



VAISALA

Lighting the way forward:

How Vaisala solar energy solutions are advancing renewable energy

An unrivaled resource

Humans have used the sun's energy for thousands of years, but we have only recently developed solar technologies efficient enough to replace fossil fuels. This energy evolution is one of humankind's most important priorities, and it is ongoing today.

Solar energy is becoming increasingly competitive and efficient, but for it to reach its potential and create significant societal change, solar stakeholders need powerful insights from fully integrated renewable energy solutions.

Those insights and solutions come from Vaisala.



Thoughtful evolution

Solar energy is one of the key pathways to a healthier, greener, more innovative future. Vaisala understands the potential — and the stakes — of this evolution, which is why we've put together the most comprehensive set of measurement technologies and digital services available in solar. These solutions are both advanced and practical, each building on the success of the one that preceded it.

Vaisala solar solutions enable stakeholders throughout the solar life cycle to:



Quantify and reduce uncertainty, protecting profitability



Make informed, data-driven product choices



Optimize performance and maintenance to prevent losses



Efficiently manage and leverage large amounts of data



Contribute to grid resilience and reliability



Avoid unexpected damages and risks



Minimize costs



Gain historical perspective and big-picture visibility

By unlocking new efficiencies and making solar projects more competitive and profitable against competing energy sources, these benefits enable solar stakeholders to meet the most pressing challenges of our time.



Solutions across the solar energy life cycle

It's no accident that Vaisala has developed its solar portfolio to overlay the most crucial stages in the solar lifecycle. Evolving the solar industry requires integrated, end-to-end solutions that empower stakeholders wherever they are — whether they're developers, funders, manufacturers, EPCs, asset managers, O&M contractors, energy traders, or anyone else.

Accordingly, we organize our solar solutions in several intuitive focus areas:



Applications that matter most

		Prospecting & development	Construction & commissioning	Operations & life management
		<ul style="list-style-type: none"> • Site prospection • Solar resource assessment • PV plant design/technology selection • Repowering 	<ul style="list-style-type: none"> • Construction planning • Worker safety • Power performance testing 	<ul style="list-style-type: none"> • Power performance monitoring • Asset management and protection • Retrofit and performance increase • O&M planning and worker safety • Minutes/hour/day ahead forecasting • Asset performance analysis/seasonal outlook
Sensors & systems	All-in-one compact weather sensor (WXT536)			■
	IEC-compliant weather station for PV plant performance monitoring (AWS310/810)	■	■	■
Digital services	Historian			
	Site prospection and solar time series tools	■		
	Climate Variability Analysis	■		
	Solar resource assessment report (with/without site adaptation - MOS)	■		
	Climate anomalies maps	■		■
	Solar reconciliation tool			■
	Forecaster			
	Site-specific energy forecast			■
	Regional/ISO energy forecast			■
	Energy Budget Outlook			■
	Lightning			
	Historical lightning maps and time series (GLD360, NLDN, Lightning Integrator)	■		
	Real-time lightning data, threats, and alerts (GLD360, NLDN)		■	■
	Lightning strike damage potential (Strike Damage Potential)		■	■

Solutions at a glance

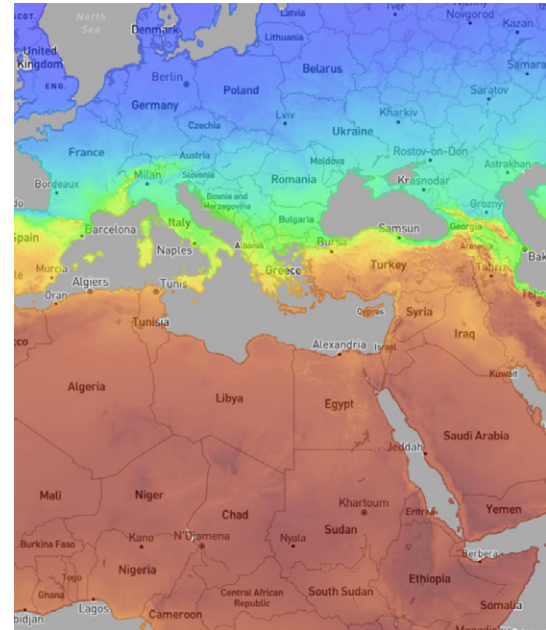
Vaisala's measurement technologies and data services are ideally suited to a growing, evolving solar industry. Built on trusted principles and technology, they are validated and continuously used around the world. This, along with our global presence and service network, makes them the most easy-to-implement and reliable technologies available.

Historian

Historian offers solar developers, consultants, and asset owners access to long-term historical solar and typical meteorological year (TMY) data to drive decisions. It provides accurate, bankable time series tools, GIS visualizations, solar climate variable analyses, and solar performance reconciliation needed to capture the most value from solar projects.

Key benefits:

- Trusted, bankable data derived from decades of satellite imagery, global weather data, and cutting-edge simulation models.
- Accurate predictions of project success using quality baselines.
- Early detection and resolution of problems using decades of data instead of weeks or months.
- Simple data integration via GUI/FTP and API.

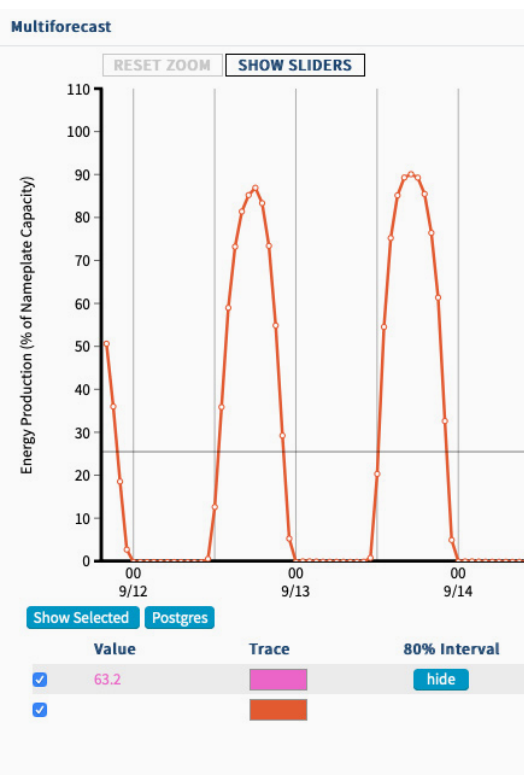


Forecaster

Forecaster creates exceptionally accurate, site-specific and regional forecasts anywhere from a few minutes to more than a week ahead of time. With it, asset owners, utilities, and energy traders can effectively off-take the energy to serve electricity demand and optimize PV plant investments. Through a convenient subscription model, it delivers data through customer-specific dashboards and provides an immediate competitive edge in the solar energy market.

Key benefits:

- Site-specific solar forecasting derived from a powerful combination of SCADA data, statistical algorithms, highly customized mesoscale Numerical Weather Prediction (NWP) models, machine learning artificial intelligence models, and publicly available forecasts.
- Based on mature, reliable technology refined over 20+ years of use and deployments around the globe.
- Accurately predict energy from 5 minutes to 240 hours in the future.
- Easy access to energy forecast data via customizable web graphical user interface and simple integration using an API, plus 24/7 guaranteed availability.



Weather Transmitter WXT536

WXT536 is a compact, all-in-one multi-parameter weather sensor that provides crucial data without adding significant costs or complexity. These weather insights are important for safe construction and operations, as well as performance monitoring of photovoltaic (PV) plants as described in the IEC 61724-1:2021 standard.

Key benefits:

- Simplicity and efficiency courtesy of a compact, rugged design and proven measurement technology. With low power consumption and optional sensor heating, WXT536 requires almost no maintenance.
- Well-suited to solar operations and compliance needs due to its six measured parameters:
 - Rainfall
 - Wind speed
 - Wind direction
 - Air pressure
 - Temperature
 - Humidity
- Straightforward integration with Vaisala Automatic Weather Stations AWS310/AWS810, expansion with a wide range of connectivity options, and simple third-party integration.



Automatic Weather Stations AWS310/810

Vaisala automatic weather stations (AWS310 and AWS810) are comprehensive weather data collection systems that measure, process, and store meteorological data according to the IEC61724-1:2021 standard.

Built on decades of experience and service to the most demanding customers, the design quality of Vaisala weather stations has been proven with extensive tests in the development phase and in the field.

Vaisala AWS310 and AWS810 can accommodate a large variety of weather sensors and connect to SCADA systems via MODBUS TCP/IP.

Key benefits:

- Turnkey weather monitoring solution for PV plant power performance monitoring in accordance with IEC61524-1:2021.
- Robust design to ensure durability, safety, and performance in even the harshest conditions.
- High-level built-in surge protection, and a modern, built-in IT and cybersecurity architecture.
- Enhanced remote maintenance and configuration management using the latest Vaisala Data Management Unit DMU801.

GLD360 Global Lightning Detection Network and National Lightning Detection Network (NLDN)

There are no lightning detection networks on the planet quite like Vaisala's GLD360 and NLDN. Unprecedented in their scope, accuracy, and availability, they protect field personnel and PV plants from weather-related hazards including hailstorms, wildfires, and lightning or tropical storms.

Key benefits:

- Outstanding accuracy, even beyond the range of radars and satellites. This provides truly global coverage for users anywhere (GLD360) and unrivaled awareness for North American users (NLDN).
- Smarter decisions and improved safety across many applications and operations, as well as reliable early warning capabilities to reduce downtime.
- Available immediately at no capital expense, without having to purchase, install, or maintain sensors or processing equipment.
- Widely validated and trusted by international meteorology, government, and commercial entities that really understand lightning and its importance across industries.
- Data feeds boast greater than 99.99% uptime, short ~12-second latency, and are delivered over a variety of real-time methods, file types, and APIs to fit various forecasting, alerting, reporting, and analytical needs. Historical lightning data can also be easily accessed and analyzed.

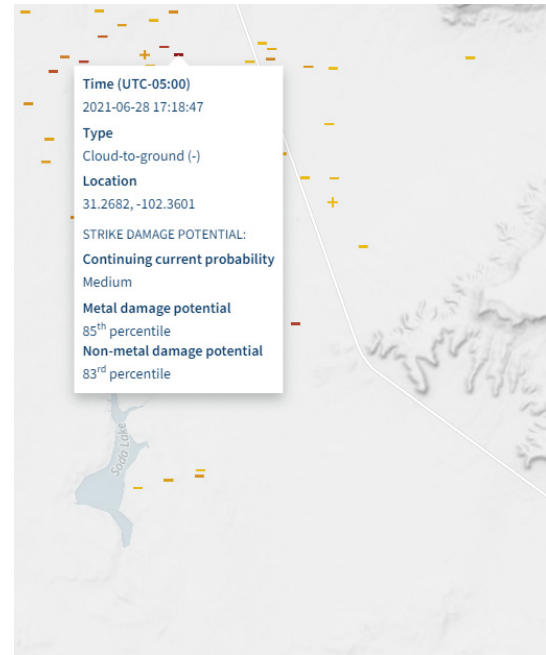


Strike Damage Potential

Strike Damage Potential enables intelligent analysis of lightning strikes, reliably distinguishing between low-risk strikes and those with greater potential to cause damage or start a fire. This creates substantial efficiency and allows solar stakeholders to plan decisively and quickly.

Key benefits:

- Enables fast, critical lightning insights by simplifying lightning data into strike points and showing the precise location of strikes — both near-real time and historical — that are most likely to have started a fire or caused damage.
- Unrivalled accuracy around the globe, with actionable insights derived from GLD360 and NLDN data.
- Enables earlier interventions that require less time and fewer resources for repairs or wildfire containment.



Lightning Integrator and Lightning Exporter

Lightning Integrator provides quick and easy access to Vaisala’s high-quality, accurate historical lightning data through an API or an easy-to-use web interface. This enables robust, data-driven safety and planning practices, as well as advanced risk assessments and incident reporting — all informed by the best lightning data on the planet.

Lightning Exporter provides an easy-to-use web interface that lets users download and compile the exact lightning data they need from hazardous weather events near facility or assets. It enhances report credibility for management, legal teams, unions, or external audiences, and it often eliminates the need to purchase, install, or maintain any lightning detection sensors.

Key benefits:

- Reduced downtime through near-real-time storm analysis, even when a solar asset(s) might have been compromised. Teams make better decisions to maximize productivity.
- Confident, objective evaluations derived from the largest, most sophisticated, most accurate lightning detection networks in the world (see GLD360/NLDN).
- Ultimate asset management and storm visibility, no matter where solar operations are located.
- Improved asset reliability and liability protection resulting from informed emergency, maintenance, and management practices.

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 renewable energy solutions are guided by several key priorities:



Thoughtful evolution

Remain a pioneer in renewable energy, always providing sensible, trusted solutions at the leading edge of R&D.



Smarter at every stage

Provide end-to-end weather and environmental solutions and critical insights throughout the renewable energy life cycle.



Legacy of leadership

Extend our proven track record and global trust to reach more customers in more ways.

Vaisala is the only company to offer 360-degree weather and environmental monitoring 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.



VAISALA

Time to take solar ever higher

Vaisala is ready to talk about your solar project and how we can make it better. Contact us today. Our lights are always on.

vaisala.com/solar

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