



THE PROBLEM

New Zealand homes are not kind on the environment. Most score just two stars out of 10 on the Homestar* rating system for environmental impact. Very few score more than four, the minimum requirement under the latest building code**.

Much of the problem with keeping our homes warm and dry lies in the following:

- Many houses were built before insulation was widely used (and made compulsory).
- Many are poorly positioned to catch the sun, the best and cheapest heating source.
- We like big windows whenever there are views, even if the windows have a cold, south-facing aspect.
- We once had a craze for exposed rafter ceilings (which make rooms harder to heat) and skillion, or flat, roofs (which make retro-fitting of insulation difficult).
- We prefer to redecorate over less exciting improvements such as insulation, solar heating or water-efficient appliances.
- Our climate makes dampness a constant threat.

Many of these things are changing. We appreciate that there are great costs – to our health and wellbeing as well as to our pocket – in cold, draughty homes. We are realising that the investment in fitting insulation, double-glazing and quality blinds can quickly repay itself. When we alter or make additions to our homes, we are beginning to choose products for their environmental friendliness as well as their price. And when we build from scratch, we think about positioning the house for optimum passive solar heating (“letting the sun heat your home” in the old terminology). All in all, we are becoming greener Kiwis. In this factsheet you will find tips on how to insulate your home and make your insulation dollar go as far as possible.

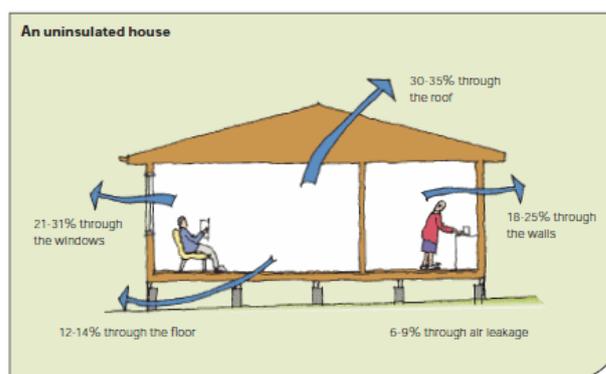
* Devised by the New Zealand Green Building Council, Homestar is a national, voluntary system to rate the impact of houses on the environment, in particular how much waste they generate in their construction, how much energy and water they consume in their running, and the level of warmth and health they allow.

** A typical house constructed in accordance with the latest building code achieves a score of four.

In a nutshell

Two-thirds of New Zealand houses were built before 1978 when it became mandatory to install insulation. That means two-thirds have hollow walls clad with weatherboards, single-glazed wooden-framed windows and wooden floors over piles. That’s not a recipe for cosiness. Insulation can go a long way to keeping your home warm and your power bills down. (It makes for a healthier environment, too, reducing colds and other respiratory illnesses by helping to eliminate condensation, dampness and mould.)

Where your heat goes: If your house has no insulation, about 30 per cent of heat is lost through the roof. Another third disappears through windows. And the final third vanishes through the floor, the walls and through air leakage (that is, gaps in floorboards and under doors – and even cat doors!).

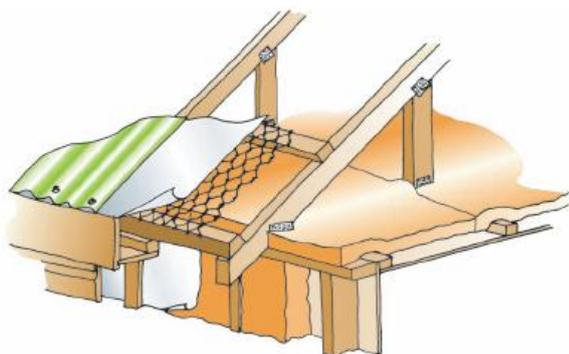


Where your heat goes

www.smarterhomes.org.nz

Priorities: The ceiling space should be your first concern for two reasons: first, because it is probably the biggest source of heat loss; and second, because it is the easiest and most accessible area of your house to insulate. There you will get the biggest impact for your dollar. You can also get subsidies to install ceiling (and under-floor) insulation. Note that recessed ceiling downlights are a source of heat loss – air gets through gaps around the bulb, but insulation must be kept well

clear of them because of the risk of fire, unless they are specially rated.



Blanket insulation in the ceiling
NZS4246-2006 Energy Efficiency – Installing Insulation in Residential Buildings

Selecting the best product

Your choice of insulation products includes fibreglass, polyester, mineral fibre and wool. (Polystyrene, another option, is for floors only.) Before deciding on an insulation product, get answers from suppliers to the following questions:

- Does it lose effectiveness if it gets damp?
- Will it eventually “settle”, that is, slowly collapse, and become less effective?
- Is there information about the product’s embodied energy (the energy consumed to manufacture and transport it), otherwise known as the life cycle assessment or LCA?
- Has an independent body such as BRANZ or Eco-specifier appraised or endorsed it?
- Has Enviro-choice or another eco-labelling system certified it?
- Is it recyclable or biodegradable in a landfill?
- What is the minimum thickness necessary to achieve its advertised R-value?*
- Is it suitable for vented and unvented walls?
- Is it, or any of its components, imported?
- Is installing it labour intensive or a health hazard?
- Is it fireproof, flammable or toxic in a fire, and if so, has this been assessed and confirmed by an independent party?
- Is there a guarantee and how long is it for?

* R-values are a way of rating the insulation effectiveness of walls, windows, floors and roofs. The higher the R-value is, the greater the insulation a product offers. The minimum R-value for roof insulation is R 2.9, though a rating of R 5.0 is recommended.

Under-floor insulation

Floors, unlike walls, are relatively easy to insulate, provided there is reasonable access. (The difficulty with existing walls is that the internal lining must be removed first. This is too costly an undertaking for an entire house, though it may be worthwhile for south-facing walls, which do not get sun and may also be hit by cold winds.) Between 12 per cent and 14 per cent of heat loss is through the floor. Gaps in floors leak heat. Even

small gaps can have a big effect. (The same, in fact, applies to the installation of insulation: a gap of 5 per cent can result in a 50 per cent loss of the potential insulation effect in the immediate area of the gap.) Installing your own under-floor heating is possible, though not always advisable, because electrical cabling is sometimes laid between floor joists. The spring-loaded polystyrene variety suits most houses. In the case of retro-fitting insulation to concrete slabs, only the edges can be sheathed in polystyrene.

Costs and subsidies

Insulation pays. In 2008 the building code set new minimum standards for insulation. According to the Ministry of Business, Innovation and Employment, the higher standards have increased the cost of building an average house by about 2 per cent, but produce an annual energy bill saving for occupants of nearly 30 per cent. The department has calculated that the cost of installing better insulation pays for itself in six years. **

** This calculation was based on an average construction cost of \$253,000 for a medium-sized house and additional costs from tougher insulation rules of between \$3000 and \$5000. Annual energy savings were estimated at \$940. This assumed the whole house is heated all day to 16 degrees Celsius, and the living areas to 20 degrees Celsius in the morning and evening.

Ceiling insulation, according to an Energy Efficiency and Conservation Authority estimate, costs about \$15 a square metre to install, and under-floor heating about \$18. The authority offers subsidies to promote the insulation of existing homes and the installation of clean-burning heaters and heat pumps. Owners of houses built before 2000 can get a refund of up to a third of the cost of installation (nearly two-thirds for Community Services card holders or landlords with tenants who have the cards). The heating rebate is \$500 (\$1200 for card holders). See the authority for more information.

Draughts

Make your house as near as possible to airtight (or turn it into a “thermal envelope”, as the experts would say). As much as 9 per cent of heat loss is through draughts. You must have some ventilation, of course. Ventilation is controlled air change; draughts are uncontrolled, constant air change. There are some simple ways to keep warm air in and cold air out.

- Seal up openings such as unused cat doors and open fireplaces.
- Get some draught “sausages” to lie against the bottom of floors.
- Fit self-adhesive weather strips around doors and wind

More information

For further information, contact the council’s eco-design advisor on 570 6666 – a source of free, independent advice on how to include sustainable features in your building or renovation project.