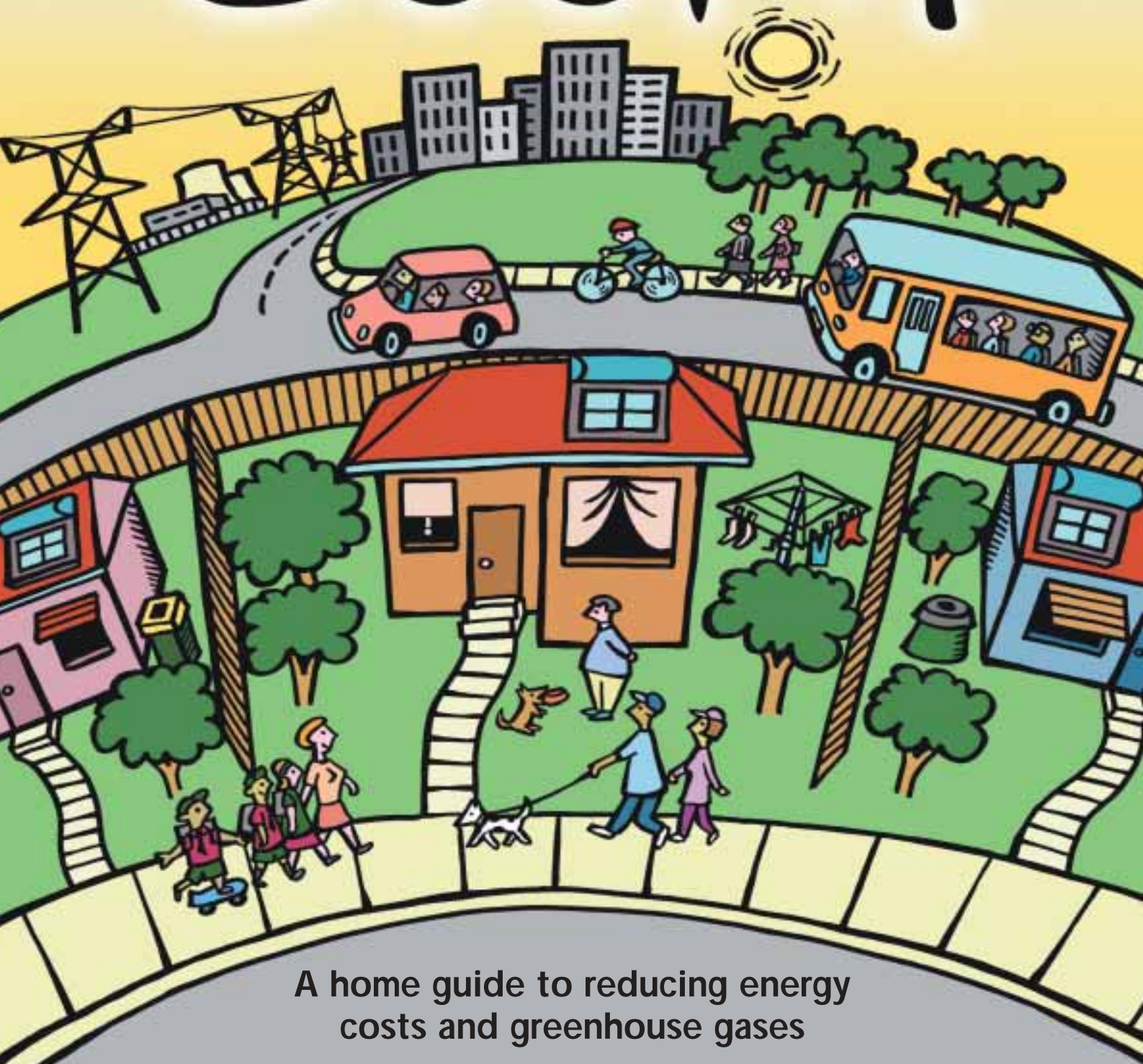




Australian Government  
Department of the Environment and Heritage  
Australian Greenhouse Office

# Global Warming Cool it



A home guide to reducing energy  
costs and greenhouse gases

# From the Minister



Reducing the amount of greenhouse gas emissions is an extremely important part of limiting climate change.

Each year, Australians emit more than 550 million tonnes of greenhouse gases. Through everyday activities such as transport, household energy use and decay of household waste in landfills, Australian households generate about a fifth of Australia's total emissions. This equals about 14 tonnes per household each year.

An effective response to the climate change challenge requires action by everyone—governments, businesses and the community.

By doing things smarter and more efficiently within our own homes we can all help to reduce Australia's greenhouse gas emissions and save money at the same time. This booklet provides information to help every Australian understand how they contribute to climate change, and how they can play an important part in reducing greenhouse gas emissions. At the end of this booklet is a list of sources of more detailed information on all the topics covered.

For its part, the Australian Government has invested more than \$2 billion to address climate change. It is working globally to achieve an effective international response that involves all major emitters, it is working domestically to reduce Australia's greenhouse gas emissions, and it is investing in research to improve our understanding of climate change and its effects.

Everyone—State Governments, Local Governments, the Australian Government, industries, communities and individuals—has a role to play in reducing climate change. There are things we can all do to make a difference.

As you read this booklet, I encourage you to consider the ways you can reduce greenhouse gas emissions in your own home to help save money and the environment. Many of the hints and tips in this booklet are simple things that are practical, cost-effective and easy to do.



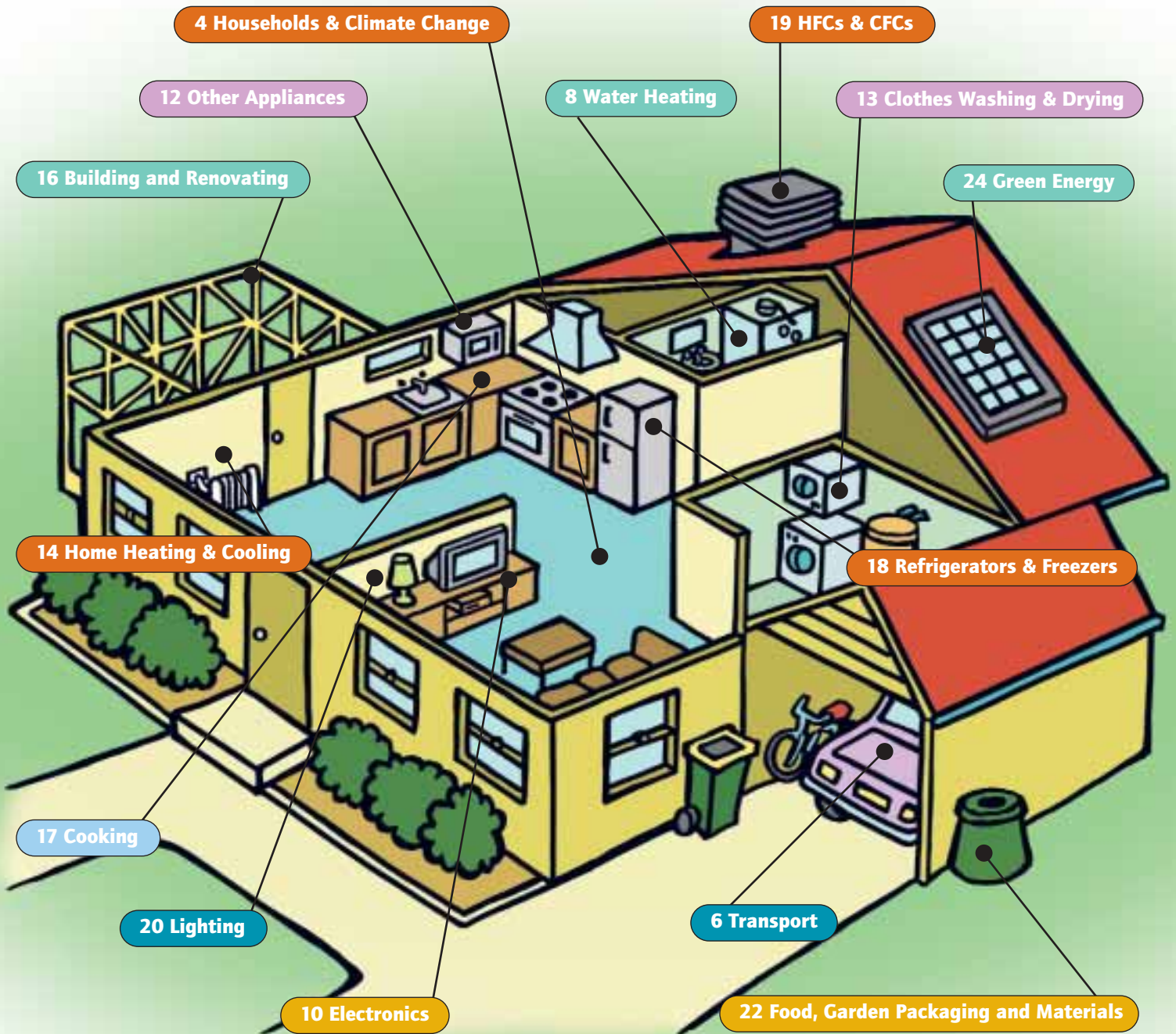
Australian Government

Department of the Environment and Heritage  
Australian Greenhouse Office

A handwritten signature in black ink, which appears to read 'Ian Campbell'.

Senator the Hon. Ian Campbell  
Australian Minister for the Environment and Heritage

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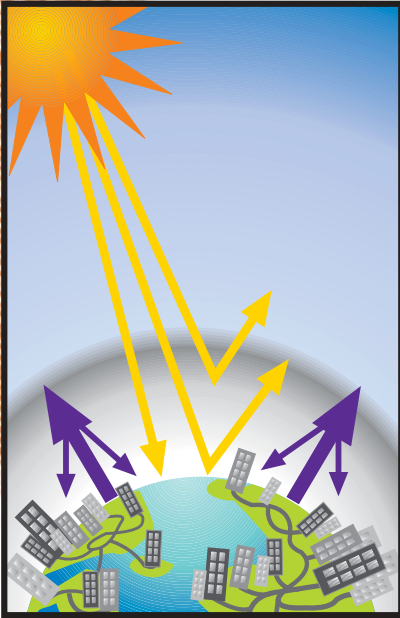
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# Households & Climate Change



## What causes climate change?

Climate change is caused by an increase in the greenhouse gases in the Earth's atmosphere. These gases absorb heat leaving the earth and return some of it, making the earth warmer overall.

Before the industrial revolution, carbon dioxide levels in the atmosphere were consistently between 260 and 280 parts per million (ppm). In recent times human activities have increased the concentration to 380 ppm—that's an increase of more than a third!

## What activities produce greenhouse gases?

- ▶ burning fossil fuels—coal, oil or gas
- ▶ using electricity generated by burning fossil fuels
- ▶ some aspects of farming: raising cattle and sheep, use of fertilisers and some crops
- ▶ clearing land
- ▶ breakdown of food and plant wastes and sewage
- ▶ some industrial processes like making cement and aluminium.

The main greenhouse gases generated by human activity are carbon dioxide, methane and nitrous oxide, as well as some manufactured gases such as chlorofluorocarbons (CFCs) and some of their replacements.

Water vapour is also a powerful greenhouse gas, but the amount in the atmosphere is not directly linked to human activity.

## What are the effects of climate change?

Research by the world's scientists, including the Intergovernmental Panel on Climate Change, suggests that:

- ▶ On average, the Earth is warming. Its temperature has already risen by around 0.7°C over the past hundred years, and may rise by between 1.4 and 5.8°C this century.
- ▶ Sea levels are rising as oceans expand and glaciers and ice sheets melt—by 2100 sea levels may be from 9 to 88 centimetres higher.
- ▶ Changes in weather patterns, such as more severe droughts, heat waves, floods and storms; changes in rainfall patterns; and higher likelihood of bushfires.
- ▶ Adverse impacts on plants, animals and human health as climate patterns shift.

Australia is very vulnerable to the impacts of climate change.

Globally, the 10 warmest years on record have all occurred since 1990. And 2005 was Australia's warmest year on record, 1.1°C above the average for the period 1961 to 1990.

## fact



Each year, the average Australian household generates about 14 tonnes of greenhouse gas.

## Climate change and the ozone hole—they're different problems!

The ozone hole is caused by chemicals combining with the ozone in our atmosphere, leaving less ozone to block out harmful types of radiation from the sun.

Some gases, such as CFCs, eat up the ozone layer and also add to climate change, but most of the greenhouse gases that cause climate change do not affect the ozone layer.



"As you'll see in this booklet, making greenhouse-friendly choices about day-to-day activities and purchases can cut greenhouse gases."

## Save money and reduce climate change

When you cut your greenhouse gas emissions **by saving energy, you'll also save money** on energy bills.

Each tonne of greenhouse gas avoided will save between \$130 and \$470 depending on the type of energy used (exact savings will depend on the price you pay for each type of energy).

More money can be saved by cutting consumption of other products and services, the manufacture of which generates greenhouse gases, such as water, paper, metals, glass and plastics.

An average household can save several tonnes of greenhouse gas and hundreds of dollars each year.

## But I'm just one person, how can my decisions affect the environment?

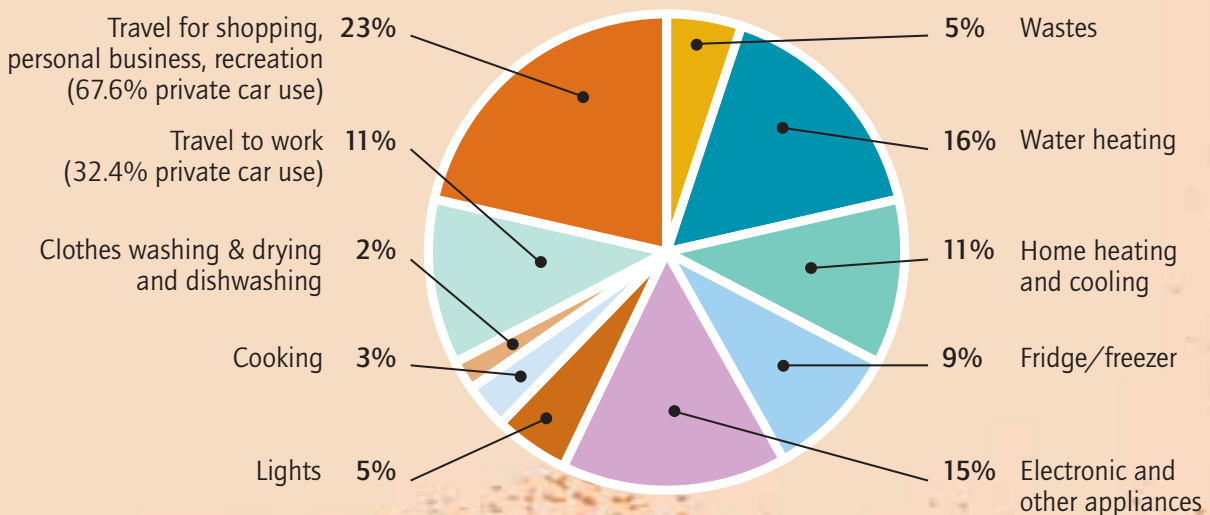
Some decisions have long-lasting effects. When buying a home, car or major appliance, that one decision will influence greenhouse gas emissions for many years. For example, buying a car that uses 2 litres per hundred kilometres less fuel will save around 14 tonnes of greenhouse gas over its life.

**tip**



The most efficient new family fridge will save more than 2 tonnes of greenhouse gas over its life compared with the least efficient new model of similar size.

## Household Greenhouse Gas Emissions



# Transport

## fact



An average Australian household generates close to 6 tonnes of greenhouse gas and spends around \$8,000 each year on transport, of which \$2,500 is for fuel. Some households spend more than \$13,000 each year on transport.

## tip



Every litre of petrol saved cuts greenhouse gas emissions by 2.8 kilograms and saves you at least \$1 plus vehicle wear-and-tear.

## How can I save?

### Travel less

- ▶ Travelling takes time, costs money, involves risks and, if using motorised transport, generates greenhouse gas. Each kilometre of car travel avoided saves up to half a kilogram of greenhouse gas and 20 cents in operating costs. If you can do without that second car, you'll also save thousands of dollars each year on car registration, insurance, loans and depreciation.
- ▶ Plan trips so you combine doing several things on each trip: save time and fuel. Short car trips with a cold engine use more fuel and cause more wear-and-tear.
- ▶ **Make a call!** Replace that drive with a phone call, email, text message or fax.
- ▶ Working from home for some or all of the time can cut transport and parking costs—and save time.

### Make the switch to smart travel

Instead of driving, **ride a bike, use public transport or walk**—get fit, reduce driving stress and save money. Public transport timetables are available on the internet, by phone call, and even by text message in some areas.

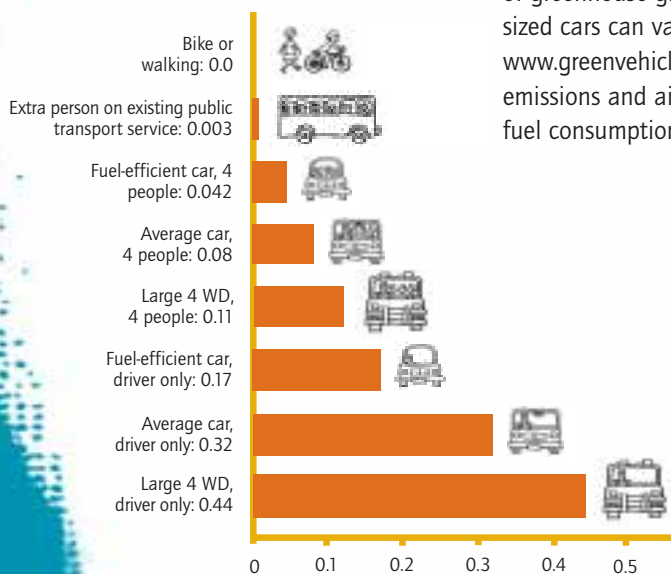
In some cities, car pooling and car sharing programmes now operate. Car sharing is for those who only need a car (or a second car) occasionally. You avoid paying registration, insurance, loan interest and other fixed ownership costs. Instead you pay for the time you use the car.

### Choose a less polluting car

**Buy a fuel-efficient car:** it may be cheaper to buy and can save up to 20 tonnes of greenhouse gas and \$10,000 in fuel over its life. Fuel consumption of similar-sized cars can vary by up to 30% depending on brand and features. Check out [www.greenvehicleguide.gov.au](http://www.greenvehicleguide.gov.au) for comparative information on greenhouse gas emissions and air pollution performance of new cars. This website can also provide fuel consumption information on second-hand cars.

### Greenhouse gas emissions from different forms of transport

(Kilograms of greenhouse gas per person per kilometre)





TravelSmart can advise on how to set up a 'walking school bus' so children can walk to school safely and happily. TravelSmart also provides information for local government and workplaces on how to help people to use public transport and other sustainable travel options: [www.travelsmart.gov.au](http://www.travelsmart.gov.au).

## Use cars efficiently

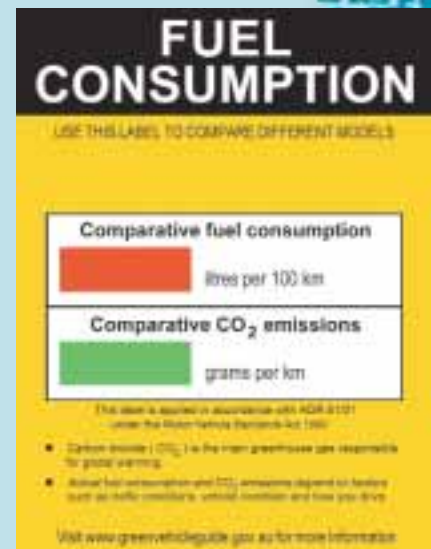
- ▶ Drive smoothly and avoid stop-start traffic: save up to 30% of greenhouse gas emissions and fuel cost.
- ▶ Ensure tyres are pumped up to maximum recommended pressure so they roll more easily: save up to 100 kilograms of greenhouse gas each year, extend tyre life and improve safety.
- ▶ Remove unnecessary weight for your car: 50 kilograms less weight cuts greenhouse gas emissions by almost 2%.
- ▶ Remove unused roof racks, external sun visors and other features that create more air drag.
- ▶ Use of road transport by households generates 42 million tonnes of greenhouse gas each year, of which more than 14 million tonnes is used travelling to and from work.

## Switch fuels

- ▶ Diesel can cut greenhouse gas emissions by up to 20% relative to petrol.
- ▶ A variety of renewable fuel blends and fuels with greenhouse benefits are becoming available.

## Car airconditioners

- ▶ Have the car airconditioner checked from time to time as leakage of refrigerant from car airconditioners also adds to climate change: see CFCs and HFCs section for information.
- ▶ Airconditioning can increase fuel consumption and greenhouse gas emissions so use it appropriately.



All new passenger cars, off-road vehicles and light commercial vehicles sold in Australia must display fuel consumption labels. Use the label to select a fuel efficient model. And check [www.greenvehicleguide.gov.au](http://www.greenvehicleguide.gov.au) to compare options before going to a showroom.

# Water Heating

## tip



An average house using electricity for water heating generates about 4 tonnes of greenhouse gas each year. Using gas generates about 1.5 tonnes.

## Which appliance and fuel?

- ▶ Buying an energy-efficient water heater that uses a low greenhouse impact fuel is a great start to saving greenhouse gases.
- ▶ Gas water heaters carry energy labels to help you choose an efficient model. Avoid units with continuous pilot lights and save \$40 and 200 kilograms of greenhouse gas each year.
- ▶ When selecting a hot water system, ensure its size suits your needs—larger tanks lose more heat but supply more hot water.
- ▶ If you have a solar hot water service, switch off the booster in the sunny months.
- ▶ Electric hot water service units made since 1999 lose 30% less heat because of Minimum Energy Performance Standards.

## Use less hot water

Showers are the biggest user of hot water in most homes. Install a 3 star rated water-efficient showerhead and save more than half a tonne of greenhouse gas each year if you have an electric hot water service. They will also save many dollars in hot water bills and pay for themselves very quickly.

**Take shorter showers:** you'll save up to half a kilogram of greenhouse gas for every minute.

**Avoid using small amounts of hot water** if cold water will do. Each time you turn on the hot water tap, a litre or more of cold water that had been heated but has cooled in the pipes runs down the sink before hot water is delivered. Doing this just 10 times a day will generate about 200 kilograms of greenhouse gas each year if you have electric hot water.

**Avoid rinsing dishes under running hot water:** it uses far more hot water than putting the plug in and using some water in the sink—and often the job can be done by scraping or rinsing with cold water.

If you're going away for more than a few days, **switch off your hot water systems** and save 1.4 kilograms per day you are away.

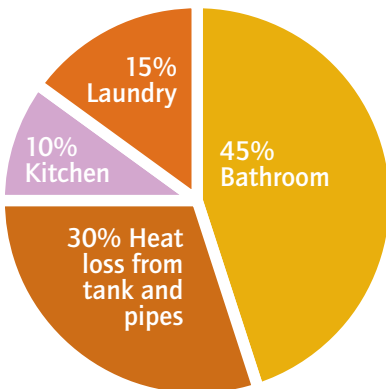
## Capture heat before it is lost

Reduce heat losses from an electric storage heater by wrapping the tank with extra insulation: save up to half a tonne of greenhouse gas each year. An insulated outdoor unit will need to be protected from the weather.

**Fix dripping hot taps:** save up to 100 kilograms of greenhouse gas each year for each tap.

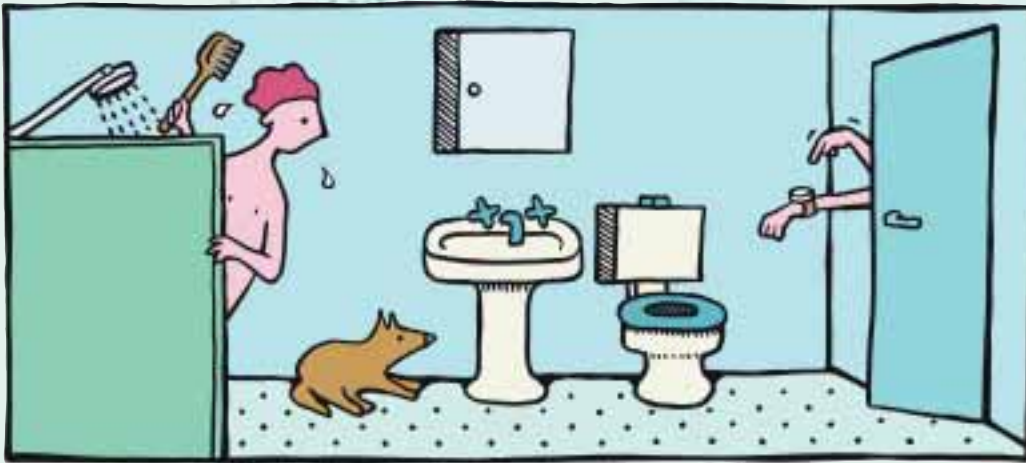
If the overflow pipe from a hot water service dumps more than a bucket of water each day, call a plumber and save hundreds of kilograms of greenhouse gas each year.

Greenhouse gas emissions from an electric HWS (based on 140 litres usage per day)



Fix dripping hot taps: save up to 100 kilograms of greenhouse gas each year for each tap.





When using a mixer tap for cold water, **position the lever as far right as possible**. Otherwise you will be wasting hot water, as most mixer taps begin blending hot water with cold as soon as they are moved from the 'hard right' position.

If you have gas hot water, you save about one third of the amounts of greenhouse gas quoted above, which apply to electric hot water. Solar water heating can generate even lower greenhouse gas emissions.

### Design for water and energy efficiency

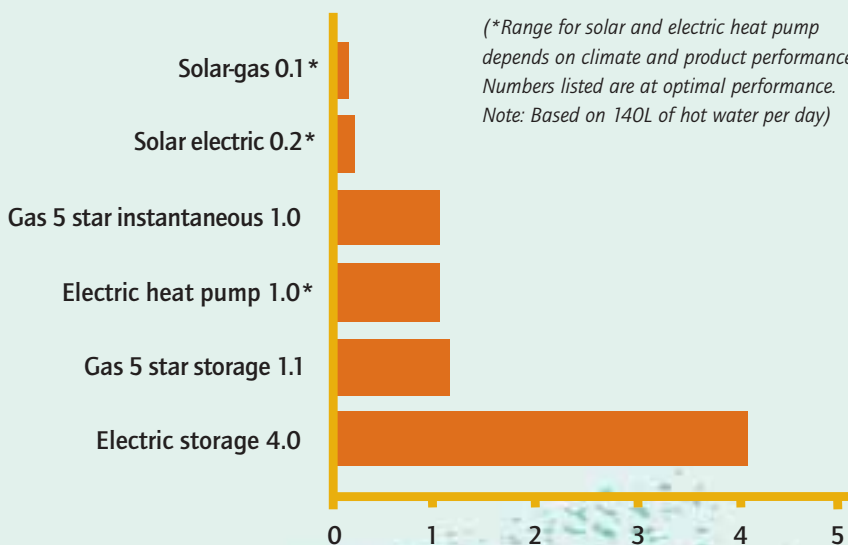
When installing a hot water service, position it so that pipes to outlets used a lot are as short as possible. This will minimise water, energy and time. Long pipes can waste thousands of litres of water and half a tonne of greenhouse gas each year.

Avoid installing a continuously circulating hot water pipe loop. They waste large amounts of heat and cost a lot to run. If long pipes can't be avoided, investigate the use of 'on-demand' pumps.

**Ensure exposed hot water pipes are well insulated**, with insulation at least 10 millimetres thick.

### Which hot water service will you buy?

(tonnes of greenhouse gas per year)



### fact

Every 15 litres of hot water used from an electric water heater generates about one kilogram of greenhouse gas.

### tip

Avoid 5 minutes of hot water rinsing every day and save half a tonne of greenhouse gas each year.

Water efficient taps can also save hot water and greenhouse gas: save up to a kilogram of greenhouse gas for every five minutes of tap use.

# Electronics

## fact

Typical home sound systems, used 6 hours a day, can generate more than a 100 kilograms of greenhouse gas each year.

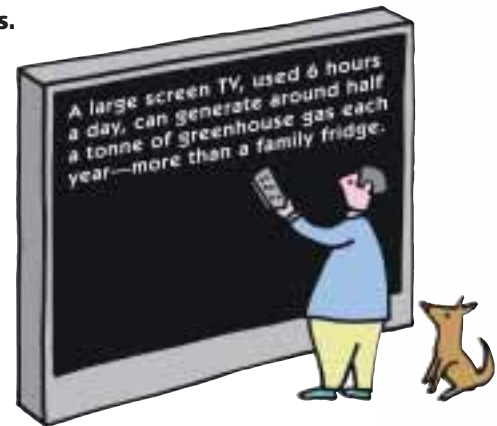
## Home entertainment

A large screen TV, used 6 hours a day, can generate around half a tonne of greenhouse gas each year—more than a family fridge.

So enjoy your big screen TV, just **turn it off if you aren't watching it!**

The most efficient conventional TVs around 76 centimetres generate a third as much greenhouse gas as big screen plasma and LCD TVs: **check the specification plate for the lowest watts.**

Most home entertainment equipment uses some electricity when it is switched off, as well as when it's operating! See Standby Power section.



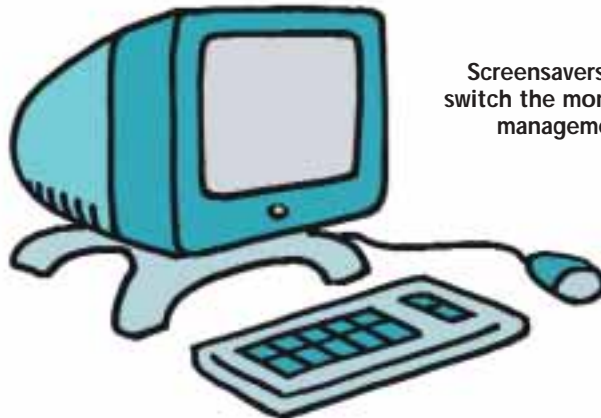
DVDs, VCRs, TVs, packaged sound systems, computers and monitors, scanners, printers and fax machines may carry an Energy Star label. This shows the product has much lower standby energy consumption than standard products. Look up [www.energystar.gov.au](http://www.energystar.gov.au) for more information.

## Computers and laptops

A laptop computer used 5 hours each day generates around 40 kilograms of greenhouse gas each year. Desktop computers used the same way can generate between 200 and 500 kilograms. More than half of this is from using the monitor.

An LCD panel monitor generates around half as much greenhouse gas as a conventional monitor. And **adjusting its brightness lower** can cut emissions to a quarter.

**Switch computers and equipment off when they're not in use.** This cuts greenhouse gases, extends product life and avoids a potential fire hazard.



**Screensavers don't save energy: switch the monitor off or use power management to control it.**



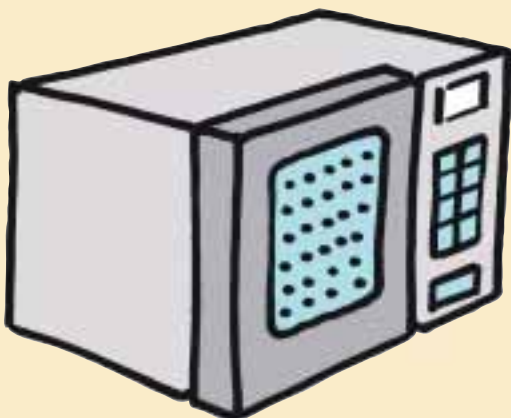
# Standby Power

## Standby for more savings

Many appliances now use electricity even when they're doing little or nothing.

**When appliances are switched off at the powerpoint, they use NO energy.**

When appliances are switched off at the appliance, but left on at the wall, they may use some energy called 'standby' power. Typically this is between 1 and 20 watts, with most appliances using less than 5 watts—that's around 45 kilograms of greenhouse gas each year for each item.



Over the whole year, some microwave ovens generate more greenhouse gas running the digital clock than cooking food.

An average Australian home has many items of equipment on standby power, together generating over 750 kilograms of greenhouse gas each year.

**Switch appliances off at the powerpoint** (or use a powerboard with switches) to avoid this waste. You will lose the digital clock on that appliance, but do you really need every one of them?

When some appliances, such as VCRs, DVDs, CD players are left on after use, they remain in 'active standby' mode, often using more than twice as much energy as they do when switched off at the appliance and in normal 'standby' mode.

**Switch them off at the appliance to save some energy, switch them off at the powerpoint to save even more!**

The Australian Government is working with industry and other governments to reduce standby power wastage.

# Other Appliances

Energy used by many other appliances around the home can generate large amounts of greenhouse gas each year.

## Dishwashers

Dishwashers generate up to 500 kilograms of greenhouse gas each year. They carry energy labels to help you **choose energy efficient models**.

To save on greenhouse gas:

- ▶ Only run your dishwasher when it's fully loaded.
- ▶ Use the shortest programme sufficient to clean the dishes.
- ▶ Clean the filter regularly to maintain washing performance.

Water-efficient dishwashers are usually also energy-efficient, as heating water is a major part of their energy use. Look for models with 4-star ratings. Visit [www.waterrating.gov.au](http://www.waterrating.gov.au) for details.

**Rinsing dishes under running hot water before putting in dishwasher can use more hot water than the dishwasher itself!**

## Other equipment

An electric towel rail used continuously over winter generates about half a tonne of greenhouse gas. Do you really need one? If so, fit a timer switch so it runs only when needed.

A water bed heater generates over 1 tonne of greenhouse gas each year. Fit a timer switch and make the bed each morning—the blankets insulate!

## Swimming pool

A pool filter pump generates 1 to 3 tonnes of greenhouse gas each year (a kilogram every 1 to 3 hours). A salt chlorinator adds up to another half a tonne.

**Fit a timer switch** and ask your pool expert how much you can cut back filtering time. Some new chemical treatments reduce the need for filtering over winter.

If replacing the pump, motor or filter, ask for high efficiency options.

To save on your energy bills, set the timing switch to off-peak periods.



## fact



A vacuum cleaner generates 1 to 2 kilograms of greenhouse gas each hour it's used.



# Clothes Washing & Drying

Each year, the energy used to run an average clothes washer produces about 90 kilograms of greenhouse gas, and supplying warm water for washing adds another 475 kilograms and costs around \$30. Typical use of a dryer (once a week) adds another 150 kilograms and costs another \$20.

## Is your head spinning from all the different options?

**Select a washing machine that uses the least energy, water and detergent, and has a high spin-dry speed.** Front-loading models usually rate best, but some top-loaders now perform well. Check the energy label. For more information on choosing an energy efficient clothes washer or dryer visit [www.energyrating.gov.au](http://www.energyrating.gov.au).

Choose a size that suits your household.

If you use a warm or hot wash and have a gas or solar hot water service, select a clothes washer with dual hot and cold water hoses in preference to a single hose model. Single hose models must heat their own water using expensive and high greenhouse impact electricity.

## Using the washing machine effectively

**Wash clothes in cold water:** you will generate less than a third of a kilogram of greenhouse gas per wash. Heating the water for a hot wash generates up to 4 kilograms of greenhouse gas.

Avoid washing more loads than necessary: washing a full load or a few socks generates almost the same amount of greenhouse gas.

Don't waste detergent: it is expensive and making it generates about a third of a kilogram of greenhouse gas per wash for top-loaders—front-loaders use half as much. Using more than the recommended amount of detergent doesn't make clothes cleaner.

Some detergents made from natural substances involve much less generation of greenhouse gas during their manufacture.



## Dry clothes efficiently

Drying a load of clothes in a dryer generates more than 3 kilograms of greenhouse gases.

**Put them on the line or over a clothes rack!**

But if you have to...

Some dryers automatically sense when clothes are dry. These generally save more greenhouse gases than those controlled by a timer, which often over-dry clothes.

Spin-dry your clothes (on a high-spin speed) to remove as much water as possible before you put them in the dryer.

Save up to 2 kilograms of greenhouse gas per load by hanging clothes on a rack for a while before finishing them off in the dryer.



# Home Heating & Cooling

## tip



When heating or cooling, close windows and external doors, as well as doors to unheated areas such as laundries and bathrooms, so you're not heating the great outdoors: save up to 3 kilograms of greenhouse gas per hour.

The energy used for heating and cooling a typical home generates more than one and a half tonnes of greenhouse gas and costs more than \$200 each year.

Energy use and greenhouse gas emissions from heating and cooling are very dependent on climate. In a cool climate, a large house with central heating could produce 10 tonnes or more of greenhouse gas and cost more than \$1,000 to heat each year.

## How can I save?

Make your home more efficient: Limit the flow of heat through your roof, walls, windows and gaps.

- ▶ Insulate ceiling, walls and floors. As much as 35% of heat loss from a house is through an uninsulated ceiling; uninsulated walls account for a further 15 to 25% and uninsulated floors lose between 10 and 20% of heat.
- ▶ Blinds and curtains should have white or reflective outer surfaces—dark colours absorb solar energy, adding to cooling problems.
- ▶ Place rugs or carpets on timber or elevated slab floors.
- ▶ Cover internal walls, particularly those that face south. Even a large woollen wall hanging can provide extra insulation, reducing heat loss in winter.

Fully insulating your home can halve heating and cooling greenhouse gas emissions and costs and dramatically improve comfort all year.

Windows are the weakest point of most houses. In winter a window can lose 10 times as much heat as the same area of insulated wall. In summer, each square metre of glass exposed to sun can gain nearly as much heat as running a single bar radiator.

In winter, close fitting blinds or curtains that create a layer of still air next to the glass are most effective. External shading is twice as effective as an internal blind at blocking out summer heat.

Unshaded skylights and roof glazing can overheat in summer and lose heat in winter. Careful design is needed.

## tip



Only heat rooms you are using and close doors between the heater and unoccupied rooms.



## Cool your home efficiently

On mornings of hot days, **close up the house and shade all windows** to block out the summer heat. When it cools down outside, open up the house to breezes.

Clean filters of airconditioners and heaters as recommended by the manufacturer: a clogged filter reduces air flow and efficiency.

In climates with dry heat, evaporative coolers provide comfort while using as little as a tenth of the energy of an airconditioner with much lower greenhouse gas emissions.

In hot humid climates, when you need cooling use a high efficiency refrigerated airconditioner. Airconditioners carry energy labels so you can compare their performance. See [www.energyrating.gov.au](http://www.energyrating.gov.au).



## Heat your home efficiently

Select a low greenhouse impact source for heating (see graph below). Reverse cycle airconditioners and gas heaters carry energy labels to help you choose an efficient model. See [www.energyrating.gov.au](http://www.energyrating.gov.au).

**If using a wood heater, use only dry, seasoned wood**, and operate according to manufacturer's instructions to minimise pollution. Consider switching to another option.

Leaving heating or cooling running when no-one is home generates more greenhouse gas and costs more money. Timer controls can switch equipment on when it's needed.

Dress appropriately for the weather: **put on a jumper before turning on a heater**, and **take off excess clothes before using an airconditioner**. A thermostat setting of 18–20°C in winter, or 26°C in summer is usually comfortable. An extra 1°C difference in temperature between indoors and outdoors can add around 10% to heating or cooling costs and greenhouse gas emissions.

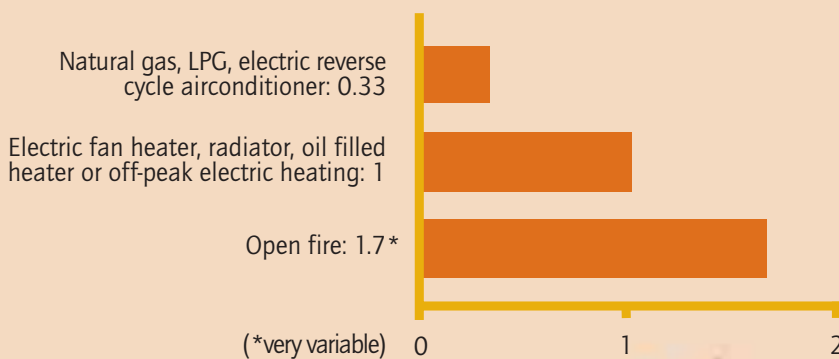
tip



Seal out draughts by sealing cracks and gaps around doors, windows and skirting boards, fitting dampers to fireplaces and open exhaust fans, and blocking unnecessary vents: cut annual greenhouse gas emissions by hundreds of kilograms and improve comfort.

## Approximate greenhouse gas emissions from heaters

(kg/unit of heat delivered)



# Building & Renovating



If installing new windows, consider using advanced glazing products such as double glazing to cut winter heat loss and summer heat gain. Most windows have Window Energy ratings to help you choose. See [www.wers.net](http://www.wers.net).

"A typical Australian house lasts for 70 years or more, so decisions made during building and renovating matter for a long time. Some measures (like insulating walls or positioning windows) can't be easily done later."

## Where do I start?

All new homes and major renovations in Australia must now meet basic energy performance requirements. By going beyond the minimum, you can further cut your energy bills and improve your comfort.

Your builder, designer or architect will help you to get the best energy and greenhouse performance from your new home or renovation.

When planning a new home or renovation, **think about the layout**.

For example:

- ▶ Locate frequently used hot water outlets near each other and the hot water service.
- ▶ Locate bedrooms away from hot afternoon sun, or protect them with shading.
- ▶ Locate living and outdoor areas where they receive winter sun and are protected from summer heat and strong winds, or protect them with shading and wind breaks.

## Watch out for the waste

Building or renovating can produce a lot of waste: one large builder's skip holds as much waste as 60 full 120 litre wheelie bins. **Make sure your builder minimises waste and recycles materials.**



'Your Home' is a great resource for anyone wanting to build or renovate a home that has low greenhouse impact, is water-wise and achieves other environmental goals. See [www.yourhome.gov.au](http://www.yourhome.gov.au).





# Cooking

## Which appliance?

Gas and microwave cooking generates 30 to 50% of the greenhouse gas generated by traditional electric cooking. Electric induction cookers are 20 to 50% more efficient than ordinary electric hotplates, but check to see if your cookware is suitable for them.

**Up to 90% of the energy used by ovens is wasted:** consider alternatives such as the microwave, electric frypan, or pressure cooker.

Or buy an oven with a triple glazed window and a high standard of insulation.

An electric kettle or gas cooker generates about half as much greenhouse gas as using a microwave oven or an electric cooktop—but be careful not to boil more water than you need.



Cooking toast in a toaster instead of under the griller reduces greenhouse gas emissions by up to three-quarters.

## Efficient cooking methods

- ▶ Putting lids on pots, simmering gently instead of boiling vigorously, or using a pressure cooker can save half the greenhouse gas generated during cooking. Each litre of water boiled off generates up to a kilogram of greenhouse gas.
- ▶ Use pots and pans with flat bases that match the size of the element. Avoid gas flames spilling up the sides of pots—turn the burner down to keep flames on the bottom.
- ▶ Thaw food in the fresh food compartment of the fridge before cooking.
- ▶ Pre-prepared meals in open aluminium foil trays with sides less than four centimetres high can be reheated in many microwave ovens with much lower greenhouse gas emissions than in an electric or gas oven (check the manufacturer's instructions and always make sure that the aluminium does not contact the sides of the microwave oven—stand it in a larger plastic container to avoid sparks).
- ▶ For small households, cooking in bulk, freezing the food, then reheating in a microwave oven cuts greenhouse gas emissions—and saves time.
- ▶ If cooking in the oven, avoid opening the door unnecessarily and consider cooking several things at once.



## tip



Fan-forced ovens generate up to 35% less greenhouse gas than conventional ovens and more items can be cooked at the same time, as heat is more evenly distributed around the oven.

## fact



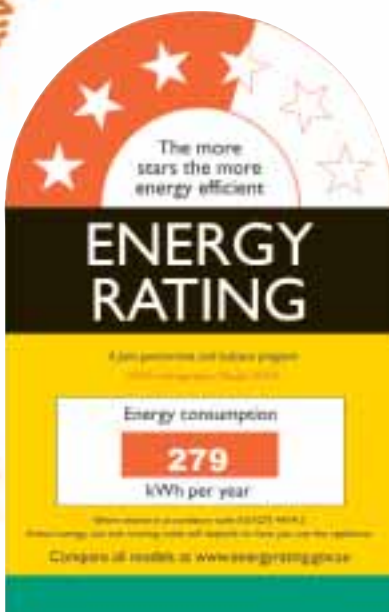
An average Australian home produces about half a tonne of greenhouse gas each year from energy used for cooking.

# Refrigerators & Freezers

## tip



Buying a family fridge with an extra star on its label cuts greenhouse gas emissions by more than 100 kilograms each year. Over its lifetime it will save \$200 in running costs.



Use energy labels to choose your energy-efficient, greenhouse-friendly new fridge or freezer. See [www.energyrating.gov.au](http://www.energyrating.gov.au) to compare products and [www.energyallstars.gov.au](http://www.energyallstars.gov.au) to see the leading products.

## tip



Ensure door seals are clean and the door closes properly—if ice builds up rapidly the door is not sealing.

On average, Australian households own 1.4 refrigerators and 0.4 freezers, which generate about one and a third tonnes of greenhouse gas and cost about \$160 to run each year.

## Which appliance?

**Buy the right size fridge to suit your needs:** the star rating on the energy label compares energy consumption per litre of storage. Don't buy bigger than you need.

To compare different sized models, use the numbers on the energy labels—they show annual energy consumption (and annual kilograms of greenhouse gas).

Small fridges and wine coolers without energy labels are now being sold. Many of these are very inefficient, and can generate up to 6 times as much greenhouse gas and cost much more to run than energy-labelled fridges of the same size.

## Finding your way around the fridge

Ensure good air circulation around the coils at the back of the refrigerator. Appliances with no coils on the back need good air circulation around both sides and back: save up to 150 kilograms of greenhouse gas each year.

**Locate refrigerators and freezers in cool spots,** out of the sun: save up to 100 kilograms of greenhouse gas each year.

Ensure door seals are clean and the door closes properly—if ice builds up rapidly the door is not sealing. The seals may also need fixing or replacing.

## Using the fridge efficiently

A third of Australian homes have at least two fridges, many of which are old and inefficient. Switch off the second fridge except when it's really needed: for a single door fridge, save up to a tonne and \$130 each year.

To keep food safe and save energy, set the fridge temperature at 3–5°C. Setting it 1°C lower than necessary releases 15 to 50 kilograms more greenhouse gas each year.

**Put cold items back in the fridge immediately after use.** Cooling a 2 litre bottle of drink from room temperature generates ten times as much greenhouse gas as opening the fridge door.

If the fridge or freezer motor runs almost all the time, ring for maintenance: otherwise you could waste over 20 kilograms of greenhouse gas for each week the fault remains.

Avoid running LPG/electric fridges on electricity: they generate three or more times as much greenhouse gas as electric-only fridges of the same size. Using LPG, they generate about as much greenhouse gas as electric-only units.

# HFCs, HCFCs & CFCs

## Fridges

Until 1994, fridges and freezers used CFCs as refrigerant fluids. CFCs are very active greenhouse gases—the small amount used in a typical fridge is equivalent to around a tonne of the most common greenhouse gas, carbon dioxide. CFCs also attack the ozone layer.

Since 1994, they have used Hydrochlorofluorocarbons (HCFCs) that have a lower potential to damage the ozone layer and Hydrofluorocarbons (HFCs), which do not attack the ozone layer, but are still powerful greenhouse gases, with the amount in a typical fridge being equivalent to up to 200 kilograms of carbon dioxide.

If your fridge motor is running for long periods or cannot maintain the correct temperatures, it may be losing refrigerant. Call a licensed service person sooner rather than later, to minimise refrigerant loss.

## Airconditioners

Like fridges, many modern airconditioners still use refrigerants that both attack the ozone layer and are very active greenhouse gases.

Airconditioners typically have ten times more refrigerant in them than fridges, so it is even more important to avoid leakage when installing them, using them, or throwing them away.

If your airconditioner isn't performing as well as it used to, it may be losing refrigerant. Check for other factors such as a clogged filter, then call a licensed service person sooner rather than later, to minimise refrigerant loss.

Car airconditioners use similar quantities of refrigerants to home units.

When disposing of an old fridge or airconditioner, ensure the refrigerant is recovered.

## It's the law!

By law, any maintenance or repair work involving refrigerants (either CFCs, HFCs or HCFCs) must be done by an appropriately licensed person who will have equipment to recover and recycle the refrigerants. Contact your local council or the Australian Refrigeration Council (1300 884 483) to find out about any local recovery schemes or to find out more about licensing.

## tip

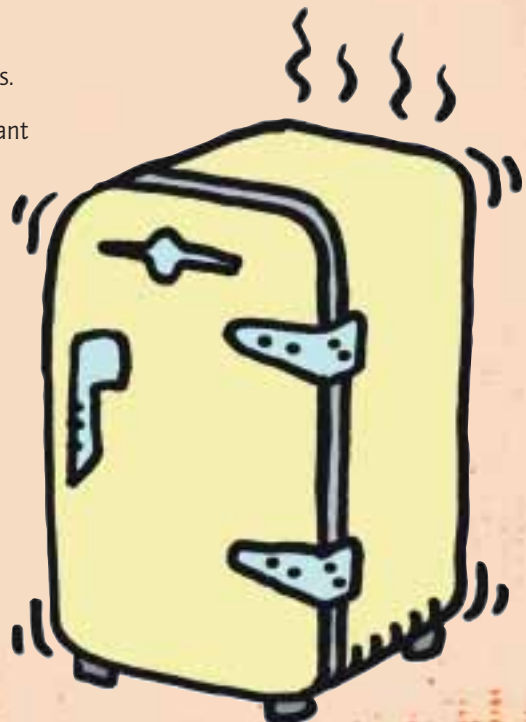


A typical new family fridge uses two-thirds less energy and generates two-thirds less greenhouse gas than a twenty year old one. Hanging onto that old clunker could be costing \$130 more and generating an extra tonne of greenhouse gas each year.

## fact



Evaporative airconditioners use water rather than refrigerants, and some new models are incorporating water saving features.



# Lighting

## Good ideas about lighting



### Install energy-efficient lighting

**Fluorescent lamps cut greenhouse gas emissions and running costs** by 75% while producing as much light. They come as circular or linear tubes, or as plug-in compact fluorescent lamps (CFLs).

Don't connect more than three lights to each light switch—then you can leave lights you don't need switched off.

Low voltage halogen lamps are not low energy lamps: each one generates a kilogram of greenhouse gas every 15 hours—about the same as an ordinary 60 watt globe, although it does produce a little more light. Halogens are not easily replaced by more efficient alternatives, so installing them locks you in to high lighting bills.

**Fit lower wattage globes** (or compact fluorescent lamps) in bright lights, especially down lights and spot lights: save up to 75% of greenhouse gas.

Select light fittings with reflectors that direct light where you want it and do not absorb too much light—coloured glass can halve light output, creating a need for higher wattage lamps.

LED (light emitting diode) lamps are beginning to appear for outdoor use and specialised applications like night-lights. These lamps are very long-lasting and efficient. We'll see a lot more of them in coming years.

Traditional CFLs deliver most of their light to the sides: an effective reflector may be needed to direct the light. Corkscrew shaped CFLs and CFLs enclosed in frosted plastic spheres distribute light in a pattern more like that of incandescent lamps.

### Install efficient outdoor lighting

Just a few outdoor lights left on every evening can double a household's lighting greenhouse gas emissions and lighting costs: **switch them off if they're not needed.**

Install daylight and movement sensors so outdoor lights switch on when they're needed but don't waste electricity.

For outdoor lights that must stay on for long periods, use energy-efficient compact fluorescent or LED lamps and choose the lowest wattage lamp that gives enough light. **It's also worth considering solar-powered garden lights.**

### tip



Remember, it's not the volts that matter: more watts means higher energy bills and more greenhouse gas.

## Use lights efficiently

**Turn off unnecessary lights, including fluorescent lamps.** Leaving fluorescent lamps on doesn't save energy or cut greenhouse gas emissions—switch them off!

Use daylight instead of artificial lights—but don't overdo it—large windows and skylights add to summer heat and winter cold.

Paint often-used rooms with light colours. Dark colours absorb light, increasing the amount of lighting needed.

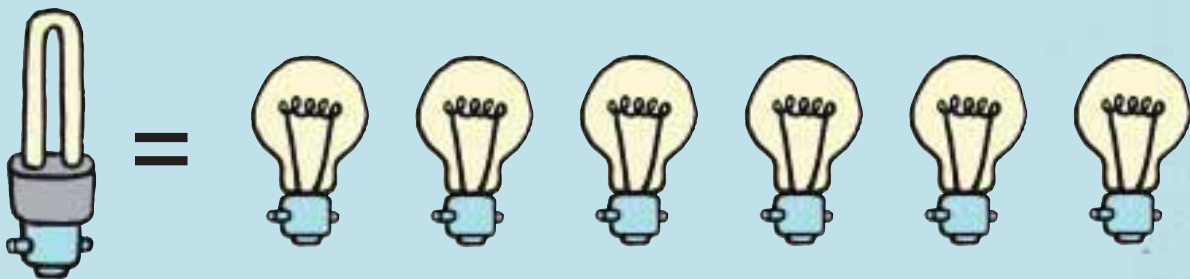
**Use desk lamps or standard lamps** (with CFLs in them) where most light is needed, so less lighting is required in the rest of the room.

Modern dimmer controls reduce greenhouse gas emissions as they reduce light output. They also extend lamp life. Dimmer controls can now also be used with some CFLs, but check the label first.

**Clean lamps and fittings regularly:** over time, dirt build-up reduces light output.

## fact

Each year, electricity used for lighting an average Australian home generates around three-quarters of a tonne of greenhouse gas and costs around \$100.



Over its life, a typical compact fluorescent lamp saves around a third of a tonne of greenhouse gas and \$45 and avoids the cost of 6 or more incandescent globes. And you don't have to change the bulbs as often.

# Food, Garden, Packaging and Materials

Food production generates greenhouse gases from a variety of sources:

- ▶ fossil fuel energy used to mine, produce and transport packaging materials
- ▶ methane released by animals and the farming of land
- ▶ the breakdown of food and garden waste.

## Food and garden waste

When food and garden wastes break down without fresh air, they create a mixture of gases including the very active greenhouse gas, methane. Save about one kilogram of greenhouse gas for each kilogram of food or garden waste avoided.

**Compost non-meat food scraps or feed them to a worm farm:** most councils can advise on composting techniques, and some even collect food scraps with green waste for commercial composting.

For grass clippings and leaves—let them break down naturally in the open air, compost them, feed them to a worm farm or put them in a green waste collection bin.

Ensure your compost heap or bin has plenty of fresh air: turn the material over regularly or use a compost tumbler. If the compost smells, there is not enough air and it is producing greenhouse gases.

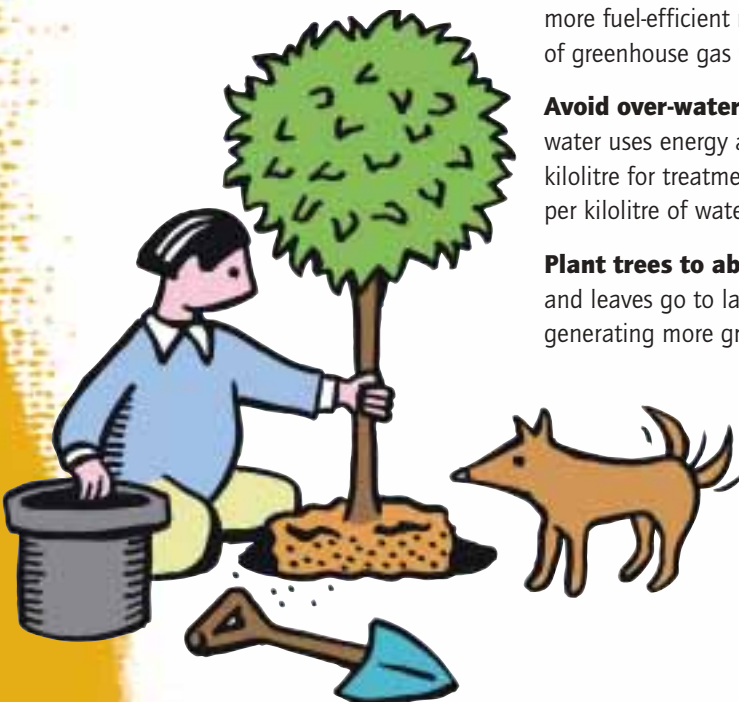


## Other actions

Reduce mower fuel use by using a hand mower, mowing less often, or using a more fuel-efficient mower (4-stroke models often use less fuel): save 2.8 kilograms of greenhouse gas for each litre of fuel saved.

**Avoid over-watering gardens and wasting water:** treating and pumping water uses energy and generates up to 0.6 kilograms of greenhouse gas per kilolitre for treatment and, in hilly areas, up to two kilograms of greenhouse gas per kilolitre of water for pumping.

**Plant trees to absorb greenhouse gases.** But be careful: if your prunings and leaves go to landfill instead of composting, they will decay without oxygen, generating more greenhouse gas than was stored in the plant material as it grew.





## Apply the rules

- Refuse:** excess packaging and materials.
- Reduce:** the amount of materials you use by buying in bulk, repairing appliances and furniture instead of replacing them, and avoiding disposable products.
- Re-use:** containers, building materials and clothing: repair and sell things you no longer need and consider buying second-hand.
- Recycle:** everything you can't refuse, reduce or re-use. Check with your local council or state environmental authority to find what and where you can recycle.

## tip



Electric mowers emit about one third of the greenhouse gas of a petrol-fuelled mower and don't release other harmful pollutants.

When out walking, collect discarded containers (for example, bottles and aluminium cans). Recycling a shopping bag full of containers saves at least five kilograms of greenhouse gas and reduces litter.

Large amounts of fossil fuel energy are used, and a lot of greenhouse gas is produced, when making the materials we use to build our homes and to make appliances and cars. For example, making a kilogram of aluminium in Australia generates more than 15 kilograms of greenhouse gas and a kilogram of greenhouse gas is generated for every three house bricks. Re-using and recycling these materials can recover much of this greenhouse gas.



# Generate Your Own Green Electricity

## fact



Natural gas, LPG and diesel fuel generate less greenhouse gas per kilometre than petrol.

## Go solar

Greenhouse gases are generated when fossil fuels such as coal, oil or natural gas are burnt.

The amount of greenhouse gas generated depends upon:

- ▶ the amount of carbon in the fuel's chemical structure
- ▶ the amounts of energy used, and other greenhouse gases produced, in mining, processing, transporting and using a fuel.

Almost half a kilogram of black coal or 1.5 kilograms of lower quality brown coal is burned to supply electricity users with one kilowatt-hour of electricity—enough to run a single bar radiator for an hour, a 100 watt light globe for 10 hours or an energy-efficient compact fluorescent lamp for 50 hours.

**Join the increasing number of people who are installing solar** on their roofs to generate electricity from the sun. You can obtain financial help from the Australian Government to purchase a solar power system for your roof. Visit [www.greenhouse.gov.au/renewable/pv](http://www.greenhouse.gov.au/renewable/pv)

Others are installing solar hot water services that use the sun for water heating.

New transport fuels, some produced from renewable energy sources, are beginning to appear. Some of these can help cut greenhouse gas emissions.

## tip



In some regions, energy retailers show household greenhouse gas emissions on energy bills, so you can check that your emissions have reduced after signing up to a green power scheme.

## Green electricity

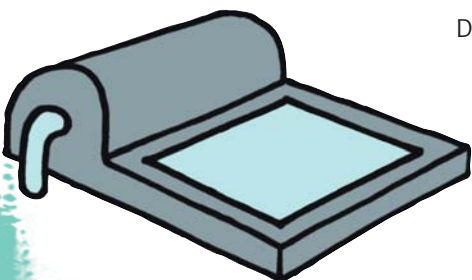
While most of Australia's electricity is generated from fossil fuels, an increasing range of schemes are available to reduce or offset our greenhouse gas emissions.

Some community groups and businesses offer schemes which plant trees or implement energy saving projects to offset your greenhouse gas emissions.

Some schemes can be used to offset greenhouse gas emissions from car use, air travel, or major events you are running.

**Green Power:** Accredited green power schemes effectively allow a consumer to replace some or all of their conventional electricity with electricity generated from renewable energy sources such as wind energy, solar generation and waste organic material.

Details of all accredited products are at [www.greenpower.gov.au](http://www.greenpower.gov.au).





# Greenhouse Calculator

## Calculate your household's greenhouse gas emissions!

Use this calculator to estimate your household's greenhouse gas emissions from everyday activities. Don't worry if you can't work out the exact numbers—a rough indication is better than nothing. Remember, an average Australian household generates around 14 tonnes of greenhouse gas each year—but a bigger household will be higher.

### fact



Burning natural gas generates around 30% less greenhouse gas than burning coal to produce the same amount of heat if they are burnt at the same efficiency. Oil is mid-way between gas and coal.

## Household energy

For each energy source, you need to find out how many units of energy you used in the past year. For electricity and gas, many suppliers include a bar graph on each bill showing how much energy per day you used for each billing period over the past year. Calculate the amount of energy used in each billing period by multiplying your daily use by the number of days in the billing period (usually 60 or 90 days). You should also be able to get this information by ringing your energy supplier and quoting your details.

## Transport

Many people don't know how much fuel they use each year, so you may have to make an estimate. Several approaches can be used to calculate how many litres of fuel you have used:

- ▶ if you know your average weekly amount of money spent on fuel, and the cost per litre, calculate annual litres using:  $(\text{weekly } \$)/(\text{cost per litre}) \times 52$
- ▶ for a few weeks, record how much fuel you buy each week (in litres) and then estimate annual litres using  $(\text{number of litres bought})/\text{number of weeks} \times 52$
- ▶ look up [www.greenvehicleguide.gov.au](http://www.greenvehicleguide.gov.au) to find out your car's fuel consumption: remember most cars use more than the standard test results, but this gives an indication. Then calculate annual litres:  $\text{number of kilometres}/100 \times \text{fuel consumption (litres}/100 \text{ km)}$

## Greenhouse calculator

Activity	units	greenhouse emissions
Natural gas or LPG: .....	megajoules	x 0.07 = .....kilograms
Or for LPG if you buy it by the litre: .....	litres	x 1.7 = .....kilograms
Or natural gas in W.A. (units in 3.6 Megajoules): .....	units	x 0.24 = .....kilograms
Electricity: .....	kilowatt-hours	x 1 = .....kilograms <sup>1</sup>
Oil or kerosene: .....	litres	x 3 = .....kilograms
Wood—Used in a slow combustion heater:.....	kilograms	x 0.23 = .....kilograms
Wood—Used in an open fire:.....	kilograms	x 5 = .....kilograms
For Petrol: .....	litres	x 2.8 = .....kilograms
For LPG: .....	litres	x 1.8 = .....kilograms
For diesel fuel: .....	litres	x 3.0 = .....kilograms
Air travel: .....	km	x 0.18 = .....kilograms
Food and garden wastes:.....	kilograms	x 1 = .....kilograms
<b>TOTAL =</b>		<input type="text"/> kilograms

<sup>1</sup>If you purchase 10% Green Power, you should reduce this figure by 10%

# Contacts

## Australian Government

### Australian Greenhouse Office

(in the Department of the Environment and Heritage)

GPO Box 787, Canberra ACT 2601

**Phone:** AGO Info line **1300 130 606**  
**Email:** [communications@greenhouse.gov.au](mailto:communications@greenhouse.gov.au)  
**Internet:** [www.greenhouse.gov.au](http://www.greenhouse.gov.au)

## Australian Capital Territory

### Environment Planning and Legislation

#### Environment ACT

PO Box 144, Lyneham ACT 2602

**Phone:** (02) 6207 9777  
**Email:** [environmentACT@act.gov.au](mailto:environmentACT@act.gov.au)  
**Internet:** [www.environment.act.gov.au](http://www.environment.act.gov.au)

### Home Energy Advice Team

Level 1, Manuka Arcade, 20 Franklin Street,  
Manuka ACT 2603

PO Box 3142, Manuka ACT 2603

**Phone:** (02) 6260 6165  
**Email:** [info@heat.net.au](mailto:info@heat.net.au)  
**Internet:** [www.heat.net.au](http://www.heat.net.au)

## New South Wales

### Department of Energy, Utilities and Sustainability

#### Energy Smart Information Centre

Level 17, 227 Elizabeth St, Sydney

**Phone:** 1300 138 638  
**Email:** [esic@deus.nsw.gov.au](mailto:esic@deus.nsw.gov.au)  
**Internet:** [www.deus.nsw.gov.au](http://www.deus.nsw.gov.au)

## Northern Territory

### Department of Natural Resources, Environment and the Arts

PO Box 30, Palmerston NT 0831

**Phone:** (08) 8999 4568  
**Internet:** [www.nt.gov.au/nreta/environment/greenhouse](http://www.nt.gov.au/nreta/environment/greenhouse)

## Queensland

### Customer Service Centre

#### Environmental Protection Agency

PO Box 15155, City East, QLD 4002

**Phone:** (07) 3227 8185  
**Email:** [csc@epa.qld.gov.au](mailto:csc@epa.qld.gov.au)  
**Internet:** [www.epa.qld.gov.au](http://www.epa.qld.gov.au)

#### Sustainable Industries

160 Ann Street, Brisbane QLD 4000

PO BOX 15155, City East, QLD 4002

**Phone:** 1300 130372  
**Internet:** [www.epa.qld.gov.au](http://www.epa.qld.gov.au)

## South Australia

### Energy Advisory Service

PO Box 1, Walkerville SA 5081

**Phone:** (08) 8204 1888  
**Freecall:** 1800 671 907 (for country callers)  
**Email:** [energy.sa@saugov.sa.gov.au](mailto:energy.sa@saugov.sa.gov.au)  
**Internet:** [www.energy.sa.gov.au](http://www.energy.sa.gov.au)

## Tasmania

### Department of Infrastructure, Energy and Resources

**Phone:** 1300 135 513

**Internet:** [www.dier.tas.gov.au/energy](http://www.dier.tas.gov.au/energy)

## Victoria

### Sustainability Victoria

28th floor, 50 Lonsdale Street, Melbourne VIC 3000

**Phone:** 1300 363 744 (toll free)  
**Email:** [Info@sustainability.vic.gov.au](mailto:Info@sustainability.vic.gov.au)  
**Internet:** [www.sustainability.vic.gov.au](http://www.sustainability.vic.gov.au)

## Western Australia

### Sustainable Energy Development Office

Level 9, 197 St Georges Terrace, Perth WA 6000

**Phone:** 1300 658 158 (Energy Smart Line)  
**Email:** [sedo@energy.wa.gov.au](mailto:sedo@energy.wa.gov.au)  
**Internet:** [www.sedo.energy.wa.gov.au](http://www.sedo.energy.wa.gov.au)



## Further Information

Copies of this booklet may be obtained by phoning the Department of the Environment and Heritage Infoline on 1300 130 606.

For more information on climate change and the practical actions the Australian Government is taking to address it, visit [www.greenhouse.gov.au](http://www.greenhouse.gov.au).

### Cities for Climate Protection

The Cities for Climate Protection (CCP) Australia programme assists local governments and their communities reduce greenhouse gas emissions. More than 210 local councils, covering 82 per cent of Australia's population have committed to achieving sustainable, long-term reductions in their greenhouse gas emissions through their participation in CCP Australia. For more information about action in your local area, visit [www.greenhouse.gov.au/local/ccp](http://www.greenhouse.gov.au/local/ccp).

### Greenhouse Friendly™

When you see the Greenhouse Friendly™ logo attached to a product or advertised in association with a service, it means that all of its greenhouse gas emissions have been offset through Australian Greenhouse Office approved greenhouse gas reduction projects. It also means the company selling the product or service is a member of Greenhouse Challenge Plus—a programme where members commit to improving energy efficiency, cutting waste and reducing greenhouse gas emissions. For more information, visit [www.greenhouse.gov.au/greenhousefriendly](http://www.greenhouse.gov.au/greenhousefriendly).

### Your Home

'Your Home' is a suite of consumer and technical guides and tools developed to help you design, construct or renovate your home in a way that is comfortable, healthy and more environmentally sustainable. The suite includes a technical manual, a DVD, a consumer guide and *Sanctuary* magazine. For more information, visit [www.yourhome.gov.au](http://www.yourhome.gov.au)

### Rating Schemes for Smarter Choices

The energy rating labelling scheme helps consumers compare the energy efficiency of different products and models. Like the Water Efficiency Labelling Scheme (WELS), products with more stars in their rating use less energy and can save you money on your electricity bills. For more information, visit [www.energyrating.gov.au](http://www.energyrating.gov.au).

WELS encourages the uptake of water-efficient products and appliances and helps consumers compare the relative water efficiency of the available models. The more stars in a product's rating, the more efficient it is. To find out more about the WELS Scheme, visit [www.waterrating.gov.au](http://www.waterrating.gov.au).

### Climate Change Science

To learn more about the science behind climate change and how it may impact our future, visit [www.greenhouse.gov.au/science](http://www.greenhouse.gov.au/science) and download the following publications:

- *Climate Change Science—Questions Answered*
- *Stronger Evidence but New Challenges: Climate Change Science 2001–2005*

### TravelSmart

Almost everyone is involved in some form of travel every day—whether it is travelling to work, school, shops, to entertainment or to sport.

TravelSmart is about reducing our reliance on cars and making smart choices about other forms of transport. We can all play a part in reducing greenhouse gas emissions and improving the quality of life for ourselves and our communities. Visit [www.travelsmart.gov.au](http://www.travelsmart.gov.au).

### Green Vehicle Guide

The Green Vehicle Guide rates new Australian vehicles based on their greenhouse and air pollution emissions.

By choosing a greener vehicle, you can make a real difference. Visit [www.greenvehicleguide.gov.au](http://www.greenvehicleguide.gov.au).

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## Top actions I can take now

- 1 Switch off lights, appliances and equipment when they're not needed.
- 2 Install energy-efficient compact fluorescent lamps.
- 3 Divert garden and food wastes from landfill to composting (either at home or through a Council scheme).
- 4 Manage home heating and cooling by insulating, draught-sealing and shading, while setting thermostats appropriately.
- 5 Cut hot water usage by installing a water-efficient showerhead, taking shorter showers and using cold water clothes washing.
- 6 Switch off your second fridge except when it's really needed.
- 7 Switch to low greenhouse impact transport options like bicycle or public transport—or use phone or email.
- 8 Minimise waste of packaging and materials—refuse, reduce, re-use, recycle.

## Good decisions I can make in the future

- 1 When buying a car, buy a fuel-efficient one. Alternatively, consider buying a transport pass or bicycle.
- 2 When building, renovating, renting or buying a home, aim for high energy-efficiency and install energy-efficient appliances and lighting.
- 3 When replacing an electric hot water service install a high efficiency gas or solar unit.
- 4 Buy energy-efficient appliances with low standby power usage.
- 5 When choosing a home location, consider the time and cost of travel from there to work, school, shops and leisure activities.



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Department of the Environment and Heritage  
Australian Greenhouse Office

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