Guidehouse, Electric Companies, and the Clean Energy Future

'Customer-Obsessed' Mindset Is Paving the Way to Net Zero

The electric power sector—once the U.S. economy's single-largest carbon emitter—has embraced ambitious emissions reduction targets on the road to a clean energy future.

The sector's carbon emissions today are as low as they were nearly 50 years ago, while electricity use has more than doubled since then. More than 40 percent of all U.S. power generation now comes from clean, carbon-free sources. And, more than 40 EEI member companies have committed to achieving net-zero emissions by 2050 or sooner.

"As we are shifting the energy source from carbon to renewables, the fundamentals of the way the grid operates change dramatically," says Chris Rogers, a partner in Guidehouse's Energy, Sustainability, and Infrastructure segment who leads the company's energy portfolio in the western United States. "With that, the planning paradigm for the grid has to be rethought and reimagined to develop the next version of the world's largest machine: the U.S. electric grid."

Advisors like Guidehouse are working with EEI member companies to reshape that planning paradigm through, among other areas of focus, predictive and scenario-based analysis; infrastructure life-cycle planning; and engagement strategies with customers, regulators, government officials, and other public- and private-sector stakeholders who will need to work in tandem to make the clean energy future a reality. →

It is that focus on people—particularly on customers and their evolving and growing needs in an increasingly electrifying economy—that is central to Guidehouse's and the electric power industry's pursuit of a clean energy future, Rogers says.

"Making sure there's a primary focus on both customers and the human element of this transformation is an incredibly important aspect of this," he says.

"Looking Into the Future"

Electric companies are making significant infrastructure investments today that will be necessary to power the grid of tomorrow, investing an estimated $167.8 billion in 2023 alone to make the grid stronger, smarter, cleaner, more dynamic, and more secure. Those investments are informed by innumerable factors, including projected regional load growth, extreme weather events, and age and condition of existing infrastructure.

Guidehouse's sophisticated forecasting and data analysis capabilities have made it an invaluable partner to electric companies as they look to meet the defined needs of customers today and their projected needs years and decades into the future. One such company that is working with Guidehouse to inform forward-looking decisions—specifically, the buildout of infrastructure needed to support the more than 26 million electric vehicles (EVs) that EEI projects will be on U.S. roadways in 2030—is Southern California Edison (SCE).

Serving 15 million people across 50,000 square miles of central, coastal, and southern California, SCE has been a leader in laying the groundwork to meet Californians' clean energy needs, particularly as the state has adopted various zero-emission rules and climate targets aimed at dramatically increasing renewable generation and significantly boosting the share of EVs on state roads by 2045.

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"We have worked with SCE on looking into the future to create a defensible forecast of how many, where, and over what period of time EVs will proliferate throughout their service area, and how that will impact the grid," Rogers says. "They're using that to help inform their investment strategies, forecasts, and general rate reviews. And, they're doing a very good job bringing others into the tent early, from regulators to customers and environmental groups to help them understand this journey."

In September, SCE and Edison International, of which SCE is the largest subsidiary, released the report, "Countdown to 2045: Realizing California's Pathway to Net Zero." The paper was an update to an initial whitepaper that SCE released in 2019 that detailed California's projected energy needs and the steps needed to reach the state's 2045 net-zero emissions goals.

To reach net zero, the updated report suggests California will need to make $370 billion in grid investments—and that 90 percent of light-and medium-duty vehicles and more than 50 percent of heavy-duty vehicles will need to be electrified. As it relates to EVs and charging infrastructure, Rogers says Guidehouse and SCE are working to understand "where more electrons will need to flow at certain times to make intelligent, informed decisions about how to best prepare the grid."

"The demand will be like nothing we have ever seen before," said Devin Rauss, SCE's principal manager of grid strategy and policy. "The electric system really has to grow to ensure that customers have the electric infrastructure that can provide them with the scale of energy they will need in the future."

"It's Going to Be a Wild Ride"

Transportation offers a wealth of "untapped potential for electrification" that will ultimately benefit customers, says Jeff Lewis, a partner in Guidehouse's Energy, Sustainability, and Infrastructure segment who leads the company's energy portfolio in the northern United States. However, he notes that electric companies are taking an economy-wide approach and stressing that it will take economy-wide efforts to reach net zero.

"We have transportation, we have agriculture, we have industry and residential. And, as each of these sectors carve out their own paths to net zero through emissions reductions, it will be hugely important that electric companies understand what other stakeholders are doing and how they can support their efforts," says Lewis.

Over several years, Lewis and his team at Guidehouse have worked with the Tennessee Valley Authority (TVA)—the nation's largest public power provider—as it pursues a clean energy future while providing wholesale power to more than 150 local electric companies in Tennessee and parts of Alabama, Georgia, Kentucky, Mississippi, North Carolina, and Virginia.

Lewis highlights the February

release of the "Valley Pathways Study Preliminary Findings," which was supported by Guidehouse and commissioned by TVA and the University of Tennessee Baker School of Public Policy and Public Affairs. The Tennessee Valley spans parts of seven states and is home to 10 million residents. A baseline of 200 million metric tonnes of carbon is emitted from the valley's different economic sectors each year. The study developed a planning framework for how the entire Valley's economy can reach net-zero greenhouse gas emissions by 2050.

Lewis describes the study as a "holistic view of reaching net zero … and what will be needed to ensure customers and communities understand and are equitably benefiting from this energy transformation."

The report found that carbon emissions in the region had fallen 30 percent since 2005, due largely to TVA's 50-percent reduction in emissions from electricity generation. As of 2019, electricity generation accounted for 27 percent of the region's carbon emissions, according to the study, whereas the transportation sector accounted for 36 percent, and industrial activity and residential and commercial buildings account for 21 percent.

"Carbon reduction touches every household, business, and community, and success means we must work together to develop actionable strategies to accelerate the transition to a clean energy economy," Jeff Lyash, TVA's president and CEO, said in a statement.

Lewis notes that "engaging the customers, communities, and all of the different stakeholders through education, evaluation, and analysis will be hugely important," listing engagement as the first of four key principles that the study recommends for the region as it pursues net-zero strategies:

- Valley-wide ownership and a commitment to stakeholder engagement.
- The establishment of benchmarks and key performance indicators to measure progress over time.
- Valley-wide consensus that ensures a variety of viewpoints are heard and considered.
- Roadmap flexibility to ensure net-zero plans can adapt to changing policy, technology, and other variables.

Lewis says TVA, the University of Tennessee Baker School of Public Policy and Public Affairs, Guidehouse, and others involved in the study "took great measures to be sure we were mindful of disadvantaged communities" and that "we created map layers for disadvantaged communities in our analyses to plot out where potential impacts of electrification and infrastructure investment would be felt and how to best mitigate that in an equitable manner."

The study identified 1,300 census tracts—about half of the tracts in the Tennessee Valley region—as disadvantaged, based on a series of indicators laid out in President Biden's Justice40 Initiative. Recommendations to support these communities vary, in part because they span rural, urban, and suburban settings. And, they are often nuanced. For example, efforts to weatherize and upgrade buildings to be more resilient to extreme weather events, which the study found more meaningfully impact disadvantaged and low-income communities, must consider that rent increases to help fund these efforts would disproportionately impact these same communities.

Lewis stresses that this study is not a "one-and-done" and that stakeholders will continue to engage with one another and update their roadmap as needed, particularly as technologies advance.

"The pace that this technology is changing our lives and the energy industry, in particular, is unbelievable. Fifteen years ago, we were all running around with smartphones for the first time. What will we be doing 15 years from now and how will technology impact the electric grid?" he asks. "There will be forks in the road to net zero based on how technology develops. But, it's going to be a wild ride."

"Playing an Impactful Role in Customers' Decarbonization Journeys"

Another electric company paving the way to a clean energy future is Duke Energy, which serves 8.2 million customers across several states in the South and Midwest and has reduced its emissions by 35 percent from 2005 levels, planning to achieve net-zero emissions by 2050.

Last year, Duke Energy published "Carolinas Resource Plan" in North Carolina, which builds on a previous report aimed at finding an affordable and reliable path to meet the state's goal of reaching carbon neutrality by 2050.

"It is a really actionable plan that took a universal approach to decarbonization, considering innovative customer-focused and grid-edge programs; reducing emissions of Duke Energy's own generation portfolio with heavy investment in renewables and advanced technologies, such as small modular reactor technologies; and managing the risk of that transition with an eye for reliability and resiliency," says Ted Walker, a partner in Guidehouse's Energy, Sustainability, and Infrastructure segment who leads the company's energy portfolio in the southern United States.

The plan estimates energy demand among Duke Energy customers in the Carolinas will grow by 35,000 gigawatt-hours over the next 15 years—more than the annual electric generation of Delaware, Maine, and New Hampshire combined, according to the report. To meet that scale of demand and

achieve net-zero emissions by 2050, all while maintaining customer affordability, the document calls for a series of near-term renewable benchmarks, with 6,000 megawatts (MW) of new solar projects and 2,700 MW of battery storage coming online by 2031, along with a variety of wind, pumped-storage hydro, and advanced nuclear energy projects launching by 2035.

"Even as we plan for unprecedented growth and demand, we have a steady focus on meeting the customer where they are—developing services and solutions to meet their individual needs and refining them until we deliver the precise value our customers expect and deserve," says Meghan Dewey, vice president of Products and Services for Duke Energy.

Walker notes that "electric companies need to find ways of partnering with customers of all shapes and sizes and playing an impactful role in customers' decarbonization journeys," pointing to Duke Energy's SmartPath program. Launched in 2022, the program helps Duke Energy's business customers streamline and finance energy efficiency upgrades. "That's a great example of a customer-obsessed partnering approach and meeting customers on their terms," Walker says.

The program initially spanned Duke Energy's service territory in the Carolinas, building upon the company's existing Small Business Energy Saver Program. Its goal is to minimize upfront costs for businesses looking to make energy efficiency investments while connecting them with skilled contractors and a portfolio of Duke Energy's skilled trade allies. In some cases, Duke Energy rebates will cover up to 75 percent of the costs associated with these energy efficiency upgrades.

"It really focuses on maximizing the entire project lifecycle: partnering with trade allies to target the right customers in the right projects, streamlining service across reviews and approval process, and making payouts within weeks rather than months of receiving an application," Walker says.

Efforts by energy companies to engage with customers in such a comprehensive and collaborative manner—benefiting businesses and skilled trades professionals to support local jobs while helping to minimize financial barriers—"are really separating the leaders from the followers as we work to reach net zero," Walker says.

Rogers concurs, noting that many "sophisticated energy companies are working to create a one-grid mentality across many different functional units" to meet residential, indutrial, and business customer needs today—and their projected needs in the future.

"Generally, people are coalescing around the idea that they want to leave this place better than they found it, regardless of political ideologies. That's very positive to see," he says. "We see moments like this once in a generation. I'm very excited to be alive at this period in time." EP

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