

INSULATION

INFORMATION SHEET # 5

THE PROBLEM

New Zealand homes are not kind on their occupants or the environment. Most score just two stars out of 10 on the Homestar* rating system for home performance and environmental impact. Very few score more than four.**

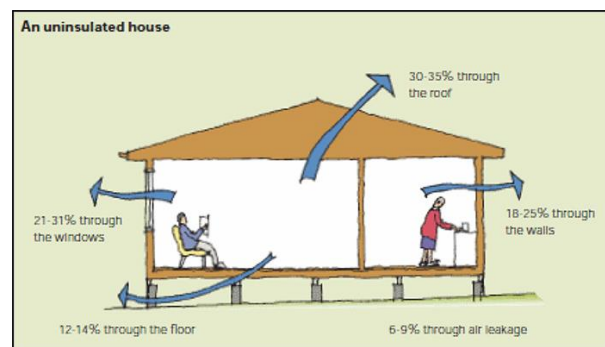
- Many houses were built before insulation was widely used (and made compulsory).
- Many are poorly positioned to catch the sun, the best and cheapest heating source.
- We like big windows whenever there are views, even if the windows have a cold, south-facing aspect.
- We once had a craze for exposed rafters and other ceilings with tiny insulation cavities, making rooms hard to heat and retrofitting 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.

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, bricks or sheeting, 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

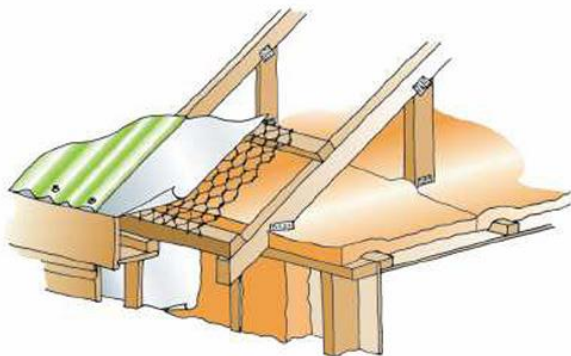
www.smarterhomes.org.nz

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 underfloor) insulation. Note that recessed ceiling downlights are a



source of heat loss – air gets through gaps around the bulb, and 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

WALLS AND FLOORS

The difficulty with insulating existing walls is that the internal lining or external cladding must be removed first, which can make it an expensive exercise. If renovating, and having to spend a lot of effort to get a good finish for new plaster and painting, consider replacing the old linings and while it's off install insulation (and building paper if missing – see detail in NZS4246). Target south-facing walls, which do not get sun and may also be hit by cold winds. (Please note that a Building Consent is required for work involving wall insulation due to bracing and weathertightness issues that may result.)

Floors, unlike walls, are relatively easy to insulate, provided there is reasonable access. 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 underfloor insulation is possible, though not always advisable, because electrical cabling is sometimes laid between floor joists. This is especially hazardous if insulating with foil.

COSTS AND SUBSIDIES

Insulation pays. In 2008, the New Zealand Building Code set new minimum standards for insulation. According to the Building and Housing Group, 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 group has calculated that the cost of installing better insulation pays for itself in six years.*

Ceiling insulation, according to an Energy Efficiency and Conservation Authority estimate, costs about \$15 a square metre to install, and underfloor insulation about \$18 (accessed 2012 – see www.energywise.govt.nz) The authority offers subsidies to promote the insulation of existing homes. Owners or landlords of houses built before 2000 can get a grant for the installation, if they or their tenants have a Community Services Card.

*** 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°, and the living areas to 20° in the morning and evening.**

DRAUGHTS

Make your house as airtight as possible. 6-9 per cent or more 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 doors.
- Fit self-adhesive weather strips around windows and strips and draught excluders around and under external doors.

SELECTING THE BEST PRODUCT

Your choice of insulation products includes fibreglass,

polyester, polystyrene, cellulose or mineral fibre and wool. Before deciding on an insulation product, get answers from suppliers to the following questions:

- What is the R-value?*
- Does it lose effectiveness if it gets damp?
- Will it eventually “settle”, that is, slowly collapse, and become less effective?
- Is exposure to it hazardous to your health?
- Has an independent body such as BRANZ appraised or endorsed it?
- Has Enviro-choice or another eco-labelling system certified it?
- Is it recyclable or biodegradable in a landfill?
- Is there a guarantee?
- What is the expected lifespan?

**** 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 may be necessary in colder areas of the country.**