load-flow, short-circuit current and selectivity:
  - Load-flow analysis for the design of electrical equipment
  - Calculation of short-circuit current to verify compliance with protective measures
  - Review or preparation of protection plans or adjustment recommendations for wind-farm cable systems
  - Selectivity analysis to minimise downtime in the event of failures in the wind-farm cable system

- Calculation of the harmonic load flow
- Analysis of impedance-frequency response to prevent resonance
- Analysis of power loss
  - Identification of the energy loss for each individual network component or cable run based on load-flow analysis
- Determination of cable size for
  - Load capacity and minimum cross section
  - Minimisation of power loss
  - Cable installation
- Optimisation
  - Reduction of power losses
  - Improvement of cost-effectiveness
  - Transformer selection

TÜV SÜD's first-class reputation, recognition and acceptance throughout the world are built on technical expertise, high standards of economic and ecological project realisation, impartiality and objectivity. For your benefit.

We provide international services. Call us!

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