

Submitted Electronically

March 28, 2022

Doug Anderson
United States Environmental Protection Agency
1310 L Street, NW
Washington, DC 20005

Re: Comments and Recommendations on *ENERGY STAR*[®] Version 7.0 Window, Door and Skylight Draft 2 Specification and EPA Response to Comments on Draft 1

Dear Doug,

Thank you again for the opportunity to participate in the EPA's process to consider proposed changes to the ENERGY STAR Windows program.

Per EPA's request, the purpose of this letter is to provide supplemental and reinforced feedback, comments and recommendations on behalf of Andersen focusing on the ENERGY STAR Version 7.0 Residential Window, Door and Skylight Draft 2 Specification ("Draft 2") and EPA's Response to Comments on Draft 1 ("EPA's Draft 1 Response"). We appreciate the chance to review and comment on Draft 2 and EPA's Draft 1 Response. In review of the changes made from Draft 1 to Draft 2, we urge the EPA to adopt the following recommendations:

- (1) Set the > ½ lite door (which would include both hinged and sliding glass doors) maximum U-factor criteria at 0.28 nationwide as originally proposed in Draft 1 or reduce it to 0.27. As a less preferable alternative, set the maximum U-factor for Northern/North Central Zones no lower than 0.26 and for the South Central/Southern Zones no lower than 0.28.
- (2) Set the North Central Zone window maximum U-factor to 0.27.
- (3) Set the effective date of Version 7.0 no earlier than January 1, 2024, given the significant supply constraints created by COVID-19 and now exacerbated by the war in Ukraine.

Our rationale for these recommendations follows, as well as some additional comments in response to EPA's Draft 1 Response.

Andersen Supplemental Recommendations to Draft 2

- (1) Set the > ½ lite door (which would include both hinged and sliding glass doors) maximum U-factor criteria at 0.28 nationwide as originally proposed in Draft 1 or reduce it to 0.27. As a less preferable alternative, set the maximum U-factor for Northern/North Central Zones no lower than 0.26 and for the South Central/Southern Zones no lower than 0.28.**

Andersen appreciates that EPA accepted our recommendation and moved sliding glass doors back to the > ½ lite door category (consistent with swinging doors and in current and previous Versions of ENERGY STAR) for Draft 2 as sliding and hinged patio doors are considered similar by customers and there is not a good rationale for treating them separately. However, we are concerned by the proposal to then lower the U-factor for all such > ½ lite doors from 0.28 in Draft 1 to 0.25 in Draft 2.

A 0.25 U-factor is a very aggressive change for glazed doors, even in the northern climate zones. We recommend that the uniform value be set at 0.28 for all ENERGY STAR Climate Zones, which would be a reasonable increase in efficiency over the current glazed door requirement of 0.30. A U-factor target of 0.28 for all patio doors would position more door products to meet the proposed requirements by adding a room-side low-e coating instead of requiring a costly and more problematic triple pane solution for patio doors.

We are also concerned about the specification of very low U-factors in the Southern/South Central Zones. Using Miami, Florida as an example, this would mean that EPA would be recommending a 0.25 U-factor patio door (hinged or sliding), which is more stringent than the proposed window U-factor criteria of 0.28 in the South Central and 0.32 in the Southern Zone and vastly more stringent than the 2021 IECC residential prescriptive UA requirement of 0.50. Setting the > ½ lite door U-factor for the Southern and South Central Zones at 0.28 would at minimum match the South Central window criteria while improving over the current Version 6.0 criteria.

(2) Set the North Central maximum window U-factor at 0.27.

With the proposed Draft 2 changes made to the “Equivalent Energy Performance” criteria in the Northern Zone, windows with a U-factor of 0.26 and an SHGC of ≥ 0.40 may qualify in the Northern Zone. True to past precedent, the U-factor requirements for the North Central Zone should be no more stringent than the Northern Zone. Therefore, at a minimum, the U-factor in the North Central Zone should not be set below the maximum 0.26 U-factor permitted in the Northern Zone under the “Equivalent Energy Performance” approach.

With this in mind, we recommend that the North Central windows criteria be set at a slightly higher U-factor of 0.27 (with the SHGC of ≤ 0.40) to recognize that the North Central climate Zone is more moderate than the Northern Zone. Adopting our recommendation would take the current ENERGY STAR Version 6.0 Northern Zone windows U-factor and drop it down to the North Central Zone, which would represent a significant and more reasonable stringency improvement in that zone.

Absent this change, the proposed North Central maximum U-factor of 0.24 would be far more stringent than the proposed Northern “Equivalent Energy Performance” U-factor of 0.26. This is illogical and would be challenging to explain to consumers how windows would comply in the Northern Zone but not the North Central.

While we recognize that a few manufacturers may find it possible to produce 0.24 U-factor dual pane products with a fourth surface low-e coating, we believe that most manufacturers will need to produce triple pane units if they choose to continue to make and market their products as ENERGY STAR in this Zone. While EPA’s analysis deems the 0.24 U-factor cost-effective in the North Central,

we note that this is based on the assumption it can be met with dual pane products. Moving to a 0.27 U-factor requirement would make the production of ENERGY STAR products much more feasible for a larger group of manufacturers, (without resorting to triple pane) thereby allowing more cost-effective options for consumers with minimal impact on energy efficiency performance.

Our detailed comments supporting this recommendation are outlined in our Draft 1 Comments, and we refer you to those comments rather than repeating them here.

(3) Set the effective date of Version 7.0 no earlier than January 1, 2024.

Should EPA decide to move forward with a Version 7.0 as proposed, we respectfully request that **the effective date be set for no earlier than January 1, 2024**. This schedule allows manufacturers more time for necessary product design changes, and just as significantly, time to procure the equipment necessary to produce these new product designs, particularly given the reality of current long lead times for delivery and installation of new production equipment due to supply chain constraints created by the worldwide impact of COVID-19 and now the war in Ukraine. Moreover, as in the past, it would be very helpful from the manufacturer's viewpoint for implementation to begin at the beginning of the calendar year.

We note that EPA acknowledged current supply chain concerns but largely dismissed such concerns on the basis that they are "likely temporary" and that implementation "is at least a year away." (EPA's Draft 1 Response, page 13)

Market conditions strongly indicate that the supply chain concerns are not as temporary as EPA suggests. In many cases, the new Version 7.0 criteria will create a need to redesign products across the industry. Some equipment manufacturers are indicating lead times of more than two years. Other concerns include availability of necessary raw materials and components to support new product configurations to meet the heightened ENERGY STAR requirements given significant supply chain constraints, which are now exacerbated as a result of the war in Ukraine.

Overall demand for IG square footage is creating industry wide lead times at unprecedented levels. To set energy standards in the Northern and North Central Zones in particular that will require triple pane for most manufacturers, will only add to this demand and challenge. The only solution is to add glass coating and IG capacity which will further increase lead times. It is very likely even an effective date of January 1, 2024 would be very difficult for the industry to deliver triple pane at any appreciable levels beyond today's level, which are incredibly low.

All of these factors plus the significant step changes EPA is proposing with ENERGY STAR 7.0, support pushing out the implementation timeline to a date no earlier than January 1, 2024. We believe that the challenge of transitioning to the proposed new specifications are much greater with Version 7.0 in comparison to previous versions. ENERGY STAR partners have invested considerably in supporting the ENERGY STAR program over many years, and we hope that EPA will grant sufficient time to enable manufacturers to transition to the final version of the new criteria given the significant step changes that will require design and production changes that will further require new equipment and supplies (including glass and IG units) in an extremely constrained supply chain environment.

Additional Discussion of Other Issues from Draft 1 and EPA's Response

As it relates to EPA's response to many of Andersen's and the industry's comments on Draft 1, we feel that some were not adequately addressed. We ask that EPA reconsider and address these comments in more detail. In particular, we suggest further consideration of our comments/recommendations related to:

- Ducker Research Study – Fewer respondents on the 2020 vs. 2019 study with results indicating a decline across all categories (except skylights) including Most Efficient
- Cost Effectiveness Approach – Baseline, product cost and availability at certain criteria levels, payback period and related issues.
- Moving IECC Climate Zone 5 to the North Central Zone (with the U-factor set at 0.27 as recommended above)

(1) *Ducker Research Study*

As we had stated in our Draft 1 Comments, we continue to believe the market shares in the Ducker Report may be unrealistically optimistic considering the data limitations and the inability of most manufacturers to provide accurate sales data as granular as the specific U/SHGC criteria of products sold by ENERGY STAR climate Zone and specific zip code. This is not a criticism of using Ducker to prepare the study of market share, it is merely a desire to recognize the limitations of the current methodology and to consider how to improve it and whether it is sufficient to support criteria change decisions.

The 2021 Ducker Report (based on 2020 shipments) saw a reduction in the number of respondents. The 2020 shipment data was based on approximately 35 respondents compared to approximately 40 in the 2019 shipment data. This prompts several questions:

- Why are most of the 190 manufacturing partners (by our count) not responding to the study?
- Why is there a reduction in the number of respondents in 2021 compared to 2020?

Based on this study, we continue to suspect that the true market share of ENERGY STAR products, particularly in the Northern Zone, is not accurately reflected in the data collected and is likely much lower than the percentages shown in the analysis report.

In review of the 2021 Ducker Report (based on 2020 shipments), the numbers in terms of percentage of shipments that met ENERGY STAR declined for each product category except skylights. Could this indicate a decline in consumer interest in paying the upcharge of an ENERGY STAR product vs. a code compliant product? Additionally, this is during the period of a federal energy tax credit that provides modest help in offsetting the higher cost of an ENERGY STAR product. This decline in consumer interest should be explored and may potentially provide key insights as to the potential impact to a more stringent and higher priced product needed to comply with Version 7.0.

We again caution against assuming the market share of ENERGY STAR products will remain at or even near current levels if consumers face higher upfront costs or reduced choices in product offerings for either replacement or new residential applications. Moreover, consumers who decide not to purchase Version 7.0 products (due to higher prices or other issues) may not buy products that would have achieved Version 6.0 specifications (since those products will no longer be labeled as ENERGY STAR) or may not even buy replacement products at all in the case of existing homes or buy less expensive products with higher U-factors for new residential homes. The EPA should seriously consider whether an efficiency increase on a smaller number of products sold will outweigh the opportunity losses associated with the likely possibility that consumers will buy less energy efficient products because they are more affordable. In other words, it does not seem reasonable for EPA to make assumptions in its savings estimates that the windows purchased that do not qualify for Version 7.0 would otherwise continue to meet the Version 6.0 criteria. A more realistic assumption would be that windows that do not qualify for Version 7.0 would default to meeting the code requirements for the given region or locality.

Before moving forward, we strongly recommend that the EPA conduct and review additional analysis to more accurately show actual projected market share of products with the new Version 7 Draft 2 proposed criteria (and other alternatives) based on current market share of products that meet these criteria (instead of simply assuming 100% or even 50% of Version 6.0 products shipped will convert to Version 7.0 as assumed in the national savings impact estimate). We recognize that it is difficult to project market share for new criteria options (see EPA's Draft 1 Response, page 15), but suggest that current market share data for various criteria would be more useful than simply relying on the fact that half of the partners have some certified product lines that meet the proposed criteria without any indication as to the market share of, cost of and current feasibility of producing large quantities of these products.

(2) *Reconsider Cost Effectiveness and Availability*

We (and other industry members) identified a number of concerns with the cost effectiveness, availability and reasonableness analysis supporting the proposed performance values in Draft 1. Some of these concerns included:

- (1) the use of a market baseline by EPA (instead of a code baseline or preferably a Version 6.0 baseline);
- (2) the choice of a reasonable payback period, which we believe should be less than 10 years and is not, in our view, being met with Version 7.0 criteria;
- (3) the identification of reasonable product upgrade costs; and
- (4) the availability and ability of products and the product features to meet various criteria levels. We do not believe that these concerns have been adequately resolved.

Choice of Baseline: We respectfully disagree with EPA's primary reliance on the "market" baseline as the starting point to determine cost effectiveness. This approach has the effect of crediting the product with creating substantial energy savings over the baseline without incurring any significant cost for improving the product (the reduction from 0.35 to 0.32 U-factor is produced at no cost and

the reduction from 0.32 to 0.28 U-factor at a mere \$6/unit cost, according to the EPA Report). The analysis then uses this relatively “free” energy cost savings to help justify the incremental cost of further and more costly reductions in the U-factor. We continue to think that Version 6.0 criteria should be used as the baseline, since the matter at issue in this process is whether the proposed improvement over Version 6.0 is cost effective (after all, the proposal is to replace the criteria for Version 6.0, not the market window). Further, at a minimum, the baseline should never exceed code minimums in any climate Zone.

EPA’s Draft 1 Response, page 4 states that “Version 6.0 was not used as a baseline since consumers are very unlikely to replace a version 6.0 ENERGY STAR window installed in the last few years with a Version 7.0 window.” We think this argument misses the mark. The issue is not what window is being replaced in the home in the case of a replacement window (note that this argument does not apply to windows in new homes since there is no existing window to replace and would vary enormously for replacement windows); the issue is what are the incremental costs for upgrading windows at the current ENERGY STAR window requirements to the proposed new criteria and would that specific upgrade be cost-effective to the consumer. We note that this is similar to US DOE’s assessment of the cost-effectiveness of model energy code upgrades. DOE does not compare the new code requirements with the “market,” but rather compares the upgraded new code with the current model code to determine incremental costs and resulting cost effectiveness.

Availability of Products and Features to Meet Requirements: The reasonableness of the EPA proposal depends in large part on the assumption that triple pane will not be required to meet 0.26 or 0.24 U-factor levels (see EPA’s Draft 1 Response, page 11). While we concede that every manufacturer’s product or every product line may not require triple pane to meet these levels, many would, particularly given variations in current frame configurations and materials. To ignore this fact based on the existence of some low-cost products that would meet the requirement without triple pane is not, in our view, the best policy. The criteria should leave enough headroom for most manufacturers’ products to be able to achieve ENERGY STAR qualification without switching to triple pane.

We also remain concerned with EPA’s exclusive reliance on an analysis of vinyl-framed products, stating they are the most common and lowest cost. We believe that the program needs a big enough tent to include other relatively comparable, higher cost and quality products made with other materials with reasonable market share. In EPA’s Draft 1 Response, page 10, EPA states that it “is trying to answer the question of whether it is possible for a consumer to find an ENERGY STAR certified product that produces cost-effective savings.” (EPA’s Draft 1 Response, page 10) We think a better question is whether most manufacturers currently produce and sell cost-effective products that will meet the new criteria.

Choice of Reasonable Product Upgrade Costs: We do not believe that the product upgrade costs chosen by EPA, particularly for triple pane, are reasonable for the purposes of the cost effectiveness analysis. To illustrate, with a range of 15 market price datapoints from below \$50 to above \$200, EPA’s original analysis “assumed” the upgrade cost to triple pane to be the third-lowest, or \$48,

producing an 11.3 year payback under the market baseline approach in the Northern Zone. EPA does not provide a rationale for choosing this particular price. While we acknowledge that EPA can choose one of the lowest costs as its assumed upgrade cost, we question whether this approach truly meets the objective of a consumer cost-effectiveness analysis – to determine the overall impact on consumers of selecting an ENERGY STAR product. We continue to believe that use of a median price would provide a more reasonable basis for assessing the true cost impact.

Choice of a Reasonable Payback Period: We continue to believe that EPA should aim for a reasonable payback period for ENERGY STAR window criteria improvements of less than 10 years. We note that in the initial EPA Report (page 19), EPA concluded that typical length of home ownership is 10 to 13 years. Even if an average homeowner stays in the same home for this period, it is unlikely that the average homeowner, whether in an existing or a new home, would be in a position to replace their windows in the first few years of occupancy – this alone would justify a reduction in the payback period

We do not agree with EPA's approach to improve cost effectiveness via shortening the payback period by offsetting a portion of the upgrade costs with uncertain utility incentives and recouping part of the upgrade costs through sale of the home. The claim that jurisdictions adopting the latest building codes often have access to utility incentives seems a questionable justification for a longer payback (or a reduced cost in the payback calculation). We note that such incentives are not universally available and do not reduce the cost of the product, they only change who pays for it. It seems to us that even if comprehensive data as to such incentives was available and considered, the incentives would need to be quantified and available across the entire climate Zone and apply only to products that exceed Version 7.0 criteria to be considered in determining cost effectiveness for the entire Zone (the product could only be considered "cost effective" where incentives are adequate and not in other locations). Similarly, the notion that part of the upgrade cost (between ENERGY STAR Version 6.0 and 7.0) should be considered to be recouped in the sale of the home seems unrealistic. We expect that some consumers may pay more for a home with newer replacement windows in general (particularly considering non-energy issues and features), but we question whether a home buyer would even be aware of the specific ENERGY STAR qualification criteria applied to such windows (e.g., Version 6.0 or 7.0), much less be willing to pay extra for the home.

(3) *Move IECC Climate Zone 5 into the North Central Zone*

If EPA sets the maximum U-factor for the North Central Zone at 0.27 as we have recommended above, then we request that EPA reconsider moving IECC Climate Zone 5 from the Northern Zone to the North Central Zone.

We respectfully ask the EPA to reconsider this recommendation for the following reasons (also see our Draft 1 Comments):

- The recently established maximum 0.40 SHGC established for IECC Climate Zone 5 in the 2021 IECC is consistent with the North Central requirements and inconsistent with the Northern Zone approach. EPA stated that "The 2021 IECC is now complete, and EPA can proceed with

more confidence on the direction of the codes.” (EPA Response on Discussion Guide, page 11.) However, the proposal in Draft 2 remains inconsistent with the 0.40 maximum SHGC for Climate Zone 5. The best and most efficient way to resolve this issue is to combine IECC Climate Zone 5 with the ENERGY STAR North Central Zone.

- Climate Zone 5 is much more like the North Central Climate Zone than the Northern Climate Zone. IECC Climate Zone 5 has a much more moderate climate for heating (compare heating degree days) and has more need for cooling than IECC Climate Zones 6-8 (which make up the rest of the ENERGY STAR Northern Zone). (In fact, the IECC already combines Climate Zone 4 Marine with Climate Zone 5 for setting criteria.)

In response to these arguments, EPA’s Draft 1 Response, page 7, contends that “There continues to be an increase in energy savings with an increase in SHGC in Zone 5....” However, in our review of EPA’s data and new analysis, it appears that energy cost savings begin to drop (instead of increase) after a 0.37 SHGC is reached in Zone 5. Moreover, an increase in SHGC has other potential negative consequences including larger HVAC sizes, higher electric system peak demands and the potential for summer occupant discomfort and correspondingly higher energy use. All of these factors support moving IECC Zone 5 to the North Central.

EPA’s Draft 1 Response also argues that “keeping Zone 5 in the ENERGY STAR Northern Zone will deliver more energy savings and cost savings for consumers.” This would normally be the case if the requirements for the North Central were less stringent than the Northern Zone. However, the fact that the North Central U-factor is currently proposed to be 0.24 while the Northern U-factor can reach 0.26 with the “Equivalent Energy Performance” trade-off undercuts this claim as demonstrated by the new data. According to the EPA results for IECC Zone 5, a 0.26 U-factor, 0.40 SHGC window (which would qualify in the Northern Zone), would produce \$74 of annual energy cost savings over the market baseline, while a 0.24 U-factor window with an SHGC below 0.40 (which would qualify in the North Central Zone), with any SHGC of 0.19 or higher, would produce more annual energy cost savings (a range of \$75 to \$90 in savings depending on the SHGC).

Conclusion

We thank you for listening and carefully considering our comments and concerns regarding Draft 2 and urge you to adopt our recommendations. We reserve our right to update and change our views on these and any other issues as this matter progresses. Please let me know if you have any questions or comments or would like to discuss any of our analysis or recommendations.

Sincerely,



Mark T. Mikkelson
Director, Corporate Regulatory Affairs