Wind and Solar Power Predictions
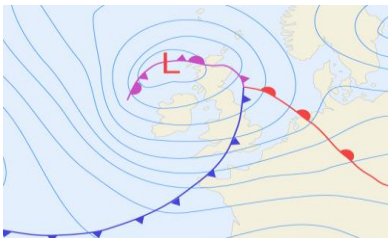
overspeed GmbH & Co. KG

- World-Wide Predictions
- Multi-Model Approach
- Ramps and Extreme Events
- Prediction Uncertainty
- More than 140 GW Installed
- 100% Reached Availability
- 24/7 Standby Team
- Research and Development
- Generic Benchmark Platform
- Offshore Wind Farms

overspeed GmbH & Co. KG

In cooperation with :

ENFOR

Contact Person

Dr. Hans-Peter (Igor) Waldl
Phone +49 441 939400-00
h.p.waldl@overspeed.de

Overspeed GmbH & Co. KG
Im Technologiepark 4
26129 Oldenburg
Germany
info@overspeed.de

overspeed.de

Predictions world-wide

Today, most energy economy sectors are reliant on predictions of future wind and solar energy input. Power plant scheduling, power trading and grid operations can only be carried out optimally when an exact and reliable prediction of renewable power is available for the next hours and days. With the Anemos wind and solar power prediction system, we provide a solution which is accurate, reliable, flexible, and cost-effective. The Anemos system is a commercial spin-off of various research and development activities and is today implemented on a world-wide scale. This system is operated by Overspeed and further developed with partners.

Predictions with High Accuracy

The high accuracy of Anemos wind and solar power predictions rests on a consistent multi-model approach. Each prediction involves combining multiple weather models as well as different physical and statistical power prediction models in such a way that an optimal accuracy is achieved at every point in time. In the process, we have the ability to draw on models from several partners ranking among the top prediction providers in Europe and in total responsible for predicting over 140 GW wind and solar farms world-wide. The fast implementation of knowledge from current research into commercial use leads to the continuous improvement of our predictions.

Any prediction should always include a specification of the related statistical uncertainty. Through an advanced statistical analysis of past behavior, we can specify the current accuracy of our predictions on a reliable basis.

Quality and Reliability

For our customers, predictions are an essential component of their business processes. For this reason, we do our utmost to ensure a high availability of our systems. With our years of experience, mirrored server systems, quality management and a support team available 24/7, we maintained 100% availability in the last 10 years.


Wind energy in the control center

This applies to server solutions operated by us for our customers as well as to systems integrated on-site into the IT infrastructure of our clients. In recent years our prediction system was intensively tested by customers both for stability and maintaining No-Single-Point-of-Failure criteria.

Ramps and Extreme Events

Managing extreme events such as storm fronts is becoming an ever more important task in light of increasing amounts of wind energy in the electricity grid. We tackle this challenge with specialized models for ramp prediction, coupled with an alarming system for extreme situations which informs the user of expected power surges, declines or shut-down events as early as possible.
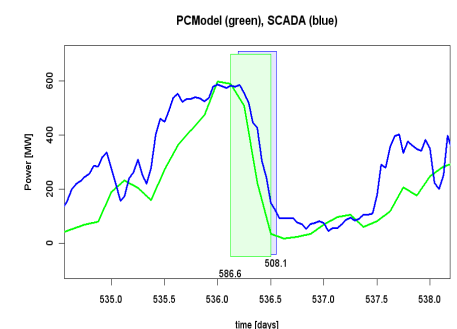
Time response of a predicted (green) and actual ramp (blue)

Platform for benchmarks

In practically all end-user wind and solar power prediction applications, the majority of tasks besides the predictions itself can be tackled on a generic level. The goals for the Anemos prediction platform development originate from the research and commercial contexts, in which it was developed, tested and enhanced. These match well with the functionalities, which are needed for prediction benchmarks and in-house prediction handling and optimisation. A mature and proven solution with a high level of quality management and resilience may be an alternative to a proprietary development for benchmarks and in-house prediction handling, using a number of prediction data feeds. Many of the Anemos platform functionalities are generic, and may be used for the implementation of individual wind and solar power prediction systems with respect to data interfaces, data storage, aggregations and uncertainties, GUIs, monitoring, QM and O&M support and benchmark reporting. By this approach, time and money is saved for in-house developments.
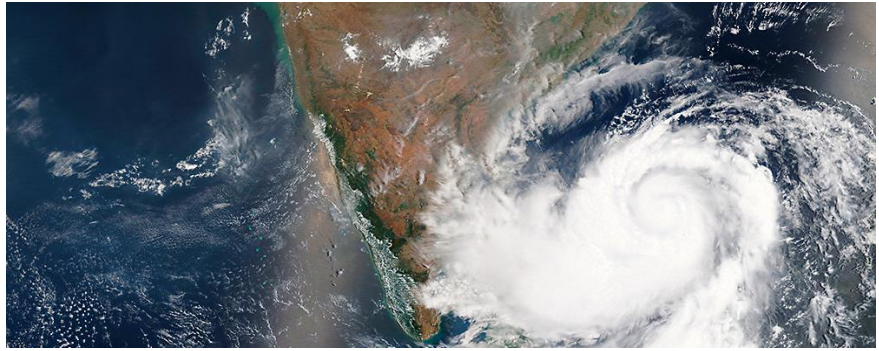
Experience and Customers

Anemos partners have now worked more than 25 years in the area of wind power predictions. As part of the interplay between research institutions and companies, we continuously improve state-of-the-art solutions along with the commercial application side of wind power predictions. Today, Anemos partners are responsible for predicting more than 140 GW of renewables.

Through the flexible Anemos prediction platform and our ongoing research, we succeed in swiftly putting research results into practice and satisfying the current and future needs of our customers.

Solar Power Forecasts

Utility-scale solar farms as well as increasing amounts of distributed rooftop solar PV installations pose new challenges to electricity grid and market operation. We are able to provide accurate forecasting for all types of solar power, large-scale farms and distributed, fixed and tracking.

Our advanced solar forecasting models have been further developed in order to precisely describe the path of the sun over the sky, support the use of satellite images, support global meteorological models with relatively low temporal resolution, and include optimal combination of several meteorological models, statistical downscaling, shadow detection, and more.

For very short-term predictions in the time range from 15 minutes to 3 hours, we offer solar forecasts based on satellite images for Europe, US, Australia and the Indian region.

Modelling Methods

In order to achieve the best forecast accuracy one can get, we are always running a combination of several specialized prediction models. Our coremodel, OSHybrid, is based on the description of a given wind farm and its surroundings with physical parameters such as power curves, terrain roughness and orography. The output of this model is optimized with a statistical model which takes the historic time series of the wind farm power into account.

In order to introduce leading-edge Artificial Intelligence technologies into the prediction process, we are cooperating with the company ENFOR in Denmark, one of the most advanced statistical modelling companies worldwide.
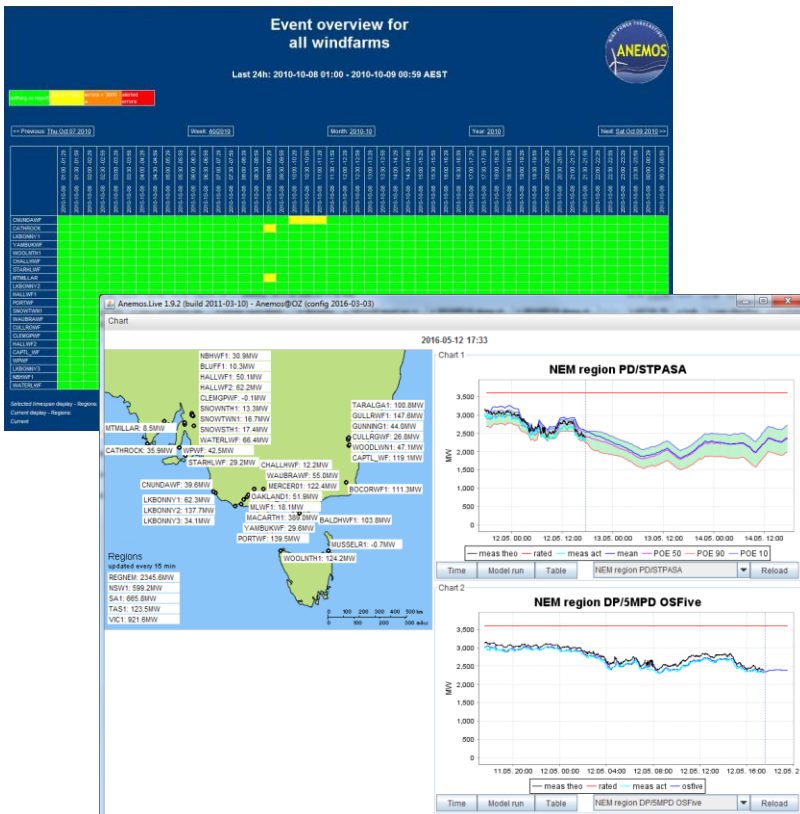
Components of the operational Anemos system (from left to right): From SCADA and NWP feed checker, operational host surveillance, the display of the current predictions for Australia (prediction time series (green) and the uncertainty (90%, light-green band)).