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

OFFICE OF
AIR AND RADIATION

August 5, 2016

Dear ENERGY STAR® Partners and other Stakeholders:

The U.S. Environmental Protection Agency (EPA) is pleased to share both an update on ENERGY STAR Most Efficient 2016 and proposed recognition criteria across 12 product categories for 2017. Stakeholders are invited to provide written comments on these criteria no later than **September 6, 2016** to MostEfficient@energystar.gov

ENERGY STAR Most Efficient 2016

As of July 2016, 2041 models from 131 ENERGY STAR partners meet the ENERGY STAR Most Efficient 2016 recognition criteria. The number of models and partners per category is noted in the following table:

Product Category	Models	ENERGY STAR Partners
Boilers	327	28
Ceiling Fans	113	16
Central Air Conditioners and Air Source Heat Pumps	53	4
Clothes Washers	81	6
Computer Monitors	99	4
Dishwashers	13	4
Furnaces	35	4
Geothermal Heat Pumps	383	7
Refrigerators-Freezers	288	28
Televisions	55	12
Ventilating Fans	141	10
Windows	453	48
Total	**2041**	**131**

ENERGY STAR Most Efficient is being leveraged by 34 energy efficiency program sponsors. These partners serve over 23 million residential customers, or nearly 58 million consumers. Their programs feature one or more of the product categories covered by ENERGY STAR Most Efficient 2016 and reflect a diverse geographic spread.

To raise awareness of ENERGY STAR Most Efficient among receptive audiences, EPA will once again implement high-profile, geo-targeted promotions highlighting the benefits of these products and recognizing regional partners in 2017. To support ENERGY STAR Most Efficient 2016, EPA worked with NPR to place radio ads in Washington DC, Long Island, and Vermont, collectively reaching nearly 700,000 customers. The ads featured the ENERGY STAR Most Efficient web site where regional programs were spotlighted. In addition to highlighting products that are ENERGY STAR Most Efficient, the website includes detailed information on availability and price to make it easier for consumers to locate and buy these models. This information is currently available for Most Efficient clothes washers

and refrigerators and will be available for dishwashers, TVs, monitors, ceiling fans and ventilating fans by the end of 2016.

2017 Product Categories and Recognition Criteria

For 2017, EPA intends to maintain 11 of the product categories currently eligible for ENERGY STAR Most Efficient recognition and add one new category. In light of EPA's effort to fully understand the way energy saving features are implemented in televisions and the savings they provide, ENERGY STAR Most Efficient recognition for this category will be suspended for 2017.

The proposed recognition criteria for 2017 were developed in consultation with the Department of Energy (DOE) based on an analysis of currently certified ENERGY STAR models. This analysis indicates that for many categories existing recognition criteria remain reflective of the "best of the best." As a result, EPA is extending the 2016 efficiency criteria into 2017 for a number of categories including boilers, dishwashers, clothes washers, furnaces, geothermal heat pumps (GHP), refrigerators-freezers, and residential windows. EPA has revised the recognition criteria for ceiling fans, ducted and ductless central air conditioners and air source heat pumps, monitors, and ventilating fans, and added recognition criteria for dryers. A summary of the changes along with the rationale is outlined below.

Ceiling Fans: EPA is proposing updated criteria for 2017, to recognize a more exclusive list of ceiling fans. The new criteria recognize fans with both a brushless DC motor and aerodynamic blade design. The updated criteria will recognize models from at least 3 manufacturers. EPA will update its infrastructure to allow for use of the new DOE test method and metric for ceiling fans for ENERGY STAR Most Efficient recognition. Fans meeting this new requirement will use only 33% of the energy required by a conventional fan.

EPA considered predicted performance under the new metric using data on the ENERGY STAR ceiling fans list combined with assumptions about standby power for units with and without occupancy sensors. However, given the significant differences in the test methods, EPA and DOE collaborated on development of this proposed level, leveraging learnings from ceiling fan testing under the new DOE metric.

EPA proposes to recognize fans using the current metrics (CFM/W at high speed) or the new DOE fan metric, whichever is applicable, in recognition that the ENERGY STAR ceiling fan specification currently uses the former, but will be using the latter. We are beginning a revision of the ENERGY STAR ceiling fan requirements that will be exclusively in terms of the new metric, with the expectation that the new ENERGY STAR specification will become effective some time in 2017. Should hugger fans become eligible for ENERGY STAR in 2017, they will also be eligible for ENERGY STAR Most Efficient recognition. We expect the ESME 2018 requirements to be exclusively in terms of the new metric.

Computer Monitors: EPA is maintaining the stringency of the current 2016 criteria with a modification to adjust the allowance for high-resolution monitors. The 2016 criteria continue to recognize a very modest segment of the market, with the exception of high resolution monitors where a disproportionate percentage is recognized. As such, EPA is proposing to cap the resolution allowance at 5MP in order to only recognize the most efficient products in today's marketplace. With this proposed adjustment, the ENERGY STAR Most Efficient 2017 criteria would recognize approximately 4% of the current market.

Clothes Washers: EPA has maintained the 2016 criteria for standard sized clothes washers for 2017. EPA and DOE are launching development of a cleaning and rinse performance test for clothes washers and welcome stakeholders to participate in the process. For ENERGY STAR Most Efficient 2018, EPA anticipates setting a floor using the finalized cleaning and rinse performance test method.

Dishwashers: EPA has maintained the criteria for standard sized dishwashers for 2017 including the minimum cleaning performance floor. EPA and DOE invite stakeholders to share comments on their experience using the ENERGY STAR Test Method for Residential Dishwasher Cleaning Performance, and seek to work closely with stakeholders to consider potential improvements to the test method.

Dryers: EPA is pleased to offer an added category for ENERGY STAR Most Efficient clothes dryers in 2017. With the addition of the ENERGY STAR dryer category in January 2015, there is now ample room for a new recognition opportunity for the top performers. The 2017 criteria include efficiency levels for both the normal and most energy consuming setting, to guard against consumers experiencing lower than expected performance.

Heating and Cooling Products: EPA has largely retained the current recognition criteria for furnaces, central air conditioners and air source heat pumps (CAC/ASHP), geothermal heat pumps (GHP), and boilers. Recognized furnaces and CAC/ASHPs represent an elite group of products with exceptional performance. While the number of recognized GHP models continues to grow, overall GHP sales remain very low, while the consumer value in terms of savings and functionality remains significant at the current levels. For boilers, the 2016 criteria remain the best means of differentiating top energy savers; however, EPA continues to seek opportunities beyond AFUE to further distinguish gas boiler energy performance. For instance, the Agency is watching the development of a uniform test method for idle loss for boilers that also deliver hot water. EPA proposes one revision to the CAC/ASHP and ductless requirements: products must be able to provide cooling at two or more capacity levels. EPA's intention is to encourage broader adoption of units with adjustable capacity in recognition that they will at a minimum deliver better performance, and may in some cases, save substantial energy beyond that predicted by their rated performance. In the long term, EPA envisions variable capacity becoming the standard for efficiency, not just an exceptional feature. We are following with interest various efforts to update requirements and test methods to better reflect the comfort and savings this capability delivers for consumers. The change will have a small effect on the list of recognized products.

Refrigerators-Freezers: EPA has made no substantive changes to the refrigerator-freezer recognition criteria in 2017. Brand owners making use of innovative, climate friendly refrigerants are encouraged to apply for added recognition through the Emerging Technology Award.

Ventilating Fans: EPA proposes expanding the scope of ENERGY STAR Most Efficient ventilating fans to include in-line fans with ≥5 cfm/W at all speeds, representing about 6% of models, sold under 5 brands. Fans meeting this level use more efficient motors than conventional in-line fans. For bathroom and utility room fans, the 2016 requirements continue to recognize fans with superior performance, and we propose not to change them. Participation has increased, and 143 models are recognized, estimated to be about 10% of vent fan models on the market. Consumers will realize 85% savings over a conventional bath fan model, and 44% savings over a conventional in-line fan. EPA again assessed the viability of adding range hood fans to the ENERGY STAR Most Efficient portfolio and concluded that there is no clear break in performance that allows for highlighting some products as top performers beyond ENERGY STAR.

Windows: No changes are planned for the 2017 residential window recognition criteria. Although recognized windows are available from over 40 product brand owners, they still represent a relatively small percentage of the market. In addition, EPA has maintained its focus on residential windows exclusively rather than expanding to include doors or skylights. The Agency does not have data demonstrating that high performance door or skylight products are widely available or that such products typically save consumers a meaningful additional amount of energy.

The proposed ENERGY STAR Most Efficient 2017 criteria for the full suite of products are summarized below. In addition to meeting these recognition criteria, 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 accompanying this letter.

<table>
<tr><th>Category</th><th>ENERGY STAR Most Efficient 2017 Recognition Criteria</th></tr>
<tr><td>Boilers*</td><td>Gas Powered Boilers: 95% AFUE or higher. Oil Powered Boilers: 90% AFUE or higher</td></tr>
<tr><td>Ceiling Fans</td><td>Standard ceiling fans must meet at least one of the following efficiency criteria:
<table>
<tr><th>Efficiency as per 10 CFR 430 Subpart B, Appendix U (cfm/W)</th><th>High Speed Efficiency as per ENERGY STAR Specification for Residential Ceiling Fans, V3.0 (cfm/W)</th></tr>
<tr><td>≥ 3.88D - 42.17*</td><td>300</td></tr>
</table>
*D is the ceiling fan diameter in inches

Note: Should hugger fans become eligible for ENERGY STAR in 2017, they will also be eligible for ENERGY STAR Most Efficient recognition at the above levels.</td></tr>
<tr><td>Clothes Washers*</td><td><table>
<tr><th>Clothes Washer Volume</th><th>Integrated Modified Energy Factor (IMEF)</th><th>Integrated Water Factor (IWF)</th></tr>
<tr><td>>2.5 cubic feet</td><td>≥2.76</td><td>≤3.2</td></tr>
</table></td></tr>
<tr><td>Central Air Conditioners and Air Source Heat Pumps</td><td>System status and messaging capabilities, variable capacity
<table>
<tr><th>Product type</th><th>SEER</th><th>EER</th><th>HSPF</th></tr>
<tr><td>Split AC</td><td>18</td><td>13</td><td></td></tr>
<tr><td>Packaged AC</td><td>16</td><td>12.0</td><td></td></tr>
<tr><td>Split HP</td><td>18</td><td>12.5</td><td>9.6</td></tr>
<tr><td>Packaged HP</td><td>16</td><td>12.0</td><td>8.2</td></tr>
</table></td></tr>
<tr><td>Ductless AC and Heat Pumps</td><td>Products must meet the following cooling and heating performance levels: 20 SEER, 12.5 EER, 10 HSPF (Heat pumps only); system status and messaging capabilities, variable capacity.</td></tr>
<tr><td>Geothermal Heat Pumps</td><td>System status and messaging capabilities.
<table>
<tr><th>Product type</th><th>EER</th><th>COP</th></tr>
<tr><td>Closed Loop Water-to-Air/GHP</td><td>17.1</td><td>3.6</td></tr>
<tr><td>Open Loop Water-to-Air GHP</td><td>21.1</td><td>4.1</td></tr>
<tr><td>Closed Loop Water-to-Water GHP</td><td>16.1</td><td>3.1</td></tr>
<tr><td>Open Loop Water-to-Water GHP</td><td>20.1</td><td>3.5</td></tr>
<tr><td>DGX</td><td>16.0</td><td>3.6</td></tr>
</table></td></tr>
<tr><td>Computer Monitors</td><td>Total Energy Consumption (E_{TEC}) in kilowatt-hours per year shall be calculated as follows:
$$E_{TEC} = 8.76 \times (0.35 \times P_{ON} + 0.65 \times P_{SLEEP})$$
Where:
P_{ON} = measured On Mode power in watts; P_{SLEEP} = measured Sleep Mode power in watts;

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:
$$E_{TEC\_MAX} = 6.13 \times r + 55 \times tanh(0.003 \times [A - 59] + 0.01) + 5.0$$
Where:
A = viewable screen area in square inches; tanh = hyperbolic tangent function; and</td></tr>
</table>

<table>
<tr><td></td><td>r = Total Native Resolution in megapixels up to 5.0 megapixels total. Products with >5.0 megapixels Total Native Resolution can receive a maximum r of 30.65 kilowatt-hours.</td></tr>
<tr><td>Dishwashers*</td><td>
<table>
<tr><th>Product Type</th><th>Annual Energy Use (kWh/yr)</th><th>Water Consumption (gallons/cycle)</th></tr>
<tr><td>Standard Dishwasher</td><td>≤240</td><td>≤3.2</td></tr>
</table>
<table>
<tr><th>Test Cycle</th><th>Cleaning Index</th></tr>
<tr><td>Heavy</td><td>70</td></tr>
<tr><td>Medium</td><td>70</td></tr>
<tr><td>Light</td><td>70</td></tr>
</table>
</td></tr>
<tr><td>Dryers</td><td>Products must meet the applicable energy performance requirements shown in the table below, as determined by 10 CFR Part 430 Subpart B Appendix D2, unless noted otherwise.
<table>
<tr><th>Cycle Setting</th><th>Product Type</th><th>CEF_{BASE} (lbs/kWh)</th></tr>
<tr><td rowspan="2">Normal</td><td>Electric</td><td>≥ 4.30</td></tr>
<tr><td>Gas</td><td>≥ 3.80</td></tr>
<tr><td rowspan="2">Most Energy Consuming Setting[1]</td><td>Electric</td><td>≥ 3.93</td></tr>
<tr><td>Gas</td><td>≥ 3.48</td></tr>
</table>
</td></tr>
<tr><td>Furnaces*</td><td>AFUE 97% or higher; system status and messaging capabilities.</td></tr>
<tr><td>Refrigerator-Freezers*</td><td>Product must be ENERGY STAR certified and have an Annual Energy Consumption (AEC) of 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.</td></tr>
<tr><td>Ventilating Fans</td><td>Bathroom/utility fans: Efficacy at high speed (cfm/W): ≥10
In line fans: Efficacy at high speed (cfm/W): ≥5</td></tr>
<tr><td>Residential Windows*</td><td>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</td></tr>
</table>

**Proposed criteria carried over from 2016 for these categories.*

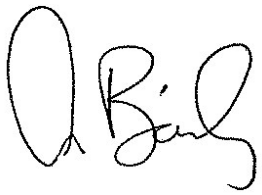
[1] For purposes of this requirement, the manufacturer shall test the dryer according to the provisions in the DOE test procedure in 10 CFR 430, Subpart B, Appendix D2, but using from among all the cycle program, temperature, and dryness settings (including any such settings that can be downloaded after the initial purchase of the product) those that result in the greatest energy consumption. At the time of certification, the manufacturer shall report the most energy consuming cycle program, temperature and dryness settings used.

EPA will provide additional information regarding the roll out of ENERGY STAR Most Efficient 2017 recognition with the finalization of these criteria. Products recognized in 2016 that meet the ENERGY STAR Most Efficient 2017 criteria will automatically receive recognition.

EPA will hold a stakeholder webinar on **Monday, September 12 from 1PM to 3PM Eastern Time** to discuss the proposed 2017 recognition criteria. To participate in this webinar, please register here by September 9, 2016. Please share written comments no later than **September 6, 2016** with MostEfficient@energystar.gov. EPA plans to finalize these recognition requirements in September.

Thank you for your support of the ENERGY STAR program.

Sincerely,



Ann Bailey, Director
ENERGY STAR Product Labeling