

# New window ratings

BRANZ is helping develop a new window rating scheme expected to launch in 2014. With six performance levels, it's suitable for any window type and will enable better choices around thermal performance.

**WINDOW SYSTEMS** have a large impact on the sustainability of New Zealand housing due to the environmental impacts in their manufacture, use and disposal.

Work undertaken in Australia has shown that the largest environmental impact from windows is during their use. In this part of their life cycle, heat passes through in both directions. The size, placement and orientation of windows directly affects the energy needed for space heating and cooling to maintain comfortable interior temperatures.

## **New Zealand windows underperform**

The 2008 change to New Zealand Building Code clause H1 *Energy efficiency* upgraded window performance standards for housing in New Zealand to double-glazing insulating glass units (IGUs) with an R-value of 0.26 m<sup>2</sup>K/W.

However, this higher thermal performance is still not enough to provide comfortable conditions in the housing stock throughout New Zealand. Although our climate is less severe, our window performance is well below that expected for windows in Europe and North America, which may have R-values of 0.5 m<sup>2</sup>K/W.

In New Zealand, most windows sold in 2009 had an R-value of around 0.25 m<sup>2</sup>K/W (see Figure 1). Single-glazed windows have an R-value of 0.1-0.2 m<sup>2</sup>K/W, while basic double-glazed windows have an R-value of 0.15-0.35 m<sup>2</sup>K/W, depending on frame and size.

## **Big savings to be had**

Based on the market profile, BRANZ has projected that improving the performance of domestic windows could save 11-16 PJ of energy

over the next 20 years - the equivalent of running up to half a million 1 kW heaters continuously for a year.

This would save 320,000-500,000 t of greenhouse gas emissions over this timeframe and between \$470 million and \$730 million in electricity bills to the consumer. It may also reduce the need for the construction of new power generation facilities.

While we cannot ignore the environmental impacts from the rest of the window life cycle - manufacture, delivery, installation, maintenance, removal and disposal - dealing with the largest environmental impacts first is a sound approach.

## **New WEERS window rating system**

To address energy demand in housing due to windows, BRANZ has developed a Window Energy Efficiency Rating System (WEERS) with funding from the Building Research Levy, in association with the Window Association of New Zealand and the Energy Efficiency and Conservation Authority (EECA).

WEERS leverages off the old WERS (Window Energy Rating Scheme) and provides a simpler non-mandatory means to rate and compare the thermal performance of windows that are installed in homes.

The WEERS is internationally unique as it allows the thermal performance of windows of any size to be calculated precisely, rather than relying on approximations for predetermined standard-sized windows, as in Australia, Europe and North America.

Each window system gets a WEERS star rating dependent upon its size, as well as the thermal performance of its components.

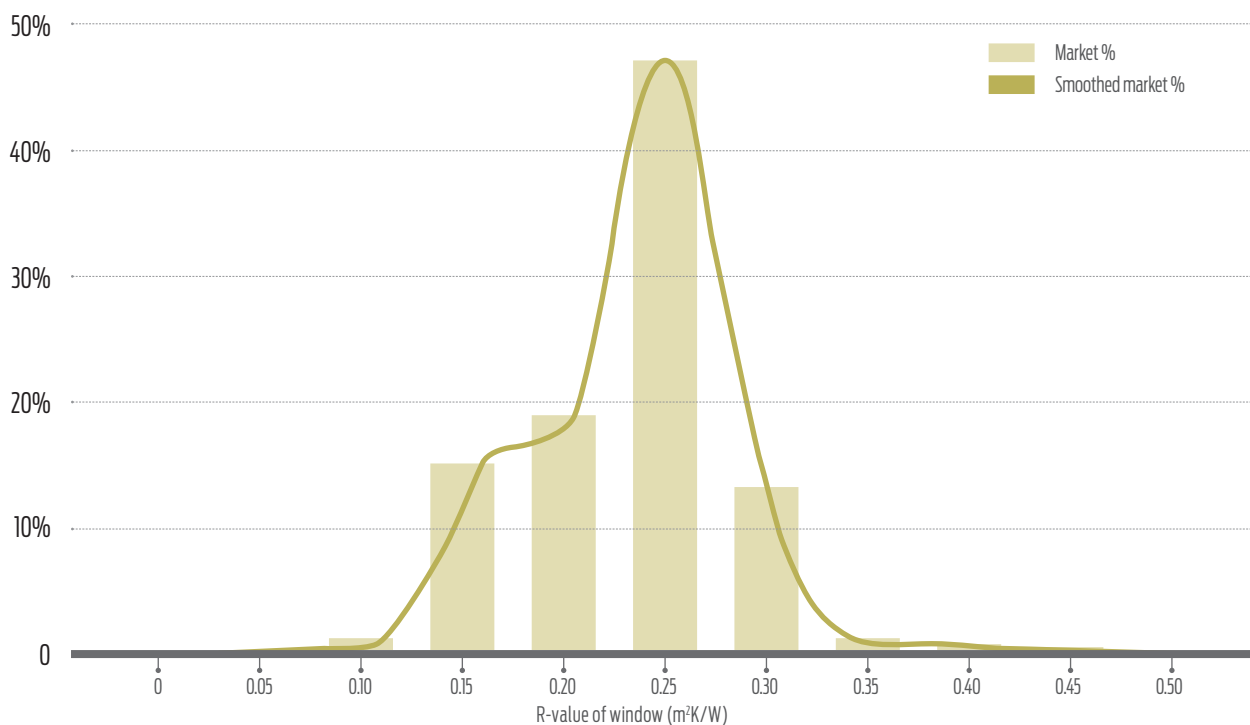


Figure 1: Profile of New Zealand domestic new window market in 2011.

### Rating provides guidance on all windows

The WEERS rating is dependent on:

- the thermal performance of the framing
- the thermal performance of the IGUs
- the size of the window
- a factor accounting for the interaction between the frame and the spacer.

It provides a rating system using one to six stars, providing guidance for design, manufacturing, supply and purchase decisions for windows with all types of frame materials, sizes and IGUs.

EECA also intends to use the output of the WEERS programme to provide an ENERGY STAR® endorsement for windows. ENERGY STAR®, the government-backed symbol for energy efficiency, is awarded by EECA to the most energy-efficient products - typically the top 25% best performing products in the New Zealand market.

While the label to be used is still being developed, windows will now join the range of products in the New Zealand market that have energy or efficiency labelling, including refrigerators, freezers, dryers, dishwashers, washing machines, heat pumps, air-conditioners and vehicles.

### Whole-house assessment

A complete house-lot of windows can also be awarded a WEERS star rating. This provides an average thermal performance for all the windows in a home and allows accurate calculations of the thermal performance of the whole home to be made. ◀