

Unlocking the Value of Data Analytics

By **LISA WOOD**

According to the U.S. Energy Information Administration's 2018 *Annual Energy Outlook*, electricity consumption in 2050 is expected to exceed 5,000 terawatt-hours—a 33-percent increase from 2017 levels. In addition, the energy mix is changing, more distributed energy resources are connecting to the energy grid, and more customers are playing a role as both consumers and producers of electricity.

All of this will require an energy grid that is connected, smarter, and more efficient than the one today. Technology, investments in new hardware and software, and data analytics are key to managing this growth and to unlocking customer and grid benefits over the coming years.

Fortunately, a decade of investment in smarter energy infrastructure has allowed electric companies to begin to leverage data to develop a more resilient, reliable, and flexible energy grid.

Increasingly, the energy grid of the future will use digital solutions to manage electricity supply, integrate distributed energy resources, accelerate electric transportation, and achieve operational and service excellence for customers.

Data Analytics and Grid Modernization

Data analytics enable electric companies to optimize their operations, enhance customer service, and minimize customer disruptions.



These solutions can be segmented into:

- advanced metering and smart grid infrastructure analytics solutions;
- distributed energy resource solutions;
- grid optimization solutions; and
- asset management solutions.

Data generated from smart meters, automated distribution systems, and sensing and measurement devices now are used for predictive analysis, automation, and detailed scenario planning. The increased emphasis on grid resiliency is driving the trend toward self-healing grids that are powered by smart substations, feeder automation models, and a telecommunications overlay that relays intelligence throughout the network. Ultimately, this shift to automation results in improved resiliency, reliability, and asset management.

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Today, electric companies also are using data analytics for scenario analysis and probability-based approaches to forecasting distributed energy resources and their interactions with the energy grid, as well as for projecting electric vehicle adoption and charging patterns.

An overhaul is quietly occurring as electric companies use data analytics for their technical and business process needs.

Electric companies are just beginning to scratch the surface of using all the intelligence gathered by Internet of Things devices, cloud-based data management platforms, and real-time information to increase efficiency, productivity, and optimization of the grid.

Real-time data is becoming a highly valuable component of data analytics. The ability to capture streaming data and make decisions in real time in the field will bring a new dimension to distribution grid operations, including dynamic operating capabilities at the grid edge. In other sectors, the combination of cloud plus data plus advanced algorithms has led to breakthroughs such as image detection and speech recognition.

Artificial intelligence (AI) is the next step for electric companies. AI can be utilized to make the energy grid more efficient in delivering energy, improving situational awareness, predicting when equipment will fail, and processing threat information to improve cybersecurity.

Data Analytics and Customer Solutions

One of the most interesting developments occurring with data analytics is around customer

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data. Previously anecdotal or unique event data, perhaps recorded on a customer service call or captured in traditional customer satisfaction surveys, now can be analyzed systematically to gain deeper insights. In fact, data analytics can help to reveal the issue that prompted the customer call or can alert a representative to engage a customer in an energy management program, for example.

It now is common to leverage third-party datasets and mine social media posts to create several hundred unique identifying traits and data points for each customer. Electric companies are using that data to better understand what different customers want.

There is no denying that advanced data analytics are playing an increasingly important role in operating the energy grid and in providing customer solutions.

These are exciting times, but, in the not-too-distant future, AI, machine learning, and advanced data analytics will come to share some traits with electricity—something that is pervasive, that powers devices and transactions seamlessly, and that improves quality of life for all customers. **EP**



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