ENERGY STAR® Program Requirements for Air Source Heat Pump (ASHP) and Central Air Conditioner Equipment

FINAL DRAFT Eligibility Criteria

Below is the **FINAL DRAFT** specification (Version 4.0) for ENERGY STAR qualified central air conditioner and air source heat pump equipment. Equipment must meet all of the identified criteria if it is to be labeled or characterized as ENERGY STAR.

1) **Definitions:** Below are brief descriptions of residential ASHPs and central air conditioners and other terms as relevant to ENERGY STAR.

A. Air-Source Heat Pump (ASHP): An air-source unitary heat pump model consists of one or more factory-made assemblies which normally include an indoor conditioning coil(s), compressor(s), and outdoor coil(s), including means to provide a heating function. ASHPs 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. Central Air Conditioner: A central air conditioner model consists of one or more factory-made assemblies which 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.

C. Single Package: A single package unit is an ASHP or central air conditioner that combines both condenser and air handling capabilities in a single casing.

D. Split System: A split system is an ASHP or central air conditioner with separate indoor (evaporator) and outdoor (condenser) units. For split systems, the energy-efficiency rating of a particular split system is based on the actual condenser-evaporator coil combination of the split system.

E. Gas/Electric Package Unit: A single package unit with gas heating and electric air conditioning that is often installed on a slab or roof.

F. Heating Seasonal Performance Factor (HSPF): This 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 is based on tests performed in accordance with ARI 210/240[1].

G. Seasonal Energy Efficiency Ratio (SEER): This 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 is based on tests performed in accordance with ARI 210/240.

H. Energy Efficiency Ratio (EER): This is a measure of the instantaneous energy efficiency of cooling equipment. EER is the steady-state rate of heat energy removal (e.g., cooling capacity) by the equipment in Btuh divided by the steady-state rate of energy input to the equipment in Watts. This ratio is expressed in Btuh per Watt (Btuh/Watt). EER is based on tests performed in accordance with ARI 210/240.

[1] Air-Conditioning and Refrigeration Institute. Standard 210/240 "2003 Standard for Unitary Air-Conditioning and Air-Source Heat Pump Equipment."

I. Matched Assembly: A matched assembly is a model combination that is listed in the ARI Directory of Certified Equipment or for which the manufacturer has published energy efficiency data that includes rated SEER and EER levels, and in which both the condenser unit and evaporator coil are installed simultaneously. A matched assembly shall also include the air handler, furnace, or other component that is used to determine the rating according to ARI 210/240.

Note: *Several commentors suggested that the word "should" be changed to "shall" in the definition of the term "matched assembly." This change has been made. Another commentor suggested that the words "or for which the manufacturer has published energy efficiency data" be inserted into the definition. These words have been added to the definition, along with the additional text "that includes both rated SEER and EER levels" to ensure the information is valuable in accordance with this specification.*

Another commentor inquired as to the potential inconsistency of requiring a matched assembly for a specific condenser/evaporator combination as listed in the ARI Directory, yet allowing the energy efficiency rating of a split system to be based on the most commonly sold combination as indicated in the definition of "Split system". To address this issue and clarify EPA's intent, the definition for split system has been revised to eliminate the option of the efficiency rating being based on the most commonly sold combination.

2) **Qualifying Products**: In order to qualify as ENERGY STAR, an ASHP or central air conditioner must meet the definition in Section 1 and the specification requirements provided in Section 3, below.

A. ASHPs: This specification shall cover residential ASHPs that are rated below 65,000 Btuh and powered by single-phase current. The ASHP may be a single packaged system, where there is only one assembly, or a split system where there are two. If such equipment is provided in more than one assembly, matched assemblies shall be used in meeting the specifications outlined in Section 3 below.

B. Central Air Conditioners: This specification shall cover residential central air conditioners that are rated below 65,000 Btuh, and powered by single-phase current. The central air conditioner may be a single packaged system, where there is only one assembly, or a split system where there are two. If such equipment is provided in more than one assembly, matched assemblies shall be used in meeting the specifications outlined in Section 3 below.

C. Gas/Electric Package Units: This specification shall cover gas/electric package units that are rated below 65,000 Btuh. To qualify for the ENERGY STAR label, they must meet the cooling portion of the single package specification outlined in Section 3 below.

Note: *EPA appreciates the feedback received regarding the possible elimination of gas/electric packaged units. The majority of comments received were opposed to the elimination of these units from the specification with some encouragement for EPA to continue investigating the issue for future revisions. At this time, EPA has decided to retain gas/electric packaged units in the specification and will continue to look at the possibility of including a heating requirement in the future should technology and economics justify doing so.*

3) **Energy-Efficiency Specifications for Qualifying Products**: Only those systems listed in Section 2 with a limited warranty that also meet the criteria below qualify as ENERGY STAR.

Energy-Efficiency Criteria for Qualified Residential ASHPs and Central Air Conditioners			
Product Type	SEER	EER	HSPF (for heat pumps only)
Split Systems	≥ 14	≥ 12	≥ 8.2
Single Package Equipment (including gas/electric package units)	≥ 14	≥ 11	≥ 8.0

Note: *EPA received several comments on the Draft 2 document strongly recommending increasing the EER level of split systems back to 12. Data was also provided demonstrating the availability of split systems at the 14 SEER/12 EER level. In particular, a significant number of rebates at this level have been processed by utilities across the country.*

Based on analysis of what is now a more complete data set, EPA finds that when the specification goes into effect approximately 15% of split CAC equipment would meet an ENERGY STAR specification of 14 SEER/12 EER. The data also suggests that an EER level of 11.5 would have minimal impact in terms of increasing product availability.

For split system heat pumps, the percentage of models that could qualify at a 14 SEER/12 EER/8.5 HSPF is approximately 10%. The data also suggests that adjusting the HSPF has a more significant impact on product availability than adjusting EER. Accordingly, in the interest of ensuring product availability for ENERGY STAR qualified heat pumps that is more on par with product availability for ENERGY STAR qualified CAC systems, EPA has decided to retain the HSPF of 8.2 as proposed in Draft 2 for split systems.

4) **Testing Requirements:** Manufacturers are required to perform tests and self-certify those product models that meet the ENERGY STAR guidelines. Partner agrees to perform energy-efficiency tests for residential ASHPs, central air conditioners, and gas/electric package units under rating conditions in accordance with ARI 210/240. For EER, manufacturers agree to perform energy-efficiency test based on ARI Standard 210/240-94, Operating Condition A: 95°F outdoor air temperature, 80°F dry bulb/67°F wet bulb indoor coil air entering conditions. The HSPF and SEER ratings shall be identical to the levels reported on the Federal Trade Commission (FTC) Energy guide Label.

It is EPA's intention to utilize the CEE Directory of ARI Verified Equipment to determine which equipment qualifies for ENERGY STAR. Any manufacturers that do not participate in the ARI certification program will be expected to submit product information directly to EPA for listing on the www.energystar.gov web site.

Note: *One commentor pointed out that the previous draft specification did not indicate the specific testing conditions for EER. This information had been added. The additional text is similar to that found in Version 3.0 of this specification.*

EPA does not plan to independently develop a complete list of qualifying products. Instead, stakeholders will be encouraged to use the CEE Directory of ARI Verified Equipment, assuming it is updated in a way consistent with the new ENERGY STAR specification, or some alternative database provided through ARI, to determine which model combinations meet the energy-efficiency criteria for qualified residential ASHPs and central air conditioners. Any manufacturers that do not participate in the ARI certification program will be expected to submit product information directly to EPA for listing on the www.energystar.gov web site.

5) **Effective Date**: The date that central air conditioners and air source heat pump equipment may begin to qualify as ENERGY STAR under the Version 3.0 specification will be defined as the *effective date* of the agreement. The ENERGY STAR Specification for ASHP and central air conditioner equipment shall go into effect on **April 1, 2006**. Any previously executed agreement on the subject of ENERGY STAR qualified ASHP and central air conditioner equipment shall be terminated effective March 31, 2006.

A. Qualifying and Marketing Products under the Version 4.0 specification: All equipment, including model combinations originally qualified under Version 3.0, with a **date of manufacture** after **April 1, 2006**, must meet Version 4.0 requirements in order to bear the ENERGY STAR mark on the product or in product literature. The date of manufacture is specific to each unit, and is the date on which a unit is considered to be completely assembled.

B. Elimination of Automatic Grandfathering: Under Version 4.0, EPA has made a significant change with regard to equipment qualification and marking during specific transitions. **ENERGY STAR qualification under Version 3.0 is not automatically granted for the life of the products model combination**. To earn the ENERGY STAR mark, a model combination must meet the ENERGY STAR specification in effect on the date of manufacture.

Note: *One commentor suggested adjusting the effective date slightly so that it coincides with the first of the month since some manufacturers only mark the month and year of manufacture on equipment. EPA has made this adjustment and the proposed effective date of this specification revision now reads April 1, 2006.*

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 stakeholder discussions. In the event of a specification revision, please note that ENERGY STAR qualification is not automatically granted for the life of a product model. To qualify with the energy efficiency criteria of ENERGY STAR, a product model must meet the ENERGY STAR specification in effect on the 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.