

Maximize the value of IoT data to accelerate digital grid transformation



Business Impact

Fifty-five percent of utilities say that using AI and IoT in coordination will be crucial for the long-term viability, success and growth of the industry.

The Autonomous Grid in the Age of the Artificial Intelligence of Things. A Zpryme and SAS study. January 2019.

Challenges

- **Operating costs.** Utilities need to cut operating costs as they adopt technologies and processes enabled by IoT and AI.
- **Innovation.** Utility companies are pressured to use hardware, software and business approaches that enable a smart, connected infrastructure to be installed at or near the edge of the electric power grid.
- **Data quality.** High volumes and veracity of IIoT data demand focus on data ingestion, quality, integration and governance.
- **DER integration.** Pressure at the distribution level to integrate local energy resources is disrupting efforts to improve asset management and reliability.
- **IT/OT integration.** Advanced sensors and devices on the network drive smart grids and help them align with renewables integration, but also require IT and operations to work seamlessly to achieve outcomes.

The Issue

Internet of Things (IoT) technology creates new opportunities for utilities to connect with consumers, digitize the grid and transform the business. But opportunities present challenges, such as how to use the influx of streaming data to enhance customer engagement, infrastructure management and service delivery. To build a cost-competitive business model for reliable power generation, distribution and delivery, utilities must improve operational insights from near-real-time data. To do it, many collect raw data from connected infrastructure and devices using Industrial Internet of Things (IIoT) capabilities.

Analysts expect tens of billions of IoT devices by 2025 – and we know that traditional approaches to data management and analytics may not suffice in this new, connected world. Simply collecting data from connected sensors, meters and systems is not enough. Utilities must be able to use analytics from traditional data centers all the way to devices at the edge of the network. From sensors on distributed energy resources (DER) to phasor measurement units, a flexible, integrated visual environment helps utilities access, prepare, model, visualize and deploy diverse IoT data, applying high-frequency data analytics at the source – whether data is in motion, at rest or anywhere in between.

Our Approach

Building from a proven technology foundation, SAS® integrates streaming data with artificial intelligence (AI) and visualization so you can get more value from IoT data. Whether data is at the edge, in motion or at rest, SAS helps you make swift, meaningful decisions while reducing data movement and storage costs. We deliver software and services to help you:

- Use data at rest and data in motion to predict critical equipment failures before they occur – avoiding the high cost of reactive maintenance.
- Efficiently integrate renewable resources with the grid, using edge algorithms to smooth transition between power resources while maintaining grid stability.
- Get accurate, real-time insights on power quality. Streaming analytics applied to transmission and distribution line data reveals insights as grid events unfold and helps you predict future issues.
- Restore power faster after a storm. You can optimize resources to minimize the duration of customer interruptions and increase restoration efficiency.
- Personalize energy products and services. As a result, you can become the company of choice for consumers – both for power and for other home services.

IoT analytics transforms the way you interact with customers, products, services and operations. To capture its full value, you need a solution that takes an enterprise approach. SAS supports analytics throughout the IoT infrastructure - from the data center or cloud all the way to the edge, and at any point in between, helping you maximize value from grid modernization investments by taking advantage of new data sources. With SAS, you can:

- **Sense what matters - even at the edge.** Our IoT solutions incorporate market-leading event stream processing technology, which analyzes data in motion by processing huge volumes at very high rates (millions per second) with extremely low latency (milliseconds). You can embed this solution in devices to shift intelligence to the edge. Intelligent filtering deciphers signals from noise so you'll know what's relevant for your utility.
- **Understand the signals in data.** Mine and analyze IoT data throughout the connected ecosystem, and combine IoT data with other sources that add context - so you can detect patterns of interest as events occur.
- **Act with speed and confidence.** Running on a range of hardware or in the cloud, our edge-to-enterprise platform enhances collaboration between data scientists and IT to speed time to market. Access and prepare data, engineer features, perform exploratory analysis, build and compare machine learning models, and create score code for implementing predictive models faster than ever before. An optimized IoT analytics infrastructure reduces data movement, and automates processes for incremental and long-term business gains. By fostering a creative and innovative environment, you can build and expand new business and operational models.

Situation

Enel Green Power (EGP), a global leader in the renewable sector, has 43GW of installed capacity. It operates more than 1,200 plants (more than 10,000 generation units) using four technologies: wind, solar, hydro and geothermal. Prior to using SAS, EGP outsourced analytics on the performance of wind farms, and received only high-level, summarized monthly data.

Solution

EGP used SAS to improve performance of power plants via a better understanding of the reasons for unplanned downtime. It produced a multiyear production plan based on statistical analysis of historical data augmented by a risk-based decision tool. It was also able to analyze each plant's production, resources, alarms and behaviors to reduce preventable faults.

Results

With help from SAS, the company was able to:

- Quickly view insights about the performance of power-generating units in granular detail - for example, it decreased the time to complete wind power generation unit analysis from one month to two days.
- Understand where assets are under-performing, and then quickly issue maintenance requests to country technology teams - resulting in improved production efficiency, which is a direct contributor to top-line revenue growth.

- Accurately predict power outages before they occur while running assets at peak performance?
- Aggregate all ecosystem data, including IIoT sensor data, and compare operational performance across all your plants?
- Give your energy customers personalized information about usage consumption and upcoming events that might affect reliability?

You can. SAS gives you
THE POWER TO KNOW®.

SAS Facts

- SAS software is used by more than 560 energy firms worldwide, including 100 percent of the Fortune 100 US utilities (80 percent of Fortune 500 utilities globally).
- SAS is a Leader in The Forrester Wave™: Multimodal Predictive Analytics and Machine Learning Solutions, Q3 2018.
- SAS helps you respond quickly and confidently in the connected world so you can claim new IoT market opportunities as you tap into the full potential of all your data.

Learn more about SAS IoT solutions for utilities at sas.com/utilities.

To contact your local SAS office, please visit: sas.com/offices

