Vaisala Forecaster for solar and wind energy

Industry-leading weather forecast data to maximize solar or wind energy production and value, mitigate risk, and optimize assets

Effective and efficient renewable energy management depends on optimizing the power of the wind and sun. Supported by cutting-edge science and robust data assimilation and supercomputing capabilities, Vaisala Forecaster for wind and solar energy provides exceptionally accurate wind forecasts to effectively manage investments, reduce risk, and gain a competitive edge in the wind energy market.

Forecaster for wind energy uses a combination of statistical algorithms, highly customized mesoscale Numerical Weather Prediction (NWP) models, machine learning artificial intelligence models, and publicly available forecasts to provide accurate wind forecasts that incorporate the actual operating characteristics of each project and the most advanced weather forecasts available.

Forecaster for solar energy relies on superior modeling techniques to provide accurate irradiance and power forecasts specific to a solar project's unique environment, with a prediction interval ranging from 5 minutes to 240 hours in the future.

The resulting forecasts are available as site-specific or regional tools, providing asset owners, project managers, energy traders, and schedulers superior information to make confident, data-driven decisions.

Key benefits

Data you can trust
Vaisala's data quality is the best available in the industry. The forecast system statistically integrates on-site data to calibrate forecasts to the area's distinct climate and geography.

Tools to succeed
Forecaster for wind energy provides users with tools for a variety of use cases, including wind power forecast, weather forecast, accurate and reliable prediction intervals, and verification tools. Optional features, such as real-time project data monitoring and higher resolution model simulations, further expand capacity. All forecasts are available via customizable graphical user interface and API.

Tested in the real world
Vaisala Forecaster has been in operation for over 20 years and is relied on by some of the world's leading renewable energy operators and traders. Together, with our customers, we have learned what works and what doesn't work. We have continuously refined and improved the system — in cooperation with our customers, and often working with national laboratories to incorporate the latest advances into our methods.

Customized forecasts for profitable decisions
The system starts with highly accurate weather forecast data and tailors each forecast to its unique local environment and project operating data, resulting in reliable and customized predictions to drive decision-making.

Site-specific wind forecasting
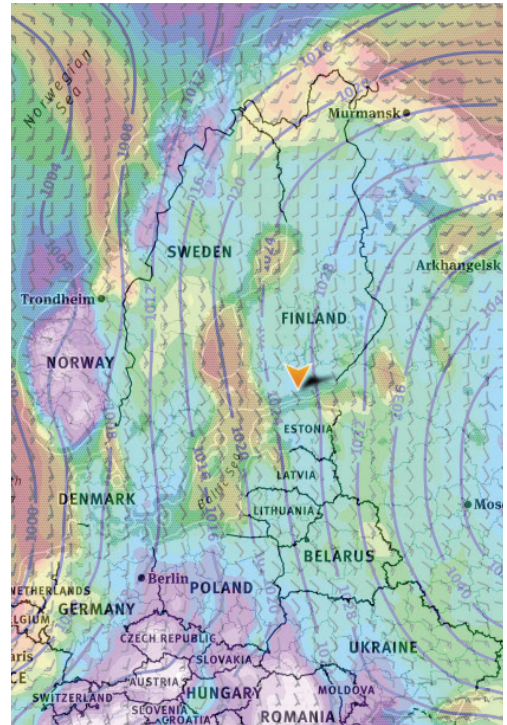
Key features

Data delivered through a client-specific dashboard with data files available in multiple formats. Output data includes aggregate power, generating capacity, and aggregated capacity-weighted wind speed. Additional output includes accurate and reliable prediction intervals at each and every forecast time horizon. Optional output includes an independent forecast of potential generation at each wind turbine.

Tools include meteograms for air temperature, precipitation, and hub height wind speed. Verification tools allow for hourly and daily time verification, wind error, cumulative advantage, and recent performance. The Rewind Tool compares current forecasts with previous predictions.

API available for faster integration of forecasts into internal analysis and programming platforms.

Guaranteed 24/7 availability with real-time forecasts updated every 10 minutes.

Data monitoring service streamlines data and resolves inaccuracies in forecasting for a competitive edge.
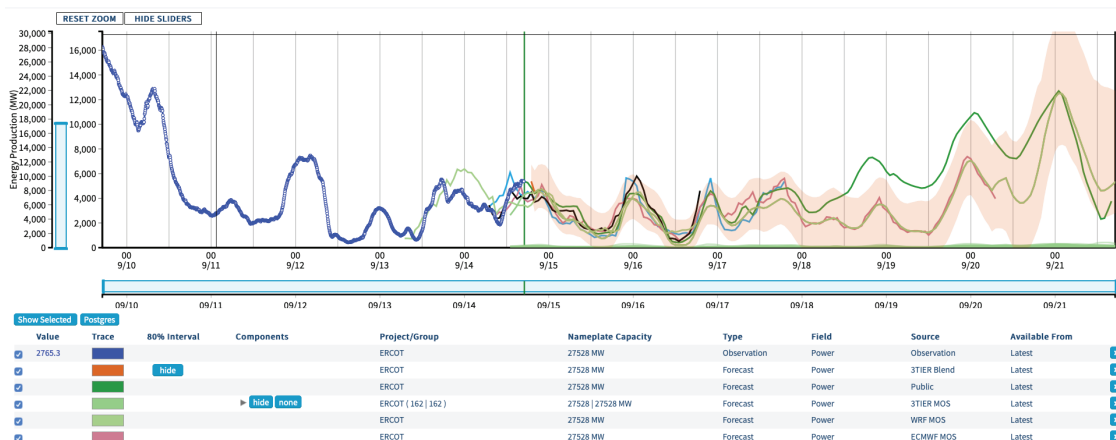

Regional wind forecasting

Key features

Available as hour-, day-, and week-ahead forecasts with 1-hour granularity and frequent updates.

Verification tools allow for hourly and daily time series verification, horizon time verification, wind error histogram, and recent wind performance. Multi-Forecast Tool enables side-by-side comparisons.

API available for faster integration of forecasts into internal analysis and programing platforms.

Guaranteed 24/7 availability through a customizable dashboard interface, complete with permissions setting and password protection.

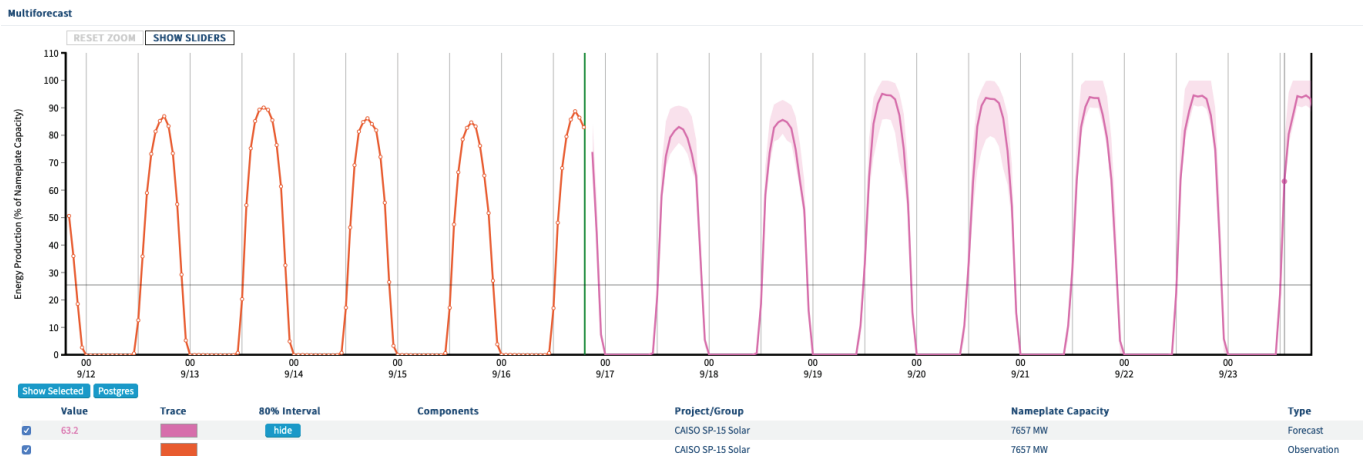| Value	Trace	80% Interval	Components	Project/Group	Nameplate Capacity	Type	Field	Source	Available From	
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Site-specific solar forecasting

Key features

Forecasts are delivered through a customizable dashboard that displays site-specific conditions and easily interpreted graphics. Day-ahead irradiance,
power forecasts, and historical forecast information
can be downloaded.

Machine learning techniques significantly reduces forecast error and bias.

API available for faster integration of forecasts into internal analysis and programming platforms.

Guaranteed 24/7 availability with forecasts updated every six hours and hourly or sub-hourly projections up to 60 hours in the future.

Regional solar forecasting

Key features

Day-ahead forecasts provide 0 to 6-day projections with 1-hour granularity and are updated multiple times per day. Validation shows that the forecasts successfully predict reduced production days 60% more often than the public forecast.

Historical data available for 3+ years for energy flow modeling and integration with YES Energy and NRG Stream partners.

API available for faster integration of forecasts into internal analysis and programming platforms.

Guaranteed 24/7 availability through a customizable dashboard interface, complete with permissions setting and password protection.

Vaisala Energy Budget Outlook Tool

Weather forecasting plays a huge role in the profitability of renewable energy products. Vaisala Energy Budget Outlook Tool provides weather forecasts that enable renewable energy project managers to create precise energy budgets. Subscription access to accurate wind forecasts and data provides asset owners, project managers, portfolio managers, and energy traders the information to mitigate risk while making confident business decisions and projections.

Key benefits

Independent assessment
Energy Budget Outlook Tool removes the guesswork and the potential for conflict of interest from clouding your understanding of the impact of weather on past, current, and future project generations.

Better data for better decisions
Vaisala Energy Budget Outlook Tool delivers historic generation information and future forecasts based on the highest level of accuracy. This allows teams to understand the degree to which past departures from expected performance were due to weather variability. Additionally, the Energy Budget Outlook Tool provides a year-ahead forecast of monthly weather expected to make data-driven decisions about future expected project performance.

Applications

- Set project budgets or recalibrate energy budgets on a monthly rolling basis.
- Accurately predict departures from budget due to weather variability in the coming months.

Key features

Operational reforecasting takes a combination of preconstruction energy project reports and operational energy project production data to reforecast the weather in order to reduce error.

Seasonal outlook allows projects to look 12 months ahead, enabling the creation of more accurate energy schedules, accounting for climate variabilities and anomalies.

Performance reconciliation helps renewable energy projects pinpoint the exact cause of under- or overperformance for a given timeframe, helping uncover reasons for underperformance.

Cost-effective pricing structure ensures access to any customer.

Why Vaisala?

Superior wind and solar data for specific sites and regions
Vaisala wind and solar energy forecasting systems apply robust modeling techniques and advanced supercomputing capabilities to provide highly accurate and customized forecasts about wind and solar conditions for local sites and entire regions. Armed with highly accurate and customized data, renewable energy asset owners, managers, and traders can make better business decisions.

Support and services you can count on
Look to Vaisala for dependable support, project capabilities, and training so you can get the most from your system. With decades of experience providing the best technologies and the finest support, Vaisala's philosophy of partnership is unmatched in the industry.

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www.vaisala.com