

"Alexa! Show Me My

Smart Home."

SMART THERMOSTAT

More than 1.3M customers are enrolled in thermostat programs.² Analysts forecast connected thermostat sales to reach 14.5M units by 2022.³

BATTERY STORAGE

New software optimizes battery use to take advantage of time-varying rates. Great timing too! From 2016 to 2017 residential battery storage grew by 200% in MW.⁴

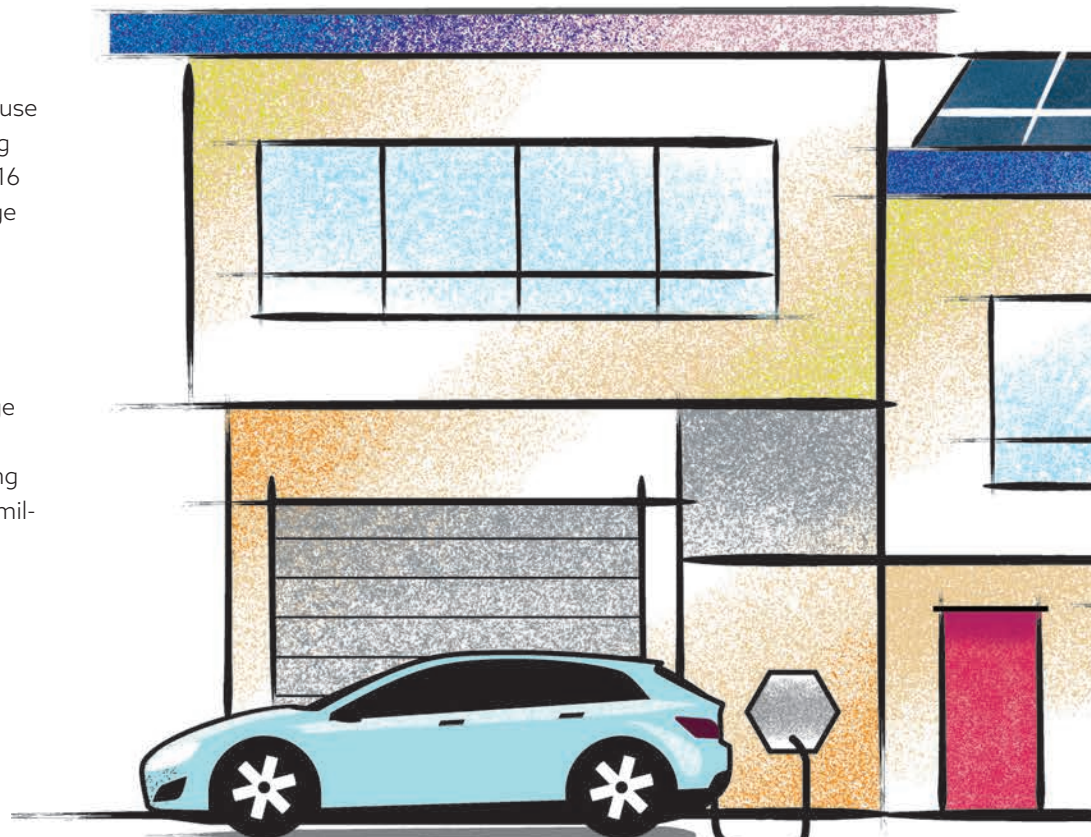
ELECTRIC VEHICLES (EVs)

Charging at night takes advantage of time-varying rates to save customers money on this growing technology; experts forecast 18 million EVs on U.S. roads by 2030.⁵

RESPONSIVE HOME APPLIANCES

(DISHWASHER, CLOTHES DRYER, REFRIGERATOR)

DR for smart appliances could reduce bills 2-9% across major appliance types with the caveat that displays and Wi-Fi control may increase draw.^{6,7}



If you happen to bump into one of your customers browsing through the appliance section at their local big box retailer, odds are they're imagining the bliss of setting their temperature without getting up from the couch, dreaming of cueing their favorite album from the backyard, or conjuring up new ways to turn off unnecessary lights. Enabling grid resiliency or load management?... Not so much.

Customers are looking for features like simple interfaces, interoperability, voice control—a trend that will only grow.¹ Utilities can now offer new ways to meet customer expectations and enable seamless participation in DR programs through the smart home. Customers get more control, utilities get deeper penetration of DR. Another positive side effect of this trend? Lower utility bills. Automation may help customers save money through time-varying rates without needing to know specifically what to turn off, how, and when. So, what technologies are offering new load management opportunities? "Alexa, show me my smart home!"

SOLAR PANELS

Residential solar can be paired with management systems and smart inverters to respond to events on the grid through voltage control and frequency stability.⁸

HOME ENERGY MANAGEMENT SYSTEM

Customers can take advantage of time-varying rates through energy management.

DEHUMIDIFIER

In humid climates especially, control can shave demand on plumbed dehumidifiers that run continuously (one study found average demand of 349W).¹¹

CENTRAL AIR CONDITIONING

Updating one-way switches to two-way devices improves reliability and provides greater control. One-way paging technologies seen as obsolete.⁹

HOT WATER HEATER

To shift load during winter morning peaks, water heaters can pre-heat water and be turned on and off instantaneously to modulate load throughout the year.¹²

LIGHTING

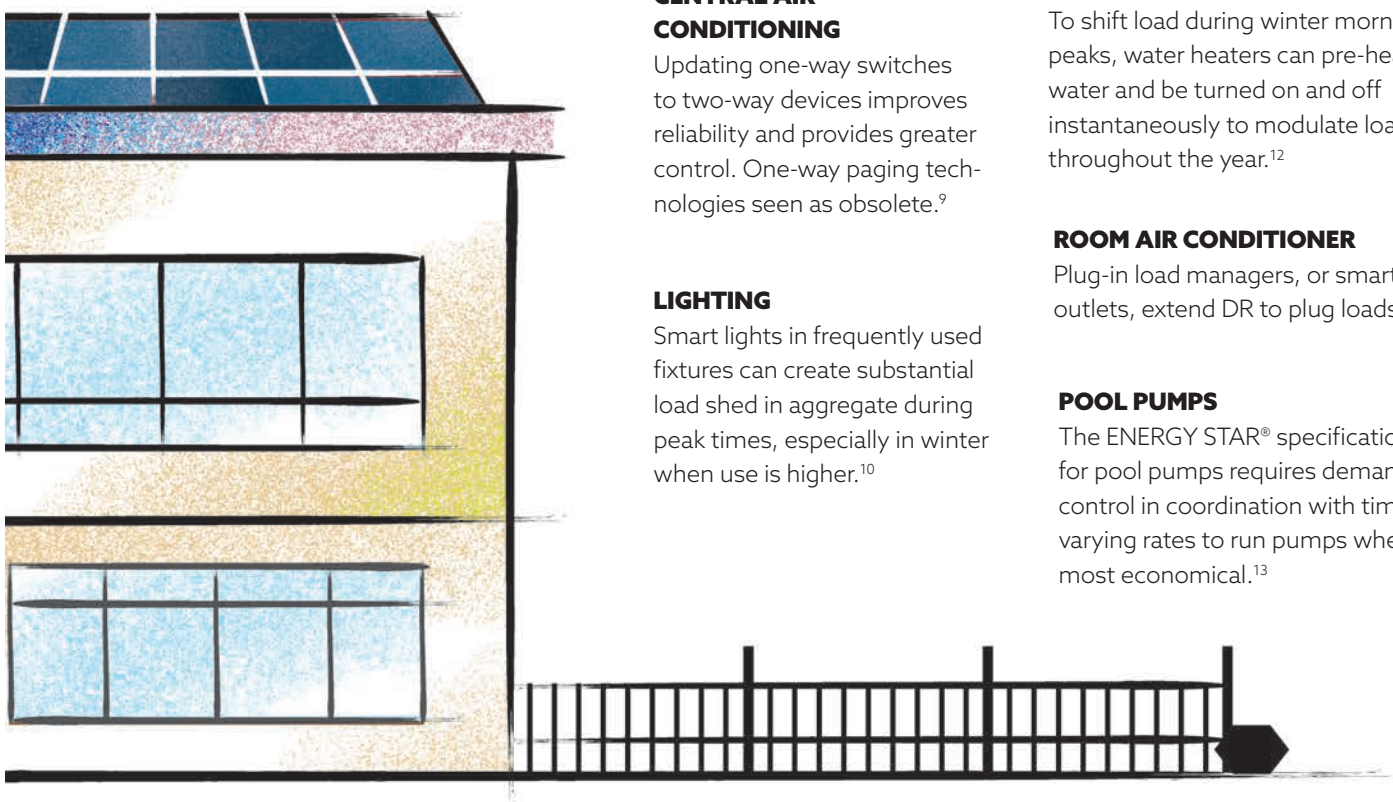
Smart lights in frequently used fixtures can create substantial load shed in aggregate during peak times, especially in winter when use is higher.¹⁰

ROOM AIR CONDITIONER

Plug-in load managers, or smart outlets, extend DR to plug loads.

POOL PUMPS

The ENERGY STAR® specification for pool pumps requires demand control in coordination with time varying rates to run pumps when most economical.¹³



-
1. Hledik, Ryan, Faruqi, Ahmad, Lee, Tony, and Higham, John. "The National Potential for Load Flexibility: Value and Market Potential Through 2030." The Brattle Group, June 2019.
 2. SEPA. "2018 Utility Demand Response Market Snapshot." September 2018.
 3. ARCH News "Smart, Connected Thermostat Sales Projected to Grow Through 2022" August 10, 2018. Accessed September 26, 2019, achrnews.com/articles/139546-smart-connected-thermostat-sales-projected-to-grow-through-2022.
 4. SEPA. "2018 Utility Energy Storage Market Snapshot." August 2018.
 5. Cooper, Adam, and Schefter, Kellen. Electric Vehicle Sales Forecast and the Charging Infrastructure Required Through 2030. The Edison Foundation Institute for Electric Innovation. November 2018.
 6. Sastry, Chellury, Pratt, Rob, Srivastava, Viraj, and Li, Shun. "Use of Residential Smart Appliances for Peak-Load Shifting and Spinning Reserves." U.S. Department of Energy, December 2010.
 7. King, Jen. "Energy Impacts of Smart Home Technologies." American Council for an Energy-Efficient Economy, April 2018.
 8. Holden, Chloe. "US Will Have 88 Gigawatts of Residential Demand Flexibility by 2023." *Greentech Media* online. October 4, 2018. greentechmedia.com/articles/read/88-gigawatts-by-2023-u-s-residential-flexibility-on-the-rise.
 9. SEPA. "2018 Utility Demand Response Market Snapshot." September 2018.
 10. King, Jen. "Energy Impacts of Smart Home Technologies." American Council for an Energy-Efficient Economy, April 2018.
 11. Robery Lamoureux, Scott Reeves, and Riley Hastings. "Home Energy Management Systems (HEMS) Paths to Savings: On-Ramps and Dead Ends." ACEEE Proceedings, 2016.
 12. Hledik, Ryan, Faruqi, Ahmad, Lee, Tony, and Higham, John. "The National Potential for Load Flexibility: Value and Market Potential Through 2030." The Brattle Group, June 2019.
 13. ENERGY STAR®. "ENERGY STAR Program Requirements for Pool Pumps." Accessed September 26, 2019. energystar.gov/sites/default/files/ENERGY%20STAR%20Final%20Version%203.0%20Pool%20Pumps%20Specification_0.pdf.