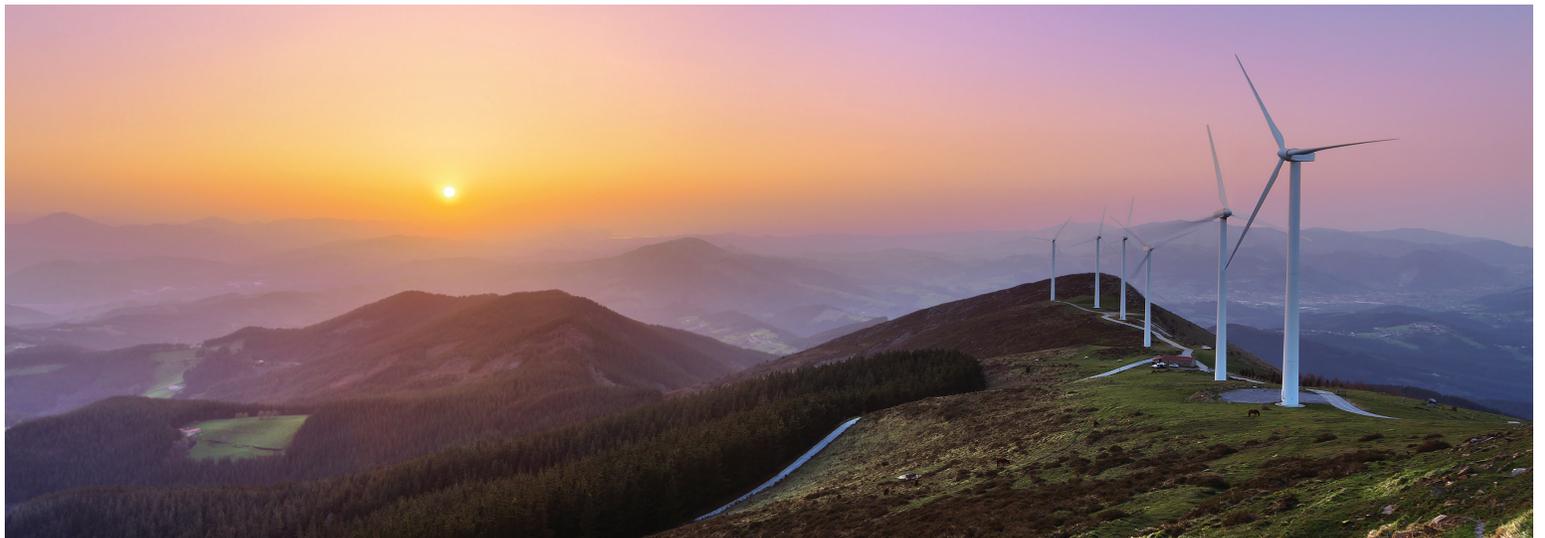
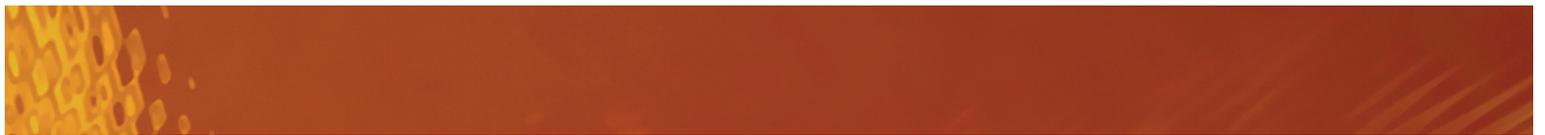


Vaisala Energy Overview



VAISALA

Weather and Renewable Energy

In the energy industry, weather matters. It drives demand, affects transmission, and with renewable energy, provides the fuel for generation. Renewable energy has a strong place in our future and will be a key solution to our global energy challenges. Making smart investments throughout the project life cycle, from siting to operations, is critical to its success.

The energy industry requires better weather solutions. The renewable energy industry has struggled to accurately forecast energy production and uncertainty, and new projects are being built in more challenging terrain with even greater uncertainty. Vaisala's weather-driven decision support tools are ideal for addressing today's most pressing energy issues.

In project development, making wise siting, design, and financing decisions is crucial as they have a direct impact on future project performance. In operations, you must harness the surrounding environment, which can both power and hamper plant production. Reliable monitoring systems and analysis provide the diagnostic information needed to uncover issues that may be impairing plant production. Forecasting information you trust ensures effective grid integration and energy scheduling to get the most value from available generation.

In order to make the best decisions possible throughout this life cycle, you need information you can depend on, information that saves time and cost, reduces uncertainty, and brings the best projects to fruition. Vaisala offers superior technologies, tools, and support to the energy sector, allowing the most successful companies in the industry to profitably design, operate, and maintain renewable energy projects around the world.



Our Experience Powers Your Success

At Vaisala, we integrate a deep understanding of your business and operations with technological insight and weather expertise. We are committed to helping your organization become more successful, and helping the energy industry make wind and solar viable power options for use on the grid.

We know you want to get the most value from your investment as well as minimize risk and uncertainty. By bringing together some of the world's greatest minds in meteorology and energy, Vaisala is able to provide consultation, service, and support, as well as all the necessary weather equipment for effective project planning, development and operations.

Fully devoted to your success, we carefully evaluate the available resource, identify project risks, and help you make investment decisions and secure financing, backing it all up with sound data. Partnering with Vaisala gives you a full understanding of the weather's impact on your project so you can make informed decisions throughout its entire lifetime.



Why Vaisala?

- **Knowledge**—by combining our weather and energy industry expertise we help you understand and mitigate the impact of the environment on your assets.
- **Experience**—we have been global leaders in meteorological and industrial measurement for nearly 80 years and active in the energy industry for decades.
- **Results**—we have helped energy companies reduce uncertainty, secure financing, effectively integrate wind and solar generation, and keep operations running at optimal levels.
 - Our industry-leading remote sensing systems have collected over 13 million hours of commercial wind data.
 - We have supplied 1000 resource assessment projects on 6 continents
 - We forecast over 130 GW of installed wind capacity worldwide.

Solutions for the entire life cycle



Helping You Succeed in Every Phase of Energy

Greenfield Prospecting	Measurement Campaigns	Due Diligence & Assessment	Energy Scheduling	Optimization	Operations & Monitoring	Energy Trading	Transmission & Distribution
<p>Vaisala's prospecting tools help you explore wind and solar resources across the globe to decide which projects to pursue.</p>	<p>With nearly 80 years of experience in weather monitoring solutions, our measurement systems are rugged and reliable, providing accurate information even in the most challenging environments.</p>	<p>Vaisala's due diligence and assessment services deliver energy estimates both developers and financiers can trust, including probability of exceedance values and a full uncertainty analysis.</p>	<p>Vaisala provides industry leading regional and site-specific energy forecasts that incorporate on-site observations multiple weather models, and powerful online tools so you can make decisions with confidence.</p>	<p>Vaisala's full-scale forensic evaluations of project performance can help you optimize power production, resulting in significant gains in operational performance.</p>	<p>Vaisala's measurement equipment allows you to monitor weather conditions to operate efficiently, safely plan maintenance, and stay ahead of approaching storms.</p>	<p>Energy traders use renewable energy forecasts to help them gain an edge in a competitive market. Vaisala forecasts enable them to better understand how weather and variable power sources are affecting the price of energy</p>	<p>Vaisala understands the impact weather has on the power grid, offering solutions and decision support for grid operators.</p>
<ul style="list-style-type: none"> • Time Series • Prospecting Tools • Windspeed GIS Layers 	<ul style="list-style-type: none"> • Triton Wind Profiler • Nomad 3 Data Logger • Weather Sensors for Met Towers • SkyServe Data Management Services • Measurement Campaign Design Services 	<ul style="list-style-type: none"> • Due Diligence Services • Preliminary & Bankable Power Estimates • Site Visits • Turbine Layout and Recommendations • Consultation & Defense of Report Services 	<ul style="list-style-type: none"> • Site Specific Energy Forecasts • Regional Energy Forecasts • On-site Observations 	<ul style="list-style-type: none"> • Portfolio Analysis and Optimization Services • Performance Reconciliation Services • On-site Observations • Consultation Services 	<ul style="list-style-type: none"> • On-site Observations • Storm Alerts and Tracking 	<ul style="list-style-type: none"> • Site-Specific Energy Forecasts • Regional Energy Forecasts 	<ul style="list-style-type: none"> • On-site Observations • Storm Alerts and Tracking

Your Weather Expert

Vaisala is a global leader in weather-related solutions. We help your business make informed decisions by leveraging nearly 80 years of operational excellence and innovation in weather measurement, advanced modeling techniques, and decision support tools that improve safety, profitability, and reduce uncertainty.

Vaisala is passionate about promoting the most advanced methods for understanding weather's impact on energy. An incomplete understanding of the weather—be it in the past or in the future—leads to uncertainty and risk in the development, financing, and operation of renewable energy projects.

Depending on weather to power renewable projects influences how you select project locations, obtain project financing, and schedule power for grid stability and economic optimization. The ability to understand and predict the weather is therefore a crucial key to unlocking the potential of renewable energy and successfully integrating it with the rest of the world's energy generation and power systems.

Our reputation is built on being the best at what we do. At Vaisala we believe in the power of innovation and investing into the future.

Partner with Vaisala

Project Developers



Vaisala weather measurement systems, decision support tools, and consultation services provide answers to vital project development questions. Tools for early stage prospecting help you identify promising sites with advanced online tools and GIS analysis. Reliable measurement systems, met campaign design services, and energy yield estimates help you complete a thorough due diligence process at potential project sites. Our expertise helps developers fully understand the uncertainty weather brings, and ultimately if a project will deliver the needed return to justify investment.

Financiers



Vaisala provides energy assessment reports, due diligence, and portfolio management services for banks, investors, and financiers for use in making sound funding decisions for renewable energy projects. Banks trust our methods and report analysis as a reliable source of information to determine a project's potential energy output and ultimately its profitability.

Owner / Operators



Significant gains in operational performance can be identified by analyzing wind farm production output. For owners and operators, Vaisala provides decision support with monitoring, analysis, and performance services that provide a better understanding of normal operational fluctuations due to weather's impact versus those stemming from equipment, design, or location.

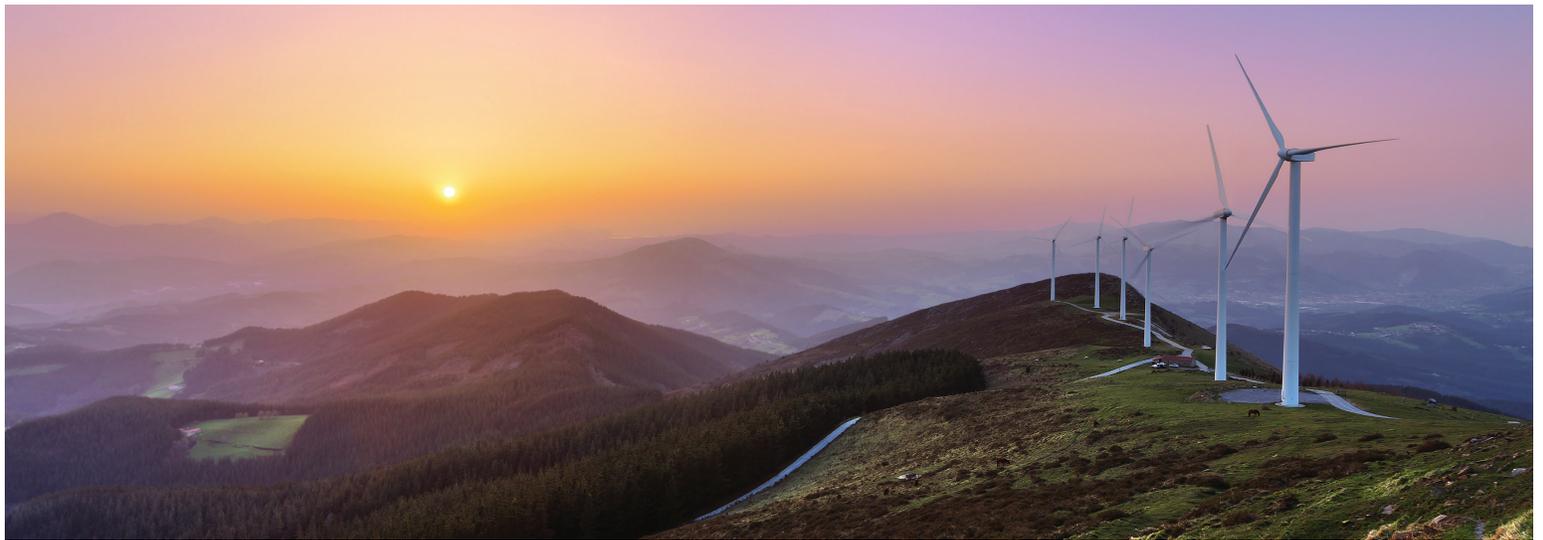
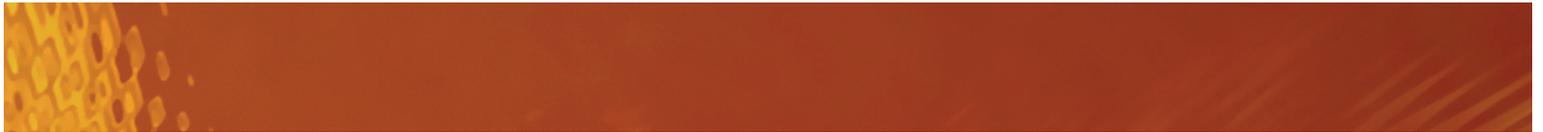
Utilities / Grid Operators



Vaisala works with utilities, grid operators, and government agencies to study the impact of integrating renewables into the electrical grid. This helps them plan for transmission and manage variable resources on a grand scale. Vaisala provides the hour-, day-, and week-ahead forecasts needed to ensure reliable electrical services and predict operational output of renewables at both the plant and the regional level. Vaisala forecasts have proven to be the most accurate in the industry, and we have more experience conducting large-scale integration studies than anyone else in the business.

Timeline of Energy Industry Experience





VAISALA

www.vaisala.com/energy

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