

An aerial photograph of a large solar farm at sunset. The solar panels are arranged in long, parallel rows across a grassy field. The sun is low on the horizon, creating a bright orange and yellow glow that reflects off the panels. In the background, there are rolling hills and some industrial structures. A large teal diagonal overlay covers the left side of the image, containing the text.

VAISALA

Lighting the way forward:

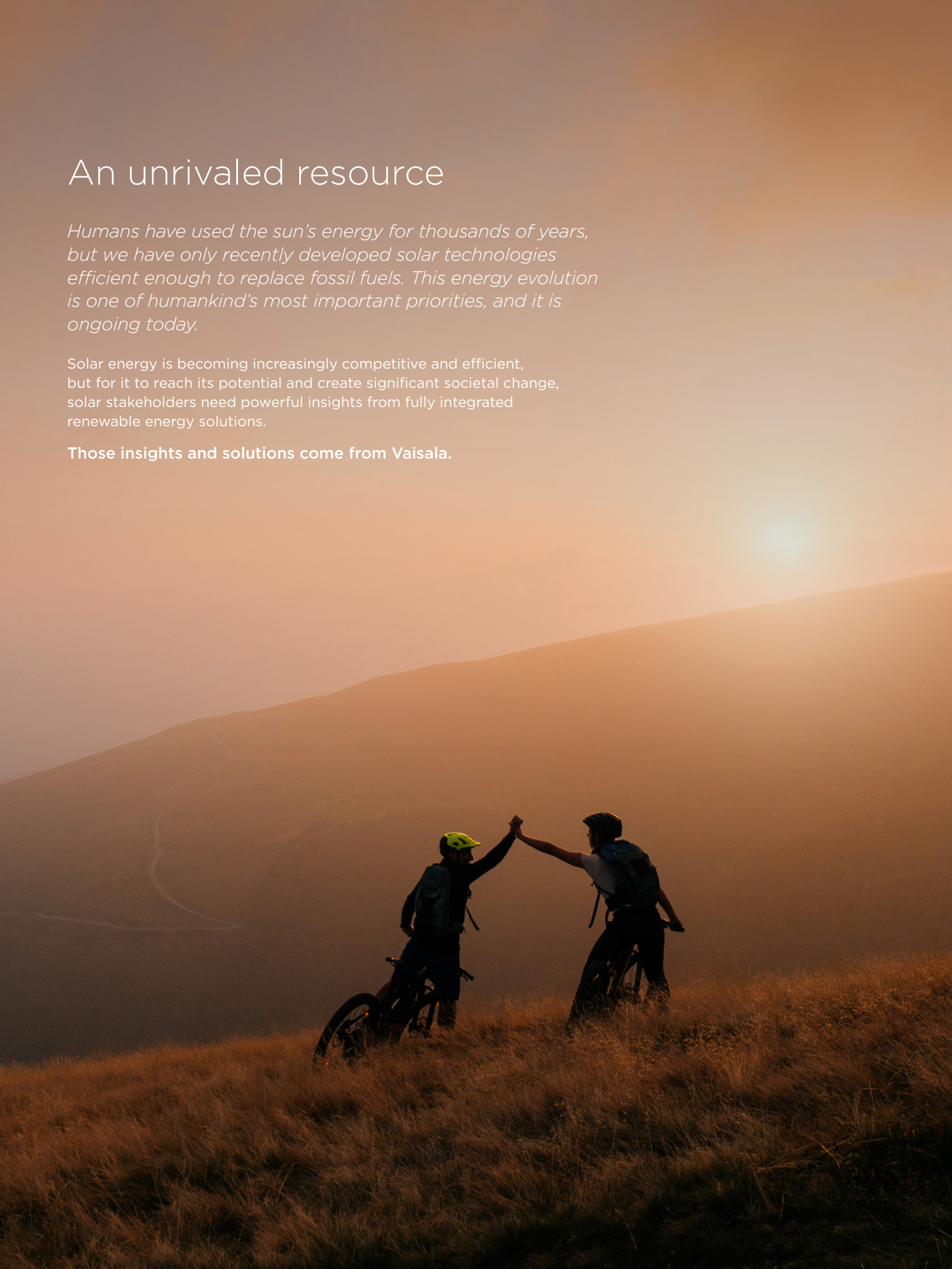
How Vaisala solar energy solutions are advancing renewable energy

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 (AWS810 <i>Solar Edition</i>)	■	■	■
Xweather digital services	Historian	■		
	Forecaster			■
	Thunderstorm Manager		■	■
	Lightning Data	■	■	■

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.

Automatic Weather Station AWS810 Solar Edition

Vaisala's AWS810 *Solar Edition* empowers maximum solar power plant performance with smart solar irradiance measurement and weather intelligence.

The smart, secure and modular AWS810 *Solar Edition* combines reliable measurements, data collection and processing, and connectivity so you can monitor the impact of weather and improve your solar power plant's performance. High-quality sensor data is included for global, diffuse and reflected solar irradiation including all key weather parameters, plus soiling sensors. The accurate, always-on and long-lasting design is IEC 61724-1 compliant and is built to last the entire lifespan of a solar power plant.

Key benefits:

- The smart, turnkey weather monitoring system includes built-in, comprehensive data security
- Modular design is easy to set up and expand with your needs, while ruggedized design and remote diagnostics ensure low life-cycle costs
- End-to-end weather and solar power measurement data, advanced analytics and actionable digital insights cover the whole solar energy life cycle



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:

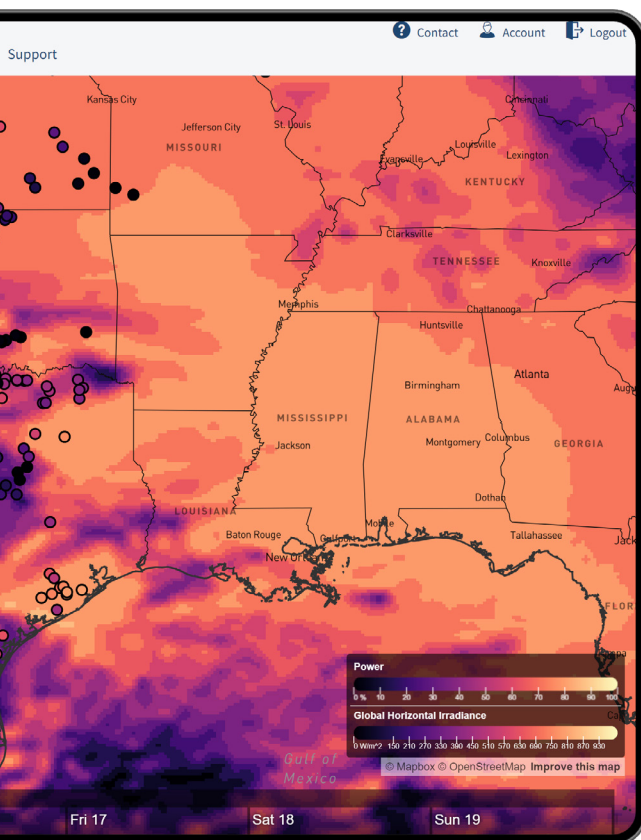
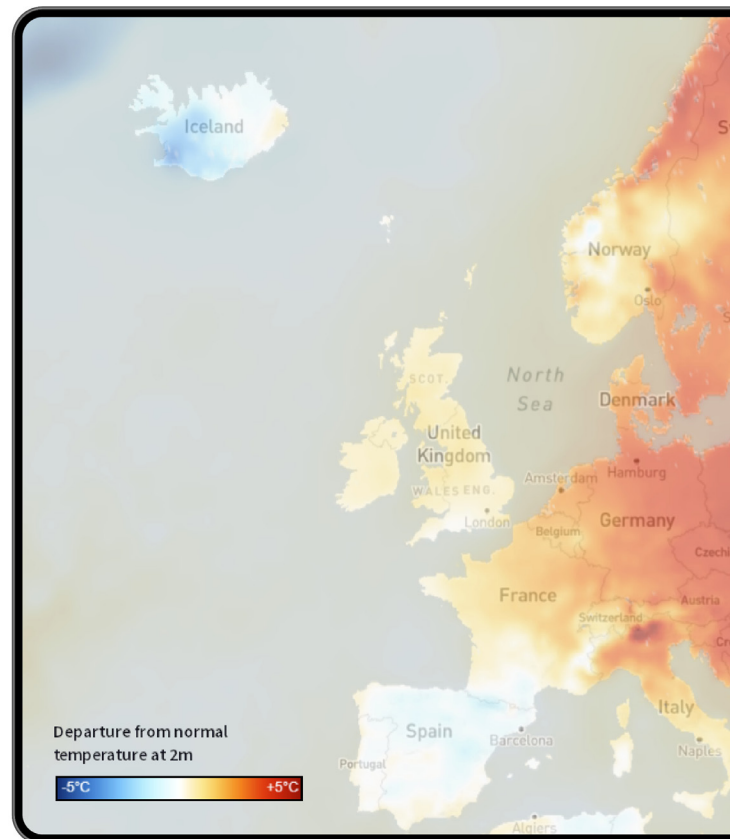
- Simplicity and efficiency courtesy of a compact, rugged design and proven measurement technology. With low power consumption and optional sensor heating, WXT536 requires almost no maintenance.
- Well-suited to solar operations and compliance needs due to its six measured parameters:
 - Rainfall
 -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

Historian

Historian, part of our Xweather family of subscription based products, offers solar developers, consultants, and PV asset owners access to long-term historical solar and typical meteorological year (TMY) data to drive decisions, create comparison reports, and analyze output year over year. Historian helps you maximize value from solar projects with accurate, bankable time series tools, GIS visualizations, prospecting maps, solar climate variable analyses, and solar performance reconciliations.

Key benefits:

- Trusted, bankable data derived from decades of satellite imagery, global weather data, and cutting-edge models.
- Accurate prediction of project success using high-quality baselines.
- Visualization of climate trends and anomalies with 40+ years of historical temperature, wind speed, direct normal irradiance, and global horizontal irradiance data.
- Easy-to-use graphical interface and simple data integration through an API.



Forecaster

Forecaster, part of our Xweather family of subscription based products, uses cutting-edge weather and environmental modeling, robust data science, and powerful supercomputing to forecast the amount of power generated by solar projects up to ten days ahead.

This valuable data helps PV asset owners, project managers, and energy traders make confident, data-driven decisions at site-specific and regional levels to effectively manage investments, reduce future risks, and gain a competitive edge in energy markets.

Key benefits:

- Site-specific and regional solar energy forecasting, analysis, and verification tools.
- Accurate solar energy forecasts from 5 minutes to 240 hours ahead.
- Intuitive, map-based visualization of solar energy production across major electricity trading regions in the United States and parts of Canada.
- Easy access with a customizable dashboard or bring forecasts directly into your systems through an API.

Thunderstorm Manager

Monitoring nearby thunderstorms is critical for protecting people, equipment and assets during the construction, commissioning and operation of solar power projects. Thunderstorm Manager, part of our Xweather family of subscription based products, delivers an all-in-one solution for lightning risk management, real-time storm monitoring and automated lightning alerts for any location worldwide.

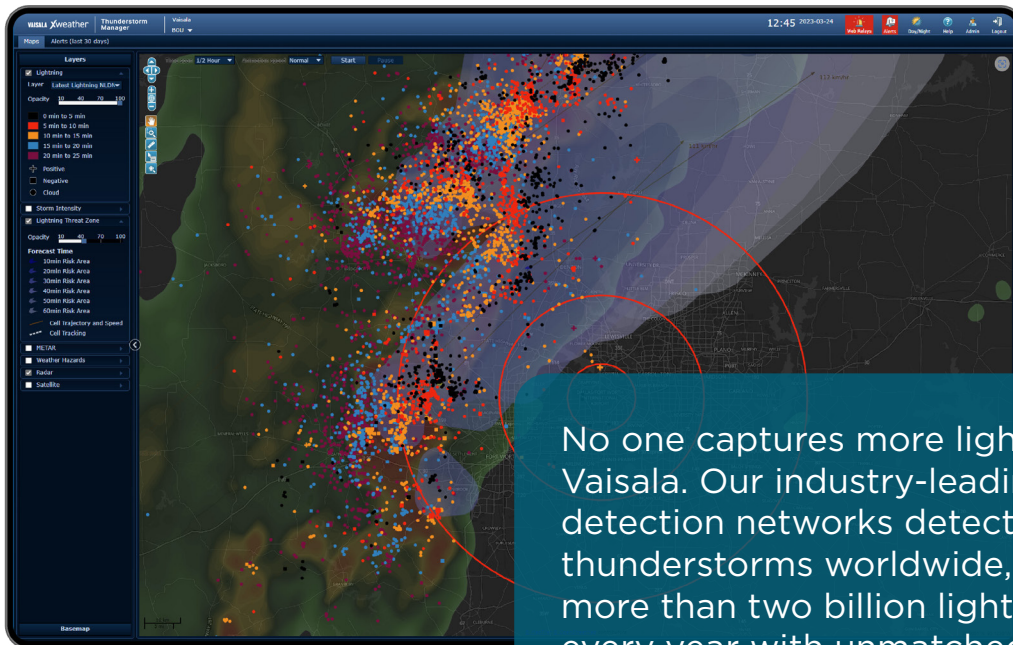
With real-time delivery from strike to alert in 30 seconds or less and 99.99% availability, Thunderstorm Manager delivers accurate, reliable lightning data wherever and whenever you need it.

Key benefits:

- Maximize safety, minimize downtime, and make safety decisions with confidence with multichannel alerts, all-clear notifications and API connectivity.
- Real-time lightning alerts for any site or location worldwide — including remote areas not covered by radar.
- Lightning Threat Zone visualizes storm cell trajectories and risk areas in 10-minute intervals up to 60 minutes in advance.
- Cloud-based software solution replaces the need to buy, install and maintain lightning detection equipment.

Applications:

- Improve site safety and protect technicians during construction, commissioning, and operations with real-time storm tracking and automated lightning alerts.
- Integrate lightning alerts into your systems and safety protocols with the secure API. Review the 30-day alert history to prioritize inspections, maintenance and repairs.
- Automatically warn construction crews and technicians with beacons and sirens to stop work and seek shelter. Send all-clear notifications when it is safe to resume work.



No one captures more lightning than Vaisala. Our industry-leading lightning detection networks detect 99.9% of thunderstorms worldwide, recording more than two billion lightning events every year with unmatched detection efficiency and locational accuracy. It's no wonder Xweather is the primary source of lightning data for the U.S. Armed Forces, National Weather Service, Federal Aviation Administration, and many electric utilities.

Xweather lightning data

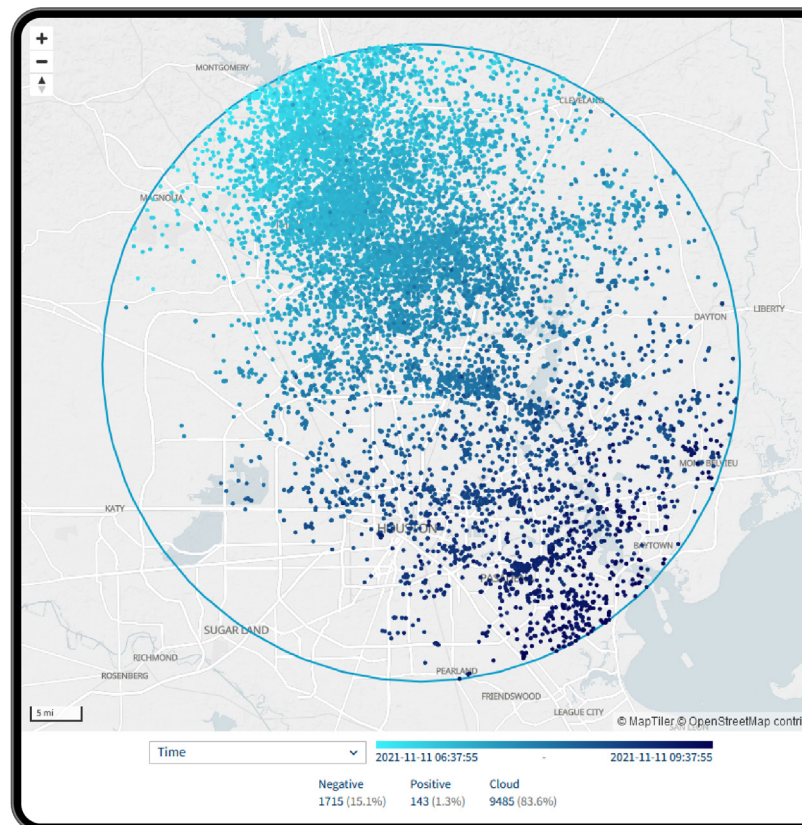
Safety and operational efficiency are critical priorities for the solar energy industry. Xweather lightning data provides fast and easy access to real-time and historical lightning data to help energy companies manage lightning risk at every stage in the solar energy life cycle.

Key benefits:

- Quick and easy access to real-time and historical lightning data for data-driven safety and planning practices, advanced risk assessments and incident reporting.
- Global coverage and outstanding locational accuracy, even for remote sites beyond the reach of radars and satellites. Data feeds boast greater than 99.99% uptime with a latency of 30 seconds or less.
- Choose from a variety of delivery methods, file types and APIs for maximum flexibility in bringing lightning data into your systems, processes, and protocols. Or use the visual web interface for instant, intuitive data access.
- Extensive data for each lightning event includes event type (cloud-to-ground stroke or in-cloud pulse), date and time with millisecond accuracy, precise latitude and longitude, peak current and polarity, Strike Damage Potential, and more.
- Eliminates the need to purchase, install, operate and maintain your own lightning detection sensors.

Applications:

- Accurately assess a site's lightning risk when prospecting locations for PV plants.
- Protect onsite technicians and avoid costly downtime during the construction, commissioning, and operation of solar power projects.
- Improve your incident response, inspection, and maintenance processes by intelligently identifying ground strikes with greater potential to cause damage or start fires.
- Fast and easy access to comprehensive historical lightning data to enhance reporting for management, legal teams, unions, and external stakeholders.



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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