



# Home Energy Management: Driving Consumer Engagement and New Revenue





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Energy management programs and smart energy solutions can deliver immediate cost benefits to consumers, but the energy industry has generally been unable to find solutions that trigger widespread engagement among their customer base.

Utilities have tried different strategies over the years to engage consumers, including a range of energy efficiency (EE) programs that leverage smart thermostats and smart meter data to deliver energy and cost savings. Despite these efforts, a large percentage of consumers still do not engage with home energy management solutions.

A variety of factors influence whether or not consumers adopt and use a specific solution, including ease of use and timeliness of information. Utilities must adopt new strategies that can account and adjust for these varying factors.

To achieve the capabilities and functionality needed, utilities can leverage the expanding presence of connected assets in the home, such as smart thermostats, smart lighting, and smart plugs, to develop a comprehensive digital strategy that improves adoption of their energy management programs and expands their offerings to generate additional revenue.



# Consumer Energy Management Behaviors

Consumer energy management behaviors in the US vary broadly, often impacted by energy costs and regulations in a given region. Parks Associates segments consumers into three main categories based on the type and extensiveness of the energy actions they are willing to take. These include **mindful actions, home improvement actions, and extreme measures.**



## Mindful Actions

“Mindful Actions” are behavioral ways of reducing energy. Mindful actions include adjusting thermostats when away from home in ways that save energy, switching out light bulbs to those that save more energy, and turning off lights when rooms are not in use. Mindful energy-saving actions are the most common among US households, with approximately 84% of consumers reporting performing at least one of these actions over the past 12 months.

## Home Improvements

“Home Improvements” involve minor home improvements such as adding caulking to doors and windows, purchasing energy-efficient appliances or HVAC systems, and increasing insulation in the home. For the past three years, roughly one-third of US consumers have taken home improvement measures to save energy.



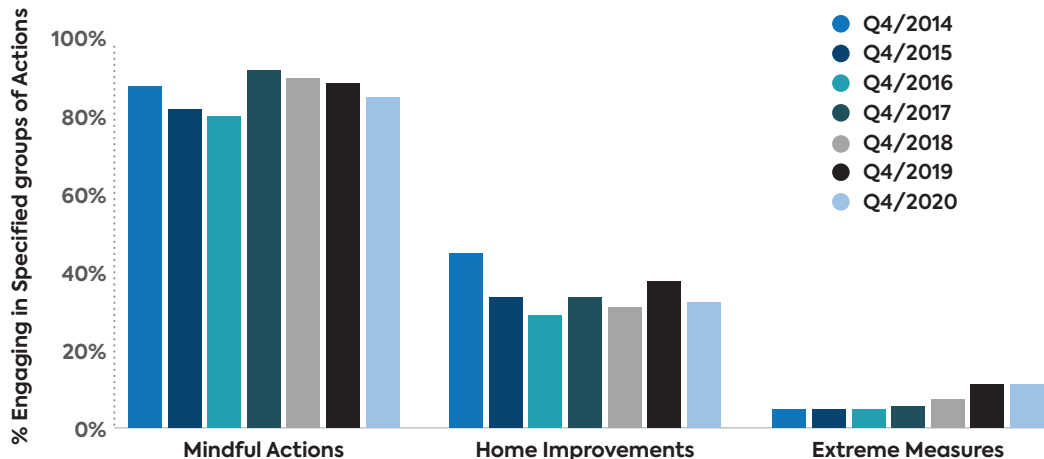
## Extreme Measures

“Extreme Measures” are major home improvements such as installing rooftop solar panels and installing a variable speed pool pump. In the last three years, consumers who take extreme measures have risen to 10%.

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There is growing interest from consumers in saving energy, particularly with extreme measures.

**Energy-Saving Actions**  
Among US Broadband Households Surveyed



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# Participation in Utility Energy Management Programs

Over the past few years, utilities have developed different programs that incentivize customers to participate in energy management programs, ranging from “light-touch” informational services to more elaborate programs that control equipment inside the house.

Informational services provide consumers with insight on their energy consumption patterns, giving them the opportunity to make changes that save energy. However, historically they often have not been able to discern the available actions to them in order to effect change.

Thirty-one percent of US broadband households report receiving a daily breakdown of the energy use from their energy provider. Among these consumers, only 7% review these insights daily (2% of all broadband households). The majority (62%) review them only on a monthly basis. These actions convey a general lack of enthusiasm about energy data.

**In general, the informational approach to date has not provided actionable insights or tangible results among energy consumers.**

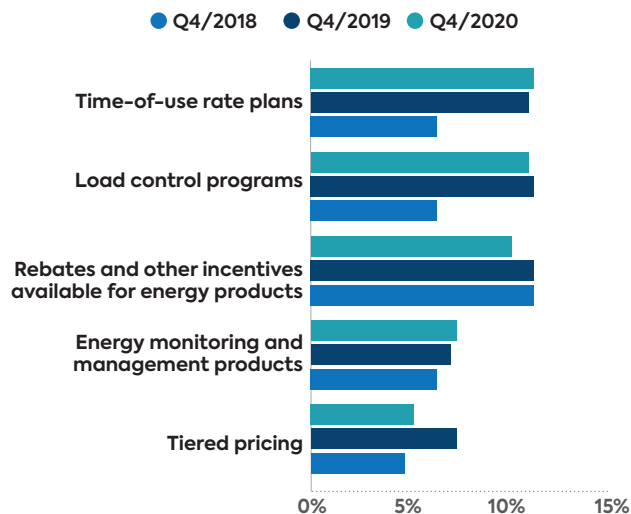
As energy management solutions evolve, programs that involve adoption and use of smart home devices, such as smart thermostats, can leverage built-in algorithms, providing automatic recommendations to consumers to modify their energy usage, which minimize unnecessary energy consumption throughout the home and aid the consumer in saving money.

Energy providers have also offered demand response (load control) programs and time-of-use rate plans, which incentivize consumers to move energy consumption away from peak periods, along with offering rebates for EE products and providing tiered price options. However, only a small minority (approximately 10%) of broadband households report adopting these different services offered.

**33% of US broadband households report that they are not sure whether they receive daily information about their energy use.**

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**Adoption of Energy Programs**  
Among US Broadband Households Surveyed



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# Consumer Motivation for Energy Management

Despite their lack of historical engagement with energy management solutions, consumers have pain points that can motivate them to participate in energy-saving actions, provided solution providers can design their offerings to meet these needs.

## Saving Money

While energy bills are somewhat predictable throughout most of the year, extreme weather conditions at the peak of summer and winter seasons can cause fluctuations in energy bills, leading to bill shock. Most consumers would prefer to avoid these unpredictable costs.

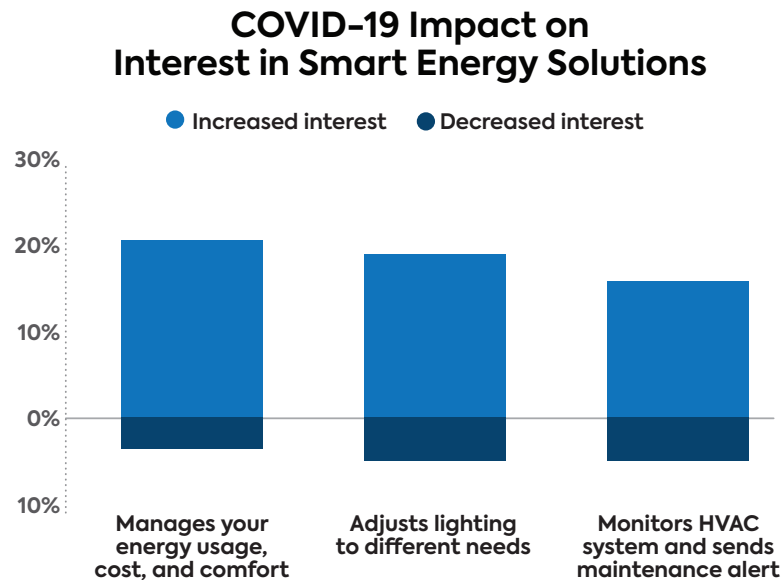
**Combining increased residential energy consumption with the negative impact on personal finances gives consumers added incentive to reduce energy usage.**

In addition, the impact of COVID-19 on consumers' lifestyles, work, schooling, and transportation patterns has been immense. Consumers have spent more time at home over the past year, driving up residential energy use and bills.

As such, 29% of consumers reported being "very concerned" with their ability to pay their bills as of September 2020 — a percentage which increased as the pandemic continued on.

**20% of US broadband households report that COVID-19 has increased their interest in smart energy solutions that can help them manage their energy use, cost, and comfort.**

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## Minimizing Carbon Footprint

Protecting the environment is gradually becoming a stronger factor in driving consumers to reduce their energy consumption and seek clean-energy alternatives. Some consumers will seek out clean-energy solutions on their own, but to drive wider adoption, utility solutions need to make these options convenient to find and painless to adopt.

## Increase in Electric Vehicle (EV) Adoption

Adoption of electric vehicles (EVs) increased by more than 100% from 2018 to 2019. Given the high impact of EVs on home energy consumption, growth in EV ownership could spark an increase in the need for home energy management solutions. Research has shown that EV owners are more likely to take extreme energy saving actions in the homes than consumers who only take minor actions to save energy. Forty-one percent of EV owners take extreme measures to conserve energy, compared to only 10% of the average broadband household.

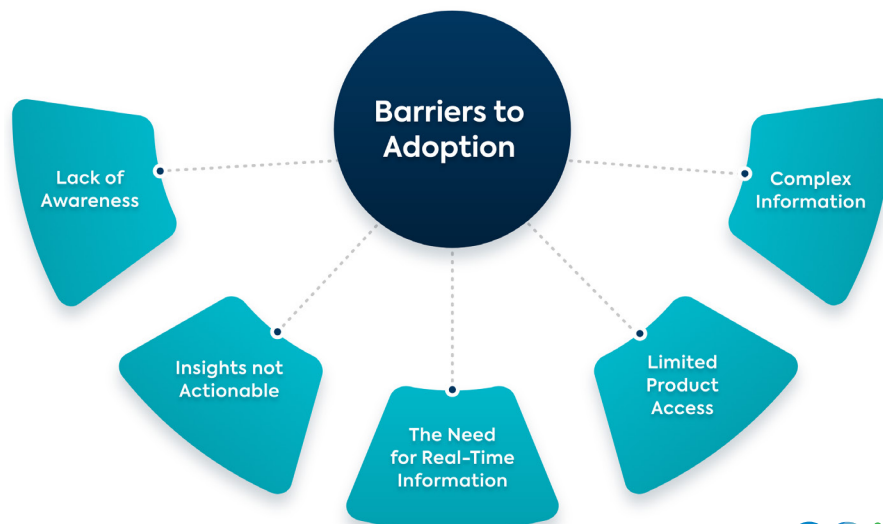
**21% of US broadband households report that the ability to reduce their home's contribution to air pollution and overall carbon footprint would increase their likelihood of investing in a solar panel.**

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## Barriers to Engagement and Participation in Energy Management Programs

Lack of awareness remains a challenge for adoption of utility energy management efforts. **Only one-half of households report awareness of at least one energy management program offered by their energy provider.** Beyond lack of awareness, several other factors serve as barriers to program participation.





Consumers have different motivations for saving energy, including saving money, protecting the environment, or promoting energy resilience. Regardless of their motivation, consumers must feel that the outcome is worth the effort. If consumers feel like their efforts are not worth the savings or that their actions are not making enough of an impact on the environment or the grid, then they will lose the motivation to participate.

**Information too complex** – Information overload or information presented in ways that are not easily comprehensible increases the level of effort required to save energy and can cause consumers to lose interest.



**28% of US broadband households report that an easy-to-understand energy bill is the most valuable tool for managing household energy use and cost.**

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**Little actionable insight** – Many times information provided to consumers about energy consumption is disaggregated breakdowns that show how much energy different products within the home have consumed throughout the month. While these insights can help consumers understand what products within the home are using the most energy, they do not facilitate effective behavioral change.

For example, monthly energy bill insights indicate that the HVAC system uses a substantial amount of energy in the home. However, consumers may not understand what to do with this information — for example, how precooling a home before the temperature rises can save energy.

**The need for timely information** – A lack of real-time information can also make energy insights less valuable. A bill at the end of the month showing that a household's HVAC system has used an unusual amount of energy that month is useful. However, an alert earlier in the month that allows the consumer to address the inefficiencies causing their HVAC system to use excess energy would have been more useful.

**Limited access to advanced energy devices** – Some energy management solutions, like those involving the use of smart home devices, may not be accessible to everyone, especially as many smart home devices have not yet reached mass-market penetration.



**However, there are signs that, as the US comes out of the COVID-19 pandemic, adoption of smart home devices overall will ramp up, with more than 40% of US broadband households planning to buy at least one device in the next six months.**

Growing interest and adoption of smart home devices are among several factors creating new opportunities for utilities that develop digital strategies to expand their energy programs.

# Impact of Digital Strategies

New digital strategies can help overcome the barriers noted in the previous section.

Digital strategies involve leveraging connected devices throughout the home as well as tapping into smart meter data to help consumers monitor and manage their energy consumption. They also benefit utilities by improving the effectiveness of their energy management efforts, driving adoption of utility energy management programs, and creating opportunities for incremental revenue by connecting new products and services to the energy account.

This number includes an average of 2.6 smart home devices. Smart home devices with strong have energy management applications, such as smart thermostats, light bulbs, smart plugs, and smart appliances, have gained traction in broadband households. Approximately 13% of US broadband households have a smart thermostat, 11% own a smart light bulb, 9% own smart plugs, and 13% own at least one smart major appliance.

## US broadband households now have an average of 14 connected devices, up from 9.2 in 2016.

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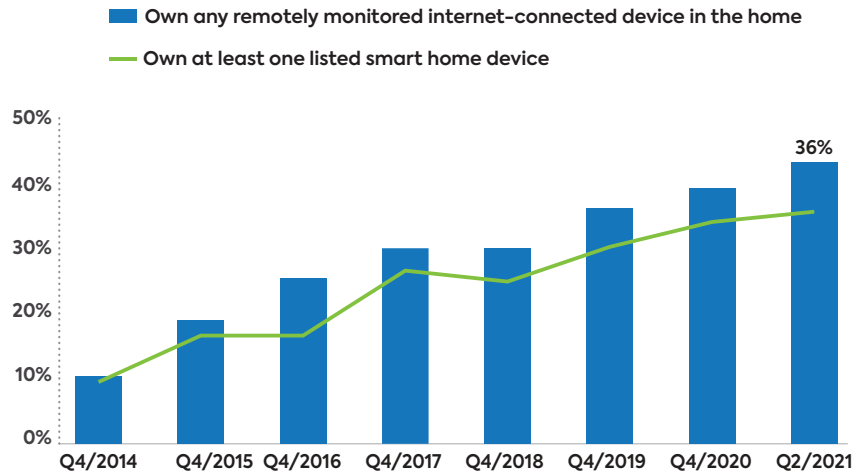
### Smart Home Current Adoption



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## Smart Home Device Ownership



- Smart Home Devices Surveyed (Q2 2021)
- Thermostats
  - Door Locks
  - Video Door Bells
  - IP Cameras
  - Light Bulbs
  - Lighting Control Systems
  - Outdoor Light Fixtures with Video Cameras
  - Outlets/Switches/Dimmers
  - Smart Plugs/Adapters
  - Sprinkler Systems
  - Garage Door Openers
  - Smoke/CO Detectors
  - Water Leak Detectors
  - Water Shut off Valve
  - Robotic Vacuum Cleaner
  - Smart Appliances

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The presence of these devices alongside smart meters can provide a wealth of energy-related data that inform new use cases for cost savings, conservation, convenience, and more. While energy providers are increasingly using smart meter data to provide a breakdown of energy consumption to consumers, much of this communication is done through monthly energy bills.

Expanding this informational pipeline to digital application-based communication can drive even greater engagement. While nearly one-half of surveyed consumers prefer to receive information through a monthly energy bill, one-quarter prefer to receive this information using a mobile app. Furthermore, as more utilities provide customers with mobile apps, consumer use of these digital platforms will likely increase.

**Providing more options will ultimately engage more consumers.**

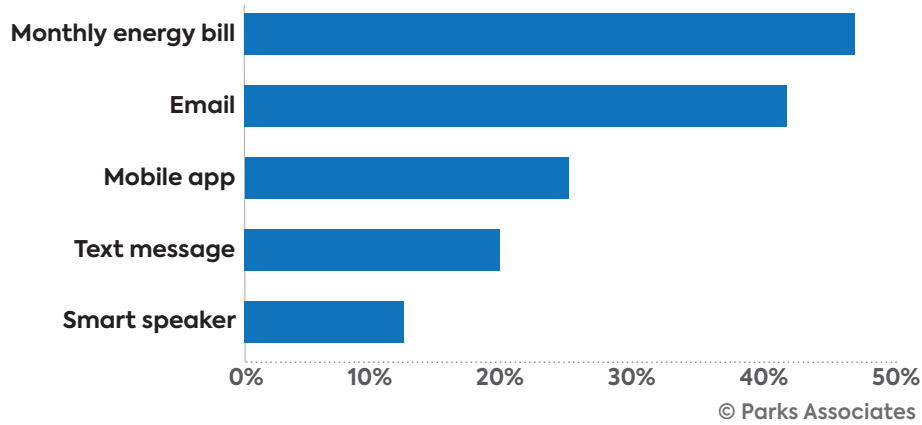
**Delivering these energy-data insights weekly by email helps utilities to engage consumers more frequently with insights that can help save energy.**

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## Preferred Method of Receiving Energy-Saving Insights

Among US Broadband Households with Energy Tracking Service Offered by the Service Provider



## Digital Consumer Engagement: Energy Data

The energy data and insights provided by different energy providers vary by frequency and granularity. At the basic level, energy data services communicate the amount of energy consumed at different intervals, but there are many enhanced features that can be included:

- **Personalized recommendations** – Combines data from a number of sources and creates personalized recommendations for consumers to curtail energy consumption.
- **Alerts** – Provides proactive notifications to consumers about high energy use to minimize cases of bill shock.
- **Progress tracking** – Keeps consumers engaged by tracking their progress with implementing energy efficiency recommendations.
- **Social engagement** – Provides consumers with a scorecard that compares their energy efficiency to that of their neighbors.
- **Gamification** – Includes points and rewards programs that drive consumers to take certain energy-saving actions, which may also include enrolling in utility programs and signing up for home audits.





## Digital Consumer Engagement: Smart Home Devices

When included in energy management programs, smart home devices help reduce barriers to saving energy.

Smart home device capabilities include the following:

**Remote control of energy-consuming products** – Smart home devices allow consumers to move beyond insight to control. The ability to manage the status of energy-consuming devices remotely gives smart home device owners an advantage in the ability to save energy. This ability makes energy insights more actionable.

**Automation of energy-saving actions** – Beyond remote control, smart devices make it possible to automate some energy-saving actions. For example, smart lights can be preprogrammed to shut off automatically at certain times. Similarly, smart thermostats can learn, over time, to detect when no one is home and automatically adjust temperatures. Automating these actions decreases the level of consumer effort involved in energy savings and increases reliability compliance. Energy-saving use cases for smart home devices already have strong consumer appeal.

- For smart thermostats, sensing when someone is home and making adjustments automatically to save money is among the leading features influencing device purchases.
- For smart refrigerators, automatically adjusting its settings in ways that minimize energy consumption is the most appealing feature of the appliance.



## Digital Consumer Engagement: Demand Response

Smart meters and devices can improve consumer engagement with demand response programs in the following ways:

**Targeted messaging** – Disaggregation of residential smart meter data makes it possible to determine which homes are driving peak usage. Understanding which homes and which products within those homes consume energy during peak periods enables utilities to target consumers that will have the greatest impact and those that will likely be most engaged in the program.

**Occupancy data** – Digital thermostats can detect occupancy data and facilitate energy optimization. For example, when Google Nest thermostats are in Away Mode, energy providers can use it as an opportunity, with permission, to make larger adjustments to thermostat set points for participants in Nest's Rush Hour Rewards TOU program. For consumers signed up for the Rush Hour Rewards program, Google Nest thermostats automatically adjust household temperature when energy consumption in their specific area is high. This generates even greater savings for program participants and minimizes consumer discomfort and program compliance.

**Load choreography** – Given that smart home products can communicate with each other, the cyclic loads of these devices can be coordinated so that they are not all running at the same time. For example, the different air conditioning (AC) units in the home can be programmed so that they do not run at the same time. Alternatively, on a very hot day where AC units do need to operate at the same time, the hot water heater can be programmed to automatically turn off at this time, thereby limiting peak demand. Preprogramming limits consumer effort.





**Quick response to DR events** – Smart devices can respond very quickly to demand response signals. Many prior DR systems required advanced notice to respond effectively to requests, which makes them less effective DR assets compared to smart home devices. New smart home devices can help overcome this barrier.



## Digital Consumer Engagement: Expanded Service Portfolio

A utility can leverage the benefits of a digital platform strategy to sell additional services. Energy provider products and services that generate even more savings for customers are the lowest-hanging fruit, but energy providers can include to add multiple new options to their portfolios via their digital platform:

- **Utility marketplaces built into engagement platforms can introduce consumers** to energy management programs, rebates, and energy efficiency and smart home devices and other products.

 <p>Consumers Energy Count on Us</p>	<p><b>Consumers Energy's</b> utility marketplace features products that help residential customers save both energy and water. These include smart thermostats and specialty faucets and showerheads. The company also carries a few products targeted for energy saving in commercial establishments and provides tips for energy saving.</p>
 <p>ComEd An Exelon Company   powering lives</p>	<p><b>ComEd</b> has an extensive marketplace that features a number of energy-saving technologies including smart thermostats and lighting products. The platform offers popular smart home control products such as Nest Mini smart speakers and Nest Hub smart displays. The platform features products for managing air quality and water use, as well as easy access to information on energy management programs, energy-saving rate plans, and rebates and discounts on energy saving products. ComEd also uses its digital platform to introduce customers to IFTTT (If This Then That) applications that can automate energy saving actions using smart products.</p>
 <p>Georgia Power</p>	<p><b>Georgia Power's</b> utility marketplace features a broad array of energy-efficiency products including thermostats, light bulbs, and power strips. It also features multiple categories of smart home products, including smart cameras, video doorbells, door locks, switches, and thermostats, along with smart speakers and displays, water fixtures, and air quality products. The platform makes it easy to enroll in home services that assess home energy usage and offers rebates and products that can improve home energy usage.</p>
 <p>Xcel Energy</p>	<p><b>Xcel Energy</b> has a webpage dedicated to helping customers find programs, rebates, and discounts for products that can save energy, including lighting products and thermostats. The platform also provides direct links to enroll in the company's demand response program. Customers can also find insight on EVs and EV charging programs as well energy-saving tips.</p>

- **Engagement platforms also provide an opportunity to monetize advanced energy management programs.** More than one-half of consumers indicate that they would pay \$10 per month for an energy monitoring service, where a dealer remotely monitors their electricity consumption patterns and makes suggestions to reduce overall energy consumption.
- **Changes in energy load can indicate a problem with major appliances and HVAC systems.** Utilities that provide these alerts to consumers can tie them to marketplaces where customers can easily access technical support or repair services. Utilities can sell space on the platform to service providers offering these services.
- **Utilities can also offer monitoring and warranty services for HVAC systems.** Fifty-seven percent of consumers who own or intend to purchase a smart thermostat report that they would be willing to pay \$10 per month for a service that monitors the health of their HVAC equipment, notifies them of issues, and advises them of maintenance needed to prevent major problems.



## Conclusion

Consumers want the benefits of energy savings, but today many do not take more than simple, minor actions to save energy. Utilities must make the benefits of energy-saving behaviors worth the effort and investment. The digitization of the home enables alerts and automations that reduce the level of effort needed by consumers to save energy, thereby increasing their engagement in energy savings actions.

**Energy-saving automations built into smart products improve the consistency and reliability of energy-saving efforts compared to consumer or utility actions.**

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Furthermore, when digital interfaces are extended to include additional relevant products and services that are beneficial to consumers, it serves the dual purpose of keeping consumers engaged with energy management platforms, while providing additional revenue opportunities for utilities.

**48% of US consumers report that their ideal control app experience is where they barely touch the app, their devices have amazing automation and are able to understand their needs with very little manual input.**

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Cox, a family owned company founded in 1898, is committed to creating meaningful moments of human connection through technology. Cox realizes the home is evolving and becoming more complex and connected. To address this 'pain point' for our customers, Cox has built a home energy management platform that enables a simpler, greener, and less costly home for customers.

By combining Cox's experience with home automation and the usefulness of energy data, **Cox's Home Energy Management Platform** enables customers to easily understand, control, and optimize the management of their home. This gives peace of mind to customers and takes us one step closer to Cox's mission of creating a better future.



## Cox's platform will enable the following:

- Current & historical reporting of your energy usage
- Recommendation engine to optimize your energy rate plan based on historical energy usage
- Ability to link 300+ smart home/smart energy devices to a single platform, to allow users to view and control their devices in one application
- Ability to group devices into rooms & routines to facilitate automation
- Recommend automation routines based on linked devices to reduce energy usage and save customers money
- One-click enrollment into demand response programs (for thermostats) to enable better management of the grid during peak periods
- Embedded toolset to allow customers to purchase other energy related products/services for their home (e.g., EV Chargers, Solar Panels, Community Solar)
- Embedded toolset to allow customers to purchase other home management product/services for their home which can leverage linked smart home device information (e.g., home warranty, property insurance, video enabled home repair)



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## About Parks Associates

Parks Associates, a woman-founded and certified business, is an internationally recognized market research and consulting company specializing in emerging consumer technology products and services. Founded in 1986, Parks Associates creates research capital for companies ranging from Fortune 500 to small start-ups through market reports, primary studies, consumer research, custom research, workshops, executive conferences, and annual service subscriptions.

The company's expertise includes new media, digital entertainment and gaming, home networks, Internet and television services, digital health, mobile applications and services, consumer apps, advanced advertising, consumer electronics, energy management, and home control systems and security. [www.parksassociates.com](http://www.parksassociates.com)



## About Cox Home Energy Management

Cox, a family owned company founded in 1898, is committed to creating meaningful moments of human connection through technology. Cox realizes the home is evolving. It is becoming more complex and connected. For this reason, Cox is launching a home energy management platform that enables a simpler, greener, and less costly home for customers. By combining Cox's experience with home automation and the usefulness of energy data, Cox's Home Energy Management Platform enables customers to easily understand, control, and optimize the management of their home. This gives peace of mind to customers and takes us one step closer to Cox's mission of creating a better future. [www.newsroom.cox.com/company-overview](http://www.newsroom.cox.com/company-overview)

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Patrice covers smart home products and services and leads Parks Associates Smart Home Tracker product, keeping clients informed of industry developments and competitive shifts across more than 10 smart home product markets. She also leads digital home technical support services with a focus on market trends, business models, and provider strategies. Patrice manages custom research projects and strategy workshops that help companies understand the consumer experience in the connected home.

Patrice earned her MBA from Texas A&M University at College Station and BSc in Psychology from the University of the West Indies.

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# RESEARCH & ANALYSIS

for Emerging Consumer Technologies

With over 35 years of experience, Parks Associates is committed to helping our clients with reliable and insightful consumer and industry research.



Smart Home Devices and Platforms



Digital Media and Platforms



Home Networks



Digital Health



Support Services



Entertainment & Video Services



Consumer Electronics



Energy Management



Home Control Systems



Home Security