ENERGY STAR® Program Requirements for Light Commercial HVAC

Eligibility Criteria (Draft 2)

Below is the Draft 2 product specification for ENERGY STAR qualified light commercial HVAC equipment. Please note that the primary focus of this initiative is cooling efficiency; ENERGY STAR reserves the right to address heating efficiency at some later date and will coordinate with industry, as appropriate.

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 coiling 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 program, 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 program, 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. 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.

   D. 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). EER will be calculated according to the test procedure listed in Section 4.

   E. 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). COP will be calculated according to the test procedure in Section 4.

   F. Integrated Part-Load Value (IPLV): IPLV is a measure of part-load performance for an air conditioner or heat pump. IPLV will be calculated according to the test procedure in Section 4.

   G. 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. SEER will be calculated according to the test procedure in Section 4.

H. 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. HSPF will be calculated according to the test procedure in Section 4.

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 water-source heat pumps. 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's used primarily in commercial settings, three-phase equipment rated below 65,000 Btu/h may also qualify for the label.

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

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

Equipment Type	Size Category	Draft Tier I Specification – April 1, 2001	Draft Tier II Specification – April 1, 2002	Test Procedure
Air-Source Air Conditioner (3 phase)	<65,000 Btu/h	$12 SEER	$13 SEER	ARI 210/240
Air-Source Air Conditioner	$65,000 Btu/h – <135,000 Btu/h	$11.0 EER; 11.4 IPLV	No change expected	ARI 210/240
Air-Source Air Conditioner	$135,000 Btu/h – #250,000 Btu/h	$10.8 EER; 11.2 IPLV	No change expected	ARI 340/360

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

Equipment Type	Size Category	Draft Tier I Specification – April 1, 2001	Draft Tier II Specification – April 1, 2002	Test Procedure
Air-Source Heat Pump	<65,000 Btu/h	$12 SEER; 7.6 HSPF	$13 SEER; 8.0 HSPF	ARI 210/240
Air-Source Heat Pump	$65,000 Btu/h – <135,000 Btu/h	$11.0 EER (11.4 IPLV); 3.4 COP	No change expected	ARI 210/240
Air-Source Heat Pump	$135,000 Btu/h – #250,000 Btu/h	$10.2 EER (11.2 IPLV); 3.3 COP	$10.8 EER (11.2 IPLV); 3.3 COP	ARI 340/360
Water-Source Heat Pump	$65,000 Btu/h – <135,000 Btu/h	$14.0 EER; 4.6 COP	No change expected	ISO 13256-1

EPA Comments: After reviewing comments on Draft 1 of the specification, ENERGY STAR has made the following changes:

- *Any specification for or other reference to water-source air conditioners have been removed in Draft 2. Given that this product category lacks any strong energy performers and only accounts for a small percentage of the market, ENERGY STAR has decided not to label these products at this time, but reserves the right to do so in the future.*
- *The Tier I specification for three-phase air-source air conditioners is identical to the current ENERGY STAR specification for single-phase equipment (covered under ENERGY STAR for Residential HVAC). As it is anticipated that this specification will change in the foreseeable future, a Tier II specification of $13 SEER is provided in Table 1 above in order to give manufacturers advance notice for planning purposes. It is suggested that the Tier II specification take effect on April 1, 2002. Similarly, a Tier II specification of $13 SEER is included for <65,000 Btu/h air-source heat pumps.*
- *A Tier II specification for air-source heat pumps ($135,000 Btu/h – #240,000 Btu/h) has been added in Table 2 above. Due to increasing demand in some areas of the country for higher efficiency models and other changes in the marketplace, ENERGY STAR believes that it is both reasonable and fair to expect models to meet the proposed Tier II specification.*

4) Test Procedure: The manufacturer shall perform energy-efficiency tests, or have tests performed by outside testing labs, as necessary, to determine which products comply. Based on the results of these tests, the manufacturer shall self-certify those products that it determines are compliant with the specification outlined above. Light commercial air conditioners and heat pumps shall qualify under rating conditions in accordance with ARI 210/240, ARI 340/360, or ISO 13256-1, 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 will be defined as the *effective date* of the agreement. ENERGY STAR proposes an effective date of April 1, 2001. A manufacturer has one year after signing the Partnership Agreement to ensure that the ENERGY STAR label appears directly on at least one ENERGY STAR qualified light commercial HVAC model.

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.

EPA Comments: A revised effective date of April 1, 2001 has been proposed in this draft specification. The original date of January 1, 2001 is no longer feasible due to various delays in submitting and processing comments on Draft 1.

The specification, effective date, and duration of the specification will be negotiated with industry. As always, ENERGY STAR welcomes comments or alternative proposals from industry that address these issues. ENERGY STAR deems industry feedback crucial to the successful development of new product areas.