

September 13, 2013

Mr. Doug Anderson  
Environmental Protection Agency  
1200 Pennsylvania Avenue, NW  
Washington, DC 20460

Re: **ENERGY STAR for Windows, Doors, and Skylights – Version 6.0 Proposed Product Specifications**

Dear Mr. Anderson:

Though critical items to be addressed within the proposed specifications for the 2015 ENERGY STAR Program for Residential Windows, Doors and Skylights remain, the American Architectural Manufacturers Association (AAMA) would like to take this opportunity to thank EPA for acknowledging and addressing several areas of concern, raised during this comment period.

- The decision to postpone ENERGY STAR 6 implementation will substantially benefit homeowners and the ENERGY STAR Program by offering manufacturers adequate time to transition to the revised specifications and ensure product availability across all markets;
- The EPA's adherence to the stakeholder comment and EPA response process remains a key component in the continuing development of appropriate criteria;
- The EPA decision to recognize the AAMA certification label as an indicator of achieving ENERGY STAR air leakage requirements, along with acknowledging industry concerns for properly addressing lead-safe retrofitting procedures, offers confirmation that the established ENERGY STAR criteria development process benefits EPA, consumers and stakeholders.

The following AAMA comments are the result of numerous discussions with fenestration industry leaders. Each recommendation has been thoroughly considered for its impact on industry, the ENERGY STAR program, consumer sentiment and the potential to increase the energy efficiency of U.S. homes.

#### **North-Central Zone U-Factor Criteria**

EPA's decision to increase North-Central climate zone U-factor requirements from  $\leq 0.29$  to  $\leq 0.30$  is appreciated. However, it is equally important to again review the factors that have determined the EPA's decision to maintain the Northern Zone U-factor at  $\leq 0.27$ .

Achieving this target will require significant stakeholder investments, resulting in increased product costs and substantial increases in consumer payback periods, while offering non-substantive energy savings over the Version 5 criteria.

Establishing a 0.29 U-factor in the Northern Climate Zone greatly exceeds the stringency of the 2009 IECC prescriptive requirement of 0.35 and considerably exceeds the 2012 IECC requirement of 0.32.

While AAMA agrees that ENERGY STAR requirements should achieve greater energy performance standards than existing and anticipated code requirements, it is important to note that [currently less than half of the states have adopted and enforce the 2009 IECC requirements](#). Further, the U.S. DOE confirms that [only five states have adopted 2012 IECC requirements](#), with just eleven additional states set to adopt and comply by the 2015 year-end.

States are also beginning to aggressively review the increased stringency standards versus the cost-benefit of IECC 2012 implementation and a trend toward modifying the fenestration requirements to maintain cost competitiveness is now being witnessed.

The AAMA proposed 0.29 Northern Climate Zone U-factor achieves the ENERGY STAR goal of exceeding national code requirements without drastically extending payback periods and substantially increasing product costs.

<b>DRAFT CRITERIA FOR WINDOWS</b>				
	<b>ENERGY STAR FINAL DRAFT U-Factor</b>	<b>ENERGY STAR FINAL DRAFT SHGC</b>	<b>AAMA Recommendation U-Factor</b>	<b>AAMA Recommendation SHGC</b>
Northern	≤ 0.27	Any	≤ 0.29	Any
	= 0.28	≥ 0.32		
	= 0.29	≥ 0.37		
	= 0.30	≥ 0.42		
North-Central	≤ 30	≤ 0.40	0.30	0.40
South-Central	≤ 30	≤ 0.25	0.32	0.25
Southern	≤ 0.40	≤ 0.25	0.40	No lower than 0.25

#### **Average Incremental Product Costs**

To further illustrate the costs and extended payback that will result from establishing a 0.27 U-factor in the Northern Zone, we request that EPA fully consider the following:

In order to accurately report incremental product cost-effectiveness throughout the Northern Climate Zone, any analysis must include triple-pane windows in developing and correctly reflecting payback conclusions.

The exclusion of triple-pane windows in the EPA cost analysis severely understates the conclusions made throughout the “Cost-Effectiveness” portion of Draft 1. Table 5 must include data on triple-pane windows or, consumers will be misled on product payback and cost-effectiveness.

Based on an AAMA survey, the average cost increase over the Best Selling ENERGY STAR windows resulted in more than doubling the EPA’s estimated payback time. In fact, the AAMA data proves the average cost to be more than double the EPA estimated \$34.00 cost increase.

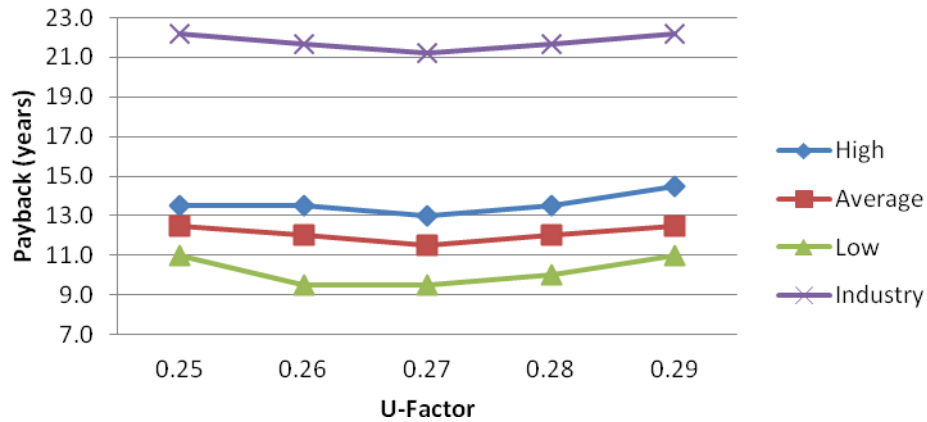
**Table 5: Northern Climate Zone Average Incremental Product Costs**

<b>Zone</b>	<b>U-Factor</b>	<b>SHGC</b>	<b>Average Cost Increase over Best Selling ENERGY STAR Window</b>	<b>AAMA Developed Cost Increase over Best Selling ENERGY STAR Window</b>
Northern	0.27	Any	\$34.00 \$173.00 (Incl. triple-pane)	\$85.38

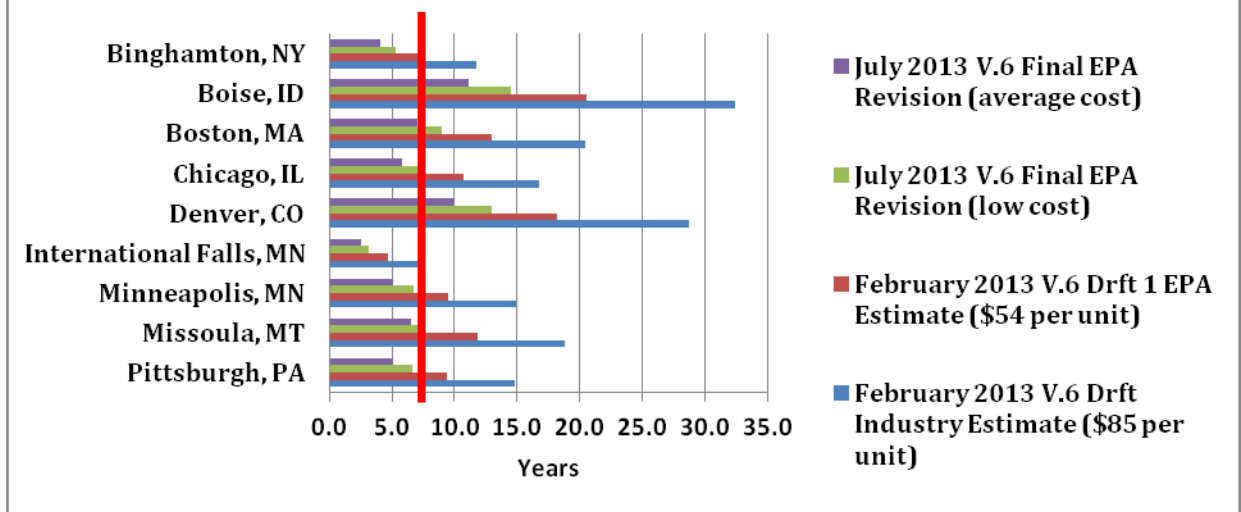
Data used by EPA to develop the incremental cost analysis was based on information received from an extremely limited group of manufacturers, not representative of the breadth of offering and the wide range of manufacturers providing products for sale in the U.S. Therefore, the \$20 incremental increase suggested by EPA is highly inaccurate and significantly understated.

The following chart incorporates industry data into the EPA Figure 8 analysis provided within the "Review of Cost Effectiveness Analysis." This analysis clearly illustrates that Northern Zone paybacks at the EPA proposed 0.27 U-factor soar to an average of 21 years, far exceeding 2010 ENERGY STAR payback periods - and aggressively dismissing the consumer expected payback period of 6-10 years. The staggering 65% - 110% difference between the industry and EPA analysis must be viewed as an indication of the skewed results of the initial analysis.

**EPA ENERGY STAR V6 Final Payback in Northern Zone  
Comparison to Industry Estimate Using Assumed EPA  
Background**



**Comparison of ENERGY STAR Payback Period from V.6 Drft 1  
February 2013 and V.6 Final August 2013 Based on Same Data**



The preceding chart further exhibits the vast discrepancy in payback calculations between EPA and Industry. When developing the ENERGY STAR 2010 criteria, the EPA frequently pointed to the significantly reduced payback calculations as an incentive for consumers to invest in energy-efficient products. During that timeframe, EPA also heavily relied on the substantial 30% tax credit available in 2009-2010 to incentivize consumers to purchase ENERGY STAR products at premium costs. (The following statement excerpted from *U.S. DOE Partner Resource Guide August 2009*.)

**Replacing old windows with new ENERGY STAR qualified models yields between 7 and 15 percent annual savings on household energy bills, which pays for the price premium in one to six years.** Based on the historic and ongoing strategic marketing efforts of the ENERGY STAR Program, consumers clearly equate ENERGY STAR product purchases with reasonable payback periods. Although a cost premium is expected, these additional costs cannot be so great that homeowners are deterred from investing in increased energy-efficiency and revert to purchasing far less efficient products offered at significantly lower price points.

Utilizing a 0.29 U-factor in the Northern Zone will fulfill the ENERGY STAR mission of offering consumers enhanced energy-efficiency, while assuring consumers that these purchases will continue to result in anticipated and expected payback periods.

### **Door Criteria**

EPA's earlier decision to adjust the U-Factor maximum to 0.25 was sound, and will now allow full-lite and ½ lite doors to use the same glass package. However, to ensure that window trade-off options included within the final specifications do not impede the ability to match the glazing color options of full-lite doors, we again strongly recommend that EPA establish a similar trade-off option for > ½-lite doors in the Northern Zone. We recommend a U-Factor of 0.32 if the SHGC is ≥ 0.40. Consumers want a consistent look in the exterior their home. This essential change should reduce the strong likelihood of glazing color mismatch of residential fenestration.

Utilizing climate zone specific SHGC criteria also presents an issue for some manufacturers who do not currently use climate zone specific labeling. The requirement for new labeling on millions of products is not cost effective.

A more realistic approach would require all > ½-lite doors remain at 0.30 SHGC (exclusive of trade-off allowances). This would significantly reduce the number of doors that would require a change to labeling requirements.

DRAFT CRITERIA FOR DOORS					
Glazing Level	ENERGY STAR DRAFT 2 U-Factor	ENERGY STAR DRAFT 2 SHGC		AAMA Recommendation U-Factor	AAMA Recommendation SHGC
Opaque	≤ 0.17	No Rating		≤ 0.19	No Rating
≤ ½ - lite	≤ 0.25	≤ 0.25		≤ 0.25	0.25
		Climate Zone			
> ½ - lite	≤ 0.30	Northern North-Central	≤ 0.40	Northern Zone	≤ 0.30 trade-off = 0.32 if SHGC is ≥ = 0.40
		South-Central Southern	≤ 0.25		

### **Door Cost-Effectiveness Analysis**

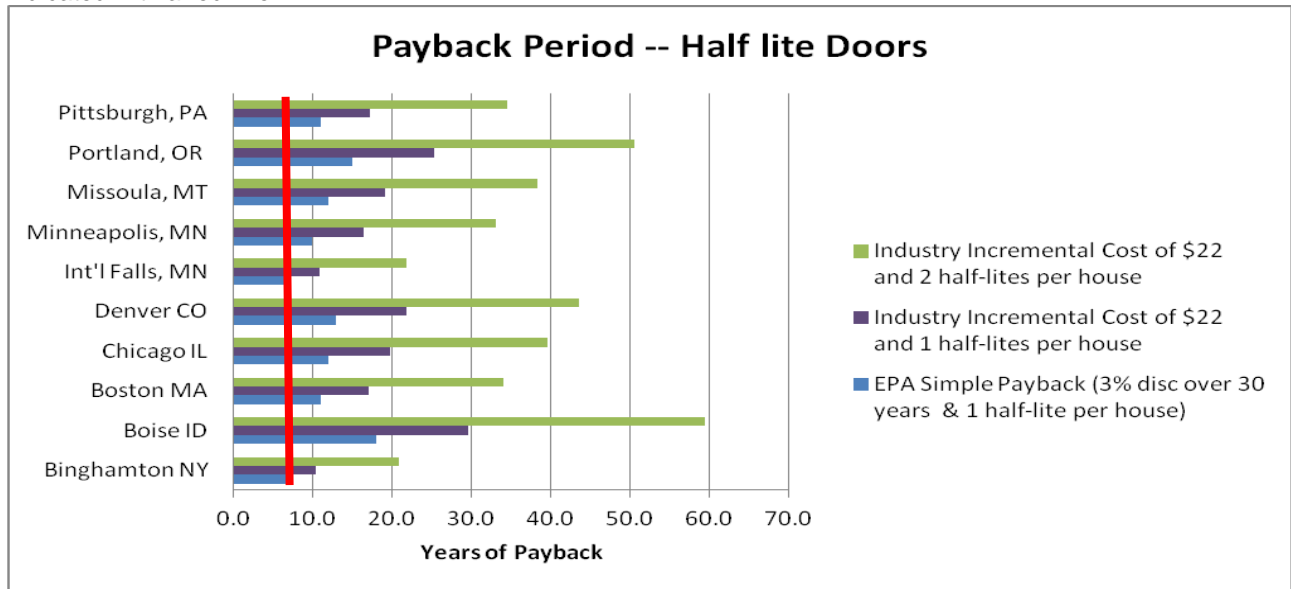
The July 2013 "Review of Cost Effectiveness Analysis" does not address the comments provided by industry on the criteria for doors. Many manufacturers made comments to Version 6, Draft 1, and Draft 2, which indicated the changes to criteria for doors offered no payback, and would only serve to increase prices to the consumer.

The EPA stated in the Version 6, Draft 1 Analysis Report, that changes to the qualification criteria for opaque doors will offer no energy savings, and energy savings for full-lite doors were rounded down to zero by RESFEN. Based on these facts, the U-value and SHGC changes proposed by EPA simply damage the affordability of the product without providing any payback to the consumer. These two points alone render any changes to the ENERGY STAR program for doors unjustifiable.

In addition, EPA indicates there will be minimal incremental cost for half-lite door changes, but analysis by door manufacturers (illustrated in the following chart) indicates the cost is nearly double the EPA estimate.

There should be no change to half-lite doors, as there are no energy savings with reasonable payback to the consumer. For example in Boise, which is a heating dominated climate, the payback period is 18 years by EPA v.6 final estimates, and 60 years by Industry estimates. Neither payback estimate is acceptable for consumers.

EPA v.6 Final and Industry Payback Comparison for Half-lite Doors with consumer expected payback of seven years indicated with a red line.



In response to Comment 10 of the v.6 final specifications, industry submits that changing the type of insulation in an opaque door to achieve 0.17 will use materials that cost at least 10% more. There will be **NO energy savings**. Why would the consumer pay a higher cost with no payback in energy savings? This type of situation will only serve to undermine the integrity of the program. EPA is basing their conclusions on “no additional cost”, and it is simply not true.

### **Recycled Material Requirements**

Due to the varying fenestration materials and product types recognized by the ENERGY STAR program, AAMA suggests that consumers be directed to the [EPA's Building Materials Reuse Center](#) website. This website directs consumers to area Recycling Centers and offers additional important evidence on the benefits of recycling and conservation.

### **Skylight and Tubular Daylighting Devices (TDDs)**

The EPA continues to dismiss the overall benefits of daylighting on humans and the energy savings realized by reducing the need for artificial lighting. By disregarding this major product attribute, the ENERGY STAR program for skylights and TDDs continues to result in prohibitive manufacturing costs and significantly decreases the energy-efficient advantages provided by these products.

AAMA continues to urge EPA take the necessary steps to separate the criteria for TDDs and skylights. Skylights and TDDs must be recognized as separate and individually effective energy conservation products. Continuing to apply the same performance criteria to TDDs and skylights results in inaccurate comparisons and ultimately provides erroneous conclusions for builders and homeowners.

EPA proposed SHGC limits will remain difficult for both products to achieve without major reductions in transmitted light; **defeating each products' purpose of delivering daylighting and value to consumers.**

### **Tubular Daylighting Devices**

TDDs are used in many places where skylights cannot be used. Their design and function differ to meet significantly distinctive consumer needs which serves to justify separate criteria.

Although EPA suggested in October, 2011, the ENERGY STAR 6.0 Development period would be used to address the significant distinctions between Skylights and TDDs, the initial proposed specifications showed the EPA decided again to place on hold the decision to properly account for Tubular Daylighting Devices within the ENERGY STAR program. Postponement of appropriate recognition of the valued performance of these products until Version 7 is issued is an unacceptable option.

AAMA asks EPA to recognize the following updates pertaining to TDDs:

- Once new testing data is available for review, AAMA requests that an interim Version 6.0 ENERGY STAR Addendum be issued, which includes separate qualification criteria for TDDs. NFRC has approved procedures for VT ratings for TDDs (NFRC 203), which will allow TDDs to meet emerging code requirements for minimum VT. A testing apparatus is currently under construction, and should be available, and accredited, to this procedure by early 2014. Also, proposals are being considered to modify NFRC's size adjustment formula for TDD U-factors, which may affect those ratings as well.
- AAMA encourages a study evaluating light to solar heat gain ratios (LSG) relative to TDDs, based on this new data. EPA should reevaluate assumptions that SHGC reductions do not affect daylight availability, particularly for TDDs.
- AAMA asks EPA to justify the methodology used in calculating the percentage of qualifying TDDs based on the CPD review discussed in the Draft 2 Version 6.0 Criteria for Skylights (comment 1 response). It is not apparent how the percentages can be added without knowing the numbers in each climate zone.

### **Skylight Criteria Development**

EPA has not technically justified SHGC criteria for skylights in the Southern and South-Central zones that are lower than 2012 IECC skylight requirements. Window criteria in both zones is at code maximum, therefore the same relationship should be applied to skylights resulting in SHGC criteria of 0.30.

### **Economic Analysis**

To conduct the cost analysis for windows, EPA correctly chose to examine double-hung windows as, according to EPA statements, they were found to be *"...the most commonly sold type of window and are also typically the worst performing by virtue of their low glass-to-frame ratio. By basing its decisions primarily on the performance of double-hung windows, EPA is taking a conservative approach towards specification development."*

EPA's examination of skylight costs should have employed these same principles, however it did not. Skylight products vary greatly and are not interchangeable as assumed within EPA's cost analysis. To properly assess costs, applying the techniques used for window analysis, data on the most commonly sold "curb mount" type (42% of market share) should have been utilized to qualify assumptions on projected cost increases and product payback periods.

AAMA asks EPA to once again, conduct a suitable and accurate cost analysis based on the information provided, and assess the revised data before finalizing the Version 6 criteria. AAMA Members have offered to be available to EPA with any assistance needed in conducting this revised analysis.

### **Skylight/TDD U-factor Requirements**

Understanding that further increasing stringency values results in the disruption of the intent of skylights and TDDs to reduce electrical load demands, the 2012 IECC prescriptive U-factor requirements of 0.55 for both the Northern and North-Central Climate Zones will be maintained in the 2015 IECC based on the actions taken during recent ICC code development hearings.

Establishing ENERGY STAR skylight and TDD requirements that surpass national codes by 13+% far exceeds the increases in stringency required of other ENERGY STAR products. Forcing the achievement of a 0.48 U-factor will significantly alter both the cost and availability of compliant product.

The proposed 0.48 U-factor in both the Northern and North Central Climate Zones disqualifies approximately 80% of double-pane curb mount skylights available today. A slight increase to a 0.50 U-factor maintains a 10% stringency improvement over the 2012 IECC values and allows the number of eligible products within the CPD to double from 6% to 12% while carrying only an equivalent or slightly higher incremental cost increase.

Additionally, as it is assumed that qualifying skylights and TDDs will soon be incorporated into the ENERGY STAR “Most Efficient” program, it is difficult to ascertain how EPA will expect manufacturers to achieve greater stringency values to meet any proposed “Most Efficient” Program criteria without further sacrificing the performance attributes and benefits of these products.

DRAFT CRITERIA FOR SKYLIGHTS								
	U-Factor				SHGC			
Climate Zone	Current ES Criteria	EPA Draft Criteria	DOE Proposed 2015 IECC	AAMA Recommendation 2012	Current ES Criteria	EPA Draft Criteria	DOE Proposed 2015 IECC	AAMA Recommendation 2012
Climate Zone	Maximum U-Factor	U-Factor	U-Factor	Maximum U-Factor	Maximum SHGC	SHGC	SHGC	Maximum SHGC
Northern	0.55	≤ 0.48	0.55	0.50	Any	Any	NR	Any
North-Central	0.55	≤ 0.48	0.55	0.50	0.40	≤ 0.35	0.40	0.40
South-Central	0.57	≤ 0.50	0.55	0.55	0.30	≤ 0.28	*0.20/0.25	0.30
Southern	0.70	≤ 0.60	Z1-0.75 Z2-0.65	0.65	0.30	≤ 0.28	*0.20/0.25	0.30

\* Exception: Skylights may be excluded from glazed fenestration SHGC requirements in Climate Zones 1 through 3 where the SHGC for such skylights does not exceed 0.30.

### **Future Fenestration Criteria Development**

The current ENERGY STAR windows, doors, and skylights criteria development process of EPA-issued criteria proposals, followed by stakeholder comment, is a cornerstone to the success of the ENERGY STAR program. Stakeholder involvement through comment periods and in-person meetings throughout the advancement of the ENERGY STAR program, continues to be a crucial component in creating a program that greatly enhances product availability and results in consumer satisfaction.

### **Conclusion**

The intent to take definitive steps toward incentivizing *all* homeowners to reduce their energy use is shared by EPA, industry stakeholders and the U.S. Government. However, it continues to appear that the direction to accomplish this goal substantially differs among the entities involved.

AAMA strongly disagrees with the EPA response “The ENERGY STAR designation is meant to **help consumers upgrade to the more energy efficient product when those consumers have already made a decision to purchase.**”

To effectively reduce the annual energy consumption in America, the estimated one billion single-pane windows in U.S. homes need to be replaced with more energy-efficient double or triple-pane options. To help drive this massive need for retrofitting; ENERGY STAR products must be marketed and made available as an affordable option to low- and middle-income consumers, while understanding that the substantial 30% tax credit that previously encouraged consumers to invest in these products, no longer exists.

The ENERGY STAR Program is widely recognized and enjoys a powerful platform to impact consumer decision-making. Using this platform to encourage homeowners with severely underperforming products to invest in energy-efficient retrofitting will propel the U.S. toward its goal of reduced energy consumption.

AAMA firmly believes that the EPA's intent to substantially reduce market share to less than 25%, and significantly drive up qualifying product costs, will force consumers to choose between ENERGY STAR fenestration products and the vast assortment of non-qualifying products that will not alter a home's efficiency.

The introduction of the ENERGY STAR "Most Efficient" Program should serve to alleviate the need for severely narrowing the field of ENERGY STAR qualifying products. The "Most Efficient" program should be viewed as the tool to persuade more affluent consumers toward greater energy savings, leaving the ENERGY STAR Program intact to address the severely underperforming products now contained in homes across the U.S.

We fully appreciate the work and dedication of those involved in developing and supporting the ENERGY STAR program. As industry leaders, the more than 300 member companies of AAMA aspire to maintain a practical, consumer-oriented program that assures its continued success. AAMA members remain dedicated to providing input to EPA to help create a workable, affordable consumer-friendly program that achieves the goal of helping Americans save energy in their homes.

Thank you for this opportunity to comment on the proposed revisions to ENERGY STAR. We are available to discuss any of our recommendations, at your earliest convenience.

Sincerely,



Rich Walker  
President and CEO  
American Architectural Manufacturers Association