



# **ENERGY STAR for Windows, Doors, and Skylights**

## **Program Update for NFRC Fall Membership Meeting**

September 24, 2019

Charlotte, NC

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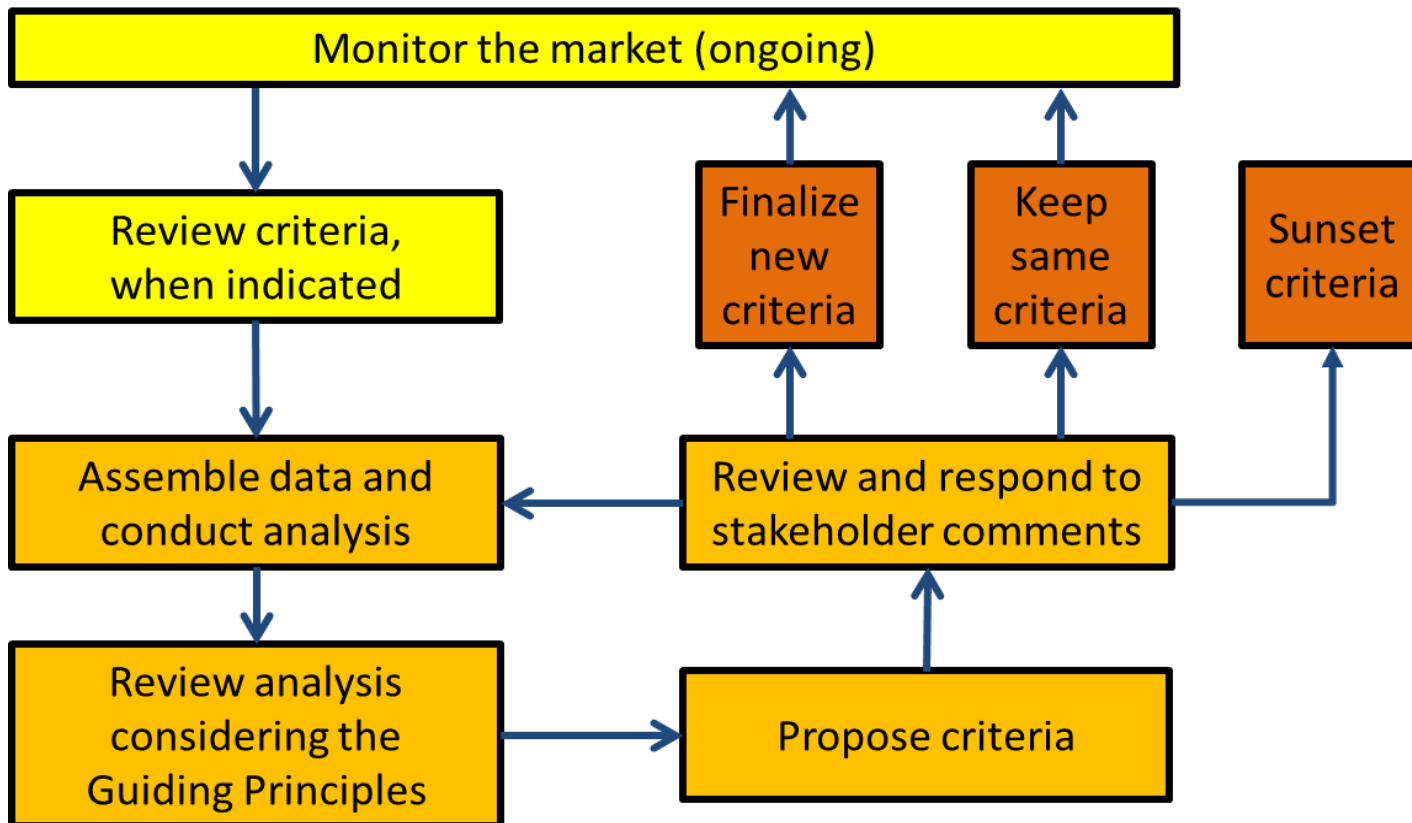
# Agenda

- I. Discussion Guide Background
- II. Current Market Assessment (from DG)
- III. Proposed Methodology (from DG)
- IV. Additional Issues to Consider (from DG)
- V. Verification Issues
- VI. ENERGY STAR Most Efficient Windows
- VII. ENERGY STAR Storm Windows
- VIII. Next Steps



# Discussion Guide Background

## ENERGY STAR (ES) Specification Revision Process





# DG - Current Market Assessment

## Market Share – Remains relatively high

	2009	2010	2011	2012	2013	2014	2015	2016	2017
Residential Windows	76%	81%	79%	77%	80%	83%	84%	83%	84%
Hinged Entry Doors	70%	71%	73%	74%	76%	77%	79%	78%	80%
All Patio Doors								81%	82%
Skylights – All	70%	70%	68%	62%	60%	62%	65%	64%	68%

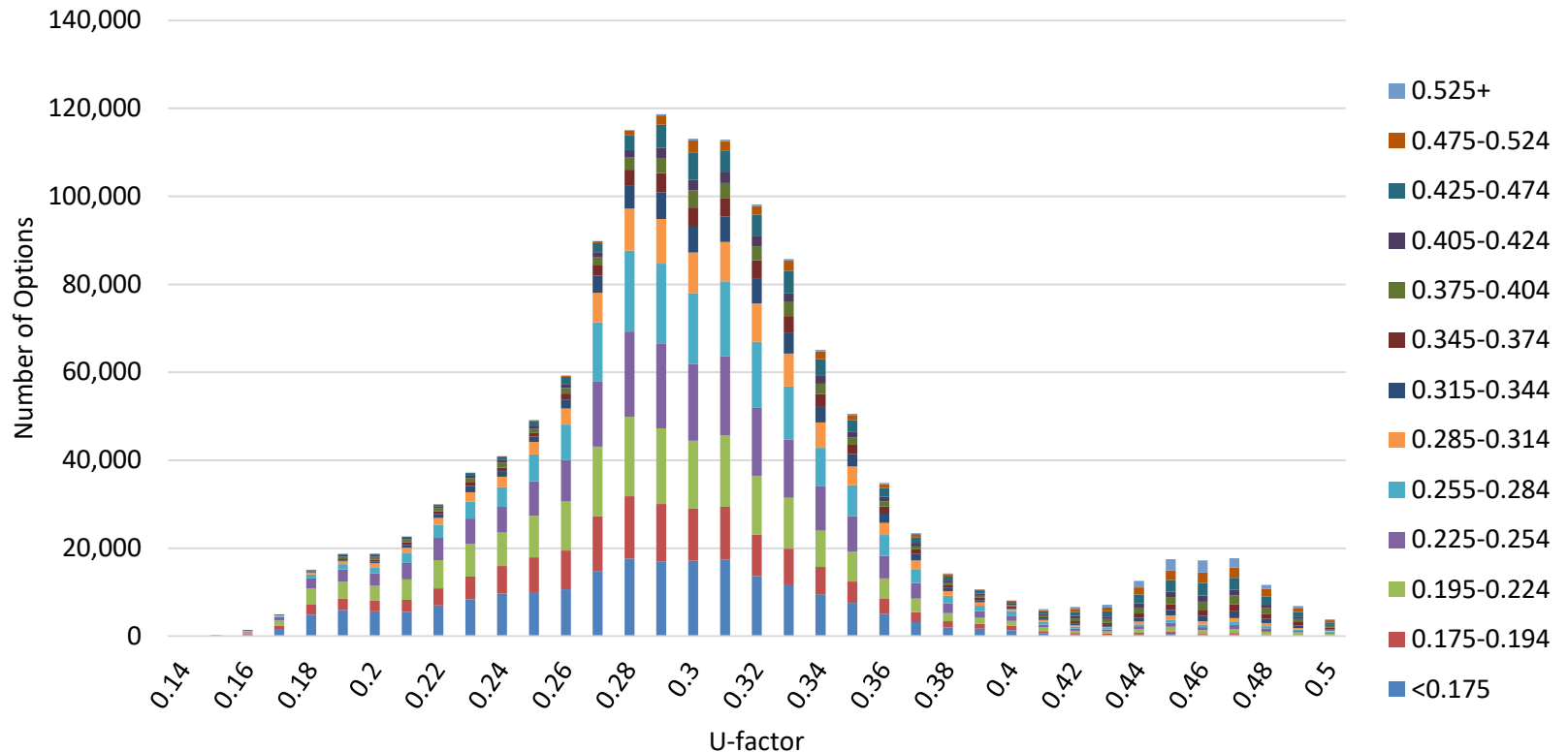
## Developments in Energy Codes

- **IECC Building Energy Codes** – proposals that meet or surpass ES
- **California Title 24** – more stringent SHGC of 0.23
- **ENERGY STAR Canada** – lower U factors (windows and skylights)



# DG - Market Assessment - Product Availability

## 2017 data (double-hung)



### Product Availability

- Are the NFRC certified product lines selected for FenStar a reasonable proxy for products available for sale? Is there better data?



## DG - Proposed Methodology - Costs

- **Component Bill of Materials**
  - EPA invites component manufacturers to share cost data confidentially
  - Only aggregated, anonymous costs will be considered
  
- **Manufacturer Costs**
  - EPA invites manufacturers to share cost data confidentially
  - EPA will provide an updated template to collect confidential manufacturer costs in a standard format
  
- **Retail Pricing and Mystery Shopping**
  - Mystery shopping with dealers and installers
  - Retail research at big box stores
  - **Focus will be on low-cost and best selling products**



## DG - Proposed Methodology – Energy Savings

### Energy Savings

- LBNL and NREL have each developed new building energy modeling tools that use EnergyPlus and have updated weather, population, and residential energy consumption data
- LBNL: Model will utilize PNNL prototype homes from geographically distributed U.S. cities
- NREL: Model will utilize ResStock tool bases household characteristics on a sophisticated statistical sample that accounts for the diversity of the single-family housing stock and climates across the United States



## DG - Additional Issues to Consider

### **Combining Southern and South-Central Climate Zones**

- Data from a DOE field study shows builders installing windows consistently already better than current ES levels

### **Establishing a Minimum SHGC for the Northern Climate Zone**

- Greatly reduces low visible transmittance (VT) glass
- Encourages more energy saving, higher SHGC products

### **Evaluating IECC Zone 5 for the Northern or North-Central Climate Zone**

- EPA to consider which ES zone is more appropriate for IECC Zone 5

### **Applying the Windows Specification to Full-Lite Sliding Patio Doors**

- Full-lite sliding patio doors (NFRC type DDSG) are more similar to windows than swinging doors so EPA will consider applying the windows criteria to full-lite sliding patio doors to simplify the specification.





## DG - Additional Issues to Consider

### **Sunseting the ENERGY STAR Swinging Door Criteria**

- Last specification revision, paybacks were long – energy impact small.
- Study whether additional cost-effective energy savings are possible for swinging doors.

### **Simplifying or Sunseting the ENERGY STAR Skylight Criteria**

- **Simplification**
  - Rely primarily on the analysis of windows to establish criteria and then add an appropriate adjustment factor to establish the skylight ES criteria to treat both categories in a similar fashion. (See preliminary data in Discussion Guide Appendix B)
- **Sunseting**
  - Last specification revision, paybacks were long – energy impact small.
  - Study whether additional cost-effective energy savings are possible for skylights.



# DG - Additional Issues to Consider

## Dynamic Glazing and Shading

- Products with dynamic glazing and integrated shading systems are currently available for sale in the market
- Consider clarifying and/or including allowances for dynamic products, as long as energy performance can be measured and verified through physical testing and the schedule properly modeled

## High Altitude and Impact Resistance

- 2021 IECC proposals to consider allowances for impact-rated and high-altitude
- EPA has concluded that such allowances are not appropriate for the ES specification
  - It would introduce significant complexity to labeling requirements,
  - Would save less energy over market baselines compared to other ES certified products
  - Products are available that can meet improved ES criteria



# DG - Additional Issues to Consider

## Extended Implementation Schedule

- Typically, new criteria become effective 9 to 12 months after publication of a final specification document
- EPA is open to extending the implementation schedule to help ensure that there will be products available for sale that meet a potential revised specification

**NOTE:** EPA has provided questions for stakeholders to consider in the Discussion Guide. Please consider these issues or any others in your response to comments.



## Verification Issues

- **Verification Testing is an ENERGY STAR requirement**
- Testing is set at 5% of ENERGY STAR product lines each year - Each manufacturer should expect that 1 out of 20 of their product lines will be selected each year
- Thank you to those partners and labs who have been responsive with verification product requests
- Partners who are not responsive should expect letters from EPA and consequences
- Labs who have been slow or unresponsive should also expect consequences – timeliness is being tracked



# Most Efficient Residential Windows (and sliding glass doors)

- **2020 Proposal:**
  - Maintain current U-factor and SHGC criteria for Windows
  - Expand the ME category for windows to include sliding glass doors using the same recognition criteria as windows
    - Only for sliding glass doors with NFRC operator type DDSG
- **Rationale:**
  - Products with performance significantly higher than ENERGY STAR minimum criteria are widely available
    - Still a relatively small slice of total market
    - 42 manufacturers and 458 product lines
  - Sliding Glass Doors are similar to windows
    - Mostly glass with narrow frames (glass has main impact)
    - Similar look and reflected color – so packages of ME products can be marketed with a similar look





# ENERGY STAR Storm Windows

## Update:

- Version 1.0 (Final) released - September 2018
- Product site up with certified products - December 2018
- Currently, 2 manufacturers with 22 products in database
- Website shortcut: [www.energystar.gov/stormwindows](http://www.energystar.gov/stormwindows)

## Performance metrics:

ENERGY STAR Requirement	Test Method Reference
Emissivity	National Fenestration Rating Council (NFRC) 301
Solar Transmittance (Tsol)	NFRC 300
Air Leakage	Attachments Energy Rating Council (AERC) 1.2 in accordance with ASTM E283



## ES Storm Window Final Criteria

- **Eligible products:** exterior and interior low-e storm windows
- **Non-eligible products:** storm doors, commercial storm windows, product components, products w/o weep holes

Climate Zone	Emissivity	Solar Transmittance
Northern	$\leq 0.22$	$> 0.55$
North-Central	$\leq 0.22$	ANY
South-Central	$\leq 0.22$	$\leq 0.55$
Southern	$\leq 0.22$	$\leq 0.55$

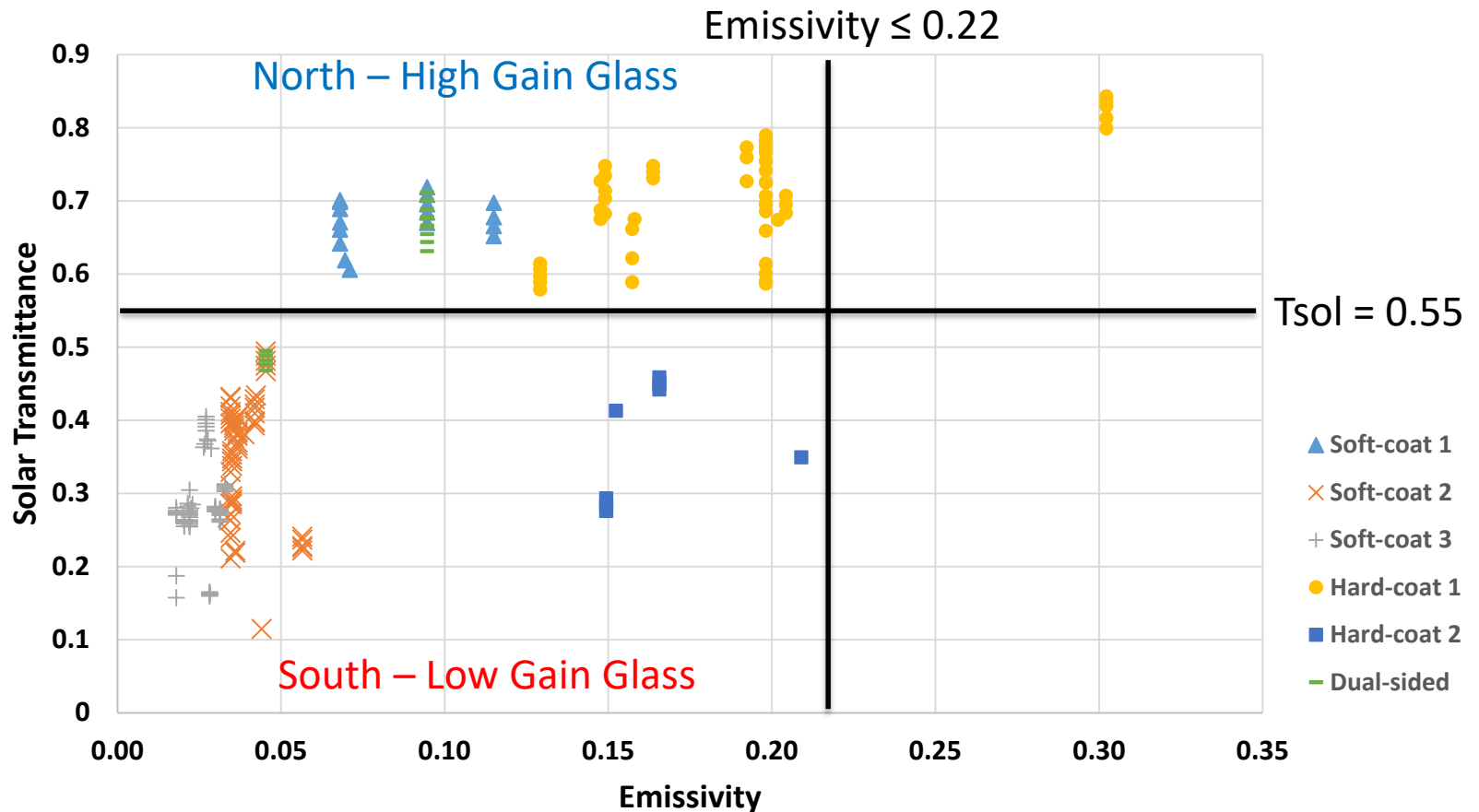
- **Air Leakage**
  - Exterior storm window:  $\leq 1.5$  cfm/ft<sup>2</sup>
  - Interior storm window:  $\leq 0.5$  cfm/ft<sup>2</sup>





# Emissivity and T<sub>sol</sub> Glass Distribution

## For about 400 coated glazing options



From: ENERGY STAR Window Technology Pathways White Paper, Jan 2017



## Next Steps

Milestone	Expected Date
Due date for Comments on Discussion Guide (DG)	Oct 4, 2019
DG Comments Posted On-Line	Q4 2019
Response to DG Comments Released	Q4 2019/Q1 2020
Criteria Analysis Report (CAR) and <u>Possible</u> Draft 1	Late Q1 or Q2 2020

Please send comments to [windows@energystar.gov](mailto:windows@energystar.gov)



# Thank you!

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