



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
 WASHINGTON, D.C. 20460

OFFICE OF
 AIR AND RADIATION

September 30, 2015

Dear ENERGY STAR® Partners and Stakeholders:

The U.S. Environmental Protection Agency (EPA) is pleased to announce final recognition criteria for ENERGY STAR Most Efficient 2016. This letter outlines the final criteria.

These criteria will recognize the most efficient ENERGY STAR products in 2016 across 12 product categories: Air Source Heat Pumps and Central Air Conditioners, Boilers, Ceiling Fans, Clothes Washers, Dishwashers, Computer Monitors, Furnaces, Geothermal Heat Pumps, Refrigerator-Freezers (see revised criteria), Televisions, Ventilation Fans, and Residential Windows. Products that meet the 2016 criteria will deliver significant savings over a conventional product as noted below:

Boilers: 14% energy savings	Furnaces: 20% energy savings	Televisions: 62% energy savings
Central AC and Air Source Heat Pumps: 20-30% energy savings Ductless AC and Heat Pumps: 25%-35%	Geothermal Heat Pumps: 20-40% energy savings	Ventilating Fans: 85% energy savings
Clothes Washers: 33% energy savings and 32% water savings (for front load models)	Monitors: 35% energy savings	Windows: Savings vary by climate, house construction, and number and type of windows replaced.
Ceiling Fans: 60% energy savings	Refrigerators: 15% energy savings	Dishwashers: 22% energy savings and 36% water savings

**Note: In the case of appliances and HVAC equipment, energy use of a product that meets ENERGY STAR Most Efficient 2016 criteria is compared to the federal standard.*

For refrigerators/freezers, EPA is pleased to offer the opportunity for dual recognition as both ENERGY STAR Most Efficient and a recipient of the ENERGY STAR Emerging Technology Award. In 2016, EPA's ENERGY STAR Emerging Technology Award will feature low Global Warming Potential refrigerant systems that deliver added energy savings. EPA is currently working with stakeholders to develop recognition criteria for these systems, new to the U.S. market. Interested stakeholders are encouraged to provide feedback by October 6, 2015, and can find out more at: <http://www.energystar.gov/about/awards/energy-star-emerging-technology-award>.

Overview of Comments on the ENERGY STAR Most Efficient 2016 Proposals

EPA received eight sets of comments on the proposed criteria distributed on August 5, 2015. Many commenters voiced overall support for the program as a tool for moving the market for efficient products forward. They commented on the growing utility support and provision of new tools such as the forthcoming price and location web information and efforts to raise consumer awareness. These commenters also encouraged EPA to continue annual review of the recognition criteria to ensure they represent the best of the best products. They also expressed interest in expanding the recognized product types to include dryers. A subset of these commenters also requested coverage of desktop computers and commercial products. One commenter raised ongoing concern with the ENERGY STAR Most Efficient program, the suitability of the criteria, as well as the benefit to all stakeholders. Product specific feedback follows.

Ceiling Fans

One stakeholder offered support for the ceiling fan recognition criteria but encouraged EPA to watch how the market responds to the forthcoming Department of Energy (DOE) minimum efficiency standard and raise the criteria in 2017 as needed.

Clothes Washers

One commenter disagreed with EPA's approach, noting that using a single bin deviates from the approach that DOE takes for minimum efficiency standards. Four stakeholders supported EPA's modest adjustment to the 2015 criteria to better recognize the best of the best in efficient clothes washers regardless of configuration. One commenter added that this modification has the additional benefit of aligning with CEE's advanced tiers. Two commenters agreed with EPA's exclusion of small washers due to the current lack of differentiation. One noted that the ENERGY STAR Most Efficient list would benefit from inclusion of more modestly sized washers. EPA will continue to monitor the efficiency of smaller washers closely and modify the requirements in the future, as appropriate.

Computer Monitors

Stakeholders provided support for the criteria for monitors. Though one stakeholder acknowledged that efficiency programs may not support incentives for computer monitors in the future, they acknowledged that at this time, there are still significant savings available in monitors. Another stakeholder supported maintaining the criteria at 2015 levels for 2016, since monitors are a comparatively slower moving product category.

Dishwashers

One stakeholder noted general concern regarding the cleaning criteria. Numerous commenters supported the maintenance of the 2015 dishwasher criteria including the cleaning performance criteria.

Televisions

Several stakeholders expressed support for the 2016 recognition criteria. They agreed with EPA's proposal to set a base level without additional allowances for features such as Ultra HD. One stakeholder asked EPA to watch standby energy use associated with internet connected TVs. EPA agrees with the importance of doing so and has set levels for this function in the ENERGY STAR Version 7 specification that will take effect next month. As such, all TVs recognized as ENERGY STAR Most Efficient in 2016 will deliver on their efficiency promise in all modes.

HVAC

A select group of stakeholders expressed support for the revisions to the criteria for HVAC. One noted support for the revised criteria for ductless heat pumps, noting the value of alignment with NEEP's efficiency program. This commenter also supported EPA's decision to hold on application

of requirements specific to cold climates until a future year. Another supported application of the system status and messaging criteria for ductless split air conditioners and heat pumps and maintaining the current boiler criteria but watching the market for opportunities to highlight greater efficiency in the coming year. One commenter recommended a single set of requirements for ducted and ductless air conditioners and air source heat pumps. Though ducted and ductless systems provide generally the same end service, the differences in installation complexity, initial cost, and applications can vary significantly. For these reasons, EPA has decided to retain the two sets of criteria for ENERGY STAR Most Efficient 2016.

Refrigerator/Freezers

In light of comments received and in line with the intention of ENERGY STAR Most Efficient designation, EPA has adjusted the refrigerator/freezer criteria to allow for greater recognition of the significant energy savings associated with top freezer models. On average, an ENERGY STAR top freezer model consumes about 375 kWh/year, while standard models of other configurations consume about 700 kWh/year -- a notable difference in energy use. At the same time, there is little differentiation among ENERGY STAR top freezers (i.e. all perform very close to the required 10% above minimum efficiency standards.) As such, EPA is proposing to recognize all certified top freezers as ENERGY STAR Most Efficient in 2016. To allow for additional feedback, finalization of this aspect of the refrigerator/freezer criteria will be deferred until October 16, 2015.

Residential Windows

One commenter voiced support for maintaining the current criteria and for considering dynamic window products in the coming years. EPA will monitor this product area.

Ventilating Fans

While one stakeholder expressed support for the proposed criteria, another suggested that rather than set a CFM/W requirement for high speed, EPA set the requirement for an intermediate speed. The Agency shares the commenter’s interest in setting the criteria at a speed that is most often used. EPA reviewed certified product data and found little consistency in what has been reported as intermediate speed. This commenter also suggested that recognized ventilating fans report some levels at .25 W.G. EPA will work with stakeholders to gather data and evaluate these suggestions in the context of future versions of ENERGY STAR as well as ENERGY STAR Most Efficient.

Responses to the full range of comments can be found in the attached ENERGY STAR Most Efficient 2016 Comment Response document. You may view this and comments received at www.energystar.gov/mostefficient by following the link to “ENERGY STAR Most Efficient 2016 criteria.”

ENERGY STAR Most Efficient 2016 Categories and Recognition Criteria

Recognition criteria have been finalized as proposed for all categories except refrigerator/freezers.

Final criteria for ENERGY STAR Most Efficient 2016 are summarized below. In addition to meeting these performance requirements, products must be certified as ENERGY STAR by an EPA-recognized certification body. Additional detail for each product category is included in the recognition criteria documents available at www.energystar.gov/mostefficient by following the link to “ENERGY STAR Most Efficient 2016 criteria.”

Category	Recognition Criteria
Boilers*	Gas Powered Boilers: 95% AFUE or higher. Oil Powered Boilers: 90% AFUE or higher
Ceiling Fans*	Efficiency (cfm/W): ≥ 170 at high speed, ≥ 270 at medium speed, ≥ 400 at low speed

Clothes Washers	<table border="1"> <thead> <tr> <th>Clothes Washer Volume</th> <th>Integrated Modified Energy Factor (IMEF)</th> <th>Integrated Water Factor (IWF)</th> </tr> </thead> <tbody> <tr> <td>>2.5 cubic feet</td> <td>≥2.76</td> <td>≤3.2</td> </tr> </tbody> </table>	Clothes Washer Volume	Integrated Modified Energy Factor (IMEF)	Integrated Water Factor (IWF)	>2.5 cubic feet	≥2.76	≤3.2																																												
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Central Air Conditioners and Heat Pumps*	<p>System status and messaging capabilities, and</p> <table border="1"> <thead> <tr> <th>Product type</th> <th>SEER</th> <th>EER</th> <th>HSPF</th> <th>COP</th> </tr> </thead> <tbody> <tr> <td>Split AC</td> <td>18</td> <td>13</td> <td></td> <td></td> </tr> <tr> <td>Split HP</td> <td>18</td> <td>12.5</td> <td>9.6</td> <td></td> </tr> <tr> <td>Packaged AC</td> <td>16</td> <td>12.0</td> <td></td> <td></td> </tr> <tr> <td>Packaged HP</td> <td>16</td> <td>12.0</td> <td>8.2</td> <td></td> </tr> <tr> <td>Closed Loop Water-to-Air/GHP</td> <td></td> <td>17.1</td> <td></td> <td>3.6</td> </tr> <tr> <td>Open Loop Water-to-Air GHP</td> <td></td> <td>21.1</td> <td></td> <td>4.1</td> </tr> <tr> <td>Closed Loop Water-to-Water GHP</td> <td></td> <td>16.1</td> <td></td> <td>3.1</td> </tr> <tr> <td>Open Loop Water-to-Water GHP</td> <td></td> <td>20.1</td> <td></td> <td>3.5</td> </tr> <tr> <td>DGX</td> <td></td> <td>16.0</td> <td></td> <td>3.6</td> </tr> </tbody> </table>	Product type	SEER	EER	HSPF	COP	Split AC	18	13			Split HP	18	12.5	9.6		Packaged AC	16	12.0			Packaged HP	16	12.0	8.2		Closed Loop Water-to-Air/GHP		17.1		3.6	Open Loop Water-to-Air GHP		21.1		4.1	Closed Loop Water-to-Water GHP		16.1		3.1	Open Loop Water-to-Water GHP		20.1		3.5	DGX		16.0		3.6
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Ductless AC and Heat Pumps	<p>Products must meet the following cooling and heating performance levels: 20 SEER, 12.5 EER and (for heat pumps) 10 HSPF; and system status and messaging capabilities</p>																																																		
Computer Monitors	<p>Total Energy Consumption (E_{TEC}) shall be less than or equal to Maximum allowable Total Energy Consumption in kilowatt-hours per year calculated as follows:</p> $E_{TEC_MAX} = 6.13 \times r + 55 \times \tanh(0.003 \times [A - 59] + 0.01) + 5.0$ <p>A = viewable screen area in square inches; \tanh = hyperbolic tangent function; and r = Total Native Resolution in megapixels</p>																																																		
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Furnaces*	<p>AFUE 97% or higher; system status and messaging capabilities</p>																																																		

Refrigerator-Freezers*	Product must be ENERGY STAR certified and use less than or equal to 637 kWh/year. Side-by-side and bottom freezer products must be at least 15% more efficient than federal requirements.
Televisions	$P_{max} = 62 \times \tanh(0.000412 [A-140] + 0.014) + 14$ P_{max} = maximum allowable On Mode Power consumption in W A = viewable screen area of the product in square inches; TANH = hyperbolic tangent function
Ventilating Fans	Bathroom/utility fans only; Efficacy at high speed (cfm/W): ≥ 10
Residential Windows*	U-factor ≤ 0.20 in all Zones SHGC in Northern Zone ≥ 0.20 SHGC in North-Central Zone ≤ 0.40 SHGC in South-Central and Southern Zones ≤ 0.25 North American Fenestration Standard/Specification (NAFS) Performance Grade ≥ 15

*2016 criteria carried over from 2015 for these categories.

ENERGY STAR Most Efficient 2016 Recognition

ENERGY STAR certified products meeting these requirements will be highlighted as ENERGY STAR Most Efficient for 2016 at: www.energystar.gov/moste efficient beginning January 1, 2016. In the coming months, EPA will begin distributing the 2016 ENERGY STAR Most Efficient designation to brand owners of eligible products. As a reminder, usage guidelines are available at http://www.energystar.gov/index.cfm?c=partners.most_efficient_criteria. As new products are certified that meet the criteria, EPA will contact partners and invite them to augment their product listing with the following:

- A product photo in a jpg file of at least 200 pixels for the ENERGY STAR Most Efficient web page; and
- A product description for use on the web page (i.e., key features and functionalities, MSRP). The first 50 words will be displayed beside the product photo on the web page; additional text will link to a separate web page

EPA is assessing how planned enhancements to the ENERGY STAR Most Efficient website may simplify the current approach to populating the product lists.

For all HVAC product categories **except boilers**, partners must apply for recognition for all products new to ENERGY STAR Most Efficient in order for the Agency to verify the system status and messaging requirements. To this end, partners must submit a narrative description of how their communications system and associated products and controllers meet the requirements. EPA has provided a guide to speed the recognition process by ensuring that narratives address all the information EPA needs. EPA recognizes that these narratives apply to series of related products and only expects one submission for the entire series. For ductless split air conditioners and heat pumps, narratives must be submitted for HVAC products recognized in 2015. For all other HVAC products, products recognized in 2015 do not need to submit additional information in order to be recognized in 2016. EPA will work with manufacturers of currently recognized systems to ensure there is no break in recognition of systems that meet the new requirements. For window products, partners will need to apply for recognition for all products new to ENERGY STAR Most Efficient in

order for the Agency to verify that a product meets the recognition criteria outlined above. Since the recognition criteria have not changed, window products recognized in 2015 need not be resubmitted. Detailed instructions can be found on this website: (http://www.energystar.gov/index.cfm?c=partners.most_efficient_instructions).

For HVAC and window products, once EPA has confirmed product eligibility for recognition, the ENERGY STAR Most Efficient 2016 designation will be provided along with usage guidelines.

The ENERGY STAR Most Efficient 2016 designation is intended for use at point-of-sale on point-of-purchase materials, product literature, and websites. It may not be factory-applied to products or product packaging. Failure to abide by these guidelines may result in loss of recognition. EPA will highlight recognized products on the ENERGY STAR Most Efficient 2016 web page through December 31, 2016.



We look forward to working with you to market ENERGY STAR Most Efficient products in 2016. Please e-mail Mostefficient@Energystar.gov with any questions.

Thank you for your support of the ENERGY STAR program.

Sincerely,

A handwritten signature in black ink, appearing to read "Ann Bailey".

Ann Bailey, Director
ENERGY STAR Product Labeling