

November 14, 2008

Richard H. Karney, P.E.
ENERGY STAR[®] Program Manager
Department of Energy
Washington, DC 20585

RE: Proposed Revisions to *ENERGY STAR*[®] Program Requirements

Dear Mr. Karney:

The **Skylight Council** of the American **Architectural Manufacturers Association** (AAMA) appreciates the opportunity to provide additional comments and suggestions related to the most recent proposed revisions to the *ENERGY STAR*[®] Program for fenestration products as presented in the *Windows, Doors, and Skylights Draft Criteria and Analysis*, ('Draft Analysis') dated August 6, 2008.¹

AAMA's Skylight Council is a part of the trade association representing many of the manufacturers of skylight-related products in the U.S. AAMA Skylight Council members are active in responsible advocacy on a wide variety of issues affecting the industry; energy efficiency and daylighting are the most important of those issues.

Our comments to the proposed criteria include the following:

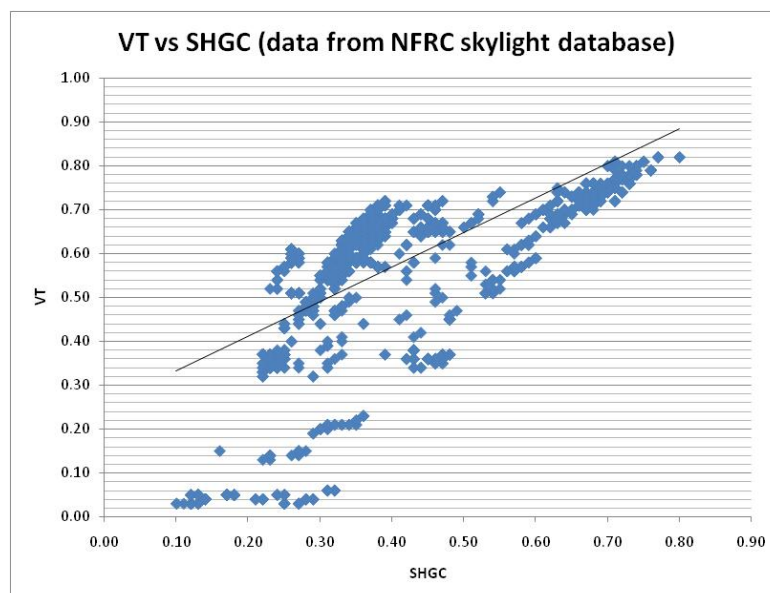
1. Climate Zone Map
 2. Glossary
 3. Consulting with the AAMA Skylight Council
 4. Economic Analysis
 5. Visible Transmission Considerations
 6. Phase I Compliance
 7. Criteria
 8. Inclusion of Tubular Daylighting Devices
-
1. **Climate Zone map.** The new climate zone map proposed is not consistent with the maps included in ASHRAE 90.1 and in use by the IECC. The use of different zone boundaries could lead to confusion in the marketplace, as product manufacturers would have to prove that their products meet different criteria based on different zone maps. This confusion could further lead to errors in compliance and could disqualify expected tax credits in many cases. Trying to prevent this confusion would represent an added cost and administrative burden to both manufacturers and consumers. The map of eight climate zones, adopted by ASHRAE and the IECC, is by far the preferable source for the *ENERGY STAR*[®] zone boundaries.
 2. **Glossary.** The definition of a 'skylight' would imply to the casual reader that skylights are glazed only in glass. This statement suggests that skylights are windows, and windows, in the experience of

¹ This letter, representing the recommendations of AAMA's Skylight Council, is referenced on page 1 of the joint AAMA – WDMA letter regarding changes to the *ENERGY STAR*[®] Program.

Richard Karney
November 14, 2008 ~ Page 2

the average person, are glazed with glass. The definitions should be more consistent with those used in the International Codes, as follows:

- **Skylight Unit** – A factory assembled, glazed fenestration unit, containing one panel of glazing material that allows for natural lighting through an opening in the roof assembly while preserving the weather-resistant barrier on the roof.
 - **Skylights and sloped glazing** – Glass or other transparent or translucent glazing material installed at a slope of 15 degrees (0.26 rad) or more from vertical. Glazing material in skylights, including unit skylights, solariums, sunrooms, roofs and sloped walls are included in this definition.
3. **Consulting with the AAMA Skylight Council.** A significant portion of all U.S. skylight industry manufacturers are represented on the AAMA Skylight Council and a straw poll of Skylight Council members present at a recent meeting indicated that none of the members had been directly contacted by the DoE. The Skylight Council requests a list of the skylight manufacturers who were contacted for input during the DoE’s development of these proposed changes. The Skylight Council urges that a broader spectrum of the skylight industry be consulted before any changes are finalized.
 4. **Economic Analysis.** The economic analysis for energy savings is not entirely correct, in that it does not take into account that lowering SHG coefficients proportionally reduces visible daylight as well. The analysis of the NFRC Certified Products Directory was also not vetted as completely as the windows listings. There are many non-production units or experimental units listed in the CPD. This is especially crucial for proper representation of the much more concentrated skylight market. Additionally, argon filling of Insulated Glass Units is becoming a *de facto* prerequisite in improved fenestration; analysis needs to include the likelihood of argon price increases caused by the resulting inevitable increase in argon demand.
 5. **Visible Transmission Considerations.** The following graph displays Visible Transmission data taken from NFRC’s CPD for skylights and plots it versus the Solar Heat Gain coefficient:



Richard Karney
November 14, 2008 ~ Page 3

The proposed *ENERGY STAR*[®] criteria changes do not address the general lighting power density in an interior space. For adequate lighting, the general power density should be between 5 W/m² and 14 W/m². Reducing SHG coefficients will also reduce general lighting power density to the point that skylights will be ineffective at providing an adequate level of lighting without the use of electric illumination.

This could in turn lead to the absurd situation of having to turn on lights during the daytime in an interior space due to insufficient illumination being provided by the skylights. Continued lowering of SHG coefficients could eventually lead to serious hardship in the skylight industry itself, as it would make absolutely no sense to install a skylight if insufficient light is being provided. Daylight efficacy should be reflected in *ENERGY STAR*[®] performance criteria for skylights. Since current NFRC test procedures preclude the availability of certified VT ratings on many popular glazing options used in our members' skylights and tubular daylighting devices, additional evaluation methods need to be developed to test these products.

The recently published DoE report *Commercial Building Toplighting: Energy Savings Potential and Potential Paths Forward* recommends methods to realize very significant energy savings in commercial buildings through the use of daylighting, and particularly toplighting. This report recognizes the value of switching off electric lighting when sufficient daylighting or toplighting is available. The proposed *ENERGY STAR*[®] criteria would reduce the amount of daylight entering an interior space and would increase the consumption of electricity needed to provide sufficient illumination. We recommend that *ENERGY STAR*[®] consider only skylights that allow electric illumination to be turned off, in order to maximize energy savings.

6. **Phase I Compliance.** It is stated that over half of today's skylights already qualify for proposed Phase I levels. The AAMA Skylight Council requests the supporting analysis for this conclusion, given the absence of an "Appendix C" –type study for skylights.
7. **Criteria.** The following table proposes *U-factors* and SHG coefficients for Phase I based on the results of the recent ICC final action hearings in Minneapolis for the IECC and the IRC. Even though these values are based on the 2009 energy codes, many areas of the United States that do not adopt the 2009 codes (and some that do not enforce ANY energy code) can still benefit from savings using the below criteria. The AAMA Skylight Council feels that it is unnecessary for *ENERGY STAR*[®] criteria to be more stringent than Model Energy Codes that are already 'pushing the envelope' as they strive to improve building energy efficiency. Since many energy efficiency measuring tools, evaluation methods, and skylight energy balance methods have not yet been refined, the AAMA Skylight Council feels it is premature to propose future criteria changes beyond Phase I at this time.

Richard Karney
November 14, 2008 ~ Page 4

Climate Zone	Draft Criteria	
	Phase 1	
	U-Factor	SHGC
7 and 8	≤0.6	NR
6	≤0.6	NR
5 and 4 Marine	≤0.6	NR
4	≤0.6	NR
3	≤0.65	≤0.35
2	≤0.75	≤0.35
1	≤0.75	≤0.35

It is also felt that the curb-mounted segment of the skylight market could be severely damaged by the proposed Phase I criteria. Very few currently listed models of this type will meet Phase I criteria, due to the overly conservative measurement procedure used by the NFRC. Since this segment is most prevalent in the existing installed base, establishing such low *U-factors* and SHG coefficients would greatly slow the economical conversion of highly inefficient existing curb-mounted stock to dual-glazed, nearly-qualified options.

8. **Inclusion of Tubular Daylighting Devices (TDDs).** TDDs should NOT be excluded from qualification, particularly in Phase I. It has been suggested that TDD's be lumped in with skylights as to qualifying criteria, but we respectfully disagree. While many of the TDD products currently shown on NFRC's CPD would generally meet current skylight criteria, new data shows that is likely to change as these products are recertified and become subject to the new "test-only" procedure that NFRC has established for these products.

This recommendation for TDDs is even more appropriate given this emerging data - all TDD's should be considered qualified (if a dual diffuser at ceiling level is used, and the air leakage and durability requirements contained in the skylight labeling provisions of the 2003 and 2006 IRC and IBC are met) based on the following facts:

- They are often used where no other fenestration product is feasible; many green building programs even award points in such instances.
- They are effectively "ENERGY STAR® Lighting" qualified, as they require no electricity to operate.
- In addition, TDDs are merely 1.1 square foot or less in area for typical residential installations (at 14 inches in diameter or less), so the actual heat loss or gain per unit is quite small even for *U-factors* above current qualifying criteria. (Given their high light efficacy, this seems reasonable.)

Conclusions: The AAMA Skylight Council request that additional analysis of alternatives to the proposed ENERGY STAR® Program be completed before finalizing the criteria. Further, we request the opportunity to provide input to the analysis and to the selection of skylight criteria used as the basis of the analysis.

*Richard Karney
November 14, 2008 ~ Page 5*

The American Architectural Manufacturers Association and our Skylight Council look forward to partnering with the Department of Energy in finalizing the revisions to the performance parameters and other key considerations of the highly-successful *ENERGY STAR*[®] Program for windows, doors, and unit skylights.

Sincerely,



John W. Lewis, Jr.
Technical Director
American Architectural
Manufacturers Association



Chris Magnuson
President, WASCO Skylights
First Vice-President
AAMA Skylight Council