



Making Sense of the ENERGY STAR SHEMS Program

For Service Providers and Device Manufacturers

October 16, 2019

Abigail Daken, U.S. EPA
Daken.Abigail@epa.gov



Welcome! We will begin shortly

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- **Questions**
 - There will be a Q&A session at the end of the presentation
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 - Presentation slides will be sent to all participants
- **Notes**
 - To improve audio quality, all attendees are muted upon entry



Introductions



Abigail Daken

EPA
*ENERGY STAR HVAC Product
Manager*

- ENERGY STAR technical lead for connected product criteria, smart thermostats, and many other product categories. Focus areas include HVAC, water heating and connected.
- SHEMS Co-lead with Taylor Jantz-Sell, who is currently out on maternity leave, returning January 2020.



Agenda

- Program Overview
 - Why ENERGY STAR?
 - ENERGY STAR SHEMS Definitions and requirements
 - Roles and processes for certifying
 - How might SHEMS be sold and installed?
 - What is EPA's long-term vision for the program?
- Questions and Discussion

Our goal today is to answer questions – please stop us and ask!



The ENERGY STAR Brand

EPA's ENERGY STAR identifies the most energy-efficient **products, buildings, plants,** and **new homes** – all based on the latest government-backed standards.

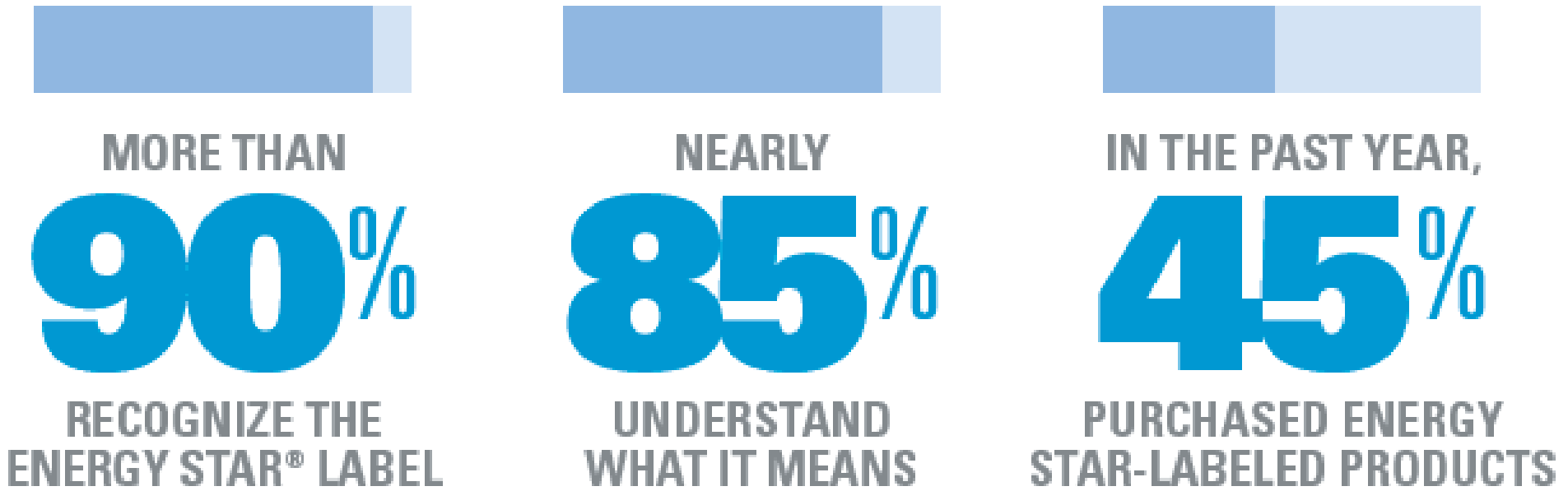
Today, every ENERGY STAR label is verified by a rigorous third-party certification process.





In American Households:

Brand Preference and Loyalty



U.S. EPA
2017

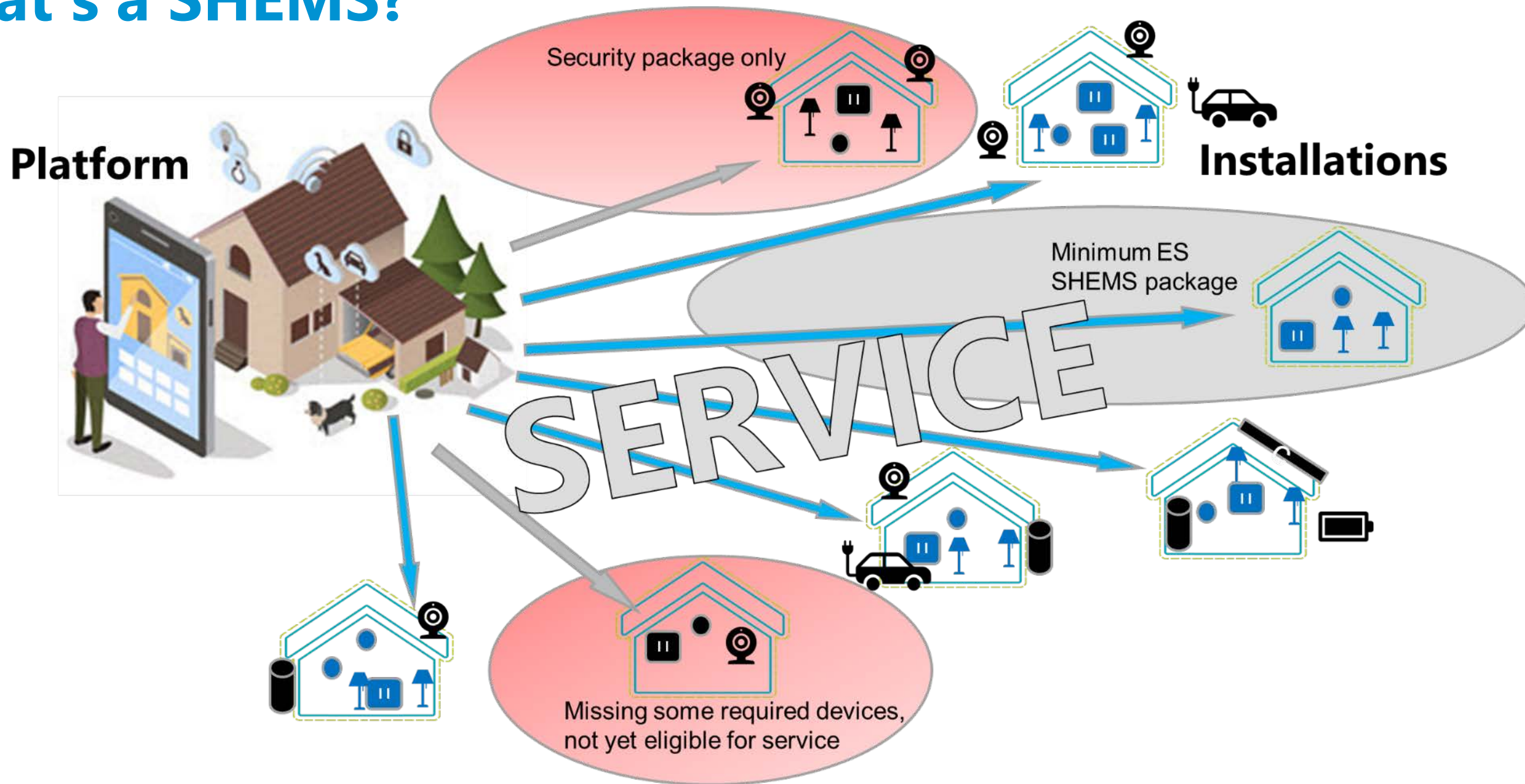


Why ENERGY STAR?

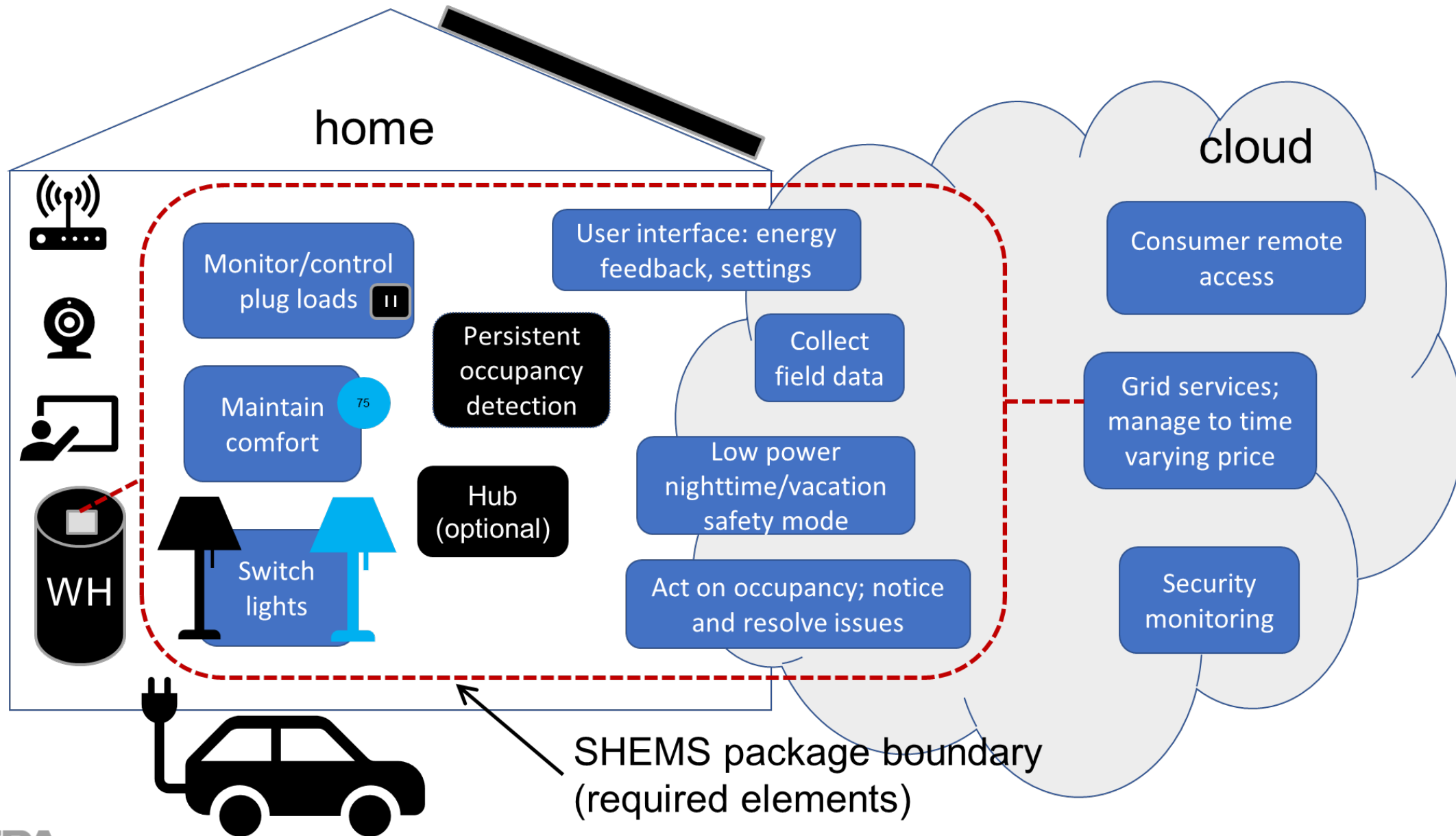


- **Consumers and utilities are interested in the smart home**, as shown with smart thermostat adoption
- **ENERGY STAR is a known and trusted label**, backed by impartial, publicly available specifications and test methods, and a powerful branding tool
- Part of the ENERGY STAR brand promise is to **make difficult decisions about energy savings simple**, as with automated SHEMS energy savings
- Offering a **uniform national platform** allows for smoother, more coordinated, deployment of incentive programs
- ENERGY STAR SHEMS can be a win for the companies that offer them, for the consumers that want them, and for the environment

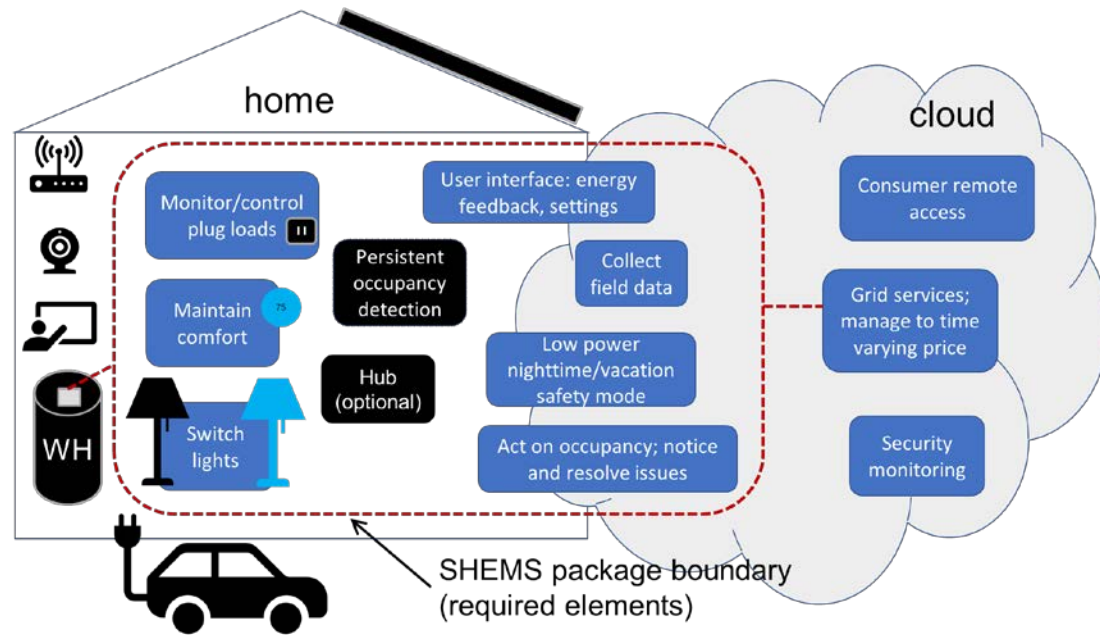
What's a SHEMS?



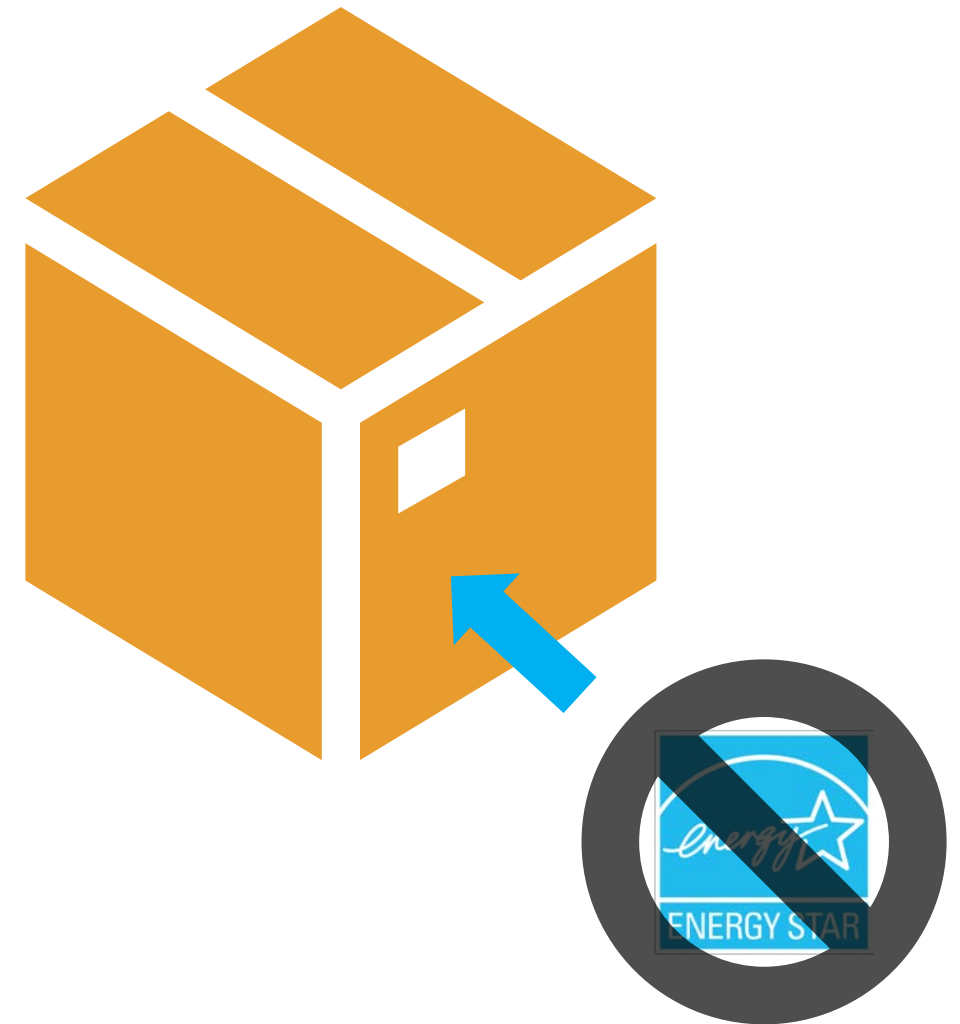
A SHEMS is a Package of Devices and Services



$$\begin{aligned} &\text{Hardware} \\ &+ \\ &\text{Occupancy Info} \\ &+ \\ &\text{Automated Services} \\ &= \\ &\text{Energy Savings} \end{aligned}$$



≠



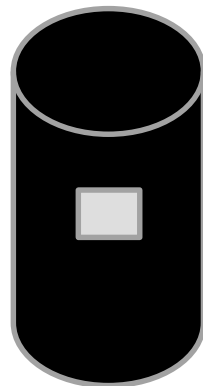
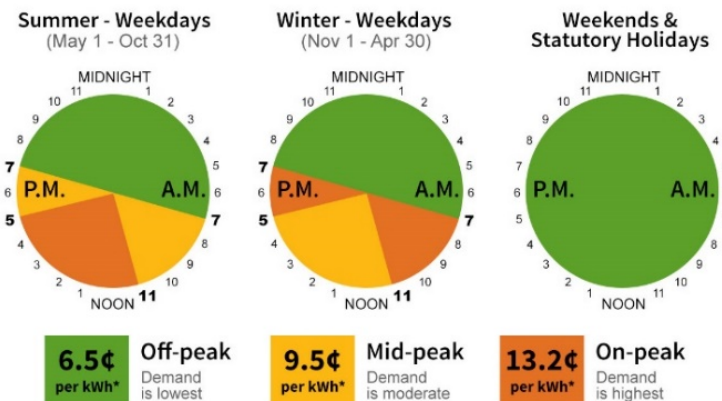
SHEMS Package

What is required of an ENERGY STAR SHEMS?

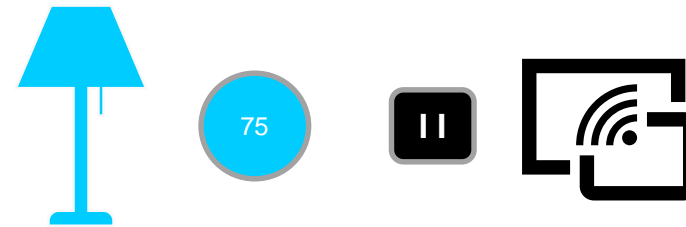
4.1 Required Base Services



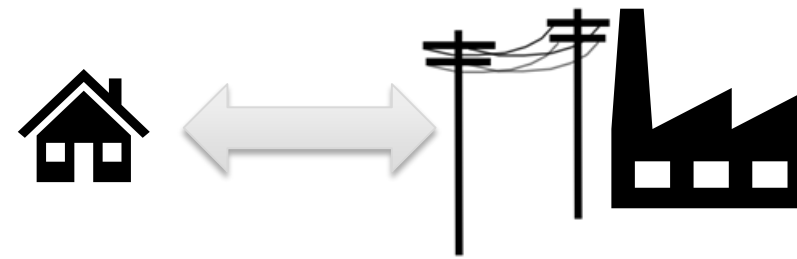
4.2 Additional Platform Capabilities



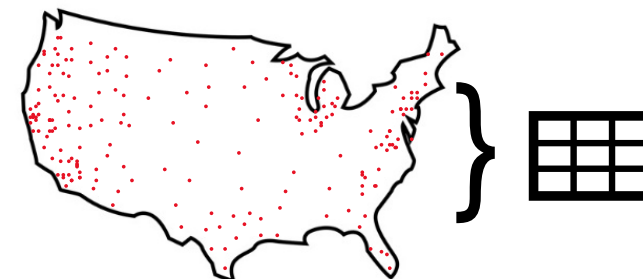
4.3 Required Devices



4.4 Grid Services



4.5 Field Data Reporting



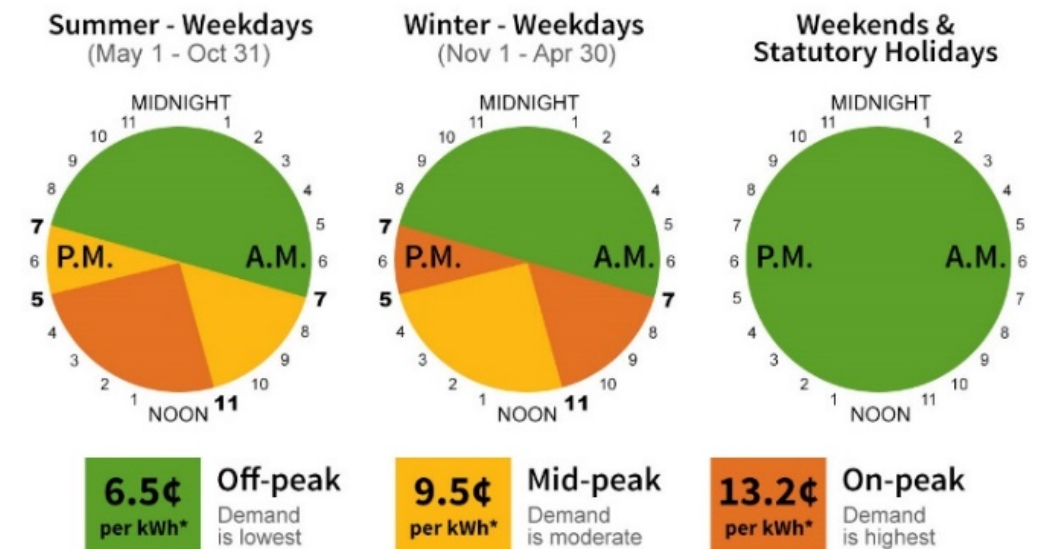
4.1 Required Base Services

- Occupancy detection
- Occupancy-based optimization
 - Implicit, explicit and suggested triggers
- Energy information for users
- Remote user access
- User customization and notification for system failures
- Vacation or nighttime safety mode
- Device recognition




4.2 Additional Required Platform Capabilities

- Ability to connect to a smart WH or WH controller
 - Connection shall enable occupancy-based control using occupancy information from the SHERMS
 - Connection cannot require the use of a third-party integration service (such as IFTTT)
- Ability to optimize system for time of use electricity prices



4.3 Connected Device Requirements

limits for standby/idle power for all devices

Thermostat (1)	Lighting Control Devices (1 ENERGY STAR + 1 other)	Plug Load Device (1)
		
<p>Note: Products shown as examples; EPA not highlighting any brands</p>		

- List of encouraged devices: DERs, ENERGY STAR connected appliances, etc.



4.3 Requirements for non-ENERGY STAR lighting load control devices

- Lighting load control device: Devices that can control lighting based on user interaction or sensor input
- Must measure lighting load and communicate energy consumption to the SHEMS service
 - The SHEMS service must display that energy consumption information to the user
- 0.5 watts maximum standby power

4.3 Requirements for non-ENERGY STAR devices: plug load management devices

- Include smart plugs, smart outlets, smart power strips, and home energy submetering systems
 - Home energy submetering system: a system that can monitor energy consumption of individual home circuits or end uses, including by disaggregation.
- Must report energy consumption data to the SHERMS
 - The SHERMS service must display that information to the user
- 1.0 watt maximum standby power



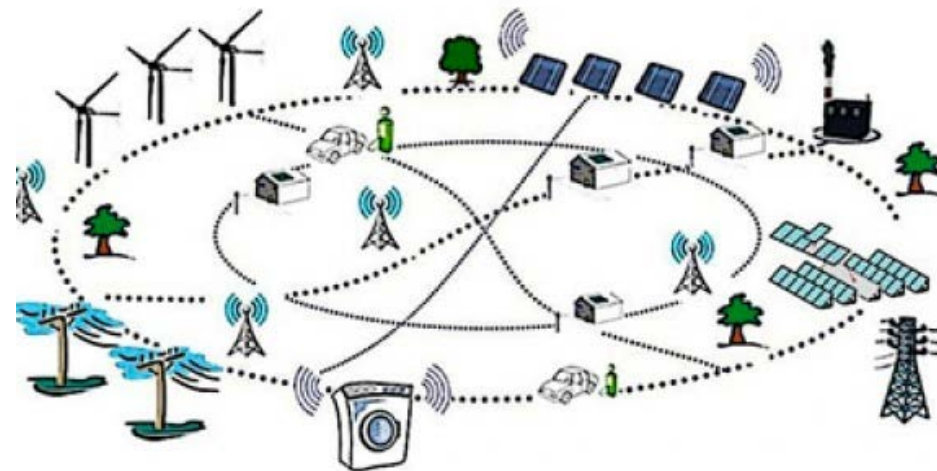


4.3 Additional encouraged devices

- Compatible: the SHERMS must provide all of the required base services (as applicable) to compatible devices
 - Recognize device connected to the network
 - Occupancy-based control
 - Energy data reporting
- To be included as part of an ENERGY STAR SHERMS package, additional encouraged devices must be compatible with the SHERMS service
- Note: water heater/controller needs to connect, but not to be fully compatible

4.4 Grid Service Criteria

- Capability to implement a demand response event to at least one device
- User override available; duration 72 hours or less
- DR capabilities reported, must include
 - Which DR protocols are supported
 - Is DR reliant on service provider's cloud



4.5 Field Data Reporting

- Unlike typical ENERGY STAR products, SHERMS save energy by affecting how people use *other* products
- Only statistical data from real users shows effect of complex behavioral interactions with tech, evens out variation
- Partner must submit data every 6 months, covering a 6-month period
- According to the SHERMS Method to Demonstrate Field Performance
- Using the provided Data Template





Data Elements are organized into three sections

- **Program Performance (Required)**
 - Minimal set of data elements needed to verify that installations comply with the basic SHEMS service and device requirements.
- **Savings Metric Development (Optional)**
 - Additional elements which EPA believes will allow for the development of a metric and would greatly appreciate receiving.
- **SHEMS Market Evolution (Optional)**
 - Additional elements that indicate the level of integration of SHEMS with the grid and other smart home devices, which are of keen interest to many SHEMS stakeholders.



What does EPA certify?

- ✓ The package (service + device bundle) meeting the requirements which is marketed to consumers
- ✗ Is the Service Provider's Platform certified?
 - No – runs many other packages (e.g. security)
- ✗ Are Individual Devices certified?
 - Only insofar as they have their own, separate ENERGY STAR specification, e.g. connected light bulbs and smart thermostats
- Is an Individual Installation certified?
 - Not all homes that purchase the SHERMS package will set it up in accordance with the SHERMS specification
 - Installations that include all elements of the basic SHERMS are considered part of the population for field data analysis



What if my service is missing some of the requirements?

- Generally two useful approaches
 - Partner with another company who offers what you need
 - Contact us if you run into a fundamental problem
- What is missing?
 - Additional platform capabilities or grid service capabilities: Start collecting data while you arrange to add these to your platform
 - Data collection capabilities: Add them
 - Some devices or base platform services: Partnership can be useful here

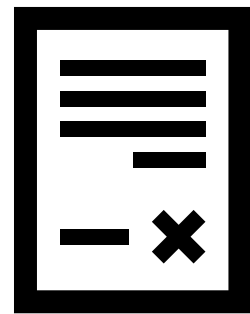


Who can be a partner?

- The Service Provider is the ENERGY STAR Partner
 - ✓ Brands the interface with which the end user interacts
 - ✓ Brand name appears in consumer-facing marketing information
 - ✓ May or may not manage service algorithms
 - ✓ Responsible for ensuring that field data is submitted to EPA
 - Data may be submitted by service OEM
 - ✓ May or may not brand any of the package devices
 - ✓ Must comply with the ENERGY STAR [Partner Commitments](#)
 - Use the logo in accordance with our [Brand Book](#)



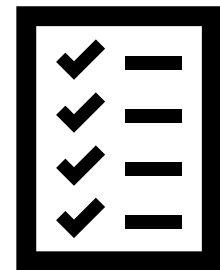
Certification Process



Complete and return an ENERGY STAR partnership agreement



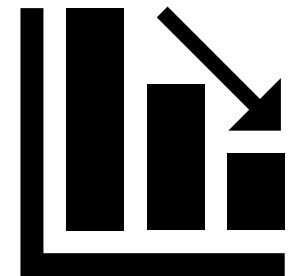
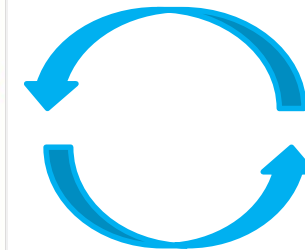
Establish relationship with a Certification Body (CB)



Submit package information, laboratory tests, field data to CB



CB Certifies your SHEMS!
Use the ENERGY STAR mark in your marketing.



Submit periodic field data to EPA contractor



What will CBs require to certify a package?

ENERGY STAR Requirement Section	Information Submitted to CB
4.1 Service Requirements	Screenshots and descriptions
4.2 Additional Required Platform Capabilities	Screenshots, descriptions, water heater device information
4.3 Connected Device Requirements	Laboratory test reports, ENERGY STAR certified device IDs, installation guidance materials, device information
4.4 Grid Service Criteria	Screenshots and descriptions
4.5 Field Data Reporting	Data Reporting Template (.xlsx)



How can device manufacturers participate?

- Partner with service providers
- Enable easy certification of a package including their products
 - Attain ENERGY STAR Certification (lighting, connected thermostats)
 - Obtain third-party laboratory standby power test reports (for non-ENERGY STAR devices)
 - Increase interoperability with other devices
 - Post a public API including energy reporting and other required capabilities
 - Implement standard protocols such as CTA-2047
- Become a service provider

How might SHEMS be sold and installed?

Option 1: Professional install

- An installation professional manages device procurement, installation and connection
- May or may not be employed by the SHEMS service provider
- The home may or may not have some devices installed previously
- In new construction, device installation may occur before the home is occupied, SHEMS is complete when occupant enrolls in service



Installation contractor is generally **not** the ENERGY STAR Partner

How might SHEMS be sold and installed?

Option 2: Package self-install

- Package of devices is offered through a retailer, service provider's online store, or utility's online marketplace
- Homeowner follows instructions to install and connect devices themselves
- SHEMS is complete when homeowner enrolls for service



How might SHEMS be sold and installed?

Option 3: Piecewise self-install

- The homeowner purchases different devices at different times, not necessarily from a single marketplace
- The homeowner chooses a service provider (and may need to acquire additional equipment such as a hub) to establish the ENERGY STAR SHEMS service





EPA's Vision

- EPA was motivated to release the SHERMS specification now largely because of where it could take us
- In our working groups over the Fall and Winter, discovered a common vision of the future SHERMS:

Seamlessly optimize energy use, storage, and production in the home for multiple priorities of cost, environmental impact, and convenience, while providing excellent customer experience.
- EPA sees the Version 1 specification as a stepping stone to bring that future closer



Roadmap from here

- First certifications expected Q2 2020: as far as we know, most Smart Home Service Providers will need to update their offerings and collect data
- Next step: energy savings metric
 - By Q1 2021, hope to have enough data to begin analysis and metric development
- Revision to Version 2 begins as metric nears completion, hopefully in 2021; likely effective 2022 or 2023
 - Other changes in Version 2 will depend on market developments

Contact Information

Specification Questions:

SmartHomeSystems@energystar.gov

Certification Questions:

join@energystar.gov

Abigail Daken, U.S. EPA

Daken.Abigail@epa.gov

Taylor Jantz-Sell, U.S. EPA

Jantz-Sell.Taylor@epa.gov

Taylor concentrating on her other job,
back in the office January 2020





Next Steps

Join the upcoming webinars:

- **October 30, 2019, 1-2pm ET:** [Making Sense of the ENERGY STAR SHEMS Program for Retailers](#)
- **November 13, 2019, 1-2pm ET:** [Working Toward Smart Efficiency: an Overview of the SHEMS Specification for Energy Efficiency Program Sponsors](#)
- **December 4, 2019, 1-2pm ET:** [Making Sense of the ENERGY STAR SHEMS Program for Home Builders](#)

Email SmartHomeSystems@energystar.gov if you are a device manufacturer looking to partner with a service provider (or vice versa).



Questions and Discussion