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:

Certifying 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. 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 Light Commercial HVAC equipment. As part of this certification process, products must be tested in a laboratory recognized by EPA to perform Light Commercial HVAC 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 Brand Book, which defines 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 Brand Book is 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 in the U.S. and/or ENERGY STAR partner countries.
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, 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 qualified Light Commercial HVAC units 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.

Training and Consumer Education

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

    10.1. 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 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 Light Commercial HVAC

Eligibility Criteria
Version 3.1
Rev. March 2017

Following is the Version 3.1 ENERGY STAR product specification for 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. Commercial Package Air-Conditioning and Heating Equipment[1]: Electrically operated, unitary central air conditioners and central air-conditioning heat pumps used for commercial applications. Small commercial package air-conditioning and heating equipment is rated below 135,000 Btu/h cooling capacity. Large commercial package air-conditioning and heating equipment is rated at or above 135,000 Btu/h and below 240,000 Btu/h cooling capacity.

   a) Air Conditioner: An 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). Air conditioners provide the function of air cooling, and may include the functions of air circulation, air cleaning, dehumidifying, or humidifying.

   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.

B. Gas/Electric Package Unit: Single package commercial package air-conditioning and heating equipment with gas heating and electric air-conditioning that is often installed on a slab or a roof.

C. Variable Refrigerant Flow Multi-Split Air Conditioner[1]: A unit of commercial package air-conditioning and heating equipment that is configured as a split system air conditioner incorporating a single refrigerant circuit, with one or more outdoor units, at least one variable-speed compressor or an alternate compressor combination for varying the capacity of the system by three or more steps, and multiple indoor fan coil units, each of which is individually metered and individually controlled by an integral control device and common communications network and which can operate independently in response to multiple indoor thermostats. Variable refrigerant flow implies three or more steps of capacity control on common, inter-connecting piping.

D. Variable Refrigerant Flow Multi-Split Heat Pump[1]: A unit of commercial package air-conditioning and heating equipment that is configured as a split system heat pump that uses reverse cycle refrigeration as its primary heating source and which may include secondary supplemental heating by means of electrical resistance, steam, hot water, or gas. The equipment incorporates a single refrigerant circuit, with one or more outdoor units, at least one variable-speed compressor or an alternate compressor combination for varying the capacity of the system by three or more steps, and multiple indoor fan coil units, each of which is individually metered and individually controlled by a control device and common communications network and which can operate independently in response to multiple indoor thermostats. Variable refrigerant flow implies three or more steps of capacity control on common, inter-connecting piping.

[1] Based on 10 CFR part 431, Subpart F §431.92. In case of conflict, the CFR shall be taken as authoritative.

E. Basic Model[1]:

a) Commercial Package Air-Conditioning and Heating Equipment: All units manufactured by one manufacturer within a single equipment class, having the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common "nominal" cooling capacity.

b) Variable Refrigerant Flow Multi-Split: All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s) that have a common "nominal" cooling capacity and the same heat rejection medium (e.g. air or water).

F. Cooling Capacity[2]: The capacity associated with the change in air enthalpy between the air entering the unit and the air leaving the unit, which includes both the latent (change in humidity ratio) and sensible (change in dry-bulb temperature) capacities expressed in Btu/h and include the heat of circulation fan(s) and motor(s).

G. Energy Efficiency Ratio (EER)[1]: The ratio of the produced cooling effect of an air conditioner or heat pump to its net work input, expressed in Btu/watt-hour.

H. Coefficient of Performance (COP)[1]: The ratio of the produced cooling effect of an air conditioner or heat pump (or its produced heating effect, depending on the mode of operation) to its net work input, when both the cooling (or heating) effect and the net work input are expressed in identical units of measurement.

I. Integrated Energy Efficiency Ratio (IEER)[1]: A weighted average calculation of mechanical cooling EERs determined for four load levels and corresponding rating conditions, as measured in Appendix A of Subpart F of 10 CFR part 431, expressed in Btu/watt-hour.

2) Scope:

A. Included Products: Air-cooled, three-phase, split system (i.e., any central air conditioner or central air-conditioning heat pump in which one or more of the major assemblies are separate from the others) and single package (i.e., any central air conditioner or central air-conditioning heat pump in which all the major assemblies are enclosed in one cabinet) central air conditioners, heat pumps, gas/electric package units, and variable refrigerant flow (VRF) multi-split systems with capacity rated at or above 65,000 Btu/h and below 240,000 Btu/h that meet the definitions specified herein are eligible for ENERGY STAR certification, with the exception of products listed in Section 2.B.

B. Excluded Products: Water-cooled, evaporatively-cooled, and water source commercial products are not eligible under this specification. Products with cooling capacity ratings below 65,000 Btu/h and products covered by other ENERGY STAR specifications are not eligible under this specification. Note that single-phase products below 65,000 Btu/h may be certified as ENERGY STAR under the CAC/ASHP specification.

[2] AHRI Standard 340/360-2015. *Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment.*

3) Certification Criteria:

A. Energy Efficiency Requirements:

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

Equipment Type	Cooling Capacity	Heating Section Type	Minimum Energy Efficiency Criteria
Small Air-Cooled Central Air Conditioner	≥ 65,000 Btu/h – < 135,000 Btu/h	Electric Resistance (or None)	12.2 EER; 14.0 IEER
		All other	12.0 EER; 13.8 IEER
Large Air-Cooled Central Air Conditioner	≥ 135,000 Btu/h – < 240,000 Btu/h	Electric Resistance (or None)	12.2 EER; 13.2 IEER
		All other	12.0 EER; 13.0 IEER

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

Equipment Type	Cooling Capacity	Heating Section Type	Minimum Energy Efficiency Criteria
Small Air-Cooled Heat Pump	≥ 65,000 Btu/h – < 135,000 Btu/h	Electric Resistance (or None)	11.8 EER; 12.8 IEER; 3.4 COP at 47°F; 2.4 COP at 17°F
		All other	11.6 EER; 12.6 IEER; 3.4 COP at 47°F; 2.4 COP at 17°F
Large Air-Cooled Heat Pump	≥ 135,000 Btu/h – < 240,000 Btu/h	Electric Resistance (or None)	10.9 EER; 12.0 IEER; 3.3 COP at 47°F; 2.1 COP at 17°F
		All other	10.7 EER; 11.8 IEER; 3.3 COP at 47°F; 2.1 COP at 17°F

Table 3: Criteria for ENERGY STAR Certified Light Commercial VRF Multi-Split Systems*

Equipment Type	Cooling Capacity	Heating Section Type	Minimum Energy Efficiency Criteria
VRF Air-Cooled Air Conditioner	≥ 65,000 Btu/h – < 135,000 Btu/h	All	12.0 EER; 17.4 IEER
VRF Air-Cooled Air Conditioner	≥ 135,000 Btu/h – < 240,000 Btu/h	All	12.0 EER; 16.4 IEER
VRF Air-Cooled Heat Pump	≥ 65,000 Btu/h – < 135,000 Btu/h	Without Heat Recovery	11.8 EER; 17.4 IEER; 3.4 COP at 47°F
		With Heat Recovery	11.6 EER; 17.2 IEER; 3.4 COP at 47°F
VRF Air-Cooled Heat Pump	≥ 135,000 Btu/h – < 240,000 Btu/h	Without Heat Recovery	10.9 EER; 16.4 IEER; 3.3 COP at 47°F
		With Heat Recovery	10.7 EER; 16.2 IEER; 3.3 COP at 47°F

* VRF models must meet these requirements in ducted, ductless, and mixed configurations to be certified.

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

C. Significant Digits and Rounding:

a. All calculations shall be carried out with actual measured (unrounded) values.

b. Unless otherwise specified in this specification, compliance with specification limit shall be evaluated using directly measured or calculated values without any benefit from rounding.

c. COP shall be expressed in multiples of the nearest 0.01.

d. IEER shall be expressed in multiples of the nearest 0.1.

e. Capacity shall be expressed as mentioned in Table 4, below.

Table 4: Rounding Requirements for Capacity

Capacity Ratings, Btu/h	Multiples, Btu/h
65,000 up to 135,000	1,000
136,000 up to 400,000	2,000

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 § 429.43. 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 light commercial HVAC equipment, the following test method shall be used to determine ENERGY STAR certification:

Table 5: Test Method for ENERGY STAR Certification

ENERGY STAR Requirement	Test Method Reference
EER, IEER, and COP	10 CFR part 431, Subpart F §431.96[3]

5) Effective Date: The Light Commercial HVAC specification shall take effect on **January 1, 2018**. To be certified to 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 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 certification is not automatically granted for the life of a product model.

[3] As per the CFR, IEER for VRF Multi-Split Systems shall be tested in accordance with AHRI 1230.