

Renewable energy forecast error

The Problem

In renewable energy, utility operators use forecast models to predict energy fluctuations over a future time horizon to account for operating reserves, and protect grid infrastructure from instabilities. These models are of limited accuracy and as a result operating reserves may be inadequate or over-provided, and grid instabilities may be caused by under or over production of power. Forecasting enables operators to manage varying levels of power generation and operate equipment efficiently and traders to make marketing decisions. However, one operator reported that over the 5 year period 2008-2013 wind power failed to meet forecast 58% of the time.

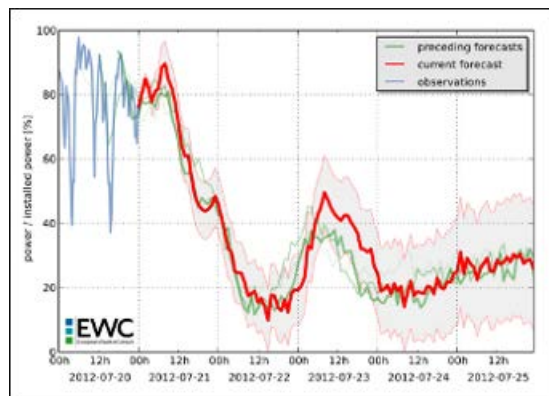


Figure showing measured power (blue), 5-day forecast (red), preceding forecasts (green) and envelope of confidence for 5-day forecast (shaded region). As the horizon is increased, the confidence falls. Figure courtesy EWC Weather Consult GmbH.

The Solution

This invention makes it possible to quantify two errors, used to qualify and improve forecast models, protecting against losses in revenue and grid instabilities caused by energy fluctuations.

Applications

- Wind power
- Ocean power
- Solar power

Benefits

- Minimal data is required to perform forecast error analysis; time series for actual power generated and forecast power
- Applicable to any data sampling rate

Keywords

Renewable energy, wind power, ocean power, solar power, forecast, operating reserves, penalties, energy markets, energy spot markets, grid instability

Opportunity

- A proof of concept based on real-world data is available to demonstrate feasibility.
- OIST welcomes inquiries from parties interested in licensing this technology.

Patent protection

This technology is protected by a US provisional patent application.

For more information

Contact the Business Development Section/Technology Licensing Section
bdtl@oist.jp or +81-(0)98-966-8937/ +81-(0)98-966-8834