SOLAR ENERGY SOLUTIONS

ACCURATE DATA FOR BETTER DECISIONS

Effectiveness, Efficiency, Optimization

CAMPBELL SCIENTIFIC®

Renewable Energy

Renewable Energy Solutions

Systems and services provided by Campbell Scientific help optimize investment returns through maximized energy yield, controllable operating costs, and optimal site placement.

Choose the right location | Site Assessment Data

Building a photovoltaic (PV) farm represents a significant investment; it can cost somewhere in the region of $1 million per gigawatt (GW) of installed capacity to create a utility-scale farm. It is essential that the developer has an accurate picture of weather conditions across the site, understands the potential yields, and knows how the prevailing conditions or seasonality will impact power generation and return on investment.

Campbell Scientific's turnkey data-acquisition systems comply with all relevant industry standards and provide field-proven reliability with options available to suit all locations and data-collection requirements. Properly collected site assessment data delivered by Campbell Scientific provides the insight required for investors and other decision makers to make fully informed yield and siting decisions based on best-in-class data collection and analysis.

Control operation and maintenance costs | Data-Driven O&M Decisions

Large-scale farms can often be sited in hard-to-reach locations and/or be so large that the maintenance costs are significantly higher than expected. In addition to the standard preventive maintenance and repair activity, PV panels need to be regularly cleaned, especially in arid regions where PV solar plants can lose 30% efficiency per month due to dust and other contaminants.

Campbell Scientific's PV soiling assessment systems are suitable for all solar installations, including large rooftop industrial solar installations and utility-scale PV farms. A soiling assessment system allows plant owners to maximize power output and return on investment by enabling strategic decision-making.

Data-driven cleaning schedules can help optimize maintenance activity to ensure maintenance is only carried out when needed. Through effective and accurate soiling assessment measures, a plant owner can optimize maintenance schedules around actual cleaning need, especially in arid regions.

Campbell Scientific's PV soiling assessment systems measure the impact of dust and contaminants across the whole PV panel to get a true soiling index. Many other systems take spot measurements and assume homogeneity across the entire panel, which can mislead and cause inefficient decision-making.

Verify and assure site performance | Data-Driven Actionable Insight

Understanding how a PV plant is performing is critical to all stakeholders across the value chain. Accurate and cost-effective data collection from across a site provides a reliable baseline for performance calculations, establishing a solid platform for future performance comparisons, troubleshooting, or future farm expansion.

Campbell Scientific's weather stations are the backbone of critical weather monitoring systems globally and have been providing high-quality measurement data for more than 40 years. In addition to measuring the standard weather parameters, a Campbell Scientific weather station can also include sensors to measure the albedo ratio for bifacial solar panels and back-of-panel temperature monitoring.

In combination with the mainline professional weather station, a series of smaller, distributed measurement stations (sunstations) such as the MeteoPV are used to fill in the data gaps. The MeteoPV is a purpose-built PV resource-data platform used in system analysis and performance assessment to provide key data to increase the measurement density required to facilitate effective decision-making.

The Proof

Delivering Insight: Global Expertise

As a trusted provider of measurement solutions since 1974, Campbell Scientific has delivered the information that helped scientists gather data to assist in the understanding of climate change and other human-made environmental impacts, and supported countless organizations, institutions, and national agencies to provide more efficient and effective solar services to their people.

Our instrumentation hardware is known to be the best in the business. Our software services provide an unrivaled level of insight. Our project delivery expertise combines them both to deliver unique end-to-end solutions.

Europe | Data-Driven Operational Decisions Maximizing ROI

Campbell Scientific's turnkey, plug-and-play PV soiling monitoring and loss assessment solution helped a European company identify and optimize inefficient plant maintenance activities while maximizing plant energy yield, which directly impacted the plant's bottom line. The company uses the soiling measurements as input for their soiling optimization algorithm to determine the optimal frequency of cleaning (based on cost, power purchase agreement rate, meteorological information, etc.) and as a correction to standard key performance indicators, such as the performance ratio.

South America | Assessing Site Suitability for Solar Thermal Power Plants

Solar energy resource assessment projects are critical to the successful siting of solar thermal power plants. One such location was in the Atacama Desert in Chile. The remote and hostile location was difficult to access and required a robust and reliable weather measurement system that could withstand the local operating conditions and deliver data via the integrator's custom satellite telemetry solution.

North America | Monitoring Power Generation in Large Retail Rooftop Arrays

Recreational Equipment, Inc. (REI) is a national retail cooperative that has made a corporate pledge to become carbon neutral. REI chose Blue Oak Energy to design and build their solar-electric generating systems in California. Blue Oak selected Draker Laboratories to develop a system to collect the electricity production data needed to earn incentives from the State of California.

The custom system uses Campbell Scientific's standard solar performance package, featuring a range of sensors and a robust data logger that can integrate data directly into the Draker systems to monitor power output and panel performance. The combination of verifying incentive qualification and maximizing system production is critical to ensuring REI's return on investment.

Africa | Site Resource Assessment to Shift the Region's Energy Balance

Historically, the South African energy sector was monopolized by a single, state-owned utility company using coal-fired power stations and one nuclear power station. To help break up the monopoly and force the adoption of renewable energy, the South African Department of Energy issued three rounds of tenders for the supply of renewable energy power plants. Campbell Scientific provided solar resource assessment services to help guide the siting and investment decisions.

www.campbellsci.com/energy

www.campbellsci.com/energy

AUSTRALIA | BRAZIL | CANADA | CENTRO CARIBE | CHINA | FRANCE | GERMANY | INDIA | SE ASIA | SOUTH AFRICA | SPAIN | UNITED KINGDOM | USA