



Intelligent Innovation

Guidehouse Is Helping Electric Companies Leverage Technology to Meet Demand

After managing decades of relatively static and predictable energy demand curves, electric companies in recent years have been racing to keep up with once-in-a-generation growth driven by data centers and artificial intelligence (AI) breakthroughs, industrialization and the reshoring of manufacturing activity, and the ongoing electrification of transportation and the broader economy.

Demand projections vary across the country and are regularly revised. The North American Electric Reliability Corporation (NERC) projected

late last year that the U.S. summer demand peak would rise by more than 122 gigawatts (GW) over the course of the next decade—a projection that grew by more than 50 percent in just a year's time.

Although the precise number of electrons that will be required to meet customer demand 5, 10, and 20 years into the future remains uncertain, experts agree that the world's appetite for electricity is only moving in one direction: up. That's forcing electric companies to rethink business as usual.

“Demand growth is at the forefront of every discussion that we have every day with our energy clients,” says Guidehouse Partner and Global Energy Providers Lead Michelle Fay. “If you think about how the industry has traditionally done things like forecasting, planning, and infrastructure development, the methods and approaches that they’ve been using to this point are not really going to be sufficient to meet the escalating demand we’re seeing.”

Advisors like Guidehouse are helping EEI member companies navigate this unique moment. Electric companies are making significant investments in America’s critical energy infrastructure, committing \$186.4 billion last year alone to make the grid smarter, stronger, cleaner, more resilient, and more secure. That was the 13th-straight year that the industry’s grid investments climbed to record highs, according to EEI’s industry financial records.

Yet, more investment in transmission and distribution infrastructure, grid-enhancing technologies, and generation sources of all kinds will be needed to meet evolving customer needs and power the economy of the future. With AI processes already revamping entire industries on the world stage, America’s global economic competitiveness will depend in part on new technologies’ and data centers’ access to power, largely on compressed timelines.

Guidehouse is helping industry leaders make informed, pragmatic changes to existing operating models, supply chains, workforce development programs, construction management processes, and contractor management practices to better equip them to move and deploy capital more quickly. To meet projected demand growth in their service territories, electric companies must continue to make

smart decisions in the coming months and years to ensure the grid is where it needs to be decades into the future.

“We will need to adapt more quickly to market demands, while at the same time handling tremendous pressure to enhance efficiency and reduce costs,” says Fay. “AI and advanced technologies are going to be critical to address these challenges and ensure electric companies can scale effectively and reliably.”

Indeed, the same technologies that are driving companies’ grid optimization and expansion plans may be key to seizing the opportunities before them. A recent IBM study estimated that 74 percent of energy companies had explored the use of AI in some capacity to enhance operations, and experts at Guidehouse consistently advise their industry clients to embrace innovative technologies and solutions as part of their capital deployment strategies.

“It can obviously be overwhelming to navigate. Part of this is balancing short-term needs and long-term implications, really looking at what near-term investments are going to allow for longer-term benefits,” says Fay. “We continue to see resiliency investments, investments that enhance energy security, and investments that leverage technology advancements and reduce risk.”

‘The Potential Is Endless’

Although AI and advanced technologies have practical uses on the grid through advanced line ratings systems, wildfire monitoring programs, and distributed energy resource deployment, one area that stands to significantly benefit from innovation is regulatory compliance.

As electric companies grow, integrating new assets and customers, so, too, does their responsibility to comply with hundreds of regulatory mandates. Many compliance standards also vary geographically, so, for large companies that operate in several different jurisdictions, expanding the grid and bringing new assets online comes with a unique set of challenges.

“Since about 2007, electric companies have seen an influx of mandatory regulations pertaining to reliability and security compliance. They’ve thrown everything at these increasing responsibilities, including people, tools, and technology solutions,” says Guidehouse Partner Chris Luras. “The problem with these solutions is that, in some cases, they’ve been fragmented and uncoordinated, which has led to disparate tools, redundant responsibilities, and just overall inefficient operations.”

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Guidehouse is working with several industry clients to help streamline regulatory and compliance work—including helping electric companies navigate Critical Infrastructure Protection (CIP) compliance, an industry set of standards to help guard against cyber and physical security threats.

CIP compliance is particularly daunting for large, multi-jurisdictional companies that operate in several states and could be audited multiple times each year. Preparing for such audits has historically been an expensive, time-consuming, labor-intensive process, often involving tens of thousands of data points.

Guidehouse is helping companies explore how they can develop centralized hubs that can monitor compliance across thousands of company assets in real time. Using an enterprise data warehouse and advanced analytics platform, companies can aggregate data across thousands of miles of infrastructure, distill it, and analyze it without needing to dedicate months of employee bandwidth to audit preparation.

Guidehouse Partner Eduardo Balbis says access to real-time information will be incredibly valuable as companies plan significant

infrastructure investments during the next several years. EEI member companies are expected to invest more than \$200 billion this year alone to upgrade the grid, with many embarking on long-term, multi-year critical infrastructure projects. Balbis also notes that AI technology can be layered on top of data collection programs to make proactive investment decisions more efficiently rather than simply reacting to compliance concerns.

“All electric companies have these compliance responsibilities, security risks and threats, and a need to quickly consolidate and analyze data,” says Luras. “And, once companies have all of this accurate information, the potential is endless for us to use AI technology to replace human monitoring and auditing.”

Articulating the Value of Innovation

An electric company’s ability to access, analyze, and share information quickly through bulk data collection also is critical to engagement with regulators, particularly as companies look to invest in new grid-enhancing technologies and critical energy infrastructure.

“Electric companies are often faced with the need to provide supporting data to inform both regulators and the public how their investments will generate value and ultimately drive better outcomes for customers,” says Guidehouse Partner Aida Hakirevic. “Moreso than ever before, they need to show tangible benefits and how investments mitigate long-term costs to customers when they’re looking to enhance grid resilience, meet demand growth, and even replace old IT systems.”

This was a concern for Public Service Electric & Gas (PSE&G), New Jersey’s largest electric and natural gas company, after they received approval from the Board of Public Utilities in New Jersey in 2021 to deploy 2.3 million smart meters across their service territory. Aimed at enhancing grid reliability, improving customer service, and enabling more efficient energy usage, PSE&G expected the deployment would cost \$775 million to implement advanced metering infrastructure (AMI) capabilities.

In an effort to report the success of the program back to regulators as part of the company’s rate review proceeding, PSE&G worked with Guidehouse to track, calculate, and report AMI benefits throughout the project’s rollout. Using the Microsoft Power Platform (MS Power BI) to develop an AMI program dashboard, PSE&G was able to map regulatory commitments to AMI use cases and associated benefits. Tracing benefits data and the information from prior relevant filings via AMI dashboard provided transparency they could holistically take back to regulators.

“Data visualization is a powerful bridge between advanced metering data and decision-making. It enables leaders to clearly demonstrate how AMI investments are delivering

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tangible value—improving service reliability, enhancing customer engagement, and driving smarter energy use across our communities. It's not just about collecting data; it's about making it meaningful and measurable,” says PSEG’s Chief Information & Digital Officer Zee-shan Sheikh.

“With technology investments, in general, it can be really difficult to define the value of an ultimate outcome and what a certain investment provides,” Hakirevic says. “Companies are often challenged how to articulate value to regulators and clearly show benefits of their technology investments. There are so many competing priorities for grid assets and IT modernization. We were incredibly proud to be one of PSE&G’s key partners to achieve this as part of their AMI technology investment.”

Hakirevic notes that electric companies’ relationship with their regulatory partners is increasingly dependent upon regular and ongoing engagement—and that systems like PSE&G’s AMI benefits tracker can help show ongoing returns on investment.

“It’s one thing to present a great business case but then not follow through to show evidence of return,” Hakirevic says. “Whereas PSE&G did this in real time, with recorded benefits and implemented capabilities reported and found to be prudent by regulators.”

‘Conditions are Changing Quickly’

Fay says she is encouraged by the industry’s embrace of new and innovative technologies to streamline processes, engage more constructively with regulators and industry partners, and accelerate capital deployment. However, she cautions that “we’re no longer in three-year planning cycles” and that “conditions

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are changing quickly, which means planning processes need to keep up with these accelerated timelines.”

When evaluating technology solutions with clients, Fay points to three key areas of focus:

- What value will this innovation bring in the short and long term, and how can those benefits be measured? “You need to ensure investments are prudent and can withstand regulatory scrutiny and be ready to change course if the project is not going according to plan,” she says.
- What sort of risk is your company willing to take on? “You need to be clear about how much risk tolerance you have. That’s often dependent on the maturity of the solution, particularly in the case of a technology investment,” says Fay.
- Is your company ready to support implementation? “You may have the greatest innovation or technology in the world that has proven to work somewhere else, but is your organization ready, and is your workforce ready, to take this on and realize the benefits?” Fay asks.

Fay says there is no shortage of tools available to help electric companies deliver reliable electricity as affordably as possible to customers—and that honest answers to these sorts of questions can provide clarity during a time of significant change for the industry.

“We’re witnessing not just a single type of technology solution emerging, but a significant influx of new technological capabilities that are specifically supporting electric companies in various ways,” she says. “Many companies are making substantial investments, exploring a wide range of vendors and solutions to ensure their needs are effectively met. It’s clear that a one-size-fits-all approach simply doesn’t apply.” **EP**