

REF No.	Topic	Comment	EPA Response
1	Air Filter Reminder	<p>The air filter requirement will be nearly, if not totally, impossible for electromechanical products to meet, which will result in products that meet the energy efficiency criteria not being qualified for ENERGY STAR.</p> <p>The air filter requirement should either be removed from the specification or those products with electromechanical controls should be excluded from the requirement.</p>	In Draft 3, EPA has revised this requirement to clarify that electromechanical RACs (defined in Section 1) are not required to have an air filter reminder. All other RACs will be required to have an air filter reminder.
2	Air Filter Reminder	<p>While there are potential energy savings associated with timely maintenance of filters, the jury is still out on whether the suggested measure will contribute to proper filter maintenance.</p> <p>Energy savings will require a change in consumer practice. The plausibility of a reminder contributing to the desired end is unknown and it is unclear what known or unforeseen costs may come into play. When a complete case can be presented with additional specificity in the definition of "filter" additional perspective may be presented.</p>	Based on stakeholder outreach, EPA believes that there is minimal incremental cost associated with this feature that can offer additional convenience and energy-savings for consumers. This feature is already implemented on a number of ENERGY STAR qualified RACs. Based on discussions with manufacturers and given its current application in many RACs, EPA has found no reason to believe there will be unforeseen costs associated with requiring this feature be available on all (with the exception of models discussed in #1) ENERGY STAR qualified RACs.
3	Definitions	Revising the definitions for room air conditioner and reverse cycle, so they match with the DOE definition and ASHRAE Standard 58 definitions respectively, is supported.	EPA appreciates the comment on the updated definitions; those definitions have been retained in Draft 3.
4	Effective Date	A revised effective date of October 1, 2012 is supported.	EPA appreciates the feedback on the effective date proposed in the Draft 2, V3 specification. Given the updated estimated schedule for completing the RAC Version 3.0 specification, in Draft 3, EPA has adjusted the proposed effective date to January 30, 2013.
5	Energy Saver Mode	<p>For larger units such as 18K and 24K BTU, which are likely placed in rooms that are greater than 500 square feet, 60 seconds of run time every 5 minutes may not be enough time to sample the air and gauge accurate control of the room temperature.</p> <p>A counter-proposal is to keep the ratio of 60 second of run time for every 5 minutes; however, it the actual minutes should be up to the manufacturers discretion, depending on the end product.</p>	In Draft 3, EPA amended the Energy Saver Mode requirement to provide more flexibility over how long the fan will run to gauge the air temperature. The maximum ratio of 1 minute fan-on to 5 minutes fan-off was retained, but additional flexibility has been added so that manufacturers may use shorter, longer or variable fan-on durations, so long as this maximum ratio is met.
6	Energy Saver Mode	<p>There are no objections to including criteria for Energy Saver Mode. However, the term default operating mode is ambiguous. EPA should clearly state its intent in regards to the criterion so that it is understood by everyone.</p> <p>While there are no objections to the criterion proposed by EPA in the June 2 webinar for electronic controls, a different approach should be taken for those products with electromechanical controls. As proposed the criterion penalizes products with electromechanical controls, even if they meet the EER qualification criteria and provide an Energy Saver Mode. Products with electromechanical controls generally provide a switch that allows the consumer to select or unselect the Energy Saver Mode, but such products cannot default to the Energy Saver Mode each time the unit is turned on. Moreover, though a manufacturer may be able to ensure shipment with the switch set to the Energy Saver Mode, the manufacturer cannot guarantee that the switch will not inadvertently change position in transit or at the warehouse.</p> <p>An alternative proposal for these electromechanically controlled models is that "default operating mode" means that the product is shipped with the switch for Energy Saver Mode in the "on" position, but does not require the unit to default to the Energy Saver Mode each time the product is turned on.</p>	<p>In Draft 3, EPA proposed additional language to clarify the intended meaning of default operating mode as it relates to Energy Saver Mode. In particular, all ENERGY STAR qualified models (with the exception of those that meet the definition of an electromechanical model) would be required to ship with the energy saver mode as the default operating mode. In addition, the product would be required to default to energy saver mode each time the product is turned on. Manufacturer may provide consumers with the option to override this mode, but the product must revert back to Energy Saver as the default mode each time the RAC is turned on.</p> <p>Based on this stakeholder feedback, EPA has amended the Energy Saver Mode requirement for Electromechanical RACs. In Draft 3, EPA has proposed RACs that meet the electromechanical definition (proposed in Section 1 of Draft 3) must have an Energy Saver Mode but are not required to default to Energy Saver mode each time the RAC is turned on (since electromechanical RACs use a mechanical switch rather than electronic switch and so cannot automatically default to this setting).</p>
7	Energy Saver Mode	The inclusion of "Energy Saver Mode" as the default operating mode is supported, as long as EPA demonstrates that the "Energy Saver Mode" still provides adequate amenity.	EPA presented details on this proposal during the Draft 2 stakeholder webinar, including analysis that having Energy Saver Mode as the default operating mode could provide additional energy and cost savings for the consumer.
8	Sampling Plan Requirements	The proposal to harmonize with DOE's sampling plan requirements for certification is supported.	In Draft 3, EPA has retained its proposed language that formalizes the current practice of allowing manufacturers the option to qualify based on a single test or leveraging testing performed for purposes of complying with minimum efficiency standards.

9	Smart Grid / Connected	<p>The communications provisions in the draft specification are supported. Opportunities exist to deliver value to the consumer and grid by building communications capabilities into Room Air Conditioners. Specifically, energy management services will be able to deliver enhanced demand response and energy efficiency with communicating Room Air Conditioners. Data that is collected by a third party can deliver double-digit percentage reductions in air conditioner energy use with residential central air systems using data to determine the "thermal battery" each home represents. This information would allow for optimization of pre-cooling strategies to maximize load shed and minimize discomfort. This will be possible with Room Air Conditioners as well, but only if third-parties are able to fully interact with control systems as set forth in the specification. Without this communication with the Room Air Conditioner innovation will be stifled.</p>	<p>EPA appreciates this comment and is encouraged that the remote management criteria specified in the draft V3 specification can provide significant opportunities for energy use optimization through integration with external energy management devices services or apps.</p>
10	Smart Grid / Connected	<p>It is shortsighted to define the universe of applications and responses allowed from Room Air Conditioners in the specification. Technology is generally best enabled by separating the major constituent layers, which in this case are hardware, communications, and applications. The specification does a relatively good job in addressing this.</p> <p>Demand response (DR) is an application. It is not necessary to mix layers by limiting the hardware to a specific version of a specific application. Limiting DR to the specific ways that utilities prefer today is the equivalent of requiring in 1985 that all personal computers must run WordStar for DOS. Applications evolve and open hardware and communications standards enable that kind of progress.</p> <p>The driving force behind the new Room Air Conditioner specification should be consumer benefit. Utilities may be satisfied with Room Air Conditioners that are capable of only very simple, hard-coded responses to a few remote commands, but Room Air Conditioners are capable of delivering far more consumer benefit if communications are not so circumscribed. Limiting the benefits of communications to grid-level benefits will only serve to limit the appeal of communications, and thus limit the adoption of this technology, thereby frustrating both goals.</p>	<p>EPA appreciates this feedback. EPA's aim in developing the bundle of criteria related to smart grid has been to deliver near term consumer energy savings and convenience features, while also supporting the potential for new demand response opportunities that can benefit the grid and help consumers save money, while not negatively affecting consumers' satisfaction of their products. The proposed specification defines a minimum set of capabilities a product must have. In developing these, EPA also recognizes that manufacturers and other companies may further innovate, building on this minimum set of capabilities by offering additional functionality to consumers.</p> <p>EPA agrees that consumer benefit must be a key consideration in developing a specification that addresses "connected" functionality and smart grid enablement. EPA continues to be interested in specific feedback in regards to DR criteria that would enable innovation, flexibility, and alternate strategies for load management and DR, in a way that supports the needs of consumers, utilities and RAC manufacturers. In Draft 3, EPA has identified several potential ways in which DR criteria might be structured. EPA is seeking more feedback from stakeholders to inform the development of these criteria.</p>
11	Smart Grid / Connected	<p>The EPA proposal for an optional Smart Grid Capable designation is supported. However, Demand Response and smart control capabilities should not be traded against energy efficiency using a credit without thorough evaluation of the costs and benefits. Any such evaluation should be considered on an individual product basis, according to unique product operational characteristics, and should not be assumed to be one flat value for different appliances.</p>	<p>EPA appreciates the comment. To clarify, EPA has indicated intent to identify products with connected functionality by highlighting such functionality on the Qualified Product List (QPL). However, EPA is not planning to develop a separate Smart Grid Capable or Connected designation, i.e., similar to the Most Efficient designation that is currently being piloted. In the Draft 3, EPA has proposed an allowance for "connected" functionality as an incentive to help jump-start the market for RACs with functionality that delivers near term consumer value, while facilitating broader electric power system benefits. To use the allowance, product's DR functionality must be demonstrated using the future DOE test method. EPA's proposed approach bundles consumer-oriented enhancements, such as the ability to interface with an energy management system, with demand response functionality that consumers could opt to leverage in the future to save money on their energy bills, once the supporting infrastructure is built.</p>
12	Smart Grid / Connected	<p>Room Air Conditioners are relatively low cost devices, where competitive pressures make it impractical for the baseline specification to require expensive communications hardware that may be used only rarely at first. However, the lost price relative to the cost of electricity that RACs use over their lives makes enabling energy efficiency more important, not less.</p> <p>However, the value of demand response and smart controls to consumers will not be fully realized until there is sufficient market penetration and consumer participation. In the short-term, it is understandable that only a small percentage of RACs will be connected to an EMS. An optional Smart Grid Capable designation will help to achieve further market penetration by incentivizing implementation without compromising consumer value.</p>	<p>As discussed in both Draft 2 and Draft 3, V3 specifications, through this specification development process EPA has signaled its intention to highlight "connected" functionality on the ENERGY STAR Qualified Product List (QPL). EPA agrees with commenter that it is currently premature to require all ENERGY STAR RACs to have communication capabilities. Also, to clarify, EPA is not contemplating a separate designation for "Smart Grid" or "Connected" in the form of new logo or variation upon the current ENERGY STAR label. Rather, EPA has indicated that it would plan to highlight such functionality on the QPL. In the Draft 3, EPA has also proposed a 5 percent credit for RACs with "connected" functionality as an incentive to help jump-start the market and increase market availability and adoption; manufacturers could take advantage of this allowance by demonstrating the product's functionality using the TBD ENERGY STAR test method.</p>

13	Smart Grid / Connected	<p>EPA's evaluation of the benefit of demand response for consumers should be from the perspective of a holistic cost of electricity that includes utility and social costs.</p> <p>Any credit against energy efficiency for DR should be tied to consumer value and it is understood that EPA considers all specifications from a consumer perspective. However, the actual value and cost of energy provided to consumers is not completely reflected in residential energy prices and rates, even with dynamic pricing mechanisms.</p> <p>The true cost of energy accounts for the utilization of grid investments by different consumers, and for a variety of environmental and social externalities. A holistic method of evaluation will ensure not only that consumers who purchase smart grid capable products receive a certain base level of value, but also that such value will be realized through product operation, and as dynamic pricing schemes are implemented. As utilities and third party providers develop and evaluate residential consumer incentive programs for demand response, they will analyze the benefits of demand response from such a perspective.</p>	<p>EPA appreciates this comment and in the Draft 3 has structured the proposed allowance to be in return for both near-term consumer oriented functionality while also supporting the inclusion of future-oriented demand response capabilities that have the potential to benefit the grid, environment and society at large. While recognizing that today, connected or DR ready appliances are limited to only a handful of pilot programs in the U.S., EPA encourages stakeholders to share any additional data, analysis or information regarding potential consumer and/or grid benefits from connected appliances.</p>
14	Smart Grid / Connected	<p>It is premature to start identifying "smart grid capable" room air conditioners, let alone allocating a 5 percent adder for compliant models. This includes recognizing or identifying in any way "smart grid capable" products under the aegis of the ENERGY STAR program. Until the consumer value can be weighed against program risk, consumer cost, and program administrator objectives it is impossible to make an informed judgment as to whether potential downside risks to the Program are worth the upside potential that we all hope to see realized. Therefore it is recommended to defer such criteria until the necessary data and considerations can be discussed.</p>	<p>EPA does not agree that it is premature to identify or propose incentives that help enable consumer adoption of connected appliances. Modernization of the US electric power grid was identified as a national priority with the passage of the Energy Independence and Security Act of 2007 (EISA). A "smart grid" that relies on greater use of information and communication technologies in the electric power system can help improve the efficiency and reliability of the grid, increase the use of distributed generation and renewable energy, demand response, and efficiency, and provide new information to consumers.</p> <p>In Draft 3, EPA discusses the near-term value proposition for consumers of "connected" RACs, including new energy savings and convenience features as well as the longer-term opportunity for grid and additional environmental benefits from DR capable RACs.</p>
15	Smart Grid / Connected	<p>EPA is strongly urged to grant the Joint Petition and provide an allowance of 5% towards reaching the more aggressive criteria that can be expected as new ENERGY STAR criteria are adopted in all product categories. EPA is urged to abandon the one-appliance-at-a-time approach set forth in the draft Room Air Conditioner Eligibility Criteria.</p> <p>The current approach will not incentivize manufacturers to produce smart appliances, but may even disincentivize manufacturers. Manufacturers are looking for certainty from EPA and DOE to help incentivize these appliances that will provide tremendous benefits to the electrical grid.</p>	<p>In Draft 3, EPA has proposed a 5% energy criteria allowance for "connected" RACs. EPA believes that in the near-term, consumer value can be driven by the availability of new energy-savings and convenience features, such as real-time feedback on the RAC's energy use that facilitate and encourage energy and cost-savings behaviours and remote control of the RAC (e.g., ability to turn the RAC on/off through a smart phone), while offering functionality that could provide future benefits to the electric grid and consumers once the supporting infrastructure is built.</p>
16	Smart Grid Capable RACs	<p>Smart appliances, with their ability to communicate with the grid, will provide consumers the opportunity to monetize deferral of energy intensive appliance operations, for example clothes or dish drying and refrigerator defrost, to off-peak periods.</p>	<p>EPA agrees that appliances that are able to shift energy use away from peak periods have the potential not only to provide grid benefits, but also to provide direct monetary benefits to consumers. Direct consumer energy cost savings are largely dependent on participation in variable pricing programs such as Time of Use or Real-Time Pricing, or the availability of opt-in Demand Response programs that offer some monetary incentive to consumers for participation.</p>
17	Smart Grid / Connected	<p>EPA is urged to abandon the micro-specification of performance criteria that are best left to the NIST Smart Grid Interoperability Panel (SGIP). The SGIP process is open and its mission is to develop open standards that all stakeholders can use to assure that all devices communicate and work together. The SGIP is able to adjust quickly to innovation and unexpected developments, unlike regulatory bodies such as EPA. EPA's efforts to specify communications criteria can only undermine the NIST effort.</p> <p>An example of micro-specification include logging data every 60 seconds and transmitting every 5 minutes. This requirement seems to be unnecessary, unlikely to be fully leveraged, and adds cost and complexity that is not warranted. It is also not clear that data logging information such as this proposal are well covered by existing standards. Finally, prescribing this level of detail will stifle innovation.</p> <p>Another example of micro-specification is accepting remote control commands from authorized devices in near-real time setting changes to certain operations at any point in time. This near-real time response may be too easy to hack or issues may be caused due to the direct/immediate control of modes. It is more favorable and secure to have mode/behavior "requests" rather than "commands." Responses within .5 seconds may have little or no impact on energy level and will not be perceivable by consumers.</p>	<p>In broad terms, EPA has crafted the ENERGY STAR "Connected" RAC criteria to reward products that provide open access to a robust set of data reporting and remote control capabilities. These capabilities are intended to stimulate development of innovative protocols and features for load control and energy management. By specifying responsive remote management and frequent reporting of data and settings that are relevant to comfort and energy use, EPA strives to stimulate development of energy management applications, algorithms and automation protocols that minimize energy use while preserving consumer comfort. However, EPA also recognizes that RACs are a relatively low-cost, price sensitive product category and has made revisions to the Draft 3, V3 specification intended to minimize incremental cost of connected RACs while providing a robust "connected" feature set that will stimulate innovation. In particular, the Draft 3, V3 specification does not specify a minimum level of accuracy for the self-energy consumption reporting. EPA welcomes stakeholder input on these revisions.</p> <p>EPA is monitoring and supports the standardization efforts of NIST SGIP. In the Draft 3 V3 specification, standards identified by the National Institute of Standards and Technology (NIST) Smart Grid Interoperability Panel are specified for the DR communications functionality. For Home Energy Management (HEM) functionality, EPA has proposed that documentation must be made available to interested parties specifying the accuracy of energy consumption reporting and to provide access to HEM data reporting and remote management functionality. However use of SGIP identified standards, while allowed, is not mandated.</p>

18	Smart Grid / Connected	<p>EPAs proposal for security requirements is inadequate to provide consumers with needed assurances regarding their personal data and non-interference with appliance operations.</p> <p>In particular the proposal is too vague and it is too early in the process to define security measures.</p>	<p>In Draft 3, EPA has not included the criteria that addressed authentication and security for connected RACs. Based on feedback from stakeholders, EPA instead is specifying that the "connected" RAC use NIST SGIP identified standards for DR communications. Use of SGIP identified standards is expected to help ensure robust authentication and security. Additional stakeholder feedback on how EPA might address security considerations within the specification is welcomed.</p>
19	Smart Grid / Connected	<p>The home appliance industry has reflected a clear preference at this time for a communications architecture featuring a hub or gateway that can communicate using common protocols and serve as the adapter or bridge to other devices on the Home Area Network (HAN). This type of architecture is consistent with the OpenHAN architecture and provides simplicity to the consumer. Additionally, this architecture type supports a more robust, comprehensive "home networking" system approach compatible with consumer electronics devices.</p>	<p>EPA recognizes this preference and believes the Draft 2 specification is compatible with, but does not require, the architecture preferred by the home appliance industry.</p>
20	Smart Grid / Connected	<p>In the Draft 2, Room Air Conditioner Specification, EPA proposed that, in order to qualify a product with ENERGY STAR as smart grid capable, the appliance industry must develop and publish an Interface Specification or Interface Control Document as well as outline very detailed signal information to enable third party devices and applications. This level of detail specified is onerous and costly, but, for example, SEP 1.0 already provides the necessary information for devices and appliances to provide energy use information to the consumer. EPA should not be working to enable one proprietary use. Instead, EPA should allow and encourage an open standards process, as outlined by NIST, to develop and evolve any required signal information. NIST has taken the lead in this area and already developed a list of "approved" communications standards that can be updated through the SGIP process.</p> <p>This has been reinforced from manufacturers in other industries as well through the CPUC hearing on May 6, 2011.</p>	<p>EPA recognizes the value of the NIST SGIP effort to drive open access and interoperability of Smart Grid communications. However, these standards generally do not extend to standardization of commands for purposes of energy management and related applications (e.g., alerts/diagnostics). Stakeholders have indicated that there may be early efforts underway to establish common command sets for appliance control and encourages stakeholders to keep EPA apprised of progress in this area. However, in the absence of suitable standards that will ensure open access and interoperability for both DR and HEM functionality, EPA believes it necessary to include criteria that requires manufacturers to provide suitable documentation to 3rd parties interested in leveraging HEM communications of connected appliances. In response to stakeholder comments, EPA has, however, revised the criteria language to reduce specificity. EPA welcomes stakeholder comments on these revisions.</p>