Honeywell | Renewable Energy Solutions

Honeywell Optimizes Renewable Energy Distributed Assets

Solution Note

Outcome-based Approach Drives Enterprise Financial Performance

Introduction

Today, the renewable energy sector is under pressure to produce energy more efficiently, reliably and economically, while reducing the environmental impact and improving safety and regulatory compliance.

Renewable assets tend to be geographically dispersed and often include aging infrastructure and systems lacking the ability to meet rigorous performance objectives. Many solar and wind farms utilize a variety of Original Equipment Manufacturer (OEM) and third-party control systems, which may not be optimized to meet the operating demands of the current renewables market and do not satisfy enterprise-wide data requirements.

At the same time, automation solutions for renewables operations are often implemented in a piecemeal fashion. Different technology suppliers provide point solutions that present integration challenges and do not work well together.

Faced with an increasingly demanding renewable energy market, electric utilities and grid operators need strong partners with the resources to provide performance and competency guarantees.

Overview

A large electric utility in the Eastern United States has a division focusing on renewable energy. The company is purchasing solar and wind farms across the US and is also constructing new renewables sites.

The utility initiated a project encompassing seven different renewables sites around the country. The goal was to collect data from the sites, bring it back to a centralized remote operations center, and display key information indicating how the dispersed operations were performing. The company's asset managers wanted to know if they were realizing the expected returns from their power generation investments. In the event of a problem, the

FEATURES & BENEFITS

- Industry's most advanced automation and process control for real-time oversight across operations
- Solutions for data resilience to satisfy regulators and stakeholders for confidence in operations and data
- Unique lean execution LEAP™ methodology to reduce risk and accelerate project schedules to get to production quicker
- Expert global services and support to keep plants and businesses running efficiently, reliably, and safely

asset managers would coordinate with local operations and maintenance teams to go out into the field to address the performance issue.

The utility's solar farms had existing Supervisory Control and Data Acquisition (SCADA) systems and other legacy control infrastructure. A decision was made to replace many of the local controllers with modernized controllers and/or add a layer of cloud SCADA solutions. In some cases, the sites were large enough that NERC-CIP requirements did not allow for remote control signals—requiring the installation of new physical control infrastructure. In addition, the utility was exploring the use of BESS to improve utilization of their solar and wind plants.

Honeywell's Solution

To meet its need for reliable and predictable renewable energy operations, the electric utility chose Honeywell to implement a hybrid control solution, which included a combination of on-site and cloud SCADA infrastructure.

Honeywell's focus is on helping renewable energy owners and operators make the most of new, smarter energy technologies and energy storage systems and guiding them towards best practices for energy management, including:

- Automating operations to ensure rapid response to evolving energy needs.
- Collecting and understanding data to make real-time business decisions for energy management and renewable energy systems.
- Defining the potential of energy storage systems—including solar/wind plus energy storage—to improve plant utilization factors, along with enabling new revenue streams like ancillary services, and wholesale market participation.
- Addressing all applicable compliance and decarbonization requirements.

Honeywell supplies a proven and robust control and SCADA system platform, and its integrated approach ensures a stable, end-to-end solution that runs the gamut from asset control, monitoring and analysis to state-of-the-art battery storage systems and flexible tools for participation in today's ever-changing energy market.

Honeywell's overall scope of supply on this project included:

- Experion® SCADA
- Battery Energy Storage System (BESS)
- ControlEdge™ Programmable Logic Controllers (PLCs) and Remote Terminals Units (RTUs)
- Experion Elevate
- Uniformance® Process History Database (PHD) Historian
- Uniformance Asset Sentinel Advanced Analytics Solution

At one solar farm, the work involved replacement of an existing PLC with a local SCADA server and historian. Project engineers tapped into the local SCADA system and supplied data to the cloud. At other solar sites, data provided to the cloud SCADA system were connected to a cloud historian, which then fed the information to a third-party analytics package.

The utility's various wind farms utilized OEM SCADA systems and PI historians. Here, Honeywell's Uniformance PHD cloud historian was connected to the existing PI historian and the data were published by PHD to third-party analytics packages.

Figure 1. Honeywell's focus is on helping renewable energy owners and operators make the most of new, smarter energy technologies.

The utility's solar farms range in size from 2 to 190 megawatts. At its remote operations center, efforts focus on determining the maximum level of power generation for each site by comparing its original design capacity with the ideal amount of solar radiation at the location. Advanced analytics examine three key factors: the site's theoretical level of energy production, its actual level of production and what it should be able to produce. The resulting analysis helps to determine if a particular solar farm is performing as expected or if there are problems such as dust

One of the biggest concerns in the field of renewable energy is power generation depending on natural resources that are uncontrollable by humans. For example, solar powered electricity is generated only when sunshine is available.

Honeywell is the only automation supplier that provides performance guarantees tailored to the customer's critical business indicators.

or snow on solar panels, damage to cabling, failures in inverters, etc.

Since the solar farms employ dual-axis trackers for positioning their Photovoltaic (PV) panels, Honeywell was asked to implement analytic algorithms in its RTUs to minimize shading and maximize sun exposure on the panels without degrading the overall performance of the solar operation. The system also interfaces with a nearby weather station to monitor environmental conditions and includes logic to charge batteries and reduce supply to grid when there is insufficient demand to consume production. And that stored energy can be used for solar smoothing or extended supply beyond evening hours.

Figure 2: Honeywell's expert global services and support helps to keep renewable energy plants running efficiently, reliably, and safely.

Project Results

A key success factor on this project was interaction between the utility's operations team and Honeywell personnel to understand the control requirements and performance expectations. In the end, Honeywell delivered an integrated, hybrid solution that met strict regulatory standards for remote operations. Its broad, holistic product/service offering also enabled the right physical and cloud-based solutions to be deployed based on specific site requirements.

Honeywell is the only automation supplier that provides performance guarantees tailored to the customer's critical business indicators. The company is a well-established global technology partner with a long-term vision for the renewable energy industry.

Honeywell supported the financial performance of the electric utility's enterprise by providing all the infrastructure and data required to enable a successful outcome. This included a turnkey solution to optimize the operation of geographically dispersed power generation assets.

Why Honeywell?

Honeywell has proven expertise in turning data into actionable insights and delivering advanced technology and services with a complete edge-to-cloud strategy to help renewable energy producers more easily reach their performance and sustainability goals.

Honeywell provides contractual guarantees on business KPIs supported by a reliable data strategy and infrastructure for customers with distributed assets. We focus on outcomes such as improved asset utilization, reduced O&M cost, increased worker efficiency, and reduced safety and compliance incidents.

For More Information

Learn more about how Honeywell's Renewable Energy Solutions can improve performance, visit www.hwll.co/RenewableEnergy or contact your Honeywell Account Manager, Distributor or System Integrator.

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