ENERGY STAR® Program Requirements for Light Commercial HVAC

Partner Commitments

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

Qualifying Products

1. Comply with current ENERGY STAR Eligibility Criteria, which define performance requirements and test procedures for light commercial HVAC equipment. A list of eligible products and their corresponding Eligibility Criteria can be found at www.energystar.gov/specifications.
2. Obtain certification of ENERGY STAR qualification from a Certification Body recognized by EPA for light commercial HVAC equipment prior to associating the ENERGY STAR name or mark with any product. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform light commercial HVAC testing.

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 qualified products. Partner may not refer to itself as an ENERGY STAR Partner unless at least one product is qualified and offered for sale.
5. Provide clear and consistent labeling of ENERGY STAR qualified light commercial HVAC equipment.

    5.1. The ENERGY STAR mark 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.

    5.2. It is also recommended that the mark appear on the product packaging and on the top/front of the product.

Verifying Ongoing Product Qualification

6. Participate in third-party verification testing through a Certification Body recognized by EPA for light commercial HVAC equipment.
7. Comply with tests that EPA/DOE may conduct at its discretion 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 the government's request.

Providing Information to EPA

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

8.1. Partner must submit the total number of ENERGY STAR qualified light commercial HVAC equipment 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).

8.2. Partner must provide unit shipment data segmented by meaningful product characteristics (e.g., type, capacity, presence of additional functions) as prescribed by EPA.

8.3. 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. Any information used will be masked by EPA so as to protect the confidentiality of the Partner;

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

10. 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

11. Partner shall comply with the following, product-specific requirements concerning training and education:

    - 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.

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, 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 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 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.
- 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 Light Commercial HVAC

Eligibility Criteria
DRAFT Version 2.1

Following is the Version 2.1 product specification for ENERGY STAR qualified light commercial HVAC equipment. 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. 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 to <240,000 Btu/h are eligible for ENERGY STAR qualification. In addition, three-phase equipment rated below 65,000 Btu/h may qualify under this specification if it meets the energy efficiency criteria outlined in Section 3, below.

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 to <240,000 Btu/h are eligible for ENERGY STAR qualification. In addition, three-phase equipment rated below 65,000 Btu/h may qualify under this specification if it meets the energy efficiency criteria outlined in Section 3, below.

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 to <240,000 Btu/h are eligible for ENERGY STAR qualification assuming they meet the cooling portion of the specification in Section 3, below. In addition, three-phase equipment rated below 65,000 Btu/h may qualify under this Version 2.1 specification if it meets the energy efficiency criteria outlined in Section 3, below.

D. Variable Refrigerant Flow (VRF) Multi-Split Systems: A split system air-conditioner or heat pump incorporating a single refrigerant circuit, with one or more outdoor units, at least one variable speed compressor or an alternative compressor combination for varying the capacity of the system by three or more steps, multiple indoor fan coil units, each of which is individually metered and individually controlled by a proprietary control device and common communications network. The system shall be capable of operating either as an air conditioner or a heat pump.

E. Product Family: The product family consists of units with same outdoor unit with several indoor blower coil combinations, where the “same outdoor unit” means models with the same compressor that is used with the same heat exchanger and the same heat exchanger air quantity or water flow.

F. 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.

G. Energy Efficiency Ratio (EER): EER is a measure of efficiency in the cooling mode that represents

the ratio of total cooling capacity (Btu/h) to electrical energy input (Watts).

H. 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).

I. 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.

J. 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.

K. 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) Scope:

A. Included Products: Three-phase, split system and single package air-source central air conditioners, air-source heat pumps, gas/electric package units, and VRF multi-split systems rated below 240,000 Btu/h that meet the definitions specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B.

B. Excluded Products: Single phase products and products rated below 65,000 Btu/h are not eligible for ENERGY STAR.

3) Qualification Criteria:

A. Energy Efficiency Requirements: To qualify for ENERGY STAR light commercial HVAC equipment shall meet the requirements provided in Tables 1 or 2 below.

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

Equipment Type	Size Category	Heating Section Type	Minimum Energy Efficiency Criteria
Air-Source Central Air Conditioner (3 phase – Single Package)	<65,000 Btu/h	All	**Tier 1 (May 1, 2010):** 14 SEER; 11 EER **Tier 2 (July 1, 2011):** TBD
Air-Source Central Air Conditioner (3 phase – Split System)	<65,000 Btu/h	All	**Tier 1 (May 1, 2010):** 14 SEER; 12 EER **Tier 2 (July 1, 2011):** TBD
Air-Source Central Air Conditioner	≥65,000 Btu/h – <135,000 Btu/h	Electric Resistance (or None)	**Tier 1 (May 1, 2010):** 11.7 EER; 11.8 IEER **Tier 2 (July 1, 2011):** TBD
		All other	**Tier 1 (May 1, 2010):** 11.5 EER; 11.6 IEER **Tier 2 (July 1, 2011):** TBD

Equipment Type	Size Category	Heating Section Type	Minimum Energy Efficiency Criteria
Air-Source Central Air Conditioner	≥135,000 Btu/h – <240,000 Btu/h	Electric Resistance (or None)	**Tier 1 (May 1, 2010):** 11.7 EER; 11.8 IEER **Tier 2 (July 1, 2011):** TBD
		All other	**Tier 1 (May 1, 2010):** 11.5 EER; 11.6 IEER **Tier 2 (July 1, 2011):** TBD

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

Equipment Type	Size Category	Heating Section Type	Minimum Energy Efficiency Criteria
Air-Source Heat Pump (3 phase – Single Package)	<65,000 Btu/h	All	**Tier 1 (May 1, 2010):** 14 SEER; 11 EER; 8.0 HSPF **Tier 2 (July 1, 2011):** TBD
Air-Source Heat Pump (3 phase – Split System)	<65,000 Btu/h	All	**Tier 1 (May 1, 2010):** 14 SEER; 11 EER; 8.2 HSPF **Tier 2 (July 1, 2011):** TBD
Air-Source Heat Pump	≥65,000 Btu/h – <135,000 Btu/h	Electric Resistance (or None)	**Tier 1 (May 1, 2010):** 11.3 EER; 11.4 IEER; 3.35 COP* **Tier 2 (July 1, 2011):** TBD
Air-Source Heat Pump	≥135,000 Btu/h – <240,000 Btu/h	Electric Resistance (or None)	**Tier 1 (May 1, 2010):** 10.9 EER; 11 IEER; 3.25 COP* **Tier 2 (July 1, 2011):** TBD

Note: COP rated at 47° F.

B. VRF Multi-split Equipment: To qualify for ENERGY STAR, VRF equipment shall meet the appropriate air conditioner or heat pump specification requirements in Table 1 and 2 above.

C. Gas/Electric Package Units: To qualify for ENERGY STAR, a gas/electric package unit shall meet the appropriate air conditioner specification requirements in Tables 1 and 2, above.

D. Significant Digits and Rounding**:** Measured capacity, SEER, EER, IEER, HSPF and COP shall be reported using the rounding principles provided below.

   a. All calculations shall be carried out with actual measured or observed values. Only the final result of a calculation shall be rounded. Unless otherwise directed below, calculated results shall be rounded to the nearest significant digit as expressed in the corresponding specification limit.

   b. Unless otherwise specified, compliance with specification limit shall be evaluated using exact values without any benefit from rounding.

c. SEER and HSPF shall be expressed in multiples of the nearest 0.05 Btu/W.h.

d. COP for heating or cooling shall be expressed in multiples of the nearest 0.01.

e. Capacity shall be expressed as mentioned in the table below.

Capacity Ratings, Btu/h	Multiples, Btu/h
65,000 up to 135,000 [19,000 up to 39,600]	1,000 [300]
136,000 up to 400,000 [39,800 up to 117,000]	2,000 [600]
above 400,000 [above 117,000]	5,000 [1,500]

4) Test Requirements:

A. Representative Models shall be selected for testing per the following requirements:

a. For qualification of an individual product model, the representative model shall be equivalent to that which is intended to be marketed and labeled as ENERGY STAR.

b. For qualification of a product family, any model within that product family can be tested and serve as the representative model.

B. When testing light commercial HVAC equipment, the following test methods shall be used to determine ENERGY STAR qualifications:

Table 3: Test Methods for ENERGY STAR Qualification

ENERGY STAR Requirement	System Type	Test Method Reference
SEER, EER, IEER, HSPF and/or COP	Air-Source Central Air Conditioner and Air-Source Heat Pump (3 phase single package and split systems) <65,000 Btu/h	ANSI/AHRI 210/240-2008 "*Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment*"
	Air-Source Central Air Conditioner and Air-Source Heat Pump ≥65,000 Btu/h – <240,000 Btu/h	ANSI/AHRI 340/360-2007 "*Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment*"
	Variable Refrigerant Flow (VRF) Equipment	AHRI 1230-2010 "*Performance Rating of Variable Refrigerant Flow (VRF) Multi-Split Air-Conditioning and Heat Pump Equipment*"

5) Effective Date: The ENERGY STAR Light commercial HVAC specification Tier 1 requirements shall take effect on **May 1, 2010**. The second phase of this specification, Tier 2 shall take effect on **July 1, 2011**. To qualify for ENERGY STAR, a product model shall meet the ENERGY STAR specification in effect on its date of manufacture. 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.

6) Future Specification 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 qualification is not automatically granted for the life of a product model.

Energy Efficiency Criteria for Equipment <65,000 Btu/h**:** In 2010, EPA intends to evaluate Tier 1 performance levels in this Version 2.1 specification for single package and split system central air conditioner and air-source heat pump equipment rated below 65,000 Btu/h to determine if new levels are warranted for Tier 2. EPA plans to use the performance data provided in the AHRI Certified Directory to establish Tier 2 requirements with the goal of representing approximately the top 25% of available models. Tier 2 is scheduled to go into effect on July 1, 2011.

Energy Efficiency Criteria for Equipment > 65,000 Btu/h**:** EPA intends to revisit the performance levels presented in this Version 2.1 specification for equipment rated at and above 65,000 Btu/h once more IEER data become available. This IEER data will help EPA to characterize the market with regard to model availability, evaluate cost-effectiveness, and determine whether the levels in Tables 1 and 2 of this Version 2.1 specification represent the top energy efficiency performers. EPA expects to begin the Tier 2 review process immediately following the Tier 1 effective date (i.e., May 1, 2010). Tier 2 is scheduled to become effective on July 1, 2011.

Similar to the Version 2.1 development process, any revisions to the program requirements will be shared with industry stakeholders for review and comment.