



# Draft Criteria for Doors and Skylights

## Criteria Revision Stakeholder Meeting

U.S. Department of Energy

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# SWINGING ENTRY DOORS



# Topics

- Motivation
- Draft criteria
- New structure
- Energy savings potential
- Technological feasibility
- Cost-Effectiveness
- Market impact

# Separate Criteria



- **Product differentiation**
- **National energy savings**
- **Technological development**

# Draft Criteria



<b>Table 25: Draft ENERGY STAR Criteria for Swinging Entry Doors</b>				
	<b>Phase 1</b>		<b>Phase 2</b>	
<b>Glazing</b>	U-Factor	SHGC	U-Factor	SHGC
Opaque	$\leq 0.21$	NR	$\leq 0.16$	NR
$\leq 1/2$ - Lite	$\leq 0.25$	$\leq 0.30$	$\leq 0.20$	$\leq 0.30$
$> 1/2$ -Lite	$\leq 0.32$	$\leq 0.30$	$\leq 0.28$	$\leq 0.30$

# New Structure

- Criteria levels by glazing, not climate zone
- Three glazing categories:
  - Opaque
  - $\leq$  1/2-Lite
  - $>$  1/2-Lite
- Intermediate SHGC ( $\leq 0.30$ )

Northern Climate Zone (Heating) 5,800+ HDD U-Factor 0.35 SHGC: Any  
 North/Central Climate Zone (Heating & Cooling) 3600-5400 HDD U-Factor 0.40 SHGC: 0.55  
 South/Central Climate Zone (Heating & Cooling) 6500-4900 CDD U-Factor 0.40 SHGC: 0.40  
 Southern Climate Zone (Cooling) >6500 CDD U-Factor 0.65 SHGC: 0.40  
 Alternative Criteria Allowed

CONFIRM U-FACTOR & SHGC BELOW TO DETERMINE DOOR MODEL QUALIFICATIONS

National Fenestration Rating Council®

**CERTIFIED**

**ENERGY PERFORMANCE RATINGS**

U-Factor/Solar Heat Gain Coefficient (SHGC)

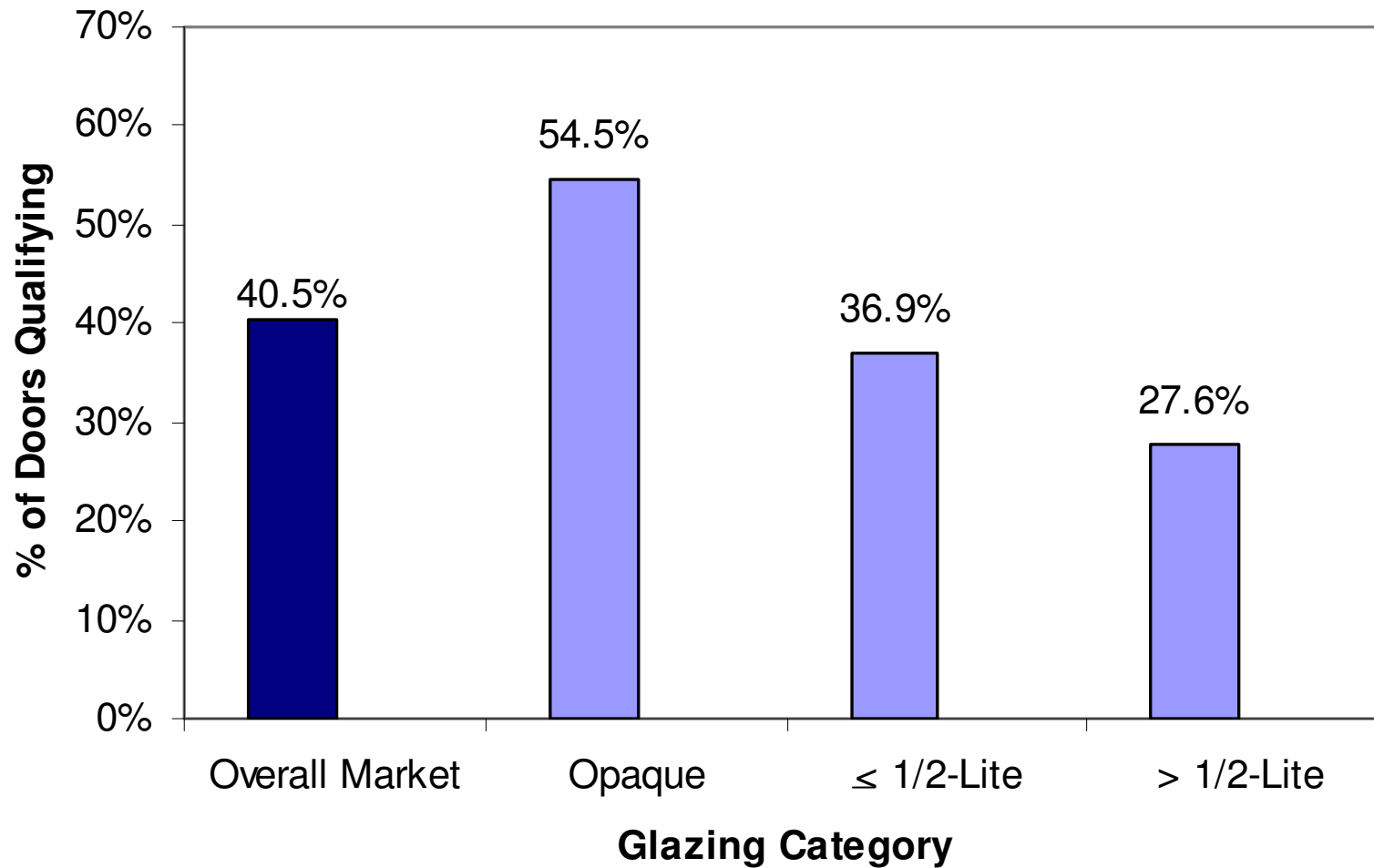
PRODUCT DESCRIPTION* Default Frame** Wood	U-Factor/Solar Heat Gain Coefficient (SHGC)			
	1/4 Lite $\leq 410\uparrow$	1/2 Lite $\leq 900\uparrow$	3/4 Lite $\leq 1100\uparrow$	Full Lite $> 1100\uparrow$
IG/Clear/Air/0.75"	0.21 / 0.04	0.30 / 0.20	0.35 / 0.28	0.39 / 0.34
IG/LowE(2)/Air/0.75"	0.21 / 0.03	0.28 / 0.17	0.31 / 0.23	0.34 / 0.28
IG/Clear/Air/.75" or .63" with Grid or Deco gls	0.21 / 0.04	0.30 / 0.18	0.35 / 0.25	0.39 / 0.31
IG/LowE(2)/Air/0.75" with Grid	0.21 / 0.03	0.28 / 0.15	0.31 / 0.21	0.34 / 0.26
IG/Clear/Air/0.813" w/Retractable IG blind	- / -	0.30 / 0.20	- / -	0.38 / 0.34

Manufacturer stipulates that these ratings conform to applicable NFRC procedures for determining whole product performance. NFRC ratings are determined for a fixed set of environmental conditions and a specific product size. NFRC does not recommend any product and does not warrant the suitability of any product for any specific use. Consult manufacturer's literature for other product performance information.  
 \* Glazing type/Clear or Coated (surface) / gapfill / gap  
 \*\* per NFRC 100 Section 3.3  $\uparrow$  square inches

**DO NOT REMOVE UNTIL AFTER FINAL INSPECTION**



# Technological Feasibility



# Technological Feasibility



## Characteristics of Doors Qualifying Under Draft Criteria

Phase 1			
	Opaque	≤ 1/2-Lite	> 1/2-Lite
Core/Fill	98% insulated cores	99% insulated cores	36% insulated cores
Glazing layers		82% double-pane rest triple-pane	85% double-pane rest triple-pane
Glass		65% clear glass some low-E, some tinted	37% clear glass 36% low-E rest tinted
Phase 2			
	Opaque	≤ 1/2-Lite	> 1/2-Lite
Core/Fill	98% insulated cores	96% insulated cores	73% insulated cores
Glazing layers		66% triple-pane rest double-pane	59% double-pane rest triple-pane
Glass		83% clear glass rest primarily low-E	75% clear glass rest primarily low-E

D&R International, Ltd., 2008. Based on analysis of 174,588 unique door records listed in the NFRC Certified Product Directory as of February 2008.



# Cost-Effectiveness



	<b>Marginal Cost</b>	<b>Payback</b>
Phase 1 Opaque Door	0%	Immediate
Phase 1 Fully Glazed Door	5%	Within lifetime of door in 60% of cities analyzed
Phase 2 Opaque Door	10%	Within lifetime of door in 75% of cities analyzed
Phase 2 Fully Glazed Door	15%	Within lifetime of door in 55% of cities analyzed

# Market Impact



- **Increased national energy savings**
- **Increased door performance**
- **Wide range of available products**



# SKYLIGHTS



# Topics

- Draft criteria
- Energy savings potential
- Technological feasibility
- Cost-Effectiveness
- Market impact

# Draft Criteria



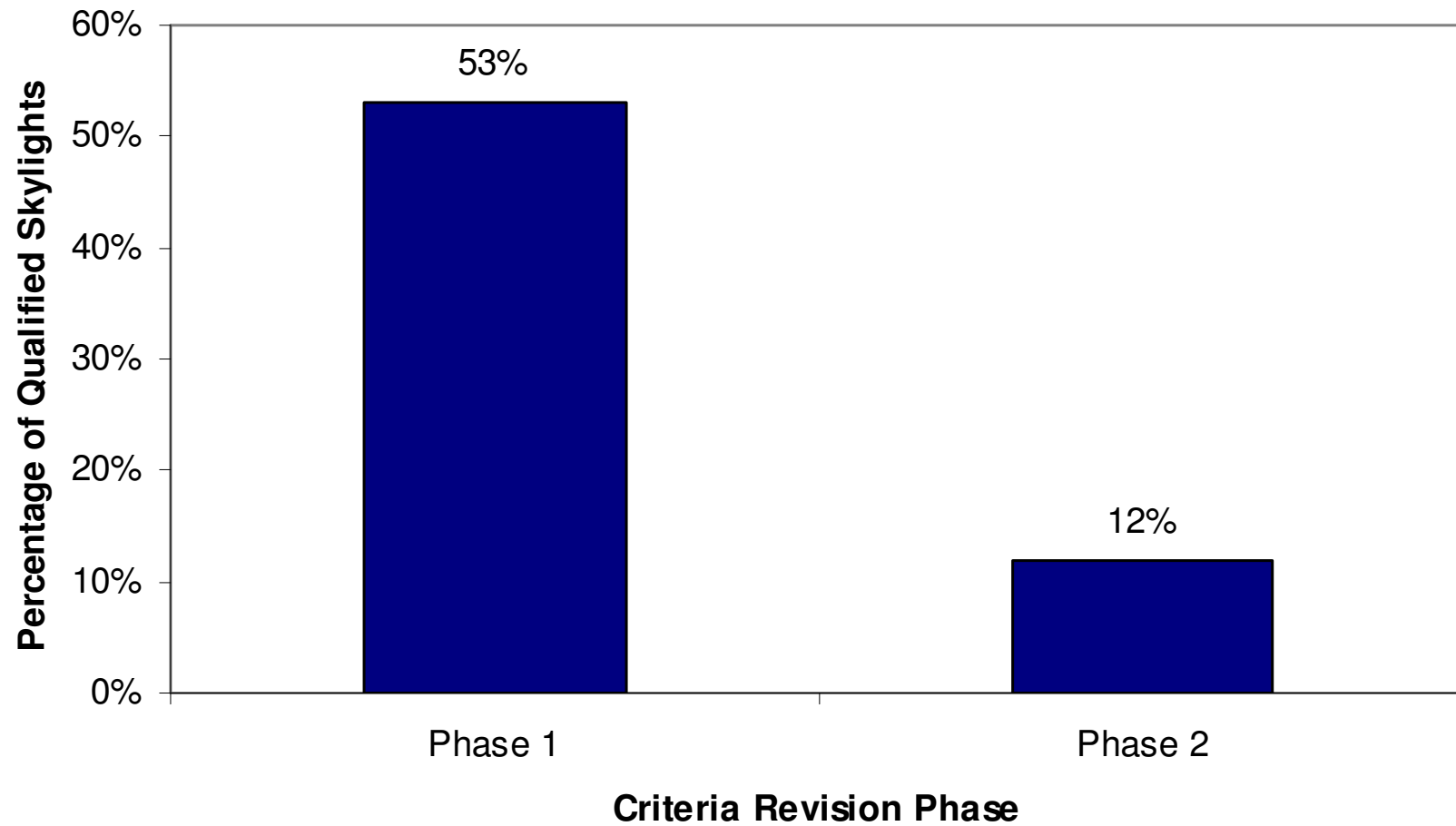
**Table 36: Context for Proposed ENERGY STAR Criteria for Skylights**

		Draft Criteria					
		Proposed 2009 IECC		Phase 1		Phase 2	
Climate Zone	U-Factor	SHGC	U-Factor	SHGC	U-Factor	SHGC	
ES5a	$\leq 0.60$	NR	$\leq 0.50$	NR	$\leq 0.42$	NR	
ES5	$\leq 0.60$	NR	$\leq 0.50$	NR	$\leq 0.42$	NR	
ES4	$\leq 0.60$	NR	$\leq 0.50$	NR	$\leq 0.42$	NR	
ES3	$\leq 0.60$	NR	$\leq 0.55$	$\leq 0.40$	$\leq 0.47$	$\leq 0.30$	
ES2	$\leq 0.65$	$\leq 0.30$	$\leq 0.55$	$\leq 0.30$	$\leq 0.47$	$\leq 0.20$	
ES1	$\leq 0.75$	$\leq 0.30$	$\leq 0.65$	$\leq 0.30$	$\leq 0.57$	$\leq 0.20$	

Sources: International Code Council, 2008. 2007/2008 Proposed Changes to the International Energy Conservation Code.



# Technological Feasibility



# Technological Feasibility



**Table 38: Characteristics of Qualifying Skylights**

	<b>Phase 1</b>	<b>Phase 2</b>
<b>Frame material</b>	Al, Al-clad wood, vinyl, wood, composite	Al, Al-clad, vinyl, wood, composite
<b>Gap width</b>	range 0.246-2.634 60% at 0.5 & above	range 0.246-2.625 15% at 0.5 & above
<b>Gas fill</b>	74% argon 25% air	72% use argon 28% use air
<b>Spacer</b>	33% use stainless steel 31% use aluminum	67% use stainless steel 21% use aluminum

# Cost-Effectiveness



	Phase 1		Phase 2	
	Marginal Cost	Payback	Marginal Cost	Payback
<b>ES Climate Zone</b>				
ES 4-5, ES 5a	15%	5-13 years	30%	5-13 years
ES1-ES3	0%	Immediate	0%	Immediate



# Market Impact



- **Increased national energy savings**
- **Increased skylight performance**
- **Wide range of available products**
- **Redesign necessary for Phase 2**



Next Up:

Scheduled Stakeholder  
Comments