

A GUIDE TO

MAKING YOUR HOME MORE ENERGY EFFICIENT



The floor to ceiling climate control specialists





MAKING YOUR HOME MORE ENERGY EFFICIENT

An energy efficient home is one that requires less electricity to run. Although heating is a large part of this, there are plenty of other things you can factor into your build to help reduce the amount of energy you use.

Why be more energy efficient?

One reason is that it helps reduce greenhouse gas emissions.

According to **The Ministry of Business, Innovation & Employment**, New Zealand's energy emissions are dominated by national transport, manufacturing industries and electricity generation. While residential contribution to this is less than 5%, we can all do our part to help.

But the obvious reason - and the one that will have a direct personal effect - is financial; being more energy efficient ultimately lowers your power bill.

This guide covers the easiest, most common ways you can improve the energy efficiency of your home.



THE SHAPE, SIZE AND POSITION OF YOUR HOME

Designed for the sun

Heat from the sun is powerful and free so ensure your home is designed with this in mind.

Design considerations

- Place the house on the sunniest part of the section
- Have the main living areas facing north
- Insulate well to trap that free heat
- Utilise thermal mass; a concrete floor, for example, will soak up the sun's heat during the day and release it when temperature drops
- Ensure windows are appropriately sized and positioned (moderate to reasonably large on the north-facing side, smaller on the east and west and smallest on the south)

- Have properly designed overhangs over north-facing windows to avoid too much sun in summer but still letting in plenty during winter (there are smart phone apps and websites that will tell how much sun your site gets at different times of the year)
- You also want the house to be sheltered from prevailing winds

TIP There are apps that will tell how much sun your site gets at different times of the year. Try [Sun Seeker](#) or [Suncalc.net](#).

House size

Smaller houses are not only cheaper to build they're easier to heat, using less energy. Think about how much space you realistically need on a day-to-day basis.

House shape

The more complex, the more floor, wall and ceiling area you have to lose heat through. Simple house designs such as small rectangular shapes have less external surface area, making them easier and cheaper to heat and keep warm.

These are all very important topics to discuss with your architect/designer and builder. Choosing one who has good knowledge and understanding of energy efficient design principles will serve you well for many years to come, so shop around and get references.

INSULATION

A lot of energy is spent heating (and cooling) our homes. The effectiveness of the heating solution you choose is highly dependent on your home's ability to retain heat (or deflect it in summer). Having good insulation plays a huge role in making your house easier and cheaper to heat properly, and more comfortable and healthy to live in.

There are minimum standards and amounts of insulation that must be included in every new build but do bear in mind these are the lowest legal requirement. We recommend always going well above this standard.

Prioritise ceiling and underfloor insulation, followed by walls.

Types of insulation

- Loose fill products (e.g. wool, mineral wool, cellulose fibre)
- Segment and blanket products (e.g. polyester, wool, mineral wool)
- Rigid sheet insulation (e.g., EPS/expanded or XPS/extruded polystyrene, PIR/polyisocyanurate)
- Semi-rigid products (e.g. wool, mineral wool, polyester)
- Pipe insulation (e.g. pre-formed tubular foam)
- Hot water cylinder wraps (e.g. wool, mineral wool, cloth or foil-backed polyester blanket)
- On-ground vapour barriers (not technically an insulation product but the purpose is similar)

VENTILATION

Dealing with moisture

Every home has to contend with moisture and damp houses require a lot more energy to heat and keep warm.

Ways to prevent and/or deal with moisture:

- Cover the ground under the house with a moisture or vapour barrier
- Use a damp proof course and polythene under a new concrete slab foundation
- Install close-fitting under-floor insulation
- Ventilate enclosed sub-floor spaces
- Ensure surface runoff or underground water has been considered at design stage
- Have extractor fans in the bathroom and laundry and a rangehood in the kitchen – vented outside, not into the roof space.

Air circulation

Home ventilation and heat recovery systems can help to circulate drier air through your home. They expel moisture and dust and bring in drier, filtered air all while minimising heat loss by recovering the heat in the expelled air to temper the incoming air.

WINDOWS

Windows are a major source of heat loss because glass is not a good insulator. The more heat lost through the windows, the harder your heating has to work, which results in escalating power bills.

To help ensure as little heat is lost through your windows install double (or even triple) glazing. Double-glazing is proven to reduce heat loss through windows. It works by trapping a pocket of air (which is not a good heat conductor) between the two panes of glass.

Triple-glazing has even better insulating performance, but does come with some disadvantages. An extra wide frame is required to accommodate the extra thick window panes and it doesn't let in much solar heat meaning you have to rely almost completely on a heat source within the home. Light transmission can also be quite low.

Plus invest in thick, properly lined curtains or blinds. According to the Energywise website, "Good curtains and blinds can reduce heat loss through windows by up to 60%."

TIP Good curtains and blinds can reduce heat loss through windows by up to 60%.





HEATING

For in-depth information and comparisons of the different heating solutions **download our free guide** to help you choose the right one or combination for your new home.

If energy efficiency is your main priority you can't go past a heat pump. They cost 5-10 cents/kWh to run and for every kWh of electricity they use they will produce 4.5kWh of heat.

Heat pumps work by taking heat from the air outside and using it to warm the air inside. They can do this even when it's very cold outside although this does mean they work harder and can be less efficient.

Today's heat pumps are incredibly versatile, with lots of advanced features that allow you to customise the way your unit operates to enhance efficiency and complement your lifestyle.

Benefits

- VERY effective in terms of the power they use compared to the heat they generate
- Good for room-specific heating
- Good for larger spaces such as open-plan living areas
- Highly controllable with a thermostat setting and timer
- Heat pumps also incorporate air filters that remove dust and pollen

Things to consider

- More expensive to buy than a small electric or gas heater
- Blasting the heat will make you nice and warm but will raise power bills
- Can be used for cooling in summer but are not necessarily the most energy-efficient option for this
- Must be installed by a qualified installer
- Require servicing to keep them tip top
- Less efficient when outside temperatures drop below 7°C and may need to stop and de-ice in very cold conditions.
- Can be noisy (both indoor and outdoor units)
- Won't work in a power cut

WATER

Water heating

Water heating uses a lot of energy, in fact, for the average home it accounts for approximately up to 40% of the power bill. When considering what method of water heating to use, an important consideration is how many people live in your household, and how much water you use. Some become more energy efficient the more you use.

Types of water heating system:

- Electric hot water cylinder
- Heat pump water heater
- Gas hot water cylinder
- Gas continuous (instantaneous) flow
- Solar water heater (electric boost and gas continuous flow boost)

The least energy efficient and most expensive to run is the classic electric hot water cylinder. Solar water heating can be as low as 1/5 the running cost. However, these systems do require a significantly bigger upfront cost to purchase and install.

While solar technologies have improved in leaps and bounds in recent years and could (in a best case scenario) eliminate water heating costs, they are only worth considering if you live in an area that gets a lot of sun. We recommend doing thorough research into the right solar system for your needs if you are interested in going down this route.

Heat pump water heaters are a great option if you are not planning on installing gas, and have a family living in the house, as the more water you use, the more you will save.

Something to consider when it comes to hot water heating is the temperature you have it set to. EECA recommend it should be at 60 degrees in the cylinder and no more than 55 degrees when it comes out the tap. Ensure your electrician or plumber sets the thermostat correctly at installation.

Water saving measures

Low flow showerheads are inexpensive and will help you save on water usage which ultimately leads to using less energy. Compared to a regular showerhead that uses 10-20 litres a minute, these devices almost cut that in half by only using 6-10 litres of water a minute.



APPLIANCES

If you're buying new appliances for your new build choose ones with good energy ratings.

Energy star rating

The **energy star rating** tells you how much energy a product uses and is a good way to compare like for like appliances with one another. The more stars on the label, the more energy efficient it is.

Energy consumption figure

The energy rating label also features an annual energy consumption figure of kWh per year with the lowest kWh per year being the most efficient and cheapest to run. This is good for comparing appliances of different sizes and types (e.g. a small fridge/freezer vs. a larger fridge or chest freezer).

EECA have a **running cost calculator** on their website that tells you how the energy rating affects the amount of energy your appliance uses and how much each appliance will cost to run annually.

How much difference does it really make?

As an example, a heat pump with less than 1 energy star costs over 50% more to run per year than one with 6 stars. That's quite a difference!



CHECKLIST

Use this checklist to make sure you've thought of everything to make your home as energy efficient as possible.

Designed for the sun

- House is placed on the sunniest part of the section
- Main living areas face north
- Thermal mass (e.g. concrete floor)
- Right sized windows:
 - North (big, with overhangs)
 - East (mid-size)
 - West (mid-size)
 - South (small)
- Sheltered from wind

Ventilation

Extractor fan:

- Bathroom 1
- Bathroom 2
- Bathroom 3
- Laundry
- Kitchen (rangehood)
- Central ventilation system
- Heat transfer system

Insulation

Ceiling _____

Underfloor _____

Walls _____

Hot water cylinder _____

Pipes _____

Windows

	Curtains	Blinds	N/A
Bedroom 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bedroom 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bedroom 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bedroom 4	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bedroom 5	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bathroom 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bathroom 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Bathroom 3	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Living area 1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Living area 2	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Kitchen	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Laundry	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Home office	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Heating

- Living area 1 _____
- Living area 2 _____
- Bedroom 1 _____
- Bedroom 2 _____
- Bedroom 3 _____
- Bedroom 4 _____
- Bedroom 5 _____
- Bathroom 1 _____
- Bathroom 2 _____
- Bathroom 3 _____
- Kitchen _____
- Home office _____

Water

- Water heating solution _____
- Bathroom 1
- Bathroom 2
- Bathroom 3
- Laundry
- Kitchen

Appliances needed

- Kitchen _____
- Laundry _____
- Living area 1 _____
- Living area 2 _____
- Bedrooms _____
- Home office _____



CONCLUSION

We hope you've found this guide to be a useful starting point in creating a home that's as energy efficient as possible. Good luck building your new home.

When it's time to talk heating solutions, **download our free guide** to choosing the right one for your needs, or **contact us** for expert advice. We're Canterbury's home heating specialists.



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