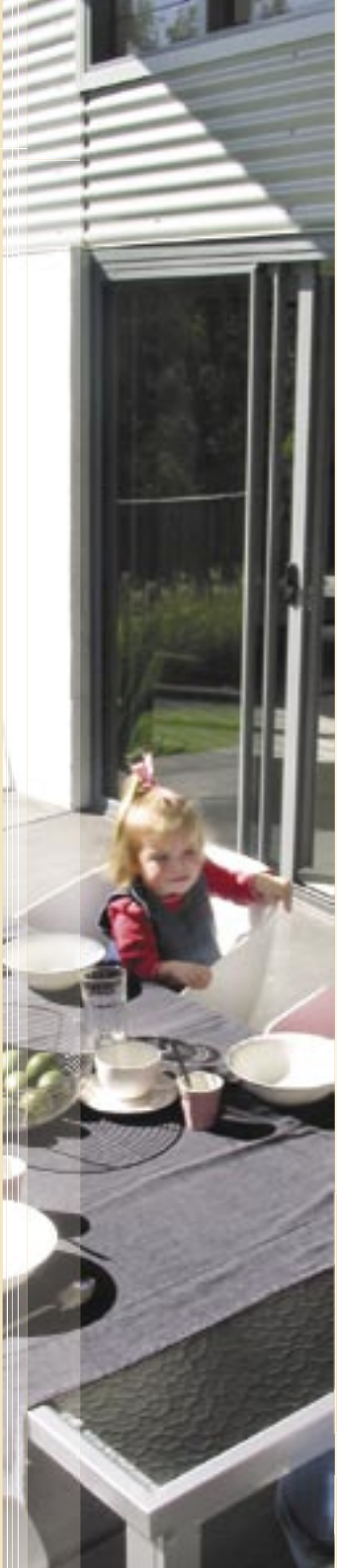
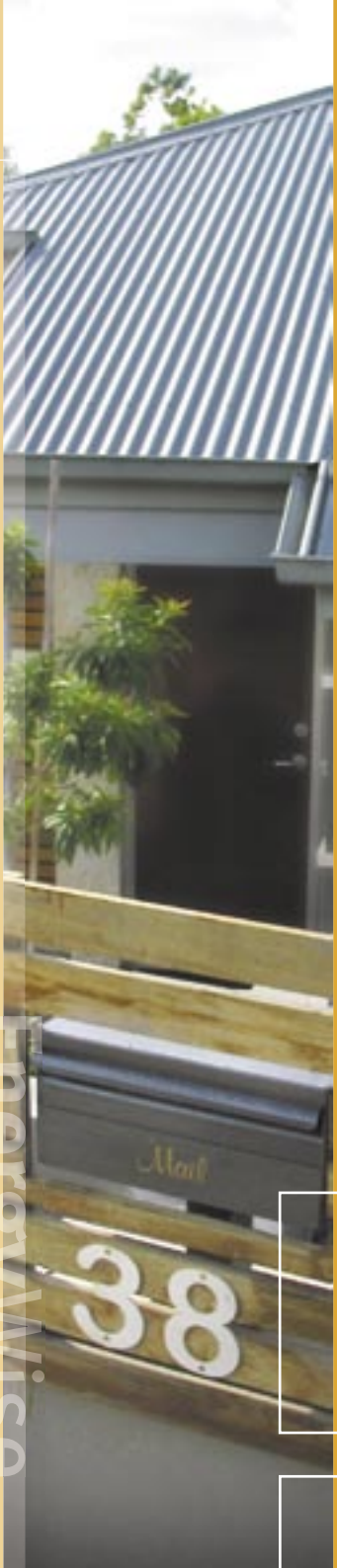
EnergyWise
Queensland

How to be **Energy**Wise at home and save on energy bills

Queensland Government
Environmental Protection Agency
Department of Energy



EnergyWise home



EnergyWise

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Saving energy in the home can be so easy! This booklet shows you how.

At a glance you will see the typical running costs for hot water systems, refrigerators, air conditioners and other household appliances. You may be surprised how much energy some appliances use.

Using less energy also means less pollution and reduced greenhouse gas emissions. So start now and save energy, help save the environment and save hundreds of dollars on your energy bills.

The household

Welcome to a typical Queensland household. Yours might not be exactly the same, but statistics indicate that this house and family, their lifestyle and type of appliances are representative of many Queensland households. Each individual household will vary, even with the same appliances and number of people. Energy consumption will also vary depending on the climate you live in.

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In the kitchen

Energy can cost between $75 and $90 a quarter.

Appliance	$ per quarter
Two door refrigerator 400 – 500 litre	
– cyclic defrost	30.00
– frost free	40.00
Electric stovetop and oven	18.50
Washing up by hand 3 times a day	13.50
12 place dishwasher – normal program x 1 load a day	13.00
Three 75 watt bulbs for 3 hrs/day	9.00
Electric kettle 5 times a day	4.00
Microwave – 1 hr/week	2.00
Fan and light in rangehood	0.75
Automatic toaster	0.75

To make energy and dollar savings

Appliances

- When buying a new fridge, freezer or dishwasher, select one with the best energy star rating you can afford and that meets your needs. Since refrigeration operates day and night, energy costs (and so potential energy savings) are high. Refrigeration accounts for nearly 8 percent of the electricity consumption in a typical household.
- Well maintained cyclic defrost refrigerators are more economical than frost-free ones.
- Where practical, switch off appliances at the power point. You can save up to $100 on your annual electricity bills by switching off appliances at the wall when not in use.

Refrigerator/freezer

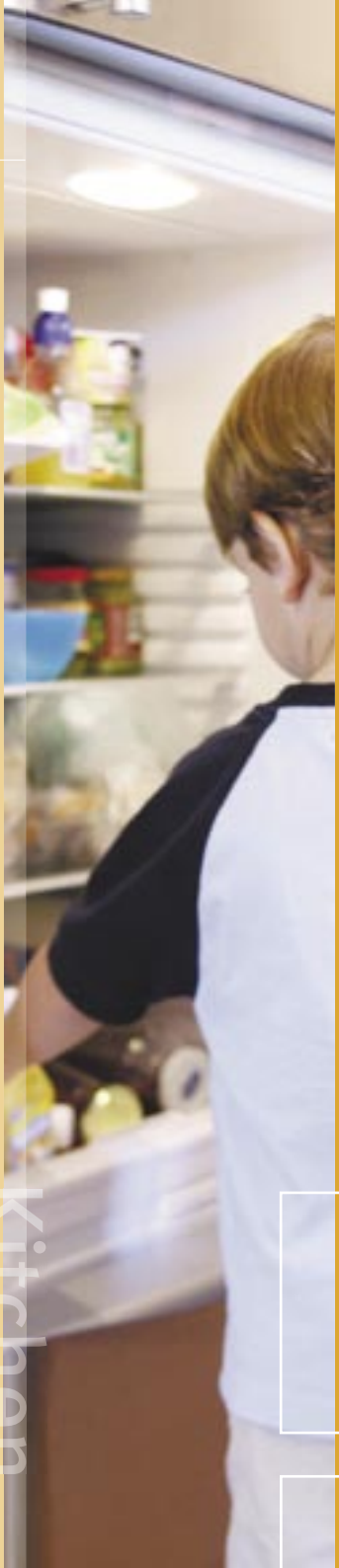
- Avoid leaving the fridge door open and ensure door seals are working efficiently. To check this, place a piece of paper where the door or lid closes. If the paper is held firmly, the seal is sound.
- Defrost the freezer when there is a 6mm (1/4 inch) frost build-up.
- Set the temperature between 2°C and 5°C for the refrigerator and between –11°C and –23°C for the freezer.
- Place the fridge in a cool, well-ventilated position out of direct sunlight and not adjacent to a heat source such as an oven.
- Keep exposed condenser coils at the rear of older style fridges free from fluff or dust. Some refrigerators and freezers have condenser coils under the outer case which should also be kept clean. Maintain around 150mm space between the coils and the rear wall, at the top of the fridge and on both sides to allow heat to escape.

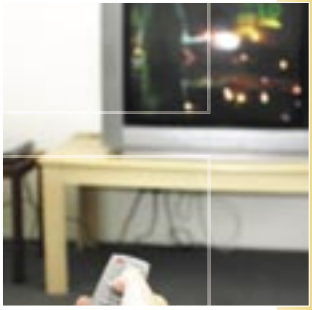
Cooking

- Avoid opening oven doors when baking as hot air escapes and lengthens cooking time. If applicable, select the fan forced setting.
- Where possible use lids on pots and saucepans to reduce cooking time. Defrost frozen food in the fridge ahead of time to save the cost of running the microwave.

Dishwashing

- Only run your dishwasher with a full load.
- Consider using the dishwasher at night and switching it to Tariff 33 which is cheaper to run.
- Use the dishwasher's 'economy' setting to wash lightly soiled dishes and to save water.





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In the living room

The energy cost could be as much as $30 a quarter in summer and $160 in winter. With air conditioning, the cost could be as much as $180 for the summer quarter.

Appliance	$ per quarter
Air conditioner 6000 watt output (2400 watt input) 6hrs/day – max	180.00
Heater 2400 watt 5 hrs/day	155.00
Three 60 watt bulbs 5 hrs/day	12.00
Colour TV 51cm 8 hrs/day	10.00
Video games console 3 hrs/day	1.75
Stereo 3 hrs/day	1.50
Ceiling fan 5 hrs/day	0.60
Video recorder 2 hrs/day	0.53
DVD player 2 hrs/day	0.30

To make energy and dollar savings

Lighting

- Install dimmers or two-way light switches.
- Install energy efficient (e.g. compact fluorescent) bulbs in rooms you use regularly – they consume 80 percent less energy than a comparable incandescent bulb and can last up to eight times longer.

Appliances

- Use the power button on the television and stereo or switch them off at the wall rather than leaving them in standby mode.
- Empty or replace dust bags in the vacuum cleaner regularly to ensure your vacuum works efficiently.

Cooling

- Install ceiling insulation and shade your windows to prevent heat infiltration.
- Consider using ceiling fans for cooling instead of air conditioning as they are cheaper to run.
- If you have one, set your air conditioner at around 24°C for maximum efficiency.

Heating

- Insulate ceilings and seal gaps to prevent draughts.
- Close all windows and doors to the heated room. It is more energy efficient to heat a small room than a large open-plan living area.
- Set your reverse-cycle air conditioner or heater to around 19 – 20°C .

How much are idle appliances costing you?

TVs, videos, microwave ovens, computers and computerised game machines all use energy if plugged in and left on at the power point. This is called standby power and can cost as much as $100 a year.

Switch appliances off at the power point when they are not being used.

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In the laundry and bathroom

Energy can cost up to $50 a quarter in summer and $90 a quarter in winter.

Appliance	$ per quarter
Three 3-minute showers a day	40.00
Clothes dryer used 3 times a week	25.00
Washing machine (top load) used daily on warm normal cycle	18.00
Electric strip heater (1000 watt) 1 hr/day	13.00
One bath a day	12.00
Hair dryer, electric shaver	3.50
Two 100 watt lights 1 hr/day	2.75
Iron used 10 minutes daily	2.00
Hot water (basin)	0.90
Exhaust fan	0.52

To make energy and dollar savings

Clothes washing and drying

- Use the economy settings and always try to wash a full load of clothes, but don't overload the machine.
- Use the 'solar' clothes dryer in your back yard (the clothes line) as much as possible and erect a washing line under cover for natural drying on rainy days.
- Wring out or spin-dry clothes before placing them into a tumble dryer – they will dry faster and that will save you money on running costs.
- Always clean the lint filter after using your dryer and open windows or doors to remove moisture if the dryer is not vented to the outside.

- Consider connecting your dryer to Tariff 33.
- Front loading washing machines are the most energy and water efficient.
- When purchasing a new washing machine or dryer buy the highest energy star rated appliance you can afford.

Ironing

- Iron low temperature fabrics first to reduce the warm up time and switch the iron off before finishing the last garment.
- Iron large batches of clothing at the same time to avoid wasting energy in reheating.

Bathroom

- Install efficient three star or higher rated showerheads. By changing your 20 litres a minute showerhead to an efficient 10 litres a minute showerhead, the average household will save at least $34 in ongoing operational costs in water and energy each year.
- Have a three-minute shower instead of a bath.
- Don't run the tap while shaving or brushing your teeth.

Safety hint

Clogged filters in clothes dryers are a known cause of house fires.

Money down the drain

About 60 drips a minute will add up to 9000 litres of water a year. If this is hot water, about $40 (on Tariff 33) will go down the drain.

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In the bedrooms

Energy can cost about $40 per quarter.

Appliance	$ per quarter
1500 watt heater 3 hrs/night	60.00
100 watt light 3 hrs/night	4.00
Home computer used 10 hrs/week	3.50
Electric clock	3.45
Two 60 watt bulbs 1.5 hrs/night	2.50
Double electric blanket 2 hrs/night	1.80
Portable stereo	1.50
Desk lamp 2 hrs/night	1.00

To make energy and dollar savings

Lighting

- Switch off all lights as you leave each room and clean lamp shades and bulbs regularly to ensure maximum light output.
- Install a light dimmer to reduce the energy use of incandescent bulbs.

Cooling

- Consider using ceiling fans instead of relying on air conditioning at night.
- A standard air conditioner in the bedroom (output of 2500 watts) running for eight hours will cost around $90 a quarter.

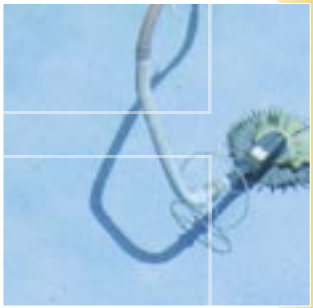
Heating

- Adjust controls of heated waterbeds to the lowest comfortable temperature. Covers will also help insulate it and save up to one third of the energy it uses.
- Consider having your waterbed heater connected to Tariff 33.
- Use electric blankets as bed warmers only and switch off the blanket before going to bed.

Safety hint

Install a safety switch to protect you and your family from electric shock resulting from faulty power circuits in your home.

Bedrooms



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In outdoor areas

The backyard and pool can cost up to $120 a quarter in summer and up to $60.00 a quarter in winter.

Appliance	$ per quarter
Swimming pool pump for 8 hrs/day	
–Tariff 11	120.00
or	
–Tariff 33	66.00
Spa pump and heater 4 hrs/week	22.00
One 150 watt light 2 hrs/night	4.00

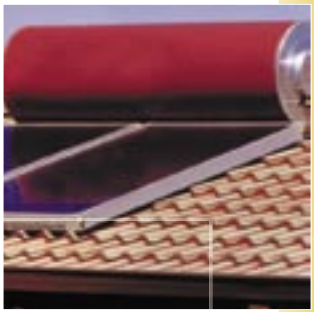
To make energy and dollar savings

Lighting

- Consider using a movement detector and light sensing controls on security lighting to enable activation of lights only between dusk and dawn.
- Clean light fixtures regularly and keep vegetation away from light fixtures.
- Replace existing incandescent bulbs with compact fluorescent bulbs where possible and consider using solar-powered walkway and patio lights.
- Install 120 watt incandescent spotlights with improved reflector or 100 watt tungsten-halogen spotlights.

Swimming pools and spas

- Ensure the correct type of timer is installed and programmed to run at the minimum recommended time for each season (6 – 8 hrs a day in summer and 2 – 4 hrs a day in winter).
- If needed, select solar pool heating instead of gas or electricity.
- Cover spa with an insulated cover to reduce heating costs by up to 50 percent and switch off if not used for some time.
- Set spa temperature to a minimum level when not in use and turn up the setting an hour before using.
- Connect the pool and spa to Tariff 33.



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Hot water systems

Water heating accounts for up to 40 percent of energy used in the home. So a wise choice about which hot water system you buy can make a substantial difference to your energy bill.

The amount of hot water used by a household can vary widely and depends on the daily amount of bathing, clothes washing, cooking and dishwashing. The average family uses about 90 – 120 litres of hot water each day.

When you install a hot water system in a new house, or replace an old system, give some thought to the type of system that best meets your needs. After all, the purchase of a hot water system entails a significant initial cost outlay, as well as a commitment to buy energy for the expected 10 – 15 year life of the system.

The main energy sources for hot water systems in Queensland are electricity, gas and solar.

Why choose solar?

Economical — a solar hot water system can reduce your hot water bill by up to 80 percent so you can recoup the purchase cost over time.

Reliable — provided you have a suitable sized tank and booster system installed, you should have a reliable supply of hot water at night and during cloudy days.

Environmentally friendly — a solar hot water system uses solar energy instead of electricity or gas to heat water, reducing fossil fuel use and hence reducing greenhouse gas emissions. Each solar hot water system installed reduces carbon dioxide emissions by an average 2.5 tonnes a year.

Types of solar hot water systems

Thermosyphon system — can be either close-coupled with the tank on the roof above the panels or have the tank inside the roof and above the panels.

Forced (pumped) circulation system — panels are located on the roof, the tank at ground level and a small pump circulates the water through the panels into the tank.

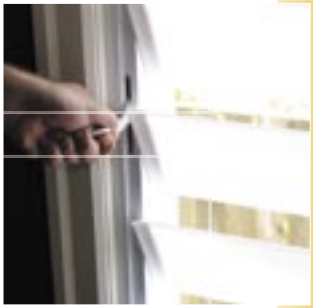
Solar boosted heat pump system — uses heat exchanger panels to absorb heat energy from the ambient air.

Tips for solar hot water systems

- Conserve hot water by using it efficiently. Follow the manufacturer's recommendation for maintenance of your solar hot water system.
- When possible, do jobs requiring hot water early in the day, so the water remaining in the tank is reheated by the sun, reducing the the need to use the booster.
- Choose the type of booster carefully. Different types available include gas and electric.
- The recommended setting for the booster thermostat is approximately 60°C. The lower the thermostat setting the less energy used to supplement solar heating.

For all hot water systems

- Insulate the first two metres of the hot water pipe from the hot water system.
- Reduce your running costs by connecting your hot water system to the most economical tariff – check with your electricity supplier.
- Turn off the hot water system when going away for more than a few days.



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Summer cooling

A cool and comfortable house can be achieved by applying energy efficient house design principles or by buying energy efficient cooling appliances.

The Energy Advisory Service has detailed publications on energy efficient house design (see back cover for contact details).

There are many ways to apply energy efficient design and landscape principles to an existing home.

Design features

- Install insulation with the recommended 'R' value in ceilings and walls – this makes the ambient temperature of rooms up to 2°C cooler in summer.
- Shade east and west facing windows with external vertical shading devices, such as blinds, awnings or shutters.
- Where required, provide additional shading to north-facing and south-facing windows with pergolas or verandas.
- If replacing sun-exposed windows, use tinted glass to reduce heat gain and consider installing reflective film on east and west facing windows.
- Seal any gaps around windows and skirting boards, cornices and between different wall materials to keep hot draughts out.
- Open doors, windows, curtains and blinds once it is cooler outside than inside.
- Close off unused rooms. These can act as a buffer zone to keep living areas cooler.
- Install weather-stripping and draught excluders on windows, external doors and doors to high ventilation areas such as bathrooms and laundries.

Landscape features:

- Avoid paving or concrete slabs in front of windows to reduce the effect of reflected heat into the house.
- Select and position plants to provide effective summer shading and a buffer against hot winds and maximise the effect of cool changes.
- Consider the use of deciduous trees and vines on the northern side to allow access of light and warmth in winter.

It is usually easier and more cost-effective to incorporate energy efficient features into your home when building or renovating. More information on Smart Housing design principles can be found at www.housing.qld.gov.au

Summer

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Cooling appliances

If supplementary cooling is required, fans, evaporative cooling or refrigerated air conditioning can be used. The best option depends on climate, house design and lifestyle as well as your budget. Here are some tips to help you choose:

Fans

- Ideal in well insulated and shaded rooms, day and night.
- Available as portable units (desk, floor or pedestal mounted) or as fixed ceiling fans.
- Reasonably priced.
- Low running costs.

Evaporative coolers

- Best in hot, dry climates.
- Available as portable units, wall mounted units or ducted systems.
- Purchase price varies from around $250 for a portable unit to $3500 for a ducted system in a typical house.
- Reasonable running costs – less than half that of refrigerated air conditioners considering both electricity and water.
- Must be operated with doors or windows open for external ventilation.
- Should be thoroughly cleaned at the end of each season in accordance with manufacturer's instructions.

Refrigerated (including reverse cycle) air conditioners

- Available in various styles and capacities – choose the model that suits your rooms and conditions.
- Purchase price varies from around $300 for a small bedroom unit to around $16,000 for a ducted system.
- High running costs particularly in very warm and humid climates.
- Filters the room air, removing airborne dust, pollens, hair and lint.
- Thermostatically controlled, allowing you to select a desired temperature.
- Should be placed on the shady side of the building (or shade the air conditioner itself), and make sure the airflow isn't obstructed.
- Before turning on the air conditioner, close all doors and windows and draw the curtains or blinds to prevent unnecessary heat getting in and cool air escaping.
- Drawing warm air in from the outside uses more electricity, so select the 'air recirculate' setting on your air conditioner.
- In summer, set the thermostat control on as high a setting as is comfortable. By increasing the room temperature by one degree, you can save up to 10 percent of operating costs.
- Set your air conditioner at 24°C in south east Queensland in summer, 25°C in other areas of Queensland.
- If the machine has adjustable vents, direct them towards the ceiling when cooling and towards the floor when heating.
- Clean the filter according to the manufacturer's instructions.

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Winter warmth

Space heating, although not required for long periods, still represents up to 10 percent of energy bills. In the southern ranges and inland areas of Queensland a greater portion of winter energy bills will be for heating.

- Choose the right size heater to suit your room and conditions and keep it in good operating order.
- Install insulation and seal gaps to prevent draughts.
- Decide which rooms require frequent heating and cooling. Make sure they are well insulated and can be closed off from the rest of the house.

Types of heating

Radiant heating — heats objects rather than air but will eventually heat the air, e.g. bar radiators, gas radiant heaters, open fireplaces and kerosene heaters. This type of heating is best suited to provide immediate personal warmth in larger rooms.

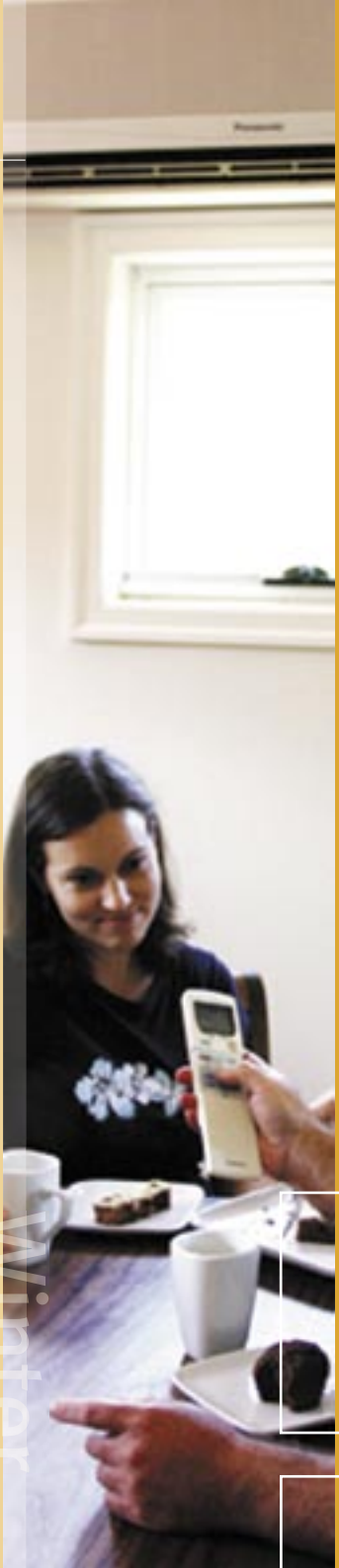
Forced convection — involves a fan drawing air into a heater where it is heated and then sent out as warm air, e.g. electric fan heaters, reverse cycle air conditioners and gas heaters. These heaters are designed to heat the air in the room and are particularly suitable for where people move around.

Reverse cycle air conditioning set at 19°C is the most efficient way to heat your home.

Convection heaters — circulate warm air through the room by natural air currents, e.g. some electric, oil and gas heaters and slow combustion stoves.

Oil filled panel-and-columns are relatively slow to heat up, and are suitable for heating smaller rooms for a long period of time, especially if several people are using the room. Most are thermostatically controlled. Their low surface temperature makes them safe for small children.

Conduction heating — transmits warmth directly to the body, e.g. electric blankets and hot water bottles. This type of heating is ideal for personal use.



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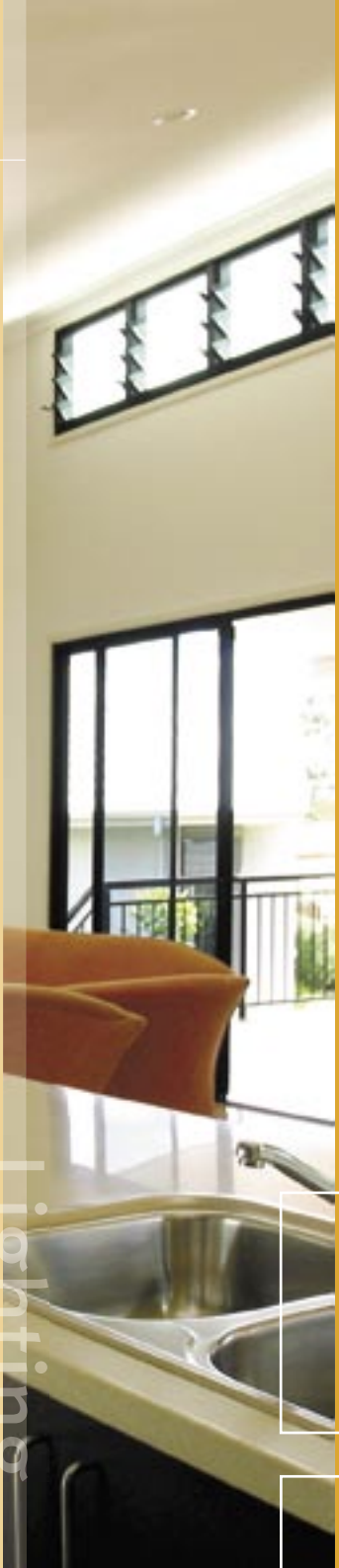
Home lighting

Efficient light fixtures and lamps

- Use fluorescent lights where possible, particularly in areas where lights are on for more than one hour at a time. Fluorescent bulbs give five times the light, last up to eight times longer than ordinary bulbs and are around 80 percent more energy efficient.
- By using six fluorescent 20 watt light bulbs instead of six normal (incandescent) 100 watt light bulbs for 5 hours each day, you can save over $100 a year on your electricity bill.
- Use the lowest wattage lamp that will adequately illuminate the required area.
- Replace old fluorescent tubes (40 watt and 20 watt) with lower wattage tubes (36 watt and 18 watt) which provide the same level of lighting but use less electricity.
- High efficiency multi-phosphor or tri-phosphor fluorescent lamps offer outstanding daylight-colour light quality, which is particularly advantageous in dining areas or sewing rooms. These lamps use the same amount of electricity as standard fluorescent tubes, but they provide about 15 percent more light output and will maintain their high light output after years of use.
- Clean lamps and shades frequently.
- Use white or pale coloured lampshades in preference to darker colours.

Turning off lights

- Encourage all members of your household to turn off lights when leaving a room for more than a few minutes. Leaving them on when no one is in the room is a waste of energy and money.
- Turning incandescent lights on and off does not use extra electricity. Turning a fluorescent light on and off uses slightly more electricity and does reduce its lifetime as it will wear out the starter device. However they are still more cost-effective than incandescent bulbs and you should turn them off if you leave the room for more than 15 minutes.
- Use task lighting, such as over desks, instead of lighting the whole room.
- Provide additional switches so one switch operates only one light.
- Provide two-way switching for stairways, halls and rooms with more than one door.
- Push button time switches and sensor lights are ideal for stairways and garages.
- Use programmable timers, daylight sensors or movement sensors for outdoor and security lighting.



When purchasing major new appliances, look for the energy rating label – the more stars, the more efficient the appliance.

Major appliances that use water also have a water rating label.

Appliance labelling

When buying a new appliance choose the one that uses the least amount of energy while meeting your needs. This helps you save money!

- Choose appliances according to their star rating. Although the purchase price of an energy efficient appliance may be higher than one which uses energy less efficiently, you will save on running costs in the long term.
- Energy rating labels help you make the right choice when buying a major new appliance. In Queensland, energy rating labels must be attached to refrigerators, freezers, air conditioners, dishwashers, washing machines and dryers.
- The white stars on the energy rating label indicate how efficient the appliance is under set conditions. The more stars the lower the energy consumption and the more money you save. The number in the red box indicates how much energy the appliance is likely to use in a year. The tests used to measure energy efficiency for the rating label require the appliance to perform the job for which it is intended. If the appliance does not meet this standard, it cannot get a label or be sold.
- Be sure to compare the labels of machines in the same category (e.g. there are nine different categories of refrigerator).
- Many gas heaters and hot water systems are also labelled under a similar scheme run by the Australian Gas Association. The labels are similar to those for electrical appliances, but are red and blue instead of red and yellow.

For more information on energy ratings, visit www.energyrating.gov.au

All figures stated in this book are estimates and are based on average running times. To find out the specific cost of energy-related running costs in your home, use an energy calculator – many can be found on the internet – but we suggest you visit the ENERGEX Institute (www.energexinstitute.com) to help you to identify the best appliances for your home.

New building regulations to improve water and energy efficiency apply to all new home plans approved in Queensland from 1 March 2006.

For more information, contact your local council or email Building Codes Queensland at enquiries@dlgp.qld.gov.au

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