Window & Door Manufacturers Association
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November 14, 2008

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 comments on the proposed revisions to the ENERGY STAR window, door, and skylight criteria. WDMA is a trade association representing the premier manufacturers of residential fenestration products in the United States. WDMA's members are active in responsible advocacy on a wide variety of issues affecting the industry, and improved energy efficiency is one of the most important. During the ENERGY STAR review period, WDMA has conducted a series of meetings and conference calls with representatives of our member companies to study the proposed criteria and all program elements. WDMA staff and members have logged hundreds of hours performing analyses of the criteria and the reported energy savings. We are attaching much of that work product to this comment for your review.

Background and WDMA Guiding Principles

During our preparation for the stakeholders meeting, WDMA developed a statement of intent and guiding principles for our position on the ENERGY STAR program. WDMA's intent is to collaborate with the DOE to reduce energy consumption in existing and new homes, recommend increased enforcement of model energy codes (particularly the 2006 IECC), support the use of ENERGY STAR as a means to communicate more energy efficient choices for builders and homeowners, and to work with the DOE to drive innovations and technologies to develop affordable and efficient fenestration products.

WDMA's participation in the ENERGY STAR criteria development is based upon the following guiding principles:

- The existing stock of single-pane windows, skylights and glass doors in the US represents the single-greatest opportunity to reduce energy use in the fenestration portion of the building envelope.
- Affordability is a critical element of the decision-making process, and is necessary to achieve the desired effect and consumer decision.
- Energy savings must provide upfront savings if the criteria are intended to drive consumer behavior. Without the benefit of a reasonable return on the decision to purchase ENERGY STAR products, the program will lose any relevance to the consumer.
- WDMA believes that the dates of implementation of the new criteria must take into consideration the logistics and seasonality of product manufacturing as well as the timing of new product launches.

Criteria Implementation Schedule

WDMA believes that scheduling of effective dates of new criteria for ENERGY STAR should take into consideration the following points:

- New product introductions are best accomplished on a calendar-year basis, due to the annually cyclical nature of the building products industry. Given the historical slowdown during the winter months and lower new construction activity, the first of January is the best date to begin shipping products labeled to the new criteria; thus, Phase 1 criteria should become effective for products manufactured on or after January 1st, 2010.
- Phase 2 criteria should coincide with the release of the 2015 International Energy Conservation Code (IECC), January 1, 2015, and should become effective for products manufactured on or after January 1, 2015. Once the criteria are set, any effective date earlier than 2015 will likely stimulate IECC code proposals. If the effective date for ENERGY STAR is earlier, proposals will be submitted to the IECC for the 2012 edition. Leaving the date for Phase 2 at 2015 will provide technical justification to keep the IECC and ENERGY STAR on parallel tracks.
- WDMA recommends the release of the Phase 1 criteria in early 2009, but holding the Phase 2 criteria until sufficient time for completion of a comprehensive analysis of the

proposed performance values. Having two sets of values in the market at the same time might add to consumer confusion should a producer jump the gun for Phase 2.

Embodied Energy Issues. Recent environmental and energy efficiency debates at the national level have included a broader consideration of the cradle-to-grave product characteristics including the evaluation of the embodied energy necessary for the production and transportation of products. In fact, in the attached letter from Congress[1] dated September 19, 2008, Senator Clinton and others urged the DOE to include product characteristics beyond direct energy consumption such as lifecycle energy use and environmental impact considerations. For example, any move towards triple glazing as a basis for window requirements should include an analysis of the energy required to produce the additional layer of glass, coatings, and additional framing materials. Comparison of that "embodied energy" is critical to provide a complete picture of the resulting energy savings.

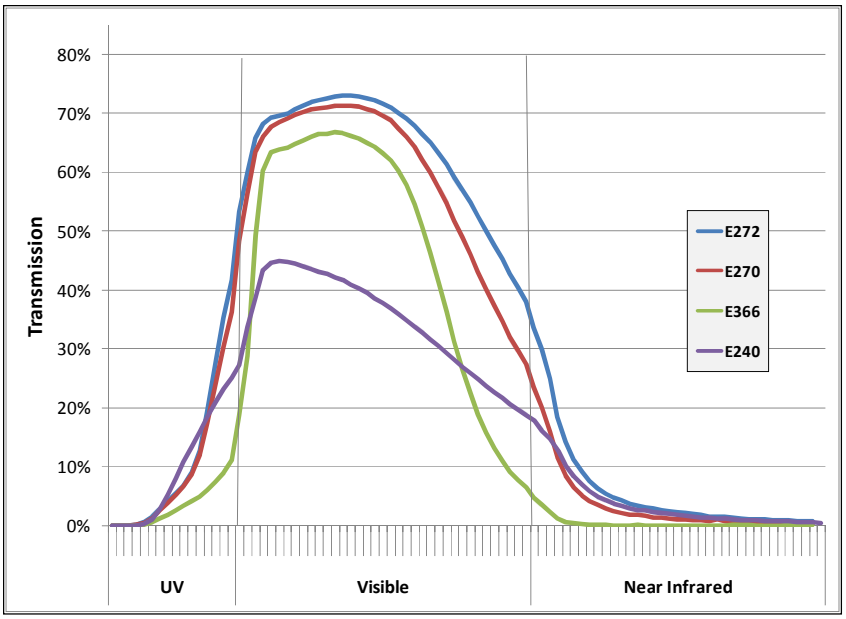
WDMA Performance Criteria Recommendations

Visible Light. Windows, skylights and doors are an important element of residential construction in the U.S., providing the well-documented benefit of natural light and ventilation to the occupants. Excessive reductions in solar gain will result in unacceptably low natural daylight. (See Fig. 2) The ENERGY STAR requirements should limit SHGC criteria reductions in order to maintain the performance of glazing packages, (See Fig. 1) and allow natural lighting sufficient for the comfort of the occupants, and the possible reductions in lighting energy consumption.

Figure 1: Cardinal Glass Study of Visible Light and SHGC

Window SHGC (max)	Glass SHGC needed to Comply as a Function of Frame Area Fixed Window ---------- Operable Window				
	15%	20%	25%	30%	35%
0.40	0.47	0.50	0.53	0.57	0.62
0.35	0.41	0.44	0.47	0.50	0.54
0.30	0.35	0.38	0.40	0.43	0.46
0.25	0.29	0.31	0.33	0.36	0.38
0.20	0.24	0.25	0.27	0.29	0.31

Figure 2: Cardinal Glass Analysis of Visible Light Properties



Glazing Package	Glass Properties	
	VT	SHGC
LoĒ²-272	72%	0.41
LoĒ²-270	70%	0.37
LoĒ³-366	66%	0.27
LoĒ²-240	40%	0.24

Energy Savings Analyses

WDMA has concerns over the methodologies used in calculating aggregate energy savings. The savings calculated by LBNL and reported in the DOE Draft Criteria document are used as a basis for revising Energy Star. Potential errors and inconsistencies in the analysis suggest that the true savings potential is not yet known. These concerns need to be addressed before announcing the new criteria. Figure 9 shows additional information regarding combinations of products used in the LBNL analysis. Many of the products listed in Figure 9 do not meet the prescriptive requirements of the 2009 IECC. Figure 10 includes examples of discrepancies in the energy savings analyses between cities with similar climates. Despite concerns over the analysis, WDMA used the information provided at //windows.lbl.gov/EStar 2008/ to estimate a comparison of annual savings from the WDMA proposal to the DOE criteria proposal. WDMA's estimate is that WDMA's zone and criteria proposal will save as much or more energy. Again, WDMA requests improvements and clarifications to the analysis procedure in addition to verification of our estimate of greater energy savings. These concerns support the WDMA recommendation that the Phase 2 criteria will require further study and analysis.

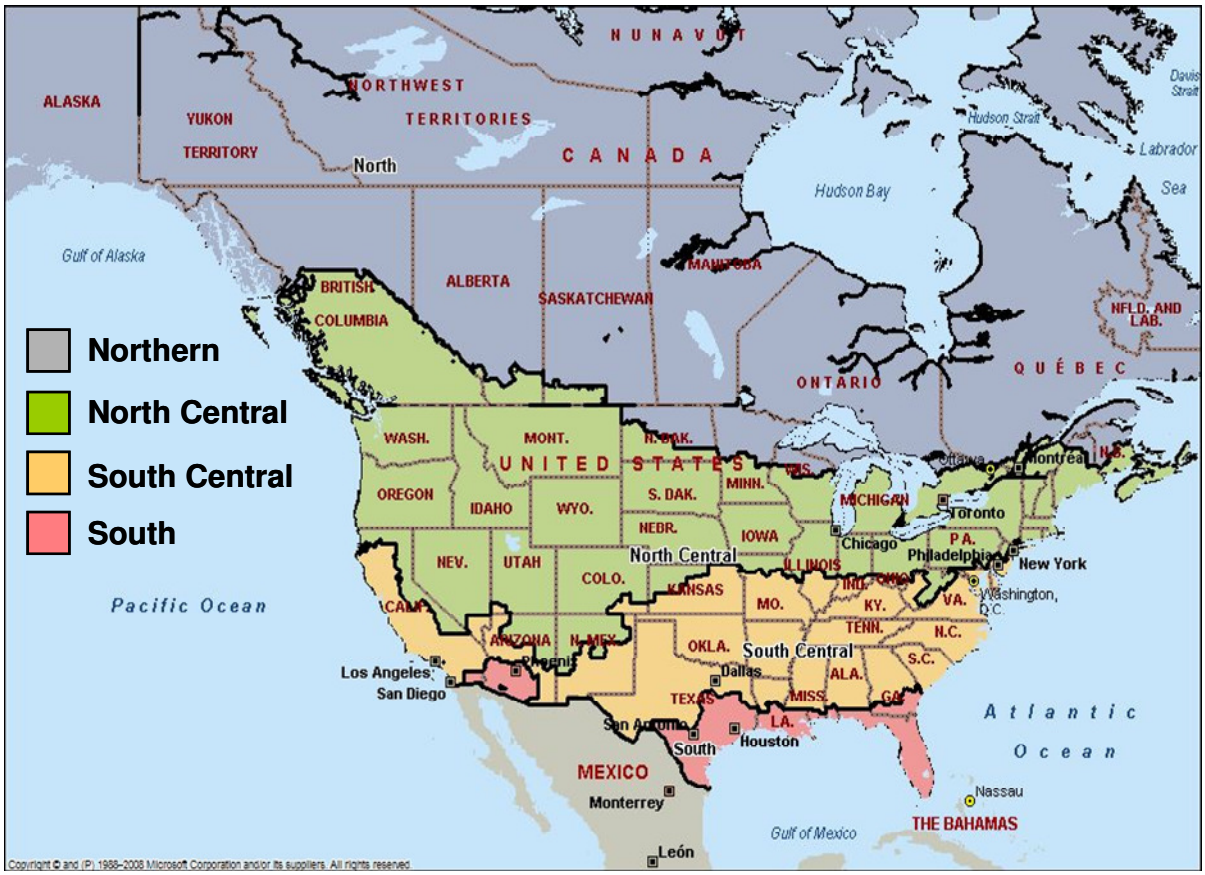
ENERGY STAR Zone Maps

WDMA is concerned with the increased complexity of the proposed criteria for Phases 1 and 2. Additional climate zones and northern zone trade-offs with upper and lower limits will likely add unnecessary confusion to the consumer. No other ENERGY STAR product program contains

such complexity. WDMA recommends a simple four zone map (See Fig. 3) that will provide the benefits below. This map serves as the basis for Figures 4 and 6.

- Simplicity and ease of use for the consumer and specifier. The DOE submitted an IECC proposal in 2003 that ultimately resulted in a simplified model energy code. The DOE proposal created an IECC climate map with eight zones. During debate on this item at the IECC hearings, the DOE presented testimony supporting the positive effect of simplified requirements in consumer awareness and compliance.
- Alignment with ENERGY STAR Canada. Manufacturers who market products throughout North America will benefit from consistent criteria that make sense to the consumer. The ENERGY STAR brand would be weakened if applied inconsistently.
- Alignment with the current IECC zones will simplify labeling and collateral materials, helping educate the consumer and enhancing the program.
- The four zone map and suggested criteria are based on IECC winter design temperatures.
- Equivalent or greater estimated annual energy savings[2] than the DOE proposed criteria.
- Improved labeling and inventory logistics for product manufacturers. Labeling complexity adds cost to the program without benefit to the consumer.

Figure 3: WDMA Four Climate Zone Map



Window Criteria. WDMA has concerns with the proposed windows criteria. We have identified a list of questions regarding the energy savings analyses, payback period, and tradeoff benefits and have shared those concerns with the DOE. Because of our concerns, as well as the timing issues, WDMA strongly recommends delaying the completion of Phase 2 criteria until on or after the announcement of the final Phase 1 values to the marketplace. The WDMA approach to the phase 1 values includes the following assumptions and concerns:

- **Technology.** The Phase 1 base product performance should be based upon the best currently available technologies.
- **Trade-offs.** Northern zone trade-offs have not demonstrated equivalent energy savings, and are presented despite DOE publications cautioning against trade-offs where solar heat gain is at issue. The only basis that would be acceptable for such trade-offs is a thorough analysis that demonstrates a worst-case scenario. Without such consideration, the effects of orientation or consumer behavior on the projected energy savings are ignored. Absent such an analysis, there is substantial risk of consumer dissatisfaction for reasons of comfort and increased energy costs. (See Attachment B)
- **SHGC.** SHGC minimums must be set no lower than 0.25. The WDMA analysis of glass to frame ratios, typical glazing packages, and commensurate Visible Transmittance values indicates that any SHGC value below the 0.25 threshold would result in unacceptably low light transmission. (See Fig. 2) Additionally, setting minimum SHGC requirements in northern zones where any benefit from that performance feature is entirely dependent upon orientation and consumer behavior is not appropriate. WDMA applauds the DOE decision to omit any minimum SHGC requirements in northern zones. The DOE EERE *Consumer Guide to Passive Solar Design* advises that passive solar is best achieved through the use of different glazing packages for different sides of the house. The guide also recommends the use of overhangs sized to reduce unwanted solar gain during summer months, while allowing the collection of sunlight during winter months when the sun is lower in the sky. The DOE is advising consumers that the use of passive solar in heating dominated climates requires careful consideration of orientation, shading and overhangs. If this advice is not heeded, any energy gains obtained in winter are likely more than offset with increased energy usage in the summer to counter increased cooling loads. With the rise in the use of air conditioning in the northern climate zones, and the effect on peak demands as well as comfort, ENERGY STAR

tradeoffs become problematic. In Southern zones, consumers selecting ENERGY STAR windows do not have to worry about the product performance as it relates to solar gain, and consumers in northern zones do not have to worry about U-Factor performance. In both cases, the consumer may use the ENERGY STAR label as the benchmark, and select window products based upon other factors. If, however, the northern ENERGY STAR zones include trade-offs for higher solar gain products, that choice becomes complicated. The consumer will now have to understand projection factors, latitude and orientation, angle of solar incidence, and window shade performance in order to make the appropriate purchase decision. Using such trade-offs complicates the buying decision, and will likely result in dissatisfied consumers. ENERGY STAR should not allow this dynamic to weaken the brand. WDMA concurs with the DOE proposed maximum SHGC of 0.55. Setting this maximum will help control overheating during swing & summer seasons. In fact, LBNL research shows discomfort with high solar gain in both summer & winter.[2] It is important to note that the lower U-Factors likely in phase 2, combined with a maximum 0.55 SHGC, represents technology combinations that don't currently exist. The WDMA criteria recommendations put the technology focus on achieving lower U-Factors rather than finding a loophole for higher SHGC products. Regardless of solar benefit, window heat loss still drives building UA and furnace sizing.

- **Products used in high-altitude areas.** Current insulating glass construction does have some limitations for use in or transport through high-altitude regions. Many manufacturers provide insulating glass units with breather tubes that allow the air space to equalize in pressure to the altitude where the product is installed. Without equalizing the pressure, the glass panes can bow out causing visual distortion and added stress to the edge seal of the insulating glass unit. Glass units with breather tubes are typically not filled with argon, as the argon would escape via the breather tube and the thermal benefits lost. WDMA asks that the DOE recognize that limitation and provide an appropriate remedy within the program. A U-Factor adjustment for high-altitude units would be one possible option. WDMA will commit to work with the DOE to resolve this issue.
- **Effects of grilles.** The addition of grilles to fenestration products can often time increase the U-Factor of the overall product. In cases where the addition of grilles can increase the U-Factor where the product is just outside the ENERGY STAR criteria, there is confusion to the consumer who is paying more for a feature upgrade, but in doing so,

may disqualify the product from qualifying for ENERGY STAR. WDMA recommends that DOE consider setting the standard product for a product line/style as the reference product to determine ENERGY STAR qualification and allows that glass type to qualify the same glass type with grilles, and/or tempered or laminated glass.

Figure 4: Proposed Criteria for Windows using WDMA Proposed Four Zone Map:

Climate Zone	U FACTOR	SHGC
North	≤ 0.30	NR
North Central	≤ 0.32	NR
South Central	≤ 0.35	≤ 0.30
South	≤ 0.50	≤ 0.25

Figure 5: Proposed Criteria for Windows Using DOE's Proposed Climate Zones:

ENERGY STAR CLIMATE ZONE	U FACTOR	SHGC
5a	≤ 0.32	≤ 0.55
5	≤ 0.32	≤ 0.55
4	≤ 0.32	≤ 0.55
3	≤ 0.35	≤ 0.25
2	≤ 0.35	≤ 0.25
1	≤ 0.50	≤ 0.25

Skylights and Tubular Daylighting Devices (TDD) Criteria. The primary purpose of skylights and TDDs, unlike other fenestration products, is providing a source of free natural daylight. As such, care should be taken that the ENERGY STAR criteria for this category recognize and support that fact. WDMA offers the following points regarding skylights and TDDs:

- The provision of sufficient natural light to significantly reduce the use of peak electricity, whether from unit skylights or (TDDs), is an essential consideration when setting new criteria.
- Effective "free" light. The DOE analysis of estimated energy savings for skylights and TDDs should include a consideration of reductions in the use of electrical energy for artificial lighting, and the commensurate energy savings.
- TDDs are becoming much more commonplace and have gained market share. By not including criteria for TDDs, ENERGY STAR limits the ability of occupants of single story homes without cathedral ceiling construction to benefit from an economical

alternative to deep-shaft unit skylights. Since TDDs are well-suited to standard truss-design applications, WDMA urges the DOE to include criteria for TDDs in the ENERGY STAR program.

Figure 6: Proposed Unit Skylight Criteria Based on the WDMA Proposed Four Zone Map:

Climate Zone	U FACTOR	SHGC
North	≤ 0.50	NR
North Central	≤ 0.55	≤ 0.40
South Central	≤ 0.55	≤ 0.35
South	≤ 0.65	≤ 0.35

Figure 7: Proposed Unit Skylight Criteria Based on DOE's Proposed Climate Zones:

ENERGY STAR	U FACTOR	SHGC
5a	≤ 0.50	NR
5	≤ 0.50	NR
4	≤ 0.55	≤ 0.40
3	≤ 0.55	≤ 0.35
2	≤ 0.57	≤ 0.32
1	≤ 0.65	≤ 0.30

Door Criteria WDMA supports the DOE proposal for a single climate zone for doors as well as the proposal to set the qualification criteria by percent glazing. However, WDMA does not support the criteria as proposed and respectfully requests the following modifications:

- The definition of amount of glazing should be consistent with the NFRC definition. Therefore, ½-lite should be defined as less than or equal to 900 sq. inches of glazing area.
- DOE should include sliding doors in the same table as side-hinged doors. Many door manufacturers utilize a common panel design with hardware options defining the operation of the assembly. A specific panel is eligible to become a component of a side-hinged entry door, a side-hinged patio door, or a sliding patio door assembly. Sliding doors should be included in this table. The only difference between a sliding door and a hinged door in the same product line is how it is operates. ENERGY STAR criteria should consider all door assemblies in like manner and not distinguish by operation.
- The proposed ½-lite value for phase 1 is too severe. As the only variable is the amount of glazing, the ½-lite criteria should be adjusted to 0.28. Otherwise, full-lite doors would

qualify with the exact same glass as a non-qualified ½-lite, thus encouraging consumers to select less efficient products (full-lite over ½-lite).

- The full-lite value is also too severe. Based on analysis of low E products in the NFRC Certified Products Directory, WDMA recommends a U-Factor of 0.34.
- The proposed balance of selecting a maximum SHGC of 0.30 eliminates some high performing glass coatings that achieve low U-Factors, but allow more SHGC for Northern climates. WDMA recommends adjusting the maximum SHGC for glazed doors to 0.40.

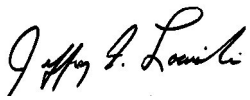
Figure 8: Proposed Door Criteria:

Climate Zone	Glazing	U FACTOR	SHGC
	Opaque	≤ 0.21	NR
ALL ZONES	≤ 1/2 Lite	≤ 0.28	≤ 0.40
	> 1/2 Lite	≤ 0.34	≤ 0.40

Product labeling. WDMA requests the DOE make the US map optional for product labeling. Given the continual increase in product 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 requiring a list of the climate zones on the label would provide much relief in space requirements on product labels.

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.

Michael Fischer
WDMA Director
Codes and Regulatory Compliance



Jeffrey Lowinski
WDMA Vice-President
Advocacy & Technical Services

Figure 9: LBNL Windows Analysis

LBNL Windows Compliance Analysis				ES1		ES2	ES3	ES4	ES5
				IECC 1	IECC 2	IECC 3	IECC 4	IECC 5	IECC 6-8
ID	Name	U-Factor	SHGC	COMPLIANCE CHECK to IECC 2009					
1010	1 - 101 - AL 1 Clr	1.159	0.756						
1020	2 - 102 - AL 1 Bronze	1.159	0.647						
1110	3 - 111 - AL 2 Clear	0.762	0.675						
1120	4 - 112 - AL 2 Bronze	0.762	0.562						
1130	5 - 113 - AL 2 SS Tint	0.762	0.469						
1210	6 - 121 - AL 2 PY Low-E	0.613	0.635						
1310	7 - 131 - AL 2 SP Low-E	0.595	0.528						
1410	8 - 141 - AL 2 SS Low-E	0.583	0.364						
1710	37 - 171 - AL 2 SS Ultra Low SG Low-E (XL70)	0.580	0.237	Okay	Okay				
2010	9 - 201 - ATB 1 Clr	1.005	0.696						
2020	10 - 202 - ATB 1 Bronze	1.005	0.594						
2110	11 - 211 - ATB 2 Clear	0.634	0.620						
2120	12 - 212 - ATB 2 Bronze	0.634	0.515						
2130	13 - 213 - ATB 2 SS Tint	0.634	0.428						
2210	14 - 221 - ATB 2 PY Low-E	0.496	0.583						
2310	15 - 231 - ATB 2 SP Low-E	0.480	0.483						
2410	16 - 241 - ATB 2 SS Low-E	0.468	0.330						
2710	38 - 271 - ATB 2 SS Ultra Low SG Low-E (XL70)	0.465	0.211	Okay	Okay	Okay			
3010	17 - 301 - W/V 1 Clr	0.837	0.635						
3020	18 - 302 - W/V 1 Bronze	0.837	0.540						
3110	19 - 311 - W/V 2 Clear	0.493	0.564						
3120	20 - 312 - W/V 2 Bronze	0.493	0.466						
3130	21 - 313 - W/V 2 SS Tint	0.493	0.385						
3210	22 - 321 - W/V 2 PY Low-E	0.365	0.529						
3310	23 - 331 - W/V 2 SP Low-E	0.350	0.436				Okay	Okay	Okay
3410	24 - 341 - W/V 2 SS Low-E	0.339	0.294	Okay	Okay	Okay	Okay	Okay	Okay
3510	25 - 351 - W/V 3 HT Super	0.285	0.382				Okay	Okay	Okay
3520	26 - 352 - W/V 3 SS Super	0.280	0.252	Okay	Okay	Okay	Okay	Okay	Okay
3710	39 - 371 - WV 2 SS Ultra Low SG Low-E (XL70)	0.337	0.183	Okay	Okay	Okay	Okay	Okay	Okay
4110	27 - 411 - INS 2 Clear	0.445	0.596						
4120	28 - 412 - INS 2 Bronze	0.445	0.492						
4130	29 - 413 - INS 2 SS Tint	0.445	0.405						
4210	30 - 421 - INS 2 PY Low-E	0.291	0.559				Okay	Okay	Okay
4310	31 - 431 - INS 2 SP Low-E	0.271	0.460				Okay	Okay	Okay
4410	32 - 441 - INS 2 SS Low-E	0.256	0.307				Okay	Okay	Okay
4510	33 - 451 - INS 3 HT Super	0.182	0.402				Okay	Okay	Okay
4520	34 - 452 - INS 3 SS Super	0.175	0.262	Okay	Okay	Okay	Okay	Okay	Okay
4610	35 - 461 - INS 3 HT Super Frame Krypton	0.138	0.398				Okay	Okay	Okay
4620	36 - 462 - INS 3 SS Super Frame Krypton	0.119	0.259	Okay	Okay	Okay	Okay	Okay	Okay
4710	40 - 471 - INS 2 SS Ultra Low SG Low-E (XL70)	0.253	0.188	Okay	Okay	Okay	Okay	Okay	Okay
5000	Al - 1 - High U, Low SHGC	1.128	0.152	Okay					
5001	Al - 2 - High U, Low SHGC	0.898	0.201	Okay					
5002	W/V - 1 - High U, Low SHGC	0.810	0.102	Okay					
5003	U=0.35;SHGC=0.45	0.350	0.447				Okay	Okay	Okay
5004	U=0.35; SHGC=0.50	0.354	0.498				Okay	Okay	Okay

Figure 10:

	Location	HDD18°C	CDD18°C	SLOPE HEAT Calibrated	Heat	Source	Average
	AZ_Flagstaff	3790	99	-1.3	-1.2	-1.4	
	MI_Grand_Rapids	3706	356	-2.9	-2.4	-6.0	
	BC_Kamloops	3630	286		-2.6	-8.0	
	WA_Spokane	3627	232	-2.6	-2.2	-4.0	
	NY_Albany	3603	315	-2.8	-2.3	-6.0	
	NY_Buffalo	3561	293	-3.0	-2.5	-5.9	
	MI_Detroit	3505	492	-2.6	-2.2	-4.6	
	IA_Des_Moines	3501	674	-2.4	-2.0	-6.8	
	IL_Chicago	3429	506	-2.6	-2.2	-6.2	
	NE_Omaha	3408	701	-2.5	-2.1	-15.9	
	OH_Cleveland	3284	489	-3.1	-2.5	-10.3	
	CT_Hartford	3200	425	-2.5	-2.0	-6.4	
	OH_Dayton	3195	539	-2.6	-2.1	-6.2	
Climate	RI_Providence	3165	437	-2.0	-1.7	-3.2	
Zone	IN_Indianapolis	3154	618	-2.6	-2.1	-20.5	-7.0
5	PA_Pittsburgh	3153	444	-3.0	-2.4	-10.4	
	CO_Denver	3131	528	-1.9	-1.6	-3.8	
	UT_Cedar_City	3126	503	-1.8	-1.5	-4.1	
	MA_Boston	3121	420	-2.1	-1.8	-3.1	
	PA_Williamsport	3106	442	-2.8	-2.3	-10.4	
	BC_Vancouver	3020	5		-2.6	-3.0	
	NV_Reno	2988	461	-1.5	-1.3	-2.7	
	IL_Springfield	2969	693	-2.4	-2.0	-13.3	
	ID_Boise	2948	465	-2.2	-1.9	-6.2	
	UT_Salt_Lake_City	2908	669	-2.3	-1.9	-20.7	
	CO_Grand_Junction	2898	727	-2.0	-1.6	-14.7	
	WA_Seattle	2544	76	-3.3	-2.5	-3.7	
	OR_Medford	2535	332		-2.2	8.5	
	OR_Portland	2292	188		-2.2	-5.3	

	Location	HDD18°C	CDD18°C	SLOPE HEAT Calibrated	Heat	Source	Average
Climate	NW_Resolute	12571	0		-5.1	-5.1	
Zone	AK_Fairbanks	7121	27	-7.2	-5.7	-7.0	-5.2
8	YT_Whitehorse	6946	2		-3.5	-3.6	
	MB_Winnipeg	5754	197		-2.5	-3.7	
	SK_Regina	5646	130		-2.3	-3.1	
	ON_ThunderBay	5623	60		-2.2	-2.6	
Climate	AB_Edmonton	5583	22		-2.5	-2.9	
Zone	MN_International_Falls	5508	164	-2.9	-2.6	-3.2	-3.1
7	AK_Anchorage	5489	0	-4.5	-3.7	-3.8	
	MN_Duluth	5206	104	-2.6	-2.3	-2.8	
	AB_Calgary	5147	40		-2.1	-2.5	
	MI_Houghton	4870	143	-2.8	-2.4	-3.6	
	PQ_Quebec	4966	111		-2.3	-3.1	
	NF_Stephenville	4723	9		-2.4	-2.4	
	NB_SaintJohn	4695	11		-1.9	-2.0	
	ON_Ottawa	4664	189		-2.4	-3.6	
	PE_Charlottetown	4646	72		-2.2	-2.6	
	NS_Sydney	4634	52		-2.0	-2.4	
	ND_Bismarck	4567	291	-2.6	-2.3	-4.3	
	PQ_Montreal	4493	234		-2.7	-4.3	
Climate	MT_Great_Falls	4222	233	-2.5	-2.1	-3.5	
Zone	MN_Minneapolis	4201	454	-2.6	-2.3	-5.0	-3.5
6	BC_PrinceRupert	4152	0		-2.4	-2.4	
	WI_Madison	4137	386	-2.6	-2.2	-4.8	
	ON_London	4111	211		-2.2	-3.8	
	ON_Toronto	4089	232		-2.5	-4.2	
	ME_Portland	4086	202	-2.0	-1.7	-2.5	
	WY_Cheyenne	3996	175	-1.9	-1.6	-2.2	
	VT_Burlington	3959	259	-2.8	-2.3	-4.1	
	NH_Concord	3931	262	-2.4	-2.0	-4.3	
	SD_Pierre	3882	493	-2.4	-2.1	-5.8	
	MT_Billings	3674	342	-2.3	-2.0	-3.7	

Footnotes:

1. See US Congress letter (Attachment A)

2. http://apps1.eere.energy.gov/consumer/your_home/windows_doors_skylights/index.cfm/mytopic=13360

Attachments

A. US Congress letter (Sens. Clinton et al.) to DOE re Xerox.

B. Pages from Window Performance for Human Thermal Comfort -- Lyons et al

Attachment A

Congress of the United States

Washington, DC 20510

September 19, 2008

The Honorable Robert J. Meyers
Assistant Administrator
Office of Air and Radiation
U.S. Environmental Protection Agency
Ariel Rios Building
1200 Pennsylvania Ave. NW
Washington, DC 20460

Dear Assistant Administrator Meyers,

As you may know, the EnergyStar program has been working on the development of new standards for imaging equipment. EnergyStar is an outstanding example of how government can work with private industry to achieve common goals – increased energy efficiency in consumer and commercial products and reduced environmental impacts such as climate change. However, we are concerned that the proposed standard may exclude some products which would have equivalent or lower life-cycle energy and environmental impacts and respectfully ask you to develop alternative standards approaches which incorporate these factors.

We understand that the EnergyStar program has historically focused on the direct energy use of the products that it covers and certifies. This has been an enormously successful approach for creating incentives for manufacturers to produce highly energy efficient goods and educating consumers about energy efficient appliances. Nonetheless, direct energy use does not capture other environmental attributes associated with using EnergyStar products such as lifecycle energy use, greenhouse gas production, or the generation of solid waste inherent in their purchase and use. In this case, the topic of how to address such impacts has been discussed as part of the development process for imaging equipment, but it is our understanding that incorporation of such attributes in the standard is being deferred to a later time.

We recognize that incorporating other environmental attributes into the EnergyStar standards is not a simple task. As expressed in the Agency's recently promulgated Advance Notice of Proposed Rulemaking on Regulating Greenhouse Gas Emissions Under the Clean Air Act (73 Federal Register 44354, July 30, 2008), developing a regulatory system for reducing the generation of greenhouse gases is a formidable challenge. Likewise, factoring in the lifecycle environmental impacts of solid waste management and disposal into product standards is an evolving science though a number of jurisdictions (such as Oregon and New York City) have begun to adopt standards for establishing producer responsibility for consumer goods, such as electronic products. Yet, as evidenced by the Agency's decision to initiate Greenhouse Gas Emissions rulemaking, these are challenges that must be addressed.

Within the past week, the Xerox Corporation has provided the EnergyStar program with an initial analysis of lifecycle impacts of two different imaging technologies. While Xerox's solid ink technology clearly has much higher direct energy use, it appears to have decided advantages

Attachment A (page 2)

in overall greenhouse gas production and solid waste generation. We realize that this is just one analysis, but believe that it does provide an important starting point for consideration of attributes and impacts beyond direct energy use. Thus we urge the Agency to promptly consider how such factors can be incorporated into the imaging standard as well as other EnergyStar standards.

Sincerely,

Ron Wyden

Jim Jeffords

Hillary Rodham Clinton

Louise M. Slaughter

Attachment B

Excerpted Figures from *"Window Performance for Human Comfort"*

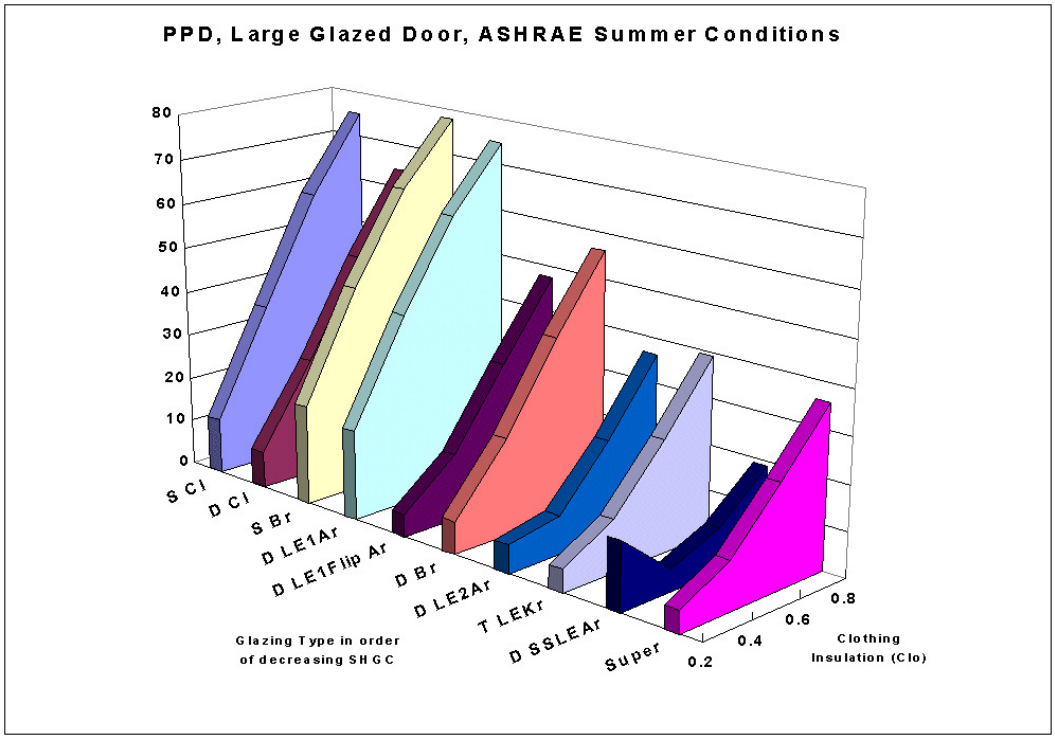


Figure 5. Percentage People Dissatisfied under ASHRAE Summer Conditions (No. 1 in Table 2) as a function of clothing level and glazing solar heat gain coefficient.

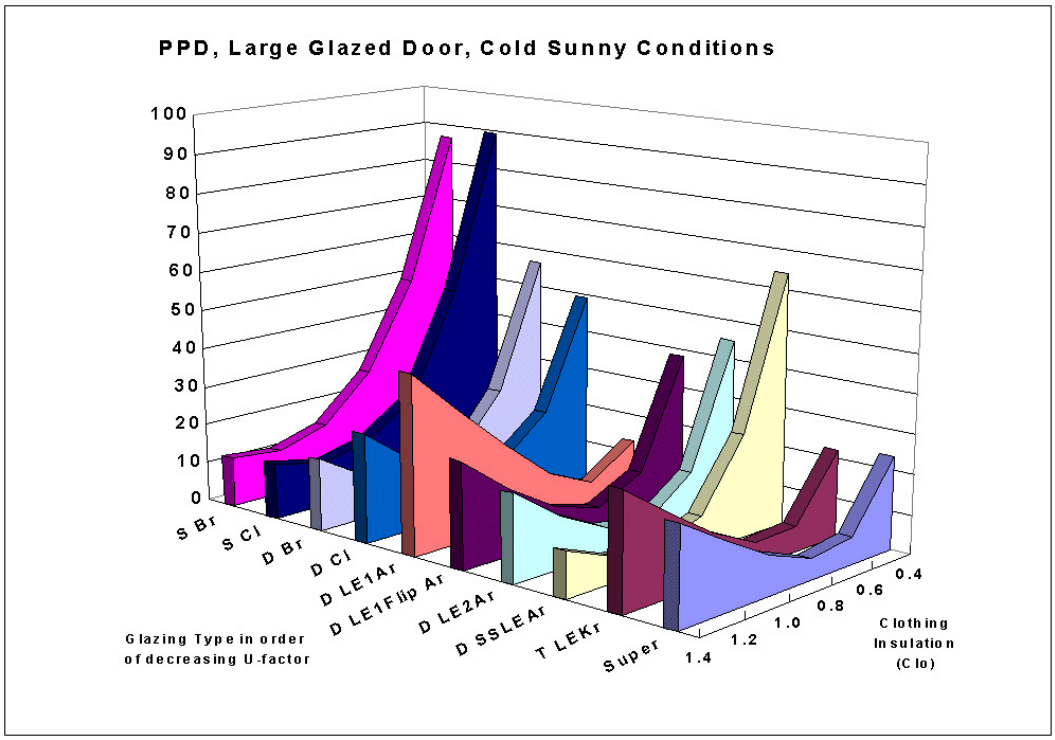


Figure 6. Percentage People Dissatisfied under cold sunny conditions (No. 4 in Table 2) as a function of clothing level and glazing U-factor.