Following is the Draft 1 Version 5.0 product specification for ENERGY STAR qualified central air conditioner and air source heat pump 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. Air-Source Heat Pump (ASHP): An air-source unitary heat pump model is a product, which consists of one or more assemblies, powered by single phase electric current, rated below 65,000 Btu per hour, utilizing an indoor conditioning coil, compressor, and refrigerant-to-outdoor air heat exchanger to provide air heating, and may also provide air cooling, dehumidifying, humidifying circulating, and air cleaning.

B. Central Air Conditioner: A central air conditioner is a product, which is powered by single phase electric current, air cooled, rated below 65,000 Btu per hour, not contained within the same cabinet as a furnace, the rated capacity of which is above 225,000 Btu per hour, and is a heat pump or a cooling unit only.

C. Single Package: A single package unit is an ASHP or central air conditioner that has all major assemblies enclosed in a single cabinet.

D. Split System: A split system is an ASHP or central air conditioner that has one or more of the major assemblies separated from the others.

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. Basic Model: All units of a given type of covered product (or class thereof) manufactured by one manufacturer and which have the same primary energy source and, which have essentially identical electrical, physical, or functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption or water efficiency.

G. Heating Seasonal Performance Factor (HSPF): HSPF is the total space heating required during the space heating season, expressed in Btu, divided by the total electrical energy consumed by the heat pump system during the same season, expressed in watt-hours.

H. Seasonal Energy Efficiency Ratio (SEER): SEER is the total heat removed from the conditioned space during the annual cooling season, expressed in Btu, divided by the total electrical energy consumed by the air conditioner or heat pump during the same season, expressed in watt-hours.

I. Energy Efficiency Ratio (EER): EER is the ratio of the average rate of space cooling delivered to the average rate of electrical energy consumed by the air conditioner or heat pump. This ratio is expressed in Btu per watt.h (Btu/W.h).

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1 10 CFR part 430 Subpart B, Appendix M
2 10 CFR 430, Subpart A, § 430.2 Definitions
Note: EPA has revised all the definitions except for Gas/Electric Package Unit (which is not included in the federal standard definitions), to be consistent with the regulatory definitions as defined in 10 CFR Part 430, Subpart A § 430.2 and 10 CFR part 430 Subpart B, Appendix M.

2) Scope:
   A. Included Products: Single package, split system, and gas/electric package units that meet the definitions of an ASHP or central air conditioner as specified herein are eligible for ENERGY STAR qualification, with the exception of products listed in Section 2.B. Units may be intended for installation into a duct system, or may be ductless.
   B. Excluded Products: Central air conditioners and ASHPs that use a third party (or independent) coil, three-phase equipment, and products rated above 65,000 Btu/h are not eligible for ENERGY STAR.

3) Qualification Criteria:
   A. Energy Efficiency Requirements:

   | Table 1: Energy-Efficiency Criteria for Qualified Residential ASHPs and Central Air Conditioners |
   |----------------------------------------------------------|--------|--------|--------|
   | Product Type                                             | SEER   | EER    | HSPF   |
   | CAC Split Systems - South Region²                        | ≥ 15.5 | ≥ 13   | N/A    |
   | CAC Split Systems - North Region³                        | ≥ 14.5 | ≥ 12   | N/A    |
   | ASHP Split Systems - National                            | ≥ 15.5 | ≥ 12.5 | ≥ 8.6  |
   | CAC Single Package Equipment⁴ - National                 | ≥ 15.5 | ≥ 12.5 | N/A    |
   | ASHP Single Package Equipment⁴ - National                | ≥ 14.5 | ≥ 12   | ≥ 8.3  |

   Notes:
   1. HSPF criteria is applicable to heat pump, only
   2. Alabama, Arkansas, Delaware, Florida, Georgia, Hawaii, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, District of Columbia, Arizona, California, Nevada, New Mexico
   4. Including gas/electric package units

   B. Multiple Assemblies: For split system ASHP and central air conditioner, ENERGY STAR qualification shall be determined by the rated performance of the particular combination of indoor and outdoor units, regardless of the fact that the components may be used in other combinations.

Note: EPA is revising the CAC/ASHP specification due to the: 1) new federal energy conservation standards, effective January 1, 2015, that are close to and in some cases equal to the current ENERGY STAR requirements; and 2) broad availability of higher efficiency products in the market. In an effort to continue to distinguish the most energy efficient products that provide significant energy and cost savings to the consumer while also providing excellent performance, EPA proposes the following changes to the requirements.
Note (Cont.):

Regional versus National Requirement: The new Federal standards propose regional requirements for CAC and national requirements for ASHP systems. The Federal standard for split system CAC divides the nation into three regions: Hot Dry (Southwest), Hot Humid (South) and Rest of the Country (North).

Taking this into careful consideration, EPA proposes to adopt a regional approach for CAC split systems but maintain national criteria for the rest of product classes, that is, ASHP split systems and CAC/ASHP single package. CAC split system criteria will include two regional requirements - North and South (combining South and Southwest regions in the Federal CAC Standard). EPA proposes a national requirement for ASHP because high SEER products which provide savings in cooling dominated climates also have high HSPF and will provide savings in heating dominated climates. Also, to the extent that the HSPF does not take into account that the heat pump may offset more expensive forms of heat in some homes, some consumers will see more monetary saving than predicted by HSPF alone. Thus, a single national level is reasonable. For single package air conditioners, their use is sufficiently rare that the complexity of regional requirements is not justified. EPA is open to considering regional specification requirements for other product classes as well if there is strong justification.

Performance Criteria: The levels proposed in Table 1 provide a balance between consumer savings, initial cost, and differentiation between standard and high efficiency products. EPA understands that the savings attained by the consumer is dependent on the application and the product delivers maximum savings when installed correctly, in the right application and climate. Similar to many HVAC products, contractors play an important role in working with homeowners to determine the best choice of product for their intended use and conditions.

For split system central air conditioners, energy savings in cooler climates will not justify the same level of performance as they do in hot climates. Therefore, for CAC split systems, EPA proposes more stringent requirements in the South, by raising the minimum SEER from 14.5 to 15.5 and EER from 12 to 13, while maintaining the current requirement of 14.5 SEER and 12 EER in the North. The more stringent levels provide excellent energy savings to consumers in hot climates. Based on the AHRI certified products directory, about 30% of the products available that will meet the new Federal standards in the South will meet the proposed requirement. A regionalized specification for split system central AC also facilitates cooperation with the ENERGY STAR New Homes program and with the new ENERGY STAR Verified HVAC Installation program, by increasing the number of installations in the North for which ENERGY STAR CAC will be appropriate.

With the institution of regional requirements, a regional certification mark will also be needed. Products that are certified to meet the requirements for labeling in the South will also meet those for the North, and will therefore carry the regular certification mark. Products that are certified only in the North will carry a separate label, similar to that developed for furnaces meeting the Version 4.0 Furnaces requirements only in the South. For CAC, the northern states will be cyan and the southern states will be white. The postal abbreviations of northern states will be listed, along with text indicating that Canada is also in this region. We do not anticipate that the map graphic will include Canada.

For split systems, EPA is considering adjusting the product literature labeling requirement to more clearly communicate which particular combinations of indoor and outdoor units have earned the ENERGY STAR. In the usual product literature, such as brochures, the performance of various combinations are presented in compact tabular form. On the Energy Guide label as well, a range of performance values are listed, reflecting the performance variation due to the indoor unit. Using these tools, it is hard for manufacturers to communicate clearly to installers, homeowners and energy efficiency program sponsors whether a particular combination has earned the ENERGY STAR. EPA anticipates the introduction of a regional label will exacerbate this situation.
To address this, EPA intends to require that manufacturers provide a downloadable document with the ENERGY STAR mark (or ENERGY STAR Regional mark in the case of units in the Northern zone) on it. The document would include the model number of the complete system, that is, both the outdoor and indoor model numbers for split systems, and the product performance rating. It would serve as proof to the consumer and utilities offering rebates that the installed unit/system complies with the ENERGY STAR criteria and is ENERGY STAR certified for the intended region. The manufacturer can choose to offer the document on their own website or through a designee such as a Certification Body. However, the manufacturer will be responsible for ensuring accurate representation of the information and the ENERGY STAR mark. Stakeholders are encouraged to provide feedback on this potential new requirement.

For ASHP split systems, EPA proposes to raise the minimum SEER from 14.5 to 15.5, EER from 12 to 12.5 and HSPF from 8.2 to 8.6. The proposed levels provide substantial savings in both hot climates (South) and cooler climates (North). In cases where the ASHP will offset more expensive forms of heating, consumers can save even more. Based on the AHRI certified products directory, about 15% of the products now on the market that will meet the new Federal North standard meet the proposed ENERGY STAR requirement. The current market provides a broad variety of models that meet the proposed requirements and in addition, EPA expects the model count will rise in reaction to new Federal standards.

For CAC single package units, EPA proposes to raise the minimum SEER from 14 to 15.5 and EER from 11 to 12.5 and for ASHP single package units, SEER from 14 to 14.5, EER from 11 to 12 and HSPF from 8.0 to 8.3. The proposed level for CAC single package offers increased energy savings to consumers. Based on the AHRI certified products directory, about 14% of the products currently available that will meet the new Federal standard also meet the proposed ENERGY STAR requirement.

Multiple Assemblies: The Multiple Assemblies requirement has been redefined to provide more clarity that for splits systems, the ENERGY STAR qualification is based on the particular combination of indoor and outdoor units.

Connected Criteria: CAC and ASHP products offer good opportunities for Demand Response (DR) and other smart grid features. EPA is aware of the collaborative efforts of AHRI and CEE to develop uniform signals and communication requirements for several connected HVAC products. EPA is following the process and will consider including connected criteria in a future revision but is not proposing inclusion in this revision.

Additional Metrics: In the Framework, EPA introduced the idea of using additional metrics, such as 17F COP or heating capacity, particularly to differentiate products that are well suited to some regions. In response to comments, and having come to better understand the range of available products and metrics, EPA does not believe such differentiation is useful for this Version 5.0 specification. However, such metrics may make sense in distinguishing ENERGY STAR Most Efficient products.

EPA welcomes stakeholder feedback on this proposal and requests that stakeholders share any test data or studies that would support their recommendation.
values without any benefit from rounding.

c. As specified in 10 CFR, 430.23(m)(3), SEER, and HSPF shall be rounded off to the nearest 0.05 Btu/W.h. Similarly, EER should also be rounded off to the nearest 0.05 Btu/W.h.

d. As specified in 10 CFR part 430 Subpart B, Appendix M, capacity shall be expressed in accordance with in Table 2, below.

### Table 2: Rounding Requirements for Capacity

<table>
<thead>
<tr>
<th>Capacity Ratings, Btu/h</th>
<th>Multiples, Btu/h</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt; 20,000</td>
<td>100</td>
</tr>
<tr>
<td>≥ 20,000 and &lt; 38,000</td>
<td>200</td>
</tr>
<tr>
<td>≥ 38,000 and &lt; 65,000</td>
<td>500</td>
</tr>
</tbody>
</table>

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 § 429.16. 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 provided above and in 10 CFR Part 430.2 is met. Further, all individual models within a basic model must have the same certified rating per DOE’s regulations in Part 429 and this rating must be used for all manufacturer literature, the qualified product list, and certification of compliance to DOE energy conservation standards.

Note: EPA has modified the sampling requirements to be consistent with the DOE sampling requirements for CAC/ASHP as defined in 10 CFR Part 429, Subpart B § 429.16. This language replaces previous direction regarding individual and product family testing. This is consistent with EPA practice across the ENERGY STAR Products program.

B. When testing ASHPs and central air conditioners, the following test method shall be used to determine ENERGY STAR qualification:

### Table 3: Test Method for ENERGY STAR Qualification

<table>
<thead>
<tr>
<th>ENERGY STAR Requirement</th>
<th>Test Method Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>SEER, EER, HSPF</td>
<td>10 CFR part 430 Subpart B, Appendix M</td>
</tr>
</tbody>
</table>
Note: The test method reference has been updated to directly refer to the Federal test method, 10 CFR part 430 Subpart B, Appendix M.

5) Effective Date: This ENERGY STAR ASHP and Central Air-Conditioners Specification shall take effect on TBD. To qualify for ENERGY STAR, a product model shall 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 (e.g., month and year) on which a unit is considered to be completely assembled.

Note: EPA expects to finalize the Version 5.0 CAC/ASHP specification in fall of 2014. At that point, EPA will establish sufficient lead time before the specification becomes effective for manufacturers to update product literature and other marketing materials for those products that no longer meet ENERGY STAR requirements.

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.