ENERGY STAR Program Requirements
Product Specification for Smart Home Energy Management Systems

Eligibility Criteria
Draft 1 Version 1.0

This document specifies the eligibility requirements for the **Draft 1 Version 1.0** ENERGY STAR Smart Home Energy Management Systems (SHEMS) program. SHEMS packages shall meet all of the identified criteria to earn the ENERGY STAR.

1 INTRODUCTION

The intent for this specification is to recognize smart home system packages designed to actively recognize and act on opportunities to save energy and help end users manage their energy in a way that saves them money and makes their lives easier. This includes but is not limited to 1) providing reliable vacancy detection linked to savings strategies that shut off or power down equipment when no one is home, 2) limiting standby power of connected devices, and 3) providing feedback to users about the energy impact of their settings.

ENERGY STAR certification is exclusive to a service provider's energy management service/package, which is eligible to the extent it is the sole energy management service/package offered for a given platform (i.e. a participating service provider may not market competing SHEMS packages that are not ENERGY STAR certified). However, the intent is for the ENERGY STAR certified SHEMS package to be customizable and scalable to function with devices beyond the minimum requirements in this specification. The ENERGY STAR certified SHEMS must be marketed distinctly from other packages such as security, entertainment, or wellness. Individual home installations may vary based on user priorities and interests.

The ENERGY STAR SHEMS specification is tailored to current market circumstances by requiring a limited set of popular smart home devices, but as the market and technology continues to evolve, we hope it will grow to provide a national framework for complete home energy management systems that work seamlessly with the grid.

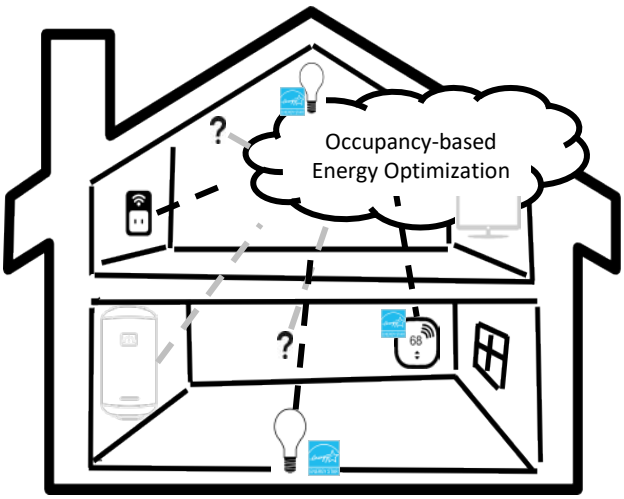


Figure 1: Simple illustration of the basic elements of an ENERGY STAR Smart Home Energy Management System (consisting of required minimum devices shown with black dotted lines, optional devices in gray, and the core service capability, occupancy-based energy optimization)

2 DEFINITIONS

A) Smart Home Energy Management System (SHEMS): A combination of devices and services that manages the energy use of connected devices in a home.

   a) Service and Device Package (Package): A combination of a service and devices marketed and sold together; for instance, a home security package might include a smart doorbell, window/door sensors, an alarm panel, and a monitoring service. A home automation package might include lighting control, window shades, and entertainment system control. Packages are defined by the company that offers them to communicate with potential purchasers what is included. A SHEMS package may be a subset of a larger home automation platform that provides other services. An ENERGY STAR certified SHEMS package shall deliver occupancy-based optimization and meet all of the device and service requirements identified in the Eligibility Criteria.

   b) Service: A combination of software, algorithms, and user interfaces that is useful to the building, its occupants, and other parties. A SHEMS service refers specifically to the service offered as part of a SHEMS package which provides for occupancy-based energy optimization strategies.

   c) Platform: A service offering encompassing multiple packages intended to serve consumer's interests such as security, health, safety etc. For instance, Company X offers a platform through which a consumer could select a variety of packages.

   d) Installation: An individual instance of a platform consisting of one or more packages as used in a single dwelling.

   e) Smart Home Service Provider: The company that owns the brand which consumers see when they interact with their smart home energy management service and is able to provide package data and analysis of field data to EPA for the ENERGY STAR program.

B) Device: A piece of physical equipment connected to a smart home service, including the following device types:

   a) Sensor: A device that detects or measures a physical property and records, indicates, communicates, or otherwise responds to it.

   b) Hub: A dedicated device in addition to a wireless router which provides network connectivity, protocol translation, and, in some cases, additional instruction between products included in a SHEMS package. For instance, an alarm panel or gateway may serve as a hub. This can be anything that would not reasonably be expected to be in a home other than to support the SHEMS and possibly other functions of a platform. Smart home systems do not necessarily need to include a hub.

   c) Persistent Occupancy Device: A device that detects room, space or dwelling level occupancy and is always present in the home. This could be a sensor integrated into another product or a standalone sensor (e.g. a passive infrared sensor) or mechanism that can detect and communicate dwelling or space occupancy (e.g. alarm control pad). Door sensors which only report when a door opens and closes do not qualify as persistent occupancy devices.

   d) Transient Occupancy Device: A device that detects room, space or dwelling level occupancy that is not always present in home. This could be a sensor integrated into a portable product or a standalone device like a garage door remote.

   e) Smart Plug: A household voltage (120V or 240V) wall outlet or device which is placed between a standard outlet and a device's power plug or incorporated into the outlet itself, and can can be controlled by a wireless remote or app using Wi-Fi, Bluetooth, or other wireless communications protocols. Most advanced smart plugs offer the ability for preset timed events, surge protection, and current draw feedback.

   f) Smart Power Strip: A multi outlet device (similar to a traditional power strip 120V or 240V) placed between a household power outlet and more than one device's power plugs. The smart power strip's multiple outlets can be controlled individually or in a group by a wireless remote or app

using Wi-Fi, Bluetooth, or other wireless communication protocols. Smart power strips incorporate either automated energy savings based on user interaction, or the ability to set timed events, or other trigger technologies such as Geo Fencing or IFTT. Smart power strips have the ability to monitor and report energy use data from each outlet or the group of outlets.

g) Home Energy Sub Metering System: A system that can measure or estimate energy usage at the circuit breaker panel, offering the ability to monitor energy usage for individual circuits to account for their actual energy usage. This may include smart fuse boxes and systems that use current transducer (CT) clamps or similar means to non-invasively measure power in household circuits.

h) Connected Thermostat (CT): A device that controls heating, ventilation, and air-conditioning (HVAC) equipment to regulate the temperature of the room or space in which it is installed and has the ability to communicate with sources external to the HVAC system. For connection, the CT device may rely on a Wi-Fi home area network and an internet connection that is independent of and not part of the CT Device. An ENERGY STAR Certified Connected Thermostat meets the requirements in the current Connected Thermostats specification.

i) ENERGY STAR Certified Light Meeting Connected Criteria (Smart Light): A lamp, luminaire, or retrofit kit certified to the latest ENERGY STAR specification as meeting the optional connected criteria.

C) Plug Load: Plug loads are a category of energy used by equipment that is usually plugged into an outlet. This term generally excludes loads that are attributed to major end uses (HVAC, lighting, water heating, etc.)

D) Occupancy-Based Optimization: Using information on occupancy to serve consumers' desires with the least energy possible, for instance by reducing idle power or reducing the amount of time energy-using devices are on. Optimization algorithms also use predictive information about when occupancy is likely to change, based on learning.

E) Occupancy Sensing: A method (or methods) to detect whether a space has a person and/or animal in it, and potentially how many. Occupancy may be sensed on a room by room basis or for an entire dwelling, and may be sensed using dedicated sensors, sensors in a product with a different primary purpose (thermostat, light fixture), system-based techniques such as geofencing or the arming of an alarm panel, or a combination of these techniques. It may include information about how long the home has been or will be unoccupied which may affect optimization.

F) Automated Actions:

a) Explicitly generated (by a hard trigger): Actions for devices initiated by a user through an intentional input, e.g. setting up a schedule (home, away, vacation, sleep), rule, or action through an app e.g. setting up geofencing to control devices, commanding a voice assistant, arming a security system, or actively pressing a button on a device in home. (For the purpose of this specification this excludes action on a suggested event).

b) Implicitly generated (by a soft trigger): Actions for devices initiated by the service based on occupancy and possibly other information, without explicit user input. This can be a machine learning scenario where a system detects new patterns and adjusts a users' schedule or simply that the system detects that the home is vacant and triggers energy saving actions on behalf of the users. This can also include a notification to the user that they can override but if ignored the system would carry on the action, unlike a suggested action where a user must grant permission for the system to take the action.

c) Suggested (by service-suggested trigger): Actions for devices that are suggested by the service based on occupancy and other information, where the service requires a user to confirm in order to take the action.

Note: Since this program hypothesizes energy saving differentiation may come from suggested and implicitly generated events, it is important to capture these distinctions in the dataset. How might a system account for subsequent events based on initially suggested or implicit actions that become explicit rules or schedules?

G) Demand Response (DR): Changes in electric usage by demand-side resources from their normal consumption patterns in response to changes in the price of electricity over time, or to incentive payments designed to induce lower electricity use at times of high wholesale market prices or when system reliability is jeopardized[1].

H) Interface Specification: A document or collection of documents that contains detailed technical information to facilitate access to relevant data and product capabilities over a communications interface

I) States or modes:

a) Idle state: A state where the device is:

(1) installed and interconnected in accordance with provided instructions,

(2) with no direct or remote user interaction (e.g., smart phone app, web interface, occupancy detection), and

(3) sufficient time has elapsed to allow the device to enter a low power state, as applicable. For example, the screen has dimmed or turned off automatically.

b) Standby State: The lowest power state which cannot be switched off (influenced) by the user and that may persist for an indefinite time when the device is connected to the main electricity supply and used in accordance with the manufacturer's instructions.

J) Open Standards: Communication with entities outside the SHEMS that use, for all communication layers, standards:

- included in the Smart Grid Interoperability Panel (SGIP) Catalog of Standards,[2] and/or
- included in the NIST Smart Grid Framework Tables 4.1 and 4.2, and/or
- adopted by the American National Standards Institute (ANSI) or another well-established international standards organization such as the International Organization for Standardization (ISO), International Electrotechnical Commission (IEC), International Telecommunication Union (ITU), Institute of Electrical and Electronics Engineers (IEEE) or Internet Engineering Task Force (IETF).

Note: EPA welcomes stakeholder feedback regarding additional important open standards to identify.

While EPA has specifically requested feedback regarding certain definitions, we encourage stakeholders to submit comments regarding any of the definitions proposed above.

3 SCOPE

A) Included Products: Only packages that meet the definition of a SHEMS, as specified herein, are eligible for ENERGY STAR certification. A SHEMS may be one distinct package offered by a platform that also provides other smart home services such as home automation, entertainment, home awareness, elder care, or security.

[1] Federal Energy Regulatory Commission, https://www.ferc.gov/industries/electric/indus-act/demand-response/dr-potential.asp

[2] http://collaborate.nist.gov/twiki-sggrid/bin/view/SmartGrid/PMO#Catalog_of_Standards_Processes

B) Excluded Products: SHEMS that are unable to collect the required data for the Method to Determine Field Performance.

> **Note:** EPA seeks feedback for a variety of systems on their approach to integrating energy management features and their ability to capture field data. EPA would like to avoid recognizing package offerings intended for purposes other than energy management which may not deliver energy savings or may even increase the home's energy use. EPA welcomes feedback regarding potential approaches that will give service providers sufficient flexibility in their package offerings while assuring that only packages likely to deliver energy savings are eligible for certification.

C) Diagrams

Figure 2: Illustration of SHEMS Package

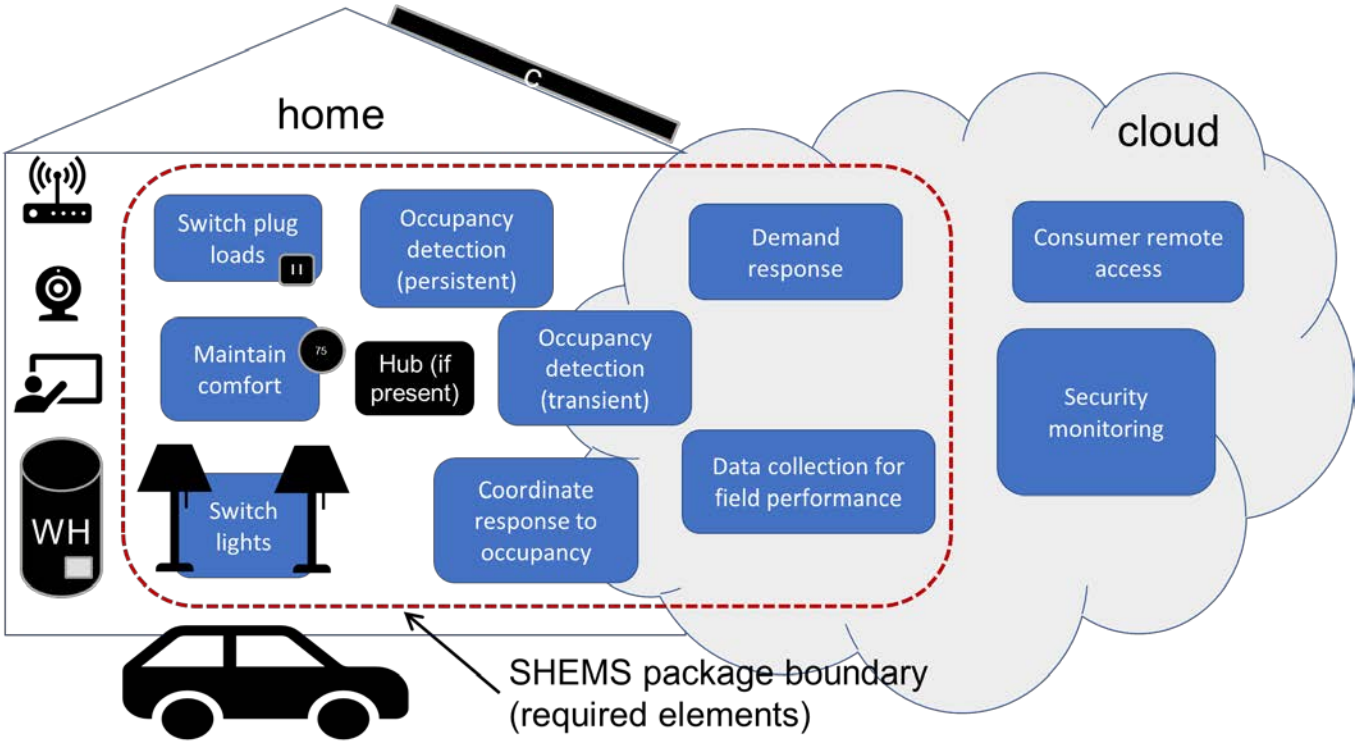
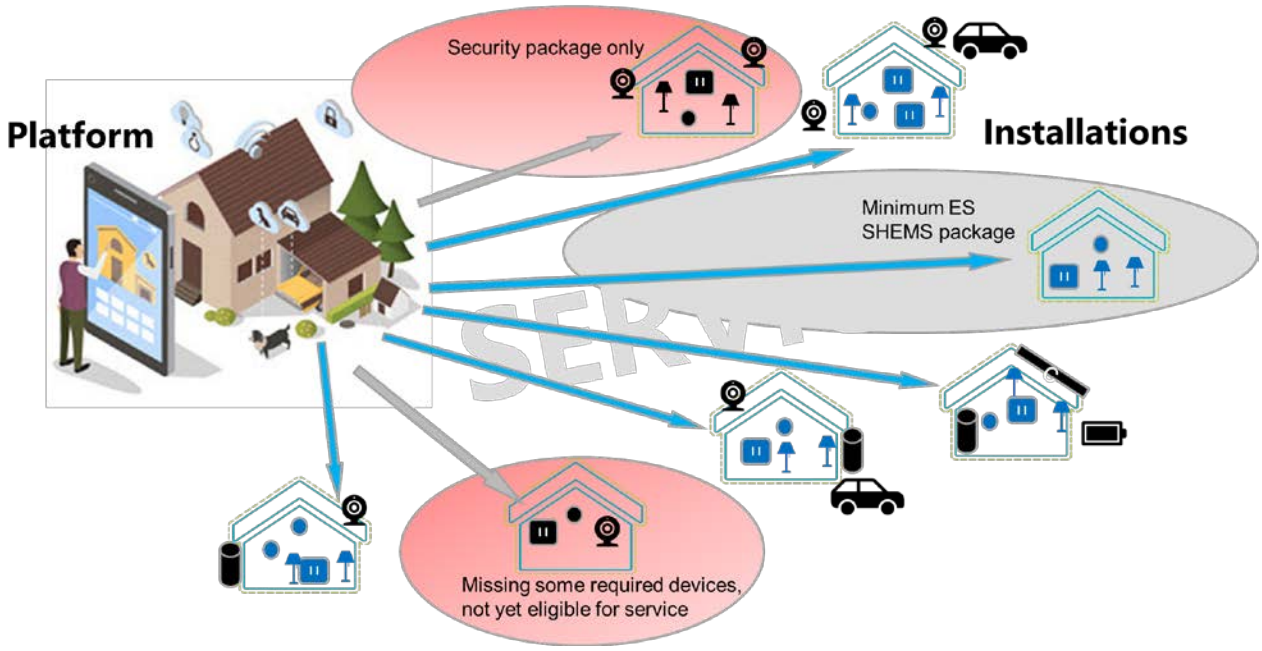


Figure 3: Illustration of installations of various packages in a platform



4 ELIGIBILITY CRITERIA

To certify as ENERGY STAR, the SHEMS package offered by a service provider must facilitate energy savings via occupancy-based optimization control of, at minimum, the connected devices as outlined below and include specified service and capabilities. In addition, field performance must be reported as detailed by the ENERGY STAR SHEMS Method to Demonstrate Field Performance. The SHEMS shall maintain these services and capabilities through subsequent firmware and software changes. The SHEMS service provider shall maintain documentation that demonstrates compliance to these requirements. The package offered by the service provider is expected to evolve (e.g. add or change compatible devices) but must continue to meet all requirements in the specification to maintain certification.

4.1 Required Base Services: The SHEMS shall perform the following services:

A) Provide a remote consumer interface (e.g. application, website, display) that allows end users to control all the devices connected to the SHEMS package from outside the dwelling.

B) Receive and utilize a minimum set of occupancy data, specifically:

a) include at least one persistent device with constant wired power or more than one solely battery-powered device; *This requirement could be met by one wired thermostat with occupancy detection, two battery-powered infrared detectors, or one bulb with presence detection screwed into a line-voltage socket.*

b) detect and communicate occupancy to the SHEMS package;

c) synthesize occupancy information for the installation; and

d) act on it by sending commands to devices connected to the SHEMS package.

C) Produce energy-saving device control actions through hard, soft, and suggested triggers, specifically:

a) to allow the end user to control all required devices in the SHEMS package on premises (hard trigger);

b) to allow the end user to set and modify a schedule (hard trigger). Default schedules are recommended features;

c) to implement control algorithms to automatically modify the operation of the devices in the package to save energy while maintaining positive user experience based on occupancy information and machine learning of user insights, i.e. patterns, preferences and user input (soft trigger); and

d) to identify and suggest energy savings events or actions to promote energy savings while maintaining positive user experience based on occupancy information and machine learning of user insights, i.e. patterns, preferences and user input (service-suggested trigger).

D) Allow the end user to access information relevant to their energy consumption. *Examples include but are not limited to real-time energy use data by device, package, platform or dwelling; daily, weekly, monthly or annual energy performance, comparison with previous periods or similar dwellings etc*.

E) Allow users to configure system preferences, provide feedback, and to adjust how responsive the system is to detected occupancy.

F) Provide a resolution and user notification process for when occupancy detection is not working properly; e.g. notifications through email, SMS and or on main access portal until resolved.

G) Provide a vacation or nighttime safety mode to automate lighting load to operate one or multiple lights minimally while away, using no more than 0.03 kWh per day while the feature is activated.

H) Recognize and identify required and encouraged devices certified in the package by type (e.g. light, outlet, thermostat, etc.) once connected.

Note: B) a) The intention here is to provide helpful examples of acceptable persistent occupancy sensing devices that are not solely powered by battery. EPA invites stakeholders to suggest additional examples for expanded clarity on this requirement.

F) Many platforms currently have built in notification systems when batteries need to be changed or a device goes offline. System reliability is important for persistent and reliable savings. Please share examples of methods of successful notification processes that we can learn from.

4.2 Additional Required Platform Capabilities

A) Ability to connect to at least one water heater controller or connected water heater which is currently available on the market.

B) Ability for users to enter a schedule of relative energy prices, and to manage energy use in the home so as to minimize energy costs according to that schedule.

4.3 Connected Device Requirements

A) Required devices: The following devices are required to be a part of a certified SHEMS package, though these devices may also be sold separately and integrated in the field.

a) At least one ENERGY STAR certified smart thermostat;

b) At least two lighting load control devices, consisting of:

- Two ENERGY STAR certified smart lights; or
- One ENERGY STAR certified smart light and one smart light switch capable of measuring lighting load.

c) At least one of the following plug load control or monitoring offerings;

- One smart power strip;
- One or more smart plugs; or
- Home energy sub metering system.

d) any additional devices needed to fulfill the required service capabilities, such as a hub or

occupancy devices.

B) Device-specific requirements:

a) Lighting Load and Plug Load Management Devices: Smart light switches, smart plugs, smart power strips, or sub metering devices included in a SHEMS package shall have the ability to communicate energy consumption of their respective loads to the SHEMS.

b) Idle and Standby Power Requirements:

Table 1: Device Power Limits

Device	**Power Limit** (Idle or standby as applicable)	**Method of measurement** (as applicable)
Smart plug, smart power strip, or sub metering device	1.0 watt idle power	IEC 62301, Ed. 2.0, 2011-01, Household electrical appliances – Measurement of standby power, subject to clarifications in sections (one set) 10 CFR Part 430 Appendix W to Subpart B 10 CFR Part 430 Appendix BB to Subpart B
Smart lighting control	0.5 watt standby	
SHEMS-specific Hub or control panel[3]	Standby or idle power shall be reported	

Note: EPA is interested in addressing the always-on power of devices included in the SHEMS package that are not covered under other ENERGY STAR programs. The goal of these requirements is to prevent avoidable increases in always-on power. EPA is requiring the reporting of hub standby or idle power without setting a limit to avoid favoring architectures relying exclusively on cloud integration without clear evidence that it is a better solution.

C) Optional Encouraged Devices: Service providers are strongly encouraged to include additional products subject to the occupancy-based optimization control of the ENERGY STAR certified SHEMs package, in addition to the basic hardware and service requirements. Such products will be highlighted on the ENERGY STAR listing for the certified SHEMS. Examples include:

- Connected water heater controller or ENERGY STAR Certified Connected Water Heater.
- Automated window coverings certified by the Attachments Energy Rating Council (AERC) for Energy Performance (EP) – Automation at aercenergyrating.org
- *ENERGY STAR certified room air conditioner
- *ENERGY STAR certified refrigerators
- *ENERGY STAR certified freezers
- *ENERGY STAR certified clothes washers
- *ENERGY STAR certified clothes dryers
- *Additional ENERGY STAR certified light bulbs and fixtures
- *ENERGY STAR certified EV chargers
- *ENERGY STAR certified pool pumps
- Solar inverters
- Battery storage

*product meets optional ENERGY STAR connected criteria where applicable

Note: inclusion of products not covered by another ENERGY STAR program in a SHEMS package does not grant such products the right to use the ENERGY STAR marks.

[3] Includes all equipment necessary to establish connectivity to the SHEMS service provider's cloud, except those that can reasonably be expected to be present in the home, such as Wi-Fi routers and smart phones.

Note: Given the rapid proliferation of smart home devices, we want to provide specific recommendations for service providers and users to consider integrating additional devices with energy savings potential as a roadmap for even better home energy management. It is important for device stakeholders to consider desirable energy management features (such as those outlined in ENERGY STAR connected criteria for individual products) and communication protocols that could integrate well with ENERGY STAR SHEMS over time.

The list of encouraged devices is a starting point for indentifying which products should be prioritized for energy management. Stakeholders are encouraged to share ideas for other priority products for this list. Regarding expansive packages, it won't be possible to list the full breadth of compatible devices for each SHEMS on energystar.gov, so we are interested in what information would be most useful to stakeholders and consumers for a given SHEMS offering and best approaches to making this information easily accessible to consumers. One idea would be to list a company URL that would include up to date listings of compatible devices beyond a priority list.

4.4 Grid Service Criteria

a) Grid Communications and Access: To enable use of the SHEMS to manage a home's response to grid requests, the platform shall offer an interconnection specified by an interface specification, application programming interface (API) or similar documentation that, at a minimum, enables DR functionality. Providers are encouraged to use open standards to meet this criterion, for example by offering an OpenADR virtual end node (VEN) in their cloud.

b) Consumer Override: Consumers shall be able to override their SHEMS' response to any grid request.

c) Capabilities Summary: A ≤ 250-word summary description of the SHEMS service provider's DR capabilities/services shall be submitted. In this summary, EPA recommends noting the following, as applicable:

(1) DR services that the SHEMS has the capability to participate in such as load dispatch, ancillary services, price notification and price response.

(2) Whether individual installations can be directly addressed via the interface specification, API or similar documentation, rather than the service provider managing groups as a whole.

(3) Support for locational DR, e.g. to ZIP code(s), feeder(s), or other locational groupings.

(4) List open communications supported by the SHEMS, including applicable certifications.

(5) Feedback about DR response, e.g. verification/M&V, override notification.

(6) Measures to limit consumer comfort impacts, if any.

(7) DR response configurability/flexibility by the consumer and/or DR program.

(8) Whether any device in the SHEMS complies with the 2016 California Energy Commission Title 24, Part 6 Joint Appendix 5.

Note: Stakeholders were united in their vision that SHEMS would evolve into a comprehensive manager of home energy consumption, including the homes' coordinated response to grid requests, such reducing or increasing load in a given time period. There was also broad agreement that at this point, it makes sense to focus on building blocks towards that future. With that intention, EPA proposes to specify minimal grid response capabilities. We would prefer to require open standards for grid signals, and are likely to in future versions, but understand that this may not be practical now given the state of the market.

4.5 Field Performance

To maintain certification and facilitate evaluation, service providers shall demonstrate SHEMS performance in the field by reporting aggregated statistical data every six months to the ENERGY STAR program according to the ENERGY STAR SHEMS Method to Determine Field Performance.

The platform must be capable of collecting certain data from each installation. This includes but may not be limited to:

- Each installation shall have a unique ID independent of its evolution over time;
- Start and end date of service;
- Information about devices attached to the platform, including the total number, how many lighting and thermostats are ENERGY STAR certified, and the number of smart outlets connected;
- The number of away hours each week of each type named in section 4.1C);
- The average time light fixtures or control devices are on per day; and
- The ability to estimate, accept data on, or look up the idle or standby power of all devices connected to the platform in each installation.

Note: EPA has included a summary of capabilities needed to fulfill the requirements of the Method to Determine Field Performance. Please see note boxes in the Method itself for discussion of data elements which EPA is not confident are comprehensively available.

EPA is proposing to require the collection and reporting of field data as specified in the Method to Demonstrate Field Performance. EPA expects that the field data collection will need to evolve at a pace that is faster than the actual specification, therefore the method and the template for data collection will remain separate documents from the specification. Those documents are the primary references regarding field data should any discrepancies with the specification arise. In the future, once metrics are established to demonstrate savings, specifics on data necessary to calculate those metrics will be added to this section.

Note that field data will be submitted to an EPA contractor. In order to protect the proprietary nature of the data, EPA will only have access to anonymized data, will only share aggregated and anonymized general information publicly, and will refrain from sharing non-anonymized data publicly without further stakeholder discussion. Further, EPA will neither collect nor share any customer-specific data.

EPA welcomes feedback on these data collection and reporting requirements.

5 TEST REQUIREMENTS:

A) Software updates: Software and firmware updates may not adversely affect product savings. Software or firmware changes that alter the principle that savings rest upon, or which are expected to reduce savings, require recertification of the SHEMS.

B) Significant Digits and Rounding:
   a) All calculations shall be carried out with directly measured (unrounded) values.
   b) Directly measured or calculated values that are submitted for reporting on the ENERGY STAR website shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

C) Test Methods: the following methods shall be used to demonstrate ENERGY STAR certification.

Table 2: Test Methods for ENERGY STAR Certification

ENERGY STAR Requirement	Applies to	Test Method Reference
Standby and Idle mode	Non-ENERGY STAR lighting control and plug load devices	IEC 62301, Ed. 2.0, 2011-01, Household electrical appliances – Measurement of standby power, subject to clarifications in sections (one set)
Network energy consumption	SHEMS hubs	IEC 62301, Ed. 2.0, 2011-01, Household electrical appliances – Measurement of standby power, subject to clarifications in sections (another set)
SHEMS Field Performance	SHEMS Package	ENERGY STAR Method to Demonstrate SHEMS Field Performance, V1.0

D) Implementation of IEC 62301 for non-ENERGY STAR Device Testing

Note: This test is not applicable to devices that are powered solely by batteries or energy harvesting.

a) Configure and provision the Device's connected functionality, including enrollment of applicable services and updating to latest version of firmware.

b) Test Conduct – Measure power consumption at the power input to the Device using the sampling method, section 5.3.2 of IEC 62301, Edition 2.0 2011-01.

(1) Verify ability to control the device over the communication link and operate the device according to its intended function. For example, turn a smart light switch on and then off, or operate a smart plug with a lamp plugged in.

(2) Set the device to its lowest power state, then close all apps and web interfaces.

(3) Wait five minutes, while taking appropriate measures to allow the device to enter into and remain in standby mode for the duration of the test, e.g.

- No additional device-user interactions,
- Ensure occupancy sensing devices do not detect occupancy,
- Ensure apps and-or web remote interfaces remain closed.
- Separately measure and record average energy consumption over a five-minute period.

(4) Check measurement stability in accordance with IEC 62301, Edition 2.0 2011-01, and section 5.3.2.

(5) If stability criteria are not satisfied, repeat the test, starting from step 2. b, with the test period extended in five-minute increments (i.e. 10m, 15m, 20m…) as necessary to establish requisite measurement stability.

(6) Once stable, repeat the test over two additional test periods, starting from step 2. b.

(7) Record power consumption as the average over the second and third test periods.

E) Configuration and testing of hub for network idle power consumption

a) Follow included instructions to connect all required devices for SHEMS to the hub;

b) Assure that the application associated with the package delivers the required service capabilities

c) The following procedure shall be used for measuring the idle power:

(1) Reset the power meter (if necessary).

(2) Begin recording elapsed time.

(3) After 5 minutes have elapsed, set the meter to begin accumulating true power values at a rate of greater than or equal to 1 Hz (1 reading per second).

(4) Accumulate power values for 5 minutes and record the average (arithmetic mean) value observed during the 5-minute period.

(5) Record measurements in the test report.

Note: EPA would appreciate feedback regarding the testing procedures proposed above.

6 EFFECTIVE DATE

The ENERGY STAR SHEMS specification shall take effect when it is complete. To certify for ENERGY STAR, a SHEMS package shall meet the ENERGY STAR specification in effect on the date it is offered to consumers.

Note: While EPA typically specifies that products shall meet the ENERGY STAR specification in effect on the date of manufacture, EPA proposes that the relevant date for a SHEMS package is the date on which it is available to consumers. EPA would appreciate feedback on this characterization for certification tracking.

7 FUTURE CRITERIA REVISIONS

EPA reserves the right to change the specification should technological and/or market changes affect its usefulness to consumers, industry, or the environment. In keeping with current policy, revisions to the specification are arrived at through industry discussions. In the event of a specification revision, please note that the ENERGY STAR certification is not automatically granted for the life of a SHEMS package.

Several topics that are likely to be examined in ongoing work and/or in future revisions have been identified.

A) EPA intends to use field data and feedback from service providers and other stakeholders to develop a performance level, to enable a more stringent performance requirement and delivered energy savings.
B) EPA will continue to monitor technology development and consider reduction of device standby power to better reflect best practice.
C) If occupancy detection methodology or any other key factors indicates substantial variance among certified packages, EPA may consider including requirements to ensure ENERGY STAR SHEMS packages effectively use occupancy detection methods that are proven to deliver more energy savings.
D) EPA will continue to monitor the development of industry-developed communications standards for security or communications platforms for passing certain information between devices or the cloud and reference in future revisions those that have broad usage and are demonstrated to be of high quality.
E) EPA will monitor the market for helpful specific device control strategies or algorithms to reference, e.g. to support time of use pricing models.
F) EPA will explore the services of distributing Demand Response signals (including prices) and of collecting energy reporting data as these are also key to reaching our energy, cost, and climate goals. Future specifications may have additional capability requirements for these services. Energy Reporting is the principle that all (communicating) devices should keep track of their own energy use (via measurement or estimation) and be able to report that data to the local network.

G) EPA will assess if other services or devices are of sufficient relevance to our energy goals to also bring into consideration for this specification.

GENERAL DISCUSSION & QUESTIONS FOR STAKEHOLDERS

Note: The Device Mode Work Group explored device control strategies depending on the duration and level of confidence of a detected vacancy. EPA appreciates this effort but does not want to inhibit innovation by prescribing device control methodologies. However, EPA does seek to encourage emerging best practices as they are identified and established through formal industry processes. For example, EPA is especially interested in recognizing SHEMS packages that include automated window coverings recognized by the forthcoming Attachments Energy Rating Council (AERC) energy performance rating. Therefore, this specification seeks to encourage service providers to work closely with device manufacturers to control their associated devices effectively and efficiently without explicitly specifying strategies. EPA recognizes that sharing best practices for control strategies or algorithms could be valuable to the smart home sector and is interested in collecting stakeholder feedback regarding an appropriate platform for such information.

Note: There was a discussion in work group on whether minimum occupancy data must be transferable among devices without aid of Wi-Fi, or without a cloud connection. Are there ways that systems can communicate occupancy information to the central control point to trigger designated away modes for energy management without Wi-Fi? It is helpful to discuss this in the context of the current and predicted state of Wi-Fi reliability. Loss of smart home functionality is extremely frustrating once a user is accustomed to it, while most systems and devices popular in operation today rely on Wi-Fi connection and cloud integration for basic functionality. Is it possible for a centralized smart system to be able to recover connectivity among devices when Wi-Fi changes, so you just have to update the Wi-Fi info on a central controller and it then updates that info on all devices connected to the system?