



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

OFFICE OF
AIR AND RADIATION

June 26, 2018

Dear Interested Parties,

The U.S. Environmental Protection Agency (EPA) is pleased to initiate a discussion on potential ENERGY STAR recognition of Smart Home Energy Management Systems (SHEMS). Through this effort, EPA means to explore with stakeholders the potential to leverage the ENERGY STAR brand and Partner network to recognize and promote energy management features in smart home systems that optimize energy savings without inconvenience or sacrifice to the end users' desired goals or comfort. EPA welcomes broad participation in this discussion.

As the centerpiece of a program designed to help prevent climate change, the ENERGY STAR label helps consumers and businesses identify energy-saving products in the marketplace. More than 90% of American households recognize the ENERGY STAR. About three-fourths of U.S. households report the ENERGY STAR label as influential in their purchasing decisions, and 80% of purchasers would recommend ENERGY STAR products to a friend. Hundreds of utilities throughout the U.S. leverage the ENERGY STAR label on products for their rebate programs, with a total of \$7.7 billion invested by utilities in energy efficiency programs more broadly as of 2015. Americans purchase more than 300 million ENERGY STAR certified products each year, with an estimated annual market value of more than \$100 billion.

This effort is a natural extension of the ENERGY STAR label. As part of the voluntary ENERGY STAR program, EPA maintains efficiency specifications defining the level of performance required to earn the label for more than 75 product categories, some of which include "smart" functionality. Smart products are becoming increasingly common, but are not consistently optimized for energy savings. EPA is hoping to capitalize on new ways to build energy intelligence into residential products and systems. In particular, EPA is interested in collaborating with service providers, product providers, utilities, and other stakeholders through the ENERGY STAR program to effectively use occupancy information to reduce household energy use. This letter and the accompanying [Discussion Guide](#) marks the beginning of EPA's effort to explore extending ENERGY STAR recognition of smart home systems with energy management features, which would involve developing a performance specification for a package of hardware (products and devices) and service (software, algorithms, installation, monitoring, reporting) that work together to save energy.

Why Smart Home Systems with Active Energy Optimization

More than half of Americans believe smart home technology will improve the quality of their life and will have a big impact on how they manage their home within the next five years. Global annual shipments of connected smart devices and systems are expected to grow fivefold from 72 million in 2016 to 364 million in 10 years, and North America will be about a quarter of the global market, with shipments growing from approximately 22 million to 96 million devices and systems.¹

The most popular smart products in homes today are smart thermostats, home security and monitoring systems, and wireless speakers. Top purchase drivers for connected products are safety, comfort, and convenience. Energy efficiency is also an important consideration, but not a primary driver. Consumers expect smart products to be energy smart, but there is nothing inherent in smart product design that delivers energy savings or true intelligence to optimize energy performance. As a result, there is an emerging opportunity to outline a systematic approach for making smart products energy smart, which can mean anything from powering down to extremely minimal energy draw when not in use, to responding to grid balancing needs or price signals. EPA is well positioned to provide such a systematic approach within the ENERGY STAR program, which is very familiar to both utilities and consumers.

Why Service Providers

Service providers play an increasingly important role in the deployment of smart home technologies, helping to ensure that customers have a successful experience with smart home systems by eliminating much of the complexity that comes with getting into home automation. Integrating systematic energy optimization services into this existing business model offers the potential of an additional value proposition for end-users who want their smart systems to be energy smart but are not well-positioned to figure out how to do it on their own. Service providers, such as security and cable companies, are integrating smart home devices into their offerings. According to one market research company, "Growth in the residential security market and its position as the leading channel for smart home solutions have attracted numerous new entrants. Telecoms, cable operators, and [consumer electronics] manufacturers are joining traditional security players as they compete to fulfill consumer demand for safety and security."² "Of the nearly 25% of U.S. broadband households with a working and active security system, 65% plan to buy a smart home device within the year."³

Home monitoring services offer a unique opportunity to create a custom optimized experience with one central relationship, a central source for data, and occupancy detectors at multiple points throughout the home. Use of professionally-trained installers and continuous monitoring can provide additional assurance that setup will be reliable and that savings will be realized. The presence of professionally-monitored security is estimated at 21%-22% of broadband customers with estimated growth to 30%.⁴

Energy Savings Opportunity

As this market grows, the opportunity to help people manage the energy use of all the devices in the home becomes a more tangible aspiration for many stakeholders focused on improving the increasingly complex home energy profile. Studies to characterize the range of energy

¹ Residential Connected Products Market Assessment. Prepared for the Environmental Protection Agency. September 2016.

² Disruptive Forces in the Home Security Market. Published by Parks Associates. © Parks Associates, Dallas, TX 75248.

³ Disruptive Forces in the Home Security Market.

⁴ Disruptive Forces in the Home Security Market.

savings achieved when optimizing smart home systems will be helpful to better understand the true potential of this model. In 2017, New York State Energy Research & Development Authority's (NYSERDA) Home Energy Management System Savings Validation Pilot Report found potential savings from plug load, smart thermostat, and lighting alone to be 1,241 kWh a year as shown in Table 1.⁵ Given the inevitability of growth in this space, the time is ripe for considering a national platform to promote effective smart home energy management systems.

Table 1 Base-load Simulation Model Maximum Annual Savings Potential by End Use

| Smart Device | Electricity Savings (kWh/year) | Heating Fuel Savings (therms/year) | Cost Savings* (\$/year) | Assumptions |
|-------------------------|--------------------------------|------------------------------------|-------------------------|------------------------------|
| Smart Thermostat | 688 | 52 | \$174 | No existing setback controls |
| Smart Outlets | 341 | | \$58 | 15-minute occupied delay |
| Smart Lamps or Switches | 212 | | \$36 | Controls only |
| Total HEMS Savings | 1,241 | 52 | \$268 | |

* Assumes average utility rates in New York: \$0.17/kWh and \$1.10/therm

Broad participation from stakeholders is welcomed during this process. Stakeholders are encouraged to submit written comments on the Discussion Guide by **July 27, 2018** to SmartHomeSystems@energystar.gov. All comments will be posted to the [ENERGY STAR product development webpage](#) unless the submitter requests otherwise. Prior to the comment deadline, EPA will host a stakeholder webinar on **July 11, 2018 at 1:00 p.m. EDT**. If you'd like to participate in this open discussion, please register prior to the webinar [here](#).

Also, an in-person discussion will be held in conjunction with the annual [ENERGY STAR Products Partner Meeting](#) being held September 5-7, 2018 in Phoenix, AZ. Please direct any specific questions to Abigail Daken at EPA, Daken.Abigail@epa.gov or 202-343-9375, and John Clinger at ICF, John.Clinger@icf.com or 215-967-9407.

Thank you for your interest, and we look forward to working with you.

Sincerely,




Taylor Jantz-Sell & Abigail Daken
U.S. EPA ENERGY STAR Products

Enclosure:

[ENERGY STAR Smart Home Energy Management Systems Discussion Guide](#)

⁵ New York State Energy Research & Development Authority. Home Energy Management System Savings Validation Pilot. Final Report, Number 17-16. November 2017.