ZAP!

Your Energy Bills

Warrnambool
City Council

WARRNAMBOOL
CITY COUNCIL

Council acknowledges the Peek Whurrong and Kirrae Whurrung Peoples of the Gunditjmara, Eastern Maar Nations as the Traditional Owners of the land, waterways and skies within the Warrnambool municipality. We pay our respects to their Elders past and present.

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Acknowledgement

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Design: www.nainaindira.com

National Relay Service

If you are deaf or have a hearing or speech impairment you can call through the National Relay Service (NRS):

TTY users can phone 133677 then ask for 03 5559 4800 OR 1300 003 280.

Speak & Listen (speech-to-speech) users can phone 1300 555 727 then ask for 03 5559 4800 OR 1300 003 280.

Internet relay users can connect to NRS on www.relayservice.gov.au then ask for 03 5559 4800 OR 1300 003 280.

Contents

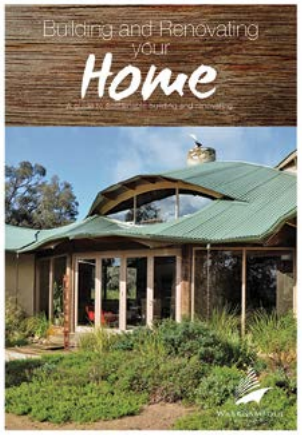
Introduction

Rising energy prices are having a major impact on household budgets. The good news is there are many simple and inexpensive actions you can undertake to lower your energy bills without compromising comfort.

To effectively reduce your energy consumption, first of all you need to understand what your energy 'hotspots' are that are eating up the kilowatts, and secondly, how you can reduce their usage and ultimately your energy bills.

The ZAP booklet focuses on actions for home owners and home renters that cost nothing at all, or for a small investment in energy efficiency, will significantly reduce your energy bills. You don't have to do them all. A few small changes can make a big difference. Start out with inexpensive actions, like turning appliances off at the power point, and remember, the more you do, the more you'll save.

Reducing your energy bill is not only good for your household budget. but has the added important bonus of reducing greenhouse gas emissions.



Warrnambool City Council has also produced a sustainable building and renovation guide to help you reduce your impact on the planet. The guide contains information on building design, construction materials and product options for saving energy and water. Download from **www.warrnambool.vic.gov.au/**

Energy and climate change

To power our homes and vehicles we use large amounts of electricity, natural gas, oil and petrol. The burning of fossil fuels (coal, oil, natural gas and woodl) to create energy produces large amounts of greenhouse gas emissions. These emissions contain high amounts of carbon, with carbon dioxide (CO_2) being a significant greenhouse gas.

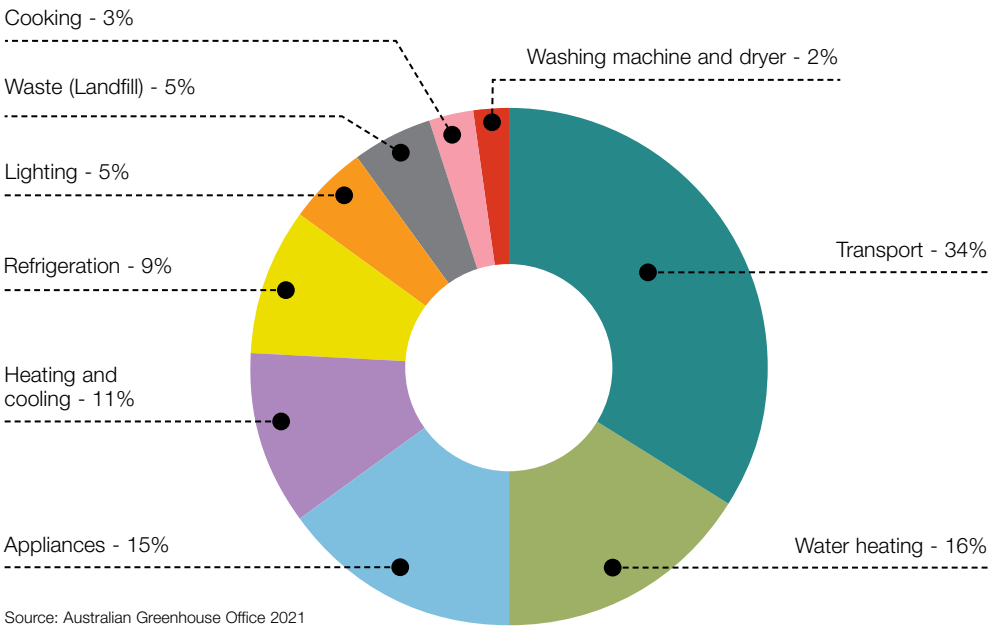
While carbon has entered the atmosphere for millions of years through natural events such as bushfires and volcanic activity, the burning of fossil fuels and the clearing of forests which absorb carbon has resulted in the highest levels of greenhouse pollution in the last 800,000 years.

Greenhouse gases can remain in the Earth's atmosphere for up to 90 years. These gases thicken the atmosphere and trap in heat that would otherwise escape from the Earth. As a result the surface temperature of the planet is rising and effecting our climate patterns.

The impacts of climate change include extreme weather events, such as severe storms and floods, increased bushfires, rising sea levels, and a warming and acidification of the oceans. These changes can be disastrous to our wildlife and ecosystems.

We can all help reduce greenhouse gas emissions by reducing our energy use.

Greenhouse gas emissions for the average Australian household



Source: Australian Greenhouse Office 2021

Energy sources

Choosing the most appropriate energy source can significantly reduce your energy bills as well as greenhouse gas emissions. Energy can be grouped into main categories according to the source of generation: renewable and non-renewable.

Renewable energy

Renewable energy is energy that comes from a source that won't run out. They are natural and self-replenishing, and usually have a low or zero-carbon footprint. Examples of renewable energy sources include wind power, solar power, bioenergy (organic matter burned as a fuel) and hydroelectric, including tidal energy. In Victoria solar and wind power are the main sources of renewable energy that are increasingly feeding into the grid or stand-alone battery storage.

Non-renewable energy

Non-renewable energy is a source of energy that will eventually run out. Most sources of non-renewable energy are fossil fuels, such as coal, gas, and oil.

Coal comes from the remains of plants that died hundreds of millions of years ago. It produces a significant amount of greenhouse gas emissions when burnt.

Natural gas was formed from the remains of tiny sea plants and animals that died millions of years ago. It is mainly composed of the greenhouse gas methane.

Oil can be extracted and refined in order to make products such as petrol, gasoline, diesel, and jet fuel.

Wood is also a non-renewable source that is used in some Victorian homes mainly for heating.

Transitioning to renewable energy

To reduce the impact of climate change, we need to reduce global warming. That means producing fewer carbon emissions and using energy more efficiently. Historically we have used non-renewable energy sources as our main energy source. For the sake of the planet, we need to transition to renewable energy as quickly as possible.

Under Victorian law, new residential dwellings built in Victoria after 1st January 2024 will no longer be built with gas connections.

All-electric homes save hundreds of dollars a year in energy bills, are healthier to live in, and are better for the planet.

GreenPower® Accredited Renewable Energy

In Victoria the State Government is taking action to ensure that 50% of Victoria's electricity will come from renewable sources by 2030.
This includes:

- large-scale solar and wind farms and storage solutions, such as utility-scale batteries
- the retirement of increasingly expensive and unreliable coal-fired power stations
- the pioneering of innovative energy sources, such as renewable hydrogen and offshore wind
- new technologies that let people take control of their energy, such as rooftop solar, neighbourhood and household batteries.

Households can contribute to the transition to renewable energy by:

- switching to a Greenpower electricity retailer. For more information visit: **www.greenpower.gov.au**
- investigating rebates to install rooftop solar panels, solar storage batteries and solar hot water systems. For details visit: **www.solar.vic.gov.au/solar-homes-program.**

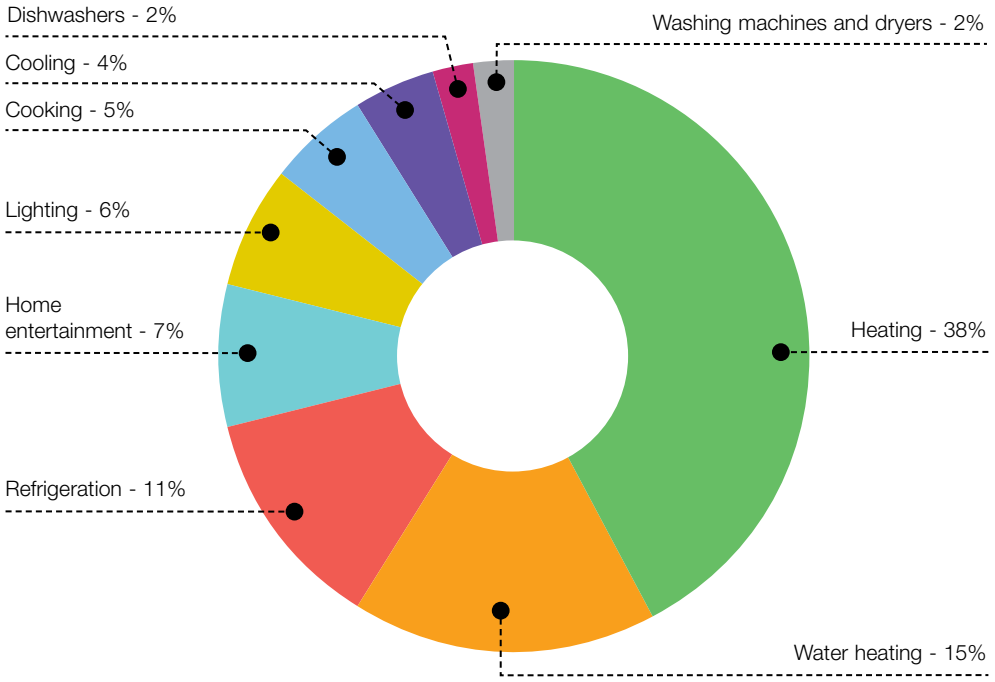
Solar Farm (photo by Tom Fisk)

What's eating my energy?!

Every household situation is different. Factors that will contribute to your household energy usage include:

- the climate where you live
- the size and features of your home
- the energy standard of your heating, cooling, lighting and appliances
- the habits and lifestyle of people in your home
- the number of people in your home
- how much time you spend at home
- your choice of energy retailer.

An important first step is to identify the big energy eaters in your home and consider what you can do to reduce usage. The following provides a general breakdown of Victorian household energy expenditure.



Source: www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home

Monitoring your energy usage

In-home displays allow you to monitor your household energy usage in real-time and help you better understand your solar feed-in tariffs. You also have the option of using your smart meter in conjunction with your provider's Tracker app to monitor your energy usage and receive weekly reports delivered directly to your inbox.

For more information visit: **www.energy.vic.gov.au/for-households/victorian-energy-upgrades-for-households/in-home-displays**

Understanding your energy bill

Your energy bill is another source of information about how much electricity you are using and your energy use patterns. Energy bills will vary depending on who your retailer is, but there are some common key elements to focus on. Here are some common terms used on most bills:

- **kWh:** electricity energy consumption is measured in kilowatt hours. A kilowatt (kW) is 1000 watts of electrical power.
- **Average daily usage:** how much power you use each day on average. It is measured in kilowatt hours (kWh) for this billing period and is often shown as a bar graph. The average Australian household uses 15-20 kWh/day.
- **Average cost per day:** how much you pay each day on average for energy for this billing period.
- **Charge/kWh:** electricity usage is priced in cents per kilowatt hour.
- **Peak and off-peak:** if you choose a flexible pricing or time-of-use electricity plan, there will be different charges for peak and off-peak use.
- **Service to Property:** a fixed charge that is also called the 'daily supply charge'.
- **Flexible Pricing:** was introduced in 2013 to provide more choice and control over your power bill. Switching to flexible pricing is voluntary. You need to have a smart meter and contact your electricity retailer to provide consent.

For more information on reading your bill and flexible pricing visit: **www.energy.vic.gov.au/for-households/help-paying-your-bills/understanding-your-energy-bill**

Other possibilities:

- **Greenhouse gas emissions:** some retailers convert your energy usage into the equivalent greenhouse gas emissions. This is usually measured in tonnes and illustrated on your bill as a bar graph or line.
- **Renewable energy tariffs (GreenPower):** most retailers offer you the option of signing up for a portion of your electricity to come from renewables such as solar, wind or biomass.
- **Solar feed-in tariff:** if you have a solar electricity system you have the option of feeding excess power into the grid to obtain credit.

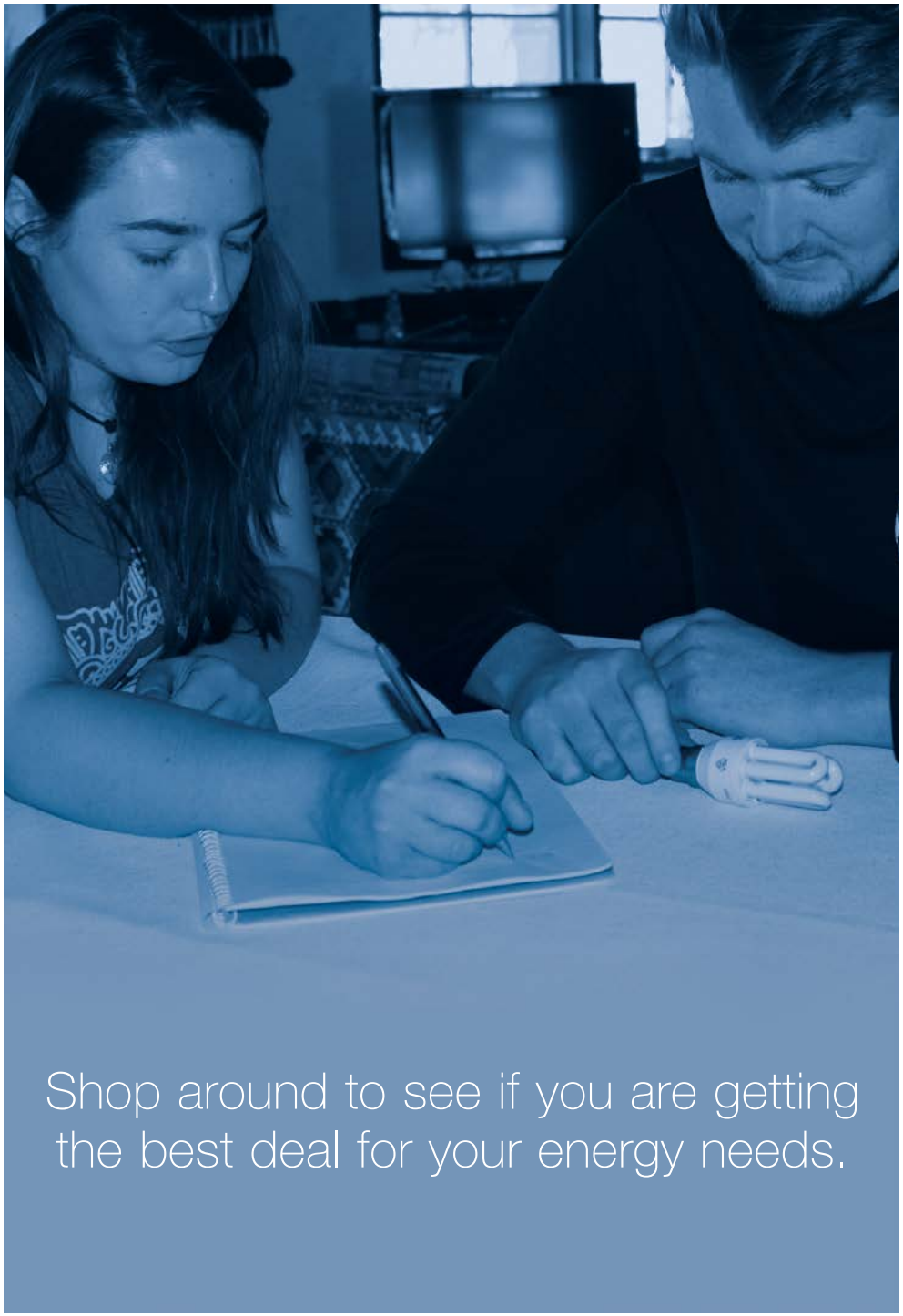
Choosing an energy retailer

One way to reduce your electricity and gas costs is to shop around to see if you are getting the best deal for your energy needs. All you need is a copy of a current electricity or gas bill with your consumption information.

A good starting point is to visit Victorian Energy Compare that provides an independent overview of energy retailer contracts and a comparison of different electricity and gas tariffs in your area.
Visit **www.compare.energy.vic.gov.au**

When contacting an energy retailer to compare offers ensure you:

- compare costs accurately by asking what their price is in cents per kilowatt hour
- check whether there are any fees for issues such as late payment or early contract termination
- find out if there are any service fees you may have to pay
- check their billing and payment arrangements including how and when you are billed and your payment options. Do they have time-of-use pricing or an off-peak hot water option?
- ask what happens at the end of the contract period. How do you renew or what happens if you wish to change retailers?
- it is a competitive market, so ask if they have any bonuses or savings on offer.



Rating labels

The Australian Government has worked with industry and state and territory governments to develop of system of energy and rating systems on a wide range of products.

Strict criteria determined under the Australian Standards must be met for a new product to be granted a rating label. This system enables consumers to compare the energy and efficiency and running costs of appliances and equipment before purchase. It means you can:

- buy more efficient models
- consume less energy
- save money
- reduce greenhouse gas emissions.

When comparing similar sized products, you need to compare the number of stars and the energy consumption per year. The lower the kilowatt consumption per year, the less electricity the product uses.

The more stars the more efficient and cheaper it is to run. For example, you can save up to 20% on the running costs on your television with every extra star.

Be sure to read the conditions of use underneath the stars and the amount of energy that appliance will use under those conditions. Be wary of buying products that do not have a label as it can mean they are not very efficient.

Different type of energy rating labels

These labels use stars to show the efficiency of a large range of appliances and equipment. The more stars, the more efficient the product is. Most appliances are rated between 1 and 6 stars. However, as technology gets better, so does their energy efficiency. More recent energy efficient products will have an energy rating label with an extra row of stars with the highest rating now being 10 stars.

Six and ten star energy rating labels

Some products, such as washing machines, carry energy rating labels that will compare energy usage for a cold wash compared to a warm wash.

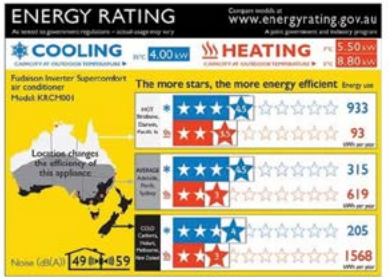
A new Energy Rating Label has been introduced for air conditioners.

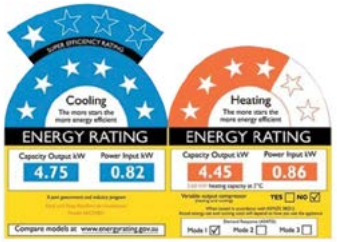
The new Zoned Energy Rating Label breaks down the systems efficiency over three climate zones across Australia and New Zealand. Most of Victoria is in the cold climate zone. The northwestern corner is in the mild climate zone.

You may see the old Energy Rating Label on systems as the market transitions to this new Zoned Energy Rating Label.

While it's a great start to buy energy efficient appliances, it is also important to use them efficiently, so you are not wasting energy – and paying the price!

Hot and cold wash energy rating label





Zoned energy rating label

Resources

For product comparisons and access to the energy rating calculator visit:
www.energyrating.gov.au

Plan of attack!

Once you've determined what are you main energy eaters you can develop a plan of action to reduce your household energy use.

It is important to get everyone in your household on board with saving energy. Working together will make it easier to put in place and maintain energy efficiency measures.

Write up an energy saving plan of what actions you would like to do, who is responsible and when you aim to achieve them.

Start with inexpensive actions that mainly relate to behaviour change. Put reminders on the fridge or next to power points and light switches.

Commit to replacing old appliances with high energy rated electric products either as you can afford it, or as your old products need replacing.

Research the cost of replacing your big energy users. You may not be in a position to switch from an electric hot water service to a heat pump now, but is it something you can budget towards in the near future?

Monitor your success against your declining daily energy usage rate on your household energy bill.

Resources

Sustainability Victoria Household Energy Action Guide
https://assets.sustainability.vic.gov.au/susvic/Report-Energy-Households-Energy-Action-Guide.pdf

Standby energy controller


Double glazed window

Renting advice

If you are renting your house or apartment there are many actions you can undertake to reduce your energy bill. Small changes like switching off appliances, turning down the thermostat on your hot water or switching your light globes to LED lamps, or inexpensive purchases such as door sausages or a pedestal fan, will not impact on your rental agreement. You can also shop around and choose your own energy retailer.

If you would like to explore options for installing solar, contact your property manager or rental provider to let them know about the Solar for Rentals rebate and the potential to save thousands of dollars on the upfront cost of installing a solar system.

For any structural changes to your house or apartment e.g. external blinds on your windows or planting a large tree, you will require the written permission from your landlord, property manager or real estate agent. Most landlords will agree to increasing the value of their property and there are a range of government rebates and tax deductions available for property owners making sustainable improvements.

For advice on approaching landlords and a sample letter requesting structural alterations, check out the ATA Renter's Guide to Sustainable Living.

And remember, even if your landlord won't invest in a more sustainable future, there are a multitude of things you can do as a tenant to use energy more efficiently.

Resources

Solar for rentals: **www.solar.vic.gov.au/information-renters**

ATA Renters Guide to Sustainable Living (Free publication):
www.renew.org.au/publications/renters-guide-to-sustainable-living/

If you live in a shared household it is important to get everyone on board with saving energy. Working together will make it easier to put a plan in place and maintain energy efficiency measures.

Adjustable shading

Building and renovating advice

When you are building or renovating your home is one of the most important times to consider energy efficiency. Building an energy efficient home should cost no more than a conventional home and will save you money in the long term with lower energy bills. Factors to discuss with your architect and builder include:

- Passive solar design to orientate your house to receive the winter sun and exclude the summer heat as best as possible
- Locate living areas to the north, bedrooms to the south. West-facing walls receive the strongest sun at the hottest part of the day in summer. Locate your garage or a pergola to the west to reduce exposure
- Choose the highest rated insulation you can afford
- Consider creating a space specifically for heatwave respite. A highly insulated, well-shaded room with small or no windows, closable doors and an energy efficient mechanical cooling system can careate a sanctuary in the worst of the heat
- Incorporate well-placed windows, skylights and light tubes to bring more natural light into your home
- Use double glazed, wood or fibreglass framed windows to control heat gain and loss
- Try to group rooms that will use hot water close together, with your hot water system located as close as possible. Ensure the pipes are insulated. Shorter pipe length and insulation will reduce heat loss from the pipes
- Zone areas with similar heating needs by adding walls and doors to allow spaces to be heated or cooled separately
- Use multiple light switches to control the number of lights on in a room at one time rather than one switch that turns on all the lights in the room
- Ensure your roof, walls and floor are insulated to keep the heat inside in winter and outside in summer
- Include space for a clothesline.

Resources

Energy Smart Housing Manual:
https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/energy-smart-housing-manual

Warrnambool Building and Renovating your Home Guide
www.warrnambool.vic.gov.au/

Heating and cooling

Heating accounts for around 38% of the average Victorian household bill with cooling around 4% making this our highest hotspot. This equates to 11% of greenhouse gas emissions from the average Australian household.

Our first challenge is to consider actions we can undertake to reduce our household heat gain in summer and heat loss in winter. There are a lot of inexpensive things we can do before resorting to switching on an expensive heater or cooler.

Inexpensive actions

Dress for the weather instead of turning on a heater or cooler. It's easy to put on a jumper and grab a cuddly blanket in winter.

Instead of an electric blanket consider a hot water bottle and extra blanket on the bed.

Switch off your heater or air conditioner an hour or so before you go to bed. The living area will generally stay warm/cool until you retire.

If you have a thermostat on your heating and cooling devices, adjust the settings as the seasons change. Generally 25-27°C in summer, 18-20°C in winter.

Leave your oven door open after cooking to let the heat warm your kitchen in winter.

Use rugs or carpet on timber or slab floors.

Safety plugs on unused power points can prevent outside air leaking into your home.

Place portable heaters away from windows.

Try and zone your house by closing doors to only heat or cool the rooms you are using. Make sure pantry doors and cupboards are closed.

Create a shady spot in your garden to relax in summer and an open sunny position to lounge in the winter sun.

Regularly clean your air filters and outlets.

Hot water bottle

Use open windows and doors to try and capture cooling breezes in summer, particularly early and late in the day. Close your windows during the hottest part of the day. Make the most of any natural airflow by opening low-positioned windows to bring the breeze in and high windows to let the hot air out.

In summer close your curtains during the hottest part of the day and open the curtains and windows at night to let warm air out and a cool breeze in. In winter, open your curtains during the day to let the sun in and close them before it gets dark to keep the heat in.

Fitted pelmets will prevent heat loss above the windows by sealing the top of the curtain. Pelmets can be made of any material as long as it creates an air barrier. They can be made of fabric, cardboard or bubble wrap! Pelmets simply need to be attached to the wall and reach slightly over the top of your curtains, virtually invisible from floor level.

Draughts

Up to 25% of heat loss in a house can be through draughts. Plug gaps. Use weather sealing and caulking to seal cracks and gaps around doors, windows, skirting boards, exhaust fans and the floor. There are different sealing products available for different situations, so consult your retailer. Seal off draughts with door 'sausages' or commercial door seals.

For further information visit Sustainability Victoria: **www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/key-principles-of-energy-efficient-design/planning-and-design/insulation/draught-proofing**

Pelmet

Caulking gun

Windows and doors

Shading your windows will vary depending on which way they face because the sun varies its height and angle from summer to winter. Fixed horizontal shade from eaves or pergolas are ideal for shading north facing windows. During summer east-facing windows gain heat from the low angled morning sun, while west-facing windows can be a major source of heat gain in the afternoon. Adjustable external shading from shutters and awnings provide flexibility to block the sun as it moves through the day.

External roller-shutters, blinds and awnings on the outside of windows can reduce heat gain through west and north-facing windows in summer by up to 85%, particularly if the material is a light colour to reflect the heat. They are more efficient than internal curtains or blinds.

Consider planting a fast growing deciduous tree to provide shade in summer and then drop leaves to allow the winter sun to enter. The tree/s should grow tall enough to shade the walls and roof and be planted on the north or west sides of the house to be most effective. A trellis of vines can also shade your house. Discuss species selection with your local nursery.

For further information visit: **https://www.warrnambool.vic.gov.au/plant-selector-tool**

Up to 40% of heat in your home could be leaking out your windows. The best energy conserving curtains are made from a heavy fabric. Floor-length curtains will stop air entering at the base.

Double glazed wood framed windows are most effective at controlling heat gain and loss through windows. If this option is too expensive, consider secondary glazing whereby a sheet of clear acrylic is placed inside an existing window with a spacer to create an air gap. Or apply solar window film to existing glazing to halve the amount of solar energy passing through the window, but be aware that they can reduce natural light levels indoors and solar warmth in winter.

For further information on glazing options and products visit the Window Energy Rating Scheme: **https://awa.associationonline.com.au/werscontent/what-is-wers**

Cool your roof

Reflecting solar heat away from the roof and insulating the ceiling are two of the most effective ways of cooling your house.

Paint a tile or metal roof with reflective paint and attach reflective foil to the underside of the roof to make it more heat reflective.

Make sure your ceiling has proper thermal insulation such as glasswool batts or blankets, natural wool underlay or recycled loose-filled cellulose fibre.

Recessed lights and downlights for fire safety reasons require an insulation clearance space. This creates a swiss-cheese effect that reduces the energy efficiency of your ceiling insulation.

For further information visit Sustainability Victoria: **https://www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/building-or-renovating/key-principles-of-energy-efficient-design/planning-and-design/insulation/ceiling**

Mechanical cooling options

Try and buy the highest energy rated product you can afford.

Fans

Portable table and floor fans or fixed ceiling fans are cheap to run and have lower greenhouse gas emissions compared to air conditioners. They circulate air, but do not reduce the temperature or humidity. However, they can be adequate for households who can reduce the heat entering the house in the first place.

Use ceiling fans instead of an air cooler. Most have a winter/summer switch. In winter they should be set to low speed to avoid creating a draught as they push the warm air trapped at the ceiling back to floor level. In summer the ceiling fan blades can be adjusted to draw up cool air.

Ventilate your roof space to prevent a build up of heat and moisture. Consider thermostat controlled fans or closable ventilators.

Summer/winter switch on ceiling fan


Ducted evaporative cooler

Evaporative coolers

Evaporative cooling systems draw air through a moist pad, cooling and humidifying the air before it is blown through your house. They are available in ducted, wall-mounted and portable units, and work best in hot, dry conditions. Evaporative coolers are less effective on humid days.

Energy usage is low because the evaporation of water provides the cooling energy. The only electricity that is used is for the operation of the fan. High energy rating coolers have efficient fans, while some models consume more energy than necessary.

To work effectively some windows and doors must be open for central evaporative cooling units to allow the hot air to escape the house. However, portable evaporative coolers should not be placed next to open doors or windows, particularly on windy days, as that can let in a lot of heat.

Winter covers are available for evaporative air coolers to prevent heat lose in winter.

Evaporative coolers can use a reasonable amount of water which may be an issue with water restrictions.

Air conditioners

Air conditioners provide comfort in any climate but use a lot more energy than fans or evaporative coolers and create more greenhouse gases than either.

Air conditioners extract heat from the air inside your house and transfer it outside, cooling the air to a temperature determined by a thermostat. They are available in portable, room and ducted systems.

Choosing the correct size is important. Visit **http://choice.com.au** and search ‘what size air conditioner do I need?’

For efficient air conditioning, the house or room should be sealed and insulated, and the windows shaded from the summer sun.

Shaded air conditioner units are 10% more efficient than those fully exposed to the weather. Locate the unit on the shady side of your house and make sure it has good airflow around it.

If a hot day is predicted, turn on your air conditioner early rather than wait for the house to become hot. It operates more efficiently when the outside air temperature is cooler.

If your air conditioner has adjustable louvres, adjust them towards the ceiling when cooling as warm air rises and cool air falls.

If your air conditioner has a thermostat use it wisely. Each degree lower in summer will increase energy use by about 10%. It is generally recommended that thermostats are set for 25-27°C in summer. Remember to adjust your thermostat as the weather changes.

Regularly maintain your cooling systems as per the manufacturer’s instructions to ensure efficient operation. In particular, clean the filters of your system at the beginning and end of each season to ensure it runs smoothly.

Unplug unused coolers or switch them off at the power point.

COST COMPARISON

Type of cooling	Power	Hourly running cost*	Cost over summer*
Pedestal or ceiling fan	30-75 Watts	1-2 cents	$0.68 - $1.70
Evaporative cooler	800 Watts	23 cents	$18.17
Air conditioner**	1500-3000 Watts	43 – 85 cents	$34.08 - $68.16

* Based on a cost of 28.4 cents/kWh and running 80 hours over summer
** Air conditioners vary in size and this is a relatively small unit

Mechanical heating options

This is THE big energy user so try and buy the highest energy rated product you can afford.

Inexpensive actions

Many people think that if you are leaving the house it is more efficient to leave your heating on low and then turn it up when you return. This practice uses more energy than switching off your heating and starting it up again when you return. If your heating appliance has a timer, program it to switch on 15 minutes before you return home.

Central heating tends to use more energy than space heating as you are usually heating more of the house. However, if you can program your central heating to zones within the house you can reduce your energy usage.

If your heater has a thermostat it is generally recommended that you set it to 18-20°C in winter. Remember to adjust your thermostat as the weather changes.

Regularly maintain your heating system as per the manufacturer's instructions to ensure efficient operation. In particular, keep reflectors shiny and free of dust and clean the air filters of your system at the beginning and end of each season to ensure it runs smoothly.

Unplug unused heaters or switch them off at the power point.

Gas heaters

If you have gas heating the first step is to investigate the option of switching to electric. The Victorian Energy Upgrades (VEU) program provides the following rebates to electrify your home heating:

- About $900 to replace a non-ducted gas heater with a non-ducted reverse cycle air conditioner.
- About $3,600 to replace a ducted gas heater with a ducted reverse cycle air conditioner.

For more information visit: **https://www.energy.vic.gov.au/households/victorian-energy-upgrades-for-households**

If you are not in a financial position to replace your gas central heating you can improve energy efficiency by:

- ensuring ducts are insulated and well-sealed
- cleaning the return air grille of the air vents regularly over winter
- zoning to only heat the occupied rooms rather than the whole house.

Gas heating systems should be serviced at least every two years. Include a check on the carbon monoxide levels when the heater is operating.

Electric heaters

Electric space heaters can be cheap to buy but expensive to run. Try to avoid electric heaters such as bar, fan and oil-filled models if possible.

An efficient reverse-cycle air conditioner or heat pump are the most energy efficient type of electric heater.

Use the timer on your heater so they are only turned on and off when required.

Consider switching the timer on in winter during the off-peak period before you get up and down low in the peak period to save money.

Generally portable electric heaters are used to heat a small area of one or two rooms and have variable efficiency.

Radiators and bar heaters are reasonable for bathrooms as they provide almost instant heat for a short period of time. Make sure they are switched off when you leave the room.

Fan heaters can warm small rooms quickly. Larger upright models are more effective and some have thermostats to help reduce energy use. However, they are very inefficient and expensive to run.

Oil filled column heaters are more suitable for large rooms with high ceilings where you plan to spend a good amount of time. They take a long time to heat a room, but maintain a balanced temperature. Some have thermostats, timers and fans, but they are slow to respond.

Wood heaters

While an open fireplace creates a lovely ambience it is a very inefficient way to heat a room. Up to 80% of heat goes up the chimney rather than into the room. Wood or pellet heaters vary in running costs depending on the type of wood, how well the system is sealed for heat loss and the efficiency of the fan that pushes heat around the room.

Wood heaters are effective in heating large open plan areas, but it is difficult to adjust the temperature and they are often supplemented by other forms of heating in the house. In addition they produce large amounts of greenhouse gases from smoke and the harvesting and transporting of firewood.

Smoke from wood-burning heaters can affect your health. Long-term exposure can cause heart and lung disease while brief exposures can aggravate asthma or worsen pre-existing heart conditions.

Resources

www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home/heat-your-home-efficiently

Some common heating options:

Fuel	Heater Type	Details	Best Use	Relative Running Costs
WOOD	**Open Fire**	Poor efficiency as most heat rises up chimney rather than into room.	None.	High - Low#
	Wood Heater	Suitable for whole of small house or small to large living areas. Sustainable supply of firewood should be used.	Living areas, regions with no access to gas.	High - Low
	Pellet Heater	Suitable for whole of small house or small to large living areas. Waste wood shavings should be used to form pellets.	Living areas, regions with no access to gas.	Med - Low

How does your wood stack up?

Choose wisely when buying your firewood. Ask your supplier for the most sustainably produced firewood.

To choose environmentally sustainable firewood and firewood alternatives, ask these questions:

- Is it sourced from outside native forests?
- Is it a local Victorian product, sustainably produced?
- Is from a tree-replanting program plantation based or woodlots on private land?
- Is recycled or offcuts?

Finding the right type of firewood can sometimes be challenging, but it is good to support suppliers trying to do the right thing.

Depending upon whether or not you pay for your wood supply.

Fuel	Heater type	Details	Best use	Relative running costs
ELECTRICITY	**Radiator**	Radiates heat at a person, does not heat air space.	None.	High
	Column/panel	'Efficient' units have thermostats but still use a lot of energy.	None.	High
	Fan	Pushes heated air around room. Not suitable for bathrooms or large rooms.	Small rooms for short periods of time.	High
	Underfloor	Coils located in slab. Can be zoned and used at low temperatures.	None.	Very High
	Inverter (air to air heat pump)	Highly efficient units are now available. They come as air heaters or water heaters for hydronic heating and can be used for hot water as well.	Whole of house.	Med - Low
	Geothermal (ground to air heat pump)	Highly efficient units are now available. They use heat from in the ground to heat air or water. High up front cost.	Whole of house.	Med - Low

Patio heaters

These have become a popular source of heating outdoor entertainment areas on a chilly evening.

Gas-powered patio heaters mainly use convection heating to warm the air around them. Electric infrared patio heaters or strips often use only infrared radiation to warm objects without heating the air around them too. As you can imagine, a great deal of energy is wasted trying to warm up the air, as opposed to the people trying to keep warm.

In summary electric infrared outdoor heaters are more efficient and emit less greenhouses gases than gas patio heaters, but a much better option is to put on warm clothes and pull out a lap blanket!

Reverse-cycle air conditioning

Reverse-cycle air conditioning performs both heating and cooling functions. Unlike other systems, reverse cycle air conditioners allows the user to either cool down a house in the summer or warm it up in the winter using a single device.

Central heating

a) Ducted reverse-cycle

This system provides whole house heating and cooling through one set of ducts, usually located in the roof space.

Heat from the outside air is pulled into a central unit. From there it's blown through ductwork to outlets in the home. The air then returns to the indoor unit to be re-heated.

The indoor air temperature is controlled by a thermostat.

This system doesn't generate heat directly using an electric element. Instead it uses heat pump technology to extract heat from the outside air. This makes it the most efficient form of electric heating.

b) Multi-split reverse-cycle

This system has one outdoor unit that pulls heat from the outside air and transfers it to multiple indoor outlets (or heads) in different parts of the home through refrigeration piping.

Each indoor outlet can be controlled independently.

Room heating

Room reverse-cycle air conditioners heat and cool a single room or open plan area. The most common systems are split systems. Window-wall mounted units are not very common any more, but are still found in older houses. They're less efficient and noisier than split systems.

Split systems have an outdoor unit that extracts the heat from the outside air and transfers it to an indoor unit with a heat exchanger and fan to blow the heated air around the room.

Most indoor units are wall mounted. Although floor and ceiling mounted units are also available.

Hot water

Hot water accounts for about 15% of household energy cost and is responsible for 16% of the total greenhouse gas emissions from home energy use. More than half of hot water use is in the bathroom, a third is in the laundry and the remainder is in the kitchen.

Inexpensive actions

One of the best ways to reduce hot water use is to install water efficient showerheads and taps. Not only will you will save on water, but also energy as you have to heat less water. Water efficient (3-star) showerheads can reduce use by about half.

Have short showers.

Immediately repair dripping hot water taps and leaking appliances.

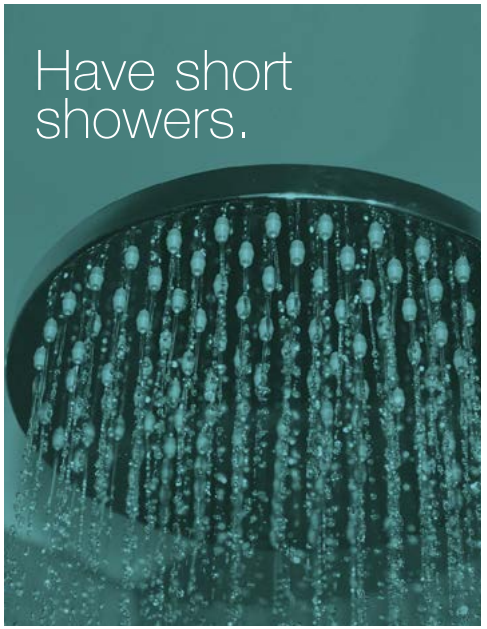
Turn off your hot water system when you go on holidays by switching it off at your meter box.

Ensure that the thermostat on storage hot water systems is set at 60°C. A higher temperature than this means that energy is used unnecessarily. Instantaneous hot water systems should be set to 50°C.

If you are buying a washing machine or dishwasher ensure it has a cold water or economy cycle option and use these cycles as much as possible. Ensure loads are full.

Insulate hot water pipes, including plastic pipes, as heat loss can occur from the hot water in the pipes. This is known as lagging and can be purchased at low cost from hardware stores.

If your hot water system is exposed to the weather consider enclosing it in screens to reduce heat loss. Just make sure it can still be accessed for maintenance.




Lagging

Hot water systems

The most energy-efficient systems for heating water in your home is either solar or electric heat pump hot water systems.

Solar powered systems usually have a electricity booster that operates when the storage tank temperature falls below desired levels. There are two main types of solar water heaters: flat-panel or evacuated tube systems.

Flat-panel systems collect radiant heat from the sun through solar collection plates that heats the water in a water storage tank.

Flat-panel units can be damaged by frost, so be sure to discuss this with your retailer.

Evacuated tube systems contain parallel rows of transparent glass tubes. Each tube contains a glass outer tube and metal absorber tube attached to a fin. The fin's coating absorbs solar energy while inhibiting radiant heat loss.

Visit **www.solar.vic.gov.au/solar-homes-program** for details on the Victorian Government's hot water rebate and to download the Hot Water Buyers Guide.


Solar flat-panel hot water system

Heat pump hot water systems use a refrigeration cycle to extract heat from the surrounding air. They then use a heat exchanger to heat water in an insulated storage cylinder.

These systems typically use around 60 to 75% less electricity than a conventional electric hot water system. This is because the electricity is used to operate the heat pump and doesn't heat the water directly with an element.

Heatpump hot water systems work in a similar way to reverse-cycle air conditioners when run on a heating cycle, but heat water instead of the air inside your home.

Heatpump water heaters are normally a single integrated unit installed outside on the ground. In other cases, the unit is split between the heat-pump, located outside, and a storage tank which can be installed either outside or inside.

Heat pump

Resources

www.sustainability.vic.gov.au/energy-efficiency-and-reducing-emissions/save-energy-in-the-home/water-heating

Appliances

Household electrical appliances, including whitegoods such as refrigerators, stoves and washing machines, plus entertainment and office equipment accounts for about 27% of the average Victorian energy bill.

Standby power

On average standby energy accounts for about 3% of our household energy usage. It's easy to switch off appliances at the power point and save money.

Standby power refers to electricity many appliance continue to draw when not switched off at the power point. Any appliances that is turned on and off with a remove control or have a digital display or memory setting will use standby power. Washing machines, microwave cookers, expresso machines, computers, printers, televisions, DVD players, games consoles, battery chargers and power packs are all typical examples.

Inexpensive actions

Switch appliances off at the power point when you are not using them. After a short period of time it can become an automatic habit that you don't even have to think about!

You can also consider installing Standby Power Controllers that plug into the power point and eliminate standby power from the attached appliance. Energy saving efficiencies vary considerably between products.

Standby power refers to electricity many appliance continue to draw when not switched off at the power point.

Choosing and using appliances efficiently

Whenever possible buy an energy efficient appliance. It may be more expensive than other models to purchase, but can save you money on your bills for years to come and reduce your environmental impact.

Avoid buying appliances that you don't really need. Why buy a clothes dryer when you could use a clothesline or clothes rack?

Buy the right sized appliance to suit your needs. Why buy a large freezer if a small one will suffice?

Follow the manufacturer's instructions when positioning, operating and maintaining your appliances.

Visit **https://reg.energyrating.gov.au/comparator/** before making a purchase.

Refrigerators and freezers

Inexpensive actions

Make sure you have adequate ventilation space (at least 50mm) around the sides and top of you fridge.

Place your fridge or freezer in a cool location out of direct sunlight and away from ovens and dishwashers.

Clean your door seal regularly. It should hold a piece of paper firmly in place when closed. If not, buy a new seal and replace.

Set your fridge thermostat between 3°C and 5°C. The freezer should be between -15°C and -18°C. Every degree lower requires 5% more energy.

Don't overload your fridge or freezer, or leave it too empty. There should be about 20% free space for good air circulation. However, when you open your fridge door, warm air comes in to replace the cool air inside. Your fridge now needs more energy to maintain temperature. So, the more empty space, the more warm air will enter, the more energy your fridge will use. Try to keep your fridge reasonably stocked to 80% capacity, or use containers filled with water to reduce empty space.

Avoid putting hot food directly in your fridge. Let it cool down first.

If you are going away for a reasonable period of time defrost your fridge and turn it off.

If you have a second fridge for entertaining, switch it off when it's not needed.

Keep the fridge door closed as much as possible.

Selecting a fridge or freezer

Fridges and freezers are one of biggest energy guzzlers. If you can, it is worth investing in a high energy rating product.

Select the right sized model for your needs. Too big and you will be cooling empty shelves, too small and you may end up buying a second fridge which will result in higher overall energy costs.

Chest freezers are usually more efficient than upright models as cold air does not escape every time you open the door.

Through-the-door features such as cold water dispensers and ice-makers use more energy.

Dishwashers

Inexpensive actions

Avoid rinsing dishes under the hot water tap before placing in your dishwasher.

Run the dishwasher only when fully loaded.

Use the cycle with the lowest temperature and the shortest time when you can.

Check the manual to see if you can open the door to let dishes dry naturally rather than using the drying cycle.

Always clean the filter between washes.

Selecting a dishwasher

Buy the highest energy star rating model you can afford.

Select the right-sized model for your needs. Two drawer models are available that allow for smaller loads. Look for a good range of programs including economy options.

Look for models with hot and cold connections.

Washing machines

Inexpensive actions

Wash with cold water, except for greasy clothes or nappies.

Wash with a full load.

Selecting a washing machine

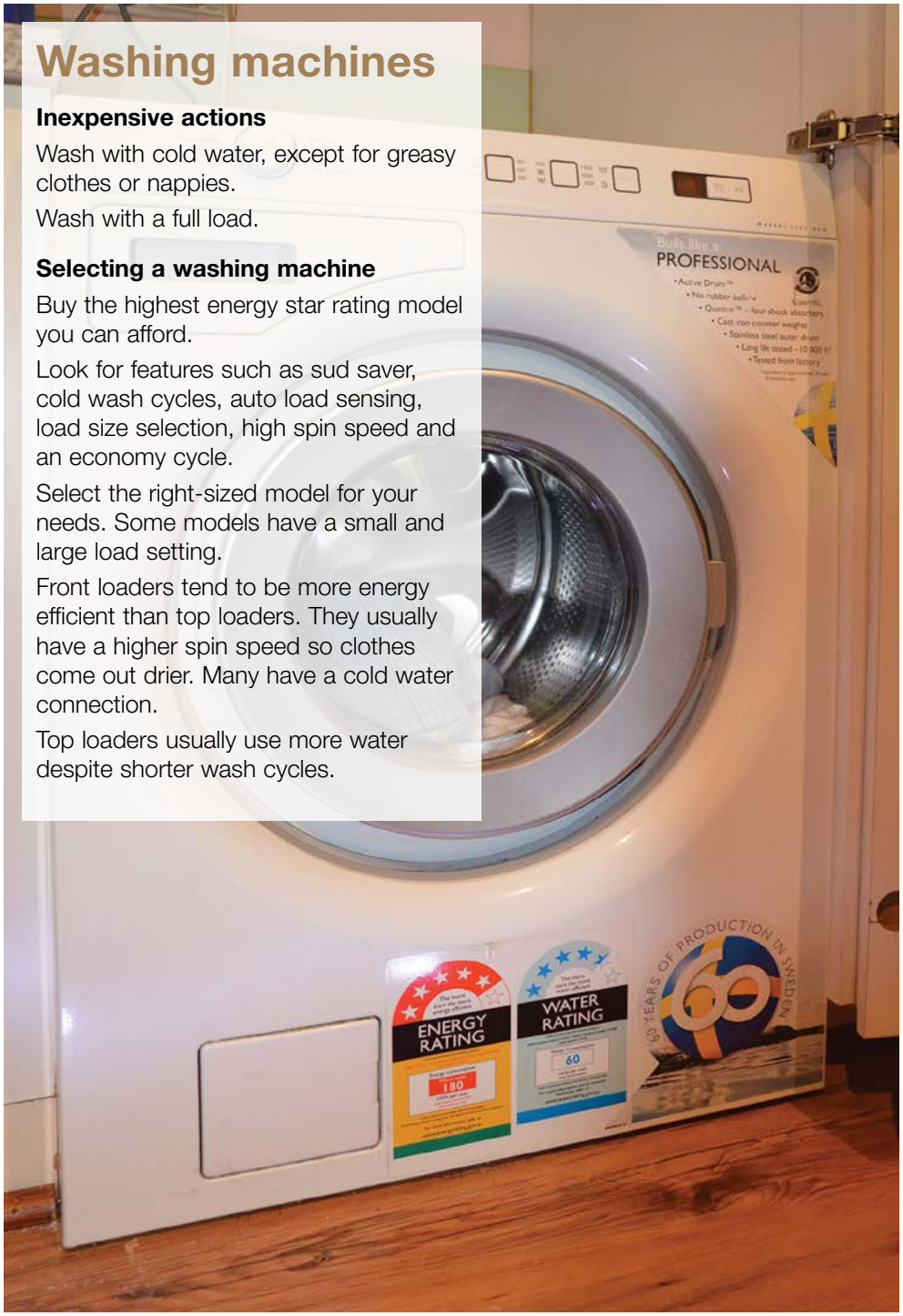
Buy the highest energy star rating model you can afford.

Look for features such as sud saver, cold wash cycles, auto load sensing, load size selection, high spin speed and an economy cycle.

Select the right-sized model for your needs. Some models have a small and large load setting.

Front loaders tend to be more energy efficient than top loaders. They usually have a higher spin speed so clothes come out drier. Many have a cold water connection.

Top loaders usually use more water despite shorter wash cycles.



Clothes dryers

Inexpensive actions

Dry your clothes on the clothesline or clothes rack.

If you don't have space for a clothes rack or clothes line, use your dryer sparingly.

Spin clothes well in the washing machine before putting them in the dryer.

Partly drying clothes outside will save energy. You can then use the dryer to finish off any damp articles of clothing.

If possible do multiple loads in a row. A dryer generates a lot of heat, so piggybacking that heat into the next load will help dry clothes faster.

Run the dryer on a medium heat setting rather than high.

Don't over-dry your clothes. It helps if you separate your loads into lightweight and heavyweight articles.

Run your lightweight articles for a shorter period of time.

Don't overload your dryer.

Clean the lint filter regularly.

Selecting a clothes dryer

Clothes dryers consume a large amount of energy to dry our clothes. Most dryers have a low star rating of two stars or less.

Consider buying a gas fired or heat pump model. Look for auto-sensing, easily accessible lint filters and features such as reverse tumbling and special fabric settings.

Entertainment and office equipment

Inexpensive actions

Turn off your equipment at the power point when not in use.

If you are away from your computer for any length of time, turn off your computer screen. Screensavers don't save power unless they turn the monitor off.

Only switch on your printer when you need to use it. Many printers are left on for long periods of time drawing standby power.

Selecting equipment

Usually, the larger the TV or computer monitor, the more energy it uses.

An LED/LCD television is generally cheaper to run than a plasma screen. Many new TVs have an energy saving mode which can help reduce energy usage.

MP3 players use far less energy than large stereo systems.

Computers and monitors account for up to 5% of home energy use. Laptop computers use less energy than most desktop computers.

Cooking

Around 4% of Victorian household energy bills is attributed to cooking. The majority of cooking is done in the early evening which is usually corresponds with the peak tariff rate. You can save money by cooking as efficiently as possible.


Induction cooktop


Air fryers

Selecting cooking appliances

Cooking is one of the oldest of technologies. The basic idea of heating food to kill bacteria and make something nutritious and tasty is fairly prehistoric. From roasting on a wood fire to cooking with gas and electricity we've come a long way.

More recent inventions include the microwave oven that uses high-energy radio waves to heat food quickly and efficiently in a fraction of the time you need with a conventional oven. Other new forms of cooking include air fryers and induction cooking.

Induction cooktops

Induction cooking uses electromagnetism (generating electricity using magnetism) to turn cooking pans into cookers. The cooktop surface only heats when a pan is present. This contains the heat in the pan itself and not in the surrounding environment. Food cooks more quickly with less energy.

Induction cooktops:

- are around 3 times more efficient than gas cooktops, driving down bills.
- promote cooler kitchens
- are also far healthier because they avoid emissions of harmful contaminants that cause respiratory illnesses and symptoms
- are favoured by a growing range of professional chefs because they heat with more precision, cook quicker and with greater temperature control.

For information on the Victorian Energy Upgrades program incentives to transition to induction cooktops visit: **www.energy.vic.gov.au/households/victorian-energy-upgrades-for-households/induction-cooktops**

Air fryers

As a rule of thumb, the larger your appliance is, the more electricity it will use. Air fryers owe their short cooking times to their small size and super convection, which provides a large volume of hot air to the chamber. Small spaces generally take less time to heat up, and most air fryers only have capacity of two to six litres.

Ovens, on the other hand, have an average capacity of 60 to 70 litres, which takes longer to heat and cook food. An oven's average cooking time is usually 30 minutes longer than an air fryer's, which means it consumes more energy for longer periods.

Air fryers have a short cooking time because the less time an electrical appliance is on, the less energy it consumes. Definitely worth considering if you cook small meals or cannot afford to replace your conventional oven.

Other appliances

Whenever possible buy high energy efficiency appliances. Use more counter appliances such as microwaves, rice cookers, griddles and grills, frying pans, pressure cookers, slow cookers, bread makers, kettles and toasters because they will use less energy than your oven or cooktop. If you are looking to buy a new oven in the near future, consider a fan-forced model that will use heat more efficiently.

Oven use

Inexpensive actions

Check the oven door seal by closing it on a piece of paper. If you can easily pull the paper out you could be losing a lot of heat and should consider replacing your seals.

Don't pre-heat ovens unnecessarily.

Keep your oven window clean so you can check on your cooking rather than opening the door repeatedly. Each time you open the oven door the temperature drops by up to 15°C.

Plan ahead and try and cook several things at once in the oven. Also consider cooking in bulk and freezing the excess.

Use a toaster to toast bread rather than the oven grill that uses around 75% more energy.

Investigate the range of electric barbeques and outside grills.

Stovetop cooking

Inexpensive actions

Use pots and pans with flat bases that are the same size as the elements.

Whenever appropriate, keep the lid on pots and pans to reduce heat loss.

Use the least amount of required water when steaming.

Electric elements continue to produce heat for some time after they are switched off. Turn them off for the final simmer.

Don't boil more water than is needed on either the stove or in the kettle.

Double check that all elements have been switched off when you finish cooking.

Microwave use

Inexpensive actions

Thaw frozen food in the fridge instead of defrosting it in the microwave.

Switch the microwave off at the power point when you are not using it.


Electric BBQ


Oven seal test


Stovetop


Microwave

Lighting

Lighting accounts for around 6% of the average Victorian household energy bill. Most households can reduce their energy use from lighting by 50% by using LED (light emitting diodes) lighting. Solar lighting is a great outdoor option and you can't beat natural lighting as the cheapest and cleanest option.

Inexpensive actions

Turn off unnecessary lights.

Whenever possible use natural lighting through windows, skylights or light tubes to let natural light in.

Make sure your light fittings or shades are not greatly reducing your light.

Clean light fittings regularly to allow more light to pass through.

Use timers or motion sensors to switch outdoor security lights on and off automatically rather than having them on all night.

Use outdoor solar lights.

Pale coloured walls, carpet and furnishings will reduce the need for artificial lighting. Mirrors opposite windows will also reflect light around the room.

Selecting lamps

Many of us have replaced our old, inefficient incandescent bulbs with more energy efficient bulbs.

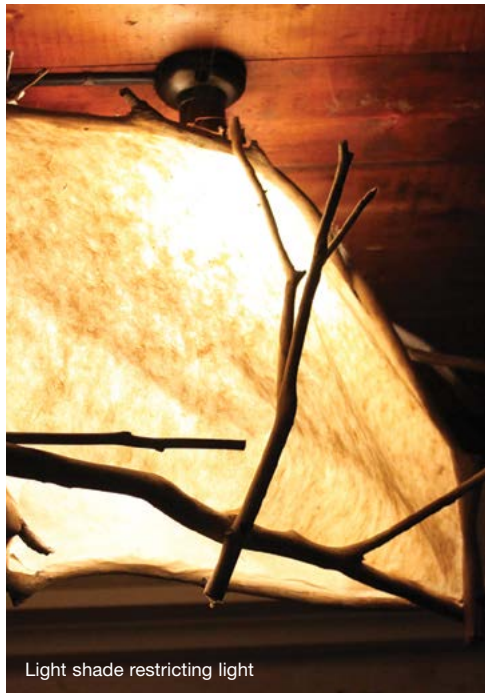
Due to the superior energy efficiency of LED lights, incandescent, CFL (Compact Fluorescent Lamps) and halogen lamps are being phased out.

LEDs have a lifespan 10-30 times greater than other lamps. They require a lower wattage to generate the same amount of light and run at lower temperatures. They are small compared to other types of lamps.

Most rooms need two types of lighting – general lighting and task lighting. Think about the wattage size you use. In general, rooms tend to be excessively lit, so consider selecting a lower wattage for your general room lighting.

Reading lights, kitchen bench and desk lighting should be a higher wattage specific to the task.

If you have a dimmer control and find you are frequently reducing the setting, you would be better off replacing the bulb with a lower wattage lamp. Reducing dimmer light output by 50% will only save about 25% of the energy.



Light shade restricting light

Getting about

Driving the household petrol or diesel car uses a lot of energy in the form of fuel and produces around 34% of the average household's greenhouse gas emissions. Transport is an area where we can reduce our energy use, save money and have a positive impact on climate change.

Electrical vehicles (EVs)

EVs run on electricity – completely or in part – and mark the start of Australia's transition from fossil fuel powered vehicles to low emissions vehicles. How they are powered determines the reduction in fuel consumption and the emission of pollutants. Electric vehicles can be more expensive to purchase than petrol and diesel vehicles, especially brand new. This may balance out through lower operating costs over time. Servicing an electric vehicle can cost less than a petrol vehicle, as there are fewer moving parts to maintain or replace. It is anticipated that EVs will become more affordable in the future.

Types of EVs

Battery Electric Vehicles (BEVs): are solely powered by the electrical energy stored in the battery. You charge an electric car by plugging it into an external electricity source. This could be a regular electrical socket, a dedicated charging unit, or one of the growing number of public charging stations around the country.

Plug-in Hybrid Electric Vehicles (PHEVs): use both petrol and electricity. The battery is charged via a plug-in outlet as well as through regenerative braking. You can run it entirely on electricity with the flexibility of running on petrol if you do not have access to a battery charger.

Hybrid Electric Vehicles (HEVs): Hybrids have an electric motor and petrol engine, which can work in two different ways. The first is a parallel hybrid where the two motor types can power independently of each other. The second is a series hybrid, where the petrol engine acts as a generator to charge the battery which in turn powers the electric motor.

Fuel-cell Electric Vehicles (FCEVs): Compressed hydrogen and oxygen from the air react in a fuel cell and generate electricity to power the car's motor. FCEVs only emit water vapour and typically have a greater range than battery powered cars. Hydrogen is expensive to produce and there are very few hydrogen refuelling stations in Australia.

Charging an EV

There are generally three ways to charge a plug-in electric car and the time taken can vary between each model. These include, from fastest (20 minutes) to slowest (about 14 hours):

- fast charging: using a high-voltage DC charger at a public charging station
- home wall recharger: using an installed battery recharger
- electrical socket: the car's mobile charge cable is plugged into an electrical socket directing electricity to the car's onboard charger

Driving a battery electric vehicle takes a little more planning than driving a traditional fuel operated car. Although the network of ultra-fast charge stations is steadily increasing along highways, they are not as common as petrol stations. This means EV drivers need to charge up when not driving and plan ahead.

Charging station map: **https://electricvehiclecouncil.com.au/about-ev/charger-map/**

Driving petrol cars

Inexpensive actions

We tend to jump in the car and take off without a lot of consideration of the way we are driving. With a little mindfulness we can drive more efficiently.

- Avoid speeding as it burns fuel at a faster rate. Driving at 110km/hr uses 25% more fuel than driving at 90km/hr.
- Try and drive smoothly with as little braking and accelerating as possible. Try and anticipate traffic flow.
- In manual cars, change gears sooner rather than later to keep revs below 2,500rpm.
- In automatic cars, ease back on the accelerator when the car gathers speed and your gears will change up more quickly and smoothly. Reduce speed when going up hills.
- Cars today do not need warming up before a journey.
- Only use your air conditioner when you need it. Switching it on increases fuel consumption by 10%.
- If you are stuck in traffic turn the engine off. Re-starting uses less petrol than idling. Otherwise put it in neutral to reduce fuel use.

The state of our car can also affect our fuel consumption.

- Keep extra weight out of your car boot and remove roof racks when not needed to reduce drag.
- Fill your petrol tank to the first click. The rest is lost in overflow and evaporation. Use the petrol recommended by the manufacturer.
- Keep your car well maintained.
- Make sure your tyre pressure is at the highest level recommended in your manual.

Think about ways to reduce your drive time.

- Try and plan your trips and combine errands to avoid lots of short trips where possible. Short car trips with a cold engine use more fuel and increase wear and tear on your car.
- Shop locally to support local businesses and reduce transport miles.
- Grow your own veggies to save on trips to the shops.
- Try and avoid driving in peak hour if possible.
- Car pool for work, school drop offs, sporting events or social gatherings.
- Work from home whenever possible.

Selecting a car

If you are buying a car, the smaller the better, and check the model for fuel efficiency.

For further information check out:

Green Vehicle Guide:
www.greenvehicleguide.gov.au

Public transport

Trains, and buses all help to reduce our consumption of energy and output of greenhouse gas emissions. Public transport (PT) also saves wear and tear on your car and you don't have to worry about traffic jams or parking costs. Even if you catch PT to work every other day, or for social events, every trip you take is good for the environment.

For information on routes on local buses visit **www.transitsw.com.au**

For information on regional train travel visit **www.vline.com.au/Plan-trip-buy-tickets**

To access bus and train timetables visit **www.ptv.vic.gov.au/journey**

Walk or ride a bike

For short trips to the local shops, visiting friends or kicking the footy in the park, can you walk or ride your bike instead? Cheap and healthy!

Encourage your children to walk or ride to school if it's not too far. Go with them if they are not confident.

Encourage your school to get involved in the Walk to school initiative. Visit **www.vichealth.vic.gov.au/programs-and-projects/walk-to-school**

Photo credit: https://corporate.vline.com.au/

Useful websites

Warrnambool City Council
www.warrnambool.vic.gov.au

Sustainability Victoria
www.sustainability.vic.gov.au

Victorian Energy Saver
www.victorianenergysaver.vic.gov.au

Energy Rating
www.energyrating.gov.au

Electric Vehicle Council
https://electricvehiclecouncil.com.au/

Green Vehicle Guide
www.greenvehicleguide.gov.au/


WARRNAMBOOL
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Web: www.warrnambool.vic.gov.au
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