What Utilities Know (And Don't Know) About EV Drivers

And how better customer insights can maximize utility investments in electric vehicles

These days, news about the benefits and momentum of electric vehicles (EV) arrives daily. From the Biden administration's proposal to build a national EV charging network of 500,000 stations to automakers like Volvo announcing they will sell only EVs in the not at all distant future, it's clear that real investments are following years of bold pronouncements about EVs.

Understandably, utilities across the world are serious about accelerating the advance of EVs, seeing it as a way to simultaneously meet consumer demand, drive down carbon emissions and earn additional revenue. North American utilities such as Xcel Energy have announced wide-ranging incentives and programs to provide charging infrastructure, encourage EV purchases and educate customers about the benefits of EV ownership.

But the current state and future trajectory of EVs is a more nuanced picture than these big-picture commitments and investments indicate. For instance, a survey conducted at the end of 2020 by Consumer Reports found that 71 percent of U.S. drivers would consider buying an EV in the future and over 70 percent understood their environmental benefits. Yet the same survey found that only 30 percent of respondents said they knew much about EVs.
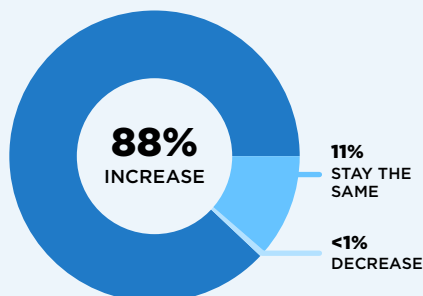
Survey results underscore EV momentum

In this dynamic and quickly moving environment, Bidgely and studioID surveyed 149 mostly North American utility professionals to get a better handle on their EV investment plans, what drives those investments, the challenges they are facing, and the potential value that could be provided by improved insights into customer charging behavior and buyer propensity. At a high level, the survey results underscored the momentum propelling EVs towards the mainstream while also highlighting the benefits improved customer insights could provide in guiding utility incentives, outreach, resource planning, education and ratemaking.

What is clear is that utilities are serious about encouraging EV ownership. Nine out of 10 utility executives surveyed reported that their companies plan to increase investments in customer programs and infrastructure to support EV ownership over the next two to three years. By large majorities, survey respondents said that their EV investments and programs were being driven by customer demand (61 percent) and revenue opportunities (57 percent).

A number of other factors are also driving utility investments. Corporate sustainability goals were cited by 46 percent of respondents, while 43 percent pointed to regulatory mandates and 32 percent highlighted company carbon reduction commitments. While less frequently cited, factors like demand response (32 percent), grid resilience (26 percent) and improved grid planning (21 percent) were anything but negligible rationales behind utility investments.

Over the next 2-3 years, do you expect your company's investments in customer programs and infrastructure to support electric vehicle ownership to...?

- **88% INCREASE**
- 11% STAY THE SAME
- <1% DECREASE

What factors are influencing your company's electric vehicle investments and initiatives?

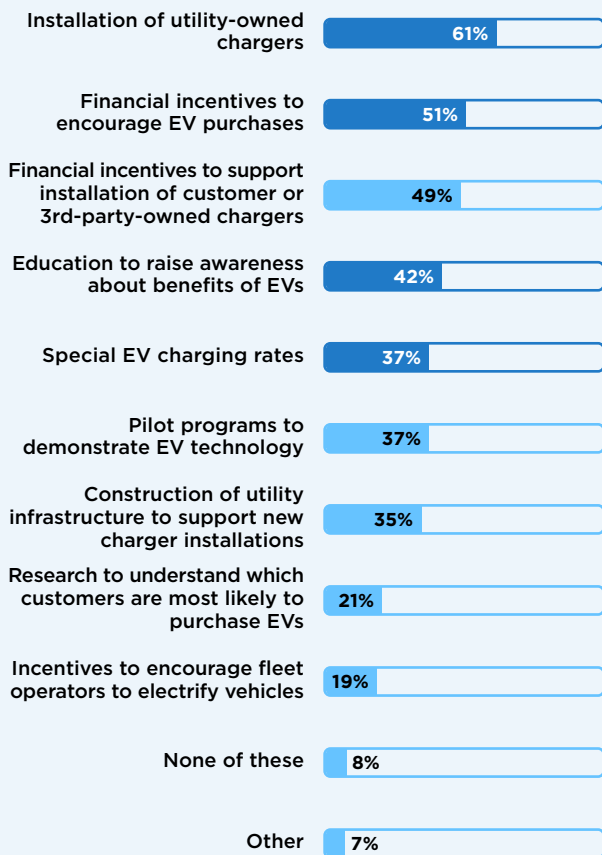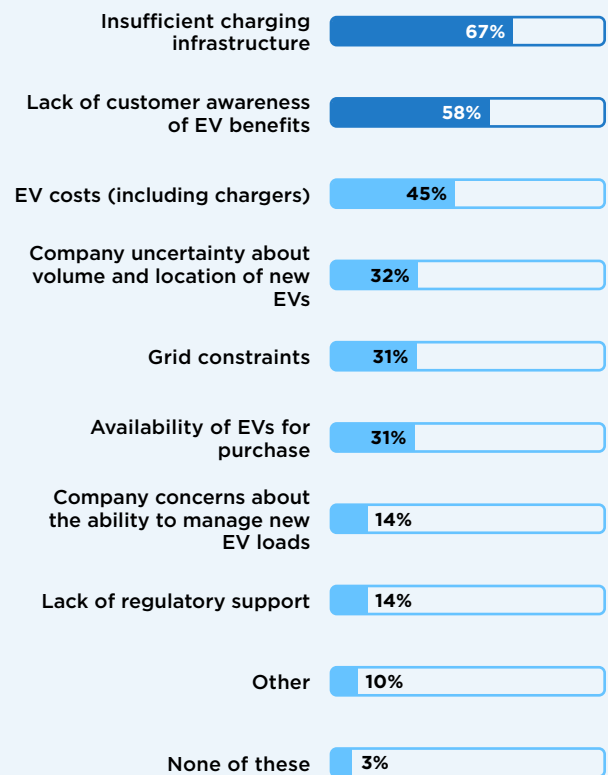| Factor	Percentage
Customer demand	61%
Revenue opportunities	57%
Corporate sustainability goals	46%
Regulatory mandates	43%
Company carbon reduction commitments	32%
Demand response	32%
Grid resilience	26%
Improved grid planning	21%
Other	6%
None of these	2%
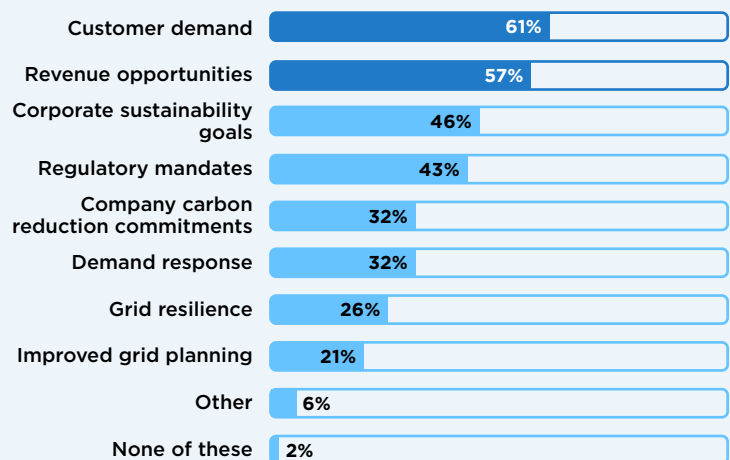
Other notable findings in the survey included:

- 61 percent of utilities have already installed company-owned chargers to support EV ownership
- 51 percent offer financial incentives to encourage purchases of EVs
- 42 percent have made investments to raise awareness about EV benefits
- 37 percent offer special EV charging rates

The reasons behind some of these investments is clear from responses elsewhere in the survey. For example, 67 percent of utility executives said insufficient charging infrastructure was a primary barrier to greater adoption of EVs in their service territory. Another 58 percent pointed to a lack of customer awareness of EV benefits as a barrier.

What investments and initiatives has your company already made to support electric vehicle ownership?

Installation of utility-owned chargers	61%
Financial incentives to encourage EV purchases	51%
Financial incentives to support installation of customer or 3rd-party-owned chargers	49%
Education to raise awareness about benefits of EVs	42%
Special EV charging rates	37%
Pilot programs to demonstrate EV technology	37%
Construction of utility infrastructure to support new charger installations	35%
Research to understand which customers are most likely to purchase EVs	21%
Incentives to encourage fleet operators to electrify vehicles	19%
None of these	8%
Other	7%

What barriers stand in the way of greater adoption of electric vehicles in your service territory?

Insufficient charging infrastructure	67%
Lack of customer awareness of EV benefits	58%
EV costs (including chargers)	45%
Company uncertainty about volume and location of new EVs	32%
Grid constraints	31%
Availability of EVs for purchase	31%
Company concerns about the ability to manage new EV loads	14%
Lack of regulatory support	14%
Other	10%
None of these	3%

bidgely

Customer data blind spots

One of the more surprising findings of the survey was that 55 percent of utility executives said that the quality of their companies' insights into both the charging behavior of their current EV customers and the likelihood that other customers would buy an EV in the future was very good or good.

The relative immaturity of the EV market in North America, where most of the survey respondents work, may explain this result. What constitutes adequate data about existing and potential customers in more advanced and deregulated markets in Europe is quite different. That's because competition among energy retailers in markets such as the United Kingdom is fierce and requires companies to have a granular understanding of customer charging and other behaviors.

"Suppliers can't get away with a generic knowledge of customers," says Wojtek Nodzynski, strategy and growth manager in Europe for the data analytics company Bidgely. "Understanding how EV drivers charge, when they charge, how often they charge and other insights is what allows retailers to adjust and innovate with the tariffs they offer. Retailers in these competitive markets really have to understand their customers or they will lose them quickly to other retailers who come up with better rates and offers."

Although the North American EV market is growing quickly, very few places combine a competitive and deregulated marketplace for EVs—something that will undoubtedly change

in the not too distant future. Without that competitive pressure, North American utilities may not be clear about the opportunities and benefits of knowing at a household level how customers use electricity.

But if you take a closer look at how many utilities understand their customers, it's easy to identify areas for improvement. "Historically speaking, utilities have relied on DMV (Department of Motor Vehicles) data in order to understand at least at a ZIP code level—maybe a ZIP code plus-four level—where EVs are registered," says Heather Williams, director of strategy and growth for Bidgely in North America. "But that data is really difficult to obtain in a timely manner, it doesn't update on an ongoing basis, and it doesn't provide any insight into the charging behaviors or driving patterns of the EV owners. So there are a lot of limitations."

How would you describe the current quality of your company's insights about EV charging behavior and buyer propensity (i.e., at what times and how long users are charging their EVs, and the likelihood that customers will buy an EV in the future)?

Poor	Fair	Good	Very good	Excellent	Not sure
9%	16%	23%	32%	13%	7%
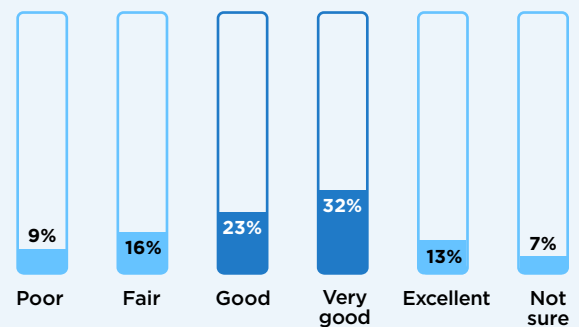
Market research data is another tool utilities use to grasp customer behavior. That, too, has its shortcomings because it reflects an in-depth knowledge of a representative group of customers. The same is true of surveys. "By definition, proxies are always proxies," says Nodzynski. "You never get a precise picture of EV customers. You always get a generic view." Another downside to generalized data about customers: it can't keep up with changes. For instance, COVID-19 dramatically changed charging and driving behaviors. Data based on results gathered in the past won't reflect those changes.

So what are the implications of using generic customer data to guide EV investments and programs? None are particularly appealing. For example, it makes it difficult to engage and educate customers with a high likelihood of purchasing an EV. Imprecise data also makes it challenging to target and effectively market to potential EV buyers, alerting them to beneficial EV rates and demand response programs. As a result, utilities conduct blanketed marketing campaigns to touch as many customers as possible but that generates a high amount of inefficiency in marketing spend. Inadequate data also makes it hard for utilities to accurately forecast EV growth and to plan necessary infrastructure upgrades or build public charging where it's needed.

"It can impact where and how many charging stations are installed," Williams says. "You can end up putting in either the wrong number of chargers or chargers in the wrong locations because the decisions are based on an incomplete understanding of driving patterns."

"By definition, proxies are always proxies. **You never get a precise picture of EV customers.** You always get a generic view."

Wojtek Nodzynski
Strategy and growth manager in Europe, Bidgely

How precise, house-level data benefits utilities and their EV customers

Utilities across North America and the world have the opportunity to quickly develop a deeper understanding of their current and prospective EV customers thanks to investments in advanced metering infrastructure (AMI). A report released last year by Wood Mackenzie Power and Renewables forecast there would be nearly 1.3 billion smart meters producing massive amounts of valuable, household-level customer data by 2025. While some companies promise to leverage household energy consumption data by installing hardware that tracks real-time usage, these devices layer on costs that are unnecessary when utilities have already invested in AMI.

Utilities can apply sophisticated data analytics to the data continuously produced by all of these smart meters to understand the types of appliances and loads, including EVs, a household has and when and how they are operated. At a high level, the use of artificial intelligence to analyze appliance-level energy use is known as energy disaggregation. Not only can disaggregation help utilities know exactly which of their customers are charging an EV and when, it can identify whether they are using a Level 1 or Level 2 charger. Equally important, utilities don't need to install any equipment or conduct surveys of customers to gather these insights.

There [will] be nearly 1.3 billion smart meters producing massive amounts of **valuable, household-level customer data** by 2025.

"AMI global forecast 2020-2025: H1 2020"
Wood Mackenzie Power and Renewables

Not surprisingly, customer knowledge derived through energy disaggregation has many potential utility applications, including improved demand side management programs and ratemaking. For EV investments and programs, this behind-the-meter knowledge can be particularly valuable.

When Bidgely's Williams looks at utility EV investments, she sees four phases, with many companies pursuing more than one phase simultaneously. **One phase is education**; it recognizes that even though many customers might be interested in EVs, their knowledge about how EVs are charged and how they work is limited. **A second phase is awareness about the EVs that are already in their service territory,** which has typically come from DMV data.

A third phase utilities are investing in is all about how to better engage with customers. "This would be about getting them access to infrastructure, like public charging stations, and how you communicate with customers to get them to see their utility as an ongoing partner that provides fuel to their vehicle," says Williams. Utilities have been keen to help customers understand how their EV charging costs can be managed by charging at off-peak times and enrolling more customers in EV rate plans. Doing so helps utilities avoid peaker plants and other peak grid operating costs. **In the fourth phase, utilities can potentially use EV battery storage to improve grid resilience and reliability.**
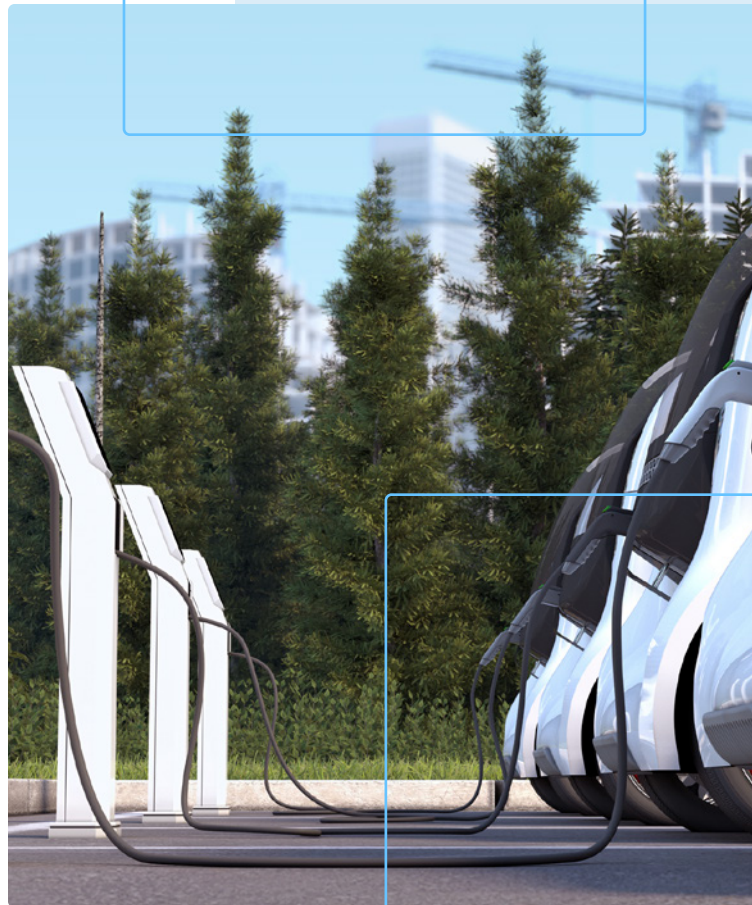
> "[The third phase] would be about getting them access to infrastructure, like public charging stations, and how you communicate with customers to get them to see their utility as an ongoing partner that provides fuel to their vehicle."
>
> **Heather Williams**
> **Director of strategy and growth in North America, Bidgely**

A Netflix-type approach to EV offers

Granular, household-level insights about customer energy use are extraordinarily helpful with each of these phases. For example, take education and engagement of EV drivers. With energy disaggregation, utilities can take a Netflix-type approach to personalizing new rates and demand response offerings because the offers are based on the actual behavior of customers.

"If a utility detects that a customer has an EV and they charge it between 5 p.m. and 6 p.m. every day, that is something they can act on," says Nodzynski. "The utility can engage the customer and point out that they're charging during peak times and that if they shift their charging behavior they can save this much money."
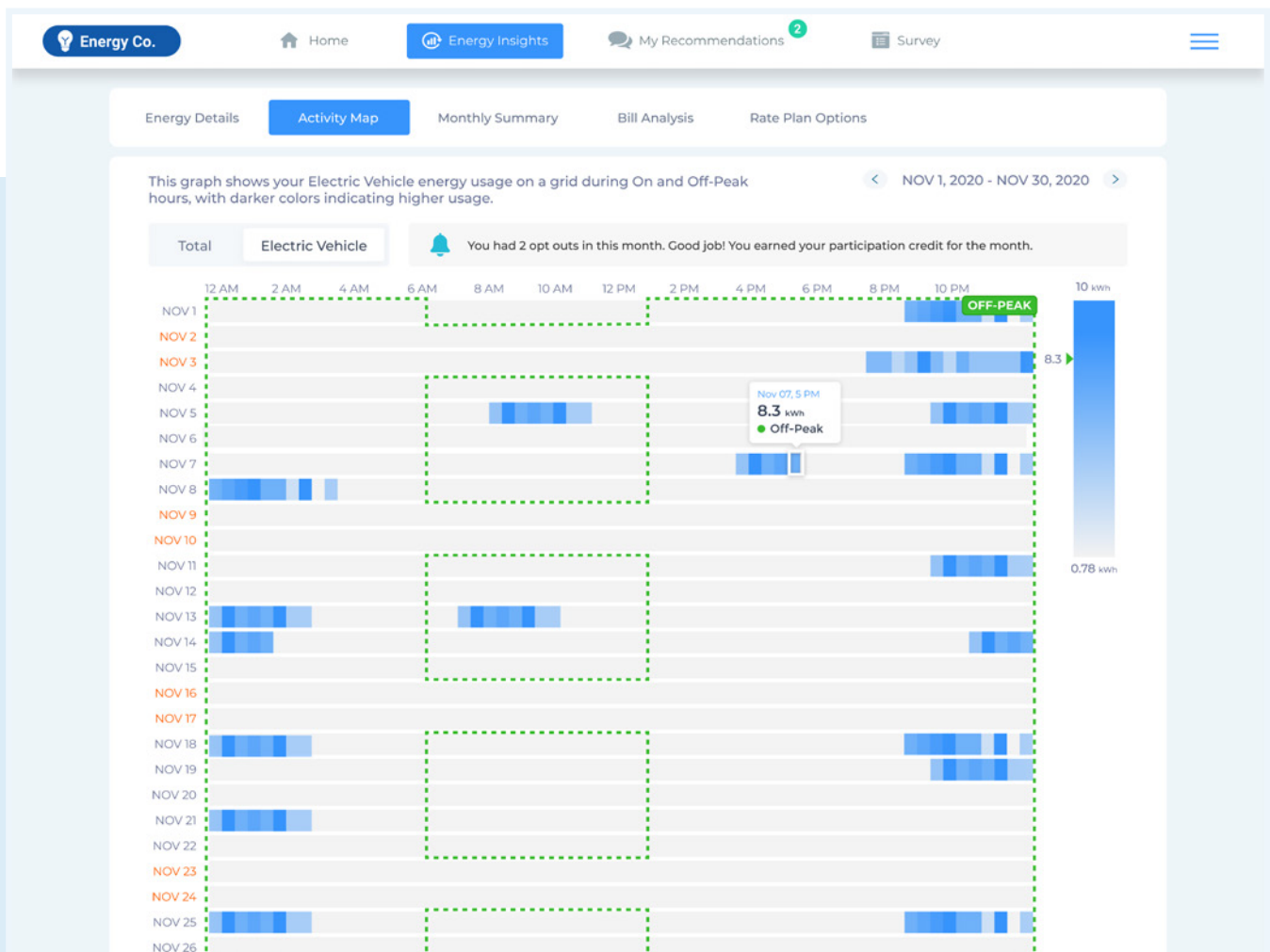
"The utility is not really in the driver's seat today as that key adviser for how customers are making these decisions. Better customer insights can help change that."

Heather Williams
Director of strategy and growth in North America, Bidgely

Precise customer insights also help utilities to optimize their grid load planning and management. One straightforward example: EV charging load insights can be paired with grid planning software to better identify grid capacity challenges. It's not just about identifying potential problems. The information and analysis can also be used to target EV customers with time-of-use (TOU) rates that can shift charging to off-peak hours. Done right, this can help better manage daily system load and potentially delay or remove the need for expensive infrastructure upgrades.

A less obvious benefit that improved customer insights deliver to utilities is to help them become trusted energy advisors to customers—an increasingly important objective as more and more third parties try to disrupt that relationship. For many utilities, the need to

strengthen their relationship with EV customers is particularly consequential.

"Utilities are constantly faced with the challenge of having third-party disruptors trying to take the focus away from the consumer-to-utility relationship and add additional services that disrupt that relationship," Williams says. "There are consequences that the utility is left with when EVs are coming on to the grid. Utilities have to be able to meet the increased demand for electricity and they have an obligation to serve. And so all of the operating costs and downstream implications of EVs coming on the market have to be addressed by the utility. And yet the utility is not really in the driver's seat today as that key adviser for how customers are making these decisions. Better customer insights can help change that."

Here's what that different future could look like. With better data and customer insights, drivers can more easily switch to EVs because they are aware of and have access to EV rebates and programs. Thanks to investments by car manufacturers and governments, this transition can be accelerated. For utilities, better data means EV charging won't be a grid constraint issue because customers know more financially attractive EV rate plans which manage charging so it occurs at off peak times. Knowledge of where EVs are charging on their grid also helps utilities conduct load research and load forecasting, which can increase grid reliability, reduce operating costs and improve grid planning.

Finally, utilities can simultaneously offer greener energy to customers and benefit those customers financially. That happens when customers draw on EV battery storage to offset fossil fuel energy usage during peak times. This benefits the customers financially and it allows utilities to avoid expensive purchases of energy from peaker plants. All of these benefits are made possible by connecting customer actions with utility decisions through data.

Bidgely is an AI-powered SaaS Company accelerating a clean energy future by enabling energy companies and consumers to make data-driven energy-related decisions. Powered by our unique patented technology, Bidgely's UtilityAI™ Platform transforms multiple dimensions of customer data—such as energy consumption, demographic, and interactions—into deeply accurate and actionable consumer energy insights. We leverage these insights to empower each customer with personalized recommendations, tailored to their individual personality and lifestyle, usage attributes, behavioral patterns, purchase propensity, and beyond. From a Distributed Energy Resources (DER) and Grid Edge perspective, whether it is smart thermostats to EV chargers, solar PVs to TOU rate designs and tariffs; UtilityAI™ energy analytics provides deep visibility into generation, consumption for better peak load shaping and grid planning, and delivers targeted recommendations for new value-added products and services. With roots in Silicon Valley, Bidgely has over 17 energy patents, $50M+ in funding, retains 30+ data scientists, and brings a passion for AI to utilities serving residential and commercial customers around the world. For more information, please visit www.bidgely.com or the Bidgely blog at bidgely.com/blog.

LEARN MORE

studio / ID

BY INDUSTRY DIVE

studioID is Industry Dive's global content studio offering brands an ROI rich tool kit: Deep industry expertise, first-party audience insights, an editorial approach to brand storytelling, and targeted distribution capabilities. Our trusted in-house content marketers help brands power insights-fueled content programs that nurture prospects and customers from discovery through to purchase, connecting brand to demand.

LEARN MORE