



ROOF WINDOWS
AND SKYLIGHTS

U.S. Environmental Protection Agency
Attn: Mr. Doug Anderson
1200 Pennsylvania Ave, NW
Washington, DC 20460

Your reference

Our reference
V-USA-

Date
November 19, 2019

RE: ENERGY STAR® Windows Doors and Skylights Version 7.0

VELUX America, LLC., a long-time ENERGY STAR® Partner in both the U.S. and Canada, is pleased to have the opportunity to comment on the Version 7.0 Discussion. We respectfully offer what we believe to be constructive, informative, and appropriate responses intended to strengthen the program and advance all of its goals.

Feedback to EPA Questions

Product Availability

1. Are there better data sources for available products than those proposed in this Discussion Guide?

We have concerns that the data included in the discussion guide lack regional details and therefore, are not a realistic representation of market data. The northern zone specifically should represent data to include whether products are “new construction” or “retrofit”.

2. What are the most common pathways (component combinations) that manufacturers use to make ENERGY STAR® certified products?

Our components consist of framing material, glazing, and the spacer. Most ENERGY STAR® skylight products will consist of a wood frame, double pane glass with triple layer silver low-e coating, and the spacer would be a stainless steel material. Various other configurations exist, for example triple pane, but are more costly.

3. Are there pathways represented in the NFRC CPD that should not be considered viable pathways?

We urge EPA’s careful consideration of the products listed in the CPD database. Many products are custom products or more niche products that are made-to-order and should not be expected to be viable for meeting typical market availability.

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4. Among the most common pathways, which (if any) energy performance ratings should EPA consider to be outliers?

What is considered to be an outlier is a very subjective viewpoint. EPA should consider continuing the current performance requirements of ENERGY STAR[®] Version 6.0 as the default metric for making that determination at this point with performance ratings that exceed those.

Product Costs

5. What sources should EPA consider when evaluating what is a reasonable payback period for building materials like WDS?

Evaluating what is practical for building materials like ENERGY STAR[®] windows, doors and skylights must be based on what consumers consider to be a reasonable payback. We recommend EPA consult with the National Association of Home Builders (NAHB), the NAHB Remodelers Council, National Association of the Remodeling Industry (NARI), and the Home Innovation Research Labs (HIRL). These organizations should be able to provide EPA with data related to acceptable payback periods from their data collection activities.

6. What other methods for estimating the incremental costs of energy performance improvements for windows, doors, and skylights should EPA consider?

One difficulty EPA is faced with in the strategy of obtaining data from big box stores and mystery shopping will be the very limited results. Most if not all manufacturers have a significant amount of products that are not sold in traditional retail markets.

The challenge of obtaining pricing from bill of materials will be inaccurate because there are various manufacturers that buy different quantities in different regions. Not all manufacturers are going to obtain the same or similar pricing.

Cost data from manufacturers might be the most accurate but the challenge arises when manufacturers are reluctant to provide this information. The information is highly complex and even a non-disclosure agreement may not ease their concerns due to the propriety nature.

7. Which incremental cost estimation methods are the most accurate?

It is our recommendation that EPA consult NAHB & NARI on costs. Retail pricing and mystery shopping could be used as a supplement to the feedback that is received

8. Are there any additional component categories that EPA should consider researching?

See question 6

Combining Southern and South-Central Climate Zones

9. Should EPA consider combining the ENERGY STAR[®] Southern and South-Central climate zones?

We are in agreement with combining the ENERGY STAR[®] Southern and South-Central climate zones.

10. What impact would the potential merging of these climate zones have on consumers and partners?

We agree that the DOE/PNNL field studies show use of similar products in IECC Zones 2 and 3. We believe meeting the ENERGY STAR[®] South-Central zone criteria and combining them is reasonable. We also support simplifying the specifications as we have confidence that doing so will not have a negative impact on consumers in terms of product availability or otherwise on manufacturers.

Establishing a Minimum Solar Heat Gain Coefficient (SHGC) for the Northern Climate Zone

11. Should EPA consider setting a minimum SHGC in the Northern climate zone?

We are not supportive of setting a minimum SHGC in the Northern climate zone.

12. What impact would a minimum SHGC have on product availability, consumer expectations, and the veracity of the ENERGY STAR[®] label in the window market?

In order to achieve a minimum SHGC in the Northern climate zone s many manufacturers may adjust the tint on the products they offer. SHGC considerations are much more complicated for colder climate regions and we do not believe there is adequate data for EPA to propose a sound minimum SHGC requirement for the Northern zone

Evaluating IECC Zone 5 for the Northern or North-Central Climate Zone

13. Should EPA consider moving IECC Zone 5 out of the ENERGY STAR[®] Northern climate zone and into the North-Central climate zone?

Yes, we do believe moving IECC Zone 5 into the North-Central climate zone is a sound decision.

14. What impact would changing climate zone boundaries have on consumers and partners?

The combination of IECC in Climate Zones 4 & 5 is particularly important because this area has a significant population in the U.S. IECC Zone 5 climate characteristics are more in-line with the ENERGY STAR[®] North-Central Zone. as with combining ENERGY STAR[®] Southern and South-Central Zones, there is no sign this will have a negative impact on consumer.

15. What characteristics are most common among ENERGY STAR certified windows sold in IECC Zone 5?

Applying the ENERGY STAR[®] Windows Specification to Full-Lite Sliding Patio Doors

- 16. Should EPA consider including full-lite sliding patio doors in the ENERGY STAR[®] Windows specification?**
- 17. What impact would this potential change have on consumers and partners?**

We are in opposition to including full-lite sliding patio doors in the ENERGY STAR[®] windows specification. Full-lite sliding patio doors do share similar components and features with windows than with swinging doors however, they are still different products. They serve different purposes and therefore prescriptions for them should have separate requirements. The current structure of three separate categories is sensible and reasonable and should not be changed.

Sunseting the ENERGY STAR[®] Door Criteria

- 18. Should EPA consider sunseting the ENERGY STAR[®] specification for swinging doors if the analysis does not reveal significant cost-effective energy savings for consumers?**
- 19. Should EPA sunset just part the criteria if additional cost-effective energy savings are only possible for some products, such as glass-only doors?**

We are not supportive of sunseting the ENERGY STAR[®] specification for swinging doors. The ENERGY STAR[®] brand, especially for windows, doors and skylights has been so well established. Withdrawing the specification for swinging doors will abruptly leave consumers and builders without a clear means for identifying superior performing swinging doors.

Simplifying or Sunseting the ENERGY STAR[®] Skylight Criteria

- 20. Should EPA consider including skylights in the ENERGY STAR[®] Windows specification?**

It is VELUX's opinion that EPA should not include skylights in the Window specification.

- 21. What significant technical and market differences between windows and skylights should EPA consider in its analysis?**

There are a number of technical and market reasons why skylights and windows should have separate specifications.

Technically, skylight (including TDD's) and window u-factors are determined by totally different procedures that do not use the same criteria. EPA is aware that skylight u-factors are calculated with a simulation at a 20 degree from horizontal pitch while window u-factors are tested at a 90 degree from horizontal pitch. The 20 degree simulation for skylights results in a significantly higher u-factor than a comparable window tested at 90 degrees. Building code requirements further the difference between skylight and window u-factors, by requiring skylights to be mounted on a curb at least 4" above the roof.

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Vertical windows u-factors are determined with windows recessed in the wall and skylight projecting from the roof on some type of curb. This projection above the roof for skylights accounts for more energy losses through the curb material adding to the increase in u-factor difference between skylights in vertical windows. TDD criteria for determining u-factor is even more vastly different than the window criteria for determining u-factor. Most consumers will never get into the minutiae of how skylight and window u-factors are determined. However, if they see them in the same specification, they may erroneously assume they both are determined in the same manner.

The International Energy Conservation Code (IECC) code language recognizes that skylight u-factors are different than window u-factors by listing maximum u-factors for skylights separate from window u-factors. IECC (2018 edition) lists maximum u-factors for skylights and windows separate in tables R402.1.2 “Insulation and Fenestration Requirements By Components” and R402.1.4 “Equivalent U-factors”. Footnote “b” in table R402.1.2 denotes the difference of skylight SHGC values from general glazed fenestration. Since ENERGY STAR® often sights being better than code and uses the energy code as a general reference, it stands to reason that ENERGY STAR® should not cause confusion in the industry by including skylights in the Windows specification.

ENERGY STAR® mentioned considering the use of a multiplier to the windows specification in order to determine skylights. A multiplier will still require a separate table for skylights in order to be understood by consumers. Providing a windows multiplier without providing separate skylight values for each zone will be extremely confusing to the average consumer.

One of the strengths of the ENERGY STAR® program is to assist consumers when comparing alike products to differentiate the energy savings of the two products. From a market perspective comparing skylights to windows is sort of like comparing a zebra to a horse. They both have a lot of similarities in how they are put together, but they are too separate species of animal native to totally different areas of the world. This analogy does not even take into account TDD’s which do not remotely resemble windows in product or installation. VELUX has not heard of any consumer or industry demand to combine skylights into the windows specification. For at least 20 years, ENERGY STAR® has an existing well-established specification for skylights and windows that is well understood by consumers and industry alike. Combining skylights and TDD’s with windows will bring unneeded confusion into the marketplace, requiring significant education for all involved. Consumers have different expectations for skylights than windows. While both skylights and windows are both fenestration products the similarities pretty much end there. Windows are purchased for views and some natural light whereas skylights are purchased to bring natural daylight into spaces where windows cannot. ENERGY STAR® does not recognize natural daylight which is the most important aspects of skylights, and the primary reason that skylights are purchased. Consumers also expect that skylights are different from windows in other areas such as glass and plastic glazing materials, installation, location on the home (roof vs wall), product cost and installed costs.

As previously mentioned in order for the skylight specification to remain clear to the consumer, ENERGY STAR® will still need to provide a separate table for skylights. Consumers desire to use ENERGY STAR® for comparing skylights to skylights and not skylights to windows. Respectfully, combining skylights into the windows specification can easily be perceived as an opportunity for EPA to save costs, and not as opportunity to assist consumers.

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In summary, the technical differences between skylights and windows are well recognized by the energy codes and National Fenestration Rating Council (NFRC) procedures for determining the thermal performance of each. The differences are well established and should not be taken lightly by EPA. EPA has well established separate specifications for skylights and windows that consumers and industry fully support. Combining skylights and TDD's into the windows specification is likely to cause much confusion and require significant education at the end user

22. Should EPA consider sunseting the ENERGY STAR® specification for skylights if the analysis does not reveal significant cost-effective energy savings for consumers?

VELUX recommends continuing the Skylight Specification as consumers rely on ENERGY STAR® ratings during their purchasing process. In 2011, VELUX commissioned a third party resource, Group 14 Engineering, to conduct an independent determination on the energy impacts of residential skylights in nine cities located in different climate zones throughout the US. The study, clearly shows that introducing skylights allows the total fenestration area to be reduced from a maximum of 20% of floor area to as low as 12% while achieving the same average daylighting factor of target of 5%. This reduced the annual heating and cooling use and costs in all but two of the 108 models with skylights that were analyzed. When combinations of skylights and windows are used to achieve the same daylighting target level, the heating and cooling savings are almost always greater than when equivalent daylight comes from skylights rather than vertical windows. Of course, the greatest savings for each city differs depending on skylight orientation, window distribution, climate type and utility rate structure. VELUX is confident that when used properly skylights can provide significant cost-effective energy savings for consumers. The Group 14 Study is attached for your use and reference.

Dynamic Glazing and Shading

23. What is the market penetration of products with dynamic glazing or integrated shading systems for residential applications? Do stakeholders expect the market for such products to expand in the next few years?

24. How should the process for certifying and listing dynamic and/or integrated products be revised to better evaluate the performance and availability of such products?

We do not have specific data on the current market penetration of dynamic glazing and integrated shading products for the variety of residential applications contained herein. However, regardless of the current or expected near future market conditions we believe the current provisions for qualifying dynamic glazing products should be maintained. Integrated shading system products also provide a cost effective alternative that deliver greater energy savings to consumers.

High Altitude and Impact Resistanc

25. What share of residential WDS are sold in places where high-altitude and/or impact-resistant products are necessary?

26. Should EPA reconsider allowances for high altitude and/or impact resistance in a potential revised specification, and why or why not?

We have not monitored how much product is sold in these areas. We don't have confidence that the amount is substantial. ENERGY STAR[®] did evaluate this in version 6.0 and found that it was not significant.

We are not in favor of making this change. Distribution systems would make it difficult at best to control which products are sold in areas subject to these conditions. There is a possibility that products being purchased by consumers may not be ENERGY STAR[®] and the consumer is unaware.

Extended Implementation Schedule

27. Should EPA consider extending the effective date beyond the typical 9 to 12 months after release of a final specification?

28. How would an extended implementation schedule make it easier to meet a potential revised specification?

We feel strongly extending the effective date of ENERGY STAR[®] Version 7.0 beyond the typical 9 to 12 months after the final specification is published, should EPA moved forward with development of it, is necessary. Tooling for the necessary product changes will take anywhere from 9-10 months. This does not take into account the necessary design changes and testing that must be made to ensure compliant products are available.

In addition, the effective date should also be close to the beginning of the calendar year to better align with manufacturers timing for bringing new products and literature to the marketplace.



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