# Thin Triple-Pane Windows: Coming soon to a hardware store near you!



Pacific Northwest NATIONAL LABORATORY



Heat transfer through windows accounts for 10% of home heating and cooling loads (\$25 billion per year).

### **The Challenge:**

**Triple-Pane Windows** work great, but they are only 1% of window sales!

## **Putting Triple-Pane Windows on a Diet**



Conventional double-pane wood-framed windows have a 3-inch-wide sash.



Although they have been available for decades, triple-pane windows haven't caught on in the United States. One reason is that traditional European-style triple-pane windows are wider and heavier than the double-pane windows most U.S. builders are used to.

Builders have identified several issues with standard triple-pane windows:

- ✓ Too expensive
- ✓ Too heavy
- ✓ Too wide; won't fit in a 2x4 wall
- ✓ Not a simple replacement for a double-pane window.
- ✓ Hard to change manufacturing line from double-pane to triple-pane windows.

Researchers at the U.S. Department of Energy's Pacific Northwest National Laboratory and Lawrence Berkeley National Laboratory are



We've transformed the windows market before, from single- or doublepane glass to double panes of glass with better frames and low-emissivity coatings.

Now nearly all windows sold in the United States have at least two panes of glass, insulated frames, and one or more lowemissivity (low-e) coatings of transparent silver to slow heat transfer. But only 1% of the window sales are for triple-pane windows.

European standard triple-pane windows have a 5-inch sash.

working to develop and test thinner triple-pane windows that are as thin as a typical double-pane window but have the same insulating properties as a traditional thick triple-pane window.

**Traditional Triple-Pane vs Thin Triple** 



### Thin Triple-Pane Windows Offer a Lot of Advantages

- Drop-in replacement for double-pane windows
- Reduced weight
- Single spacer
- Same width as double-pane, but same performance as a traditional triple-pane window.
- Lower cost



### **PNNL Lab Home Studies Verify Triple-Pane Savings**



Pacific Northwest National Laboratory's Lab Homes are two identical sideby-side homes located on PNNL's campus in southwest Washington state. Researchers used the Lab Homes to compare the thin triple-pane low-e windows with insulated frames installed in Home A with the double-pane clear-glass uninsulated windows installed in Home B. Data was collected on the energy usage of each home over several months. Results showed the thintriple windows reduced heating loads by 12% in the winter and cooling loads by 28% in the summer.

### Field Studies are showing how much energy and money you can save with triple-pane windows.

Can we transform the market again to highperformance triple-pane windows?





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For more information, visit https://www.pnnl.gov/news-media/how-triple-panewindows-stop-energy-and-money-flying-out-window