U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

DOE High Performance Windows Volume Purchase Program

Moving to Phase II

Presented at
Fenestration Day™ 2011
Indianapolis, Indiana

Graham Parker
Senior Staff Engineer
Pacific Northwest National Laboratory
Richland, WA 99352

April 7, 2011

DOE Integrated Program to Reduce Price of Highly Insulating Windows

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Technical support

Building America demonstrations/production housing for easy markets

High-performance specs in LEED for Homes & NGBS

Production engineering RFP – 50% cost share

Technology procurement/volume purchases

Develop advanced utility program specs

Support utility programs for advanced windows

ENERGY STAR Phase I

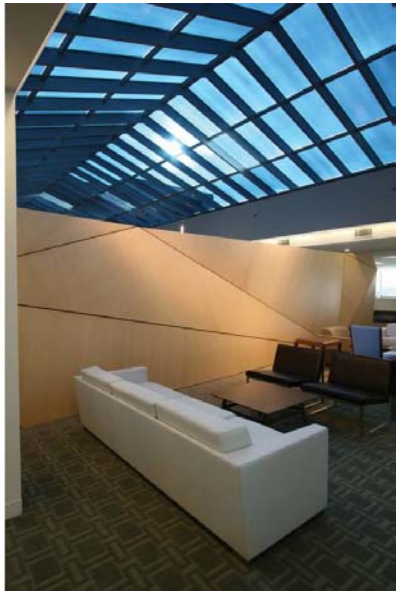
ENERGY STAR Phase II specifications

2007 | 2008 | 2009 | 2010 | 2011 | 2012

DOE Goals for Windows Programs

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

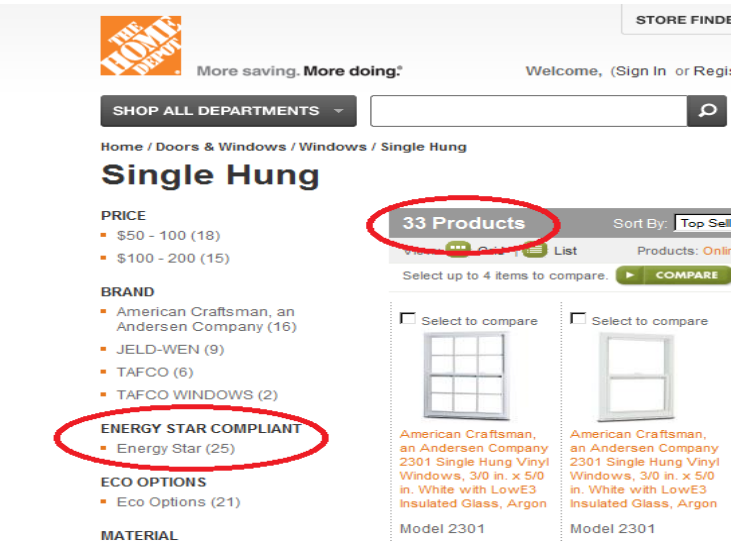
- Highly Insulating Windows
  - Goal is U-factor 0.10
  - Evaluate vacuum glazing
  - Advance dynamic glazing
- Market-Based Approach
  - Alternative to codes and standards
  - Technology specifications & procurement
  - Demonstrations

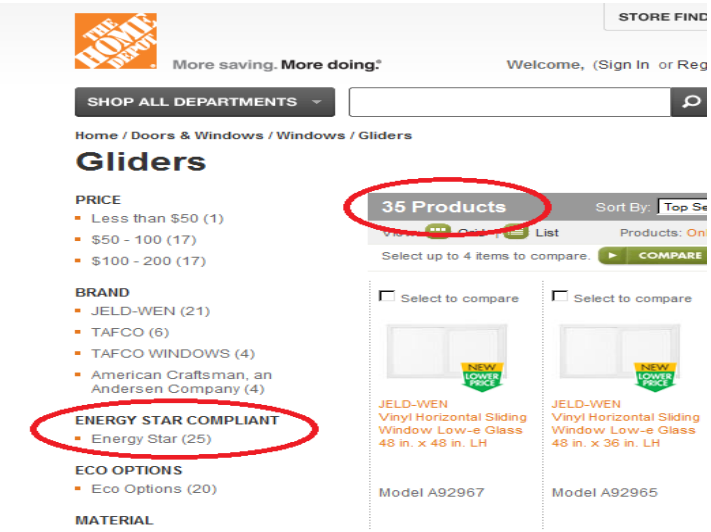


Prototype – Concept Window
Highly Insulating and Dynamic
SHGC 0.04 – 0.34

Today's Residential Windows Market

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy



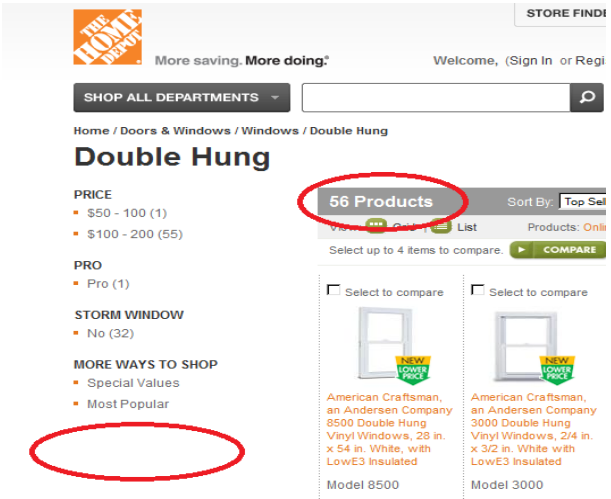


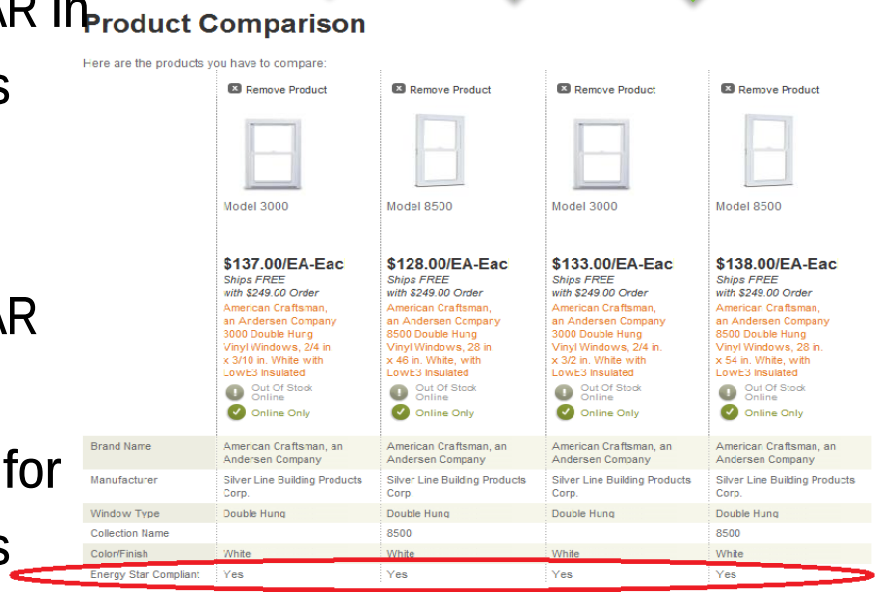
Home Depot

Major manufacturers of residential products

Over 85% ENERGY STAR in most markets

ENERGY STAR approaching the baseline for many regions



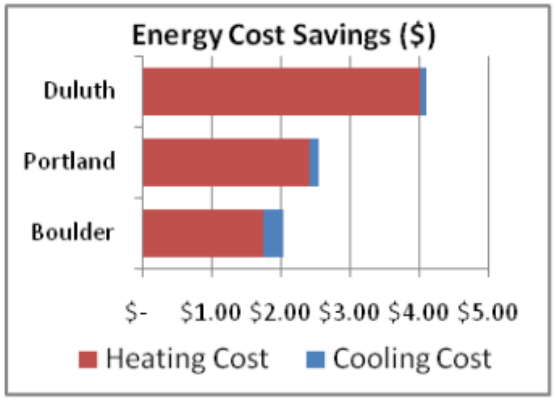


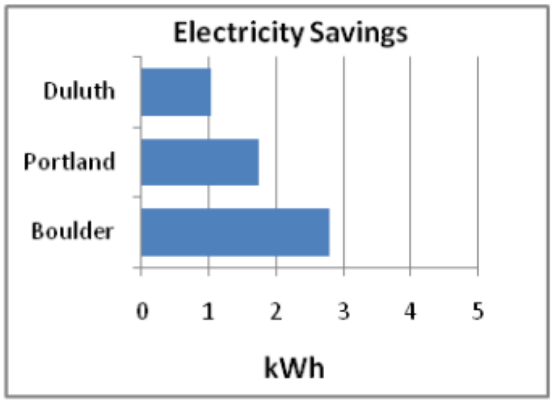
Today's Highly-Insulating Windows

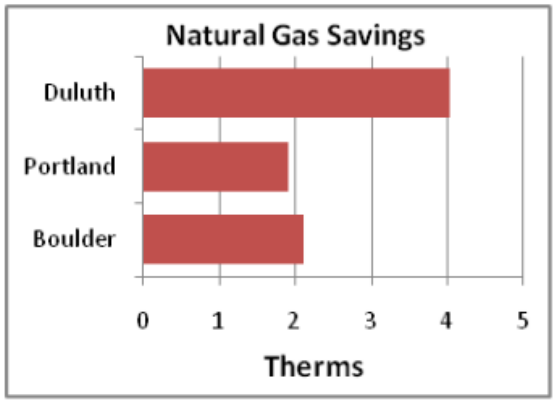
U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- Whole-window U-factor <0.22 is currently the top tier of readily available energy-efficient windows primarily for cold and mixed climates. Most are also ENERGY STAR.
- Increasing the U-factor from 0.33 to 0.22 reduces average heat loss through the window by over 30% and improves occupant comfort.
- Highly insulating windows are cost-effective in many climates, particularly in new construction.

Annual Savings per 3'X5' U-0.22 window compared to double-pane low-E—new construction, gas heating





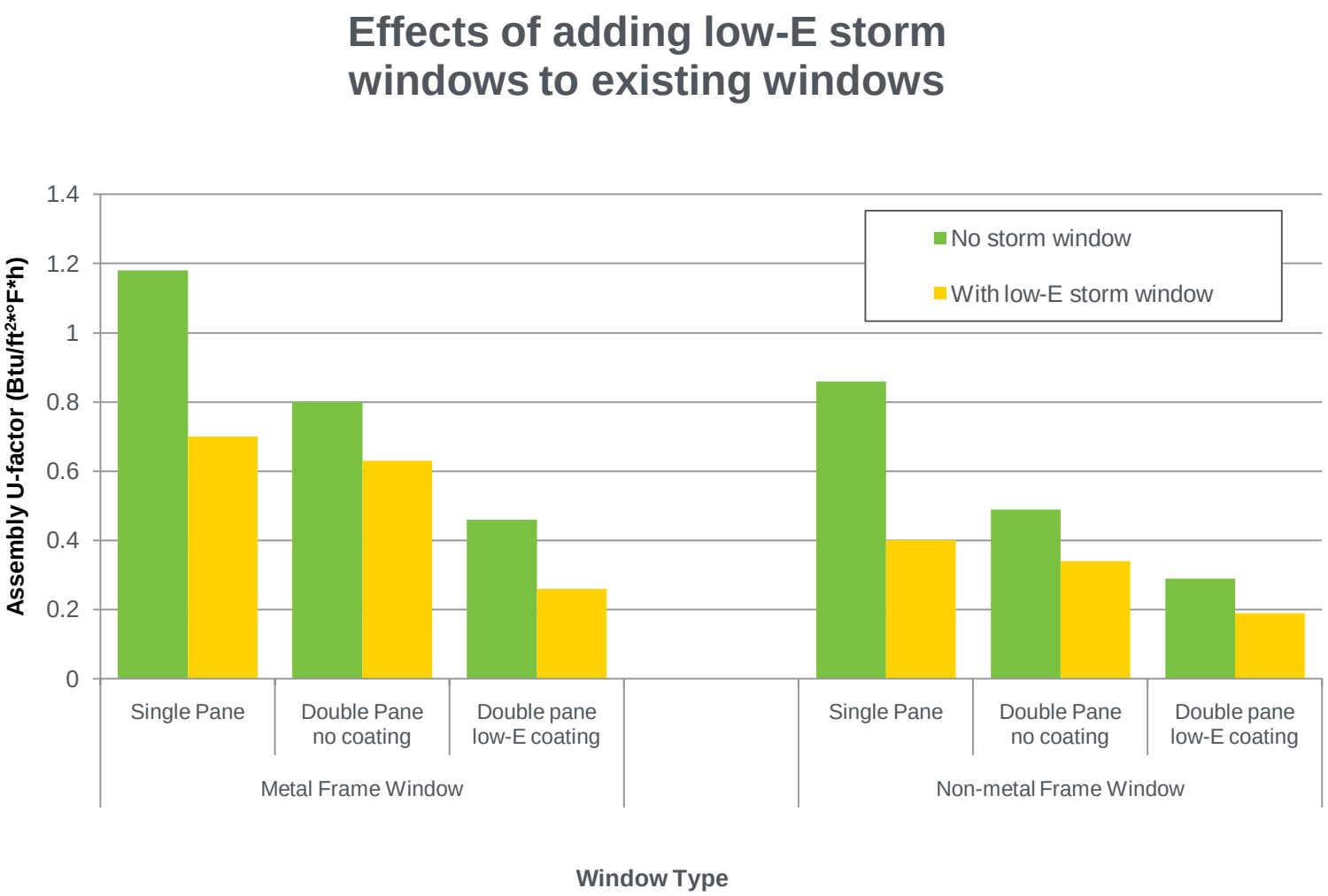


Today's Low-E Storm Windows

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- Common storm windows can reduce heat loss through the windows by 25% compared to single pane windows with a U-factor of 1.1.
- Low-E storm windows are even more effective as much as 50% heat loss reduction.
- HUD's PATH program (with DOE and industry partners) sponsored a field evaluation and concluded that low-E storm windows reduced heating load by 20% and achieved less than a 5-year simple payback.
  - Chicago weatherization agency identified 6 older homes with single pane windows (U-value of 1.1) for evaluation. (http://www1.eere.energy.gov/buildings/windowsvolumepurchase/storms.html)
- Retrofitting with low-E storm windows can be a very cost-effective solution in select residential and commercial buildings, even in moderate/mixed/temperate climate zones.
- Low-E storm windows are appropriate for historical buildings where primary windows are difficult or impossible to modify.

Showing Low-E Storm Windows Benefits



U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Phase I "R-5" Windows and Low-E Storm Windows Specifications and Certifications

High Performance Windows

- U-factor: 0.20-0.22
- Air leakage: ≤ 0.30 cfm/ft^2
- Certifications: NFRC/NAFS
- Warranty (yr): 20 glass/10 non-glass
- NFRC label required
- NAFS 05: Performance Grade R25
- Minimum order: 15/20

Low-e Storm Windows

- Emissivity: <0.22
- Structural test: ANSI/AAMA 1002.10-93
- Registry: IGDB (LBNL database)
- Warranty (yr): 10 glass/non-glass
- Minimum order: 20

Phase I Certified Vendors

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- Vendor's products (over 100) are listed on the volume purchase website with the vendor's URL.
- There are currently 40 certified vendors.
  - 36 R5 windows and 4 low-E storm windows
  - 9 of the top 16 window manufacturers (by sales)

UI Range*	Maximum Price Range
up to 50	$112 - $1011 [full price list]
51-60	$123 - $1081 [full price list]
61-70	$134 - $1200 [full price list]

Frame Type	Color	Vendor	Shipping Region†
Vinyl	White	Newtec Window and Door	Regions 1-10
Vinyl	White	Sunrise Windows	Regions 1-9
Vinyl	White/Other	Atrium Windows & Doors	Regions 1-10; Canada
Vinyl	White	NT Window, Inc.	Regions 4, 6, 7
Vinyl	White	Shwinco	Contact Vendor
Vinyl	White	Jeld-Wen, Inc.	Regions 1-10; Canada

71-80	$144 - $1395 [full price list]
81-90	$155 - $1687 [full price list]
91-100	$166 - $1763 [full price list]
100+	100 UI base price plus $2.05 - $19.75 per UI unit over 100. [full price list]

Discreet Prices for Retrofit R-5 Single-Hung Windows, 61-70 UI

The following are the maximum prices listed by vendors offering Retrofit R-5 Single-Hung Windows in this size:

- $134
- $285
- $319
- $435
- $494
- $1200

Windows Products Website

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

www.windowsvolumepurchase.org

- Optional bid request form
- Many homeowners are responding.
- Focus is now on contractors builders, remodelers, institutions, and weatherization agencies.
- Sales through 03/11:
  - 2,976 windows
  - $742K
- Phase II products: May 3, 2011

Phase II Program Specifications

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Phase II High Performance Windows and Low-E Storm Windows Specifications and Certifications

High Performance Windows

- U-factor: 0.20-0.22 (R); 0.24-0.27 (CW); 0.27-0.32 (AW)
- Air leakage: ≤ 0.30 cfm/ft^2
- Condensation Resistance ≥50
- Certifications: NFRC/NAFS
- Warranty (yr): 20 glass/10 non-glass
- NFRC label required; verified on NFRC/CPD
- Minimum order: 20

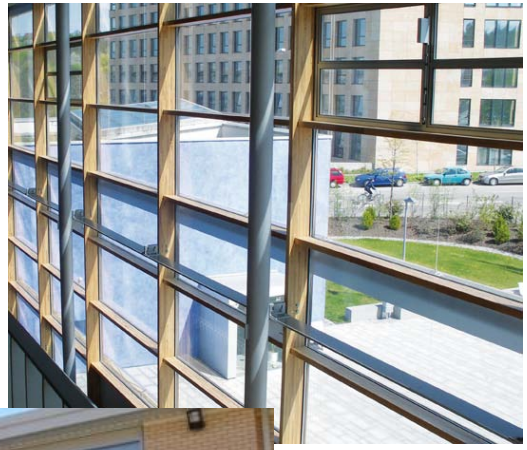
Low-E Storm Windows

- Emissivity: <0.22
- Structural test: ANSI/AAMA 1002.10-93 or ASTM E1886-05
- Performance Grade: ≥ 15
- Registry: IGDB (LBNL database)
- Certification/certification numbers required
- Warranty (yr): 10 glass/non-glass
- Minimum order: 20

Phase II Commercial Products

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- NFRC Component Modeling Approach (CMA) allowed for non-residential windows products
  - Designed to allow for site-built products
  - Follow certification process
    1. Simulate (CMAST) performance values
    2. Validate
    3. Generate certificate (replaces NFRC label)



Summary of Significant Changes in Phase II

- Name change to: *DOE High Performance Windows Volume Purchase Program*
- Commercial-grade products added to solicitation.
- Certification of low-E storm window products required.
- Only manufacturers allowed to submit bids.
- Bids will be accepted for 6 months after priority closing date (March 18).
- Optional pricing of smaller and larger quantities (prices for 20-49 windows is required).
- Vendor base bid price to be shown on website by UI by product.
- Vendor's linked-to websites are to clearly show products in the program.
- Vendors will be allowed to adjust prices at month 6 after submittal of certified bid.
- www.windowsvolumepurchase.org website will be redesigned.

Timeline for Phase II

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

- January 24, 2011: Phase II solicitation released
- March 18: Priority deadline for bids closed
  - Responses received after deadline will be processed in order received after bids meeting priority deadline have been processed.
- May 3: Phase II launch at the National Green Building Conference, Salt Lake City
- September 18: Deadline for entry into Phase II.
- May 2012: Tentative end of Phase II

Phase II Status

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

To date, we have received 32 bids in Phase II and are processing these bids.

32 bids
-4 with storm windows
-2 with commercial grade windows

Agreement
Validated URL

Certified Vendors

Data base with products

Launch Phase II Web Site
May 3, 2011

Phase II Marketing & Media

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

Planned Marketing and Media Events

- Conferences/trade shows*
  - Hotel/Motel Association, April 11
  - Green Building, Salt Lake City, May 2-3
  - AIA, New Orleans, May 12-14
  - PHADA, New Orleans, May 15-18
  - Greenbuild, Toronto, October 4-7
- Workshops*
  - April 26, Columbus, OH
  - May 4, Salt Lake City
  - June, New York & Washington D.C.
  - Fall, Denver, CO
- Webinars
  - Youthbuild, April 12
  - AESP, April 28
  - Better Buildings, May
- Publications & media
  - PNNL press release March 15 with multiple trade associations picking up.
  - Window & Door & DWM feature articles for May editions.
  - PlyGem interview with PNNL
  - Workshops press coverage
  - Papers planned at future buildings conferences

***With vendors as partners**

Contacts

Contacts

Graham Parker, CEM/BESA
Senior Staff Engineer
Energy Technology Division
Pacific Northwest National Laboratory
Richland, WA 99352
graham.parker@pnl.gov
509-375-3805

P Marc LaFrance, CEM
Technology Development Manager
Building Technologies Program
U.S. Department of Energy
marc.lafrance@ee.doe.gov
202-586-9142

Terry Mapes
Engineer
Energy Technology Division
Pacific Northwest National Laboratory
Richland, WA 99352
terry.mapes@pnl.gov
509-371-6745

Anne Hass
Media Relations
Pacific Northwest National Laboratory
anne.haas@pnl.gov
509-375-3732