Technology Innovation Project

Project Brief

TIP 182: Field Evaluation of High Performance Energy Efficient Windows in Manufactured Housing

Context

The Northwest Power and Conservation Council's Sixth Northwest Power Plan recommends that the region acquire all electric energy conservation savings from new residential and new commercial buildings that have a cost-to-benefit ratio greater than one when compared to the Council's forecast of future regional power system cost. The Council believes that at least 85 percent of all regionally cost-effective savings in new residential and commercial buildings are practically achievable.

Specifically, the Council's Regional Technical Forum (RTF) recently analyzed the cost effectiveness of savings from high-performance window products. The RTF concluded that products with U-factors of 0.25 and below were cost effective in both new construction and retrofit applications.

Description

This project is a factory-floor implementation evaluation and field demonstration of the energy savings attributed to high-performance windows (R-value of five or higher) in a manufactured home.

Pacific Northwest National Laboratory (PNNL) will partner with a Northwest manufactured home builder to design a matched pair of well-insulated, single-wide manufactured homes for testing the energy savings from high-performance windows installed in one of the homes. One home will have windows appropriate for cold climates (likely to be ENERGY STAR®), and one home will have high-performance windows (U-factor of 0.22 or lower). The high-performance windows will be selected from Northwest manufacturers that are part of the Department of Energy's volume purchase program for high-performance windows. The homes will be colocated and end-use metered to determine the energy performance of each. They will be sited in a heating-driven climate and monitored in an unoccupied condition for a heating season. In addition, the shop-floor implementation of high-performance windows will be evaluated, including the cost of installation and additional structural requirements for the high-performance windows.

Why It Matters

The Council is committed to securing all regionally cost-effective electricity savings from new residential and commercial buildings. The Council believes this can best be accomplished through a combination of continued enhancements, enforcement of state and local building codes and the development and deployment of effective regional market transformation efforts.

This demonstration will add to the region's market transformation efforts. This project also fills an R&D demonstration and deployment gap for the DOE envelope and windows R&D program, as well as for BPA's Energy Efficiency Technology Roadmap. All prior and currently planned DOE-led high-performance window demonstrations have been in either commercial buildings or site-built homes.

This demonstration can also serve as a platform for demonstrating other efficient technologies in manufactured homes.

Goals and Objectives

The overall goal of the project is to demonstrate the cost effectiveness of high-performance windows in the manufactured housing sector as a feature to significantly improve overall efficiency of manufactured homes in the Northwest and thus help BPA meet its 2010–2014 regional energy-saving goals.

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Project Start Date: October 2010

Project End Date: June 2012

Links

The Building America Industrialized Housing Partnership (BAIHP)
http://www.baihp.org/

Funding

Total Project Cost:	$180,000
BPA Share:	$ 90,000
External Share:	$ 90,000
BPA FY2012 Budget:	$ 53,000

Participating Organizations

U.S. Department of Energy (DOE), Pacific Northwest National Laboratory (PNNL), Richland WA

Washington State University (WSU)-Extension Energy Program, Olympia WA

Northwest Energy Works, Northwest Energy Efficiency Manufactured Homes (NEEM) program, Corvallis OR

Efficiency Solutions, Richland WA

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