



# The utility customer of the future

Operating an energy platform built for elevated human experiences

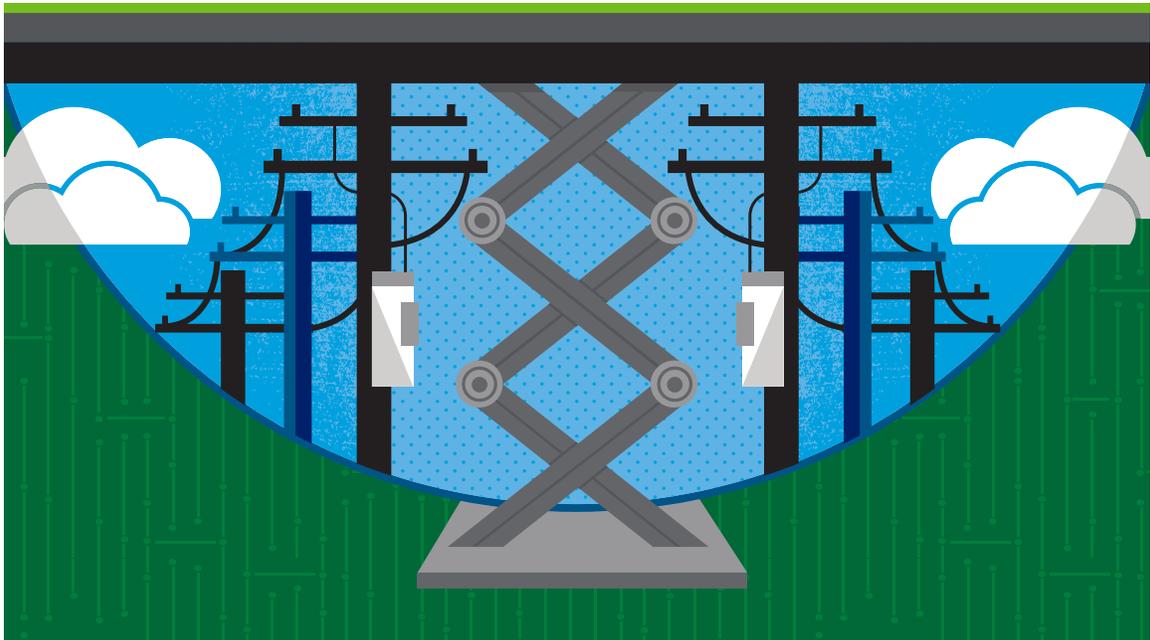
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# Introduction

The stakes have seemingly never been higher for the electric utility to elevate the human experiences of its residential customers. Big technology and other companies have raised the bar, with customers now expecting to be a click, swipe, or voice command away from a seamless and personalized experience. Many have also redefined the customer's role by enabling both the consumption and production of content on their expanding platforms. Some of these companies have set their sights on the data-rich smart home as one of the next frontiers for customer engagement, as have many electric utilities. To maintain and grow its relationship with households, it behooves the utility to meet customers' new expectations and support their evolving role as energy consumers and, increasingly, producers. How can the utility profitably leverage technology to elevate human experiences (see sidebar, "Elevating the human experience") and align home energy management with its operation of an increasingly complex energy platform?



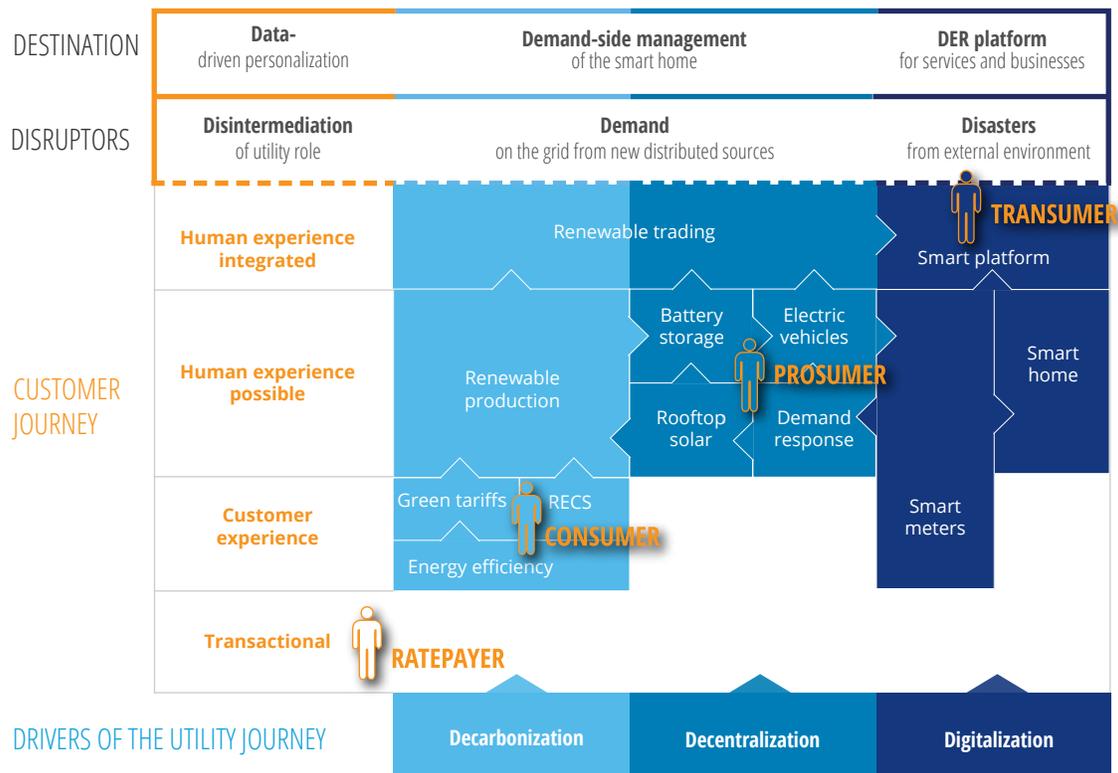
# The 3D framework

Interrelating the customer and utility journeys

OUR ANALYSIS IS structured around a framework that interrelates the customer’s journey with three sets of drivers, disruptors, and destinations that could transform utilities. We call this the 3D framework (figure 1, with additional details in figures 2 and 8).

The customer’s relationship with utilities is evolving as three key industry drivers reshape the power industry and transform customer expectations: **digitalization**, **decentralization**, and **decarbonization**. However, this relationship and the emerging new utility platform face

FIGURE 1  
The 3D framework



Source: Deloitte analysis.

potential disruption related to **demand**, **disintermediation**, and natural or manmade **disasters**. Successful customer engagement can help forestall these disruptors. In order to reach a destination where they are profitably leveraging new technology while enhancing the human experience, utilities should consider three capabilities that build on one another: **data**-driven personalization, customer engagement in demand-side management (**DSM**) of the **smart home**, and a distributed energy resource (**DER**) **platform** for energy services and businesses.

## The customer's journey from ratepayer to transumer, and the pivotal prosumer

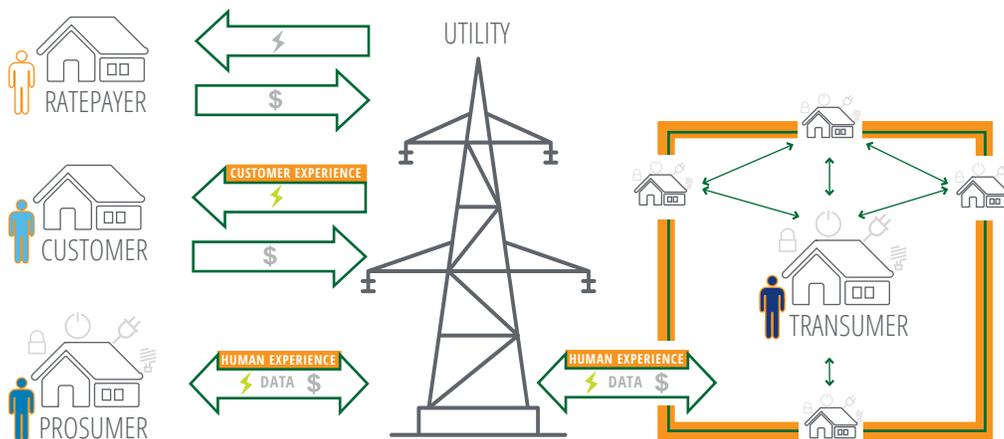
The utility customer's journey typically starts with a unidirectional commodity transaction between **ratepayers** and the utility (figure 2). As energy choice grows and electrons gain attributes such as "greenness" and time-varying rates, utilities can start offering **consumers** a customer experience,

which might not only impact the utility's bottom line and growth opportunities, but could also become a centerpiece in new approaches such as performance-based ratemaking. The most significant development in the journey often occurs when a smart home's resources enable a bidirectional flow of energy and data between the utility and **prosumers**, who both consume and produce electricity. The prospective next stage of this relationship involves the enablement of real-time, peer-to-peer electricity trading to optimize the deployment and monetization of a smart home's solar-plus-storage-plus-electric vehicle (SSEV) system. We refer to participants in these transactive markets, all at the pilot stage, as **transumers**. Of course, not all customers are journeying from ratepayer to transumer. They can still participate in the new electric ecosystem via aggregators, community energy projects, and energy service providers.

While expectations are changing for many customers, they are most rapidly shifting in the growing prosumer segment; that is, customers who

FIGURE 2

### From ratepayer to transumer in a smart home



Source: Deloitte analysis.

are both consumers and producers of electricity. Prosumers typically have rooftop photovoltaic (PV) solar panels, increasingly paired with battery storage, which help power their homes. The installed capacity of residential PV and residential battery storage in the United States are forecast to double, respectively, to 31.8 MW and increase 13-fold to 3.9 MW within the next five years (figure 3).<sup>1</sup>

If households are further able to harness the batteries within the growing number of EVs on US roads as supplemental storage, residential storage capacity could exponentially increase from the current 682 MWh to a combined 63,791 MWh within the next five years (figure 4).<sup>2</sup>

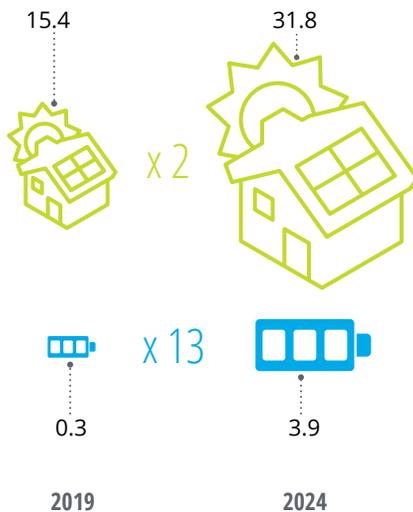
Beginning with prosumers, the wealth of data can enable a more personalized approach, accounting for the different values that people assign to various energy attributes. By connecting these attributes to individual stories during key moments that matter, the utility can deliver elevated human experiences (see sidebar, “Elevating the human experience”).

## The customer’s relationship with utilities is evolving as three key industry drivers reshape the power industry and transform customer expectations: digitalization, decentralization, and decarbonization.

FIGURE 3

### Prosumers in smart homes are a rapidly growing customer segment

Five-year outlook for US installed capacity of residential PV and residential battery storage (in MW)



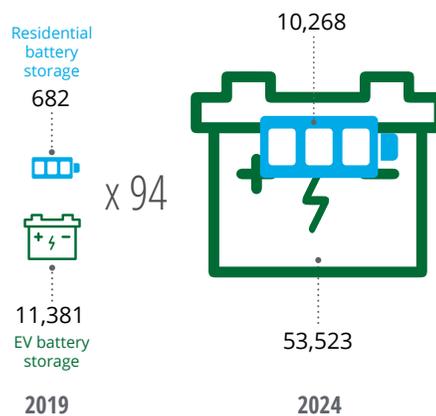
Sources: SEIA & WoodMackenzie, US Solar Market Insights; WoodMackenzie Power & Renewables and Energy Storage Association (ESA), *US energy storage monitor*.

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FIGURE 4

### Harnessing EV batteries exponentially increases residential storage potential

Five-year outlook for US installed capacity of residential battery storage and EV battery capacity (in MWh)



Sources: International Energy Agency (IEA), InsideEVs; WoodMackenzie Power & Renewables and ESA, *US energy storage monitor*; Deloitte analysis.

## ELEVATING THE HUMAN EXPERIENCE

Elevating the human experience (EHX) is about creating a human-centric operating model that is optimized for taking actions that align to the human values (H) of ambition, belonging, curiosity, and control for customers (CX), workforce (EX), and partners (PX). EHX organizations deploy cutting-edge technology to connect, engage, and empower their customers by getting to know them, anticipating their needs, and offering personalized solutions while embracing a shared purpose. They do so during “moments that matter,” that is, during key interactions with the customer that provide opportunities to deepen the relationship. EHX can drive economic value and growth.<sup>3</sup>

$$\text{EHX} = (\text{CX} + \text{EX} + \text{PX})^{\text{H}} @ \text{ Moments that matter} \dots \rightarrow \text{to create connections} \dots \rightarrow \text{that fuel growth}$$

For example, an outage is a key moment that provides an opportunity for utilities to nudge a customer toward residential storage. The utility might cast storage as a self-reliance tool for one customer, while touting the maximization of renewables or savings for environmentally conscious and budget-conscious customers, respectively. And a technologically savvy customer

might appreciate more detailed information on how the system works than others, whom the same information might confuse and dissuade. Other traditional moments that matter include billing and new services. New prosumer moments that matter include the purchase of a smart home system or of an electric vehicle.



## WILL MILLENNIALS BE THE FIRST PREDOMINANTLY PROSUMER GENERATION?

Deloitte annually produces a research study focused on the evolution of the utility industry related to customer relationships and opportunities. The findings of the *Deloitte Resources 2019 Study*<sup>4</sup> show a Millennial generational tipping point for potential prosumers (figure 5).

FIGURE 5

### Generations



**Millennials**  
Ages 21–37



**Gen X**  
Ages 38–53



**Baby boomers**  
Ages 54–68



**Matures**  
Ages 68+

Source: Deloitte Resources 2019 Study survey methodology.

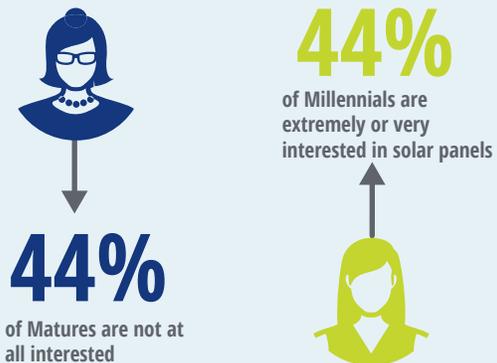
The exact same share (44 percent) of Matures and Millennials are, respectively, not at all interested and extremely or very interested in solar (figure 6). Around a quarter of Boomers fall on each end of the spectrum, while Gen X shares on both ends are exactly in between those of Millennials and Boomers. The share of Millennials interested in electric vehicles (37 percent) is also more than double that of Matures and Boomers (both 18 percent). These results suggest that as Millennials increasingly become heads of households and overtake Boomers as the largest living adult generation in the United States,<sup>5</sup> the number of prosumers may rapidly grow.

Furthermore, at least 50 percent of Millennials are very or extremely motivated by over half of the resourceful activities (figure 7) on which they were surveyed, including the energy management opportunities that smart meters create. By contrast, the only two activities that garner majority Gen X and Boomer interest involve tax credits and rebates. No Mature majorities showed interest in any of the activities.

Millennials appear to offer the greatest generational opportunity for deeper customer engagement around resourceful energy management. However, the study also suggests that their relationship with utilities is relatively weak. While Millennials and Gen Xers are most likely to be open to at least some additional services from electricity providers, customer service is a motivator for only a fifth of Millennials—the lowest share of any generation—suggesting that utilities have the most room for improving their relationship with Millennials.

FIGURE 6

### Millennials and Matures are equally very interested and not interested, respectively, in solar panels



Source: Deloitte Resources 2019 Study.

Cont.

FIGURE 7

### Millennials are most motivated by many resourceful activities

Percentage of respondents who indicated they are very/extremely motivated

	 Millennials	 Gen X	 Baby boomers	 Matures
Tax credits for investing in ways to reduce electric usage	63%	53%	51%	37%
Instant rebates on efficient lightbulbs	57%	54%	51%	45%
Energy management to take advantage of hours when rates are lower	55%	47%	40%	35%
Saving money by utilizing time-of-use rates	52%	47%	40%	35%
National program to reduce energy consumption by 10–15% in next 3–5 years	50%	43%	42%	41%
Home energy audit	48%	41%	37%	40%
Applications showing the most efficient home electricity usage	45%	35%	29%	31%
Saving 15% on bill by agreeing to be “powered off”	44%	31%	27%	19%

Source: Deloitte 2019 Resources Study.

#### TAKEAWAYS FOR UTILITIES ON THE MILLENNIAL PROSUMER TIPPING POINT

- Millennials may usher in a large new wave of prosumers as they become heads of households.
- Millennial targeting could increase enrollment in utility solar, EV, and efficiency programs.
- Elevating the experience of Millennials could boost utility prospects for expansion into additional services.



## The 3D drivers: Decarbonization, decentralization, and digitalization

Aside from expectations that have been set by technology companies, three key industry trends are reshaping the power and utilities sector and transforming customer expectations.

**Decarbonization** is occurring as clean technologies become more competitive with fossil fuels, enabling carbon reduction goals set by organizations, regulators, and, increasingly, companies. Customers expect utilities to support their adoption of renewables with green tariffs and energy efficiency incentives. In addition, prosumers expect support for producing renewables.

**Decentralization** results from connections of rooftop solar, residential storage, and dispatchable demand response to the grid. As prosumers deploy these energy resources behind the meter, they are increasingly expecting incentivized load shifting and facilitated bidirectional transactions and billing.

**Digitalization** refers to the deployment of digital infrastructure, which is creating new data streams. As utilities deploy digital technology on the grid, and customers deploy smart home technologies, expectations are growing for more actionable and real-time home energy data to maximize convenience and savings.

As figure 1 shows, each of these drivers tends to be most salient for different customer segments. Consumers intersect with decarbonization in the form of green tariffs, renewable energy credits (RECs), and energy efficiency. For prosumers, the most salient feature is decentralization as they install SSEV systems. And for transumers, it is

digitalization with the integration of smart meters and smart homes into a smart energy platform.

## The 3D disruptors: Demand, disintermediation, and disasters

Disruptors detrimental to the utility may jeopardize the customer-utility relationship, the decarbonization and decentralization processes, and the digitalization process (figure 8).

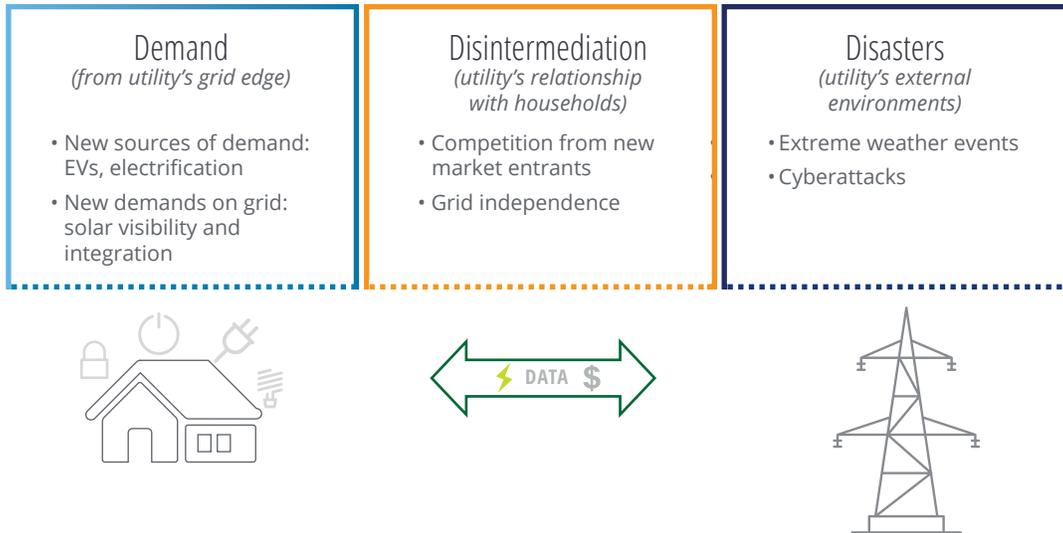
Utilities face **disintermediation** risks in their relationship with customers. If they do not meet expectations, some customers might develop stronger relationships with new entrants competing with utilities to provide energy services. For example, in California, one of the nine states that has authorized community choice aggregation, utilities have already lost millions of customers.<sup>6</sup> Other customers might deploy SSEV systems to seek independence from the grid, diminishing the utility's role and growth opportunities.

Second, the decarbonization and decentralization processes have created new sources of **demand** from and on the grid, requiring customer engagement to help prevent load spikes from EV charging (if a cluster of EVs all charge at once) and to gain greater visibility into, communicate with, and integrate rooftop solar. For example, solar output can destabilize the system if it isn't controlled. The customer relationship is key to ensuring that DER demand from and on the grid is not disruptive, but rather harnessed to create grid assets.

Third, the utility's operations and reputation are at risk from **disasters** in the utility's external environment, such as the growing number of extreme weather events—such as wildfires and

FIGURE 8

## Disruptions related to demand, disintermediation, and disasters



Source: Deloitte analysis.

floods—that further fuel calls for decarbonization and cyberattacks on digital infrastructure, leading to community relations challenges. While some of these external disruptors may be inevitable, whether the utility weathers the storms may hinge on the strength of its relationship with customers and on the human experience provided throughout the disruption.

They can deliver a **data**-driven experience by building analytical capabilities that harness the power of smart meter data to personalize offerings. Personalization could strengthen the utility relationship with customers and thereby minimize the risk of disintermediation.

### The 3D destination: Data, DSM, DER

Strong customer relationships can enable utilities to thrive in a decarbonizing, decentralizing, and digitizing world, and to minimize the occurrence and/or impact of detrimental disruptions. Evolving utilities can profitably meet new residential customer expectations in three ways.

**Strong customer relationships can enable utilities to thrive in a decarbonizing, decentralizing, and digitizing world, and to minimize the occurrence and/or impact of detrimental disruptions.**

A next step could be to engage customers in smart home **DSM** by bringing real-time energy data to customers, communicating via voice assistants, and connecting to customized product bundles from energy marketplaces. This customer engagement could help avoid demand disruption.

Finally, utilities can create a **DER** platform for energy services and businesses that empower customers while creating a self-healing grid that is more resilient to disasters.



# The data-driven human experience

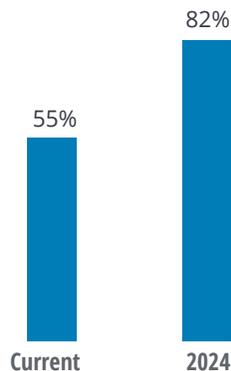
## The utility's digital backbone: Smart meters

A utility's journey to deliver a data-driven experience generally starts with deployment of its digital backbone: smart meters. When integrated with communications and data management, smart meters form an Advanced Metering Infrastructure (AMI) of bidirectional data flows between utilities<sup>7</sup> and their customers, which primarily enhances the customer experience by allowing the utility to more proactively serve households. Over half of the installed meters in the United States are now smart, and over eighty percent are forecast to be smart by 2024 (figure 9).<sup>8</sup>

FIGURE 9

### Smart meters poised to become ubiquitous

Five-year outlook for smart meter penetration



Source: EIA, "Electricity: Annual electric power industry report," October 1, 2019.

Besides providing digital meter readings every 15 minutes (or at even shorter intervals) and on demand, smart meter sensors can collect information on voltage that gives utilities greater visibility into grid equipment health and power quality, in addition to other sensors they have on equipment across the grid. By enabling a more proactive maintenance approach that helps minimize unplanned outages, this visibility offers systemwide benefits to all households. In addition to operational cost savings, the attendant avoidance of truck rolls enabled by remote readings and the greater visibility also dovetail with decarbonization objectives.

The smart-metered majority can enjoy an enhanced customer experience from the greater convenience and lower cost of remote connections and disconnections, and from the greater clarity of billing based on actual versus estimated consumption. The utility can also proactively alert customers to high usage and to outages. Thanks to smart meters' "last gasp" feature signaling lost service at an endpoint, utilities know when households lose and regain power. Rather than react to calls from the 20 percent of customers who call customer service when there is an outage,<sup>9</sup> with the right communication tools, the utility could immediately reach out to most affected customers to inform them of the outage and restoration.

Finally, smart meters more specifically benefit prosumers by validating demand response participation and enabling net metering and new rate structures that improve the economics of residential production and storage. Utilities can

## AMI's greatest value lies in its production of terabytes of data that can yield actionable insights on customer preferences.

also enhance AMI capabilities to support the customer-to-prosumer transition. For example, smart meters can host inverter functions to mitigate grid disruption from high penetrations of rooftop solar production.<sup>10</sup>

### From data to personalization

AMI's greatest value lies in its production of terabytes of data that can yield actionable insights on customer preferences. AMI increases the data points collected from annual reads alone from 12 per meter to 35,040 per meter.<sup>11</sup> However, most utilities barely use this data, and analytics are applied to only 3 percent.<sup>12</sup> When organized into a meter data management system and data lake and/or integrated with a utility's other information systems, such as its geographic information system, outage management system, and customer information system, and with nonenergy information from weather forecasts, census results,

social media, and self-reported customer information, this data can be used to develop highly granular information about each customer. The great challenge is to aggregate all this data from disparate sources into a 360-degree view of the customer, and to contextualize it with more qualitative research such as ethnography, ecosystem maps (visualizations of key stakeholders as they relate to utility customers), and action segmentation (which focuses on customers' behaviors as opposed to demographics). Utilities that succeed in doing so can go beyond recording people's energy usage to understanding their lifestyles, values, and preferred areas and channels of communication, and thus to offering a highly personalized experience. In addition, utilities can offer this experience to non-AMI customers. Energy disaggregation company Bidgely uses artificial intelligence and machine learning to pair customers without smart meters with the profiles of AMI customers who most resemble them, enabling personalization for all utility customers.<sup>13</sup>

#### PERSONALIZING THE EXPERIENCE FOR POTENTIAL PROSUMERS

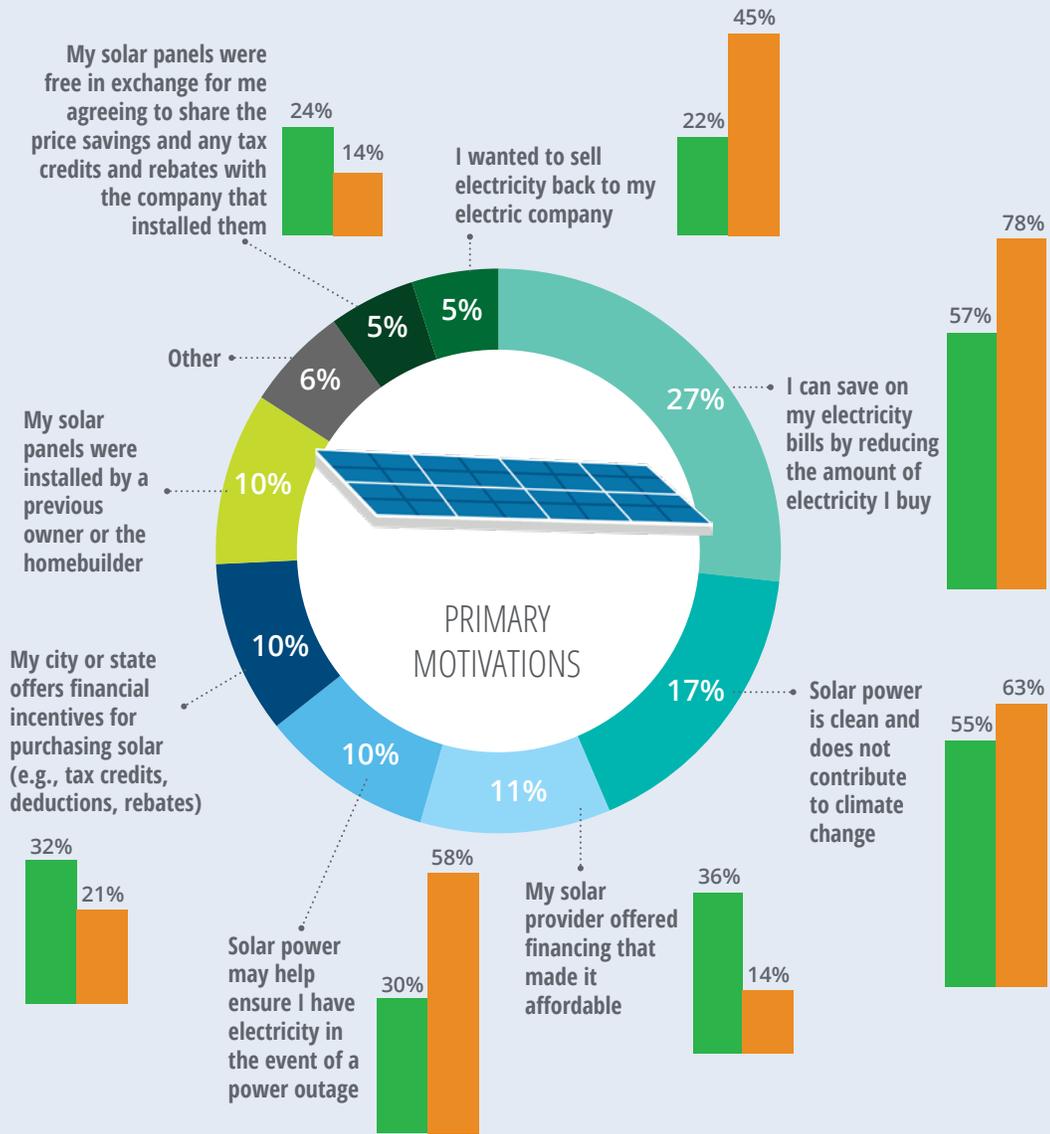
The Deloitte Resources 2019 Study points to a group for whom more targeted approaches drawing on data analytics could elevate the experience: People interested in solar—that is, potential prosumers. Given the aforementioned key role of the consumer-to-prosumer transition in the customer journey, a utility customer's expression of interest in solar is a new moment that matters.

The motivation profile of potential prosumers for installing solar differs from that of people who have already installed solar. Saving on electric bills and carbon emissions were the leading primary and general motivators for people surveyed who have solar. Five other primary and general motivators were relatively equally distributed, including solar provider financing, city or state incentives, free panels in exchange for price sharing, backup power in the event of an outage, and the ability to sell electricity back to the provider. However, respondents who do not have solar but are interested in it are twice as motivated by the last two factors, and significantly less motivated by the three financing factors (figure 10).

FIGURE 10

### Motivations to install solar panels

■ General motivator for people who have solar panels ■ General motivator for people interested in solar



Source: Deloitte 2019 Resources Study.

**THESE FINDINGS OFFER THREE TAKEAWAYS FOR UTILITIES:**

- Potential prosumers are a multimotivated group.
- Their motivations may differ from those of first adopters and are skewed toward emerging transumer interests (residential participation in electric system sales and in resiliency).
- Potential prosumers would benefit from education about solar financing options that people with solar may have only become aware of once they started the process of purchasing panels.

Data analytics could help both in identifying these potential prosumers and personalizing communications aligned with their combination of motivations. Some utilities have already started developing predictive analytics on customers' "propensity to adopt" DER.<sup>14</sup> Others have succeeded in increasing enrollment in their solar programs by associatively mining AMI data to personalize pitches to customers.<sup>15</sup>



# Demand-side management in the smart home

## The customer’s digital interface: The smart home

On the customer side, digitalization is increasing in homes, enabling integration of the smart grid with smart homes. While some smart home segments—such as energy management, comfort and lighting, and smart appliances—are more directly related to energy than others—such as home monitoring and security, and entertainment—they all are of potential interest to utilities (figure 11). Smart devices across the segments are producing more data, communication channels, and markets that the utility can leverage to enhance customer engagement in demand-side management.

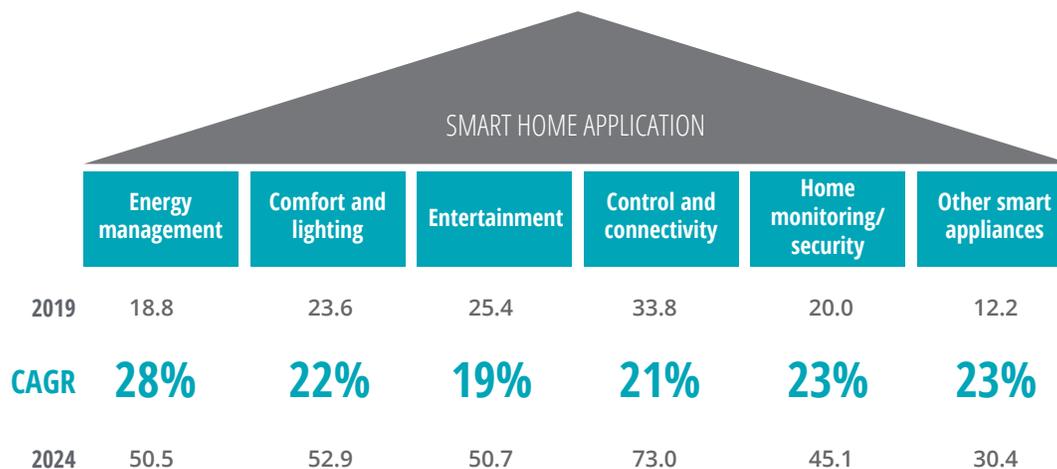
## An energy-focused smart home with personalized DSM

The smart meter–smart home connection can create an energy data-driven ecosystem supportive of customized DSM. Once connected to a Home Area Network (HAN) via a smart hub, the meter can share energy usage data down to the appliance level, creating a real-time data flow between utilities and customers. Utilities could build on this exchange to engage customers in an energy-focused smart home platform. For example, home energy management company Powerley has created a hub around a visualization of real-time usage and costs that customers can easily access using a

FIGURE 11

### Smart homes are projected to move beyond early adopter stage to becoming mainstream

Millions of active US households



Source: Statista, “Smart home,” accessed January 13, 2020; Deloitte analysis.

smartphone app.<sup>16</sup> The platform can communicate with all smart home protocols to connect with the home's smart appliances, manage them from the platform, and automate usage based on time-of-use rates and customer preferences. It continuously engages customers via personalized energy coaching, gamification, and incentivized invitations to participate in peak demand events. The platform is also utility-branded, forestalling the risk of disintermediation. A limitation to the growth of this type of platform, however, is that it's estimated only an eighth of smart meters are currently equipped with a HAN gateway.<sup>17</sup>

As is the case with AMI, demand-side management of smart homes benefits all utility customers but engages prosumers most. Peak-time rebates and critical peak pricing allow prosumers to save on their bill by reducing load during peak periods. And by shaving and shifting peak residential loads, smart home DSM helps achieve system cost savings that can be redeployed to further enhance the experience of all customers. While longstanding air conditioning switch programs also shape load, programs harnessing smart appliances such as smart thermostats and grid-interactive water heaters provide both utilities and prosumers with visibility into and proactive control over demand and dispatchability. Prosumer engagement has even helped redefine the attributes of DSM electrons in alignment with decarbonization goals: It now matters what type of generation DSM is modulating. While DSM has traditionally focused on reducing demand or shifting usage to reduce peak demand, some prosumers see it as a tool to maximize demand for renewables or help integrate more renewables into the grid by shifting demand to times of excess wind and solar output. In this case, connecting demand response to a prosumer's values surrounding climate activism might be more powerful than monetary incentives in encouraging DSM participation.

## Voice-assisted DSM

Next, smart homes offer a new channel for enhanced DSM engagement: Voice Assistant Devices (VADs). Mail, phone, and in-person communication have long been hallmarks of utility communication, and utilities are lagging other customer-facing industries in the digital experience they provide to customers on their websites, apps, social media, emails, chats, and text messages;<sup>18</sup> VADs provide a leapfrog opportunity. Amazon's Alexa and Google's Home Assistant virtual assistants are the hubs of most smart homes. Over a fifth of US adults owns a smart speaker, and most of them use it daily.<sup>19</sup> VADs are also being directly integrated into energy products, such as smart thermostats, light switches, and big appliances such as refrigerators. Amazon recently announced a partnership with Paymentus, which services bills for 700 utilities, to allow customers to receive bill

## Prosumer engagement has even helped redefine the attributes of DSM electrons in alignment with decarbonization goals.

notifications, pay bills, and compare them by voice.<sup>20</sup> However, the function disintermediates the utility to the extent that billing questions addressed to Alexa do not mention the utility brand (i.e., the question is "Alexa, what is my current electric bill?"). Some utilities have started developing basic VAD capabilities in partnership with Amazon and/or Google that maintain a relationship to the utility (i.e., "Alexa, ask PSE&G what my current bill is?"). Other offered skills include scheduling appointments, outage status updates, and energy-saving tips.<sup>21</sup> While these tips remain generic, home energy management company Uplight and Indiana Michigan Power have started developing more personalized tips using next-gen voice

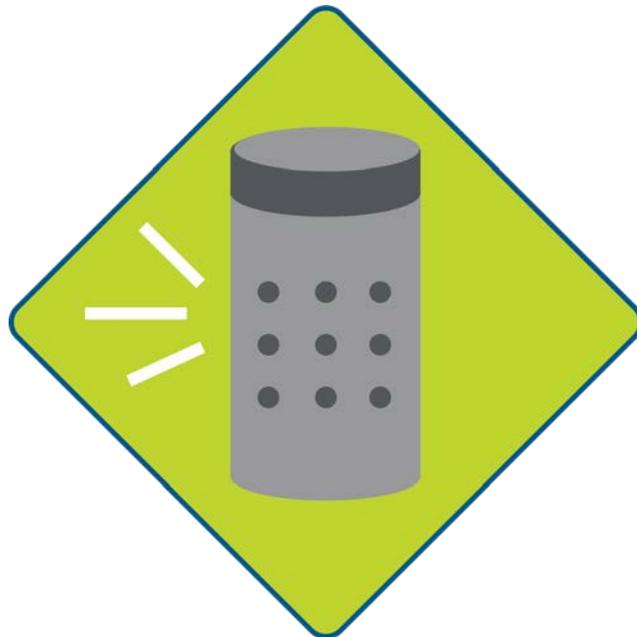
assistants featuring screens to interactively educate customers about their usage and DSM options, and many others are planning similar functions.

According to the SEPA utility survey, over half of the utilities are either interested, planning, or piloting the integration of voice-enabled smart home devices into their existing or new demand response programs.<sup>22</sup> Future applications for enhanced customer engagement might enable enrollment in demand-response programs and purchases from utility marketplaces via voice.

## Marketplaces to equip the smart home for DSM

Utilities have developed marketplaces for smart appliances that engage customers in smart home DSM. Eight of the 10 largest investor-owned utilities (IOUs)<sup>23</sup> offer an energy marketplace that

gives their customers the ability to buy energy-related products directly and/or compare and review energy-related products on an online website. Thermostats and lighting are the most offered products. The marketplaces give customers the freedom to select their preferred devices and enhance the experience by providing instant rebates. Some also provide thermostats preprogrammed for demand response and bundled with a customized rate. Within six months of its deployment, Xcel Energy's Store drove most of the utility's enrollments in demand response programs for smart thermostats.<sup>24</sup> However, the marketplaces do not yet meet the new bar for customer experience. Of the seven IOUs that allow their customers to directly buy energy-related products, none provide experiences many have become accustomed to, such as free two-day shipping or a "one-click buy." Further, the marketplaces are not accessible via mobile apps.



# A DER platform for energy services and businesses

## Platform orchestration

Utilities seem best positioned to integrate the grid's heterogeneous energy resources, data sources, and third-party players into an interoperable DER platform that can elevate the human experience. This platform would have two dimensions. The first is an energy-as-a-service platform where utilities could play the role of an aggregator by creating an open platform that customers and third parties could plug into. For example, utilities could aggregate residential thermostats and EV batteries, on their own or in partnership with a third party, to enable prosumer participation in wholesale markets. The second would be an energy-as-a-business platform that allows customers and third parties to create their own energy-related businesses. For example, PG&E has created a Pay-for-Performance program based on smart meter data, wherein vendors provide tailored DSM solutions to customers and do so at a lower cost than the utility's existing programs.<sup>25</sup>

## Platform monetization

Utilities could create and sell services by leveraging data and insights from these platforms.

Interoperability requires sharing of basic energy usage data with customers and authorized third parties in standardized digital formats, as utilities are doing through the Green Button initiative.<sup>26</sup> However, utilities can monetize the value-added data they create from their analytics. They would need to work with regulators to determine the controls and opportunities in this area, as most

states have not clearly defined data access regulations.<sup>27</sup> Some regulators, such as the New York Public Service Commission, would like to see utilities develop a new revenue source by selling value-added usage data to DER providers.<sup>28</sup> Utilities can also monetize the data-aggregating platforms they create. A utility developed the aforementioned Powerley platform in partnership with a startup and is now selling it to other utilities. Other opportunities include expanding marketplaces to other smart home products and services, capitalizing on the utility's role as a trusted advisor. For example, Exelon is positioning itself as an EV advisor, and Duke has developed a contractor referral program that generates revenue.<sup>29</sup>

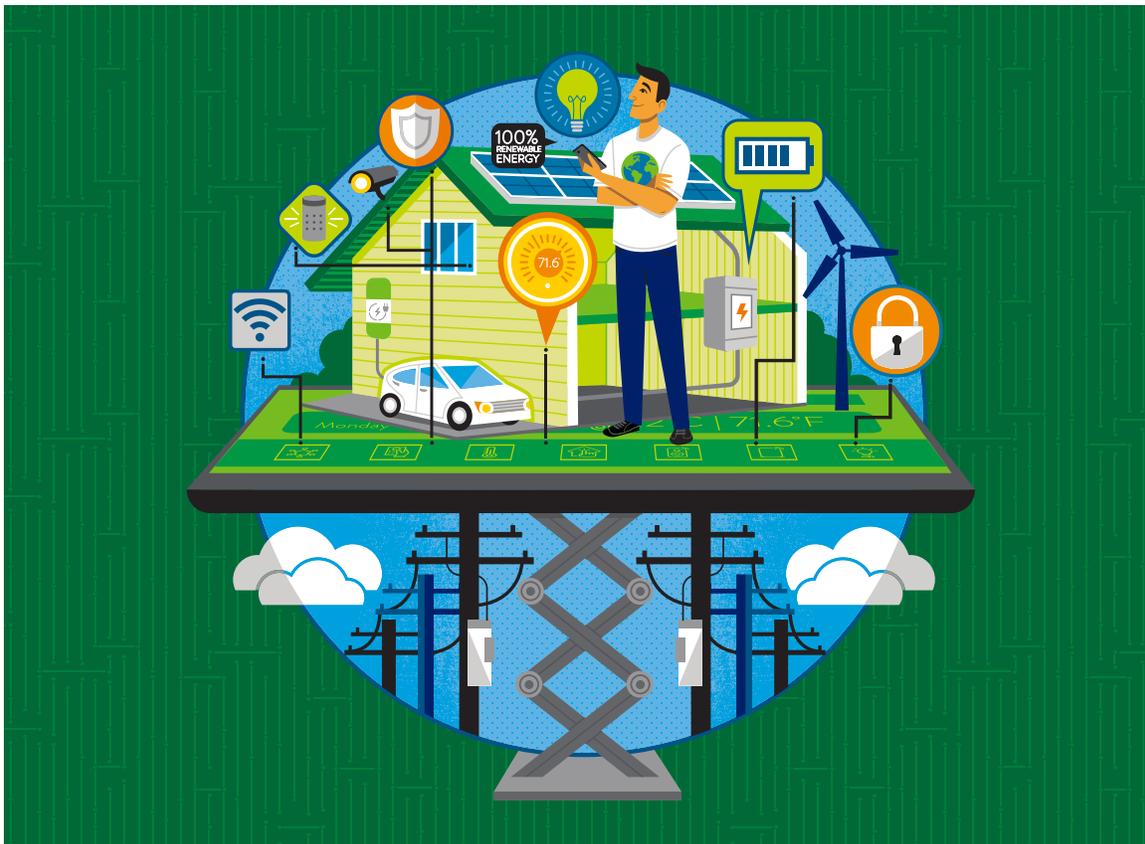
## Expanding the platform beyond residential energy

The utility platform would not need to be limited to residential energy. Utilities could provide non-energy-related services such as a home monitoring service for the elderly or ill that alerts caretakers of irregular energy usage routines. The platform would also allow utilities to explore new services at the intersection of the residential and business customer experiences. For example, some businesses are seeking to go beyond 100 percent renewable and decarbonization targets by assessing the footprint of their supply chain and workers. These businesses might work with a utility to extend initiatives to employee homes through customized green energy and EV programs.

# Conclusion

IN AN INDUSTRY where digitalization, decentralization, and decarbonization are reshaping customer expectations, while utilities contend with a new confluence of three types of potentially costly disruptions related to demand, disintermediation, and disasters, a path exists to profitably leverage new technology while elevating human experiences. First, utilities can deliver a data-driven experience by building analytical capabilities that harness the power of smart meter data to personalize their offerings. Second, they can engage customers in smart home DSM by bringing real-time energy data to customers, communicating

via voice assistants, and connecting to customized product bundles from energy marketplaces. Finally, utilities can create a DER platform for energy services and businesses. While these developments could benefit all customers, they would most enable and be enabled by prosumers. The platform play is not an incremental change and may not be comfortable for utilities at first. But they can start small with pilots and bring along their ecosystem partners to help pave the way to a smart energy platform that seamlessly integrates the smart grid and smart homes.



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