

Meeting Summary  
**Windows Performance-Based Rating System Meeting**

U.S. Department of Energy (DOE)  
1000 Independence Avenue SW, Washington DC  
September 30, 2003

**Overview Summary:**

The DOE held an open meeting to explore the feasibility and desirability of a performance-based window rating system for use with ENERGY STAR® in Washington on September 30, 2003. Ninety people representing a broad cross-section of the window industry attended. Meeting participants supported the idea of DOE and the National Fenestration Rating Council (NFRC) developing a performance-based rating method for window systems that can be used as an adjunct to existing ENERGY STAR prescriptive compliance criteria. The meeting consensus for follow-on action incorporates two parallel elements to ensure a timely response, strong technical credibility and adequate industry input. The underlying technical basis for any such performance approach is a set of annual energy simulations that demonstrate “equivalence” between performance and prescriptive alternatives.

Prior to the meeting, industry participants reviewed several potential options for using simulations, which we generated using the RESFEN computer program. Participants agreed to allow an NFRC task group to review and update the default assumptions, input the variables for the RESFEN computer program and examine the methodology of aggregating city climate data within each ENERGY STAR climate zone. In parallel with the NFRC activity, the Lawrence Berkeley National Laboratory (LBNL) will continue to refine its analyses using the current RESFEN model and will focus on the application of appropriate filters to address issues such as peak energy demand impact and code compliance. The analysis is intended to result in limits to a performance trade-off system between U-factor and the solar heat gain coefficient (SHGC). If NFRC recommends changes in the RESFEN default assumptions, LBNL can incorporate it into the revised analyses. Stakeholder input will be required during this process for feedback on proposed technical criteria, such as an “assumed” baseline for SHGC in the north, and at various stages after presentation of the results. DOE strongly encourages constructive comments from the entire window industry to assist in this analysis.

There was some concern expressed as to how a new performance-based approach might affect the recently revised ENERGY STAR criteria. We reiterated that the current four zone ENERGY STAR criteria and the implementation dates would remain the same. DOE will consider the inclusion of a voluntary alternative rating method based on a performance approach at the conclusion of the analysis described above. Such a system would allow a manufacturer not currently in the ENERGY STAR program to join if their products meet the performance-base criteria; however, it would require some extra effort for those new companies to comply. Participants stated that there should not be an impact on companies that currently use the prescriptive criteria nor should there be any

impact on consumers, who will only see the ENERGY STAR label. Several stakeholders raised the issue of possible impacts on consumers as a concern and, DOE agreed to address this issue. See the attached project schedule to see the overall planned activity.

### **Meeting Details:**

On September 30, 2003, the U. S. Department of Energy's Windows ENERGY STAR and Research & Development Programs convened a meeting in Washington, D.C. to begin discussion on how and whether to develop a performance-based rating system for windows for the potential use in qualifying window products for the ENERGY STAR program. Approximately 90 people attended with representatives from a spectrum of organizations; including window manufacturers and component suppliers, government, homebuilders, efficiency advocates, researchers, certification and rating agencies and other interested parties.

DOE Assistant Secretary for Energy Efficiency and Renewable Energy, David Garman, welcomed participants to the meeting. He stated that DOE would continue with the current four climatic zone ENERGY STAR prescriptive criteria and implementation date. He indicated that DOE will explore moving to a performance-based approach, and he requested that industry cooperate in developing an understanding of how the windows can obtain equivalent performance. He noted that certain factors had to be considered and addressed including, NFRC's previous lack of success, possible conflicts with building codes and other issues.

Mr. Richard Karney presented an overview of the Windows ENERGY STAR program, including the qualification criteria for windows, doors and skylights four climatic zone map and table. The four climate zone ENERGY STAR criteria was distributed on May 28, 2003.

Mr. Marc LaFrance presented an overview of the current Windows R&D program including DOE's goal to work with industry to develop the next generation of window technologies that can become net energy producers rather than energy consumers. These windows will be highly insulating and exhibit dynamic solar control. Mr. LaFrance explained that to fully evaluate or rate their performance, static thermal and optical properties would not be adequate. DOE will consider annual energy performance. Thus, DOE has a strong interest in seeing the current annual energy rating activity advanced and plans to reinvigorate this activity within NFRC. [Click here](#) for a copy of the presentation.

Mr. Dariush Arasteh (LBNL) presented his report entitled: "Performance Based Ratings for ENERGY STAR Windows Program - A discussion of issues and future possibilities." He based his presentation on the LBNL white paper that was completed and posted on our [GovForums](#) website for comment on August 1, 2003. Over 900 ENERGY STAR and Windows R&D stakeholders were sent information about the workshop and available analyses. [Click here](#) for the presentation. The presentation focused largely on technical issues by providing background information on historical work to establish annual energy

performance, identifying a number of technical issues that needed further consideration, and concluded by describing four alternative approaches for a performance based rating system for the ENERGY STAR program. The intent was to stimulate industry discussion on the pros and cons of these options and provide feedback and input to DOE on the Forum website, both from a technical basis and a market basis. In the last few weeks preceding the meeting, there was a useful level of postings on the Govforums website.

We opened the meeting to a general Question & Answer session on the technical analysis. The feedback from industry was a free ranging discussion of a wide range of issues. The meeting then largely focused on a technical discussion of the four approaches and performance-based tradeoffs. While there were many differences of opinion on which options to pursue, or even whether a performance option was desirable, there was support for approaching the issues in terms of short- and long-term objectives. There was significant support for pursuing options 1, 2, and 3 in parallel development paths.

### **Short Term Activities:**

LBNL used RESFEN with its DOE-2 engine for the options analysis prepared as input to the meeting. They chose RESFEN because it had been used and discussed over several years as part of the work within the NFRC Annual Energy Rating task group. Although NFRC has been working on this rating for many years, a final approved rating has not yet emerged--a point discussed at some length in the meeting. NFRC will convene a task group and review all the current (1998) underlying assumptions in RESFEN. NFRC will also look at the climatic city data used in RESFEN and the aggregation methodology used by LBNL to determine how specific cities are correlated with ENERGY STAR zones and whether any revision is required to the initial aggregations that were proposed. Participants suggested that some California cities and Miami may be a concern. The task group will draft any recommended changes to the RESFEN input assumptions by January 2004. If approved at the task group level, NFRC will attempt to fast track the approval of the changes through the Subcommittee, Technical Committee and Board of Directors for resolution at the March 2004 meeting.

On a parallel path, LBNL will continue its analysis by generating coefficients for option 3 and by expanding option 2 to specify SHGC values for every 0.01 unit of U-factor. Included in this analysis will be filters to limit extreme trade-offs due to issues such as peak energy demand or code compliance. Additional assumptions and stakeholder input such as the baseline for SHGC in the northern zone will also be considered in this analysis. The variable for air infiltration, as suggested in the "white paper" for option 3, will not be considered for the short-term analysis. We will use a default value as specified in the RESFEN model. The calculations will be performed using the current RESFEN assumptions.

After receiving NFRC's recommended changes (if any) to the assumptions and the city climate data aggregation, along with comments on its analysis for extreme trade-off

limits, LBNL will further refine the analysis. Please see the attached [schedule](#) the process.

DOE will use the Envelopes Forum web site to communicate key issues and to elicit responses from all interested parties.

**Long-term Activity:**

DOE plans to work with LBNL to reinvigorate activity within the NFRC regarding annual energy performance since it will be needed for emerging window technologies. We will address the full compliment of issues associated with the short-term activities and participants suggested that we also address:

- air infiltration
- long-term energy performance
- inclusion of sloped skylights
- multifamily high rise applicability
- planning for commercial availability of new technologies (switchable glazing and low U-factor products)
- consumer outreach/education impacts

The meeting adjourned at 3:45 PM