



ENERGY STAR® Program Requirements for Commercial Water Heaters Partner Commitments

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

Certifying Products

1. Comply with current ENERGY STAR Eligibility Criteria, which define performance requirements and test procedures for commercial water heaters. 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 commercial water heaters. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform commercial water heater testing. A list of EPA-recognized laboratories and Certification Bodies can be found at www.energystar.gov/testingandverification.

Using the ENERGY STAR Name and Marks

3. 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.
4. Use the ENERGY STAR name and marks only in association with certified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is certified and offered for sale in the U.S. and/or ENERGY STAR partner countries.
5. Provide clear and consistent labeling of ENERGY STAR certified commercial water heaters.
 - 5.1. The ENERGY STAR mark must be clearly displayed on the top/front of the product (on product labels and/or as a permanent mark), in product literature (i.e., user manuals, spec sheets, etc.), and on the manufacturer's Internet site where information about ENERGY STAR certified models is displayed.
 - 5.2. It is also recommended that the mark appear on the product packaging.

Verifying Ongoing Product Certification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for commercial water heaters, providing full cooperation and timely responses. EPA/DOE 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.

Providing Information to EPA

7. Provide unit shipment data or other market indicators to EPA annually to assist with creation of ENERGY STAR market penetration estimates, as follows:

- 7.1. Partner must submit the total number of ENERGY STAR certified commercial water heaters shipped in the calendar year or an equivalent measurement as agreed to in advance by EPA and Partner. Partner shall exclude shipments to organizations that rebrand and resell the shipments (unaffiliated private labelers).
- 7.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type, capacity, presence of additional functions) as prescribed by EPA.
- 7.3. Partner must submit unit shipment 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.

8. Report to EPA any attempts by recognized laboratories or Certification Bodies (CBs) to influence testing or certification results or to engage in discriminatory practices.
9. 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.

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 certified 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 certified 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 certified 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 certified 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 certified 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 certified 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 certified 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 Commercial Water Heaters

Eligibility Criteria Version 2.0

Following is the Version 2.0 product specification for ENERGY STAR certified commercial water heaters. A product shall meet all of the identified criteria if it is to earn the ENERGY STAR.

1) Definitions: Below are the definitions of the relevant terms in this document.

- A. Commercial Water Heater: A product that utilizes gas or electricity to heat potable water for use outside the heater upon demand, at a thermostatically controlled temperature, including:
 - a. A storage type unit¹ which heats and stores water within the appliance at a thermostatically controlled temperature for delivery on demand, including:
 - i. Gas-fired storage water heaters with an input rate both greater than 75,000 British thermal units (Btu) per hour and less than 4,000 Btu/h per gallon of stored water, and
 - b. Commercial heat pump water heaters¹ designed to transfer thermal energy from a low-temperature source to a higher-temperature sink for the purpose of heating potable water, including air-source, water-source, and direct geo-exchange units, with a rated electric power input greater than 12 kW (including all ancillary equipment such as fans, blowers, pumps, storage tanks, piping, and controls, as applicable).
 - c. A gas-fired instantaneous type unit¹ with an input rate both greater than 200,000 Btu/h and not less than 4,000 Btu/hr per gallon of stored water.
 - i. Storage-type instantaneous water heater means an instantaneous water heater that includes a storage tank with a storage volume greater than or equal to 10 gallons.
- B. Thermal Efficiency (TE)¹: The ratio of the heat energy (Btu/hr) transferred to the water flowing through the water heater to the amount of energy (Btu/hr) consumed by the water heater during full-firing rate, steady-state operation.
- C. Standby Loss (SL)¹: The average hourly energy, expressed in Btu per hour, required to maintain the stored water temperature based on a 70°F temperature differential between stored water and ambient room temperature.
- D. Coefficient of Performance (COP_h)¹: The dimensionless ratio of the rate of useful heat transfer gained by the water, expressed in Btu/h, to the rate of electrical power consumed during full input rate operation, expressed in Btu/h.
- E. Manufacturer Limited Warranty: An assurance by the manufacturer to the consumer that the water heater, including purchased system equipment and components, is guaranteed to work for a defined period of time.
- F. Basic Model¹: All units of a given type of covered product (or class thereof) manufactured by one manufacturer, having the same primary energy source, and which have essentially identical

¹ 10 CFR Part 431 Subpart G

electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency.

- G. Fault Detection and Display: System is capable of detecting and reporting, in plain text, system faults to the owner and/or technical professional. This includes, but is not limited to, the ability to detect leaks which may lead to catastrophic failure. Faults are displayed on the system or remotely (preferred). The system is also capable of storing at least five faults in a history log.
- H. Performance Reporting: System is capable of reporting at least three system performance metrics. Examples of performance metrics include, but are not limited to, fuel usage, hot water usage, and run time.
- I. Energy Savings Reporting: System is capable of analyzing performance in order to report energy saving opportunities capable of being addressed via maintenance, firmware updates, or operational changes. Plain text indications and/or detailed visuals that relay opportunities for improvement to technical professionals are reported.
- J. Predictive Maintenance Alert: System is capable of tracking water heater use and wear rates to predict and alert the owner/technical professional when maintenance may be required. Predictions are based on wear rates that are measured in real time or pre-programmed data that indicate typical lifetimes of water heater components.

2) **Scope:**

- A. Included Products: Only products that meet the definition of a commercial water heater, as specified herein, which are marketed for sale in the commercial market are eligible for ENERGY STAR certification.
- B. Excluded Products: The following products are not eligible for certification under this specification:
 - a. Products that are covered under other ENERGY STAR product specifications, including gas-fired storage residential-duty commercial water heaters, as defined in the ENERGY STAR Residential Water Heaters specification. The list of specifications currently in effect can be found at www.energystar.gov/specifications.
 - b. Oil fired water heaters.
 - c. Combined heating/cooling and hot water systems.
 - d. Storage water heaters with greater than 140 gallons of capacity. Heat pump water heaters designed to operate in conjunction with tanks or storage type water heaters are exempt from this exclusion.

3) Certification Criteria:

A. Product Performance Requirements for Gas-fired Water Heaters:

Table 1: Requirements for Certified Gas-fired Water Heaters

Criteria	Type	ENERGY STAR Requirements
Thermal Efficiency	Storage; Instantaneous	TE ≥ 0.94
Maximum Standby Loss ²	Storage	≤ 0.84 * [(Input Rate / 800) + 110(Volume _r) ^{1/2}] (expressed in Btu/hr)
	Storage-type Instantaneous	

B. Product Performance Requirements for Commercial Heat Pump Water Heaters:

Table 2: Requirements for Certified Electric Heat Pump Water Heaters

Criteria	Type	ENERGY STAR Requirements
Coefficient of Performance (COP _h)	Commercial Heat Pump	COP _h ≥ 3.0

C. Status and Messaging Reporting: While not required, the reporting of any system status and messaging features outlined below is encouraged. Products reported to offer any of the following functionality, as defined in Section 1, will have that information identified in the ENERGY STAR Product Finder. If reporting these functions, Partners should also report any ancillary equipment needed to use them, such as a Wi-Fi router or proprietary hub.

- a. Fault Detection and Display
- b. Performance Reporting
- c. Energy Savings Reporting
- d. Predictive Maintenance Alerts

D. Significant Digits and Rounding:

- a. All calculations shall be carried out with actual measured (unrounded) values. Only the final result of a calculation shall be rounded.
- b. Unless otherwise noted in this section, compliance with specification limits shall be evaluated using exact values without any benefit from rounding.
- c. Reporting on the ENERGY STAR website shall be performed using measured or calculated values that are rounded to the nearest unit in the last right-hand digit as specified in the corresponding specification requirements. Standby Loss shall be rounded to the nearest whole number.

² Volume is the rated volume in gallons. Input Rate is the nameplate input rate in Btu/hr.

4) Test Requirements:

- A. One of the following sampling plans shall be used for purposes of testing for ENERGY STAR certification:
 - a. A single unit is selected, obtained, and tested. The measured performance of this unit and of each subsequent unit manufactured must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to certify additional individual model variations within a basic model as long as the definition for basic model provided in Section 1, above, is met; or
 - b. Units are selected for testing and results calculated according to the sampling requirements defined in 10 CFR Part 429, Subpart B § 429.44. The certified rating must be equal to or better than the ENERGY STAR specification requirements. Results of the tested unit may be used to certify additional model variations within a basic model as long as the definition for basic model provided in Section 1, above, is met. Further, all individual models within a basic model must have the same certified rating based on the applicable sampling criteria. This rating must be used for all manufacturer literature, the qualified product list, and certification of compliance to DOE standards.
- B. When testing commercial water heaters, the following test methods shall be used to determine ENERGY STAR certification:

Table 3: Test Methods for ENERGY STAR Certification

ENERGY STAR Requirement	Test Method Reference	Applicable Products
Thermal Efficiency	10 CFR Part 431.106	Gas-fired Storage and Instantaneous Water Heaters
Standby Loss	10 CFR Part 431.106	Gas-fired Storage and Storage-type Instantaneous Water Heaters
Coefficient of Performance	10 CFR Part 431.106, Subpart G, Appendix E	Commercial Heat Pump Water Heaters

5) Effective Date:

The ENERGY STAR Commercial Water Heaters specification shall take effect **October 1, 2018**. To certify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on the model's date of manufacture. The date of manufacture is specific to each unit and is the date on which a unit is considered to be completely assembled.

6) 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 product model.