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

OFFICE OF
AIR AND RADIATION

September 26, 2019

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 2020. This letter outlines the final criteria.

These criteria will recognize the most efficient ENERGY STAR products in 2020 across 14 product categories: Air Source Heat Pumps and Central Air Conditioners, Boilers, Ceiling Fans, Clothes Washers, Dishwashers, Dryers, Computer Monitors, Freezers, Furnaces, Geothermal Heat Pumps, Refrigerator-Freezers, Room Air Conditioners, Televisions, Ventilation Fans, and Residential Windows and Sliding Glass Doors. The proposed criteria for Dehumidifiers will be shared with stakeholders this fall. Products that meet the 2020 criteria will deliver significant savings over a conventional product as noted below:

Boilers: 53 kWh/yr in annual energy savings, 14% over the Federal Minimum	**Dishwashers:** 67 kWh/yr in annual energy savings, 22% over the Federal Minimum and 387 gal/yr in annual water savings, 36% over the Federal Minimum	**Monitors**: 15.0 kWh/yr in annual energy savings, 27% over a standard model
Central AC and Air Source Heat Pumps: 266-694 kW/yr in annual energy savings, 20-30% over the Federal Minimum	**Dryers:** 170-213 kWh/yr in annual energy savings, 28%-43% over the Federal Minimum	**Standard Refrigerators:** 40-134 kWh/yr in annual energy savings, 10-20% over the Federal Minimum **Standard Freezers:** 36-73 kWh/yr in annual energy savings, 10-20% over the Federal Minimum **Compact Refrigerators and Freezers:** 34-80 kWh/yr in annual energy savings, 20-25% over the Federal Minimum
Clothes Washers: ≤ 2.5 cu-ft: 107 kWh/yr in annual energy savings, 24% over the Federal Minimum and 1,534 gal/year in annual water savings, 37% over the Federal Minimum	**Non-Ducted Split Air Conditioners and Heat Pumps**: 799-1012 kWh/yr in annual energy savings, 25%-35% over the Federal Minimum	**Room Air Conditioners**: 138-496 kWh/yr in annual energy savings, 20-26% over the Federal Minimum (25-35% over DOE CEER Standard)

> 2.5 cu-ft: 466 kWh/yr in annual energy savings, 43% over the Federal Minimum and 3,509 gal/yr in annual water savings, 46% over the Federal Minimum		
Ceiling Fans: 83 kWh/yr in annual energy savings, 66% over the Federal Minimum	**Furnaces**: 114 kWh/yr in annual energy savings, 18% over Federal Minimum	**Televisions**: 20.0 kWh/yr in annual energy savings, 22% over a standard model
Dehumidifiers: TBD	**Geothermal Heat Pumps**: 1027-1614 kWh/yr in annual energy savings, 28-44% over the Federal Minimum	**Ventilating Fans**: Bathroom/utility: 17 kWh/yr in annual energy savings, 85% over the Federal Minimum In-line: 7 kWh/yr in annual energy savings, 44% over the Federal Minimum
		Windows and Sliding Glass Doors: Savings vary by climate, house construction, and number and type of windows replaced.

**Note: In the case of appliances and HVAC equipment, energy use of a product that meets ENERGY STAR Most Efficient 2020 criteria is compared to the federal standard.*

Overview of Comments on and Revisions to the ENERGY STAR Most Efficient 2020 Proposals

EPA hosted a webinar on August 7th to present the 2020 proposed recognition criteria. Stakeholders shared feedback with EPA during the webinar and through written comments. The majority of commenters stated support for the program as a tool for advancing efficiency in consumer products and for the proposed 2020 criteria. EPA received a modest set of comments requesting amendments to the proposals. EPA notes areas of change in the proposals and responds to more significant comments below. Additional comments are addressed in the comment response document.

Televisions: Three stakeholders supported the proposed criteria for TVs for ENERGY STAR Most Efficient 2020. Another stakeholder noted that recent testing has shown that standby power can increase significantly for certain models when connected to a smart speaker. They recommended that EPA incorporate standby criteria for TVs capable of supporting voice control into the ENERGY STAR Most Efficient criteria. Absent a testing protocol and data, EPA will consider this issue in the context of the next ENERGY STAR TV revision.

Clothes Washers: One stakeholder recommended that EPA separate its clothes washer efficiency criteria by product class, recommending more stringent criteria for 2020 for front load washers of ≥ 3.0 integrated modified energy factor (IMEF) and ≤ 3.2 integrated water factor (IWF). A second stakeholder supported a single bin for ENERGY STAR Most Efficient clothes washers and encourages EPA to take this approach with ENERGY STAR as well. Recognizing the superior energy and water performance of the front load design and the intention of ENERGY STAR Most Efficient to recognize products that deliver top efficiency for customers who prioritize it, EPA has maintained one product bin for clothes washers. EPA plans to redouble its efforts, in close collaboration with partners, to educate consumers about the benefits of front load washers with the intention of increasing their prevalence in the US market.

One stakeholder supported EPA's continued inclusion of minimum cleaning performance requirements for ENERGY STAR Most Efficient, while another stakeholder opposed the minimum cleaning performance requirement due to concerns with the ENERGY STAR Test Method for Determining Residential Clothes Washer Cleaning Performance. As a voluntary program, ENERGY STAR is successful only as long as consumers have a positive association with the label. On occasion, requirements are added to prevent trade-offs between efficiency and performance. The need to ensure performance takes on added significance in the context of ENERGY STAR Most Efficient where the levels are more stringent. As such, EPA has maintained the cleaning floor.

Dishwashers: One stakeholder recommended that EPA require manufacturers to report if their dishwasher includes a soil sensor. EPA will leverage its website to educate consumers about the benefit of soil sensors and equivalent features and invites partners to highlight such features in the product description they share with EPA along with their product image for posting to the ENERGY STAR Most Efficient product list.

Dryers: EPA proposed a single level for each electric and gas dryers, consolidating the Compact Ventless Electric (240 V) product type into existing categories for electric and gas, as all compact ventless (240V) models have met the more stringent electric (all other) level to date. EPA received stakeholder feedback asking EPA to retain separate levels for this product class to allow for possible future models that may not be able to meet a combined product class level to be recognized as ENERGY STAR Most Efficient. An additional stakeholder commented that dryer levels should be set such that hybrid heat pumps could be recognized. As such, EPA will carry the 2019 compact ventless (240V) level into 2020.

Reporting on the Most Efficient Product Lists: Three stakeholders recommended that for products that use refrigerants, manufacturers should be required to report the name and global warming potential of the refrigerant used for highlighting on the ENERGY STAR Most Efficient list. EPA will add voluntary reporting of this information for highlighting on the Most Efficient product list. Partners who wish to post this information will submit it through their certification body at the time of certification or may have it added to currently certified products through their certification body. For central air conditioners and air source heat pumps, partners will provide this information through the Most Efficient HVAC application. EPA will enable this reporting before the 2020 recognition year begins.

One stakeholder asked EPA to consider making connected criteria required for ENERGY STAR Most Efficient recognition for some or all products with optional connected criteria associated with their ENERGY STAR specifications. The Most Efficient product lists associated with products that have voluntary connected criteria do allow for sorting by ‘Connected’. Recognizing that many highly efficient products do not include this feature, EPA believes providing optional reporting is more consistent with the objective of ENERGY STAR Most Efficient.

Responses to the full range of comments can be found in the ENERGY STAR Most Efficient 2020 Comment Response document. You can find all comments received at www.energystar.gov/mostefficient.

ENERGY STAR Most Efficient 2020 Categories and Recognition Criteria

Final criteria for ENERGY STAR Most Efficient 2020 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.

<table>
<tr><th>Category</th><th>ENERGY STAR Most Efficient 2020 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>Efficiency as per 10 CFR 430 Subpart B, Appendix U (cfm/W)
<table>
<tr><th>Ceiling Fan Type</th><th>Blade span (D)* (inches)</th><th>Ceiling Fan Efficiency (CFM/W)**</th></tr>
<tr><td rowspan="2">Standard and Hugger Ceiling Fans</td><td>19” ≤ D ≤ 36”</td><td>≥ 1.03D + 60.43</td></tr>
<tr><td>> 36”</td><td>≥ 3.88D - 42.17</td></tr>
<tr><td>Low-Mount HSSD Ceiling Fans</td><td>All Blade Spans</td><td>≥ 4.16D + 0.02</td></tr>
</table>
*D is the ceiling fan blade span in inches
**This is a weighted average efficiency in different modes, according to 10 CFR 430 Subpart B, Appendix U </td></tr>
<tr><td>Clothes Washers</td><td>Top-loading and front-loading products must meet the energy and water performance requirements shown in the table below, as determined by the DOE test procedure in 10 CFR 430, Subpart B, Appendix J2.
<table>
<tr><th>Clothes Washer Capacity</th><th>Integrated Modified Energy Factor (IMEF)</th><th>Integrated Water Factor (IWF)</th></tr>
<tr><td>≤ 2.5 cu-ft</td><td>≥ 2.20</td><td>≤ 3.7</td></tr>
<tr><td>> 2.5 cu-ft</td><td>≥ 2.92</td><td>≤ 3.2</td></tr>
</table>
<table>
<tr><td>Total Cleaning Score (CS_t)</td><td>≥ 85.0</td></tr>
</table></td></tr>
<tr><td>Ducted Central Air Conditioners and Air Source Heat Pumps</td><td>System status and messaging capabilities, two or more capacity levels.
<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>13.0</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>Non-Ducted Split Air Conditioners 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, two or more capacity levels.</td></tr>
<tr><td>Dehumidifiers</td><td>Criteria for Dehumidifiers will be proposed this fall.</td></tr>
</table>

<table>
<tr><td>Geothermal Heat Pumps</td><td>System status and messaging capabilities; two or more capacity levels except water-to-water models.

<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:

$$E_{TEC\_MAX} = (1.9 + (0.12 \times A) + [3.1 \times (r + C)]) \times eff_{AC\_DC}$$
Where:

eff_{AC_DC} = 1.00 for AC-powered monitors
0.85 for DC-powered monitors

A = viewable screen area in square inches;
r = Total Native Resolution in megapixels; and

$C =$ 1.2 if $A < 180$ in^2
2.0 if 180 in^2 ≤ $A < 220$ in^2
1.2 if $A \geq 220$ in^2</td></tr>
<tr><td>Dishwashers</td><td>Products must meet the applicable energy and water performance requirements shown in the table below, as determined by the DOE test procedure 10 CFR 430, Subpart B, Appendix C1.

<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</td></tr>
</table>

<table>
<tr><td></td><td>D2, unless noted otherwise.

<table>
<tr><th>Cycle Setting</th><th>Product Type</th><th>CEF_{BASE} (lbs/kWh)</th></tr>
<tr><td rowspan="3">Normal</td><td>Compact Ventless Electric (240 V)</td><td>≥ 3.70</td></tr>
<tr><td>Electric (All Other)</td><td>≥ 4.30</td></tr>
<tr><td>Gas</td><td>≥ 3.80</td></tr>
<tr><td rowspan="3">Normal, Maximum Dryness[1]</td><td>Compact Ventless Electric (240 V)</td><td>≥ 2.68</td></tr>
<tr><td>Electric (All Other)</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 have an Annual Energy Consumption (AEC) of less than or equal to 637 kWh per year.

As determined by the DOE test procedure in 10 CFR 430 Subpart B, Appendix A, side-by-side and bottom freezer product types must be ENERGY STAR certified and at least 20% more efficient than federal requirements. Top freezers must be ENERGY STAR certified. Compact refrigerator or refrigerator-freezer product types must be at least 25% more efficient than federal requirements. As determined by the DOE test procedure in 10 CFR 430 Subpart B, Appendix B, standard-size freezer product types must be at least 15% more efficient than federal requirements. Compact freezer product types must be at least 20% more efficient than federal requirements.</td></tr>
<tr><td>Room Air Conditioners</td><td>Product must have a Combined Energy Efficiency Ratio (CEER) that outperforms the U.S. Department of Energy (DOE) Federal Minimum Standard by the percentages in the table below.

<table>
<tr><th>Cooling Capacity (BTU/hour)</th><th>Percent Better than the Federal Standard (%)</th></tr>
<tr><td>< 14,000</td><td>25%</td></tr>
<tr><td>≥ 14,000</td><td>35%</td></tr>
</table>
Products must also be at or below a maximum sound level of 45 dB(A) for the lowest operational setting.</td></tr>
</table>

[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 where the drying temperature setting can be chosen independently of the program, it shall be set to the maximum. At the time of certification, for each basic model the manufacturer shall report per this criteria section the energy performance (CEF), the cycle program name, the temperature setting, the dryness setting, as well as any settings enabled by default, and the time taken to complete the energy test cycle (as defined in the ENERGY STAR Version 1.1 specification, Section 5C).

Televisions	Product must be certified to the ENERGY STAR Televisions Version 8.0 Program Requirements. The On Mode Power shall be less than or equal to the sum of the maximum allowable On Mode Power consumption and the high resolution On Mode Power Allowance: $P_{ON} \leq P_{ON\_MAX} + P_{HR}$ $P_{ON\_MAX} = 66 * \tanh[0.000412 \times (A - 140) + 0.014] + 14$ $P_{HR} = 0.45 \times P_{ON\_MAX}$ *Where:* P_{ON} is the On Mode Power in watts; P_{ON_MAX} is the maximum allowable On Mode Power consumption in watts; P_{HR} is the high resolution On Mode Power Allowance in watts; *A* is the viewable screen area of the product in square inches; and *tanh* is the hyperbolic tangent function.
Ventilating Fans	Bathroom/utility fans: Efficacy at high speed (cfm/W): ≥ 10 In line fans: Efficacy at high speed (cfm/W): ≥ 5 In-line Ventilating Fan tested with a filter in place (6 ≤ MERV < 13): ≥ 4.7 In-line Ventilating Fan tested with a filter in place (MERV ≥ 13): ≥ 3.8 Bathroom and Utility Room Fans must provide a sound level ≤ 4.0 sones at 0.25 inches of water gauge external static pressure at high speed.
Residential Windows and Sliding Glass Doors	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

ENERGY STAR Most Efficient 2020 Recognition

ENERGY STAR certified products meeting these requirements will be highlighted as ENERGY STAR Most Efficient for 2020 at: www.energystar.gov/mostefficient beginning January 1, 2020. Shortly, EPA will begin distributing the 2020 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 image**. Product images can be in any common format (jpg, png, gif), should include only one product - do not include other people and objects - be a minimum of 250 pixels wide, and for best results, be on a single-color background, preferably white;
- **A product description** for use on the web page (i.e., key features and functionalities). The first 50 words will be displayed beside the product photo on the web page; additional text will link to a separate web page; and
- **The name of retail stores or online distributors** where the product is available for consumer purchase. This information helps provide price and store location information to consumers on the web page.

To ensure the greatest utility of the ENERGY STAR Most Efficient webpage to consumers, EPA will only highlight products that are currently available for sale in the U.S. As such, EPA

reminds partners that it is critical that they keep product availability information with their Certification Bodies current.

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 and staged capacity requirements. To this end, partners must submit an application describing how their communications system and associated products and controllers meet the requirements. EPA will be providing an updated HVAC Application in order to expedite this process and recognizes that these applications apply to series of related products and only expects one submission for the entire series. 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. The ENERGY STAR Most Efficient recognition criteria for windows has been expanded to include sliding glass doors using the same recognition criteria as those applied to all other windows. Since the recognition criteria have not changed, window products recognized in 2019 need not be resubmitted and EPA will distribute the ENERGY STAR Most Efficient 2020 graphic. Detailed instructions can be found on this website.

The ENERGY STAR Most Efficient 2020 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 2020 web page through December 31, 2020.

Most Efficient 2020
www.energystar.gov

We look forward to working with you to market ENERGY STAR Most Efficient products in 2020. Please e-mail mostefficient@energystar.gov with any questions.

Thank you for your support of the ENERGY STAR program.

Sincerely,

Ann Bailey, Director
ENERGY STAR Product Labeling