



WIND MEASUREMENTS & WRA

From field measurements to energy yield assessment

2EN supports wind projects from the first measurement campaign through to the energy yield assessment.

CONNECTED MEASUREMENT CHAIN

Meteorological masts • Vertical LiDAR • Scanning LiDAR • Wind resource assessment • AEP

MEASURE

Field data

ANALYSE

Wind resource

ASSESS

Energy yield





WIND MEASUREMENTS & WRA

From campaign design to energy yield

One connected workflow, with support available at any individual stage.

01

PLAN

Campaign design

Locations, heights, equipment and strategy

02

MEASURE

Field operation

Installation, monitoring and support

03

ANALYSE

Data quality

Review, long-term context and modelling

04

ASSESS

Energy yield

AEP, losses, uncertainty and reporting



2EN can manage the full process or support individual stages, including projects with existing measurements.

Design, field operation and quality control are treated as one measurement process.

01 Plan the campaign

We define the measurement locations, heights and equipment around the site conditions and the needs of the assessment. This includes sensor configuration, power supply and communications, with practical arrangements for access and maintenance.

02 Operate and monitor

We install and maintain the measurement systems, collect data remotely and monitor their operation throughout the campaign. Our team provides remote diagnosis and field support, including at sites with difficult access or no grid connection.

03 Review the measurements

We check data completeness and consistency, investigate sensor faults, icing and other anomalies, and apply documented quality control. Equipment records, calibration certificates and maintenance histories support traceable measurements and clear reporting.

ISO/IEC 17025 accredited Wind Measurement Laboratory · Active participation in the MEASNET Site Assessment Expert Group

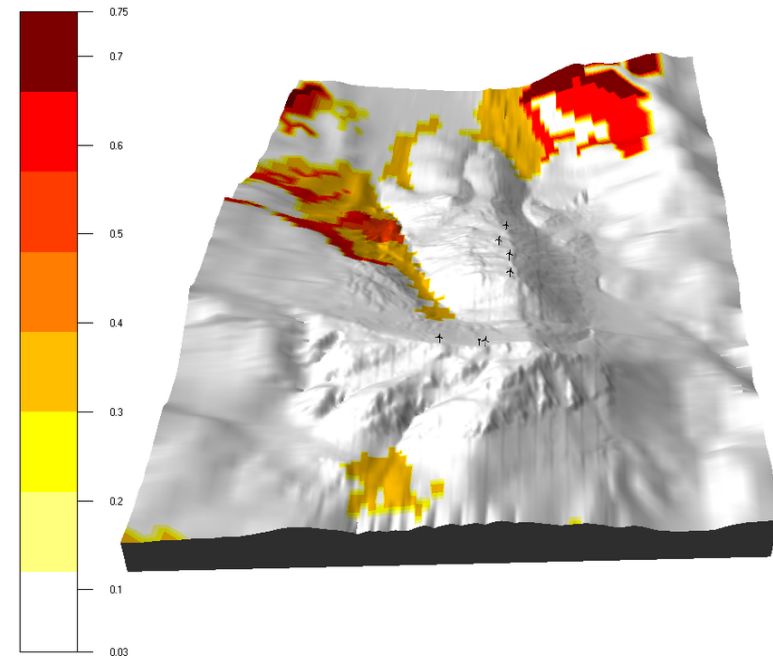
Reviewed measurements are placed in long-term context and translated to turbine locations.

01 Long-term wind climate

We assess suitable reference datasets and correlate them with site measurements using measure-correlate-predict (MCP) methods. This places the measurement period in a longer-term context and establishes the wind climate used in the energy assessment.

02 Wind conditions at each turbine

We assess the variation of wind speed with height and model the flow across the site, accounting for terrain and surface roughness. Vertical and horizontal extrapolation provide estimates at the proposed turbine locations and hub heights.



Example flow-model terrain visual

Site measurements

+ reference data



Long-term

wind climate



Flow model

+ extrapolation



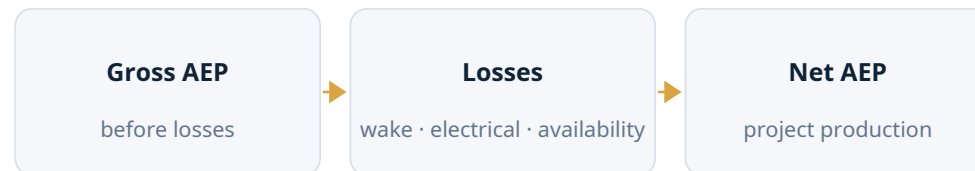
Turbine locations

+ hub heights

The assessment makes the assumptions behind production estimates explicit.

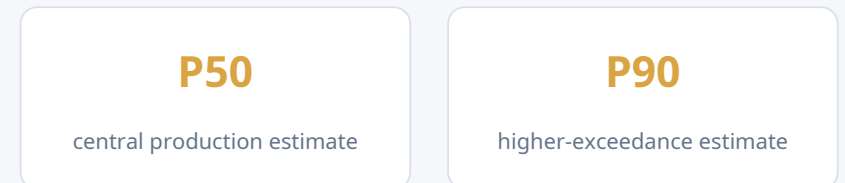
03 Energy yield and losses

We calculate gross and net annual energy production (AEP) using the turbine power curves and wind farm layout. Wake effects, electrical losses, availability and other project-specific losses are assessed with clearly stated assumptions.



04 Uncertainty and P50 / P90

We evaluate the main uncertainty contributions, including measurements, long-term correction and flow modelling. These are combined to calculate production estimates at different exceedance probabilities, including P50 and P90, for the stated assessment period.





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What you receive

Clear datasets, documented assumptions and assessment results that can be followed and reviewed.

PROJECT DELIVERABLES

- Quality-controlled wind datasets and measurement reports
- Long-term wind climate and wind conditions at turbine locations
- Gross and net AEP, with a documented loss breakdown
- P50 / P90 estimates and an uncertainty budget
- A technical report explaining methods, assumptions and limitations

INDEPENDENT TECHNICAL REVIEW

We also review measurement campaigns and wind resource or energy yield studies prepared by third parties, examining data quality, methodology, assumptions and the basis of the reported results.

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