Building America Expert Meeting on

Windows Options for New and Existing Homes

Date: Monday, November 14, 2011
Time: 8:30 am to 4:00 pm
Meeting Location: 140 Nolte (on the University of Minnesota campus)
Meeting Hotel: University Hotel Minneapolis (formerly Radisson)
615 Washington Ave. SE
Minneapolis, MN  55414
612-379-8888
Facilitator: NorthernSTAR Building America Partnership
Meeting Manager: John Carmody, University of Minnesota
612-624-1351
carmo001@umn.edu
List of Presenters: Steve Selkowitz/Charlie Curcija, Lawrence Berkeley National Labs
John Carmody, Center for Sustainable Building Research
James Larsen, Cardinal Glass
Pat Huelman, Cold Climate Housing Program
Peter Yost, Building Green
Peter Baker, Building Science Corporation
Theresa Weston, DuPont Innovations

In order to register to attend the meeting in person in Minneapolis click the following link:
https://docs.google.com/spreadsheet/viewform?formkey=dHNDISlVMwMwVpUIz05YyM0FzRG
NyN2c6MQ

In order to register to participate in the webinar only click the following link:
https://www1.gotomeeting.com/register/352960800

Objectives: To bring together window experts from Building America teams and other related
programs and research activities to share information and determine future research issues and
needs. Windows are critical components of both new and existing homes in meeting the Building
America energy targets in a cost effective manner. Understanding the impact of high performance
windows on HVAC system sizing and cost is another important aspect of determining cost
effective energy upgrades. Understanding when refurbishing old windows or using attachments
instead of replacement in retrofit situations is clearly relevant to Building America goals as well.

Windows have a very important impact on heating, cooling and air leakage in homes. They also
have many other benefits such as comfort, reduced condensation and increased durability that are
harder to quantify. With the focus on retrofit in the Building America program, understanding
replacement versus refurbishing options and attachments is critical. There is also a need to
understand the impact windows can have on the sizing and cost of HVAC systems. Finally,
window installation is often done poorly with consequences for moisture, IAQ and durability.
There has been a great deal of technological development as well as increased code requirements associated with windows in the last 25 years. There is still potential for significant technological improvements. The question is whether the cost can be justified. There is also a constantly evolving set of tools and information addressing new and replacement windows. Only recently has there been greater interest in the ability to measure performance and determine cost effectiveness for refurbishing existing windows or applying attachments such as shades, blinds and high performance storm windows.

**Key Questions:**

1. What are the life cycle costs and benefits of new and retrofit window options?
2. What are the trade-offs between replacement and refurbishing or attachments in retrofit situations?
3. What are the available tools and information to make cost effective window choices?
4. Are there any new technologies or strategies that make windows more energy efficient or cost effective?
5. What are the problems and solutions associated with window installation?

**Expected Results:** Many of the leading researchers, government program managers, and industry experts will be available to participate. We expect a very interactive session informing all Building America teams about the latest technologies, tools, and installation issues in the windows arena. In turn, Building America team members can raise questions and share experiences to inform the experts from research and industry. The meeting outcomes will help to shape both the Building America Program and the DOE Windows and Glazing Program.

**Invitees:** Participants will be key people working in the fields of window development and installation, building enclosure research and consulting, residential construction, and building energy efficiency. A blend of industry, research, and government participants will be sought.

**Meeting Agenda:** Below is a tentative agenda for this Expert Meeting.

- 8:30 Welcome and Meeting Introduction – Carmody & Booten
- 9:00 Overview of Window Research and Information – Selkowitz & Curcija
- 9:30 Window Measure Guideline for New Homes – Carmody
- 10:00 Windows and Comfort Research – Larsen
- 10:45 Break
- 11:00 Discussion on New Window Issues and Research Needs
- 12:00 Lunch
- 1:00 Window Challenges for Existing Homes – Huelman
- 1:30 Windows Attachment Research – Yost
- 2:00 Windows Research for BA – Baker
- 2:30 Windows Research for PNNL – Weston
- 3:00 Discussion on Replacement Window Issues and Research Needs
- 4:00 Adjourn meeting
- 4:30 Vans leave for Lab Tour and Reception

**Presenter Bios:**
Steve Selkowitz is Head of Building Technologies Department at Lawrence Berkeley National Laboratory. He has been active in windows and glazing research for over 30 years and is the author of *Window Systems for High Performance Buildings* and *Residential Windows: A Guide to New Technologies and Energy Performance*. Alternate: Charlie Curcija, Building Technologies, Lawrence Berkeley National Laboratory

John Carmody is the Director of the Center for Sustainable Building Research at the University of Minnesota. He has worked in building-related research for 30 years and is the author of several books on building design and construction including *Window Systems for High Performance Buildings* with Lawrence Berkeley National Laboratory, and the new edition of *Residential Windows: A Guide to New Technologies and Energy Performance*. Mr. Carmody is one of the co-leaders of the Northern STAR Building America team.

James Larsen is Director of Technology Marketing at Cardinal Glass Industries. He has twenty years of experience in the research and development of glass products. His responsibility is to support the recognition of energy efficient windows through state and national codes. Jim also provides product support and serves on the board of directors for the National Fenestration Rating Council.

Pat Huelman is an Associate Professor in Residential Energy and Building Systems with the University of Minnesota's Department of Bioproducts and Biosystems Engineering and serves as Coordinator of the Cold Climate Housing program with the University of Minnesota Extension. He is the lead faculty for the Residential Building Science and Technology undergraduate degree, a principal investigator for hygrothermal testing at the Cloquet Residential Research Facility, and is directing the new NorthernSTAR Building America Team. With more than 30 years in the field, Pat has extensive experience and expertise in energy-efficient design, innovative building systems, residential indoor air quality, mechanical ventilation, and moisture management.

Peter Yost is Residential Program Director at Building Green. He brings more than 25 years experience in building, researching, teaching, writing, and consulting on high-performance homes to his twin roles as director of residential services for BuildingGreen, and technical director for Taunton Press’s GreenBuildingAdvisor.com. Peter has been called upon to provide this building-science expertise to the nation’s leading homebuilding programs, including NAHB’s Green Building Standard, USGBC’s LEED for Homes, EPA’s WaterSense, and the U.S. Department of Energy's Building America.

Peter Baker is a Senior Associate at Building Science Corporation. He is responsible for providing building forensics and design reviews, setting enclosure design standards, as well as working as project manager for the Building America Program. He is responsible for conducting field investigations of commercial and residential buildings with assembly or system problems, providing explanations of the identified problems and developing retrofit recommendations.

Dr. Theresa Weston, DuPont Innovations, leads the building science technology group for DuPont Building innovations. She participates in industry research programs and in standards and codes development. Theresa has over 20 years experience in materials and fiber development and is an inventor of 4 U. S. patents. Theresa has a Bachelor of Science in Chemical Engineering from the MIT, and Masters and Doctorate degrees in Chemical Engineering from the CalTech. Theresa is actively involved industry organizations, including ASHRAE and ASTM, for both of which she has chaired technical and standard committees.