

ENERGY STAR® Most Efficient 2013 Proposed Recognition Criteria Comment Summary and Response

Windows Draft 1 Criteria			
No.	Topic	Stakeholder Comments Summary	U.S. Environmental Protection Agency (EPA) Response
1	Recognition Period	Several stakeholders commented that the recognition period of one year is too short and instead suggest at least a 3-4 year period to allow for product development, marketing preparation, cost recoupment, and future certainty. They noted that unlike other industries, window technology evolution is not as rapid, new products are not able to be designed and produced as quickly, and consumer purchase decisions and planning may occur over many months.	The Most Efficient program is intended to recognize the “best-of-the-best”, cutting-edge technologies among ENERGY STAR certified models. Doing so in a meaningful way requires frequent re-evaluation of the recognition criteria. However, while the review cycle will take place on an annual basis, Most Efficient recognition criteria may not change every year.
2	Product Availability, Cost, and Sales	A stakeholder noted that window systems at competitive prices meet the proposed performance criteria without the need for expensive gas fills such as krypton, or exotic glass sandwiches. This stakeholder strongly believes that a Most Efficient Windows program should truly represent the highest performing products and that EPA should stand firm with the guidelines and implementation dates as proposed.	EPA appreciates the support for the proposed guidelines and timeline.
3	Product Availability, Cost, and Sales	One stakeholder commented that EPA’s proposed U-factor and SHGC values conflict with their interpretation of the main principles of the ENERGY STAR program since products meeting the requirements are not climate specific and do not have an acceptable payback period. The stakeholder emphasized that EPA has a responsibility to ensure that consumers are directed to suitable products, and requiring triple-pane, exotic gas-filled units in southern Florida is not meeting the program goals. Noting that much less than 5% of their products meet Most Efficient criteria, the stakeholder proposed less stringent U-factor and SHGC values that would allow for comparable numbers of products to qualify in the South-Central and Southern Zones compared to the other zones. Some stakeholders argued that the U-factor is too low, particularly for the southern zones, given the potential for an unreasonable payback period and the high cost of manufacturing and development. Another stakeholder indicated that sales in the Southern Zone will be lower. Stakeholders proposed U-factor maxima from 0.22 to 0.30 in the Southern Zone to encourage manufacturer buy-in and ensure wide market availability of recognized products.	Most Efficient recognition is intended to accelerate the availability of the most efficient products among those that are certified. The target audience is early adopters and environmentally conscious consumers, who are willing to pay more. EPA believes that setting a single, low U-factor for all climate zones will help to expand the availability of high-performance products. EPA also notes that the DOE Volume Purchase Program (VPP), which set similar performance parameters, had as many as 60 participating manufacturers.

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4	North American Fenestration Standard/ Specification (NAFS)	<p>Several stakeholders expressed support for the NAFS certification requirement with a Performance Grade (PG) of ≥ 15. Another stakeholder recommended changing NAFS “certification” to “tested to the NAFS standard by an independent lab” since factors other than air, water, and structural testing may prohibit certification.</p> <p>Another stakeholder proposed that the bar be set higher for NAFS certification. A PG of 15 is the entry level for NAFS certification, and the Department of Energy (DOE) Volume Purchase Program used an entry level PG of 25. Therefore, they recommend that the Most Efficient program require a PG of 20.</p>	<p>EPA appreciates the support for the proposed NAFS certification requirement. EPA believes that requiring NAFS certification is an effective mechanism to help ensure the quality and performance of ENERGY STAR Most Efficient windows. EPA requires certification of all metrics used as qualification criteria across all ENERGY STAR product categories and will therefore not accept data directly from labs as a proxy for NAFS certification.</p> <p>The ENERGY STAR Most Efficient program for windows is a residential program. Therefore, EPA believes that using the grade NAFS specifies for residential construction (a minimum PG of 15) is appropriate. EPA notes that the DOE VPP was not limited to residential buildings and specified an appropriately higher PG level.</p>
5	U-Factor	<p>Several stakeholders expressed support for the proposed U-Factor requirement. Another stakeholder supported the requirement being more stringent than the DOE High Performance Window Volume Purchase Program since the Most Efficient program should represent only the highest-performing products available.</p> <p>In contrast, another stakeholder commented that aligning with the DOE program by increasing the maximum U-factor to 0.22 would enhance the effectiveness of the Most Efficient program and leverage the research already conducted by DOE.</p>	<p>EPA appreciates the support received in favor of the proposed U-factor criteria. EPA understands that many stakeholders would like to see a higher (more lenient) U-factor requirement, particularly in the Southern Zone, but notes that one reason given for a loosening of the U-factor criterion is cost. As mentioned above, the primary goal of the Most Efficient recognition criteria is to accelerate the availability of the most energy-efficient products on the market, regardless of cost.</p>

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6	Solar Heat Gain Coefficient (SHGC)	<p>Several stakeholders expressed support for the SHGC proposal, however, some stakeholders noted that the SHGCs proposed in the Southern and South-Central Zones are less stringent than the International Energy Conservation Code (IECC) 2012, which states are already reviewing and implementing. Stakeholders asked EPA to consider this potential conflict.</p> <p>One stakeholder proposed a minimum SHGC of 0.30 or 0.35 (rather than “Any”) for the Northern Zone arguing that the “loss of free heat” caused by ultra-low SHGC windows during the winter more than outweigh any increased cooling loads experienced during the summer. Another stakeholder disagreed with this statement noting that most of the northern United States is “summer peaking” and that higher solar gain will result in more cooling with higher electric peak demands, causing less electric system reliability, the need for more power plants, and greater use of inefficient plants (with greater pollution).</p>	<p>EPA has opted to revise the SHGC criteria in the Southern and South-Central Zones to match the SHGC criteria in IECC 2012. These levels also match those proposed in the Draft 1 Version 6.0 ENERGY STAR specification. EPA thanks stakeholders for their feedback on this point.</p> <p>EPA has revised the SHGC proposed in the Northern Zone from “any” to a minimum of 0.20. This proposal will allow Most Efficient to recognize higher SHGC products, which may provide additional free solar heat in the winter. It also allows recognition of lower SHGC products, which save on cooling costs and reduce peak load, but eliminates extremely low SHGC products (below 0.20), which may not perform as well in northernmost climates. This proposal also aligns with the proposed Most Efficient levels for ENERGY STAR Canada. Further, EPA plans to perform analysis and develop consumer materials addressing the topic of high-gain windows to ensure that savings are achieved, comfort is maintained, and peak load is reduced.</p>
7	Visible Transmittance (VT)	<p>Most stakeholders argued that EPA should not include a VT minimum. Some stakeholders suggested that EPA vary the VT as SHGC decreases or, preferably, establish an SHGC range for each climate zone. Stakeholders made the following points:</p> <ul style="list-style-type: none"> • The VT requirement excludes triple silver low-e coatings used to meet lower SHGC requirements in warmer regions. • Consumer preference demands adequate VT levels without the need for a Most Efficient requirement. • The VT requirement, unless used in conjunction with indoor lighting controls to reduce electric lighting loads, has no direct effect on energy efficiency. • VT values can differ across operator types even if performance is the same due to the National Fenestration Rating Council (NFRC) sizes used for thermal simulation. • Products that meet the U-factor and SHGC criteria but do not meet the VT requirement offer superior thermal performance. 	<p>EPA appreciates the extensive feedback received on this topic. Due to the many significant technical concerns expressed by stakeholders, EPA is removing the VT requirement and adding a minimum SHGC requirement for the Northern Zone (see topic 6 above).</p>

Responses to Comments on ENERGY STAR® Most Efficient 2013 Proposed Eligibility Criteria

Windows Draft 2 Criteria			
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1	U-Factor	<p>Several stakeholders reiterated support for the proposed U-factor.</p> <p>However, some stakeholders did not support the proposed U-factors. One stakeholder did not agree with a uniform U-factor for all climate zones. Based on the increased cost, some stakeholders proposed more lenient U-factor criteria for the southern zones and a U-factor of 0.22 for operable windows in the Northern Zone. Another stakeholder said that the criteria conflict with the ENERGY STAR principles of being climate-specific with an acceptable payback period, while another suggested a cost-benefit analysis should be conducted. One stakeholder cited limited product availability as a reason for relaxing the U-factor requirements.</p>	<p>EPA appreciates the support for the proposed U-factor.</p> <p>EPA understands that several stakeholders would like to see more lenient U-factors for the Most Efficient program, especially in the southern zones. Most Efficient recognition is intended to accelerate the availability of the most efficient products among those that are certified. The target audience is early adopters and environmentally conscious consumers, who are willing to pay more.</p>
2	Solar Heat Gain Coefficient (SHGC)	<p>Several stakeholders supported the minimum SHGC in the Northern Zone. Several more stakeholders expressed support for proposed SHGC specifications in the other zones.</p> <p>Some stakeholders wanted a higher minimum SHGC in the Northern Zone. Several stakeholders suggested keeping “any” for the Northern Zone SHGC. One stakeholder cited that SHGC is not always a good indicator of how much light is allowed. One stakeholder disagreed with matching the Canadian Most Efficient criteria given that cooling loads are a larger concern in the United States. Additionally, they stated that the criterion is punitive to products with grids, heavy frames, and/or heavy sashes and may disproportionately affect casement-style windows due to frame-to-glass ratio.</p> <p>Some stakeholders noted that the proposed SHGC criteria impede passive solar design and recommended establishing different SHGCs for different orientations or allowing any SHGC for all climate zones. One suggested consumer education on the ENERGY STAR website.</p>	<p>EPA appreciates the support for the proposed SHGC criteria.</p> <p>EPA outlined the rationale for selecting the 0.20 SHGC minimum in Topic 6 of the Responses to Comments Draft 1 from manufacturers above. EPA will continue to monitor product submissions and make adjustments as necessary based on initial responses to the program.</p> <p>EPA’s selection of SHGC criteria in the southern climate zones aligns with the IECC 2012 SHGC maxima to avoid the situation where ENERGY STAR Most Efficient products do not meet code. EPA does, however, plan to develop consumer guidance about the benefits and limitations of high- and low-gain windows.</p>

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3	National Fenestration Rating Council (NFRC) Testing	<p>A stakeholder expressed support for NFRC testing requirements.</p> <p>Another stakeholder expressed concern that whole-product U-factor and SHGC do not provide a consistent basis of product comparison across operator types due to variations in NFRC test sizes. Another stakeholder suggested that because U-factors are based on conductive values, the glass should be looked at with an infrared heat lamp with BTU meter to obtain a better metric than U-factor.</p> <p>A stakeholder noted that the U-factor being set at 0.20 for all styles would mean retesting to verify the difference from 0.22 to 0.20. [Note: A U-factor \leq 0.22 was used in the DOE Volume Purchase Program for operable windows.]</p> <p>A stakeholder suggested that EPA specify whether U-factors are center-of-glass or whole window to prevent confusion.</p>	<p>EPA appreciates the support for the continued use of NFRC testing requirements.</p> <p>EPA appreciates new ideas and encourages those stakeholders who have concerns or new ideas on window thermal performance test procedures to become involved with the NFRC test method development process so they can be vetted with industry for possible adoption.</p> <p>EPA is not aware of any additional testing that would need to occur by the shift in U-factor from 0.22 to 0.20. The same NFRC-certified test results can be used for the new program.</p> <p>EPA requires NFRC-certified U-factors for ENERGY STAR qualification and recognition under the Most Efficient program. NFRC only certifies whole-unit U-factors.</p>
4	Skylights	<p>A stakeholder expressed concern that skylights are excluded from the Most Efficient program.</p>	<p>EPA opted to recognize only windows for the first year of the program due to time and resource constraints. EPA may consider adding skylights at a later time.</p>
5	Products Installed at High Altitude	<p>A stakeholder asserted that EPA needs to address the U-factor restrictions with high-altitude products because of the inclusion of breather tubes. They noted that U-factors are reduced by four points and that there needs to be a new clause in the International Residential Code (IRC).</p>	<p>EPA considered the high-altitude products issue in the Draft 1 Version 6.0 Criteria and Analysis Report; several manufacturers indicated that they have identified other solutions to this problem. EPA urges stakeholders with concerns about or suggestion for the IRC to become involved with the code development process.</p>
6	Visible Transmittance (VT)	<p>Some stakeholders agreed with removing the VT requirement. One noted that VT is not a true reflection of light admitted due to the varying size and mass of framing.</p> <p>A stakeholder to know what alternative approach EPA is considering to replace the VT requirement.</p> <p>A stakeholder did not support removal of the VT requirement because using triple panes could result in limiting light in homes.</p>	<p>EPA appreciates the support for the revised approach that does not use VT.</p> <p>EPA has opted to set a minimum SHGC in the Northern Zone in lieu of establishing a minimum VT (see Topic 6 in the Responses to Comments Draft 1 above).</p> <p>EPA understands that triple-pane windows may result in lower VTs, but setting a minimum SHGC in the Northern Zone will help limit low-VT products.</p>
7	Program Approach	<p>One stakeholder suggested revising the climate zones and focusing the program on whole projects, especially since walls are more energy-efficient than windows.</p>	<p>EPA establishes the ENERGY STAR climate zones based on the zones established in the model code. EPA also notes that there is an ENERGY STAR Certified Homes program, which does address the performance of entire residential projects.</p>

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8	Air Leakage (AL)	A stakeholder suggested changing the AL requirement to 0.05 cfm/ft ² or 0.10 cfm/ft ² to reduce complaints about drafty windows.	This issue is addressed in detail in the Draft 1 Version 6.0 Criteria and Analysis Report. Stakeholders are encouraged to review the report and submit comments on this issue through the Version 6.0 criteria revision process. NAFS certification will cover AL requirements for the Most Efficient Program.
9	North American Fenestration Standard/ Specification (NAFS)	Some stakeholders agreed with the NAFS certification requirement, but one stakeholder wanted the Performance Grade (PG) set at 20. Another stakeholder would like to see the requirement revised to specify “independent” testing to prevent self-certification.	EPA appreciates the support for the NAFS certification requirement. The ENERGY STAR Most Efficient program for windows is a residential program. Therefore, EPA believes that using the grade NAFS specifies for residential construction (a minimum PG of 15) is appropriate. EPA will modify the NAFS requirement language in the final recognition criteria to address certification requirements.
10	Recognition Period	A stakeholder reiterated that a recognition period of one year does not allow enough time to develop new technologies and recommended that EPA produce a roadmap with foresight into future criteria. Another stakeholder requested that Most Efficient only revise the criteria every 3-4 years. Another stakeholder suggested that products should retain the Most Efficient designation for three years.	EPA developed the Most Efficient program to recognize the most energy-efficient products currently available on the market. As such, EPA must re-evaluate the Most Efficient recognition criteria each year to ensure that the program is still targeting those products. However, while the review cycle will take place on an annual basis, the criteria may not change every year. EPA also notes that partners may continue to use the 2013 Most Efficient designation in association with recognized windows as long as the model remains on the market.