



# Energy, Security, Automation: Converging into Peace of Mind

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# Meeting New Energy Demands

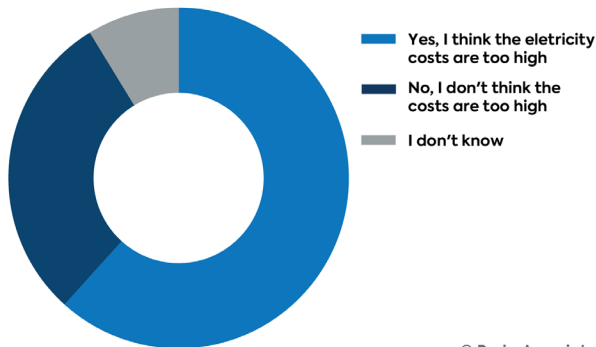
For years, Americans have enjoyed access to reliable and inexpensive energy. Reducing consumption is the goal of environmentally conscious individuals, but not all consumers have made it a priority or know what to do to save energy. Natural disasters are impacting the electrical grids resulting in power outages, infrastructure damage, increased demand for energy, fuel supply disruptions, and environmental damage. Consumers struggle with power outages caused by these disasters.

Higher energy costs are impacting consumer sentiment, even among higher-income households.

Meanwhile, energy prices globally continue to rise as part of a difficult macroeconomic climate that includes supply chain issues, inflation, and war in Eastern Europe.

Parks Associates latest research shows 70% of US internet households report spending \$100 or more per month on their electricity and 62% think the electricity costs are too high, an increase of eight points since the end of 2021. Bills are particularly high for larger families, raising concerns even further regarding energy costs and availability. As economic uncertainty persists, consumers will continue to be cost-sensitive.

**Consumers' Perception Regarding Monthly Electricity Bill**



In addition to cost, supply is a concern. Energy is limited, and a growing population that is increasingly reliant on energy threatens the ability of an aging grid to keep up. One notable trend is the rise of plug-in electric vehicles. While only 5% of internet households own an EV today, 20% say they intend to buy one in the next year. Major changes are occurring in the energy space as supply and distribution race to keep up with growing demand and consumers grapple with higher costs.

In this white paper, Parks Associates reveals consumer perspectives on renewable energy solutions and explores the convergence between security, home automation, and home energy solutions. It assesses how these drivers, plus an enormous influx of funding from the government, are accelerating change and creating new opportunities for smart home manufacturers, security players, and energy companies to meet consumer's growing and changing needs.





# New Government Investments in Energy

Recent legislation in the US has paid particular attention to addressing growing energy concerns. Two major pieces of legislation, the Inflation Reduction Act (IRA) and Bipartisan Infrastructure Law (BIL), have extensive segments in them regarding solar and renewable energy.

**Inflation Reduction Act (IRA)** – A landmark bill with \$500 billion in new spending and tax breaks to boost clean energy and reduce inflation.

- The federal tax credit for solar panels set at 30% through 2032.
- Other technologies that can claim the investment tax credit include carbon capture and storage (CCS), nuclear power, biofuel, and clean hydrogen.
- Through December 31, 2025, the IRA will extend the Investment Tax Credit for solar, wind, biogas, geothermal, and combined heat, power and microgrid projects.

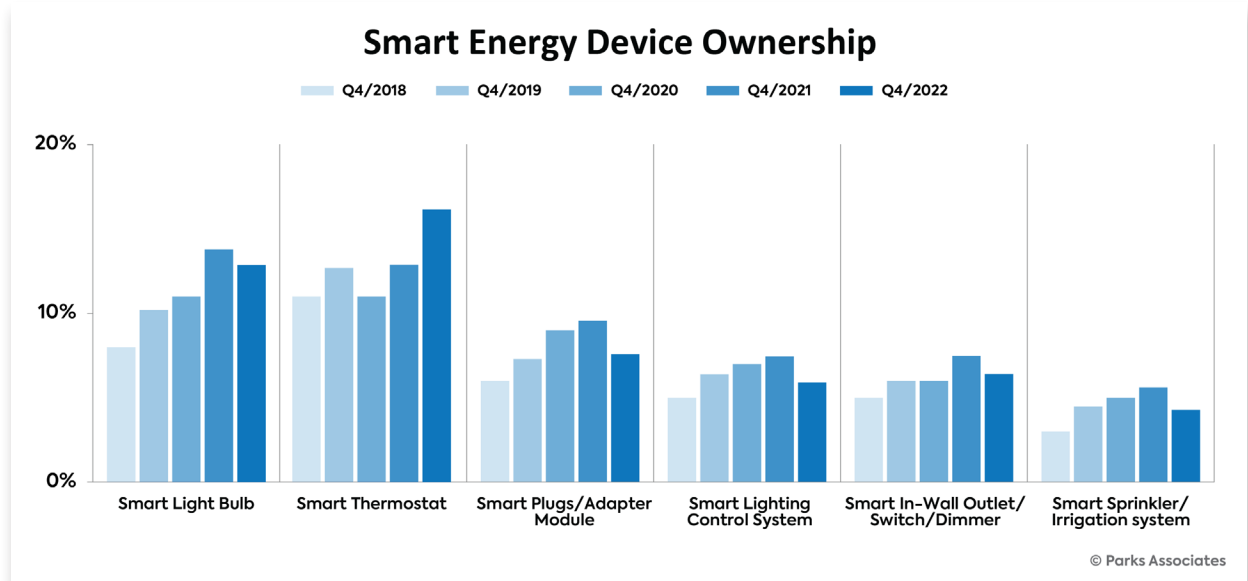
**Bipartisan Infrastructure Law (BIL)** – A wide-ranging piece of legislation aimed at revitalizing existing grid infrastructure and developing new technology to meet climate and US energy needs moving forward.

- The Department of Energy announced that \$26 million would be allocated to developing new projects that are geared towards bolstering the grid with a mix of different clean energy sources.
- The law provides a total of \$1.5 billion over the next five years to promote “environmental justice” and revitalization initiatives.

# Connected Devices Help Reduce Energy Consumption

Home automation has experienced slow but steady growth and innovation over decades, and the smart home ecosystem has expanded as new types of devices are introduced to provide comfort, convenience, and peace of mind. The role of smart energy solutions has gained significance as consumers place more value on energy efficiency and savings.

The following devices/solutions deliver information to their corresponding apps and platforms so users can better understand and control their energy consumption and lower electricity bills. These smart home devices can be attached to home security systems to provide more robust control and comfort experience, as well as safety and security features.







- **Smart Light Bulbs**

A smart light bulb is a wirelessly connected, energy efficient LED light bulb that can be remotely controlled, scheduled, or triggered by other smart devices. Some smart lightbulbs are dimmable, and some can shift colors among shades of white or the whole color spectrum.

- **Smart Thermostats**

Smart thermostats perform all the tasks that traditional and non-connected programmable thermostats perform, but users can also control them remotely and the devices can utilize the cloud to facilitate sophisticated home automation. Some advanced smart thermostats gather and analyze a variety of data from HVAC runtime, home environment, owner location, weather, utility company plans, and other sources to efficiently automate home energy consumption and comfort.

HVAC remains the largest electrical load in most households, so it remains the logical target for impacting the electricity bill. Smart thermostats are also crucial to protecting grid stability by granting utility control during spikes in demand.

- **Smart Lighting Devices**

Smart lighting devices belong in the family of smart home energy devices including smart light bulbs, smart in-wall switches, and smart plugs/adaptor modules that give users wireless control. While lighting is not among the biggest electrical loads in the home, control and management of lighting is part of an energy efficient home.

- **Smart In-Wall Switches**

A smart in-wall switch replaces a traditional in-wall light switch with one that is connected to the internet wirelessly and can be remotely controlled, scheduled, or triggered by other devices.

- **Smart Plugs/Adapter Modules**

A smart plug is a portable device that plugs into a wall outlet and wirelessly connects to the internet. A smart plug can be used to remotely control or schedule any appliance, lamp, or electronic device that is plugged into it. Some smart plugs can measure energy usage and detect appliance faults or fire risks.

- **Smart Blinds/Shades**

Smart window shades are part of the future of home privacy, security, and energy conservation. Opening and closing shades has implications beyond privacy; blinds and shades can be utilized as energy efficiency tools.

There are a variety of smart window shades available on the market ranging from devices that attach to existing "dumb" shades, to premium window treatments with luxurious fabrics that are custom sized to the buyer's windows. Smarter automated window shades with sensors can detect presence, leverage onboard sensors or connected smart devices like thermostats to collect temperature and weather data, and open or close blinds based on schedules, geofencing, presence sensing, and scenes.

- **Energy Monitoring Devices**

Smart panels and circuit breakers are now available for consumers to purchase from companies like Schneider Electric, Leviton, and SPAN. These devices enable users to view real-time performance of individual electrical circuits in the home, monitor/calculate energy consumption and costs, and receive remote alerts while out of the house. Many of these device offerings also have integrations with EV chargers, adding another layer of connection between home, power, and vehicle(s).

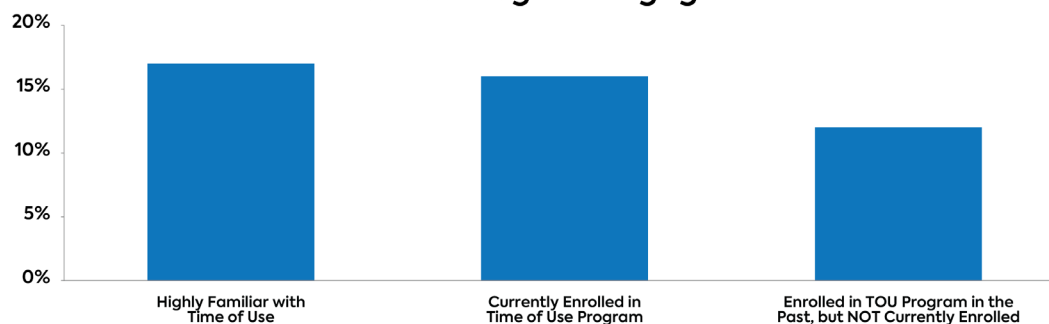


# Electricity Rate Programs Help Reduce Cost Per Kilowatt

Many utilities have started to offer special rate programs to customers designed to change behaviors, reduce energy used during peak periods, and encourage more consideration in energy consumption. Retail energy providers in competitive markets have even more incentive to market attractive rates and differentiate their brand.

Smart thermostats are critical to the success of demand response (DR) programs, and the security industry is in a great position to expand their adoption, and leverage consumers' growing interest in energy savings, by including these devices as part of the system sold to homeowners.

### Time of Use Program Engagement



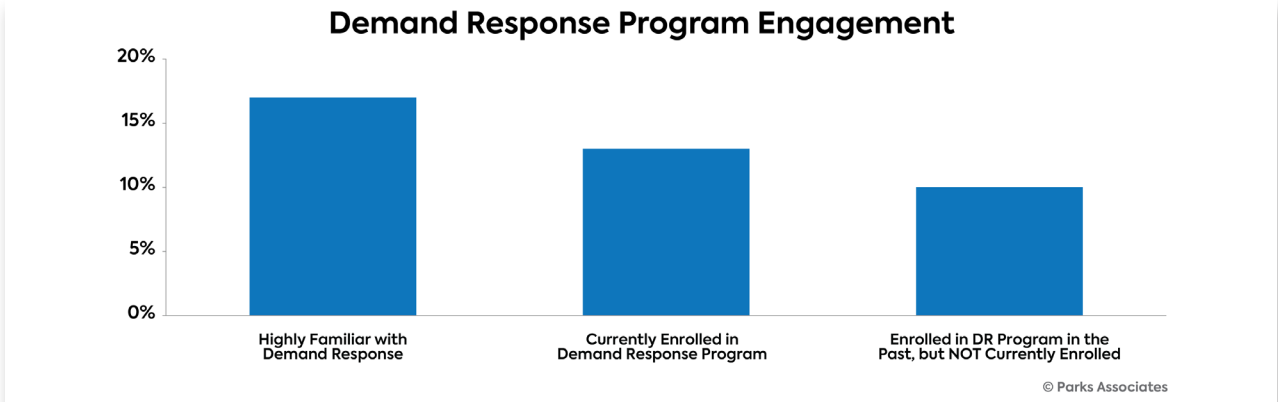
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## Time of Use

Time of Use (TOU) programs are often marketed as “free nights and weekends” rather than using the “time of use” phrase. Smart devices are best paired with a program where time-shifting high-use activities can be automated or at least controlled remotely.

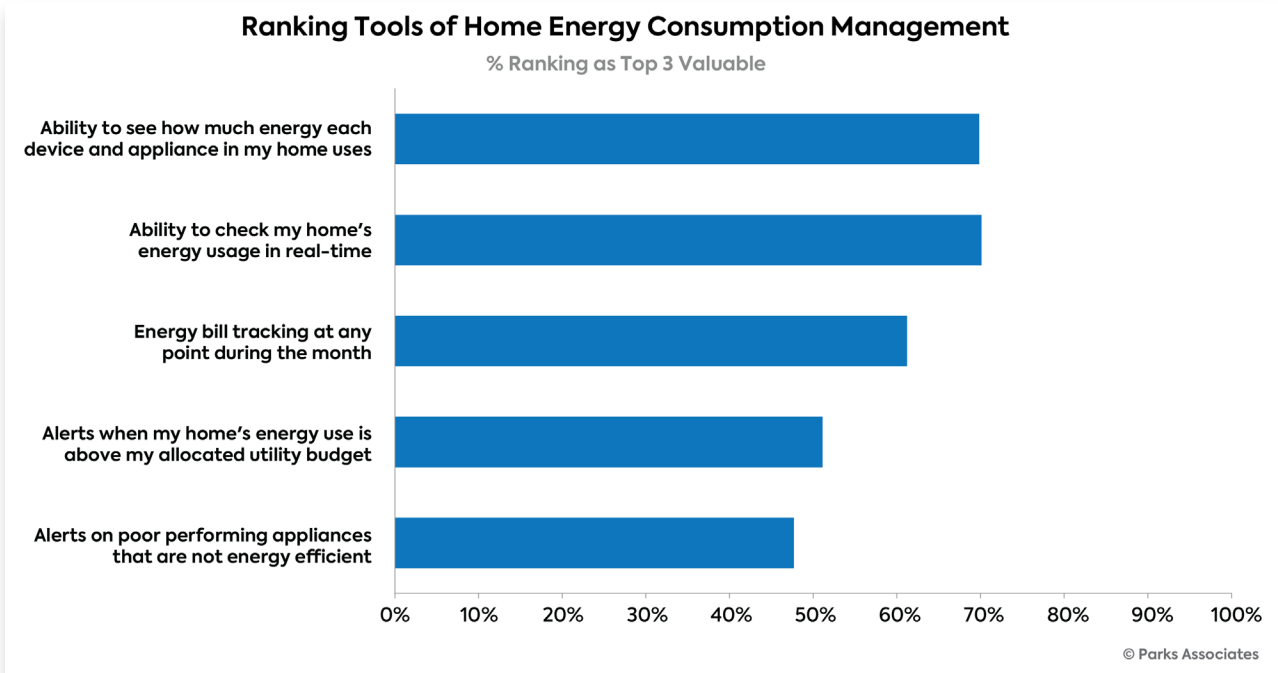
- Smart washers and dryers can have their cycles delayed
- Smart EV chargers can delay charging until the middle of the night
- Smart thermostats can pre-heat or pre-cool a home in anticipation of a rate increase during unfavorable rate windows as described in the TOU plan





## Managing Energy Consumption

Reducing energy used during peak periods can prevent blackouts and save money. While energy providers think of these programs as peak-time usage reduction or DR, they brand these programs for consumers with names such as Nest Rush Hour Rewards or PGE’s SmartDays, with incentives for participation such as a credit on their bill or a free smart thermostat. Consumers typically need assurances they won’t lose control of the devices in their home and can override adjustments, if necessary, which can come from the installer who provided the smart thermostat.





# Home Energy Generation and Storage

Another way for households to reduce spending on electricity is to generate and store energy. The most common solution is solar photovoltaic systems, which include panels or shingles to collect energy, as well as additional devices to store or distribute the energy as needed. This system requires installation and configuration, another prime crossover opportunity from the security industry, where installers can configure the solution in a variety of ways based on a consumer's needs and preferences and even discuss the potential to sell excess energy back into the local electrical grid.

7% of internet households say they have solar power generation at home

Typical systems include the following:

- **Solar Panels and Shingles**

Manufacturers have developed more efficient ways to produce the panels, to make the panels thinner, and to make systems better able to function in partial shade. In general, the design and features are similar across brands. Two companies are trying something different: Tesla Energy's power roof, and GAF Energy's solar shingles. These manufacturers offer alternatives to the standard solar panel that may appeal to homeowners for aesthetic reasons or because their roof configuration is not favorable for a panel array.

- **Inverter and Controller**

For most purposes, the DC energy collected in solar panels needs to be converted to AC, and this process is done by the use of an inverter. A photovoltaic inverter is a device that converts variable DC into AC that can then be fed into the local grid and/or individual households. The software platforms underlying inverters are responsible for measuring the amount of energy collected and reporting that data to the homeowner.

- **Battery Storage**

The underlying technology of the most common form of home battery storage, the lithium-ion battery, has existed for decades.

Innovation in manufacturing has caused costs in lithium-ion batteries to come down and interest in battery backup to increase.

These two factors have recently combined to drive more batteries to be included in home solar setups. Additionally, some OEMs are developing accompanying software controls that help battery performance to be optimized in a home setup. Others are working to make modular battery setups so consumers can add more and more backup power following the initial installation and to make it possible larger-capacity battery solutions to fit more elegantly in different areas of the customer's garage and yard.





# Recouping Investment in Home Solar and Storage

A home solar system represents a significant investment as a typical solar photovoltaic panel systems today costs over \$20,000 before the addition of a battery, which are becoming more common and can cost an additional \$10,000. As a result, cost is consistently cited as the top barrier, even for higher-income households.

While solar and other renewable solutions may seem inaccessible at first glance, prospective customers have options and support:

56% of households would choose an energy provider that offers renewables if the cost(s) was the same as a traditional source.

- **Incentives** from state and federal agencies have become especially prevalent in the wake of the passage of the Inflation Reduction Act and Bipartisan Infrastructure Law. There are a variety of tax incentives households can take advantage of for solar systems, including systems also paired with batteries. The tax credit for installation of new solar PV systems was recently increased from 26% to 30% as part of the newly passed IRA, for example.<sup>1</sup>
- **Financing** is available for eligible households that may wish to utilize renewable energy in their home, but don't want to face a sizable upfront charge. Most, if not all, major providers/distributors of panels offer financing plans spread out over several years for prospective households. Sunrun for example offers a \$0 down monthly loan for households seeking to purchase and finance their panels.
- **Leasing** panels and other equipment is another alternative to financing that households can utilize. Monthly lease plans are growing in popularity among households going solar, primarily since they can benefit from lower upfront costs. With warranty and rate hike protection incorporated into lease plans, users can feel confident that they will receive the benefits of solar while still retaining a level of affordability.
- **Earning money with net metering**, which is a utility rate program where the utility purchases excess solar energy created by a given home's panels. Net metering is beneficial because it shifts the energy load back to the grid while also rewarding customers for using less power than they generate. A net metered home's meter will "spin backwards" (during the day) when the home is sending electricity back to the grid. During the day, as the meter spins backwards, the home's utility will then apply the credit. At night, when the house's panels are not creating electricity, the home can then take power from the grid, which spins the electric meter forward.

Once a billing period is concluded, the utility company will "net" how much a given net metered home sent to the grid versus how much it consumed, with the monthly bill being the difference between the amounts. Most utilities also allow credits to carry over from month to month, which is especially valuable to consumers in the summer months. During times when sunshine is abundant, households can accumulate credits to use in the darker, winter months.

<sup>1</sup> How the IRA Affects the Solar Industry. Solar Power, Policy, and Regulation. Guidehouse Insights. September 2022. (<https://guidehouseinsights.com/news-and-views/how-the-ira-affects-the-solar-industry>)



# Energy Monitoring and Energy Device Control

Software platforms are the key to controlling the array of connected lights, blinds, and solar panels, batteries, thermostats that help smart homeowners to optimize their energy use.

Home automation players like Brilliant, Savant, and Crestron have devices and features available to high-tech and high-end households.

- **Savant's** home energy modules are smart circuit breakers that track and control devices at the electric panel.
- **Crestron's** partner Adapt energy has solutions that optimize Sonnen home battery usage and collect weather data so that the system charges the battery in anticipation of blackouts from storms.
- **SmartThings Energy** leverages the wide array of devices connected to the platform, including Samsung smart appliances, and enables users to view real time energy use metrics.
- **Alarm.com** also shares critical energy information in the platform (see panel on the next page for details.)



## Coming Soon: More Virtual Power Plants and Distributed Energy Resources

Virtual power plants (VPPs) and distributed energy resources (DERs) are other solutions that enable energy management on a smaller scale and serve as innovative ways to reduce stresses placed on the electrical grid while still meeting the energy needs of households. A key feature of VPPs is that they can accumulate energy capacity to resolve peaks in electricity demand, as well as being integrated into the grid.

VPPs can be assembled using assets connected to any part of the grid, whereas microgrids are usually restricted to a particular location, such as an island or a neighborhood. Additionally, while an individual VPP would not be adequate to service a large area, a VPP made up of many units (batteries for example) could function in the same way a large plant would.

Distributed energy resources (DERs) are small-scale electricity supply/demand resources that work in conjunction with the larger electrical grid. They are typically located close to load centers and can be used in isolation or as a larger, interconnected entity to bolster the grid. Virtual power plants and distributed energy resources are strategies gaining popularity as effective ways to leverage connected energy devices to reinforce the grid by giving utilities additional control and flexibility to manage electrical loads.





Households using Alarm.com can find peace of mind not just from burglary and fire but also from high energy bills. The platform can control and report data not simply from cameras and sensors, but also smart energy devices.

In addition to controlling smart lights, blinds, and thermostats with schedules, Alarm.com can trigger scenes based on presence detection by leveraging cameras and a geofencing feature called Alarm.com Places. Alarm.com systems also use energy-saving Rules that will leverage integrated devices. One example is turning off the HVAC when sensors or smart door locks indicate the door has been left open.

To further enhance the experience for energy device users, in June of 2022, Alarm.com announced integration with solar inverter from the two biggest residential brands, Enphase and SolarEdge.

Households with solar systems that include Enphase or SolarEdge devices will have the opportunity to view data on their energy generation in the Alarm.com platform. Users can see the energy they produced on a daily, weekly, monthly, or yearly basis and the benefit of using that solar energy over fossil-fuel created energy will be calculated and communicated in terms of trees or gallons of gas saved to make the results more tangible.

The company also has a program that effectively promotes residential solar growth by offering commission to Alarm.com service providers who refer customers that lead to sales for solar installers as well as promoting “stickiness” among customers with both solar and security services.

This move joins an industry-wide trend that includes ADT’s acquisition of SunPro and Brinks partnering with Sunnova. Parks Associates’ data indicates that security system owners are almost six times more likely than non-owners to own solar systems, so this customer base will now be able to access the solutions together.

Learn More at [Alarm.com](https://www.alarm.com) →





# Competitive Implications and Conclusions

The home energy industry is at the beginning of a major shift, with implications for a variety of industries. As energy prices rise, consumers are looking to save money but encountering multiple challenges. Technology such as smart thermostats, smart plugs, and smart energy monitoring devices can help but familiarity is low and adoption progresses slowly.

Utilities are offering rate programs to support these devices but familiarity with these programs is also low, and shopping for electricity is a confusing new task for many households. Investing in home renovations and major energy devices like home solar and battery storage are encouraged by government incentives, but the overall economic climate is causing concern and consumers are being cautious with future purchases.

Energy device makers, utilities, security players, and software platform players in the energy space have an opportunity to benefit from tailwinds of rising consumer demand and government funding if they are able to take the necessary actions to connect consumers to their solutions:

- Energy providers must work to strengthen trust as recent blackouts may have shaken the faith of “rate payers.” Utilities will need consumer cooperation in the form of demand response participation to collectively avoid future blackouts. Communication will need to be transparent and consumers will need to understand how all parties benefit if they are going to embrace their new role as responsible buyers of electricity and contributors to the goal of grid stability.
- Device OEMs must continue to innovate and educate consumers so they can better understand and utilize the solutions available to reduce energy consumption and save on electricity costs. Co-promotion of Time of Use programs would help households maximize the benefits of connected energy devices.
- Home automation and security platform players must continue to expand interoperability, reporting tools, and control features to include both their core offerings and energy devices. The truly smart home is comfortable, safe, and energy efficient. The apps and platforms that power these smart homes will need to report energy data and device status in a simple, relatable way. To keep users engaged, the control must be easy and the tracking of data over time should connect to real-world outcomes such as cost savings and carbon emissions saved.

Consumers have shown that they can adapt to new technologies that require changes to their lives. As telecommunications advanced through the 1990s and early 2000s, consumers learned about data plans and smart phones where they previously had nothing more complicated than a long-distance rate plan and basic hardware to manage. Similarly, TVs with antenna gave way to cable which gave way to a diverse streaming video marketplace. Now a major change in how consumers use and understand energy and security devices is necessary, and there are huge opportunities for companies to provide these advanced services at home.

## About Alarm.com



Alarm.com is the leading platform for the intelligently connected property. Millions of consumers and businesses depend on Alarm.com's technology to manage and control their property from anywhere. Our platform integrates with a growing variety of Internet of Things (IoT) devices through our apps and interfaces. Our security, video, access control, intelligent automation, energy management, and wellness solutions are available through our network of thousands of professional service providers in North America and around the globe. Alarm.com's common stock is traded on Nasdaq under the ticker symbol ALRM. For more information, please visit [www.alarm.com](http://www.alarm.com).

## About Parks Associates



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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.

## About the Author



### **Chris White, Research Director, Parks Associates**

Chris is a research director with Parks Associates, covering the smart home and smart energy markets. He was previously a Director of Insights at PeopleMetrics in Philadelphia and the Data Manager of a youth-serving collaborative in New Orleans. He leverages this background in marketing research and data gathering to contribute to the design of Parks Associates consumer surveys.

Chris earned his BBA in Marketing from the College of William & Mary and his MBA in Marketing and Finance from American University.

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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