

# Low Carbon Living starts at home...

## About this guide

This simple guide looks at efficient water and energy use options throughout your home that will save you money as well as help reduce your impact on the environment.

No matter what style of housing you live in, there are many ways to save energy and water and reduce waste. You can make smarter choices for your home, even if you're renting. If you're building or renovating, there are even more options available to you.



## Contents

Topic	Page
Throughout the house .....	2
Building .....	4
Bathroom .....	6
Cleaning .....	7
Bedroom .....	7
Laundry .....	9
Study .....	10
Yard .....	11



**Low Carbon Diet**  
A Queensland Government initiative

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# Throughout the House

## Lighting

- Incandescent light bulbs use 95% of their energy generating heat, not light!
- Energy-efficient lighting will help you save on your power bill and help our environment. Compact fluorescent lights (CFLs) and fluorescent tubes are the most energy and cost-effective lighting for your home.
- CFLs last 6 to 15 times longer than incandescent light bulbs and use about one fifth of the energy.
- Get into the habit of turning off the light whenever you leave the room. This will reduce unnecessary usage.

**Did you know?** Replacing 5 incandescent lights with CFLs will reduce greenhouse gas emissions by about 450 kg/year, saving you around \$70/year in electricity. If every Queensland household did this, the greenhouse gas savings would be equivalent to taking about 145,000 cars off the road...

## Hot water systems

- ⚠ Every 15 L of hot water used from an electric water heater generates about 1 kg of greenhouse gas. Heating water represents about 27% of your home's CO<sub>2</sub> emissions and is the biggest single source of energy consumption in homes.

### Hot water alternatives:

- Solar hot water systems are a great investment – saving you money and adding value to your property.
- Direct-heat gas systems deliver hot water as it's required.
- Having the thermostat reset to 55°C on electric systems will save energy and money.
- Heat pump hot water systems are significantly more efficient than standard electrical systems.

### Efficient hot water use

- Showering in four minutes or less greatly reduces power consumption.
- In many cases, hot water tanks are oversized to avoid running out of water. Match your hot water system to the number of people in the house and the number of bathrooms and fixtures.



- Wrap hot water pipes with insulation. This practice means you run less water through the tap before it reaches the temperature you need.
- Turn your hot water system to "off" or "pilot" if you're going away for more than a weekend.
- Opt for a shower - baths generally use more hot water.
- Repair leaks in taps and shower heads and install low-flow fixtures like a sink aerator.

## Heating

The most effective way of keeping your house warm in winter is to stop as much heat as possible from escaping. To keep your house warm:

- Install insulation.
- Where possible, keep your windows closed overnight to stop heat escaping.
- Close your curtains or blinds at night. Thick curtains with pelmets are most effective at preventing heat escaping from your home.
- Double glaze your windows to stop heat from entering or leaving a room.

Other tips for heating:

- The most energy-efficient and cost-effective way of heating is simply to put on additional layers of clothing or bedding.
- If you are going to use an air conditioner select one with a high star rating. When heating, air conditioners should be set to 18 - 20 degrees. Close doors to areas that don't need to be heated and close curtains/blinds.
- Electric blankets can be used efficiently by turning them on only half an hour before going to sleep. Make sure the bed is well made to slow escaping heat.

## Cooling

To stop heat entering your home:

- Install insulation in your roof and walls.
- Close your windows and curtains during the day. Open them in the evening to let warm air escape.
- Choose light coloured curtains and blinds, interior paints and roof colours as they reflect heat.
- Plant trees on the western, northern and eastern sides of your house. Use deciduous trees on the northern side to allow winter sun in.
- Consider double glazing your windows.

Other tips for cooling your home:

- Pedestal and ceiling fans are an energy efficient way of cooling your house. Bear in mind that they cool you only by moving air over your skin, so switch them off if you leave the room.
- If you are going to use an airconditioner, select one with a high energy star rating. The optimum temperature for air conditioners used to cool a room is 24 - 28 degrees, and they work best when you close doors to areas that don't need to be cooled. Ensure the outside part of your airconditioner is well shaded and ventilated.

**Did you know?** A clogged airconditioning filter can use 5% more energy than a clean one. So clean it regularly!

## Standby power

- ⚠️ If every household in Queensland turned off their standby power, the savings would be enough to power all the homes in Ipswich.

Even if appliances are turned off, they can still be using power if they are turned on at the wall. Standby power uses unnecessary energy, which means more greenhouse gases and more money spent on your power bill. You can help save energy and money:

- Turn off at the wall those items that don't need power continuously.
- For multiple appliances (e.g. TV, Stereo, DVD player), move them to the one powerboard, and you can turn them all off with one switch.
- Whenever you leave the house or get ready for bed, remember to switch off all your standby power.

Just a couple of seconds of your time can save you money and reduce your impact on the environment!



# Building & Renovating

Being Climate Smart at home starts with design. Even existing dwellings can be modified and adapted to use fewer resources and cost less to run.

You can find handy tips on how to design a sustainable home on the Smart Housing website [http://www.build.qld.gov.au/smart\\_housing](http://www.build.qld.gov.au/smart_housing)

**Did you know?** Insulation is measured on an R-rating scale: i.e. how resistant to temperature change it is. The higher the R value the better. An R-rating of 2.5 can reduce your home energy bills by up to 50%.

## Insulation

Insulation is a permanent way to make your home more energy efficient.

### Getting the most out of insulation

- Insulation can be installed in roofs, wall cavities and under the floor. When renovating, take advantage of the opportunity to install insulation. If you have to choose where to insulate first, start with the roof.
- Use a combination of thin heat reflecting insulation and bulky heat transfer insulation.
- Consider whether it will interfere with wiring, and whether it will be exposed to water.
- Consider double glazing on windows, or direct coating systems that reflect substantial amounts of heat from the glass.

## Materials

- ⚠ Buildings consume 32 percent of the world's resources, including 12 percent of its fresh water and 40 percent of its energy.

You can choose “greener” renovation or building materials by:

- Selecting sustainable construction materials based on reused and recycled content, zero or low off-gassing of harmful air emissions, zero or low toxicity, sustainably harvested materials, high recyclability, durability, longevity, and local production.
- Using materials that reduce energy costs both during construction and in service.
- Using recycled construction and demolition materials, for example using demolition materials as a base for foundations.

## Regulations

Since 1 March, 2006 changes to building codes require new houses in Queensland to be more water and energy efficient. As part of these laws, all new houses must have:

- Water efficient 3-star-rated shower roses
- Dual-flush toilets
- Energy efficient lighting in at least 40 per cent of the house
- Greenhouse efficient hot water systems such as solar, heat pump or gas hot water

## Orientation

**In hot climates** aim to exclude the sun and maximise exposure to cooling breezes by:

- Facing the long axis of a house east-west, to minimise wall areas receiving hot morning and afternoon sun.
- Placing large windows only on the northern sides. Windows to the south will cause heat loss in winter. Windows on the eastern and western sides will cause overheating in summer.
- Having eaves set at an angle on the north side that shades windows in summer when the sun is at a high angle, but allows sunlight in during winter when the sun is lower in the sky.
- Orientating the building and windows for ventilation by cooling breezes.
- Utilising effective shading: plant trees to shade the house; use blinds or screens on verandas to block sunlight but allow ventilation; use heavy curtains or blinds to reduce heat transfer through windows.
- Choosing high thermal mass construction materials in regions with large day and night temperature ranges (and low thermal mass construction in regions with small temperature ranges).
- Using light-coloured roof and wall finishes to reflect more solar radiation and reduce heat gain.

**Sites running north-south** are ideal because they receive good access to winter (northern) sun with minimum overshadowing by neighbouring houses. In summer, neighbouring houses provide protection from east and west sun.

North-south sites on the north side of the street allow north facing living areas and gardens to be located at the rear of the house for privacy. Sites on the south side of the street should be wide enough to accommodate an entry at the front as well as private north-facing living areas. Set the house back far enough to accommodate a north-facing garden or trees that won't interfere with winter sun.

**Did you know?** A good decision about where a house is placed on a block of land can save its occupants thousands of dollars over the lifetime of the dwelling

**Orientation of Rooms** (when building a new home): it makes sense and saves heating/cooling money to site 'living' or day rooms to the north and 'night' rooms to the south. Putting the garage against the west wall provides a buffer from heat.

# Bathroom

We use more water in the bathroom than anywhere else in the house.

Tips for more climate smart bathrooms include:

- Fix dripping taps – it's easy!
- Use a sink plug instead of running the water.
- Install tap nozzle aerators and flow restrictors.
- Make your own simple bathroom cleaners that send fewer chemicals down the drain.
- Open a window to cool the bathroom rather than using an exhaust fan.
- Only switch on heat-emitting bulbs when standing directly beneath them as they don't warm a whole room effectively.
- Never use heaters and the extractor fan at the same time.
- Seal gaps under doors and around windows with rubber or foam strips to minimise heat loss in winter.


**Did you know?** A leaking tap dripping at one drip per second will waste 10,000 litres of water a year. Fixing the leaking tap washer will take just minutes.

## Showers

Long showers consume huge amounts of expensive hot water. You really can do everything in four minutes! Use a shower timer to remind you, or try showering for the time it takes to sing your favourite song.

**Did you know?** Normal shower heads use 13 – 20L of water per minute. Replacing your old shower head with a 3-star rated model will reduce water consumption to less than 9L per minute.

## Toilets

 Many of us flush around 40,000 to 50,000 litres of drinking water down our toilets each year. That's more than enough to fill a large backyard pool.

- Install a dual-flush toilet or simply put a house brick into the toilet cistern.
- Set up a greywater or tank water system to flush the toilet.
- Fix leaking toilet cisterns, which can waste more than 60,000 litres a year.
- Use toilet paper made from recycled paper.

### Check for Leaks

Before you go to bed, make sure all your taps are turned off then check the reading on your water meter. When you get up in the morning, check the meter again. If the numbers have increased, you probably have a leaking pipe, dripping tap or faulty toilet. Locate and have the problem fixed.

# Cleaning

⚠ You can make effective cleaners for just a few cents, using ingredients you probably already have around the home.

## Bathtub, sink and tile cleaner

Mix 1.5 cups bicarbonate of soda and half a cup of pure soap powder in a spray bottle. Add half cup of water and 2 tablespoons of white vinegar; stir until all ingredients are dissolved. Shake well before use.

## Toilet cleaner

Mix half cup bicarbonate of soda and 1 cup white vinegar in a spray bottle. Spray onto the porcelain, leave for a few minutes then scrub off.

## Spray deodoriser

Fill up a spray bottle with 1/2 water and 1/2 vinegar, add a few drops of your favourite essential oil and shake well before use.

## Floor cleaner

Mix 1 cup white vinegar and 5 litres of hot water in a 10-litre bucket. Add a few drops of essential oil. Mop floor.

**Did you know?** Only about a quarter of the electricity used by a vacuum cleaner sucks up dust. The rest becomes heat and noise. A common misconception is that higher wattage equals a more powerful vacuum cleaner, but it only means it uses more

## Other natural cleaning ideas

- Drains can be kept clean using a mix of bicarbonate of soda and salt.
- A wad of newspaper dipped in a little eucalyptus oil will clean the bathroom mirror without leaving streaks, and will keep it fog-free.

# Bedroom

We spend around a third of our lives in the bedroom. While bedroom comfort is important, there are ways to save energy.

- Keep windows closed and curtains/blinds shut during the hottest part of the day to help keep your bedroom cool in summer.
- Put on an extra blanket instead of turning on the heater or air-conditioner in winter.
- Ditch the electric blanket. Use a hot water bottle to pre-warm your bed instead. You can save the cooled water to use in your garden the next day!
- Replace incandescent light bulbs with compact fluorescent lights.
- Plant deciduous plants outside your bedroom windows to shade them in summer yet allow sunshine through in winter.
- Install a ceiling fan – they use less energy than air-conditioners and aid natural air flow.



# Kitchen

The kitchen is one of the most visited areas in a home so it should especially have energy efficient lighting and be well ventilated to avoid overheating in summer.

## Saving water in the kitchen

- Don't run the tap when cleaning vegetables – just rinse them in a plugged sink or bowl of water.
- Keep a bottle of drinking water in the refrigerator rather than running the tap until it is cool.
- Use garbage disposal units (insinkerators) sparingly as they use up to 6 litres of water a day. Compost food scraps instead.
- When handwashing dishes, don't rinse them under running water. If you have two sinks, use one for rinsing. If you only have one sink, stack your washed dishes in a dish rack and rinse them with a bowl of water.

## Dishwashers

Every time you run your dishwasher you use enough electricity to release nearly 1 kg of CO<sub>2</sub>. If you use it just once less a week, that's a saving of around 52 kg! Here are some tips for using dishwashers:

- Use only when it's full. If you only have a few dishes, wash them by hand.
- Wash large items by hand. This will leave more room in the dishwasher for other items.
- If you have to rinse, use cold water and use a plug in the sink.
- Clean the filter of your dishwasher regularly to keep it working at maximum capacity.
- Use the most economical program with the lowest temperature or shortest running time.
- Eliminate power drying (most machines have this setting). Open the door after the final rinse cycle is completed to assist with air drying while the load is still hot.

## Refrigeration

Tips for using refrigerators:

- Place your fridge away from direct sunlight or other heat sources.
- Allow at least 5cm space above and behind your fridge. Restricting ventilation can add about 15% to your energy bill. Never put your fridge in an unventilated cupboard!
- Allow hot food to cool before putting it in the fridge.
- Ensure door seals are clean and in good condition.
- Top or bottom freezers are generally more efficient than side by side models.
- Run one large refrigerator rather than two small ones.

**Did you know?** The refrigerator is one of the largest users of energy in the home. Roughly a third of Australian homes have two of them. Turning off your second fridge and only using it when it is really needed can cut your yearly electricity bill by up to \$100.

# Cooking

## Saving energy when cooking

- Microwaves use less power and cook faster than electric stoves and ovens. Gas or induction stovetops are also more efficient.
- Putting lids on pots to boil water or using a pressure cooker can halve energy use.
- Only ever boil as much water as you need using an electric kettle or gas stove top.
- Use pots and pans that match the size of the element or gas flame.
- Thaw food before cooking.
- Avoid opening the oven door unnecessarily and consider cooking several things at once.
- Cooking in bulk, freezing the food, then reheating in a microwave oven uses less energy and saves time.

**Did you know?** Every cup of water you boil represents about 25 cups of CO<sub>2</sub> released. So, only boil the amount of water you need.

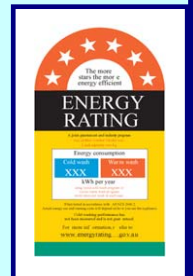
## Star ratings

The energy used by major appliances will impact significantly on your electricity bill for years to come, so consider energy efficiency before you buy. The Energy Rating label for electrical and gas appliances shows the appliance efficiency and how much energy or gas it uses each year (or each hour, in the case of air conditioners).

### Water Rating Labels

Choosing a 3-star item over a 2-star item will save:

- Washing machine: 40 litres per load.
- Dishwashers: 15% water.
- Showerheads: 3-7 litres per minute.
- Toilet: 3 litres per flush
- Tap: 3 litres per minute



# Laundry

Tips for reducing water and energy use in your laundry:

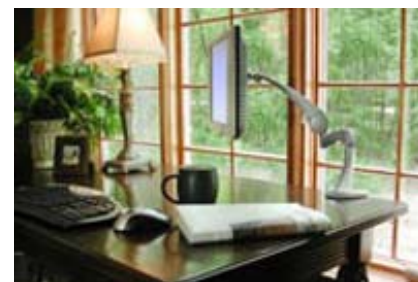
- Wash in cold water using cold-water detergents. It can save 90 percent of your energy consumption! Warm water is only needed for a few items, like killing dust mites in bedding or removing grease stains.
- Only wash full loads. If you must wash a small load, use the appropriate water-level setting.
- Front loader machines are better for the environment as they use less water, less energy and less detergent.
- Use the sun where possible to dry clothes. Clothes dryers are most efficient at drying full loads since they use the same amount of energy for small or large loads.
- Separate your wet clothes into heavy items and light items. Drying your light items takes less time, and you can use the existing heat in the drying drum to help dry your heavier items.
- Clean the lint filter in the dryer after every load to improve air circulation.
- Gas clothes dryers, although more expensive to buy and install, are cheaper to run, dry faster and have lower greenhouse gas emissions.
- Consider using phosphate-free and biodegradable detergents, especially if you are using your rinse water as greywater.

**Did you know?** Using an electric clothes dryer can cost about \$100 a year in energy bills and creates nearly half a tonne of greenhouse gas. Sun drying costs nothing...

# Study / Office

Every tonne of paper recycled saves 13 trees. But there are other ways to save energy in your home office or study:

- Make the most of natural lighting – arrange furniture so your work area is well lit and paint internal walls a light colour.
- Turn off lights when you leave the room
- Use a desk lamp instead of lighting the whole room.
- Switch off your computer monitor when not in use for longer than 10 minutes. A monitor in standby mode uses more energy than a computer processor.
- Recycle any waste paper and reuse paper for draft printing or making notepads. Also use paper with recycled content.
- Refill printer cartridges rather than replacing them.



## Recycling in the office

Find your closest recycling collection agent at [www.recyclingnearyou.com.au](http://www.recyclingnearyou.com.au).

### Battery recycling

Rechargeable batteries can be used up to 1000 times, making them a cheaper alternative to single-use batteries, and better for the environment. In general, only batteries that can be recharged are suitable for recycling. This includes your car batteries. Service stations will accept car batteries as a trade-in, or you can take the old battery to a metal or battery recycler.

### Mobile phones

Over 90 percent of the plastics and metals used in mobile phones, batteries and accessories can be recycled to create new products. Organisations such as the Cerebral Palsy League of Queensland recycle or reuse functional handsets by donating to third world countries.

### Printer cartridges

Throughout Australia more than 18 million print cartridges are thrown out every year, amounting to more than 5000 tonnes of waste. Empty print cartridges can be either refilled or recycled. There are specially marked boxes in any Australia Post, Harvey Norman, Officeworks, Dick Smith Electronics or Tandy for recycling.

### Computers/Printers

Manufacturing one desktop computer and monitor uses the same amount of chemicals (22kg), water (1500kg) and fossil fuels (240kg) as a mid-size car. You could consider upgrading your existing computer rather than buying a new one, look after your existing computer a little better, or re-use the machine by donating it to friends, family or a charity. Planet Ark has a comprehensive list of approved businesses for recycling.

# Yard

Traditional gardens require a lot of time, money and energy to maintain, have high water needs, need frequent application of water, fertilizers and pesticides, and generate waste. Doesn't that seem crazy?!

## Landscaping

- Protect existing natural areas, such as woodlands and wetlands, and stream corridors.
- Plant water-thrifty plants, particularly native varieties. Native plants also improve the ecosystem by providing food and shelter for native animals. A list of water wise plants can be found at <http://http://www.nrw.qld.gov.au/water/waterwise/pdf/plants.pdf>
- Raise the cutting level of your lawnmower to between five and eight centimetres causes less stress on the grass and encourages deep root growth.
- Use lawn clippings as mulch around plants. This will retain moisture and require less watering.
- Water at night when plants absorb water best and there is less evaporation.
- Position plants to block or filter summer sun but permit winter sun through to living areas.
- Grow vines on walls or trellises to reduce absorption of heat from the sun.
- Consider creating a permaculture food garden. This will support your family with fruit and vegetables year round as well as supporting a vast array of natural flora and fauna. This type of garden is low maintenance once established and creates a natural ecosystem that removes the need to use pesticides or artificial fertilisers. Your local library will have books on how to get started.

**Did you know?** Smart landscaping your yard could change the microclimate around your home by 1-2°C, saving up to 30 percent of your heating bills, and reducing air conditioning costs by 50 percent.



## Composting & Mulching

**Composting** reduces the amount of rubbish we throw away and provides a chemical-free fertilizer for gardens. It not only returns nutrients to the soil that would otherwise be lost, but also improves soil structure and increases the water holding capacity of the soil.

**Mulching** prevents moisture loss, reduces soil temperature, returns nutrients to the soil and inhibits weeds. It can be any garden waste – lawn and plant clippings, leaves and shredded bark – or purchased materials like sugar cane, hay straw and wood chips. When applying mulch:

- It should be applied so that it is about 10 centimetres deep and topped up to maintain thickness.
- If installing drip irrigation, put it under the mulch.
- Mulch can be applied at any time, but is best applied in mid-spring or early summer.
- Don't pile mulch up against the stems of plants as this can lead to stem rot.

**Did you know?** Almost half of our domestic rubbish consists of kitchen and garden waste. If every Queenslanders composted, we'd save nearly 1,000,000 tonnes of landfill waste each year

## Rainwater tanks

- The cost of a tank can be reduced through rebates available from the Queensland Government and your local council. Visit [http://www.nrw.qld.gov.au/water/saverscheme/rebate\\_schemes.html](http://www.nrw.qld.gov.au/water/saverscheme/rebate_schemes.html) for more information and also ask your local council if any regulations apply.
- Tank size will depend on local rainfall patterns, roof catchment area and number of people in your house. As a general rule, a 3000-litre tank is recommended for external uses, and a minimum of 5000 litres for toilet flushing and laundry.
- All tanks in Queensland must be installed by a licensed plumber.



## Fertiliser and Pesticide

Householders use 20 times more pesticides and fertilizers than farmers. Pesticides and fertilisers used in urban areas can be washed into stormwater drains which can end up polluting natural areas and contaminating our food and water. Artificial fertilisers and manufactured pesticides disrupt the natural ecosystem. Provide your own fertiliser by growing green manures and creating compost. And avoid growing rows or blocks of the same vegetable. The following tips will also help:

- Do not over-use products. Follow the manufacturer's instructions regarding amount and frequency of application.
- Look for organic alternatives.
- Plant waterwise Australian plants as they are more resistant to pests and disease.
- Visit a car wash that recycles detergent and water. If this is not an option wash your car on the lawn rather than washing it on a hard surface like your driveway or the road.

## Pool

A backyard pool in a Brisbane suburb can lose up to 350 litres a day — 51,000 litres between October and March — just through evaporation. A backyard pool remains a luxury item and inevitably compromises any household's attempts to reduce its ecological footprint. But with careful selection of pool equipment, supplementary water supplies and regular maintenance, a pool need not be an endless drain on resources.

- Cartridge filters can save about 15,000 litres of water a year over sand filters, which need to be backwashed.
- Thermal covers reduce evaporation and keep your pool warm in winter.
- Use a rain water tank to top up the pool instead of using mains water.
- Shade structures over the pool reduce leaf and dirt contamination, slow evaporation rates, and give sun protection for swimmers.
- Careful pool chemical monitoring and regular filter cleaning can maintain healthy water and reduce the need to frequently replace the water.
- In winter, with cool conditions and pool covers, pool pumps can be effective if run for as little as 4 hours a day.



**Did you know?** Using a swimming pool cover can reduce evaporation by up to 75 percent