

# Why Customer Engagement Is Key to Creating the Flexible Grid of the Future

Using technology to improve the consumer's energy experience is key to unlocking gigawatts of flexible load

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**The overarching story of the North American electric grid over the past decade has been its rapid and ongoing evolution to become more distributed, digital and decarbonized.**

In many ways, this seems largely like a technology and public-policy story. But it's also one that is causing utilities to rethink the role that customers will play in this transition toward a grid that is cleaner, increasingly reliable and more flexible than ever before. Put another way, utilities increasingly understand the importance of not viewing customers as meters and instead regarding them as consistent, active and unique individual participants in the grid of the future. For many utilities, this is a profound change, one that underscores the need to engage

individual customers based on their own unique needs and priorities. To actually do that, utilities not only need to understand their customers in ways they haven't before, but they also need to use technology to cater to those very personal needs in order to achieve mass scale load flexibility.

"In the same way that the industry is moving away from thinking of customers as ratepayers and the cash register for the utility, utilities have to expand their understanding of the home, recognizing each home's role in enabling the comfort, productivity and security of its inhabitants in addition to its value as a grid asset," said Maria Woodman, associate vice president, innovation and commercialization for Energy Impact Partners, a strategic

investment company that backs businesses leading the transition to a sustainable energy future.

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**"There's a really strong recognition that if we are going to move to a decarbonized energy future, that is going to necessitate a lot of decentralization where the customer starts to play a more critical role."**

**MARIA WOODMAN,  
ASSOCIATE VICE PRESIDENT,  
INNOVATION AND  
COMMERCIALIZATION FOR  
ENERGY IMPACT PARTNERS**

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# Customer engagement becomes a fundamental utility priority.

The increasingly important role of customers can be seen clearly in how their behavior affects a utility's ability to effectively balance supply and demand. For example, extreme weather events and unplanned outages – such as the heat waves and wildfires across the Western United States in August 2020 – can trigger blackouts when customers are unable to lower demand when generation is limited.

“With the exception of a few price-responsive wholesale demand-response programs today, utilities and energy markets dispatch generation to meet demand. The grid of the future is likely to turn this paradigm upside down, from matching supply to demand to matching demand to supply,” said Jonathan Houle, product marketing manager, ecobee Energy, the smart home and energy management company.



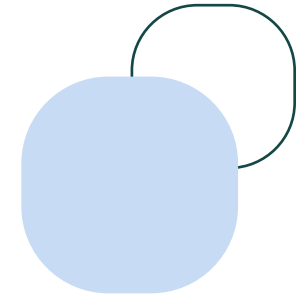
Many utilities and regulators increasingly understand the vital role of consumer participation in creating a flexible grid. But as the need for flexible load grows, utilities will not only be challenged with evolving their program models, but they will also need to refine the measures of program success. Adding to this challenge will be the need to accommodate personalized, unique customer experiences for residential energy customers to ultimately drive distributed energy resource (DER) participation at scale.

“Despite utilities having experience and expertise with demand-side management programs, using the same approach won’t support the transition to a more flexible grid,” said Kari Binley, who worked on energy-efficiency programs at a California utility before joining ecobee Energy as a partnership manager. “There could be instances when utilities want customers to actually increase usage, such as to prevent renewable curtailments. Utilities and regulators will need to change how they value DERs accordingly to support their adoption at scale to truly make a meaningful impact to the grid.”



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# Customer engagement begins with customer understanding.

Although there is a growing recognition about the importance of engaging customers, nobody should assume it is easy. In fact, according to a consumer [survey](#) by consulting company Accenture, the average customer of a regulated U.S. utility spends only nine minutes each year interacting with their energy provider via digital channels and an additional 11 minutes if interacting with a utility representative. The same survey found that 44% of respondents had no interest whatsoever in interacting with their energy provider.

“When they’re procuring these things for the home, energy savings are one of the primary reasons for many consumers to buy one,” EIP’s Woodman said. “But equally important is the convenience of being able to turn the thermostat on and off when they leave for vacation and forget to do it. With batteries, it’s about resiliency and safety and security for their family. The value proposition around energy is important, but in many cases, I do think it’s somewhat secondary to the comfort, safety and security of their home.”

Fully grasping customer priorities and incorporating that knowledge into program design and messaging is essential to any utility effort to leverage customers as a grid resource. Utilities do not yet deliver the personalized messages and offers that customers have come to expect from leaders like Netflix and Amazon, who are shaping the direction that unique, personalized customer experiences are headed across all industries.



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The ultimate objective of improved customer experiences should not be to turn regular people leading busy lives into energy experts.

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# An audience with potential: The Frenzied Family.

Given the increasing importance of personalization and customer focus across the entire economy, the question for utilities is this: How can you innovate in ways that promote greater and sustained customer engagement? One clear answer is to evolve utility program design in a more customer-focused way and to engage with technology providers able to deliver solutions that are, in fact, personalized and customized.

Understanding customers is clearly an important aspect of providing solutions that meet their individual needs and priorities. Which is why ecobee has extensively researched the priorities and attitudes of an audience the company calls “the frenzied family,” a group of consumers with the potential to be instrumental in creating a more flexible grid. As the name indicates, this is a group of about 30 million North American households that are time-crunched and looking for ways to balance the many demands of work and family life.

A key understanding about this audience is their constant struggle to make purchasing decisions or lifestyle changes that free up more time but also align with their values.

“They tend to care for the future of the planet because they have children who will inherit its future,” Houle said. “They are eco-conscious to a degree, but because of their busy lives, they don’t have time to dig into the nitty-gritty details. This segment of the population is primed to help in this transition so long as it’s easy to do and affordable.”



# Meet the Frenzied Family

## AUDIENCE SIZE

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30 million connected families across North America

## HOME OWNERSHIP

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Own a home (or planning to purchase in next 12 months)

## EDUCATION

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College-educated with disposable income

## DEFINING CHARACTERISTICS

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Short on time, saddled with responsibility, want control over their lives (not just their devices), juggling kids' schedules, work, caring for pets, etc.

## AGE

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25-54 years old

## FAMILY

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Married, engaged or living with a partner. They already have kids or are expecting or planning for kids

## TECHNOLOGY FLUENCY

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Average tech adoption speed: not early adopters, but not late to the party. Most own a voice assistant and have started to explore smart home solutions like lighting and thermostats

## HOW THEY MAKE PURCHASING DECISIONS

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No time for research - they're looking for short-cuts, reviews, and reputation to inspire trust/confidence

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# The essential role of automation.

While the frenzied family is a promising demographic, the larger message for utilities is the need to understand their unique set of customers and develop messages and offers that will resonate. Technology offers an important tool for utilities to do just that, especially when it features automation that makes it simple for customers to achieve their unique objectives around financial savings, convenience and sustainability while preserving their comfort.

**Think about it through the lens of a customer.** If a utility has a program that sends messages asking customers to adjust their thermostat during times of peak demand, its success depends on busy customers' acting – often when they are not even in a position to do so.

“If you have your peak hitting at 3 p.m., folks are at work and school, so you’re going to get a small level of participation if all you can do is send a message asking them to turn off their lights, appliances or air conditioners,” Binley said. “If you can automate that, you can get to the next level of the flexible grid because the loads are working in harmony with generation without asking anything of customers.”

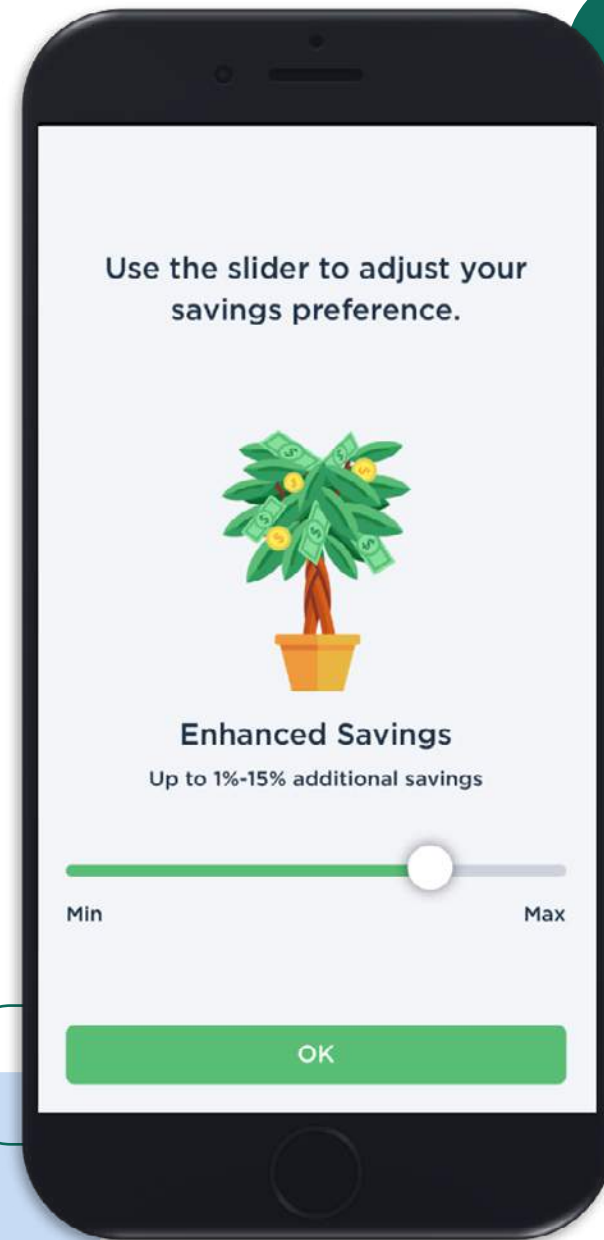


# How eco+ delivers improved personalization and customer engagement.

One example of a technology that enables automation and personalization that benefits customers and utilities is ecobee's eco+ thermostat optimization platform. Initially released to the market in the summer of 2019, eco+ automatically adjusts the performance of residential HVAC systems based on the preferences of individual customers, their daily occupancy patterns, the local weather and pricing signals, all of which help to build a more precise thermal model of a customer's home.

**Personalization is made easy for customers because they have the option to set their own comfort and savings preferences with a sliding scale that can be adjusted and refined whenever a customer chooses.**

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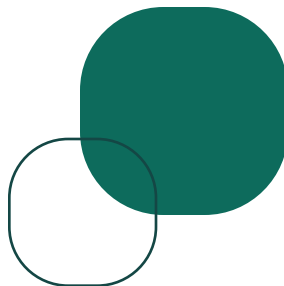


“One of the key insights behind eco+ is that everyone has what I call ‘**comfort flexibility.**’ Some folks like their home at 72 degrees and 40% humidity all day and all night, while others have a large range of temperatures they find comfortable,” Houle said. “eco+ allows customers to configure its savings settings according to their comfort flexibility. For those more flexible customers, we can deliver significant incremental savings.”

For consumers subject to utility time-of-use rates, eco+ can automatically shift energy use away from high-priced periods while still maintaining a customer’s comfort preferences through steps such as pre-cooling homes when prices are low. It also provides an easy way for customers to participate in utility demand-response programs that help mitigate service interruptions by shifting loads away from peak demand.

Having all these features in one automated and customer-driven package helps utilities better engage their customers while providing an integrated solution for their different programs. “What we wanted to do is meet customers where they are and bring them into programs in a way that doesn’t make them feel like they’re giving away control of their devices, their lives and their homes,” Houle said.

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“When customers understand that they don’t have to relinquish control of their comfort, they’re much more likely to participate in utility programs, which enables utilities to engage a broader base of customers.”

**JONATHAN HOULE, PRODUCT MARKETING  
MANAGER, ENERGY AT ECOBEE**

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In fact, since launching eco+ into utility programs in December 2019, ecobee has seen a 150% increase in enrolled thermostats compared to cumulative enrollments from the previous five and a half years.

There is ample evidence that the eco+ feature can help utilities achieve their time-of-use, demand-response and energy-efficiency goals by better engaging their customers. In the summer of 2019, ecobee enlisted a third-party measurement and evaluation company to conduct a randomized trial of 250,000 smart thermostats deployed across a variety of climate zones in the United States and Canada, some of which were outfitted with the eco+ personalization and automation capabilities.

Among the study's [findings](#) were that customers with eco+ enabled enjoyed average incremental energy savings of 6%. Importantly for utilities with time-based pricing, customers equipped with eco+ with time of use optimization enabled reduced their on-peak energy consumption between 13% and 36%. Those customers also enjoyed incremental average bill savings between 8% and 19% compared to those without eco+. The per device demand impacts ranged from 0.10 to 0.25 kilowatts.

These findings from summer 2019 have now been supplemented with additional results from summer 2020 which show persistent savings, even as customers spent more time at home as a result of the COVID-19 pandemic. In 2020, customers using eco+ saw average incremental energy savings of 5%. Customers with eco+ time of use enabled experienced additional bill savings ranging from 7% to 23%, and reduced their on-peak energy consumption by 20% to 33%. The per device demand impacts ranged from 0.25 to 0.46 kilowatts.

The 2019 study also examined a total of 55 demand-response events, which ranged between two and four hours in length during hot weekday afternoons. Results varied by region, but the analysis found an average demand-response savings of about 1 kilowatt per opt-in thermostat across all event hours, and this impact was sustained through summer 2020 as well. None of these events were part of a utility program offering

incentives. This demonstrates that the results were achieved because customers had a genuine desire to save energy and help their community.

A big upside to the use of smart thermostats in reducing peak demand is the simple fact that they are in high demand with customers.



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**A survey by the Smart Energy Consumer Collaborative found that nearly half of respondents (44%) said they were more likely to participate in time-of-use rates if automation technology was included compared to only 7% that would do so without the technology offer.**

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Research from the Brattle Group has also found that the reduction of peak demand possible by combining time-varying rates with an enabling technology such as smart thermostats is 25%, compared with 10% without the technology.

# Personalization and automation in action.

Like other utilities around North America, the Sacramento Municipal Utility District (SMUD) in California has made a shift toward time-of-day (TOD) pricing. For SMUD, the move from tiered pricing, in which rates were determined by the total volume of electricity consumed each month, to TOD pricing was a way to better align rates with the actual cost of providing service to customers.

“Our peak time in summer is between 5 p.m. and 8 p.m., Monday through Friday. During those hours, we pay two or three times more to provide service,” said Karen McCord, a marketing specialist at SMUD. “Switching to time-of-day rates helps manage demand so that we can avoid building new power plants. We also don’t have to buy more expensive energy from sources that may not be environmentally friendly, which is ultimately a cost for the customer. Time-of-day rates also give customers the ability to manage their electricity use and save on their energy bills.”

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Reducing demand at peak times depended on getting customers to take advantage of TOD rates (it wasn't mandatory) and adjust their behavior in ways that had a meaningful effect on the grid. The task of educating and engaging SMUD customers about TOD rates fell to McCord. As a first task, McCord focused on education. Among other efforts, she and the TOD team developed marketing materials to help SMUD customers understand the new TOD rates, particularly when the more expensive peak-demand times are. The team also developed a cost calculator and infographics to clearly illustrate the financial benefits of doing laundry and using their air conditioning during off-peak hours.

While customers would see increased savings on their bills from their behavioral changes, SMUD recognized the potential of automated solutions that would deliver simplicity, convenience and personalization to their customers as they switched to TOD. One of the ways SMUD offered these solutions to customers was via their e-commerce platform, [SMUDEnergyStore.com](https://www.smudenergy.com).

Helen Werner, marketing specialist for the SMUD Energy Store, saw the opportunity to work with ecobee, encouraging customers to use eco+ as an empowering tool to help them gain the greatest benefits from the rate transition.



Werner said she believed that because eco+ allows customers to set their comfort preferences and then automatically responds to TOD pricing signals, it could help mitigate a lot of wariness about the new rate structure.

“It’s a really valuable feature because it addressed initial resistance that TOD would be too complicated and inconvenient, that I’ll never remember to turn down my thermostat,” Werner said. “With automation technology and the ability to set your preferences around the savings you want to earn, we were supporting the assertion that customers have more control and choice than they previously had with tiered rates. Customers have the power to shift their behavior and positively impact their bills.”

By many measures, SMUD has succeeded both in its move to TOD rates and in educating customers about the effect eco+ can have on their bills and experience. As a starting point, about 98% of SMUD customers have now moved to TOD rates. SMUD also saw above-average e-commerce conversion rates on ecobee smart thermostats sold through its online marketplace as a result of highlighting eco+ and time-of-day optimization in its outreach. And, just over one month after launching their marketing of the eco+ solution, they saw a 26% increase in eco+ enrollments, and a 31% increase in customers who enabled the eco+ Time of Use feature on their ecobee smart thermostat.

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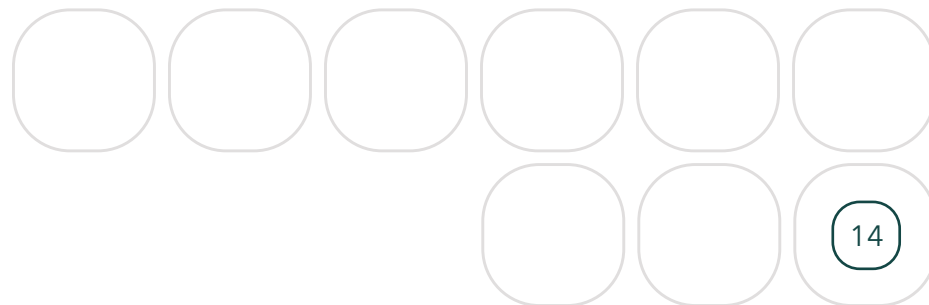
Enlisting customers to help SMUD achieve a reduction in peak demand has been a bigger success than the utility originally imagined. SMUD forecasted their efforts would lead to a peak load reduction of 5.8%. The actual reduction has been 8%.



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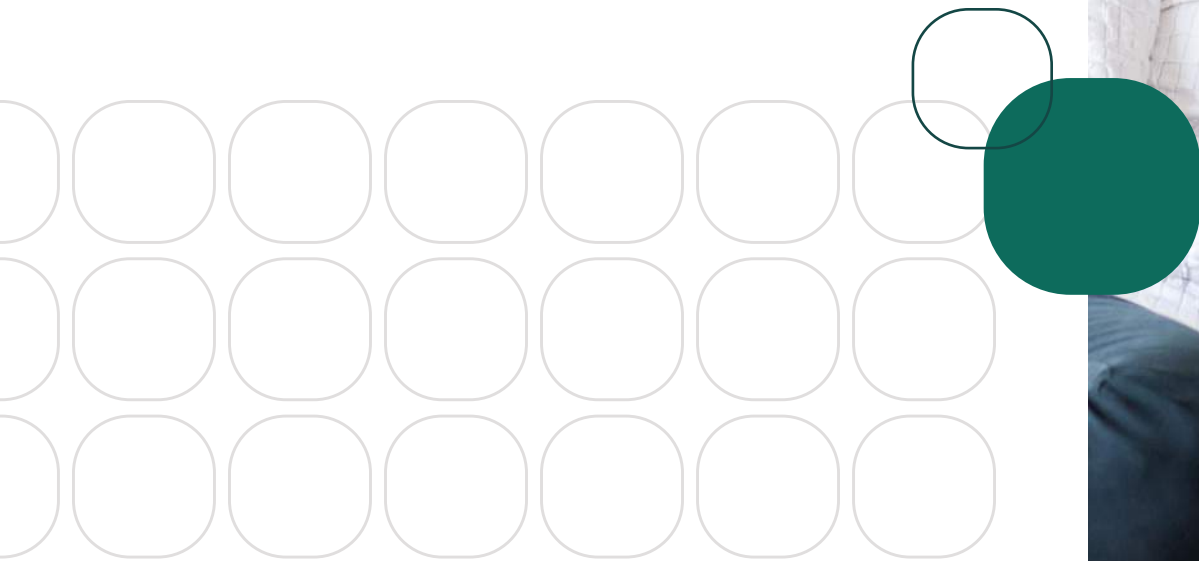
**“We couldn’t do this without our customers,” McCord said. “That is why it’s so important to get them engaged, help them understand why we are doing this and also establish that trust. I was confident we would meet our goals. I just didn’t realize we would exceed them like that.”**

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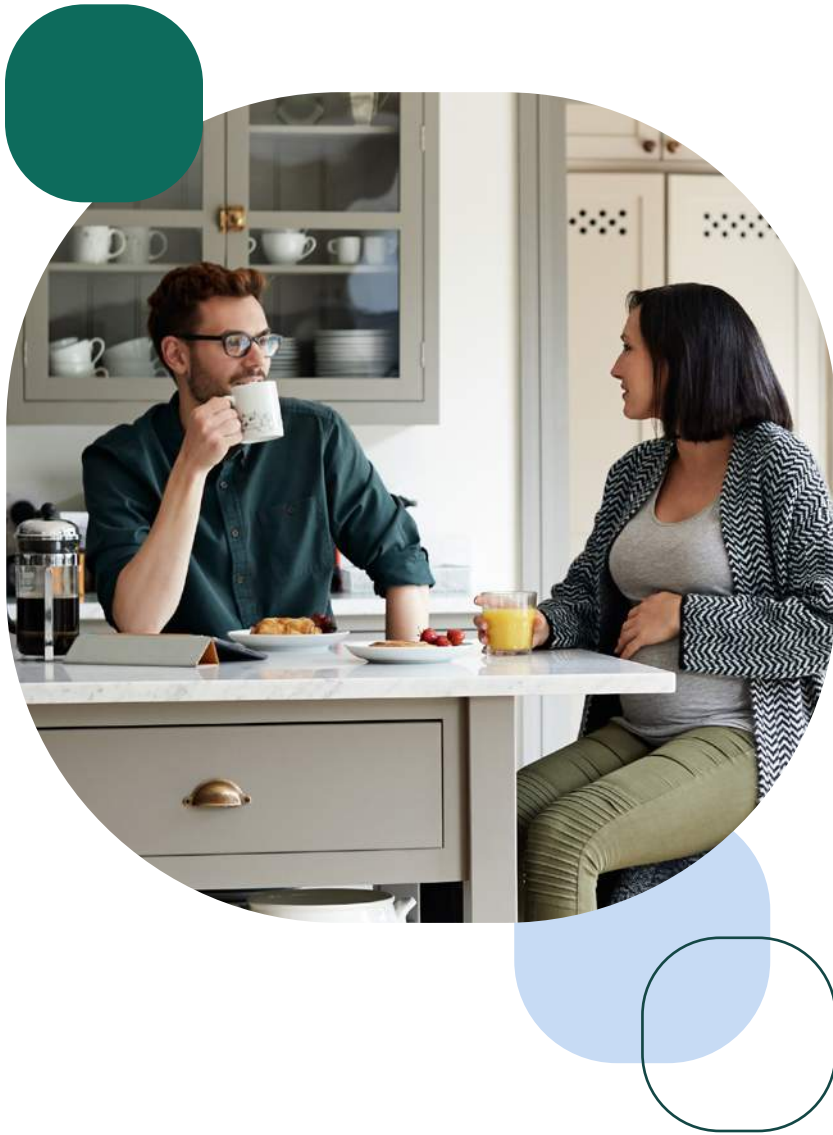


What SMUD has achieved is just one example of the power that engaging customers in a personalized way can have for utilities as they work to create the flexible grid that society increasingly depends on. The potential is massive. In fact, the Brattle Group projects that a portfolio of load-flexibility programs could triple existing demand-response capability by 2030, an amount equal to 20% of system peak.

But to achieve the load flexibility that will be required as the power system becomes more distributed, utilities must understand and cater to the unique priorities and needs of their customers on a massive scale. And key to actually unlocking that potential is **a more robust use of technology that allows utilities to understand and meet the personal needs of all their customers.**



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ecobee's mission is to create smart home solutions that improve everyday life and provide savings for families while creating a more sustainable world. In 2019, the company introduced eco+ which is a set of smart features that allow ecobee thermostats to deliver enhanced comfort and savings. For utilities looking to deliver engaging energy programs, eco+ creates a personalized experience that drives participation and performance, delivers deeper savings and harnesses the power of homes for a clean, flexible and resilient grid of the future through personalized automation.

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