



March 25, 2009

United States Department of Energy, ENERGY STAR® program
Re: Window and Door Manufacturers Association ENERGY STAR comments

Attention Richard Karney:

Dear Richard:

The Window and Door Manufacturers Association (WDMA) is pleased to provide the DOE with these additional comments on the March 11, 2009 ENERGY STAR Windows, Doors, and Skylights Revised Draft Criteria and Report.

WDMA commends DOE for addressing the concerns and comments we submitted in November and December 2008 relating to both the Draft Criteria and the Additional Requirements. Specifically, we commend DOE for:

- Simplifying the program for windows and skylights to four zones instead of six
- Eliminating Zone 5a and its corresponding criteria
- Maintaining a single national zone for doors
- Naming the zones by their climate location, rather than by number
- Simplifying the U-Factor and SHGC trade offs for windows in the Northern zone
- Clarifying the ½ lite criteria for doors to correctly account for glazing type
- Eliminating the requirement for printing the full CPD number on the NFRC temporary label
- Deferring the issue of IG certification to NFRC
- Agreeing to work with WDMA and AAMA to expand the Study of the U.S. Market for Windows, Doors and Skylights to incorporate aggregated shipment reporting data
- Delaying analysis of Phase 2 until after completion of Phase 1

While we believe that the March 11, 2009 Revised Draft represents a considerable improvement, we offer the comments below, supported with more detail on the following pages. WDMA recommends:

- That the transition timeframe for Phase 1 apply to products manufactured after 3/31/2010, not to those in the distribution chain, and that the Phase 1 ENERGY STAR Product Label include identification that the product complies with the 2010 program.
- That several window U-Factor and SHGC criteria be revised to better reflect DOE's move away from 6 to 4 climate zones.
- That the door criteria be revised to require all doors (entry and patio, swinging and sliding) to be qualified using the door table of values.
- That tubular daylighting devices (TDDs) be included in ENERGY STAR program, permitting them to qualify with the same criteria as skylights.
- That consideration is afforded in the U-Factor criteria for products with IG units that are identified as including a breather tube.

- That printing of the ENERGY STAR U.S. map be optional on the ENERGY STAR product label.
- That DOE consider using the 4-zone North American climate zone map and the corresponding U-Factor and SHGC criteria proposed by WDMA in November 2008.
- That Phase 2 development begin as soon as possible following completion of Phase 1, and that Phase 2 consider the embodied energy used to produce ENERGY STAR qualifying products.

WDMA realizes the difficulty DOE faces in changing the climate zone map as WDMA recommends. We therefore have structured our comments on specific U-Factor and SHGC criteria using the 4 climate zones and zone areas as now proposed by DOE.

Phase 1 Transition: WDMA recommends that the transition timeframe for Phase 1 apply to products manufactured after 3/31/2010, not to those in the distribution chain, and to further add a requirement that the Phase 1 ENERGY STAR Product Label include identification that the product qualifies to ENERGY STAR Program Revision “D” (the 2010 program). Requiring manufacturers to either remove from distribution or re-label all products within the distribution chain that are essentially older than 3 months would be an enormous economic burden that can be easily solved by adding the date of the new ENERGY STAR program to the new program label. Time and normal market pressure will eventually clear products with older labels from the distribution chain. Incentive programs and other interested parties could then easily reference and recognize the new product label only, if they so choose.

Window Criteria: WDMA is concerned with some of the proposed windows criteria, largely related to those values in relation to the differences among the areas included within the DOE August 11, 2008, 6-zone map, the 4-zone map recommended by WDMA and the 4-zone map in the current DOE Draft. The highlighted areas in the table below show WDMA recommendation for revising the criteria, followed by our rationale.

Zone	Revised Draft DOE Phase 1		March 2009 WDMA Recommendation	
	U-Factor	SHGC	U-Factor	SHGC
Northern	≤ 0.30 0.31 0.32	NR ≥ 0.35 ≥ 0.40	≤ 0.30 0.31 0.32	NR ≥ 0.20 ≥ 0.25
North-Central	≤ 0.32	≤ 0.40	≤ 0.32	≤ 0.35
South-Central	≤ 0.35	≤ 0.30	≤ 0.35	≤ 0.30
Southern	≤ 0.60	≤ 0.27	≤ 0.55	≤ 0.30

- **Northern Zone:** The new Northern zone does appropriately limit the maximum U-Factor to 0.32 for this cold climate region. Lower U-Factor products will have warmer room-side surface temperatures during cold winter nights and hence deliver better comfort for the occupant. The March 22, 2009 DOE Northern zone combines the ES4 and ES5 from the DOE August 11, 2008 Phase 1, 6 zone proposal

and uses the more stringent 5:1 SHGC trade-off across this larger region. As shown in earlier WDMA analyses, expanding one set of criteria across a broader zone leads to inherently larger energy savings.

WDMA recommends that the trade off values in the Northern Zone be changed as shown in the table above. Figure 5 from the August 11, 2008 DOE proposal derived an SHGC of 0.15 at a U-Factor of 0.30. The March 11 DOE revision ramps up the stringency by “presuming” a 0.30 SHGC at that same point and increasing SHGC at the 5:1 ratio. This increases the stringency across this entire broader region and leads to a serious disconnect at the border between the Northern and North-Central zones. On the “north” side of the line, a 0.32 U-Factor windows must have $SHGC \geq 0.40$ while “south” of this line, that same U-Factor window must have an $SHGC \leq 0.40$.

Keep in mind also that the energy analysis uses a “bulk average” technique – it presumes uniform window distribution for all buildings and that all occupant operation is idealized (interior shades open in winter and closed in summer, thermostat setbacks, etc.). It’s unlikely that the analysis behind the energy savings has enough precision to support this dramatic shift across such a narrow geographic region.

- **North-Central Zone:** WDMA recommends setting the maximum SHGC for this region at 0.35. This value represents an increase in stringency and aligns the SHGC criteria with products that can actually be produced. Table 8 in the DOE August 11, 2008 Phase 1 analysis shows that for a U-Factor of 0.32 the SHGC will be 0.27 ± 0.06 . The DOE proposed SHGC maximum of 0.40 for the North-Central is not required for ENERGY STAR to be considered better than code and doesn’t account for BTU savings from real products in compliance with the proposed U-Factor.
- **Southern Zone:** WDMA believes that the proposed 0.60 U-Factor requirement is too lenient, and too much of a change from the 0.50 U-Factor proposal in earlier DOE recommendations. WDMA recommends a U-Factor of 0.55 as a compromise, with a corresponding change in SHGC to 0.30. Changing SHGC to 0.30 equates to the value for the South-Central zone where the DOE analysis shows the highest energy savings.

Door Criteria: WDMA supports the continued DOE position for a single climate zone for doors as well setting the qualification criteria by percent glazing. However, WDMA respectfully requests the following modifications:

Glazing	Revised Draft DOE Phase 1		March 2009 WDMA Recommendation	
	U-Factor	SHGC	U-Factor	SHGC
Opaque	≤ 0.21	NR	≤ 0.21	NR
$\leq 1/2$ lite	≤ 0.27	≤ 0.30	≤ 0.27	≤ 0.30
$> 1/2$ lite	≤ 0.32	≤ 0.30	≤ 0.34	≤ 0.30

- **Door Swing and Location:** WDMA recommends that all exterior doors be qualified and labeled using the door table, regardless of location of the door on the building, manner of door operation (swing or slide), or door construction style. Many door manufacturers utilize a door and glazing design that is configured with one of several hardware options which determine the operation of the

door assembly. For these manufacturers, the same specific door/glazing design becomes a component of a side-hinged entry door, a side-hinged patio door, or a sliding patio door assembly; the only fundamental difference is how it operates. To avoid confusion and complication, ENERGY STAR criteria should consider all door assemblies in like manner and not distinguish by operation. However, if the U-Factor limits stay at 0.32, some energy-efficient full-lite sliding door configurations may not be able to qualify, as they would if they were qualified using the window table. Thus, WDMA is also recommending that the U-Factor for >1/2 lite doors be revised to ≤ 0.34 .

- **Definition of 1/2 lite:** A definition is needed for precisely what constitutes a 1/2 lite door. WDMA believes this definition should be consistent with the NFRC definition use to rate products. Therefore, 1/2-lite should be defined as less than or equal to 900 sq. inches of glazing area.

Tubular Daylighting Devices (TDD) Criteria: The primary purpose of skylights and TDDs, unlike other fenestration products, is providing a source of free natural daylight. WDMA agrees with the U-Factor and SHGC values proposed for skylights. However, WDMA continues to recommend inclusion of TDDs in ENERGY STAR, permitting them to comply with the same criteria as skylights. NFRC obtains and lists valid U-Factors for TDDs, within an acceptable range of accuracy, and has not chosen to remove these listings. While not explicitly included or excluded, TDDs are currently allowed to qualify for the current ENERGY STAR program using these NFRC values. ENERGY STAR should continue to recognize these products and also continue to monitor the status of TDDs in the NFRC Certified Products Directory.

High-Altitude Products: WDMA believes it is critical for Phase 1 that ENERGY STAR account for the need for IG manufacturers to include breather tubes in units that are being shipped through or shipped for use in high-altitude areas. These breather tubes are required to allow the internal pressure within the IG to equalize to lower atmospheric pressures at high altitude to prevent IG unit failure. The presence of breather tubes affects the NFRC U-Factor. ENERGY STAR criteria, however, requires the same U-Factor for IG units, regardless of whether or not they are required to contain a breather tube because of the altitude of their use. WDMA recommends an adjustment of 0.04 to the U-Factor for IG units that are identified as including a breather tube. This will allow ENERGY STAR products to be qualified in high altitude regions where the use of breather tubes is necessary.

Product labeling: WDMA continues to request that DOE make printing the US map on the ENERGY STAR product label optional. Given the continual increase in window, door and skylight labeling requirements nationally and by regions/states, the required size of product labels is continually increasing. Understanding the ENERGY STAR climate zones and a products' qualification in a particular zone is important on product displays or at information at retail counters when consumers are making product choices. Making the US climate zone map optional, but alternatively requiring a list of the climate zones on the label would provide much relief in space requirements on product labels.

ENERGY STAR Zone Maps: While WDMA commends DOE for simplifying the climate zone map, we continue to recommend that DOE use the North American Climate Zone map we provided to DOE last November. Our zone map forms the basis for many of the technical recommendations accepted by DOE, but they are now applied to a zone map different from what we proposed. It is difficult to correlate the potential energy savings and impact of some of the new technical provisions unless the original map is

also used. We urge DOE to consider using our original climate zone map, and to use the U-Factor and SHGC coefficients as we had proposed in November 2008. Full justification for North American Climate Zone map was included in our November 2008 comments.

WDMA North American Four Climate Zone Map



As an alternative, WDMA recommends that Phase 1 use the existing 2005 ENERGY STAR map. The current ENERGY STAR and DOE proposed climate zone maps aren't that different from one another, but significant effort will be needed by ENERGY STAR partners to reprint and re-educate users in areas where the maps have changed from one zone to another.

Phase 2 Criteria Implementation Schedule: WDMA commends DOE for delaying analysis of Phase 2 until after completion of Phase 1. However, WDMA urges that DOE begin development of Phase 2 as soon as possible after completion of Phase 1. Manufacturers will need as much lead time as possible to re-engineer whatever products are required to meet final Phase 2 criteria. The longer the lead time between announcement of the final numbers and their effective date, the better. Beginning the development of Phase 2 as soon as possible helps lengthen this lead time.

WDMA continues to believe that the consideration of the embodied energy required to produce some of the re-engineered products that will be needed to meet Phase 1 and Phase 2 ENERGY STAR is necessary to provide a complete picture of the resultant energy savings. As we stated in our previous comments, the energy required to produce additional layers of glass, coatings, and additional framing materials must be considered along with the in-use energy efficiency of the product when determining total energy savings and economic payback.



WDMA is eager to work with LBNL to ensure a complete understanding of the energy savings potentials of all possible Phase II criteria, and consistency of modeling and input across climate zones and product types.

Summary: WDMA is grateful to the DOE and program staff for their interest in the ENERGY STAR windows, doors and skylights program. WDMA remains committed to support the efforts of our members who are the partners of the DOE.

Respectfully Submitted:

A handwritten signature in black ink that reads 'Jeffrey F. Lowinski'.

Jeffrey F. Lowinski
Vice President, Advocacy & Technical Services
Window & Door Manufacturers Association