Forecaster for solar or wind energy

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

Weather is the fuel of your renewable energy project

Effective and efficient renewable energy management depends on optimizing the intermittent power of the wind and sun integration into the grid. Supported by cutting-edge science with robust data assimilation and supercomputing capabilities, Vaisala Forecaster for wind and solar energy, part of our Xweather family of subscription based products, provides exceptionally accurate energy forecasts to help you effectively manage investments, reduce risk, and gain a competitive edge in the energy market.

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

For solar energy applications, Forecaster 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
Wind energy tools include 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 through a customizable graphical user interface and API.

Tested in the real world
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. In cooperation with customers and national laboratories, Vaisala continuously refines and improves the solution and incorporates the latest advances.

Customized forecasts for profitable decisions
The solution 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.

Weather is the fuel of your renewable energy project
Site-specific wind forecasting

Key features

Data is delivered through a client-specific dashboard, available in multiple formats.

Output data:
- Aggregate power
- Generating capacity
- Aggregated capacity-weighted wind speed
- Prediction intervals at each and every forecast time horizon
- Optional: 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 programming platforms.

Guaranteed 24/7 availability through a customizable dashboard interface, complete with permissions setting and password protection.
Site-specific solar forecasting

Key features

Forecasts are delivered through a customizable dashboard that displays site-specific conditions and easy-to-read 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; Proven to 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 energy 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**
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**
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. Also provides a year-ahead forecast of monthly weather expected, so you can 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 for renewable energy?

We are innovators, scientists, and discoverers who are helping fundamentally change how the world is powered. Vaisala elevates wind and solar customers around the globe so they can meet the greatest energy challenges of our time.

Our weather and environmental monitoring solutions for renewable energy are guided by several key priorities:

- Thoughtful evolution in a time of change
- Making renewable energy smarter at every stage
- Extending our legacy of leadership

Vaisala is the only company to offer 360-degree renewable energy solutions — from sensors and systems to digital services and actionable intelligence — nearly anywhere on the planet (and even on Mars). Every Vaisala solution benefits from our 85+ years of experience, pioneering deployments in 170+ countries, and unrivaled thought leadership.

Our innovation story, like the renewable energy story, continues.