



ENERGY STAR[®] Program Requirements for Programmable Thermostats

Partner Commitments

Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified programmable thermostats. The ENERGY STAR Partner must adhere to the following program requirements:

- comply with current ENERGY STAR Eligibility Criteria, defining the performance criteria that must be met for use of the ENERGY STAR certification mark on programmable thermostats and specifying the testing criteria for programmable thermostats. EPA may, at its discretion, conduct tests on products that are referred to as ENERGY STAR qualified. These products may be obtained on the open market, or voluntarily supplied by Partner at EPA's request;
- comply with current ENERGY STAR Logo Use Guidelines, describing how the ENERGY STAR labels and name may be used. Partner is responsible for adhering to these guidelines and for ensuring that its authorized representatives, such as advertising agencies, dealers, and distributors, are also in compliance;
- qualify at least one ENERGY STAR labeled programmable thermostat model within one year of activating the programmable thermostats portion of the agreement. When Partner qualifies the product, it must meet the specification (e.g., Tier 1 or 2) in effect at that time;
- provide clear and consistent labeling of ENERGY STAR qualified programmable thermostats. The ENERGY STAR label must be clearly displayed in product literature (i.e., user manuals, spec sheets, etc.) and on the manufacturer's Internet site where information about ENERGY STAR qualified models is displayed. It is also recommended that the label appear on the top/front of the product and on the product packaging;
- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying programmable thermostat models. Once the Partner submits its first list of ENERGY STAR labeled programmable thermostat models, the Partner will be listed as an ENERGY STAR Partner. Partner must provide annual updates in order to remain on the list of participating product manufacturers;
- provide to EPA, on an annual basis, unit shipment data or other market indicators to assist in determining the market penetration of ENERGY STAR. Specifically, Partner must submit the total number of ENERGY STAR qualified programmable thermostats shipped (in units by model) or an equivalent measurement as agreed to in advance by EPA and Partner. Partner is also encouraged to provide ENERGY STAR qualified unit shipment data segmented by meaningful product characteristics (e.g., capacity, size, speed, or other as relevant), total unit shipments for each model in its product line, and percent of total unit shipments that qualify as ENERGY STAR. The data for each calendar year should be submitted to EPA, preferably in electronic format, no later than the following March and may be provided directly from the Partner or through a third party. The 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;
- notify EPA of a change in the designated responsible party or contacts for programmable thermostats within 30 days.

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:

- consider energy efficiency improvements in company facilities and pursue the ENERGY STAR label for buildings;
- purchase ENERGY STAR labeled 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 labeled product information to employees for use when purchasing products for their homes;
- ensure the power management feature is enabled on all ENERGY STAR qualified monitors 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 labeled product models;
- feature the ENERGY STAR label(s) on Partner Web site and in other promotional materials. If information concerning ENERGY STAR is provided on the Partner Web site as specified by the ENERGY STAR Web Linking Policy (this document can be found in the Partner Resources section on the ENERGY STAR Web site at www.energystar.gov), EPA may provide links where appropriate to the Partner Web site;
- 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, communicate, and/or promote Partner's activities, provide an EPA representative, or include news about the event in the ENERGY STAR newsletter, on the ENERGY STAR Web pages, etc. The plan may be as simple as providing a list of planned activities or planned milestones that Partner would like EPA to be aware of. For example, activities may include: (1) increase the availability of ENERGY STAR labeled products by converting the entire product line within two years to meet ENERGY STAR guidelines; (2) demonstrate the economic and environmental benefits of energy efficiency through special in-store displays twice a year; (3) provide information to users (via the Web site and user's manual) about energy-saving features and operating characteristics of ENERGY STAR qualified products, and (4) build awareness of the ENERGY STAR Partnership and brand identity by collaborating with EPA on one print advertorial and one live press event;
- 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.



ENERGY STAR® Program Requirements for Programmable Thermostats

Eligibility Criteria

Below is the product specification (Version 1.1) for ENERGY STAR qualified programmable thermostats. A product must meet all of the identified criteria if it is to be labeled as ENERGY STAR by its manufacturer.

- 1) **Definitions:** Below is a brief description of a programmable thermostat and its common operational modes as relevant to ENERGY STAR.
 - A. **Programmable Thermostat:** A device that enables the user to set one or more time periods each day when a comfort setpoint temperature is maintained and one or more time periods each day when an energy-saving setpoint temperature is maintained. This device enables the user to save energy because the heating and cooling equipment is not running needlessly at a comfort temperature setpoint 24 hours per day. A programmable thermostat may be capable of controlling one or more zones of a conditioned space.
 - B. **Setpoint Temperature:** The temperature setting in degrees Fahrenheit or degrees Celsius for any given time period.
 - C. **Comfort Setpoint Temperature:** The temperature setting in degrees Fahrenheit or degrees Celsius for the time period during which the building is expected to be occupied, e.g., the early morning and evening hours.
 - D. **Comfort Time:** The time period during which the conditioned space is expected to be occupied, e.g., the early morning and evening hours.
 - E. **Energy-Saving Setpoint Temperature:** The setpoint temperature for the energy-saving periods, usually specified for both the heating and cooling seasons.
 1. **Set-Back Temperature:** The setpoint temperature for the energy-saving periods during the heating season, generally at night and during unoccupied hours. This is a lower setpoint temperature than the comfort setpoint temperature.
 2. **Set-Up Temperature:** The setpoint temperature for the energy-saving periods during the cooling season, generally at night and during unoccupied hours. This is a higher setpoint temperature than the comfort setpoint temperature.
 - F. **Cycle Rate:** The number of times the heating or cooling unit goes on and off in a given hour. This is measured when the heating and air-conditioning equipment is operating at a 50% load condition, as measured under the National Electrical Manufacturers Association (NEMA) DC-3 standard titled "Residential Controls- Electrical Wall-Mounted Room Thermostats".¹
 - G. **Recovery Systems:**
 1. **Conventional Recovery:** A feature of a programmable thermostat that activates the heating or cooling system at the comfort time set by the user.

¹ National Electrical Manufacturers Association (NEMA), 1300 North 17th Street, Suite 1847, Rosslyn, VA 22209

2. Heat Pump Recovery: A feature of a programmable thermostat that allows the heat pump to recover gradually from an energy-saving setpoint temperature to a comfort setpoint temperature. The heat pump recovery feature is designed to minimize the use of auxiliary heat while also minimizing the on-time of the system.
3. Pre-Comfort Recovery: A feature of a programmable thermostat that allows the heating/cooling system to recover gradually from an energy-saving setpoint temperature to a comfort setpoint temperature. This feature provides comfort while minimizing the on-time of the system during the recovery period. If the pre-comfort recovery system is capable of minimizing the use of auxiliary heat, then it is identical to a heat pump recovery system.

H. Hold Feature: This feature enables the user to override the programmable thermostat's program for a period of time, either specified or unlimited. A short-term hold may allow the user to skip to the next part of the program, and/or temporarily set the programmable thermostat to a different temperature until the next part of the program begins. A long-term hold may allow the user to set the programmable thermostat at a temperature for a fixed period of time, usually during a vacation.

- 2) Qualifying Products: For the purposes of ENERGY STAR, programmable thermostats shall have at least two different programming periods (for weekday and weekend programming) and at least four possible temperature settings (i.e., wake, day, evening, and sleep settings). Programmable thermostat settings shall be pre-programmed so the day and sleep time periods are at least 8 hours long.
- 3) Energy-Efficiency Specifications for Qualifying Products: Only those products listed in Section 2 that meet the criteria below (see items A through G) may qualify as ENERGY STAR.
 - A. Programmable thermostat shall be capable of maintaining room temperature swings within $\pm 2^{\circ}\text{F}$ of the setpoint temperature.
 - B. Programmable thermostat shall be capable of cycling the heating/cooling equipment at the cycle rates required by all ENERGY STAR qualified heating and cooling equipment. The cycle rate and heating/cooling anticipator setting shall be easy for installer to adjust and must remain at their installed setting even if there is an external power outage or battery failure that causes the programmable thermostat to be de-programmed.
 - C. All programmable thermostat models shall be equipped with a conventional recovery system. Programmable thermostat models marketed and sold for use with heat pump systems shall be equipped with a heat pump recovery system. Programmable thermostat models marketed and sold for use with non-heat pump systems shall be equipped with a pre-comfort recovery system. Definitions of these recovery systems are provided in Section 1, above.
 - D. Programmable thermostat shall have a hold feature that allows the user to temporarily override the program for an unspecified period (such as a vacation), without deleting the program. It is recommended that the programmable thermostat have more than one way to override the program. For instance a long term hold (vacation) and short term hold (override to the next setpoint) is recommended.
 - E. Partner shall ship programmable thermostats with setpoint temperatures and times as specified in Table 1 below. For a specific example of acceptable setpoint time and temperature settings, see Table 2 below.

Table 1: Programmable Thermostat Setpoint Temperatures		
Setting	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	≤70°F	≥78°F
Day	setback at least 8°F	setup at least 7°F
Evening	≤70°F	≥78°F
Sleep	setback at least 8°F	setup at least 4°F

Table 2: Acceptable Setpoint Times and Temperature Settings			
Setting	Time	Setpoint Temperature (Heat)	Setpoint Temperature (Cool)
Wake	6 a.m.	70°F	78°F
Day	8 a.m.	62°F	85°F
Evening	6 p.m.	70°F	78°F
Sleep	10 p.m.	62°F	82°F

F. Partner shall provide clear instructions and packaging regarding whether the programmable thermostat is intended for use with a heat pump or conventional system, instructions for the installer to adjust the cycle rates, and instructions for the user to adjust the times and temperatures for the setpoint temperatures.

G. In addition to the above criteria, Partner shall ensure that the customer may be able to change the settings on the programmable thermostat with little difficulty. The ease with which the customer can change the setback times and temperatures is of primary importance. Therefore, the programmable thermostat must include easy to follow instructions, and clearly defined settings on the programmable thermostat. In order to achieve this, Partner shall consider focus groups to analyze the ease of programming of the programmable thermostat, and other methods of determining the ease of use of the programmable thermostat.

- 4) Test Criteria: Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines.
- 5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR will be defined as the *effective date* of the agreement. The ENERGY STAR Programmable Thermostat specification is effective immediately.
- 6) Future Specification Revisions: ENERGY STAR 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.