



## Energy Efficiency

Home energy efficiency operates on two fronts: it impacts the environment, and it impacts your comfort and your power bills. We will look at these separately below, but of course they should be considered jointly whenever you are planning a new build or an upgrade to an existing home.

### Energy efficiency, the environment, and the building code

Building and construction accounts for about 15 per cent of New Zealand's carbon emissions. This figure includes the energy that is used once a home is built.

Clause H1 of the New Zealand Building Code regulates the energy efficiency of our homes. The clause was updated in November 2022 to help New Zealand achieve its net zero emissions goals. The revised H1 includes requirements for insulation (roofs, walls, floors, windows, doors and skylights), draughts, hot water systems, artificial lighting, and HVAC (heating, ventilation and air-conditioning) systems.

Under the new clause, New Zealand is divided into six climatic zones, from 1 in the Far North to 6 in the lower South Island. There are variations in compliance requirements between the zones, spelt out as R-values (insulation values). You can check the requirement for your location [here](#). New build specifications are required to demonstrate how each build element will comply with H1.

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## How energy performance is calculated

Building energy performance is assessed in one of the following three ways:

- By using a ready-made 'schedule' of building elements with known energy performance values,
- By calculating the building performance using a manual 'calculation' method, or
- By 'modelling' the building using approved computer software.

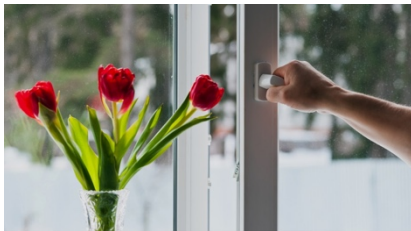
The details of these methods are described in New Zealand Standard NZS 4218 and you can get assistance from an engineer, architect or designer to make these calculations. MBIE's Building Performance acceptable solution and verification documents provide tables and a simple calculator,

which design and construction professionals can use to determine R-values. (You can, for instance, consult the document [H1 Energy Efficiency Acceptable Solution H1/AS1 to identify your climatic zone.](#)) You can also use a mix-and-match approach, which involves both calculating and modelling building performance. This allows you to take the energy performance of different building elements and trade off the cost and benefits of each option to give you an overall BPI (building performance index), which is the measure that matters.

If you are altering an existing property, different rules apply: while there is no need for code compliance, the energy performance of the building must be as least as good as it was before you made alterations. For instance, if your house originally lacked double glazing, you don't need to introduce double glazing when installing new windows – so long as there are no other alterations which will compromise your home's energy efficiency.

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## Making energy efficiency work for you



By choosing energy-efficient options, you increase your house's energy performance, comply with standards and reduce the annual energy cost of running your home.

If you make energy-efficient choices at construction stage, your home will not only be comfortable to live in, but also cheaper to run over its lifetime. There are many ways, too, that you can improve energy efficiency in an existing home.

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## Tips for creating an energy-efficient home

- For aluminium joinery, use thermally broken or insulated window and door frames. These have an insulating barrier to reduce loss of energy via the frame, improving insulation and reducing condensation.
- Orient the longest elevation of your home towards the sun for winter warmth and free heating.
- Design roof eaves so that the low angle of the winter sun can enter the building and warm the rooms. Eaves should also be wide enough to provide some shade from the high angle of the summer sun.
- Use insulation to keep the indoor temperature stable and slow the rate of energy loss or gain. Roof, wall and floor insulation is cheap compared with most other building materials. (Take the opportunity to install ceiling, wall and floor insulation during construction, as adding it later can be difficult.)
- If insulating on a budget, aim to spend where your dollar brings the greatest benefit. Begin with the ceiling, then the floor, then walls.

- Install windows and doors in strategic locations to provide good cross-ventilation for free summer cooling.
  - Windows are the greatest source of heat loss in a new build. Use your window dollars wisely by installing energy-saving double or triple glazing, and choose window glass that has low E coating and/or is tinted.
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## Window Energy Efficiency Rating System (WEERS)



To help you achieve an accurate measure of the energy performance for your home, we've developed WEERS (Window Energy Efficiency Rating System), which gives every glazed window or door you purchase an accurate energy efficiency rating. The rating can be given to your architect or energy consultant to use as part of assessing your home's total energy performance calculation or BPI.

WEERS is similar to the energy rating label you find on appliances. It makes it easy to satisfy the requirements of the New Zealand Building Code, and to meet any other energy performance targets that may be required by local authorities.

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## Benefits of the WEERS rating system



Most other window rating systems are based on standard window sizes and configurations. With WEERS you get an accurate rating specific to each window and door that you purchase. Even if you buy two similar windows, each one will have its own unique and accurate rating. WEERS ratings are also specific to the New Zealand climate – which cannot be said for ratings from other regions, such as Australia, the USA, Canada and Europe.

WEERS ratings are used in calculating NZ Green Building Council Homestar ratings (a comprehensive, independent national rating tool that measures the health, warmth and efficiency of New Zealand houses).

## How WEERS works



The windows and doors that you purchase from some members of the Window and Glass Association will be WEERS energy-rated and a certificate will be issued to you describing the windows and their ratings. The certificate uses a familiar star rating system, with the maximum possible rating of six stars. The certificate also records the thermal efficiency or R-value of each window, and also the R-value for the house lot.

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