

October 17, 2017

Doug Anderson  
ENERGY STAR® Program  
U.S. Environmental Protection Agency  
Washington, DC 20460

Dear Mr. Anderson:

The Consortium for Energy Efficiency (CEE) respectfully submits the following comments in response to ENERGY STAR® Exterior and Interior Storm Windows Draft 1 Version 1.0, released by the Environmental Protection Agency (EPA) on July 21, 2017.

CEE is the binational organization of energy efficiency program administrators and a staunch supporter of the ENERGY STAR® Program. CEE members are responsible for ratepayer-funded efficiency programs in 46 US states, the District of Columbia, and seven Canadian provinces. In 2015, CEE members directed nearly \$7 billion of the \$8.7 billion in energy efficiency and demand response program expenditures in the two countries. These comments are offered in support of the local activities CEE members carry out to actively leverage the ENERGY STAR brand. CEE consensus comments are offered in the spirit of strengthening ENERGY STAR so it may continue to serve as the national marketing platform for energy efficiency.

CEE highly values the role ENERGY STAR plays in differentiating energy efficient products and services that the CEE membership supports locally throughout the US and Canada. We appreciate the opportunity to provide these comments.

## **CEE Supports an ENERGY STAR Label for Exterior and Interior Storm Windows**

Fenestration is a critical variable of a home's energy consumption, as overall envelope performance depends greatly on the effectiveness of window systems to prevent energy loss or heat gain. In older houses, fenestration accounts for about 25 percent of annual heating and

cooling costs and contributes up to 40 percent of electric energy consumption.<sup>1</sup> CEE recognizes that housing stock varies significantly, with no one fenestration solution available to suit all consumer needs and circumstances. We believe it is important to support all cost-effective options that provide efficiency gains without compromising customer satisfaction. Exterior and interior storm windows are one such application, and we are pleased to see EPA identify this category within the ENERGY STAR portfolio. Given the complexity and diversity of the broader fenestration market, development of the federal binary label for this area will help denote to end users that storm windows can deliver energy savings and that there is distinction among the performances of different products available.

CEE members greatly value the thorough process that EPA undertook to ensure that this product effectively aligns with the guiding principles of the ENERGY STAR label. These considerations are particularly important with a new category, where the binary mark is introduced to consumers for the first time. We appreciate the thoughtful attention to each of the *ENERGY STAR Products Program Strategic Vision and Guiding Principles* that EPA deployed in developing the proposed requirements, and believe this foundational backbone will help ensure success of the label in the market. In particular, we note the following two considerations that have to date presented a challenge for promoting storm windows.

## Energy Savings Are Persistent and Demonstrable

EPA conducted robust analysis and research to demonstrate that this draft specification upholds the guiding ENERGY STAR principle that “significant energy savings can be realized on a national basis.” Achieving energy savings above baseline products is a critical consideration for program administrators, and discrete member research has found results consistent with those cited in the EPA analysis. Studies conducted in Chicago and Philadelphia found roughly 20 percent heating energy use reduction from low-e storm windows compared to clear glass storm windows.<sup>2</sup> In modeling and field studies that evaluated different baseline primary windows, energy savings have ranged from six percent (for already efficient windows, such as double-pane and glazed) to 28 percent (for inefficient single-pane windows).<sup>3</sup> The proposed ENERGY STAR specification

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<sup>1</sup> [Window Retrofit Options: Deciding What to Do With Existing Windows](#). DOE fact sheet EE-0591. June, 2011.

<sup>2</sup> Drumheller, SC, C Kohler, and S Minen. 2007. [Field Evaluation of Low-E Storm Windows](#). Ernest Orlando Lawrence Berkeley National Laboratory, Clearwater Beach: Ernest Orlando Lawrence Berkeley National Laboratory. Accessed September 18, 2017. Knox, JR, and SH Widder. 2014. [Evaluation of Low-E Storm Windows in the PNNL Lab Homes](#). Pacific Northwest National Laboratory, US Department of Energy.

<sup>3</sup> Studies include:

Knox, JR, and SH Widder. 2014. [Evaluation of Low-E Storm Windows in the PNNL Lab Homes](#). Pacific Northwest National Laboratory, US Department of Energy.

Culp, TD, and KA Cort. 2015. [Energy Savings of Low-E Storm Windows and Panels across US Climate Zones](#). Pacific Northwest National Laboratory, Pacific Northwest National Laboratory. Accessed September 18, 2017.

Petersen, JM, GP Sullivan, KA Cort, MB Merzouk, and JM Weber. 2015. [Evaluation of Interior Low-E Storm Windows in the PNNL Lab Homes](#). Pacific Northwest National Laboratory. Accessed September 18, 2017.

Cort, Katie, and Erica Johnson. 2017. [Window Attachment Opportunity Assessment for the Pacific Northwest](#). Pacific Northwest National Laboratory, Northwest Energy Efficiency Alliance. Accessed September 18, 2017.

Sacramento Municipal Utility District. [SMUD Window Attachments Energy Savings Report](#). January 23, 2017.

further addresses regional considerations and local energy savings potential; these are effectively managed through variation of requirements based on climate zones.

### Referenced Test Procedures Are Verified Third-Party Processes

The proposed specification adopts test procedures that have already been openly vetted and accepted in the market; this enables manufacturers to develop fenestration products that can effectively be compared against each other and demonstrate performance through credible channels. By using existing metrics that reference national, third-party procedures for emissivity, solar transmittance, and air leakage, EPA effectively addresses the guiding ENERGY STAR principle that “product energy consumption and performance can be measured and verified with testing.”

## Window Attachments Are a Promising Product Category for Residential Energy Savings

Energy efficiency portfolio managers are continually looking for measures to garner savings for their customers. This is increasingly true as program goals become more ambitious, building codes and equipment standards rise, and technologies advance in the market. For example, new federal minimum lighting standards are driving many electric programs to find new offerings to replace the savings that they were previously able to obtain by promoting CFL and LED lamps. For gas programs, the prevailing low cost of fuel continues to be a challenge in achieving customer participation. With this context in mind, CEE members are especially interested in identifying fenestration options that can serve to deliver cost-effective savings to customers. Members have identified window attachments, including storm windows, as one such measure, and CEE supports EPA development of an ENERGY STAR specification in this space.

Efficiency programs are interested in promoting window attachments for a myriad of reasons identified by various CEE member organizations across diverse climates. These include:

- Promising energy savings potential above baselines
- Nonenergy benefits, such as comfort, privacy, and noise reduction
- Current availability and accessibility of products in the market
- Recent advancements in the development of third-party ratings and certifications
- Diverse retrofit options to serve individual customer needs

While the broader swath of window attachment products offers potential from a program perspective, several reports and studies point to low-e storm windows as an especially promising subcategory. Research conducted by the Pacific Northwest National Laboratory indicates that

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adoption of low-e glass over clear glass yields energy savings between 21 and 36 percent, with results varying based on house conditions and climate; the study also found the payback period for storm windows to be consistently between two and five years in all climate zones.<sup>4</sup>

Some programs are actively promoting storm windows or pursuing them as a cost-effective measure in their respective jurisdictions. In 2015, Efficiency Vermont ran a pilot promotion of low-e storm windows through markdowns of qualifying products at local retailers;<sup>5</sup> they are currently developing a technical reference manual characterization and are exploring different program delivery models. Low-e storm windows are now approved as a deemed unit energy savings measure by the Regional Technical Forum and are included in Bonneville Power Administration's 2016–2017 Implementation Manual.<sup>6</sup> A 2017 report conducted for Sacramento Municipal Utility District stated that storm windows and interior window panels have consistently high energy savings, ranging between 12 and 35 percent, and can yield annual energy savings between \$64 and \$428 depending on base conditions.<sup>7</sup> As CEE members continue to pursue window attachments (including, but not limited to, storm windows) in their residential portfolio of offerings, the ENERGY STAR label can fulfill a critical role of differentiating high performing options in the market.

## Storm Windows Provide Savings Opportunities in Residential Markets with Limited Options for Efficiency

As noted above, there are many considerations and variables when determining the appropriate fenestration options to help improve the overall performance of a home. CEE recognizes that exterior or interior storm windows may be especially relevant and beneficial for several specific building types and consumer segments. For instance, historic homes often are often required to maintain certain physical features of the building or preserve its aesthetics. These parameters can greatly reduce the number of energy improvement choices available to the homeowner, making storm windows an ideal candidate. Another situation of particular relevance is low-income households, where higher-cost retrofit options such as window replacements are not always economically viable. With ratepayer-funded programs seeking to effectively serve all customers, CEE views storm window programs as playing a complementary role to existing window programs in the residential market.

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<sup>4</sup> PNNL-24826. [Energy Savings of Low-E Storm Windows and Panels across US Climate Zones](#). October 2015.

<sup>5</sup> Efficiency Vermont. [Low-E Storm Windows Provide a New Way to Solve the Window Conundrum](#). December 31, 2015.

<sup>6</sup> Bonneville Power Administration. [2016-2017 Implementation Manual](#). Measure information effective April 1, 2017.

<sup>7</sup> Sacramento Municipal Utility District. [SMUD Window Attachments Energy Savings Report](#). January 23, 2017.

## Considerations Moving Forward

CEE supports the advancement of exterior and interior storm windows through this specification and welcomes the ENERGY STAR label as an important mechanism to help differentiate efficient options in the market for consumers. While storm windows represent an especially promising opportunity for efficiency programs in terms of a cost-effective energy saving solution, the broader suite of window attachments offers additional energy savings potential for residential customers. As the Attachments Energy Rating Council (AERC) develops procedures to certify various window attachments, we believe there are ways to help support the adoption of efficient products beyond those identified in the scope of this draft specification. EPA may be able to play a unique role in differentiating high performing options and bringing attention to energy savings opportunities for residential customers through the ENERGY STAR label. We look forward to working together to identify ways to capture savings across all cost-effective fenestration applications.

CEE would once again like to thank the EPA for the opportunity to comment on ENERGY STAR® Exterior and Interior Storm Windows Draft 1 Version 1.0. Please contact CEE Senior Program Manager Alice Rosenberg at 617-337-9287 with any questions about these comments.

Sincerely,



Ed Wisniewski  
Executive Director