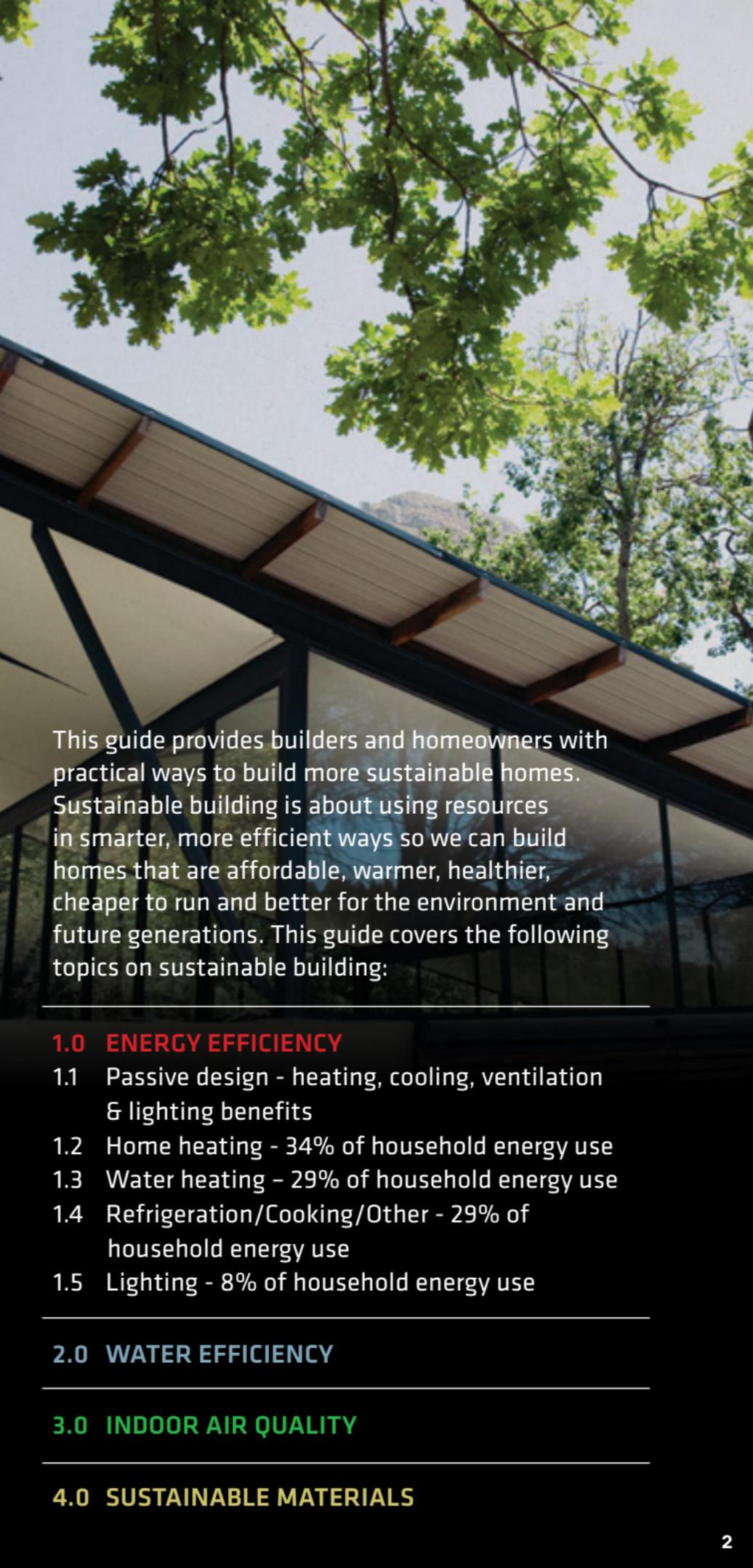


*"We'll see you right"*



# ITM BUILDING GUIDE: SUSTAINABLE BUILDING





This guide provides builders and homeowners with practical ways to build more sustainable homes. Sustainable building is about using resources in smarter, more efficient ways so we can build homes that are affordable, warmer, healthier, cheaper to run and better for the environment and future generations. This guide covers the following topics on sustainable building:

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## **1.0 ENERGY EFFICIENCY**

- 1.1 Passive design - heating, cooling, ventilation & lighting benefits
  - 1.2 Home heating - 34% of household energy use
  - 1.3 Water heating - 29% of household energy use
  - 1.4 Refrigeration/Cooking/Other - 29% of household energy use
  - 1.5 Lighting - 8% of household energy use
- 

## **2.0 WATER EFFICIENCY**

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## **3.0 INDOOR AIR QUALITY**

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## **4.0 SUSTAINABLE MATERIALS**

# 1.0 ENERGY EFFICIENCY

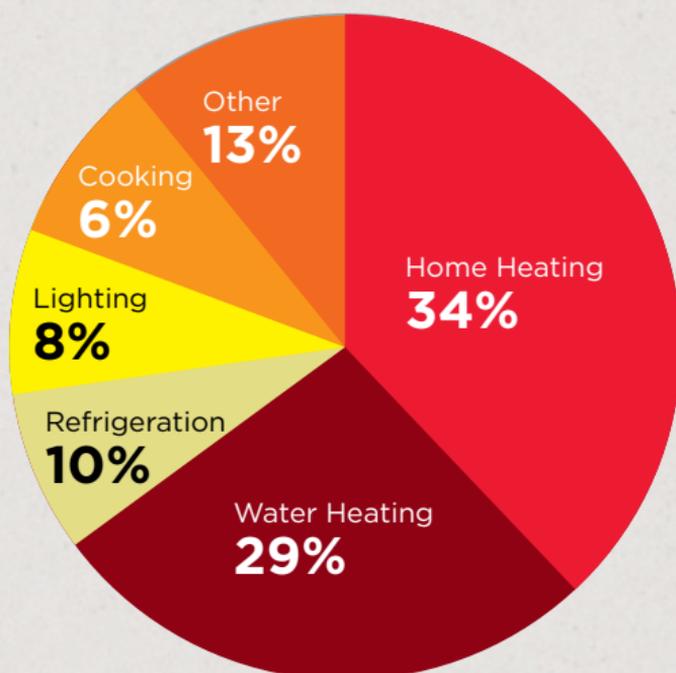
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To effectively reduce household energy use you must first understand where energy is used. The average family household uses energy in the following ways:

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## ANNUAL ENERGY USE IN NZ HOUSEHOLDS

Data source: BRANZ report SR155, 2006



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Energy Use	Kilowatt Hours	Running Costs (at 25c per kWh)
Home heating	3570	\$890
Water heating	3045	\$760
Refrigeration	1050	\$260
Lighting	840	\$210
Cooking	630	\$160
Other	1365	\$340
<b>Total</b>	<b>10500</b>	<b>\$2,620</b>

# 1.1 PASSIVE DESIGN

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## HEATING, COOLING, VENTILATION & LIGHTING BENEFITS

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Passive design (measures that work without power) uses natural resources (sun, wind and site features) to gain heating, cooling, ventilation and lighting benefits. Some passive design measures may counter other benefits or requirements so consider which is more important e.g. winter heating or summer cooling, maintaining views, privacy, practical living and building site requirements.

### SOLAR DESIGN

Design or orientate the building so the main living areas and outdoor spaces ideally face **true north** or within 20° of true north to maximise full day solar heat and light. Consider the sun's highest angle during summer (approx. 70-80 degrees) and lowest angle during winter (approx. 20-30 degrees). The east side will gain morning sun, the west side afternoon sun and the south side receives the least sun so is best for bedrooms and utility rooms i.e. laundry, storage or garage.

### GLAZING

To maximise solar heat and light during the day, glazing should be largest on the North facing side. South facing windows should be kept to a minimum and mainly used for ventilation or natural lighting purposes. West facing windows in particular can be affected by glare and overheating in summer. To counter this, consider their position and sizing or use blinds, louvres or tinted glass. If you wish to minimise solar heat gain during the day then use less glazing or double glazed, tinted, reflective or low-e glass.

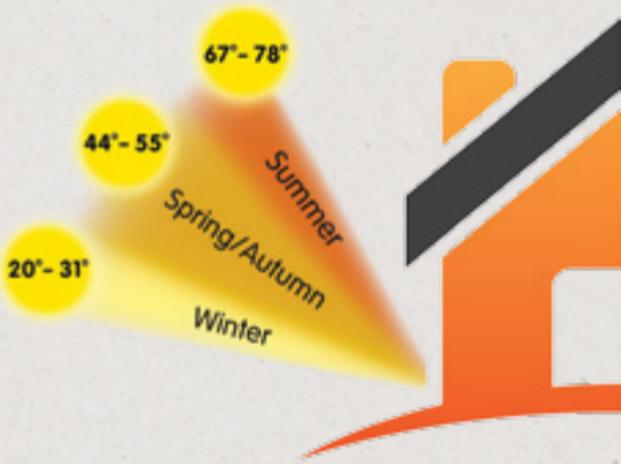
### THERMAL MASS

Use high thermal mass exposed concrete and/or masonry floors or walls to absorb and store heat from **direct** sunlight during the day and release it slowly at night as temperatures fall. The thermal mass elements should be well insulated to the outside or ground in order to work effectively.

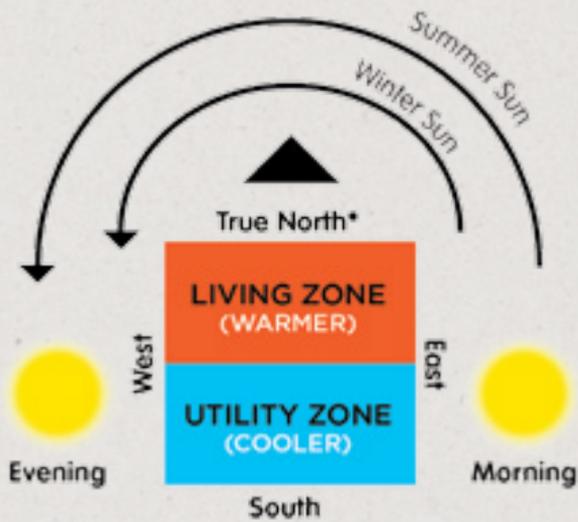
### COLOURS

Solar heat absorption will be increased using dark coloured exterior walls, roofing and internal surfaces in direct sunlight. Light coloured exterior walls, roofing and internal surfaces will reflect light and absorb less solar heat.

## SUN ANGLES



## HOME ORIENTATION



\*In NZ, true north is approx. 22° west of magnetic north (known as 'Declination')

## SUN ANGLES AT NOON

	Dec 22	Jun 22	Mar 21 & Sept 23
Whangarei	78°	31°	55°
Auckland	77°	30°	53°
Hamilton/BOP	76°	29°	53°
Wellington/Nelson	72°	25°	49°
Christchurch	70°	23°	47°
Dunedin	68°	21°	44°
Invercargill	67°	20°	44°

## 1.1 PASSIVE DESIGN...CONT.

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### HEATING, COOLING, VENTILATION & LIGHTING BENEFITS

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#### **SHADING**

Manage overheating and glare by using deep overhanging eaves on the north side, louvres, awnings, verandahs, window treatments or shade planting. Careful planning will allow shade from the high angle summer sun while allowing solar gain from the lower angle winter sun (refer to 'Sun Angles' table on page 5).

#### **VENTILATION AND WINDFLOW**

Encourage cross ventilation air flow using window and door openings at opposite sides of a room or building. Higher window openings will vent rising hot air and encourage cool airflow. Allow windows to open or vent in high moisture areas such as kitchens, bathrooms, toilets and laundries. An open plan layout will encourage cooling air movement by minimising barriers to airflow. Manage wind flow using wind breaks. Fences, trees and/or earth mounds can significantly reduce prevailing winds by half for distances up to ten times their height.

#### **SITE CONSIDERATIONS**

Where site selection is possible consider; good solar access, wind zone and prevailing winds, shading from existing and neighbouring trees, landforms and other buildings (actual and proposed). Locate buildings and yards outside of shaded areas and build towards the southern boundary to maximise full day sun.

#### **HOMESTAR™ RESIDENTIAL RATING TOOL**

Homestar™ is a voluntary residential rating tool that evaluates the environmental attributes of New Zealand's stand-alone residential homes in terms of energy, health and comfort, water, waste and more. It also provides a comparative star rating and recommendations for improvement. Visit [www.homestar.org.nz](http://www.homestar.org.nz) for details.

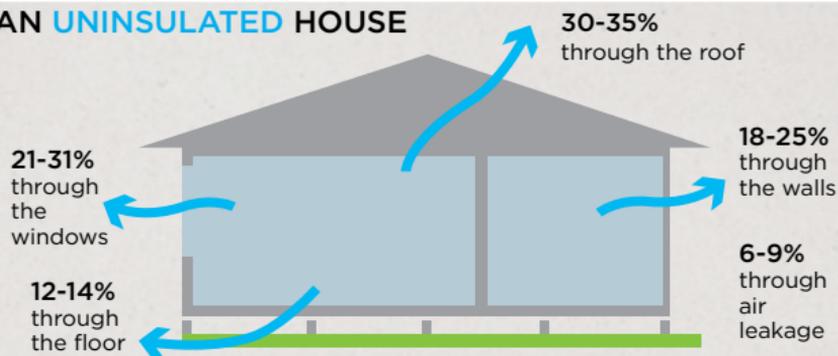
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## INSULATION - MORE IS BETTER!

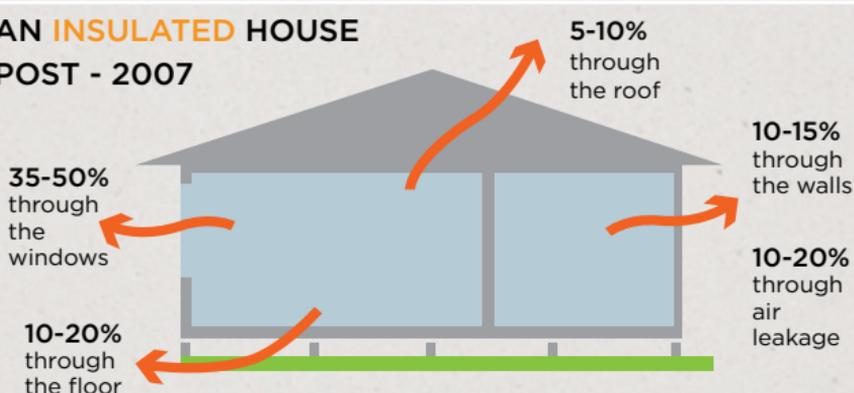
One of the most efficient and cost-effective ways to make a home warmer in winter and cooler in summer is to insulate well and the best time to do this is during construction.

# HOW HEAT IS LOST

## AN UNINSULATED HOUSE



## AN INSULATED HOUSE POST - 2007



Data source: BRANZ House Insulation Guide (2014)

## HOME INSULATION

For excellent value for money, consider increasing R-Values for your ceiling, wall and underfloor insulation above building code minimums. Ensure insulation is installed correctly - even small gaps can significantly reduce insulation performance.

### AIR LEAKS

Up to 20% of heat escapes through gaps around windows, under doors and where ducts, drains and water pipes enter rooms. Seal ducts and pipes with mastic tape and fillers, fit weather strips around doors and windows if necessary and draught-stoppers to the bottom of exterior doors.

### GLAZING AND DOORS

Up to 50% of heat loss is through glazing. Heat loss can be halved using double glazing so do this first. Then, consider other options to reduce heat loss by using Low-E glass and/or argon gas between the two panes of glass and/or timber, PVC or thermally broken aluminium frames. Curtains can make a real difference if they are thermal lined and preferably floor length with few gaps. Use solid and/or insulated exterior doors or an enclosed entrance lobby to reduce heat loss.

### USE CA, IC OR IC-F RATED DOWNLIGHTS

CA (Closed and Abutted), means approved heat resistant insulation can 'abut' the light fitting, i.e touch the sides. IC (Insulation Cover) rated light fittings may be covered by approved heat resistant insulation. IC-F light fittings can have approved heat resistant insulation covering or abutting the light fitting. Using CA, IC, or IC-F rated light fittings reduces heat loss through ceilings.

# 1.2 HOME HEATING

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## 34% OF HOUSEHOLD ENERGY USE

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For health and comfort, inside temperatures should be between 18°C and 24°C. The World Health Organisation recommends a minimum indoor temperature for health of 18°C, with up to 20-21°C for more vulnerable groups, such as the elderly and young children. Temperatures below 16°C result in an increased risk of respiratory illness and premature mortality.

### EFFICIENCY OF HOME HEATING SYSTEMS

#### BEST (COP\* >1)

Passive solar design (see 'Solar Design' on page 4)

Heat pumps (Air to Air)

\*Co-efficient of Performance (COP) is a ratio of heating output (kW) divided by heating power input (kW).

#### GOOD (COP\* ~1)

Electric heater (Radiant/Convection)

Hot water radiators (Electric)

Electric cable (Underfloor)

#### AVERAGE (COP\* <1)

Flued gas heaters (LPG/Natural Gas)

Solid fuel burner

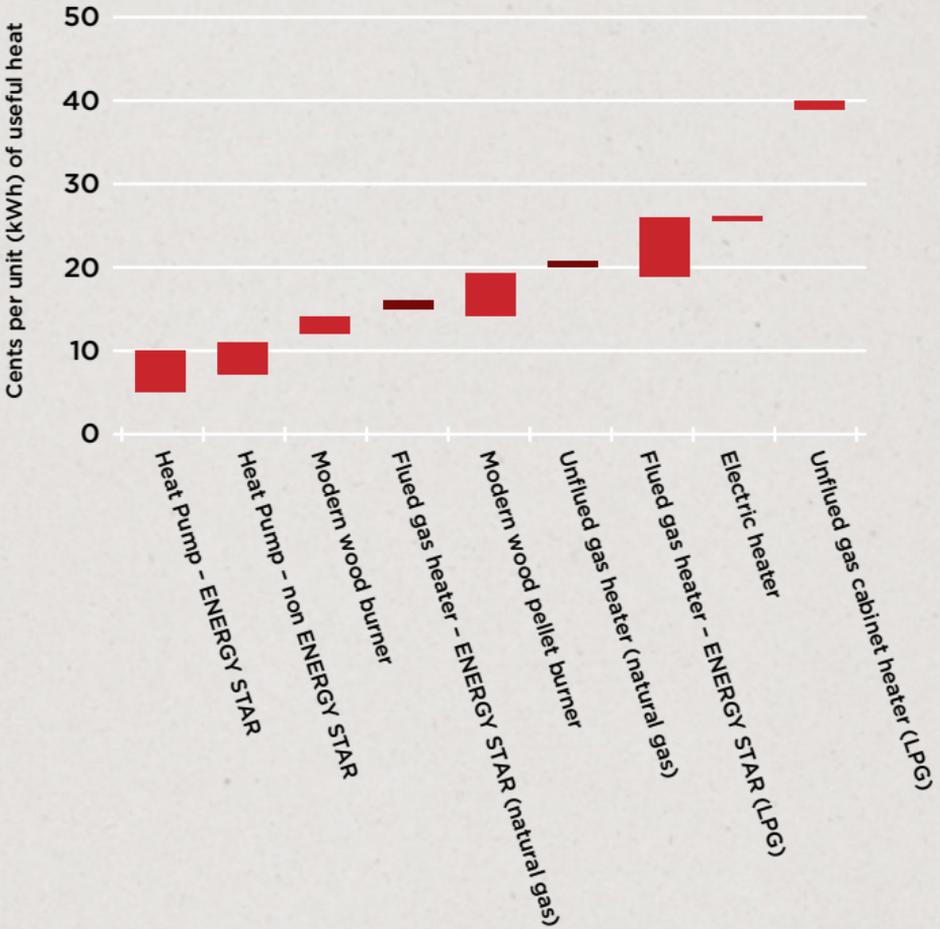
Underfloor hot water (Gas/Electric/Heat exchange)

Hot water radiators (Gas/Oil)

Ducted hot air (Electric/Oil/Gas/LPG)

# RUNNING COSTS OF DIFFERENT HEATING OPTIONS

Data source: [www.energywise.govt.nz](http://www.energywise.govt.nz) (February, 2014)



## 1.2 HOME HEATING...CONT.



34% OF HOUSEHOLD  
ENERGY USE

### HEAT RECOVERY VENTILATION SYSTEMS

Heat recovery ventilation systems are very efficient and use a heat exchanger attached to the ventilation system in the roof space to transfer heat extracted from the inside air to the incoming fresh outside air. In this way, most of the heat is recovered. Due to their high upfront cost, they are most suited to well insulated, well heated and tightly sealed homes in colder climates.

**TIP**

A true heat recovery ventilation system should; 1) Extract stale inside air; 2) Replace with fresh outside air; 3) Use an air-to-air heat exchanger to recover heat and; 4) Provide balanced indoor air pressure.

### ELECTRIC RADIANT, CONVECTION & UNDERFLOOR HEATERS

Radiant or convection heaters such as fan heaters, wall panel heaters, electric hot water radiators and electric underfloor cables have above average heating efficiency. They are generally inexpensive to purchase but can cost more to run. Ideal for smaller rooms requiring infrequent use.

### GAS HEATERS

Flued gas heaters provide easily adjustable, instant heat and because the flue on some models can be run down and out, horizontal or vertical they can be installed in most places in a home. They offer average heating efficiency.

**TIP**

Ensure your gas system complies with the AS4553 standard and look for a minimum 4-star performance rating or the ENERGY STAR® mark for gas heaters. Visit [www.energywise.govt.nz](http://www.energywise.govt.nz) for more information.

**WOODBURNERS AND PELLET BURNERS** - Modern, enclosed wood and pellet burners are much more efficient than open fires. Pellet burners use compressed wood pellets made from sawmill waste.

**TIP**

**GENERAL HEATING TIP** - Ensure your home is well insulated to minimise your home heating requirements. Ensure your chosen heater can meet your space heating requirements e.g. Is the heat output sufficient for the space/s required? Do you need instant, adjustable, periodic, portable and/or directional heating? An example of periodic heating is a bedroom that only needs heating at night time.



## HEAT PUMPS

Heat pumps are among the most energy-efficient forms of heating available. They take heat from the air (or ground) outside and use it to warm the air inside. Reverse cycle heat pumps also provide cooling in summer.



Select an ENERGY STAR® qualified heat pump. The ENERGY STAR® mark is only awarded to the most energy efficient heat pumps available in the market. Visit [www.energywise.govt.nz](http://www.energywise.govt.nz) for details.

**TIP**

The heat output rating of a heat pump can vary significantly based on outside temperatures. To ensure optimum performance, compare heat output ratings based on the accepted test standards for varying outside temperatures: H1 (+7°C), H2 (+2°C) or H3 (-7°C). These ratings allow you to select the appropriate heat pump for the climate and household requirements (i.e. the designed temperature and heating load) of individual situations.

# 1.3 WATER HEATING

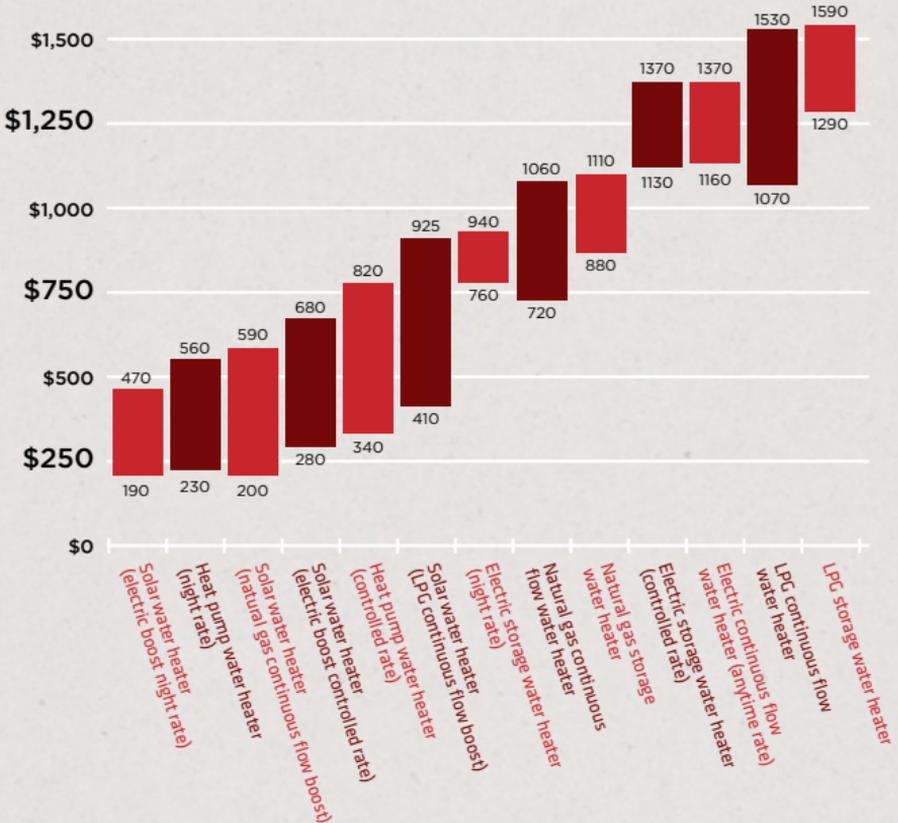


29% OF HOUSEHOLD ENERGY USE

There are two main types of water heating systems – storage and instant flow (tankless). When selecting a hot water system ensure it can supply about 40-60 litres of hot water a day per person. Data source: [www.level.org.nz](http://www.level.org.nz) (February, 2014)

## HOT WATER SYSTEM ANNUAL RUNNING COSTS

Data source: [www.energywise.govt.nz](http://www.energywise.govt.nz) (February, 2014)



TIP

**WATER HEATING OPTIONS** - Use the water heating tool at [www.energywise.govt.nz](http://www.energywise.govt.nz) to compare the upfront and running costs of various water heating systems.

### BUILDING TIPS FOR ENERGY EFFICIENT HOT WATER USE:

- > Install an energy efficient hot water heating system
- > Use low flow, energy efficient showerheads and taps or install flow restrictors. Use the water efficiency labelling on packaging to compare products
- > Install water-efficient household plumbing and appliances visit [www.waterrating.com.au](http://www.waterrating.com.au) to compare models
- > Reduce the hot water cylinder temperature, but not less than 60°C
- > Check and fix any leaking taps or pipes
- > Wrap at least the first metre of the hot water pipe attached to the cylinder
- > Install showers instead of baths where possible
- > Cluster rooms using hot water together to reduce pipework & heat loss

## HEAT PUMP WATER HEATERS

These cylinders are usually located on the outside of the house and work by taking heat from the outside air to heat the water inside the cylinder. They are one of the most energy efficient options available, but cost more upfront.

## SOLAR WATER HEATING

These systems are very efficient and can be effective anywhere in New Zealand, providing up to 75% of a household's annual hot water needs. You'll require an unshaded section of roof approximately 3-5 square metres, ideally north facing. The optimum angle depends on your latitude: in Auckland, panels should be angled about 37° and in Dunedin about 46° (i.e. subtract the Mar/Sep sun angle from 90° - refer to 'Sun Angles' table on page 5). Your installer can supply a frame to provide the right tilt.

Select an **ENERGY STAR**® qualified solar hot water system. The **ENERGY STAR**® mark is only awarded to the most energy efficient solar hot water systems available in the market. Visit [www.energywise.govt.nz](http://www.energywise.govt.nz) for details.

**TIP**

## INSTANT FLOW GAS

Water is heated as required, so you don't need a storage tank. Select a system with a flow rate suitable for the household's needs.

## GAS HOT WATER CYLINDERS

Gas hot water cylinders can use natural or LPG gas and can be situated inside or outside the house.

## ELECTRIC HOT WATER CYLINDERS

The cheapest and most common water heaters but are not the most efficient to operate. Consider a 'heat pump or solar-ready' tank, which can have a solar panel, or heat pump, connected to it in the future.

## WETBACK SYSTEMS

A hot water system can be boosted with a wetback fitted to a wood or pellet fire, range or burner system. A wetback uses a water pipe arrangement at the back of the heat source to help heat water.

**GENERAL WATER HEATING TIP** - For very efficient water heating systems consider a heat pump or solar water heating system. They cost more upfront but will cost half the running costs of an electric hot water cylinder.

**TIP**

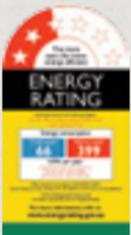
# 1.4 REFRIGERATION/COOKING /OTHER



29% OF HOUSEHOLD ENERGY USE



## ENERGY RATING LABELS



Energy rating labels use star ratings and show energy use (usually kilowatt hours per year) to make it easy to compare the energy efficiency of different models. Each extra star means an extra 10% or more savings in running costs. Visit [www.energyrating.com.au](http://www.energyrating.com.au) to compare the energy efficiency of appliances.

## THE ENERGY STAR® MARK



ENERGY STAR® is the global mark of energy efficiency and is only awarded to the most energy efficient products in each class.

Visit [energywise.govt.nz](http://energywise.govt.nz) for more information.

## CORRECT SIZE

Choose appliances that are the right size for the household to reduce running costs.

## REFRIGERATORS & FREEZERS (10% OF HOME ENERGY COSTS)

Upright fridge-freezers with one door above the other are generally more efficient than units with side-by-side doors. Upright freezers with enclosed drawers (not baskets) are a good compromise. Avoid placing the fridge or freezer in direct sunlight or next to the oven or cooktop.



### **COOKING RANGE (6% OF HOME ENERGY COSTS)**

In terms of efficiency induction cooktops are the most efficient but relatively expensive. Ceramic glass and halogen are less efficient than induction and moderately expensive. Gas, exposed coil and solid disk elements are the least efficient but relatively cheap. Convection or fan ovens use less energy than conventional ovens.

### **CLOTHES DRYER (1-2% OF HOME ENERGY COSTS)**

Look for a model with an auto-sensing feature to save energy and prevent overdrying. Ensure the dryer is vented to the outside to remove moisture.

### **DISHWASHER & WASHING MACHINE (1% OF HOME ENERGY COSTS)**

Look for dishwasher and washing machine models with an eco-cycle, these can help save water and energy. Front loading (horizontal-axis) washing machines may cost more to buy but use less energy and water than top-loading machines. Look for washing machines with a cold wash cycle, auto load sensing or load size selection and high spin speed. If there are a small number of people in the household it would be better to purchase a slim-line or single drawer dishwasher.

# 1.5 LIGHTING



8% OF HOUSEHOLD  
ENERGY USE



GOOD LIGHTING  
OFFERS SAFETY  
& COMFORT WITH  
THE MINIMUM USE  
OF ENERGY

## MAXIMISE NATURAL LIGHT

Reduce artificial lighting needs by using natural lighting from good solar design, home orientation, well positioned and sized glazing, skylights & reflective light coloured surfaces.

## USE EFFECTIVE LIGHTING CONTROLS

Use multiple switches to control lighting in specific areas of larger rooms rather than a single switch to light the whole room. Use two- or three-way switches for rooms with multiple exits. Use **dimmers**, **timers** and **light sensors** to reduce or switch off lighting when not required.

## COMPACT FLUORESCENT LAMPS

Medium price, long life (10,000 hours) and high energy-efficiency (up to 80% less energy than incandescent bulbs). Recommended in most household situations, especially for extended use. Disadvantages include delayed full brightness and restricted use with dimmers and downlights.

## LED BULBS

Still relatively expensive but pricing and availability are improving. Ultra long life (30,000 hours!) and very high energy-efficiency with minimal heat output (up to 90% less energy than incandescent bulbs). Very cost effective life cycle cost so recommended subject to availability.



### **HALOGEN LAMPS**

Medium price, medium life (approx. 2,000 hours) and energy-efficient (up to 30% less energy than incandescent bulbs but not as efficient as CFL's or LED's). They produce an instant, bright white light - excellent for task lighting.

### **FLUORESCENT TUBE**

Expensive but long life (approx. 10,000 hours) and high energy-efficiency (up to 80% less energy than incandescent bulbs). Can be used for task and general lighting requiring extended use e.g. kitchens, bathrooms and workshop/garages.

### **INCANDESCENT BULBS**

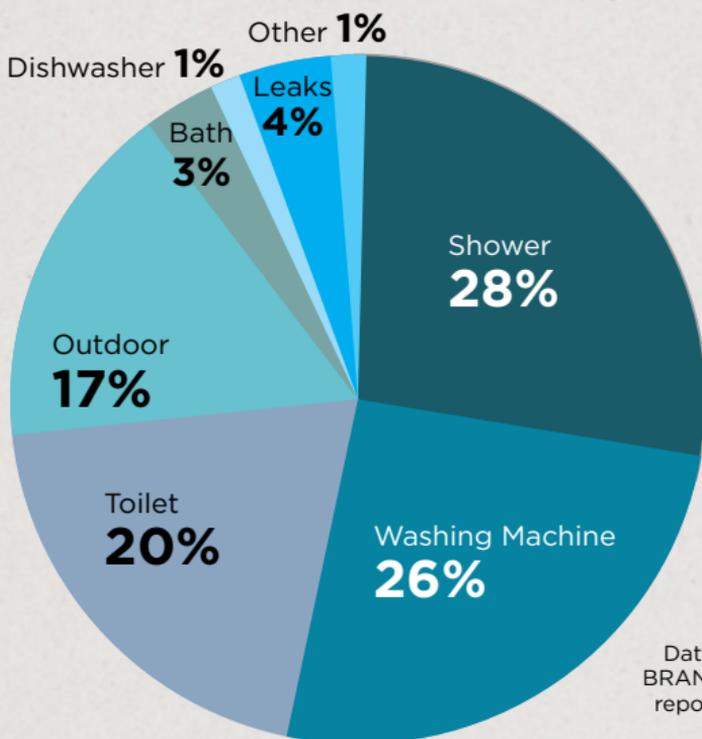
Cheap but short life (approx. 1,000 hours) and poor energy-efficiency (up to 95% of energy is wasted as heat). Not recommended due to high running costs compared to alternatives above.

## 2.0 WATER EFFICIENCY

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ANNUAL WATER USE  
IN NZ HOUSEHOLDS



Data source:  
BRANZ WEEP  
report SR159,  
2007

### ***DID YOU KNOW...***

- > Each person uses about 200 litres of water per day in summer and 170 litres in winter
- > Each person uses about 67000 litres of water per year

## **WATER EFFICIENCY LABELLING SCHEME (WELS)**



Search for water-efficient taps, dishwashers showerheads, washing machines and toilets at [www.waterrating.gov.au](http://www.waterrating.gov.au). As an example, an efficient washing machine can use 100 litres less water per load than other models.

## **REDUCE WATER FLOW**

Install water efficient ('low-flow') showerheads and taps, or flow restrictors ('low-flow' is usually defined as 9 litres or less per minute).

## **CORRECT SIZE**

Choose dishwashers and washing machines that are the right size for the household, so it's practical to run them only when they're full.

## **INSTALL WATER EFFICIENT TOILETS**

Look for a dual flush, 6/3 litres or less. This is a particularly good investment if the household uses a septic tank, or is on metered water or rainwater tank supply.

## **RAINWATER SYSTEMS**

If local regulations allow, consider a rainwater tank for outdoor use, flushing toilets and laundry use - over 60% of water use! If treated or purified, tank water can also be used for drinking, bathing and in the kitchen. Correct tank volume will depend on typical rainfall in an area, roof area available for collection, the number of residents in a household and their expected water use. Slim wall or underfloor options are ideal in restricted spaces.

## **GREYWATER SYSTEMS**

Greywater (wastewater from laundry tubs, washing machines, showers, baths and basins) can be re-used through subsurface garden irrigation systems or for flushing toilets.

## **BLACKWATER SYSTEMS**

If public sewerage systems are not available, blackwater (waste from toilets) can be processed using a composting (waterless) toilet system, septic tank system or an aeration system which treats sewerage to a higher level.

## **LEAKS**

Check and fix any leaking taps and pipes and especially toilet cisterns which can often go unnoticed.

## 3.0 INDOOR AIR QUALITY

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Poor indoor air quality is caused by concentrated levels of moisture, pollutants and allergens which can lead to headaches, tiredness, asthma and allergic responses. Modern homes are tightly sealed to avoid heat loss, but this can lead to poor internal air quality - so remember to 'Build Tight, Ventilate Right'. To avoid poor air quality consider the following options:



### **PRODUCT SELECTION**

Choose products with low risk of toxic emissions such as zero or low VOC products e.g. low VOC carpets, low formaldehyde particle board, MDF and mouldings, water based rather than solvent based paints & adhesives.

### **INSULATION**

Good insulation will avoid poor air quality due to condensation forming on interior surfaces and possible mould growth.

### **SEAL LEAKS**

Check and seal all pipes, flues and ducts. Seal internal garage or workshop doorways to avoid toxic fumes entering the house.



## VENTILATION

**Open the doors and windows to ventilate the home, especially after interior stopping, painting, laying carpet and prior to occupancy. The following measures will help extract moisture and pollutants from inside the home:**

- > Ducted rangehoods, clothes dryers and flued gas heaters
- > Extractor fans in bathrooms, laundries and toilets
- > Air ventilation systems (including heat recovery ventilation systems)
- > Windows that can be left open during the day (use security or double tongue latches) or include passive vents.

For spaces with natural ventilation only, an occupied space requires a net openable area (i.e. windows, doors etc) that is no less than 5% of the floor area.

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**NZS 4303:1990 *Ventilation for acceptable indoor air quality*, sets out the mechanical extract air flow rate requirements. In houses, the minimum extract air flow rate is:**

- > Living areas (living room, bedrooms, dining room) – 0.35 air changes per hour but not less than 7.5 litres a second (l/s) per person
- > Kitchens – 50 l/s intermittent (or 12 l/s continuous or with opening windows)
- > Bathrooms and toilets – 25 l/s intermittent (or 10 l/s continuous or with opening windows)
- > Laundries – 20 l/s intermittent

## 4.0 SUSTAINABLE MATERIALS

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Use the following criteria to help you select **ENVIRONMENTALLY PREFERABLE** materials for your next building project.

**ASSESSMENT CRITERIA** – Think of the goal as selecting the most environmentally, economically and socially preferable product available, and remember, few products will meet all criteria so rely on common sense.

1. **PERFORMANCE** - Will the product perform its purpose? Is it durable, easily maintained or repaired relative to alternatives?
2. **SUSTAINABLE** – Is the product sourced, produced, used and disposed of in an environmentally and socially responsible way? Refer to independent third party certification if available (see Environmental Product labelling).
- I. **TOXICITY** – Is the product non-toxic and unlikely to release harmful substances before, during and after its useful life? e.g. PVC, lead, harmful volatile organic compounds such as formaldehyde and solvents etc.
- II. **RE-USE AND RECYCLING** – Can the product be re-used or recycled? Alternatively, does it have a significant recycled content?
- III. **LOCAL PRODUCTION** – Can the product be produced and sourced locally at a competitive price to avoid unnecessary transport costs?
3. **AFFORDABILITY** – Is the product affordable in your local market?



## ENVIRONMENTAL PRODUCT LABELLING

Look for **recognised** eco labels backed by **independent third party certification** such as Energy Rating labels, ENERGY STAR®, Water Efficiency Labels, Environmental Choice, Sensitive Choice, Green Tick, CarboNZero (For sustainable timber and wood products visit [www.itm.co.nz/sustainability](http://www.itm.co.nz/sustainability)). Other international eco-labels of note include Environmental Choice (Canada and Australia), SCS Certified, C2C Certified, Green Seal and Greenguard (US), EU Eco-Label (EU), Blue Angel (Germany), EcoMark (Japan), Green Choice (Russia), Green Label (Hong Kong and Thailand), Eco Label (China, Korea), Green Mark (Taiwan) and Nordic Swan (Sweden).



## ADDITIONAL REFERENCES & RESOURCES

Additional sustainable building resources, including the **ITM Building Guide: How To Minimise Construction Waste** can be found on the ITM website [www.itm.co.nz/sustainability](http://www.itm.co.nz/sustainability).

> **BRANZ** - Level book series and [www.level.org.nz](http://www.level.org.nz)

> **ENERGYWISE™** - [www.energywise.govt.nz](http://www.energywise.govt.nz)

> **Efficient Household Energy and Water Use**

- Homeowners should visit [www.smarterhomes.org.nz](http://www.smarterhomes.org.nz) for useful advice on household energy and water efficiency.

> **Homestar™** - [www.homestar.org.nz](http://www.homestar.org.nz)

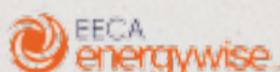
### DISCLAIMER

This document contains a range of information, data, advice and recommendations, which are intended as a guide only.

Whilst the information in this document has been prepared with due care we do not warrant or assume any legal liability or responsibility for the accuracy, currency, completeness, or usefulness of any information, product or process disclosed.

This document is not a substitute for independent professional advice and users should obtain any appropriate professional advice relevant to their circumstances. Please contact your suppliers, product manufacturers and/or local territorial authority for further advice.

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*"We'll see you right"*

