

HOW TO ADDRESS INCREASINGLY COMPLEX ENERGY SYSTEMS

Solutions for renewable energy and distributed assets

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Renewable energy sources worldwide are rapidly reaching grid parity. This milestone, once considered to be all but unattainable, has been aided in part by government policies and financial incentives that accelerated the adoption of utility-scale resources.

At the same time, technology advancements and cost improvements further support the energy's growing "democratization." As part of this movement, small-scale distributed resources such as rooftop solar make it possible for non-traditional parties to both own and generate electricity. These new part-time power producers, part-time power consumers add complexity for grid operators and utilities tasked with providing the community with reliable power any time they might need it. They need the right tools to meet this challenge – starting with visibility of the overall system."

Underlying these shifts in the energy resource landscape is the steady move to automate systems and put formerly underutilized data streams to work. Here, too, lie opportunities for growth.



AUTOMATION AND DATA TRENDS

The power industry was an early adopter of systems like Supervisory Control and Data Acquisition (SCADA) and process data historians.

However, only around 10% of the energy industry is automated. By 2022, however, Honeywell estimates that percentage will have grown to 80%. Around two-thirds of companies still require work to help them transition from manual to digital processes.

Unfortunately, nearly three-quarters of energy employers cannot find enough talented workers for available and newly created jobs, leading to a gap in expertise. Furthermore, because the Distributed Energy Resources (DER) industry is full of smaller-scale technology companies, limited project execution capabilities may leave these firms unable to provide performance and competency guarantees.

EXPANDING ADOPTION OF RENEWABLES AND DERS

Against this backdrop is the expectation that renewable and distributed energy resources will continue to experience rapid rates of adoption. The Energy Department (DOE) said in January 2019 that it expects renewable energy resources such as solar and wind to represent the fastest-growing source of U.S. electricity generation, at least for the near term.

Solar energy is a particular focus as it enjoys growing levels of adoption at the utility scale and also at the commercial and industrial (C&I) level as DER. According to DOE, the U.S. electric power sector plans to add more than 4 GW of new solar capacity in 2019 and almost 6 GW in 2020.

In addition to the deployment of utility-scale solar, residences and businesses are installing smaller-scale solar photovoltaic systems. DOE said these resources are on track to grow by almost 9 GW through 2020, an increase of 44%.

The growth of distributed energy resources is being driven by a variety of state, local, and federal policies. DOE noted that some parts of the country have experienced disproportionately greater growth in DER installed capacity. For example, California currently has more than 7,000 MW of installed DER capacity, and is working to integrate 12,000 MW of DERs by 2020.

ACTIONABLE DATA

The rapid adoption of renewable energy resources, along with DER, is changing the utility operating environment. The traditional model of centralized power generation and one-way distribution networks is being forced to make room for widely deployed assets across a range of platforms and configurations. The traditional line between power producers and power consumers is becoming blurred.

Competitive markets mean energy stakeholders need to have clear, current and actionable data at their fingertips, offering insight into the increasingly complex energy ecosystem to enable real-time decision making.

For decades, Honeywell has been a trusted partner in the process industry, including oil and gas, petrochemicals, mining, pulp and paper, and electricity generation. Like the renewable energy industry, these process industries share a focus on optimizing production and efficiency, while also proactively managing maintenance programs to control costs and maximize asset uptime.

In a global economy, a growing number of companies manage operations across multiple sites and on multiple continents. The energy sector is data-intensive and project-based, involving collaboration between various stakeholders with diverse goals and perspectives. Stakeholders use a wide variety of analytical platforms, making it critical to pursue integration strategies to meet a wide range of organizational goals. This, along with the

energy sector's mandate to provide reliable and affordable electricity as the backbone of modern economies, introduces challenges and raises the stakes for data management.

FOCUS ON KPIS

Honeywell uses software solutions, analytical capabilities, monitoring, dashboards and virtualization to provide an outcome-based lifecycle management program and offer contractual guarantees on mutually agreed key performance indicators (KPIs) under a long-term service agreement.

Service agreements are supported by an infrastructure that uses Honeywell hardware and software solutions as well as third-party technologies. Our technology enables energy producers to reduce their levelized cost of energy, microgrid owners to optimize their operations and C&I clients to better achieve corporate sustainability goals.

BRING MEANING TO YOUR DATA STREAMS

Distributed energy resources may differ from central station assets in terms of scale, but at their core, operational efficiency at any scale depends on data acquisition, data cleansing and the application of appropriate algorithms to bring meaning to the data.

Honeywell's approach to help operators move from raw data to actionable analytics takes place on several levels. A first step is to partner with original equipment manufacturers and engineering firms to deliver an appropriate solution to the customer. Second is to integrate methodologies and technologies with software solutions. The third is to optimize and maintain mission-critical assets through centralized monitoring and operation, reliable data acquisition and analytics, and mobile functionality to enhance worker competency, efficiency, and safety.

An example may help to explain the approach. One utility lacked an enterprise-wide view across multiple assets, making it difficult to make data-supported decisions and resulting in escalating O&M costs. Operators needed to manually combine data from multiple data sources to approximate an enterprise view. The process of assimilating data from multiple platforms resulted in tedious and costly labor, large data gaps, and missed opportunities.

Working with Honeywell, the customer combined data to a single resource based on automated cloud-based solutions. So-called "collaboration cockpits" were deployed, allowing the status of KPIs and real-time production to be easily visualized and acted upon. Proactive maintenance, best-practice benchmarking, financial analysis, and production targets as they related to contractual agreements all became visible and readily understandable.

As a result, the client was able to cut its annual operating costs and increase overall asset availability and production up to 5%. These improvements resulted in as much as a \$4 million value add to the overall operations.

A key component in realizing these results is to maintain a focus on the goals of a range of stakeholders at the client company. An owner may be most concerned about overall fleet performance and having real-time insight into asset economics and market conditions. On the other hand, an operator may place greater value in analyzing data that helps to support power purchase agreements and energy management objectives.

Supporting those diverse goals and driving the achievement of critical performance indicators is enhanced through Honeywell's outcome-based services. These are multi-year service arrangements to maintain, support and optimize the performance of Honeywell control systems, regardless of the industry or size of operations. These services:

- Deliver on agreed service levels rather than prescribed quantities of materials and labor;



STAKEHOLDER ACCESSIBILITY

Distributed energy resources often have multiple owners, yet the grid operator and local electricity distribution company need to have insight into those assets' operations and availability, particularly when it comes to planning for two-way energy flows.

Honeywell addresses these needs with Experion SCADA (available as onsite, hybrid, or "Elevate" fully hosted solution) and / or Uniformance Suite which pulls data from multiple data sources to provide role-based dashboards and reporting for each stakeholder. Uniformance Suite provides real-time digital intelligence through advanced process and event data collection, asset-centric analytics and visualization technology. These Honeywell solutions become the backbone for an organization's "Internet of Things".

LEAN EXECUTION

Honeywell offers a methodology known as Lean Execution of Automation Projects (LEAP), which often delivers 30% capital savings and 25% faster execution for large automation projects. Honeywell's approach removes traditional dependencies that previously forced project flows to be sequential in nature. This approach separates physical from functional design, allowing parallel workflows, using standardized designs, and enabling engineering to be done from anywhere in the world. This dramatically improves the overall project schedule.

Honeywell utilizes three innovative technologies – Universal I/O, Virtualization and Cloud Engineering – to enable this project execution methodology. These solutions enable important project benefits such as late binding of automation systems to physical hardware and equipment, flexible hardware procurement, improved agility and flexibility, and enhanced design options.

Virtualization allows for a large reduction in hardware, thereby enabling corresponding savings in space, power, cooling, and weight.

In the past, data management systems could take a year to deploy and become operational. As increasing numbers of assets take advantage of efficiencies that reside in the cloud, however, the implementation time can be reduced, often by as much as 50% compared to a traditional system. And once the initial deployment in the cloud is complete, the system can be scaled easily and rapidly, further enhancing deployment economics.

On the operations side, a key performance indicator is existing and potential revenue. Cloud-based analytics can bring real-time visibility to asset availability and market conditions. The result often translates to increased revenue potential for an individual asset.

Operational visibility makes it easier to schedule maintenance activities based on real-time plant and asset data. Cloud-based analytics can lead to a 20% improvement in O&M performance and 5% improvement in asset availability to significantly accelerate the ROI payback.

SUSTAINABLE TECHNOLOGY PARTNER

While technologies and players in the energy ecosystem continue to change, one constant is the need for reliable and actionable data that is gathered and made ready for analysis by reliable, proven platforms. With decades of experience serving hundreds of customers in the global process industry, Honeywell is well positioned to be a valued and sustainable technology partner as energy companies, industrials and C&I customers deploy energy assets and work to maximize the efficiency, productivity, and profitability of energy assets. Learn more about Honeywell's suite of offerings and how they can be applied to your organization's energy assets.

For more information

To learn more about Honeywell's Renewable Energy Solutions visit www.hwll.co/RenewableEnergy or contact your Honeywell account manager.

Honeywell Process Solutions

1250 West Sam Houston Parkway
South Houston, TX 77042
Honeywell House, Skimped Hill Lane
Bracknell, Berkshire, England RG12 1EB UK

Building #1, 555 Huanke Road
Zhangjiang Hi-Tech Industrial Park
Pudong New Area, Shanghai 201203

www.honeywellprocess.com

We reserve the right to make technical modifications in the interests of progress.
WP-19-04-ENG | 05/19
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