



ENERGY STAR[®]

Room Air Conditioners

Draft 2 Version 3.0
Stakeholder Webinar

June 2, 2011

Agenda



1. Welcome/ Goals

Amanda Stevens, US EPA

2. Draft 2 Specification Changes: Summary & Discussion

Ryan Fogle, D&R International

3. Conclude & Next Steps

Amanda Stevens, US EPA



Meeting Goals

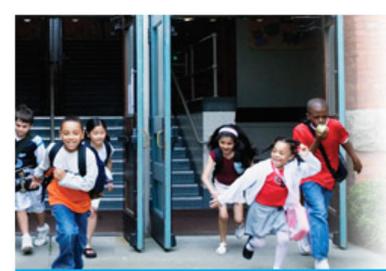
- Highlight changes in the Draft 2 Version 3.0 specification
- Solicit feedback on new proposals:
 - Energy Saver Mode
 - Air Filter Reminder
 - Opportunity for Recognition as Smart Grid Capable on Qualified Product List
- Address stakeholder questions about the specification process
- Next steps and updated timeline



Summary of Changes to Draft 2, Version 3.0



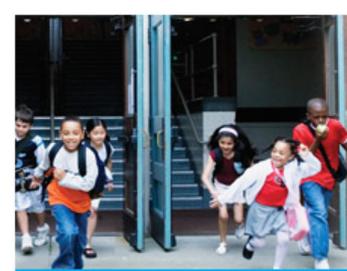
- Definitions
- New Intelligent Product Features
 - Energy Saver Mode
 - Air Filter Reminder
- Opportunity for Recognition as Smart Grid Capable on Qualified Product List
- New Effective Date
 - October 1, 2012



Definitions



- Room Air Conditioner
 - Product definition has been changed to match the DOE definition.
- Reverse Cycle
 - Definition has been changed to exactly match the definition found in ASHRAE 58.
- Basic Model
 - DOE clarified its interpretation of the Basic Model definition in a recent Final Rule and to harmonize, EPA has incorporated the latest definition from 10 CFR 430.2.
- Energy Management System (EMS)
 - Definition adapted from the draft ENERGY STAR Residential Climate Controls specification.



Test Requirements & Model Numbers

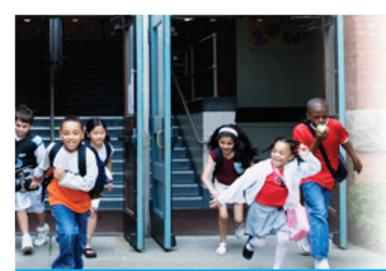


- Formalized current practice of allowing manufacturers to qualify products by using one of two sampling plans:
 1. A representative unit may be selected for testing based on the definition for Basic Model.
 2. Units may be selected for testing per the DOE sampling requirements defined in 10 CFR 429.15, which references 10 CFR 429.11.
- Model numbers used for ENERGY STAR qualified product submissions shall be the same as those submitted to FTC and DOE.

Proposed Draft 2, V 3.0 Criteria



Units Without Reverse Cycle		
	ENERGY STAR EER (with louvered sides)	ENERGY STAR EER (without louvered sides)
Less than 6,000 Btu/hr	11.2	10.4
6,000 to 7,999 Btu/hr		
8,000 to 13,999 Btu/hr	11.3	9.8
14,000 to 19,999 Btu/hr	11.2	
20,000 Btu/hr or more	9.8	
Units With Reverse Cycle		
< 14,000		9.8
≥ 14,000		9.2
< 20,000	10.4	
≥ 20,000	9.8	
Casement Units		
Casement-only	10.0	
Casement-slider	10.9	



Air Filter Reminder



- EPA has proposed requiring an air filter reminder in all ENERGY STAR qualified models.
- RACs shall provide visual notification recommending the filter be checked, cleaned or replaced, as applicable.
 - The air filter reminder may be based on operating hours, sensing technology, or other means.
- Compliance with this requirement will be verified by observation or examination of product documentation.

Savings Analysis– Air Filter Reminder



Per-Unit Results (With Louvers, Without Reverse Cycle)

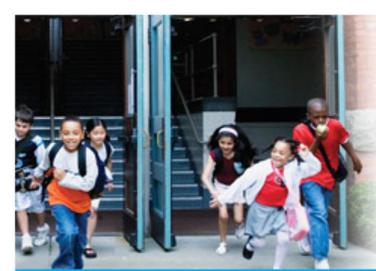
Estimated Annual Savings

(Btu/hr)	5,000	7,000	10,000	18,000	20,000
(kWh/year)	6	9	13	23	25
(\$/year)	\$0.67	\$0.97	\$1.40	\$2.49	\$2.75

Estimated Lifetime Savings

(Btu/hr)	5,000	7,000	10,000	18,000	20,000
(kWh/year)	55	80	115	206	227
(\$/year)	\$5.99	\$8.76	\$12.57	\$22.41	\$24.77

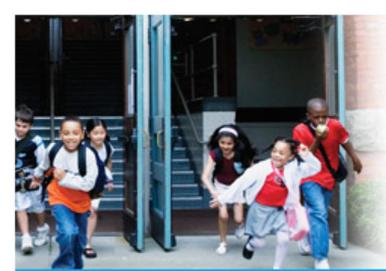
- Estimated National Savings of 21 million kWh/year, which would save consumers roughly \$2 million.
- Benefit: Increase the number of consumers that check and/or clean filter regularly; periodic filter cleaning helps maintain peak operating



Assumptions – Air Filter Reminder



- Research indicates that most RACs do not currently include an air filter reminder.
- Calculation of estimated savings, assumed:
 - Estimated efficiency degradation of 5 percent was used.
 - Consumer response estimates:
 - Assumed that on average consumers without a filter reminder clean their filter once every season (once every 1455 hours)
 - Assumed that on average consumers with a filter reminder clean their filter approximately 3 times every season (approximately 3 times every 1455 hours)
 - Run time includes time the compressor is running as well as fan-only hours.



Energy Saver Mode



- In Draft 2, EPA is proposing that “Energy Saver Mode” be the default operating mode. In this mode, fan operation shall occur only in conjunction with compressor operation, with the following exceptions:
 - The fan may continue to run for a period not exceeding 5 minutes, after the compressor is switched off.
 - The fan may be cycled for up to 60 seconds at a period of 5 minutes or greater to facilitate accurate control of room temperature.
- EPA estimates consumer annual savings would range from \$3 to \$17, depending on the size of the unit.
- Compliance with this requirement will be verified by observation or examination of product documentation.

Savings Analysis

Energy Saver Mode



Per-Unit Results (With Louvers, Without Reverse Cycle)

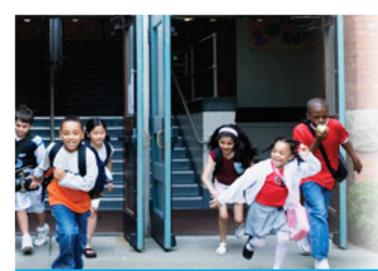
Estimated Annual Savings

(Btu/hr)	5,000	7,000	10,000	18,000	20,000
(kWh/year)	28	59	92	146	156
(\$/year)	\$3	\$6	\$10	\$16	\$17

Estimated Lifetime Savings

(Btu/hr)	5,000	7,000	10,000	18,000	20,000
(kWh/year)	255	533	828	1313	1400
(\$/year)	\$28	\$58	\$90	\$143	\$152

- Estimated National Savings of 109 million kWh/year, which would save consumers roughly \$12 million.
- Benefit: Additional energy and monetary savings to the consumer.



Assumptions

Energy Saver Mode



- EPA research indicated that most ENERGY STAR qualified RACs include an Energy Saver mode.
 - RACs surveyed did not have this mode as the default setting.
- For the savings estimates, EPA assumed the following:
 - The fan runs for 2 minutes after compressor shuts off.
 - Fan will run for 2 minutes every 10 minutes to test the air temperature.
 - If increase in temperature is sensed, RAC will return to active mode.
 - Fan on/off ratio of 1/6.
 - Number of fan mode hours assumed to be 705, per DOE (2010).
 - Fan power calculated using stakeholder feedback.
 - 2/3 of consumers will operate RAC in default Energy Saver Mode.



Smart Grid Capable



- EPA is evaluating how best to address and encourage smart grid functionality as ENERGY STAR specifications are revised.
- In the near term, EPA is proposing to offer recognition of ENERGY STAR RACs that are Smart Grid Capable on our Qualified Product List.
 - RACs would need to meet criteria, proposed in Draft 2, in order to take advantage of this opportunity.
- EPA will continue to engage with stakeholders on additional ways to address and encourage smart grid functionality as part of specification process.
 - Eye towards potentially adopting an incentive, as progress on this front allows.



Smart Grid Capable Criteria



- ENERGY STAR Room AC would need to meet these criteria to be categorized as “Smart Grid Capable” on the Qualified Product List.
 1. Communications Requirements
 2. Date and Time
 3. Delay Load Capability
 4. Spinning Reserve Capability



Smart Grid Capable



- EPA seeks feedback from stakeholders on this approach.
- Will designating products as Smart Grid Capable help stimulate the market introduction and consumer adoption of RACs with communications and demand response functionality, through consumer incentives?
- Does EPA's proposed "Smart Grid Capable" criteria help ensure consumers that purchase these products are receiving a base level of value?



Communications Requirements



- On-board secure bi-directional communications capability or end-user field upgradeable to add this capability.
 - EPA is seeking to ensure ENERGY STAR products are future-oriented and flexible.
- Manufacturers must supply an interface Specification or Interface Control Document (ICD) to 3rd party developers to enable open access to the product's full range of communication and remote control capabilities.
 - EPA believes open access and interoperability are important for products that are smart grid capable.



Communications Requirements (cont)



- For those products requiring an additional module, device, and/or infrastructure to activate its communications capabilities:
 - Prominent labels and instructions explaining what consumers or utilities must do to activate these capabilities, will need to be:
 1. Displayed at point of purchase on a product tag that ships with the product; and
 2. In the product literature (e.g., user manual)



Communications Requirements, Date & Time (cont)



- Communications must include basic authentication and authorization, and security measures.
- Send/Receive:
 - Product must be capable of recording data at least once every 60 seconds, and transmitting it every 5 minutes, upon request from connected device.
 - Product must be capable of accepting remote control commands from authorized devices or software applications to enable real-time (within 0.5 seconds of receiving command) setting changes to a number of settings.
- Date & Time: When networked, the product shall maintain correct time and date without user input, with min. accuracy of +/- 0.5s per 24hrs.

Delay Load & Spinning Reserve Capabilities



- Delay Load Capability

- *RACs shall include a consumer-overrideable capability to respond to a signal requesting a delay of load for a time duration not exceeding either 4 hours or such other period that the consumer may select. Upon receipt of this signal, the product must automatically reduce its average wattage during this period by at least 25 percent relative to average wattage in the operating cycle under the DOE test conditions.*

- Spinning Reserve Capability

- *RACs shall include a consumer-overrideable capability to respond to a signal requesting the start of a reduced load period for a time duration not exceeding 10 minutes. Upon receipt of this signal, the product must automatically reduce its average wattage during this period by at least 80 percent relative to average wattage in the operating cycle under the DOE test conditions.*



Updated Timeline



May 17, 2011	Draft 2 Specification Distributed
June 2, 2011	Draft 2 Stakeholder Webinar
June 16, 2011	Draft 2 Comment Period Ends
July/September 2011	Further refinement on proposed smart grid criteria, stakeholder webinar, and comment period.
October/November 2011	Final Draft Specification Distributed
December 2011	Final Version 3.0 Specification Published
October 1, 2012	Version 3.0 Specification Effective

- EPA welcomes all partner and stakeholder comments by **June 16, 2011**.
- Comments should be submitted in writing to appliances@energystar.gov



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