



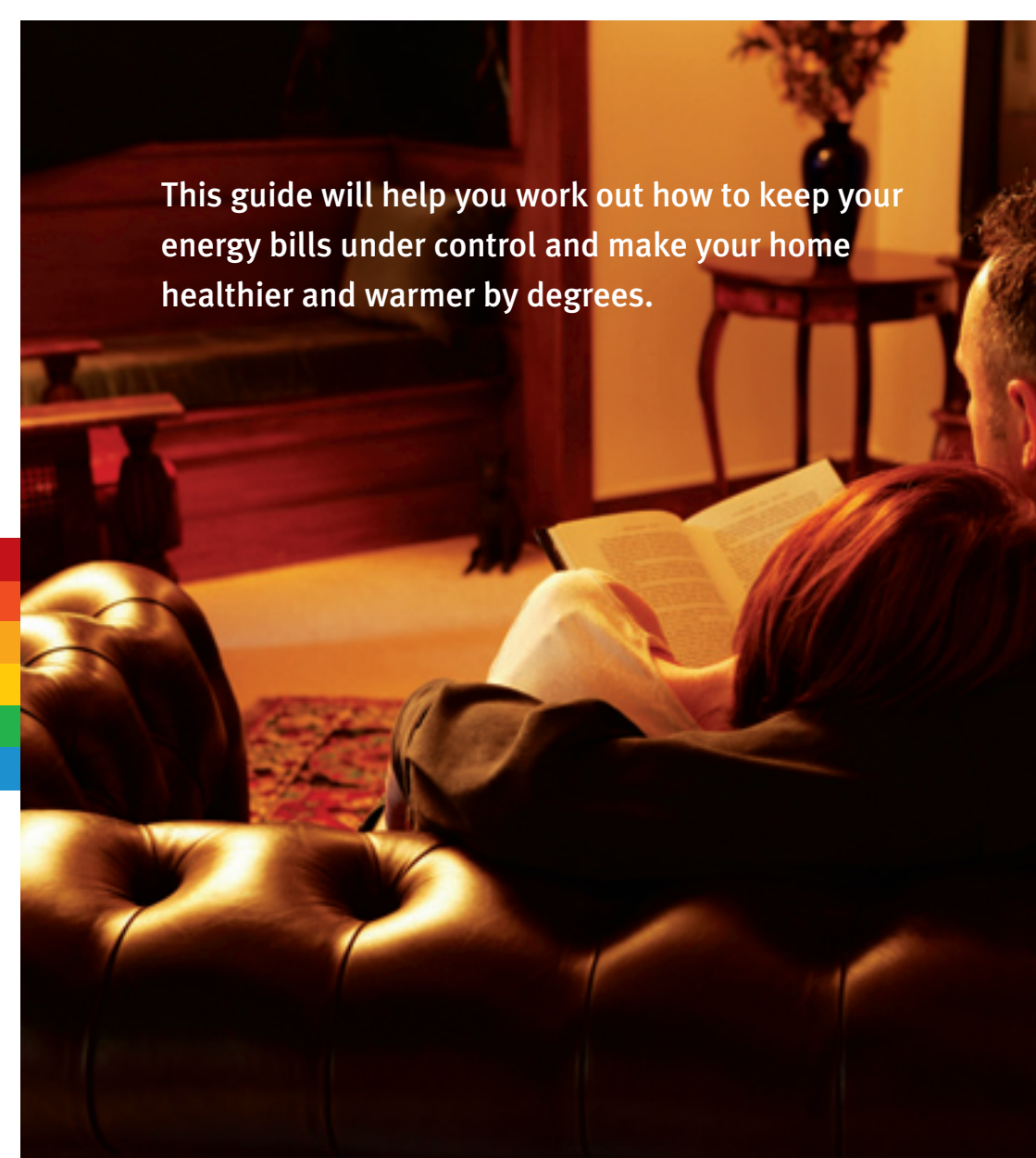
Getting warmer^{by} Degrees^o

A HOMEOWNER'S GUIDE TO ENERGY SAVINGS
AND COMFORTABLE, HEALTHIER LIVING

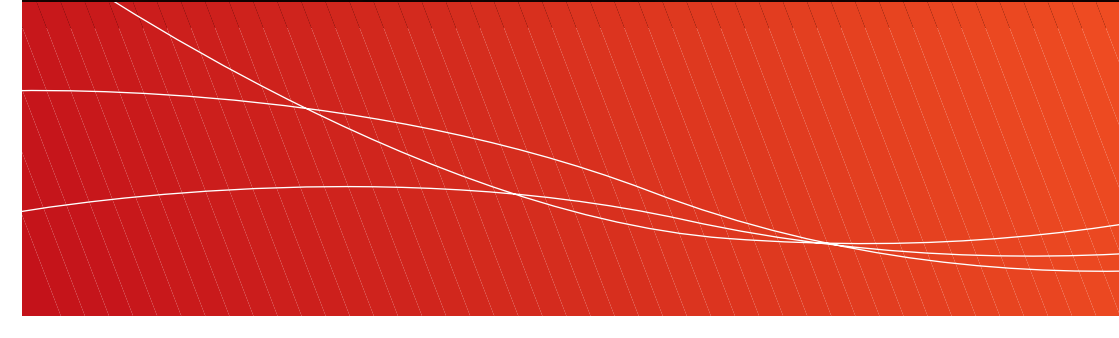


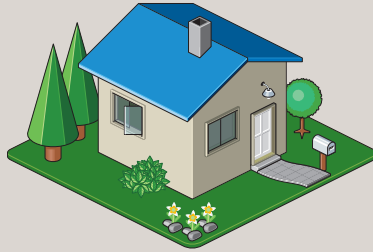
Energy Efficiency and
Conservation Authority
Te Tari Tiaki Pūngao

Improving energy choices

A photograph of a man and a woman sitting on a dark leather tufted sofa in a living room. The woman is holding an open book and they appear to be reading together. The room is dimly lit with warm, golden light, possibly from a fireplace or a lamp. In the background, there is a wooden coffee table, a side table with a vase of flowers, and a bed. The overall atmosphere is cozy and intimate.

This guide will help you work out how to keep your energy bills under control and make your home healthier and warmer by degrees.





Using this guide

Just go to the problem that's worrying you most, and you'll find a range of suggestions, most with how-to tips or ideas on where to go for advice.

First things first

Make sure you tackle the tasks in **First Steps** before you move on to the ideas in **Getting Serious** and **Looking Ahead**. Working your way through in order will ensure you do the easiest and cheapest jobs first, many of which can make the most difference.

Three priority levels



FIRST STEPS. SIMPLE JOBS, CHEAPEST AND EASIEST TO DO FIRST



GETTING SERIOUS. BIGGER TASKS THAT WILL BRING SOLID RESULTS



LOOKING AHEAD. PROJECTS TO CONSIDER WITH RENOVATIONS OR EXTENSIONS

What's the energy problem in your home?

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Too cold for comfort?

Your main suspects will be the lack of adequate insulation and draughts (under doors, around windows and up fireplaces). In fact, if your ceiling and floors aren't insulated, up to 33% of your warmth could be escaping through them.

A fully insulated home (ceiling, walls and floors insulated) will almost halve the heating requirement when compared to an uninsulated home.

Ceiling insulation is inadequate in around a third of homes built before 1977.



STOP DRAUGHTS

- Plug the fireplace. Fill it by stuffing plastic bags filled with newspaper up the chimney. Leave a reminder note in the fireplace.
- Stop draughts under doors. You can buy draught stoppers from hardware stores. For interior doors, try stuffing an old rugby sock with scrap material.
- Draughtproof around doors and windows with self-adhesive strips, available from hardware stores.
- Fill or 'gunk' gaps where cables and pipes go through walls to the outside or wherever you can feel a draught. You can do this yourself, or ask a builder.

KEEP HEAT IN

- Windows are a significant heat loss area. Closing windows and curtains around sunset keeps in warmth that has built up during the day.





Too cold for comfort? | Getting Serious

INSULATE THE CEILING

- Ceiling insulation is available from most hardware stores. Or, check your **Yellow Pages** under 'Insulation – thermal'.

UPGRADE CEILING INSULATION

- Older ceiling insulation can get blown about or moved. Plus it may also get thin and less effective over time. Have it checked by a builder or insulation professional – you may need to replace or upgrade.

INSTALL UNDERFLOOR INSULATION

- DIY-ers can do this job, but it's often best left to a skilled installer. If you have polished wooden floors, make underfloor insulation one of your 'First Steps'. Check your **Yellow Pages** under 'Insulation – thermal'.

RE-CURTAIN

- Curtains should be bigger than the window frame and close fitting with no gaps for warm air to escape. Use thermal or close-woven materials and linings. You can make your own or check your **Yellow Pages** under 'Curtains'.





INSULATE YOUR WALLS

- Installing wall insulation isn't difficult but you can't normally get into the spaces. Take the opportunity when you renovate.

DESIGN FOR THE SUN – USING THE SUN TO HEAT YOUR HOUSE

- In planning renovations or building a new home, consider your home's layout in relationship to the sun – that is, which rooms need sun, and when. Also consider the sun's different positions in summer and winter and through the day. Discuss these issues with your designer or architect or visit www.greenhouse.gov.au/yourhome/ for more ideas.
- To get the most from the sun, you should aim to keep its free heat within your home for as long as possible. This can be done by insulating the ceiling, floor and walls of your home, so that the heat doesn't escape.
- Another way to store free heat from the sun is to use thermal mass. Heavy construction (such as internal concrete floors and walls) will soak up heat from the sun when exposed to direct sunlight during the day and later when the temperature drops it releases the heat it has stored.
- North-facing, vertical windows are most effective for maximum sun in winter and minimum sun in summer. Avoid having too many west-facing windows, or make sure they're shaded. Avoid skylights or glass roofs. They let in too much sun in summer and lose too much heat in winter.
- Although windows give you excellent internal heat gains, they are responsible for large heat losses when temperatures fall outside. If you are building a new house, EECA recommends double glazing. If you are renovating, why not replace windows that need replacing with double glazing? Double glazing has the added benefits of less condensation and less external noise.



Power bill a shocker?

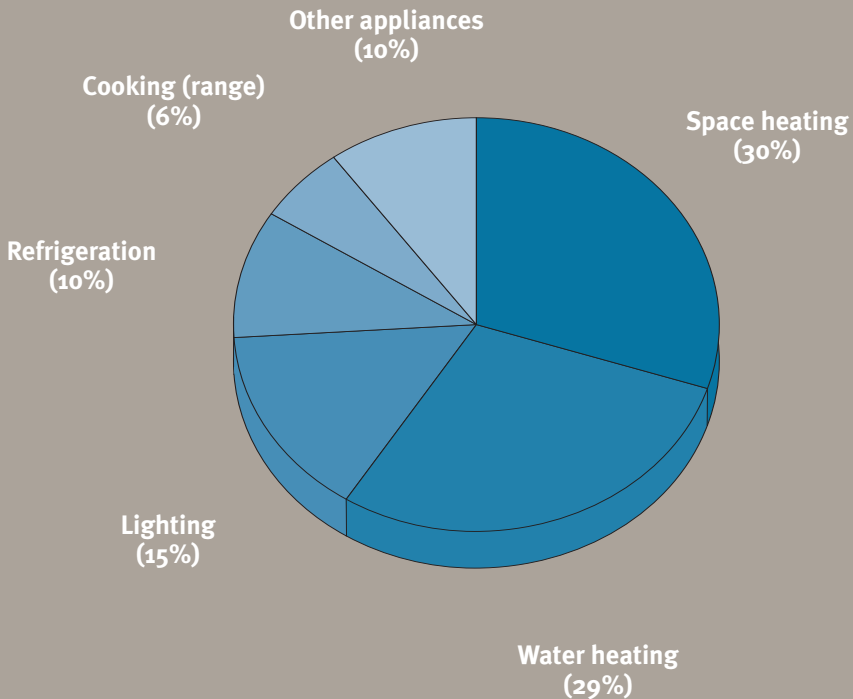
What's reasonable? Every home, every family use energy differently but in general, larger homes use more energy. Energy use is also higher the more people live in the house, and if people are often home during the day.

A typical family household uses around 10,000 kWh of electricity a year for their energy needs. Electricity prices are changing fast but at an average of 19 cents per kWh (including fixed daily charges), that's \$1,900 a year.

One of the big issues with most power bills is hot water. This one element accounts for almost 30% of the average household's energy bill (and possibly up to 50%), making it an obvious place to start looking for savings.

TYPICAL HOUSEHOLD ENERGY USE

The graph shows the typical household energy (all fuels – electricity, gas, wood, etc) consumption by usage.





Power bill a shocker? | First Steps

GET INTO HOT WATER

- Check the hot water temperature. Older cylinder thermostats aren't that accurate so you need to find the tap nearest to the cylinder and run it before measuring the temperature. If it's over 55°C then the thermostat may need adjusting¹. Re-check the temperature next day after lowering the thermostat.
- Check your hot water cylinder. If it's warm to touch, it probably needs an insulation wrap, available from hardware stores.
- Wrap the cylinder pipes that you can see in your hot water cupboard with insulation foam, available from hardware stores.
- Fix leaky hot water taps. A drip a second can add \$20 or \$30 a year to your electricity bill.
- If the vent pipe in the roof or on an outside wall is dripping, you will be losing heat. Your plumber may need to adjust the pressure-reducing valve.
- Check your shower flow. You may need a more water-efficient shower head. It can give a really decent shower but with half the water. To check, run the shower at normal temperature. If it fills a 2 litre container in less than 10 seconds, you could use a more efficient shower head. These are available from hardware stores.

¹ If you need to remove a cover to access the thermostat you should get an electrician to do this.



SWITCH OFF AND EASE BACK

- Switch TVs, computers, washing machines etc off at the wall. Even if the red light is all that is showing, this standby function uses surprising amounts of electricity.
- Turn lights off when you leave the room.
- Switch off your heated towel rail during the day if you can or have an electrician fit a timer.
- Do you need that second fridge or old freezer all the time? Switching it off can save a significant amount.
- Use cold water washes. A warm wash uses as much energy as drying the clothes in the dryer.
- Line-dry clothes as much as possible before using the dryer.
- Only heat the rooms you're using.
- Shower instead of bathing, and keep your showers shorter.
- Replace the lightbulbs you use most often with the energy saving variety. They only use 20% of the energy and give out the same light.





Power bill a shocker? | Getting Serious

INSTALL OR UPGRADE YOUR INSULATION

- Around a third of your energy bill is for heating – and about 45% of your heat could be escaping if you don't have insulation. See the insulation information in *Too cold for comfort*.
- Check your hot water cylinder has an A-grade symbol. If not, you'd save energy with a cylinder wrap or a replacement cylinder. Cylinders manufactured after January 2003 may not have the symbol, but they still meet A-grade requirements because they're made to the new Minimum Energy Performance Standard.

REPLACE WITH ENERGY EFFICIENT APPLIANCES

- Look for Energy Rating Labels when you're purchasing appliances – the more stars, the more energy efficient they are. For more information, visit www.energyrating.gov.au.
- Different types of heaters are better for certain homes and locations. For more information see *Choosing the right heater for your home* or visit www.energywise.org.nz.



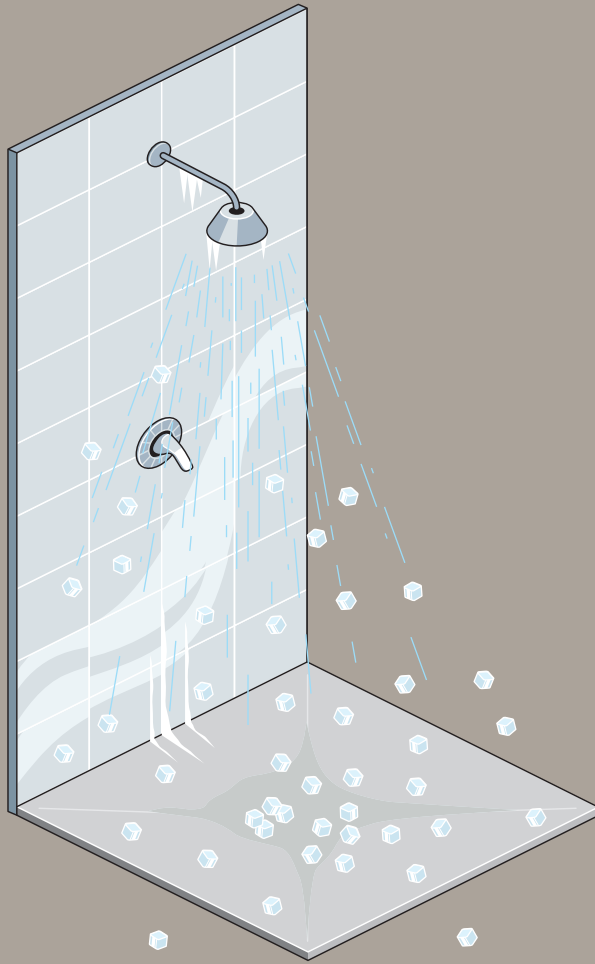
CONSIDER YOUR HOT WATER OPTIONS

- Replacing a hot water cylinder? Systems that supplement conventional gas or electric cylinders with free solar energy are worth considering for long-term benefits in some situations – for example, for a large family living in a sunny area. For information visit www.solarsmarter.org.nz.

INSULATE YOUR WALLS

- If you're renovating, be sure to insulate the walls too. Take the opportunity, it is easier and cost effective to do it now.





Cold showers?

Sick of putting up with lukewarm or cold showers? Either your hot water system needs help or you need to find ways to use hot water more efficiently.



CONSERVING HEAT

These are steps you should consider:

- Fit a water-efficient shower head.
- Fit an insulation wrap to your electric hot water cylinder.
- Wrap the hot water pipes with insulating foam.

For more information see the section *Power bill a shocker?*

CHECK FOR LEAKS

- Leaks could be losing you hot water. You may need to get your hot water system checked by a plumber.



UPGRADE

- If running out of hot water is a major problem, you might need a larger hot water cylinder. For four people, 180 litres is usually about right.



OTHER OPTIONS

- You could consider an instantaneous gas system – but remember, having more hot water can tempt you to have longer showers.
- Solar smarter: A solar water heater could provide you with a plentiful supply of hot water and save up to 75% of your hot water bill. For information visit www.solarsmarter.org.nz.



Hot in summer?

In some areas of the country, homes get so hot they need air conditioning which can be unnecessarily costly.



STAY COOL

There are some obvious things you can do – such as creating cross-draughts by opening doors and windows, and drawing curtains to keep out the heat of the midday sun.



CIRCULATE

- A ceiling fan circulates the warm air, sucks up cold air, and creates a cooling draft.

APPLIANCES

- Buying the right air conditioner for your home is important. To help you make the right choice visit www.energyrating.gov.au.

BUILD OR PLANT

- Consider installing awnings or overhangs over windows and planting trees that will shade the north and west sides of your home in summer (then shed their leaves to let winter sun in).
- Insulation is also very effective for keeping houses cooler during the hotter summer months.



DESIGN FOR THE SUN

- The most effective way to deal with excess heating is through planning extensions, renovations (or your new home) around where the sun and breeze come from.
- The principles of passive solar design (see *Too cold for comfort ... Looking Ahead... Design for the sun*) also apply to keeping homes cool in warm climates.



Dampness or asthma?

Mildew and dampness are found in 45%² of New Zealand homes.

They cause unsightly mould, musty smells and they're bad for your health, contributing to asthma and respiratory problems.



FIND THE CAUSE

- Dampness is not strictly an energy issue. Sometimes, it's a plumbing or drainage problem – a matter of finding where the moisture is coming from and dealing with it at the source.

VENTILATE

- It's all about removing moist air from inside the home. Use the rangehood or open a window when cooking, vent the clothes dryer to the outside and use an extractor fan or open a window when having a shower or bath.

RESEARCH

- The Building Research Association of New Zealand (BRANZ) has several good bulletins to check; in particular if you have a dampness problem, see number 379, Preventing Moisture Problems in Existing Buildings. Visit www.branz.org.nz.



INSULATE

- Insulating to avoid cold spots where condensation can form and keeping your home warm may be part of the solution. Warm air absorbs more moisture, and carries it away more effectively, keeping the house drier. That's an area this guide can help you with – see the tips in the section *Too cold for comfort*.

Your Action Plan

These are the 'First Steps' to a warmer and more energy efficient home. Use this checklist to identify tasks that need to be done around your home:

	Tick	Comments
Plug fireplace	<input type="checkbox"/>	_____
Stop draughts under doors	<input type="checkbox"/>	_____
Draughtproof around doors and windows	<input type="checkbox"/>	_____
Fill gaps through walls and floors	<input type="checkbox"/>	_____
Insulate the ceiling, or check existing insulation	<input type="checkbox"/>	_____
Install underfloor insulation	<input type="checkbox"/>	_____
Check curtains	<input type="checkbox"/>	_____
Check the shower flow	<input type="checkbox"/>	_____
Check the hot water cylinder is A-grade or wrapped	<input type="checkbox"/>	_____
Wrap hot water pipes	<input type="checkbox"/>	_____
Check the hot water temperature	<input type="checkbox"/>	_____
Fix leaky hot water taps	<input type="checkbox"/>	_____
Check the outside vent pipe	<input type="checkbox"/>	_____
Check for leaks in the hot water system	<input type="checkbox"/>	_____

What does it cost?

	Estimated cost	Annual savings*
Draught stopping and weather stripping doors	\$10 - \$30	\$61 - \$75
Compact fluorescent light bulb replacing standard incandescent	\$5 per bulb	\$13.80 per bulb
Low-flow shower head	\$38 - \$53	\$74
Hot water cylinder wrap and hot water pipe lagging	\$100	\$100
Thermal-lined curtains	\$100 - \$250	\$27 - \$58
Ceiling insulation	\$1,300 - \$1,400	\$100 - \$400
Underfloor insulation	\$800 - \$1,000	\$50 - \$300

Approximate costs only and based on an average house of 120m². Cost and savings will vary depending on the number of occupants and their lifestyle and on the type of house and its location – there will be big variations from the north to the south of the country.

Choosing the right heater for your home

Selecting the right heater is like choosing a car – there's no 'one size fits all' solution. Our lifestyles, whether we work, or are retired, or have young children, will impact on when we need heat and the best type of heater for us.

The better insulated your home is, the smaller the heater and less heating you will need to maintain a comfortable temperature. There are a lot of heating options to choose from, and they all work differently.

WHERE DO YOU NEED HEAT?

Do you want to heat the whole house, or just heat parts of it? This is one of the most important decisions in choosing the right heater, bearing in mind it is better to heat only the rooms you are using.

If you want to heat a large part of your home, you will need to consider how the heat can be distributed effectively.

THERMOSTATS AND TIME SWITCHES

Ensure that any heater or heating system you purchase has thermostats and time switches. They are essential in helping you maintain a comfortable, healthy temperature and can save you money.

* Annual savings based on a rate of 16 cents/kWh (any time) for space heating related measures and 13 cents/kWh (controlled) for hot water related measures.

Heating recommendations

Firstly, decide which insulation level most likely matches your home. Then choose the column that best fits the area you want to heat – whole house or just the living areas.

Uninsulated

Whole house

We recommend

- Heat pump
- Flued gas heater¹
- Pellet or low-emission wood burner.²

Living area

We recommend

- Heat pump
- Flued gas heater¹
- Pellet or low-emission wood burner.²

Ceiling & underfloor only

Whole house

We recommend

- Central heating – heat pump or gas
- Pellet or low-emission wood burner.²

Living areas

We recommend

- Heat pump
- Flued gas heater¹
- Pellet or low-emission wood burner.²
- Large radiant heater.³

Fully insulated

Whole house

We recommend

- Central heating – heat pump or gas
- Flued gas heater¹
- Nightstore
- Pellet or low-emission wood burner²
- Underfloor heating.

Living areas

We recommend

- Heat pump (small)
- Nightstore
- Flued gas heater¹
- Pellet or low-emission wood burner²
- Underfloor heating
- Radiant or convection heater.³

¹ Not 'open fire' type.

² If necessary supplement the heating with portable convection heaters, especially in bedrooms.

³ Only suitable if you are heating for short periods; for example, only in the evening.

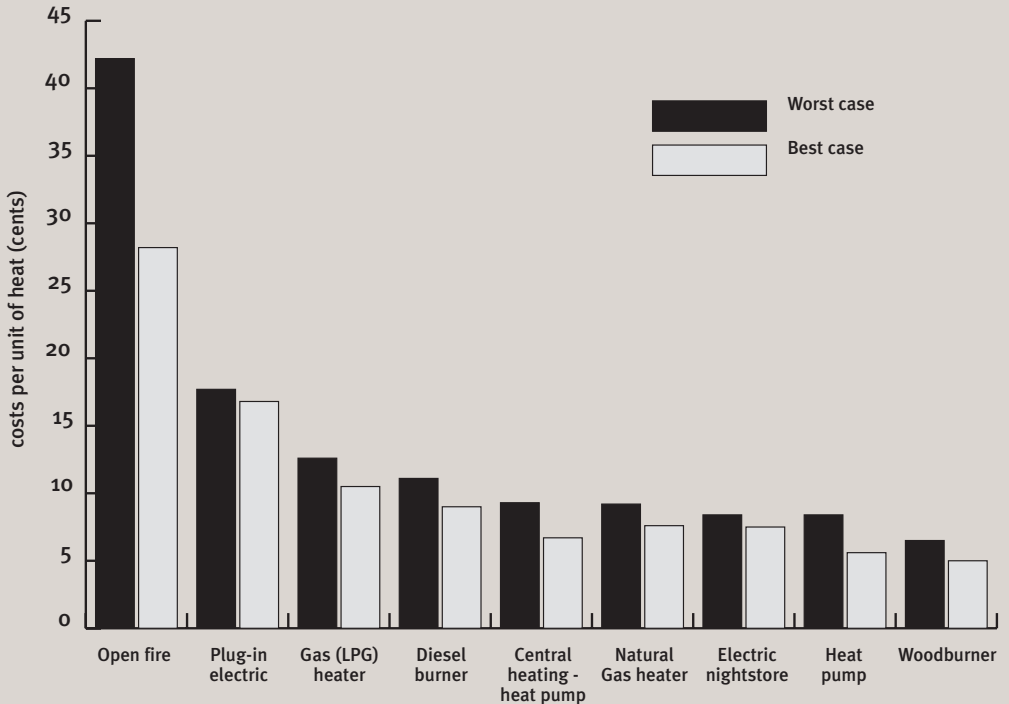
How powerful?

A simple rule of thumb is to measure the volume of the room (length, times width, times height in metres) and divide by 20 to get the kW rating of the heater needed. For example, a room, 6 metres long, by 4 metres wide, by 3 metres high, will need a heater with a heating output of 3.6 kW. If the room is uninsulated or draughty it will need to be larger. For more detailed calculation visit our website www.energywise.org.nz/inmyhome/

The cost of running your heater

While the initial cost of a heater is important, running costs should also be taken into account. The running cost of a heater depends on a number of factors including the size and efficiency of the heater, fuel prices, if the house is insulated and the length of time you heat.

To give a simple comparison, we have estimated the cost of one unit of heat for each of the major heating options – based on estimated fuel prices May 2004.





June 2005