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

OFFICE OF AIR AND RADIATION

July 12, 2022

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 2022 and proposed recognition criteria for 2023. Stakeholders are invited to provide written comments on these proposed criteria no later than August 15, 2022, to MostEfficient@energystar.gov.

ENERGY STAR Most Efficient 2022

As of June 2022, 3308 models from 258 ENERGY STAR partners meet the ENERGY STAR Most Efficient 2022 recognition criteria. The number of models and partners per category is noted in the following table:

Product Category	Models	ENERGY STAR Partners
Ceiling Fans	186	13
Central Air Conditioners and Air Source Heat Pumps	300	10
Clothes Dryers	28	7
Clothes Washers	60	6
Computer Monitors	105	18
Dehumidifiers	244	44
Dishwashers	125	11
Freezers	14	7
Geothermal Heat Pumps	819	9
Refrigerators	659	56
Room Air Conditioners	29	6
Ventilating Fans	207	25
Windows and Sliding Glass Doors	532	46
Total	**3308**	**258**

ENERGY STAR Most Efficient enjoys robust utility support and is leveraged by 37 energy efficiency program sponsors, serving over 8.4 million households (or roughly 23.2 million consumers). These rebate programs feature one or more product categories covered by ENERGY STAR Most Efficient 2022 and reflect a diverse geographic spread, including one water utility in California.

ENERGY STAR Most Efficient is also leveraged for retailer incentives as part of the ENERGY STAR Retail Products Platform (ESRPP), an innovative, nationally coordinated, market transformation initiative. ESRPP retailers now represent 822 appliance storefronts in current program sponsors' service areas. In 2022, there are 13 efficiency program sponsors participating in ESRPP currently serving nearly 15% of U.S. households.

EPA provides consumers with information about recognized products through a special view of the ENERGY STAR Product Finders. Consumers can now directly access ENERGY STAR Most Efficient models through a filter on the popular ENERGY STAR Products Finders and are also highlighted in the search results as having earned the ENERGY STAR Most Efficient recognition. In addition to highlighting ENERGY STAR Most Efficient models on the ENERGY STAR website, EPA is also sharing information on ENERGY STAR Most Efficient models with Amazon to be featured in their Climate Pledge Friendly program. The UPC codes recently added for all ENERGY STAR products currently enable the Amazon listings.

2023 Product Categories and Recognition Criteria

In light of an unexpected budget cut, EPA is pursuing a limited update of the ENERGY STAR Most Efficient criteria for 2023. EPA completed a review of the data associated with currently recognized models and found in all cases that the current criteria would adequately recognize the best of ENERGY STAR for another year. As such, EPA is extending the 2022 efficiency criteria into 2023 for ceiling fans, clothes washers, computer monitors, dehumidifiers, dishwashers, dryers, refrigeration products, room air conditioners, vent fans, and windows. EPA is proposing changes to the CAC/ASHP and geothermal heat pump criteria to ease the recognition processes. In response to sustained stakeholder interest and in service to consumers seeking ENERGY STAR Most Efficient products, EPA proposes to add recognition for room air cleaners in 2023. Televisions will not be recognized in 2023.

Ceiling Fans: EPA proposes to maintain the current criteria for ceiling fans into 2023. Savings offered by the current criteria are significant, 67% for a 52-inch fan, the most common size on the market.

Clothes Washers: No changes are proposed to the current criteria for clothes washer types. The ENERGY STAR Most Efficient list includes 20 base models from 6 brands, providing consumers with a good selection of models with superior energy and water efficiency.

Computer Monitors: EPA proposes to maintain the current criteria into 2023 as the number of models in the market is steady since the last update. Recognized models demonstrate significant energy savings and there has been no technology update due to the chip shortage.

Dehumidifiers: EPA proposes to maintain the current criteria for dehumidifiers into 2023. 227 portable models meet these rigorous criteria, offering consumers significant savings of 22% over conventional models. Nine whole-home dehumidifiers meet the criteria with a savings of 25% over conventional models.

Dishwashers: In light of the ongoing revision of the ENERGY STAR Dishwasher specification, EPA will maintain the current recognition criteria into 2023. Currently, the ENERGY STAR Most Efficient list includes 34 base models from 12 brands.

Dryers: No changes are proposed to the criteria for dryers. The ENERGY STAR Most Efficient list includes 30 base models from 8 brands, representing both heat pump and hybrid heat pump technologies. EPA encourages partners to complete optional fields for technology type when certifying products to make it easier for utilities to incentivize these technologies in the market.

Central Air Conditioners and Heat Pumps and Ductless Air Conditioners and Heat Pumps: EPA proposes to maintain the current criteria for CAC and Heat Pumps. The Agency will simplify the criteria to allow EPA to nominate products automatically from products certified to ENERGY STAR Version 6.1, eliminating the need for an application. The current criteria set in 2022 account for the revised ENERGY STAR specification, and reward certification to the V6.1 cold climate heat pump criteria. Inclusion of optional installation capabilities in Version 6.1 allows automatic recognition of units that meet the criteria as ENERGY STAR Most Efficient. The inclusion of compressor staging (single, dual, multi-stage, variable capacity) in QPX allows automatic recognition of dual and multistage units. EPA believes this change will ease participation in ENERGY STAR Most Efficient for partners.

Geothermal Heat Pumps: EPA also intends to move away from use of an application for Geothermal Heat Pumps for ENERGY STAR Most Efficient recognition. In light of the truly superior efficiency of these products, EPA proposes to recognize all models that meet the current ENERGY STAR criteria.

Refrigerators-Freezers and Freezers: EPA proposes to maintain the current criteria for refrigerators and freezers. There are 204 base models from 49 brands of standard size refrigerators, which represents 20% of the standard size market. For compact refrigerators, there are 44 base models from 24 brands that meet the proposed criteria representing 5% of the market. There are 12 upright freezer and chest freezer base models from 5 brands that meet the criteria.

Room Air Cleaners: EPA proposes to add Room Air Cleaners to the portfolio in 2023. EPA proposes this expansion due to the rich savings offered by this higher level of efficiency, 65% to more than 70%, over the level used in numerous state standards. There has been a tremendous growth in shipments over the past couple of years due to both COVID + wildfires making it more important to highlight greater efficiency for consumers. Lastly, stakeholders like the ESRPP have requested this expansion consistently in the last few years.

Room Air Conditioners: No changes are proposed for the current criteria for room air conditioners. Available models stayed steady from last year, and there are currently 13 base models from 6 brands meeting the proposed criteria, which represents 2% of the market.

Ventilating Fans: EPA proposes to maintain the 2022 criteria for ventilating fans into 2023. The current efficiency criteria are met by an appropriate subset of products, just 2.3% of HVI's product list; however, a very small number of those fans are currently recognized as ENERGY STAR Most Efficient. This is due to a lack of reported data for the noise criteria as measured at 0.25 in wtg. static pressure for bathroom/utility fans. EPA encourages partners to submit this data and contact EPA with questions regarding how to do so.

Windows and Sliding Glass Doors: No changes are proposed for the 2023 residential window or sliding door recognition criteria. While high performance window products are widely available, they are still a relatively small slice of the total market. EPA will consider revising the criteria next year after the Version 7.0 Window, Door and Skylight specification is finalized.

The proposed ENERGY STAR Most Efficient 2023 criteria for the full suite of products is 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 as well as the stakeholder slide deck accompanying this letter.

<table>
<tr><th>Category</th><th>ENERGY STAR Most Efficient 2023 Recognition Criteria</th></tr>
<tr><td></td><td></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, Hugger, and Low-Mount HSSD Ceiling Fans</td><td>D = 36”</td><td>= 1.44D + 83.86</td></tr>
<tr><td>D > 36”</td><td>= 5.26D - 53.66</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>
<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>= 2.2</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>

To be recognized, laundry centers must meet the ENERGY STAR Most Efficient washer and dryer criteria.</td></tr>
<tr><td>Ducted Central Air Conditioners and Air Source Heat Pumps</td><td>Installation benefits, multiple capacities

<table>
<tr><th>Product type</th><th>SEER2</th><th>EER2</th><th>HSPF2</th></tr>
<tr><td>Split AC</td><td>16.9</td><td>12.4</td><td></td></tr>
<tr><td>Packaged AC</td><td>15.2</td><td>11.5</td><td></td></tr>
<tr><td>Split HP</td><td>16.9</td><td>12.0</td><td>8.2</td></tr>
<tr><td>Packaged HP</td><td>15.2</td><td>11.5</td><td>7.2</td></tr>
<tr><td>Cold Climate HP</td><td>15.2</td><td>11.5</td><td>8.5</td></tr>
</table>

Cold climate heat pumps must also meet a COP of 1.75 at 5 degrees F, and provide 70% capacity maintenance at 5 degrees F.</td></tr>
<tr><td>Dehumidifiers*</td><td>Product must meet the following applicable minimum Integrated Energy Factor (IEF)[2]:</td></tr>
</table>

Type, Size	Integrated Energy Factor (IEF)[2]
Portable, capacity = 25.00 pints/day	= 1.70
Portable, capacity 25.01 to 50.00 pints/day	= 1.90
Portable, capacity > 50.00 pints/day	= 3.40
Whole Home, case volume = 8.0 ft3	= 2.22
Whole Home, case volume > 8.0 ft3	= 3.40

Ductless AC and Heat Pumps

Installation benefits, multiple capacities.

Product type	SEER2	EER2	HSPF2
Ductless CAC	18.7	12.0	
Ductless HP	18.7	12.0	8.5
Ductless Cold Climate HP	16.9	11.5	8.5

Ductless old climate heat pumps must also meet a COP of 1.75 at 5 degrees F, and provide 70% capacity maintenance at 5 degrees F.

Geothermal Heat Pumps

Product type	EER	COP
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.	3.5
DGX	16.0	3.6
DGX-to-Water	15	3.1

Computer Monitors*

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:

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

Where:

$$eff_{AC\_DC} = \begin{cases} 1.00 \text{ for AC-powered monitors} \\ 0.85 \text{ for DC-powered monitors} \end{cases}$$

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

$$C = \begin{cases} 0 & \text{if } A < 180 \text{ in}^2 \\ -0.2 & \text{if } 180 \text{ in}^2 = A < 220 \text{ in}^2 \\ -1.0 & \text{if } A = 220 \text{ in}^2 \end{cases}$$

Dishwashers*

Product Type	Annual Energy Use (kWh/yr)	Water Consumption (gallons/cycle)
Standard Dishwasher	= 240	= 3.2

Test Cycle	Cleaning Index
Heavy	= 70
Medium	= 70
Light	= 70

Dryers*

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.

Cycle Setting	Product Type	CEF_{BASE} (lbs/kWh)
Normal	Compact Ventless Electric (240 V)	≥ 3.70
	Electric	= 4.30
	Gas	= 3.80
Normal, Maximum Dryness[1]	Compact Ventless Electric (240 V)	≥ 2.68
	Electric	= 3.93
	Gas	= 3.48

Refrigerator-Freezers and Freezers*

Product must have an Annual Energy Consumption (AEC) of less than or equal to 637 kWh per year.

Side-by-side and bottom freezer product types must be at least 30% more efficient than federal requirements. **Top freezers** must be at least 10% more efficient than federal requirements. **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. **Compact refrigerator or refrigerator-freezer product types** must be at least 30% more efficient than federal requirements.

NEW Room Air Cleaners

Product must meet the minimum Smoke Clean Air Delivery Rate per Watt (Smoke CADR/W) requirements shown in the table below, as determined by ANSI/AHAM AC-1-2020: Method of Measuring the Performance of Portable Household Electric Room Air Cleaners.

Smoke CADR Bins	Minimum Smoke CADR/W
30 = Smoke CADR < 100	5.4
100 = Smoke CADR < 150	6.6
150 = Smoke CADR	7.6

Room Air Conditioners*	Product must have a Combined Energy Efficiency Ratio (CEER) that is greater than or equal to 35% better than the DOE Federal Minimum Standard. Products must also be at or below a maximum sound level of 45 dB(A) for the lowest operational setting.
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

**Proposed criteria carried over from 2022 for these categories with no changes.*

[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).

EPA will provide additional information regarding the roll out of ENERGY STAR Most Efficient 2023 recognition with the finalization of these criteria.

In light of the minimal changes proposed to the 2023 ENERGY STAR Most Efficient criteria, EPA is distributing a slide deck that relays data associated with this year's review rather than sharing this information via a stakeholder webinar. This document as well as the criteria documents can be found here. Please share written comments no later than August 15, 2022, with MostEfficient@energystar.gov. Unless the commenter asks otherwise, all comments will be posted to the ENERGY STAR Most Efficient criteria development page. EPA plans to finalize these recognition requirements in the coming months.

Thank you for your support of the ENERGY STAR program.

Sincerely,

Ann Bailey, Director
ENERGY STAR Product Labeling

Enclosures:
ENERGY STAR Most Efficient 2023 Proposals with Rationale