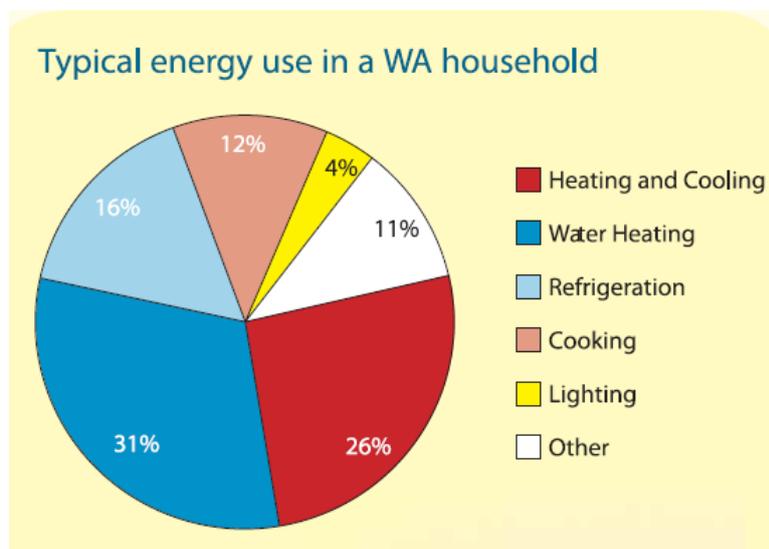




ELECTRICITY, GAS and WATER

How to save money and help the environment



Source: Office of Energy

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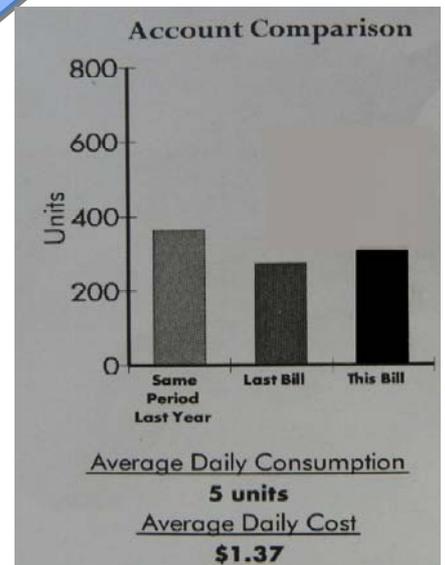
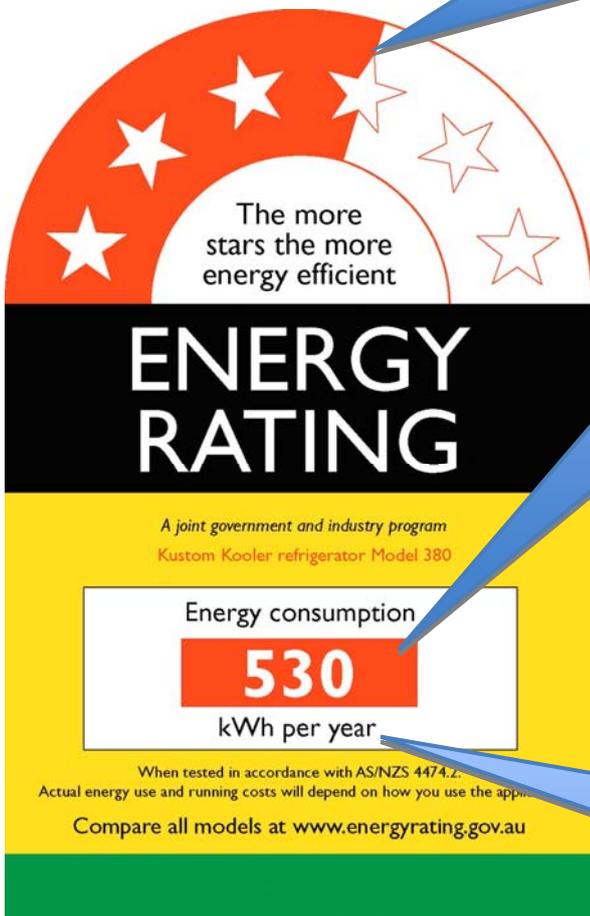
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www.environmenthouse.org.au

This appliance has 3½ stars

This appliance uses about 530 Units of energy every year.



kWh (kilowatt hours) = Units
(the same Units that are shown
on your electricity bill)

COUNT THE STARS and SAVE ENERGY AND MONEY!

Usually more stars means higher up-front cost. But you will save money in the long run because more stars means less electricity is needed.

The Federal Government's STAR RATINGS are based on typical use as shown below. (Even if you don't use your appliances so much, you can still compare the efficiency of different brands accurately by counting the stars!)

FRIDGE One year, door closed, 32°C room temperature

WASHING MACHINE One load each DAY, on NORMAL cycle

CLOTHES DRYER One load each WEEK, hot cotton program

DISHWASHER One load each DAY, on NORMAL cycle

TV 10 hours each DAY

This government website lets you search for and compare new appliances: www.energyrating.gov.au

SAVING ENERGY

In WA, electricity and gas are sold in quantities called 'Units'. A Unit of gas is the same amount of energy as a Unit of electricity. In Perth, electricity is sold to us by 'Synergy' and gas by 'Alinta'. It is easy to use too much electricity and gas, but with a little care you can reduce your bills significantly. You will also be helping the environment by causing less GHG (greenhouse gases, mainly carbon dioxide) to be released into the atmosphere.

TRANSPORT

Transport may be your biggest energy user, but it should be the EASIEST to reduce! Every litre of petrol you use releases **2kg of GHG**. If possible, buy or rent a home close to public transport, schools or work. Only use a car when you can't walk, ride a bike or catch a bus or train. Keep your engine tuned and tyres pumped up.

ELECTRICITY

Most of WA's electricity is produced by burning coal or gas in power stations near Perth (Kwinana, Cockburn, Pinjar), Collie and Muja.

One Unit of electricity is sold to Perth homes for nearly 18 cents (17.61c).

Burning enough coal and gas in power stations to make 1 Unit of electricity releases approximately 1kg of GHG. 1 unit = 1 kWh = 1000 Watts running for 1 hour.

A family using 14 Units of electricity a day will pay \$2.47 a day AND cause 14kg of GHG to be released every day.

(14 Units x 17.61cents = \$2.47
14 x 1kg = 14kg GHG)

Some examples to show dollar costs and greenhouse gases (GHG) released. Use of each household item sounds cheap, but they can add up to a lot! (17.61c/Unit)

1. If an old-fashioned 60W light globe (0.06 kW) is left on for 10 hours

0.06kW x 10hrs = 0.6kWh = 0.6 Units
@ 17.61c/Unit = **10.6c plus 0.6kg GHG**

2. If a 2000W electric heater (2.0kW) is on for 5 hours

2kW x 5hrs = 10kWh = 10 Units
@ 17.61c/Unit = **\$1.76 plus 10kg GHG**

3. If the thermostat keeps your 2400W storage electric hot water service on for 4 hours a day

2.4kW x 4hrs = 9.6kWh = 9.6 Units
@ 17.61c/Unit = **\$1.69 a day plus 9.6kg GHG**

4. If a 450W plasma TV is on for 4 hours, 0.45kW x 4hrs = 1.8kWh = 1.8 Units

@ 17.61c/Unit = **32c plus 1.8kg GHG**

GAS

1 Unit = 1kWh (the same amount of energy as a Unit of electricity). We pay 10 cents for 1 Unit of gas which releases about 250g of greenhouse gas. A gas heater with a heat output of 6kWh costs about 60c per hour to run.

Old style clock meter



Newer digital meter



The more times the light flashes or the more times the silver wheel spins, the bigger your bill will be.

Read dials from smallest unit to largest unit – writing numbers down as you go. **NOTE that some of the dials go anti-clockwise.** The old and new meters both show that 40254 KWh (Units) have been used since the meter was first installed. Someone from Synergy comes every 2 months to see how much your total has increased by. Then you receive a bill for that amount.

1 kWh clock	The pointer is past the 4, so this clock shows 4				4
10 kWh clock	The pointer is past the 5, so this clock shows 5				5
100 kWh clock	The pointer is past the 2, so this clock shows 2		2		
1000 kWh clock	The pointer is past the 0, so this clock shows 0	0			
10,000 kWh clock	The pointer is past the 4, so this clock shows 4	4			
Altogether, the meter shows		4	0	2	5 4 kWh

HOT WATER

This is usually the biggest energy use in your home. Your hot water system will be either **storage** (electric, gas or solar – with electric or gas booster) or **instant** (electric or gas).

An old style electric hot water heater (not a pump type) will probably be the cheapest to buy BUT the most expensive to use.

Gas hot water is cheaper than electric, but solar is cheaper than both.

Heating 20L (2 buckets) of water for a shower uses about 1 Unit of energy (electricity or gas).

STORAGE HOT WATER

Gas or electric storage hot water heaters have a tank and keep water hot all the time. Heat is always being lost from the storage tank and about 30% of energy can be wasted by this. To save energy:

- ✓ Turn thermostat down to 60°C.
 - ✓ Insulate the outlet pipe from the water heater for 2 metres.
 - ✓ Fix dripping taps.
 - ✓ Install water-saving shower heads. (Using less hot water will save energy.)
 - ✓ Have shorter showers.
 - ✓ Use less water in the bath.
 - ✓ Wash clothes in cold water.
 - ✓ Turn off the water heater if you are going away for a few days.
- ☹ Don't wash dishes in running water – this uses a *lot* of water. Better to put the plug in, wash the dishes and rinse in a second sink or a plastic bowl.

HEAT PUMP HOT WATER SYSTEM

A heat pump is a very efficient electric storage hot water system. It works like a reverse cycle air conditioner but instead of putting the heat into the air, it puts heat into the water. Heat pumps are cheaper than solar hot water systems and make a noise like a fridge or small air conditioner when they are heating water.

INSTANT HOT WATER

An instant hot water system heats the water every time you turn on the hot tap, but it doesn't store this hot water in a tank.

It may need about 5L of water per minute running through it to stay turned on. If your shower is running hot-cold-hot-cold, this probably means that not enough water is going through the heater.

SOLUTION: Turn **down** the thermostat on your instantaneous system so you don't need to add any cold water. This will **increase the flow rate** through the hot water system.

- ☹ With an instant hot water service, the hot water seems to be endless, but it costs money every minute you use it!
- ☺ With an instant hot water service you don't pay to store hot water hot all the time.

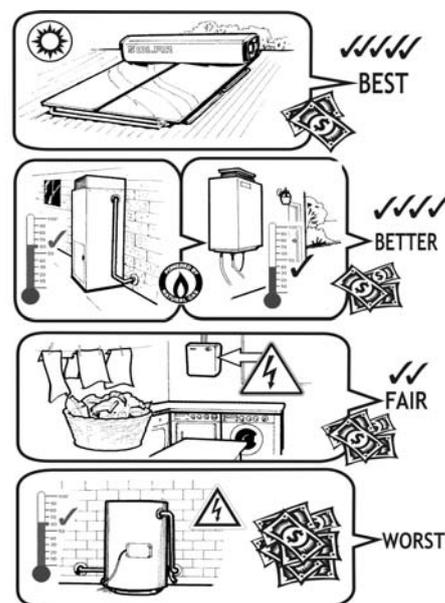
SOLAR HOT WATER

A solar hot water system is a **storage** system. Solar is expensive to buy and install, but MUCH cheaper than gas or electric in the long run and much better for the environment! You will need:

- an unshaded north-facing roof or a frame built to face north for the solar hot water panels
- to keep it maintained
- to insulate the outlet of the hot water tank
- to use it properly.

Boosting your solar hot water in winter

Solar hot water heaters are usually boosted in winter by electricity or gas. **You should only need to boost it for an hour at the most**, just after sunset. If you really need hotter water at other times, use the booster, but turn it off just **before** you have your shower or wash your dishes. **Keep the booster OFF over the spring, summer and autumn.**



HEATING & COOLING

(natural & artificial)

Perth has a mixed climate; sometimes it's too hot and sometimes it's too cold for comfort.

IN WINTER the most important thing is to help your home to **collect heat from the outside and keep it inside.**

IN SUMMER you need to keep the heat outside.

Are you choosing a house to rent or buy?

Or are you planning a new house?

Use the ideas below to get the most comfort for the least cost.

IN WINTER

Letting heat in

Most windows should be on the north side of the house. Open the curtains or blinds on the north-facing side on winter mornings so the low winter sun can shine deep inside your house.

Keeping the heat in

- Get your ceiling insulated if it isn't already. Also insulate wall cavities and under wooden floors.
- Seal all gaps and close air-cooler vents to reduce draughts and heat loss.
- Close all the doors that you can – to laundry, toilet, bathroom etc.
- Close curtains in the late afternoon and keep them well-closed all night. **(Warning: Do not close vents used for portable gas heaters!)**

Getting warm & keeping warm

- Wear more clothes, woolly hats, scarves, socks, slippers, warm shoes.
- Watch TV under a rug or doona.
- Go for a fast walk, play active games.
- Eat and drink hot foods, soups and beverages.
- Use rubber hot water bottles in bed for extra heat.
- Shut all the doors and curtains to warm your lounge room on very cold nights. Turn off the TV and get your kids to do their homework on the dining table.

Artificial heating

Heating is expensive so...

- try to heat the smallest space possible by closing doors to unheated areas
- heat just enough, not too much. 19 degrees should be enough if everyone is dressed warmly (every extra 1°C can cost an extra 10%)
- keep heaters away from doors and windows.

Which heater to buy?

- Reverse cycle air conditioners are an efficient way to heat one well-insulated, closed room.
- Larger spaces may need a gas heater.
- Electric radiators are cheap to buy but expensive to use, but okay occasionally. (A blower heater is best because it is noisy, reminding you that it is on. Close off the room, and just put it on for 10 minutes to warm the air.)

IN SUMMER

Keeping unwanted heat out with insulation

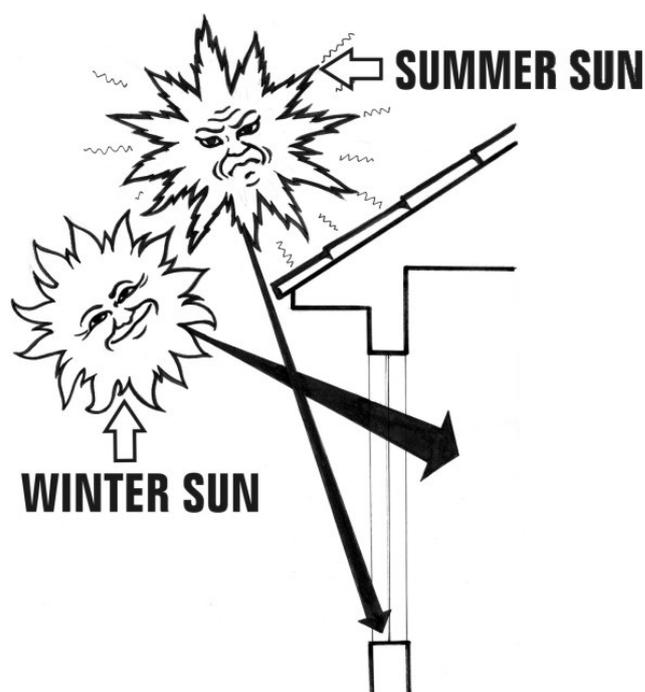
On a summer's day it can be 50°C inside your roof. If there is no insulation in the ceiling it can get almost this hot inside your house.

Windows

East and west windows collect too much heat. If you have west or east-facing windows, shade them on the *outside* with shade cloth, awnings or a tree. Closing curtains will keep out some but not all heat.

Using the breezes

If there is a breeze, let it in – and let it out on the other side. (Open opposite windows.) If it is safe, open everything at night to really cool the house down. Combination fly/security screens are a great investment for naturally cooling your home. (There are rebates for pensioners and seniors.)



REFRIGERATION

If you have gas hot water and gas space heating, then **refrigeration is likely to be your biggest electricity user.**

- ✓ Choose the right-sized fridge. One bigger fridge uses less electricity than two smaller ones running all the time.
- ✓ Buy one with as many stars as you can afford; investing in a more efficient fridge will save you money over time.
- ✓ Set the thermostat to just keep the fridge cold enough to store food safely (3-5°C). *Like a hot water system, space heater or air-conditioner, a small difference in fridge temperature can make a big difference in your bill (1°C up or down can cause as much as 10% difference in energy consumption).*
- ✓ Check that your fridge and the wire grille at the back of it are well ventilated. It should be at least 50mm from walls. If the outside of the fridge gets warm, don't stick papers etc there.
- ✓ Dust the wire grille regularly.
- ✓ Check that the seal around the fridge door is clean and in good condition, with no gaps or cracks. To test it, close the door on a piece of paper – a good seal will hold the paper firmly. If your fridge is a good one, it could be worth getting the seal replaced.
- ✓ Don't let ice build up. Defrost it before the ice is 8mm thick.
- ⊖ Ice build-up can be a sign of doors not sealing properly.
- ⊖ You will probably hear your fridge motor turning on and off. If you hear that it is **on** more than it is **off** then something is probably wrong.
- ✓ Try to decide what you need from the fridge before opening it and shut the door quickly.
- ✓ If you can plan your meals ahead, thaw frozen food inside the fridge to make use of the stored cold in the thawing food.

How much does it cost to run a fridge?

Each fridge has an energy-rating label. Inside the arch of stars (e.g. 3, 4, 5 stars) on the energy rating label there is another number e.g. **740 kWh per year.**

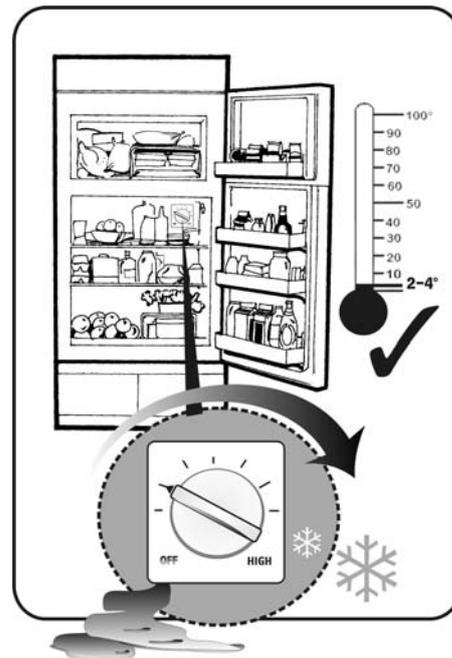
Remember: kWh = Units (the same Units as on your electricity bill). This number is the amount of energy the fridge will use each year.

Remember each Unit (or kWh) of electricity costs 17.61c (and causes 1kg of greenhouse gas emissions) so the fridge in this example costs:

$$740 \times 17.61c = 13,031 \text{ cents}$$

$$= \$130 \text{ every year}$$

and 740kg of greenhouse gases
if it is clean, well-ventilated and the thermostat is not set too cold. Otherwise it will cost more!



LIGHTING

During the day the cheapest way to get light into your home is to open the curtains, have light-coloured walls and/or install a skylight.

Incandescent (old-fashioned bulbs)

These old-fashioned lights were banned from sale in November 2009, because most of the energy they use is wasted as heat. They use 4-5 times more electricity to give the same light as a fluorescent or LED lamp.

Halogen lighting

Halogen downlights and globes use nearly as much electricity as the old-fashioned incandescent bulbs.

Their sale will probably also be banned in the next few years.

☹ Halogen downlights are often arranged so that many lights (maybe more than you need) turn on from one switch.

✓ are good for lighting a small work area for a short time.

If you already have halogen downlights you can save power by taking out some globes or substituting a lower wattage lamp. We strongly suggest that you buy fluorescent or LED replacements for them. This action will save a lot of power and money.

Fluorescent lighting

All fluorescent tubes and globes contain a few grams of mercury which is toxic, so must be handled with care when they break or are 'spent' (finished).

See instructions on the back of this booklet on what to do if a fluoro lamp breaks, and where to take 'spent'/finished fluoro tubes and globes.

Fluorescent tubes

They are long thin tubes – usually straight but sometimes round – which make a lot of light for the amount of energy they use. They come in different shades of white usually called by the manufacturers *warm white*, *cool white*, and *natural* (bluish light).

Compact fluorescent lamps (CFLs, 'energy savers')

These lamps make light in the same way as the long tubes, but are more compact, either curly or prong-shaped. They also come in *warm white*, *cool white* and *natural* (bluish light).

LED (Light Emitting Diode)

These lamps are an electronic way of making light and use the least energy to make the most light.

- ✓ They can be used for all lighting jobs
 - ✓ night light
 - ✓ reading lights
 - ✓ general lights
 - ✓ some outdoor lighting.

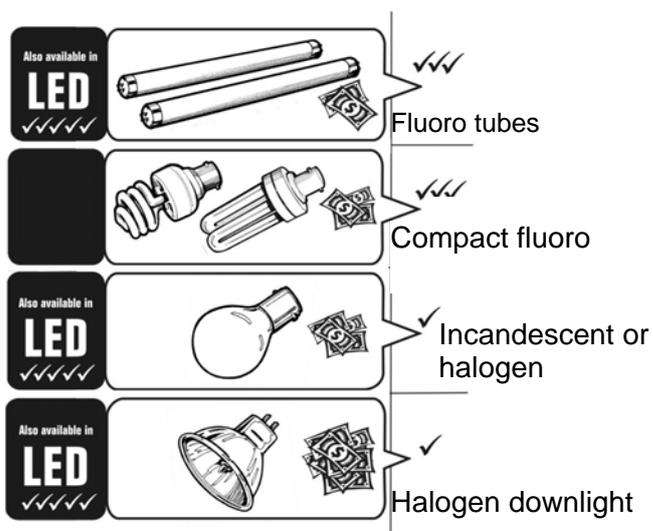
They are more expensive to buy, but they are a great investment. To buy AND to run, they are the cheapest. They DON'T contain mercury.

Outdoor lighting

Some outdoor lights use a lot of energy because they are high power (150-350 Watts) and they can be on for a long time.

☹ Use sensors properly so that security lighting only comes on for the minimum amount of time.

Remember: Energy used = power (Watts) x how long the appliance is on (hours).



COOKING

Cost-cutting tips

- Whenever possible, keep lids on pots and pans during cooking.
- Turn off hot plate or gas burner before the food is completely cooked, cover it, and let it sit and finish cooking in its own heat!
- Don't use more water than necessary. Heating water uses a lot of energy. Steaming food can be done with very little water. And only boil enough water in the kettle for the number of cups you are actually making. **(Careful: some kettles won't turn off if there is too little water inside!).**
- Keep draughts away from your cooking area, because they can take heat away from your cooking.
- Check that the seal around the door of the oven is not letting heat escape, by seeing if your oven door can firmly hold a piece of paper. If not, the seal might need replacing.

• **Use the smallest appliance that you can to do the cooking job.** For example:

- ✓ Use a toaster instead of the griller to make toast.
- ✓ Use a small hot plate or gas burner to heat a small pot or pan.
- ✓ Use a rice-cooker instead of the stove top to cook rice.

Electric cooking appliances

Each cooking element on an electric stove can use 800-2000 Watts.

Electric frypan	~ 2000 Watts
Oven	~ 2000 Watts
Electric jug	~ 2000 Watts
Sandwich maker	~ 1200 Watts
Upright grill	~ 1200 Watts
Microwave	~ 1000 Watts
Toaster	~ 800 Watts
Blender	~ 50 Watts

Remember:

Watts x Hours = energy used.

Large electric hotplate 2000W on for 30 minutes (0.5hr) on HIGH

2000W x 0.5hrs = 1000Wh = 1kWh
@ 17.61 cents/unit

Cost = 17.61c + 1kg greenhouse gas.

Small electric hotplate 1000W on for 30 minutes (0.5hr) on HIGH

1000W x 0.5hrs = 0.500 kWh (½ a Unit)
@ 17.61c/Unit

Cost = 8.8 cents + 0.5kg greenhouse gas.

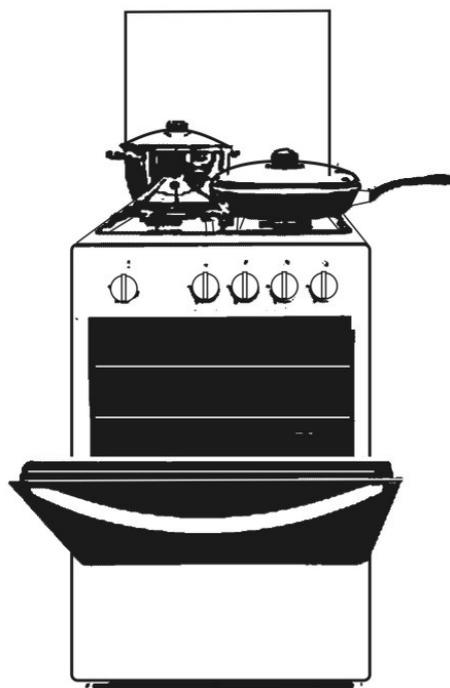
GAS

The smallest gas burner on the stovetop uses about 1 Unit every hour that it is on.

Remember: The Unit shown on the gas bill is the same amount of energy as the Unit shown on the electricity bill.

For more information and costs of cooking appliances, see:

www.clean.energy.wa.gov.au/uploads/cooking_52.pdf



HOUSEHOLD APPLIANCES

Some appliances use a lot of energy – some use very little. Read the label on the appliance. It should show its *power* consumption in Watts. For example:

Toaster 800 Watts
Electric jug 2000 Watts.

‘Power’ is the *rate* of energy use (how *fast* an appliance uses energy).

Some appliances use energy at a high rate (e.g. electric jug 2000 Watts) but are not on for very long (maybe just 3 or 4 minutes).

Some appliances use energy at a low rate, (e.g. the ‘standby’ on a stereo) but stay on for a long time (maybe all day and night).

Cost-cutting tips

To avoid wasting ‘standby’ energy

- turn off switches at the wall, or
- buy a powerboard with individual switches for your entertainment or computer appliances so you can easily turn off everything that you are not using.

Turning off the switches on the board is the same as turning off at the wall.

**Total energy used =
the *rate* (Watts) of energy use
x the time (Hours) it is used for.**

For example:

An electric jug uses 2000 Watts and is on for 6 minutes (0.1 of an hour) each day.

$$\begin{aligned}\text{Energy} &= \text{Watts} \times \text{Hours} \\ &= 2000\text{W} \times 0.1\text{hr} \\ &= 200\text{Wh or } 0.2\text{kWh}\end{aligned}$$

(to boil a few cups of water)

Wasting ‘STANDBY’ power with entertainment equipment

If the ‘standby’ function on a small stereo uses 10 Watts and is on for 24 hours each day.

$$\begin{aligned}\text{Energy} &= \text{Watts} \times \text{Hours} \\ &= 10\text{W} \times 24\text{hrs} \\ &= 240\text{Wh or } 0.24\text{kWh}\end{aligned}$$

A ‘sub-woofer’ (to give an amplifier more bass) with its own power supply can use half a Unit a day just on ‘standby’.

In these examples, the stereo that you were not even using used more energy each day than the electric jug you were boiling!

WASHING & DRYING CLOTHES

Electric clothes dryers use a lot of energy and are on for a long time. The sun is best and it’s free! So use a clothesline if you can.

To wash clothes in

- cold water uses 0.3 Units of energy
- hot water uses 1 Unit.

To dry that load of washing in an electric dryer might use **5 Units!**

If you are not able to dry clothes outside

You will be surprised how fast your clothes can dry inside on a clothesline or on a clothes rack.

Suggestion: Hang sheets over open bedroom doors.

HOME OFFICE EQUIPMENT

✓ Get in the habit of only turning your computer, scanner and printer on when you need them, and then turn them off.

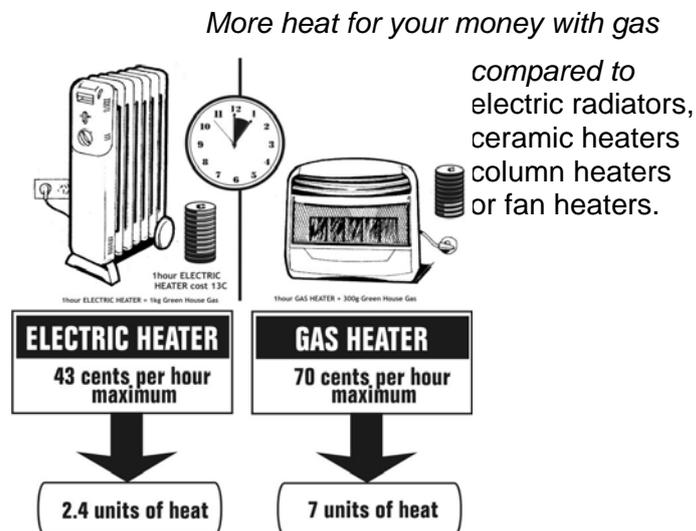
✓ Buy an individually-switched powerboard if any of these items don’t have their own power switch. Place it somewhere you can reach it easily and use it to turn off each appliance.

✓ Make sure you’ve activated all the energy saving features on your computer.

Energy used = Watts x Hours

YOU WILL REALLY SAVE A LOT OF ENERGY if you find out which of your appliances use the most energy. Use these less often or for a shorter time. Usually, hot water uses the most energy; next is air heating and cooling.

See the pie chart on the cover of this booklet and work out if that is true for your home.



SAVING WATER

In the last 30 years, run-off into Perth dams has decreased by 60%. To meet the greater demand of a bigger and thirstier city, desalination (taking the salt out of sea water) has begun – at great expense to the taxpayer. Natural mounds of water (that our bushland needs) are also being used up just to water our lawns and allow people to have long showers!

Gardening

Most of Perth's fresh water is used on lawns and gardens. Here are some tips to save water, which means a little saving in money and a big saving for the environment!

☺ Native plants

Plant all (or mostly) native plants that have always grown in Perth without much water. There is a huge and beautiful variety of groundcovers, native grasses, shrubs of all sizes and small trees to choose from. It's a good idea to visit a native plant nursery and Kings Park in the spring and write down the names of the plants you like. Then you can buy them, very small and very cheap, the next winter.

Plants in these tiny tall pots are called 'tubestock'. They sell for \$1-\$3. They grow well if you start them in May/June and soon catch up with bigger, more expensive potted native plants.

You can choose plants that flower in every season. They will attract native birds and butterflies to your garden. For a list of waterwise garden centres, see www.watercorporation.com.au/_files/Waterwise_Garden_Centres_Listing.pdf

☺ **MULCH** around plants to keep the soil cool and stop water from evaporating from the soil. A mulched garden needs much less water. Tree mulch is much better than mulch in plastic bags from hardware stores.

You can get FREE MULCH (with a long wait) or get it faster for \$49 (delivery fee) from Mulchnet, which only takes orders through its internet site. If you can't access the internet, ask a friend to order it for you. You will get enough for your neighbours to share! www.mulchnet.com

Watering

If you have an automatic sprinkler system, make the water droplets big, so they don't just evaporate.

DRIP irrigation systems are best, watering the roots of plants from under the surface.

☹ Drip, drip, drip...

Ask your landlord/agent to fix dripping taps, inside and outside, and leaking toilet cisterns. **One slowly dripping tap can waste 10,000L of water in a year.** If it's a **HOT** tap, this will cost a lot in electricity or gas as well. Also, make sure that the pressure relief valve from the hot water system is not dripping all the time.



Clothes washing

Wash clothes using as little water as possible and try not to wash until you have a full load. Cold wash is okay for most washing. You may consider buying washing balls (\$50-\$60) which wash your clothes without foam, so you won't need to rinse them. This saves a lot of water.

A twin tub machine is cheaper to buy and cheaper to repair, and you can control exactly what goes on with your washing.

Most front-loader washing machines use less energy and water than most top-loader machines.

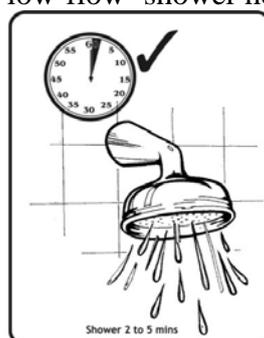
Re-using water

You can re-use the water from your washing machine or shower to water the garden. This used water is called GREY WATER. There are many different types, sizes and prices of greywater systems on the market. But they are not suitable for every household. You should NOT use greywater on vegetables or herbs, but you can use it on fruit trees. It is also best not to use it on lawns that children play on.

Saving water in the bathroom

If you have a storage hot water system, install a 'low-flow' shower head. This should give you 9L a minute or less, which is plenty! Try to limit showers to 3-4 minutes.

BE STRONG WITH YOUR TEENAGERS!



Good luck with your efforts!

ENVIRONMENTAL & SAFETY ISSUES with FLUORO TUBES & GLOBES

Fluorescent tubes and globes (sometimes called 'Energy Saver') contain a small amount of mercury, so must be handled carefully.

When your fluoro tubes and globes don't work anymore, take them to Town of Vincent Administration and Civic Centre, corner of Loftus and Vincent Streets, Leederville. From there, these tubes and globes go to a special recycling centre where the mercury and other components will be recycled safely, and used in new products.

If a fluorescent lamp or tube breaks inside your home, you and your family must try to avoid contact with the mercury gas and broken parts. It is especially important for pregnant women, babies and children to avoid this contact.

1. OPEN windows and doors.
2. TURN OFF air conditioner, fan or heater.
3. Put on disposable rubber gloves.
4. Sweep up pieces with a piece of cardboard (e.g. a playing card) or a brush you can throw away.
5. Use a damp rag for very fine pieces. DO NOT VACUUM, as it will contaminate the vacuum cleaner.
6. Wrap the pieces in newspaper and place carefully in GENERAL RUBBISH BIN.
7. If babies or young children use the room where the globe broke, and it is carpeted, cover the affected area with a mat or replace carpet.

Suggestion: Put together a little kit of all these items

- rubber gloves
- glass jar with tight fitting screw top
- old brush (e.g. stiff paintbrush) you can throw away
- pieces of fine cardboard (playing card ideal).

Make sure all adult members of the household know where to find this kit when needed.

After a breakage, replace used items, to be ready for possible future breakages.