



# ENERGY STAR® Program Requirements for Light Commercial HVAC

## Partner Commitments Version 2.0 – DRAFT 1

### Commitment

The following are the terms of the ENERGY STAR Partnership Agreement as it pertains to the manufacturing of ENERGY STAR qualified light commercial HVAC. 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 light commercial HVAC and specifying the testing criteria for light commercial HVAC. 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 light commercial HVAC model within one year of activating the light commercial HVAC 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 light commercial HVAC models. The ENERGY STAR label must be clearly displayed in product literature (i.e., user manuals, consumer brochures, 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;
- offer and encourage training to distributors and/or contractors on the following issues: air distribution issues and their effect on equipment performance, refrigerant charging, proper installation of registers, duct work, and plenum to ensure low leakage and to meet insulation requirements, and proper use of the Manual N calculation, or other equivalent commercial load calculation, in order to encourage proper sizing of equipment;
- provide to EPA, on an annual basis, an updated list of ENERGY STAR qualifying light commercial HVAC models. Once the Partner submits its first list of ENERGY STAR labeled light commercial and central air conditioner 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 light commercial HVAC models 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 light commercial HVAC 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](http://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) 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 (3) 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.
- join EPA's SmartWay Transport Partnership to improve the environmental performance of the company's shipping operations. SmartWay Transport 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](http://www.epa.gov/smartway);

- join EPA's Climate Leaders Partnership to inventory and reduce greenhouse gas emissions. Through participation, companies create a credible record of their accomplishments and receive EPA recognition as corporate environmental leaders. For more information on Climate Leaders, visit [www.epa.gov/climateleaders](http://www.epa.gov/climateleaders);
- 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, visit <http://www.epa.gov/grnpower>.

**Note:** Under Performance for Special Distinction, EPA has three additional partnership opportunities for manufacturers to consider: Smart Way Transport Partnership; Climate Leaders Partnership; and Green Power Partnership.



## ENERGY STAR® Program Requirements for Light Commercial HVAC

### Eligibility Criteria Version 2.0 – DRAFT 1

Below is the **DRAFT 1** Version 2.0 product specification for ENERGY STAR qualified light commercial HVAC equipment.

A product must meet all of the identified criteria if it is to be qualified as ENERGY STAR by its manufacturer.

- 1) **Definitions:** Below is a brief description of light commercial HVAC equipment and common measures of efficiency applicable to ENERGY STAR.
  - A. **Central Air Conditioner:** A central air-conditioner model consists of one or more factory-made assemblies that normally include an evaporator or cooling coil(s), compressor(s), and condenser(s). Central air conditioners provide the function of air-cooling, and may include the functions of air circulation, air cleaning, dehumidifying, or humidifying. For the purposes of this specification, both split system (i.e., a system with components located both inside and outside of a building) and single package units (i.e., a system that has all components completely contained in one unit) rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specification in Section 3.
  - B. **Heat Pump:** A heat pump model consists of one or more factory-made assemblies that normally include an indoor conditioning coil(s), compressor(s), and outdoor coil(s), including means to provide a heating function. Heat pumps shall provide the function of air heating with controlled temperature, and may include the functions of air-cooling, air circulation, air cleaning, dehumidifying, or humidifying. For the purposes of this specification, both split system and single package units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specification in Section 3.
  - C. **Gas/Electric Package Unit:** A single package unit with gas heating and electric air conditioning that is often installed on a slab or a roof. For the purposes of this specification, units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label assuming they meet the cooling portion of the specification in Section 3. In addition, three-phase equipment rated below 65,000 Btu/h may qualify according to the specification in Section 3.

**Note:** Currently, light commercial HVAC equipment with capacity between 65,000 and 250,000 Btu/h are eligible for ENERGY STAR qualification. EPA is considering expanding this range to include equipment with cooling capacities larger than 250,000 Btu/h based on information that energy-efficient technologies currently exist for larger equipment and end users are looking for an easy way to identify the top energy performers.

There is some evidence that this larger equipment category represents a sizeable portion of the market. In a 2006 report for the Northeast Energy Efficiency Partnership (NEEP) entitled "Packaged Commercial HVAC Equipment Market Characterization," the 20 to 30 ton (240,000 to 360,000 Btu/h) size category represented roughly 17% of units sold in 2005 in the northeast and approximately 45% of total capacity in tons. Furthermore, including units over 250,000 Btu/h

**Note continued:**

would capture a sizable portion of the retail and commercial markets as well product offerings from several existing ENERGY STAR partners.

Increasing the capacity of units eligible for qualification would also capture greater energy savings and CO<sub>2</sub> emission reductions and offer consumers more energy-efficient choices to meet their heating and cooling needs. Stakeholders are encouraged to provide input on increasing the Btu/h ceiling within the scope of this specification, provide suggestions for efficiency levels, and outline any challenges that may be encountered by including these equipment sizes.

- D. Cooling Capacity: The cooling capacity is the quantity of heat in BTU (British Thermal Units) that an air conditioner or heat pump is able to remove from an enclosed space during a one-hour period.
- E. Energy Efficiency Ratio (EER): EER is a measure of efficiency in the cooling mode that represents the ratio of total cooling capacity (Btu/hour) to electrical energy input (Watts).
- F. Coefficient of Performance (COP): COP is a measure of efficiency in the heating mode that represents the ratio of total heating capacity (Btu) to electrical input (also in Btu).
- G. Integrated Energy Efficiency Ratio (IEER): IEER is a measure that expresses cooling part-load EER efficiency for commercial unitary air-conditioning and heat pump equipment on the basis of weighted operation at various load capacities<sup>1</sup>.

**Note:** According to the minimum efficiency standards, as of January 1, 2010, Integrated Energy Efficiency Ratio (IEER) will replace the metric Integrated Part Load Value (IPLV) as the part load energy efficiency descriptor for all commercial unitary products rated above 65,000 Btu/h. Therefore, the definition for IPLV has been removed and a new definition for IEER has been added above. The citation for the definitions for IEER is the Public Review Draft of the Proposed Addendum s to ASHRAE Standard 90.1-2007, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, October 2007.

- H. Seasonal Energy Efficiency Ratio (SEER): SEER is a measure of equipment energy efficiency over the cooling season. It represents the total cooling of a central air-conditioner or heat pump (in Btu) during the normal cooling season as compared to the total electric energy input (in watt-hours) consumed during the same period.
  - I. Heating Seasonal Performance Factor (HSPF): HSPF is a measure of a heat pump's energy efficiency over one heating season. It represents the total heating output of a heat pump (including supplementary electric heat) during the normal heating season (in Btu) as compared to the total electricity consumed (in watt-hours) during the same period.
- 2) Qualifying Products: For the purposes of ENERGY STAR, light commercial HVAC equipment includes the following: air-source air conditioners, air-source heat pumps, and gas/electric package units. As mentioned above, both split system and single package units rated at 65,000 Btu/h or up to 250,000 Btu/h are eligible for the ENERGY STAR label. As it is used primarily in commercial settings, three-phase equipment rated below 65,000 Btu/h may also qualify for ENERGY STAR.

**Note:** As explained above, EPA is considering expanding the range of eligible equipment to include light commercial HVAC equipment larger than the current ceiling of 250,000 Btu/h. Based on stakeholder input, the size range eligible for ENERGY STAR qualification may be revised.

<sup>1</sup> Public Review Draft of the Proposed Addendum s to ASHRAE Standard 90.1-2007, *Energy Standard for Buildings Except Low-Rise Residential Buildings*, October 2007.

- 3) Energy-Efficiency Specification for Qualifying Products: Products outlined in Tables 1 and 2 below may qualify as ENERGY STAR. Please note, where applicable, products must meet both the EER and IEER specification in order to qualify for ENERGY STAR.

**Table 1: Criteria for ENERGY STAR Qualified Light Commercial Air Conditioners**

Equipment Type	Size Category	Specification	Test Procedure
Air-Source Air Conditioner (3 phase – Single Package)	<65,000 Btu/h	≥14 SEER; ≥11 EER	AHRI 210/240 (formerly ARI 210/240)
Air-Source Air Conditioner (3 phase – Split System)	<65,000 Btu/h	≥14.5 SEER; ≥12 EER	AHRI 210/240 (formerly ARI 210/240)
Air-Source Air Conditioner	≥65,000 Btu/h – <135,000 Btu/h	EER <b>TBD</b> ; IEER <b>TBD</b>	AHRI 340/360 (formerly ARI 340/360)
Air-Source Air Conditioner	≥135,000 Btu/h – <240,000 Btu/h	EER <b>TBD</b> ; IEER <b>TBD</b>	AHRI 340/360 (formerly ARI 340/360)

**Gas/Electric Package Unit Note:** To qualify for the ENERGY STAR label, a gas/electric package unit must meet the appropriate air conditioner specification based on its size category.

**Table 2: Criteria for ENERGY STAR Qualified Light Commercial Heat Pumps**

Equipment Type	Size Category	Specification	Test Procedure
Air-Source Heat Pump (3 phase – Single Package)	<65,000 Btu/h	≥14 SEER; ≥11 EER; ≥8.0 HSPF	AHRI 210/240 (formerly ARI 210/240)
Air-Source Heat Pump (3 phase – Split System)	<65,000 Btu/h	≥14.5 SEER; ≥12 EER; ≥8.2 HSPF	AHRI 210/240 (formerly ARI 210/240)
Air-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	EER <b>TBD</b> ; IEER <b>TBD</b> ; COP <b>TBD</b>	AHRI 340/360 (formerly ARI 340/360) COP rated at 47° F
Air-Source Heat Pump	≥135,000 Btu/h – <240,000 Btu/h	EER <b>TBD</b> ; IEER <b>TBD</b> ; COP <b>TBD</b>	AHRI 340/360 (formerly ARI 340/360) COP rated at 47° F

**Note:** Based upon preliminary feedback that single- and three-phase versions of any one model are comparable in product design and can achieve similar levels of efficiency, EPA proposes to revise the specification for three-phase, <65,000 Btu/h light commercial HVAC equipment to harmonize with current ENERGY STAR Tier II levels for single-phase residential CAC/ASHP equipment. Typically, EPA aims to develop specification levels that represent approximately the top 25% of available models in terms of energy efficient performance while ensuring adequate representation across manufacturers. Upon review of the Air-Conditioning, Heating, and Refrigeration Institute (AHRI) Directory of Certified Products, including only those models that meet EPACT (Energy Policy Act of 2005) standards, single package CAC and ASHP compliance rates at these proposed levels are approximately 20%. While split system CAC and ASHP compliance rates are currently below this level, split systems are less common in commercial applications. In addition, EPA anticipates that as a result of the new minimum efficiency standards, more split systems equipment will meet the new levels, and that by January 1, 2010, EPA expects that the compliance rates for this equipment will be closer to the 25% goal. Stakeholders are encouraged to provide feedback on these proposed levels.

**≥65,000 Btu/h and IEER:** As noted above, the IPLV metric will be phased out in 2010. Therefore, EPA will set levels for IEER instead of IPLV in this revised specification. According to AHRI, the earliest that certified ratings for IEER will be listed in a public database is January 1, 2010. In order to ensure that

**Note continued:**

ENERGY STAR continues to represent the top energy performers, new ENERGY STAR levels will need to take effect at the same time the federal minimum requirements take effect (January 1, 2010). While EPA would prefer to use IEER performance results provided by the AHRI Certified Directory to analyze potential new levels, the timing of its availability does not coincide with the timeline for finalizing this new specification (i.e., approximately nine months prior to the effective date). EPA is anticipating receiving a proposal from the AHRI Committee with suggested IEER levels for ENERGY STAR. EPA will review this proposal for possible inclusion in subsequent drafts of this specification. Stakeholders are also encouraged to provide other suggestions for deriving IEER levels in the time period before an AHRI Directory that includes these values is available.

**Size Categories:** EPA proposes to revise the  $\geq 135,000$  Btu/h to 250,000 Btu/h size category to  $\geq 135,000$  Btu/h to  $< 240,000$  Btu/h and include an additional size category that covers equipment rated at 240,000 Btu/h and above. This change would align ENERGY STAR with the categorization provided in the Energy Policy Act of 2005 and ASHRAE 90.1 Standard.

**Test Procedure References:** The current ENERGY STAR specification references ARI Standard 210/240 as the test procedure for equipment rated between 65,000 Btu/h and 135,000 Btu/h. ARI 210/240 covers only equipment rated below 65,000 Btu/h. Therefore, in Tables 1 and 2, EPA references AHRI Standard 340/360-2007 (formerly ARI Standard 340/360-2007), which covers light commercial HVAC equipment at or above 65,000 Btu/h, as the appropriate test procedure for this size category.

- 4) Test Procedure: The manufacturer shall perform energy-efficiency tests, or have tests performed by third party testing labs, as necessary, to determine which products comply. Based on the results of these tests, the manufacturer shall self-certify those products that meet the specification outlined above. Light commercial air conditioners and heat pumps shall qualify under rating conditions in accordance with AHRI 210/240 (formerly ARI 210/240) or AHRI 340/360 (formerly ARI 340/360), as appropriate. The test procedure for each equipment type and size category is provided in Tables 1 and 2 of Section 3.
- 5) Effective Date: The date that manufacturers may begin to qualify products as ENERGY STAR is defined as the *effective date* of the agreement. Any previously executed agreement on the subject of ENERGY STAR qualified light commercial HVAC shall be terminated effective **December 31, 2009**.
  - A. Qualifying and Labeling Products under Version 2.0: The ENERGY STAR Light Commercial HVAC specification shall become effective on **January 1, 2010**. All products, including models originally qualified under the previous Version 1.0 light commercial HVAC specification, with a date of manufacture on or after January 1, 2010, must meet the new Version 2.0 requirements in order to qualify for ENERGY STAR. The date of manufacture is specific to each unit and is the date (e.g., month and year) on which a unit is considered to be completely assembled.
  - B. Elimination of Grandfathering: EPA will not allow grandfathering under this Version 2.0 ENERGY STAR specification. **ENERGY STAR qualification under previous Versions is not automatically granted for the life of the product model.** Therefore, any product sold, marketed, or identified by the manufacturing partner as ENERGY STAR must meet the current specification in effect at the time of manufacture of the product.

**Note:** The effective date of the ENERGY STAR Version 2.0 specification aligns with the date that EPACT federal minimum standards for light commercial HVAC equipment rated above 65,000 Btu/h takes effect. Manufacturers may continue to use the ENERGY STAR mark on 3-phase models rated below 65,000 Btu/h that meet the Version 1.0 specification. However, EPA will no longer accept new

**Note continued:**

Qualified Product Information (QPI) forms for ENERGY STAR qualification for this size equipment at these efficiency levels. Once the new Version 2.0 specification takes effect, all ENERGY STAR qualified light commercial HVAC models will be required to meet the new Version 2.0 levels to remain qualified. Models qualified under Version 1.0 are not grandfathered into Version 2.0. Those models that no longer qualify under Version 2.0 will be delisted from the ENERGY STAR qualified product list. Manufacturers may retest and resubmit performance results for these models once the new Version 2.0 specification is finalized.

In addition, manufacturers will need to submit a new ENERGY STAR Commitment Form to acknowledge their commitment to the new Version 2.0 program requirements. This form must be supplied to EPA prior to the Version 2.0 effective date to continue the ENERGY STAR partnership.

EPA's goal is to finalize the new specification no later than April 1, 2009 in order to provide manufacturers at least 9 months prior to the effective date to transition product literature and other ENERGY STAR materials.

- 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.