



ENERGY STAR® Program Requirements for Connected Thermostat Products

Partner Commitments

Following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the provision and labeling of ENERGY STAR connected thermostat products. The ENERGY STAR Partner must adhere to the following partner commitments:

Providing Qualified Service/Hardware Products

1. Comply with current ENERGY STAR Connected Thermostat Products Eligibility Criteria, which define performance requirements and test procedures. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. **Prior to associating the ENERGY STAR name or mark with any product**, obtain written certification of ENERGY STAR qualification from a Certification Body recognized by EPA for Connected Thermostats. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform connected thermostat device testing. A list of EPA-recognized laboratories and Certification Bodies can be found at www.energystar.gov/testingandverification.
3. A new product is defined as a connected thermostat with either significantly different hardware or software features relative to an existing product. Products receiving software updates are not considered new products.

Note: EPA typically requires retesting and recertification of products when they change significantly. EPA is seeking a clear and easy way to identify when a connected thermostat product changes enough to require recertification. We recognize this is a case where regular updates are to be expected. If a regular update improves the metric performance of an existing product, we expect that the Service Providers will be able to work with their CB to have the savings listed with their product updated.

Using the ENERGY STAR Name and Marks

4. Comply with current ENERGY STAR Identity Guidelines, which define how the ENERGY STAR name and marks may be used. Partner is responsible for adhering to these guidelines and ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance. The ENERGY STAR Identity Guidelines are available at www.energystar.gov/logouse.
5. Use the ENERGY STAR name and marks only in association with qualified connected thermostat products. The Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
6. Provide clear and consistent labeling of ENERGY STAR certified connected thermostat products (i.e. service and device).
 - 6.1. The ENERGY STAR mark must be clearly displayed in product literature (i.e., user manuals, spec sheets, etc.) and on the partner's Internet site where information about ENERGY STAR qualified products is displayed. Specific guidance on using the

ENERGY STAR mark on Internet sites is provided in the Web-Based Tools for Partners document.

- 6.2. All ENERGY STAR Connected Thermostat applications and web interfaces must bear electronic certification marks at minimum 1” square and legible, in cyan, black or white, as applicable:
- The mark shall appear on the control application’s main screen or main settings screen for at least 3 seconds when a user first encounters the screen; and
 - the mark shall appear on the web interface’s main screen or main settings screen for at least three seconds when the interface is first activated.
- 6.3. All ENERGY STAR Connected Thermostat devices must bear certification marks as applicable:
- 6.3.1. An electronic label, consisting of the certification mark, at minimum 1” square and legible, in cyan, black or white, shall appear on the device’s main menu screen by default for at least 3 seconds when the menu is activated.
- 6.3.2. For products that use a dedicated hardware device (i.e., the device is only for use with services provided by a single service provider),
- The certification mark must appear on product packaging.
 - The electronic label requirement (6.3.1) is waived if there is a physical label on the thermostat device front or top.

EPA will consider alternative proposals for electronic labeling on a case-by-case basis.

- 6.4. For ENERGY STAR Connected Thermostat products that are part of a broader product, such as a home security system, labeling shall clearly indicate that only the Connected Thermostat product is certified. Neither physical nor electronic labels shall not be associated with the full product, and product literature shall state: *“This [insert product type (e.g., security system, home automation system)] includes an ENERGY STAR Connected Thermostat. Only the Connected Thermostat is certified as ENERGY STAR.”*

Note: EPA looks forward to discussing these product labeling requirements with stakeholders and to working together to refine them. EPA’s overall goal is to assure that consumers associate the ENERGY STAR certification mark with certified connected thermostat products, and only those products, without imposing undue burden on product providers. Most of these requirements are the same as or similar to those for other ENERGY STAR products. There are a few particular areas to note:

Section 5: There is an “ENERGY STAR Partner” logo that companies providing ENERGY STAR products can use. Service providers need to have an ENERGY STAR certified connected thermostat device to use this mark.

Section 6.2: The requirements here reflect that most connected thermostats are intended to be accessed by several interfaces; thus there are labeling requirements for each.

Section 6.3: EPA typically requires that products bear a physical ENERGY STAR logo, so that when they are in the home it is obvious that they are certified. For this product category, we expect many products will not use a dedicated hardware device. For some ENERGY STAR product categories, such as televisions and displays, we allow the option of electronic labeling. The goal of the specific requirements is to provide flexibility to partners while still ensuring the consumers are aware of the certification of their product. Package labeling is intended to address products sold at retail where labeling the product packaging will influence purchasers and increase awareness of ENERGY STAR for Connected Thermostats.

Stakeholders are encouraged to comment whether these requirements fulfill EPA’s intention effectively.

Providing Information to EPA

7. Provide aggregate savings data and associated statistics to EPA every 6 months in accordance with the ENERGY STAR Test Method for Connected Thermostats. Submitted data shall be representative of savings for the product's entire installed base and must demonstrate continued compliance with the requirements of the specification. This data will also be used for program evaluation purposes:
 - 7.1. Every July 1, Heating season data:
 - average heating run time reduction (%)
 - average resistance heat utilization (%) in 5°F bins from 0F to 60F
 - *[TBD] statistical data*
 - 7.2. Every January 1, Cooling season data:
 - average cooling run time reduction (%)
 - *[TBD] statistical data*

Note: This is a placeholder for regular submission of savings metric data. We propose that cooling season summary data be submitted in the middle of the heating season, and heating season summary data in the middle of the cooling season. EPA welcomes stakeholder feedback on the proposed approach.

8. Participate in verification of thermostat device hardware through a Certification Body recognized by EPA for Connected Thermostats, providing full cooperation and timely responses. EPA may also, at its discretion, conduct tests on products that are referred to as ENERGY STAR certified. These products may be obtained on the open market, or voluntarily supplied by Partner at the government's request.

Note: EPA typically requires verification testing of off the shelf samples of certified products. For Connected Thermostat products, CBs will test 10% of available connected thermostat devices to ensure that they continue to meet the device requirements in the Eligibility Requirements.

9. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY STAR market penetration estimates, as follows:
 - 9.1. Partner must submit the total number of units newly subscribing to the service portion of ENERGY STAR qualified Connected Thermostat products within the calendar year or an equivalent measurement as agreed to in advance by EPA and Partner.
 - 9.2. Partner must provide subscription data segmented by meaningful product characteristics (e.g., controlled system types, presence of additional functions) as prescribed by EPA.
 - 9.3. Partner must submit subscription data for each calendar year to EPA or an EPA-authorized third party, preferably in electronic format, no later than March 1 of the following year.

Submitted unit shipment data will be used by EPA only for program evaluation purposes and will be closely controlled. If requested under the Freedom of Information Act (FOIA), EPA will argue that the data is exempt. Any information used will be masked by EPA so as to protect the confidentiality of the Partner.

Note: EPA collects unit shipment data from all ENERGY STAR partners to monitor market penetration and in order to estimate how much GHGs the program has prevented in the calendar year. For ENERGY STAR Connected Thermostats, EPA believes the relevant information is new users of the service. While we expect services that now exist and have subscribers to earn the ENERGY STAR, the savings are not attributable to the ENERGY STAR Connected Thermostat program. Thus we only ask for new subscribers and not total number of users.

10. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence testing or certification results or to engage in discriminatory practices.
11. Notify EPA of a change in the designated responsible party or contacts within 30 days using the My ENERGY STAR Account tool (MESA) available at www.energystar.gov/mesa.

Training and Consumer Education

12. Partner shall train distributors, sales staff and installation contractors on the value of the ENERGY STAR program. This training shall include, at a minimum, identification of ENERGY STAR certified products within the Partner's offerings and on the Partner's web site.
13. All consumer information documents – operating manuals, installation instructions, etc.—must be easily accessible to consumers at a public website.

Performance for Special Distinction

In order to receive additional recognition and/or support from EPA for its efforts within the Partnership, the ENERGY STAR Partner may consider the following voluntary measures, and should keep EPA informed on the progress of these efforts:

- Provide quarterly, written updates to EPA as to the efforts undertaken by Partner to increase availability of ENERGY STAR qualified products, and to promote awareness of ENERGY STAR and its message.
- Consider energy efficiency improvements in company facilities and pursue benchmarking buildings through the ENERGY STAR Buildings program.
- Purchase ENERGY STAR qualified products. Revise the company purchasing or procurement specifications to include ENERGY STAR. Provide procurement officials' contact information to EPA for periodic updates and coordination. Circulate general ENERGY STAR qualified product information to employees for use when purchasing products for their homes.
- Feature the ENERGY STAR mark(s) on Partner website and other promotional materials. If information concerning ENERGY STAR is provided on the Partner website as specified by the ENERGY STAR Web Linking Policy (available in the Partner Resources section of the ENERGY STAR website), EPA may provide links where appropriate to the Partner website.
- Ensure the power management feature is enabled on all ENERGY STAR qualified displays and computers in use in company facilities, particularly upon installation and after service is performed.
- Provide general information about the ENERGY STAR program to employees whose jobs are relevant to the development, marketing, sales, and service of current ENERGY STAR qualified products.
- Provide a simple plan to EPA outlining specific measures Partner plans to undertake beyond the program requirements listed above. By doing so, EPA may be able to coordinate, and communicate Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR website, etc. The plan may be as simple as providing a list of planned activities or milestones of which Partner would like EPA to be

aware. For example, activities may include: (1) increasing the availability of ENERGY STAR qualified products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrating the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) providing information to users (via the website and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products; and (4) building awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event.

- Join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. The SmartWay Transport Partnership works with freight carriers, shippers, and other stakeholders in the goods movement industry to reduce fuel consumption, greenhouse gases, and air pollution. For more information on SmartWay, visit www.epa.gov/smartway.
- Join EPA's Green Power Partnership. EPA's Green Power Partnership encourages organizations to buy green power as a way to reduce the environmental impacts associated with traditional fossil fuel- based electricity use. The partnership includes a diverse set of organizations including Fortune 500 companies, small and medium businesses, government institutions as well as a growing number of colleges and universities. For more information on Green Power, visit www.epa.gov/greenpower.



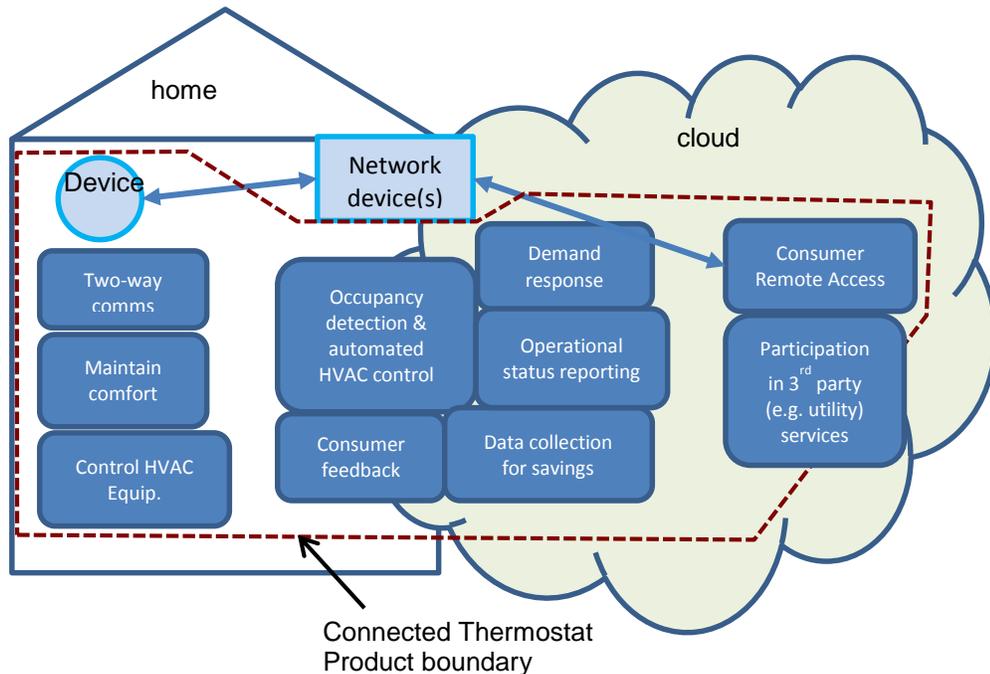
ENERGY STAR Program Requirements Product Specification for Connected Thermostat Products

Draft 1 Eligibility Criteria Version 1.0

8 Following are the eligibility requirements for the Version 1.0 ENERGY STAR Connected Thermostats
9 program. Connected Thermostat Products shall meet all of the identified criteria to earn the ENERGY
10 STAR.

11 12 1) Definitions:

13 A. Connected Thermostat Product: For the purposes of this specification, the connected thermostat
14 product includes the thermostat device in the home with associated firmware, which is assumed
15 to be updated during the time the product is used in the home, as well as a service component
16 supported by hardware and software outside of the home. The service component would
17 typically provide web and smart phone based thermostat control. See below for a pictorial
18 representation of one example. Functions on the left must be in the home, those in the center
19 either require both, or may be enabled by various combinations of cloud services and hardware,
20 and those on the right typically reside in the cloud.



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22 B. Connected Thermostat Device: A product that controls heating, ventilation, and air-conditioning
23 (HVAC) equipment to regulate the temperature of the room or space in which it is installed, and
24 has the ability to communicate with sources external to the HVAC system. For connection, the
25 device may rely on a home area network (e.g. Wi-Fi) and an internet connection that is
26 independent of the Connected Thermostat.

- 27 C. Connected Thermostat Service Provider: The organization that brands the service component
 28 associated with the Connected Thermostat. Associated services typically include smart phone
 29 and web control applications, messaging relevant to energy consumption, and open APIs that
 30 enable consumer-authorized interconnection with utilities and other 3rd parties.
- 31 D. Home Area Network (HAN): A network that interconnects devices on the consumer's premises,
 32 typically within or in close proximity to the home.
- 33 E. Static temperature accuracy: The deviation in the displayed room temperature from 70°F (21°C);
 34 after one hour in a calibrated temperature chamber set to 70°F (21°C).¹
- 35 F. Droop: The deviation in the cut-in point that results from a change in the duty cycle, heating load,
 36 or cooling load.²
- 37 G. Operating differential: The difference between cut-in and cut-out points as measured at the
 38 thermostat under operating conditions specified by NEMA DC 3-2013 par. 4.5.2.¹
- 39 H. Network Standby: A state with the Connected Thermostat Device is:
- 40 1) connected to the service provider by typical means,
 41 2) with no direct or remote (e.g., smart phone app, web interface) user interaction, and
 42 3) sufficient time has elapsed such that the device, as applicable, has entered a low power
 43 state. For example, if there is a screen that dims or turns off automatically, it shall be
 44 dimmed or off.

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 46 **Note:** The standby power consumption definition is intended to refer to the state that the thermostat
 47 device will spend most of the time in: connected but not actively communicating. EPA believes that the
 48 switching state of the HVAC will not substantially affect the standby power consumption of the connected
 49 thermostat.

50 Stakeholders are encouraged to provide feedback on these definitions and note additional definitions
 51 which may be needed to make this specification clear.

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 53 **2) Scope:**

- 54 A. Included Products: Only products that meet the definition of a connected thermostat product, as
 55 specified herein, are eligible for ENERGY STAR certification. Connected thermostats provided
 56 as part of a larger product offering, such as a home security system, may be certified but will be
 57 subject to specific labeling requirements.
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 59 B. Excluded Products: Products that are unable to collect the required data for the energy savings
 60 metric (as defined in the ENERGY STAR Connected Thermostat Test Method) are not eligible.
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63 **3) Eligibility Criteria:**

- 64 A. Thermostat Device Requirements: These requirements apply to connected thermostat devices.
 65 For providers that offer a service which may be used with several devices, all device choices for
 66 the service shall fulfill these requirements.
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 68 1) In the absence of connectivity, retain the ability for residents to locally:
 69 i. view the room temperature,
 70 ii. view and adjust the set temperature, and

¹ NEMA DC 3, Annex A-2013

² NEMA DC 3-2013

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Note (cont.): EPA welcomes feedback on this approach, and on a reasonable interval. The requirements in section 3B are intended to be very general and provide a likelihood that the connected thermostat product has the capability to deliver savings. The requirements in section 3C are yet to be determined, but stand in for required performance on the run time reduction metrics currently being developed. This table implies that there will only be requirements on averages, and only nationally, but there may also be requirements for other statistical measures, and it may arise that it makes more sense to set requirements by climate region. It may also make sense to have national requirements but report by climate region. As the metric development process continues, this section will become clearer. Stakeholders are encouraged to participate in that highly technical process. At this time, EPA anticipates resistance heat utilization of heat pumps will be a reporting requirement only.

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D. Significant Digits and Rounding:

- 1) All calculations shall be carried out with directly measured (unrounded) values.
- 2) Unless otherwise specified below, compliance with specification limits shall be evaluated using directly measured or calculated values rounded to the nearest 0.1°F.
- 3) 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.

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4) Test Requirements:

When submitting data for connected thermostats, the following methods shall be used to determine ENERGY STAR qualification:

Table 3: Test Methods for ENERGY STAR Qualification

ENERGY STAR Requirement	Test Method Reference	Applicable Products
Reduction in average annual % run time, heating (HS)	ENERGY STAR Test Method for Connected Thermostats, V1.0	All
Reduction in average annual % run time cooling (CS)		
Average resistance heat utilization for heat pump installations (RU)		
Thermostat Device Standby Power		
Thermostat Device Standby time		
Thermostat Device static temperature accuracy	NEMA DC-3 Annex A-2013	
Thermostat device droop		
Thermostat device operating differential		

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Note: The ENERGY STAR Test Method for Connected Thermostats does not yet exist. The current development of the metric for heating and cooling run time reduction and resistance heat utilization will inform the test method, which we expect will reference a particular revision of open source code for metric calculation. EPA intends to base the standby power measurement procedure on IEC 62301, Ed. 2.0, 2011-01, "Measurement of Household Appliance Standby Power".

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135 **5) Effective Date:**

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137 The ENERGY STAR Connected Thermostat specification shall take effect XXXX. To qualify for ENERGY
138 STAR, a Connected Thermostat Product shall meet the ENERGY STAR specification in effect on the date
139 of connection. The date of connection is specific to each unit and is the date on which a unit is
140 considered to be a Connected Thermostat Product.

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143 **6) Future Criteria Revisions:**

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

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