# Your Energy Bills

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## COUNCIL LOGO

#### Acknowledgements

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

The Zap booklet focuses on solutions 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.

The main sources of household energy are natural gas and electricity. Natural gas produces about a third the greenhouse gas emissions compared to conventional electricity. Electricity is the most widely available and usually the most expensive per unit to use. Most of the recommended

actions in this booklet will therefore predominantly focus on reducing electricity use. Another energy expense that impacts on household costs is petrol. Transport options and how to drive smarter will also be considered.

Using energy efficiently is a challenge we can all achieve. And the added bonus? Using energy more efficiently will reduce greenhouse gas emissions that contribute to climate change. So every household that takes action, large or small, is not only helping their hip pocket, but also contributing to Australia's efforts to tackle climate change. Good for your wallet and good for the planet!

# **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 and oil) to create energy produces large amounts of greenhouse gas emissions. These emissions contain high amounts of carbon, with carbon dioxide 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 trapped in the Earth's atmosphere for up to 90

## Greenhouse gas emissions from home energy use



Source: Baseline Energy Estimates 2008

years. This trapped carbon thickens the atmosphere and heats up rather than harmlessly escaping skywards. As a result the Earth's climate patterns are changing with the last decade being the hottest on record.

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

## **Energy sources**

Choosing the most appropriate energy source can significantly reduce your energy bills as well as greenhouse gas emissions. The main sources of household energy are natural gas, electricity and wood. Cars can be run on diesel, electricity or gas, but the most common fuel is petrol.

## Gas

Natural gas has traditionally been the cheapest source of energy and produces only about a third of the greenhouse gas emissions compared to conventional electricity. However, gas is a non-renewable fuel with limited reserves. The price of gas has been rising significantly and is predicted to continue to do so. It is largely used for water heating, room heating and cooking. Natural gas is not available everywhere but liquefied petroleum gas (LPG) can be used instead and is purchased in cylinders. LPG has the same greenhouse gas emission output as natural gas, but is around twice the price.



## Electricity

Electricity is the most widely available source of energy and the only one that can run all household appliances. However it is the most expensive energy source per unit to operate and produces the most greenhouse gas emissions.

Victoria currently produces electricity with the highest volume of greenhouse gas emissions in Australia. This is due to the fact that most of our electricity comes from burning brown coal.

Electricity from renewable sources such as solar and wind, produce no greenhouse gas emissions and are becoming more widely available. Households now have the option of installing their own solar panels to feed electricity back into the grid, or to purchase GreenPower renewable energy as their electricity source. The tariff on GreenPower tends to be slightly higher per unit, but by choosing this energy source you are supporting the expansion of renewable energy industry.

For more information visit: www.greenpower.gov.au or talk to your energy retailer.



Wood is generally an expensive choice of energy source compared to gas and electricity

## Wood

Wood can be a renewable energy source if it comes from sustainably managed plantations. Sugar gum is usually sourced from plantations, while red gum is not. Wood is generally an expensive choice of energy source compared to gas and electricity. In many regional areas it is used for heating, cooking and heating water. Slow-combustion woodheaters are a more efficient option than the traditional open fireplace that lose around 80% of heat up the chimney. The burning of wood produces a lot of  $CO_2$  and other pollutants. In many urban areas burning wood may be banned by local government due to the issue of pollution in built up areas.



## Petroleum

Petrol is a fossil fuel that takes millions of years to form and is non-renewable. For every litre of petrol burned, 2.3 kilograms of greenhouse gases are produced. More than half our air pollution comes from the burning of petrol. It is the most common fuel used in transport today and for most people the car if our primary mode of transport.



# 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 number of people in your home
- the size and features of your home
- the energy standard of your heating. cooling, lighting and appliances
- how much time you spend at home
- the habits and lifestyle of people in your 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: Sustainability Victoria 2013

On the basis of the above, most households would benefit from especially reducing energy usage for the big energy users such as heating and hot

water, however, any reduction of usage in any area of the home will contribute to a lower energy bill.

Many energy retailers are now providing free online energy usage services for customers with smart meters. You simply log in to your own personal web portal to see graphs and statistics of your energy use over time. Contact your energy company for details.

If you have a smart meter you can also contact your retailer and request an interval report for several months energy use. This report will often be sent as an excel file, showing energy use in half hour intervals.

Some councils and libraries also have Home Energy Toolkits available to borrow free of charge. They contain the equipment you need to audit the energy use of individual appliances.

For around \$70 you can purchase a Power Meter to monitor appliances or an In Home Device for around \$150.

# **Understanding your energy bill**

Your energy bill is another source of information about how much electricity or gas 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:

- 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
- **kWh:** electricity energy consumption is measured in kilowatt hours. A kilowatt (kW) is 1000 watts of electrical power
- 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.switchon.vic.gov.au

## 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 My Power Planner (**www.switchon.vic**. **gov.au**) that provides an independent overview of energy retailer contracts and a comparison of different electricity and gas tariffs in your area.

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's a competitive market, so ask if they have any bonuses or savings on offer.



shop around to see if you are getting the best deal for your energy needs

# **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 products either as you can afford, it or as your old products need replacing.

efergy ON-OFF Max. Load 2400W

Suitch OFF."

Research the cost of replacing your big

energy consumers. You may not be in a

water service to a heat pump now, but is

it something you can budget towards in

Monitor your success against your

your household energy bill.

Reward yourselves!

www.go5.org.au

Double glazed window

declining daily energy usage rate on

For help with setting energy reduction

goals, visit the Go5 website which was

achievable goals for energy reduction:

developed to help householders set

the near future?

position to switch from an electric hot

## **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.

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.

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

Victorian Green Renters Guide: www.environmentvictoria.org.au

ATA Renters Guide to Sustainable Living: www.ata.org.au/wp-content/ sustainability/ata\_renters\_guide\_ sustainability.pdf

Moreland Energy Foundation: www.mefl.com.au

Australian government rebates: www.environment.gov.au/rebates

## Tax deductions:

www.environment.gov.au/settlements/ local/publications/pubs/brochure5pdf

Insulation:

www.environment.gov.au/ energyefficiency/insulation-renter

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.









# **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 designer 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 snacturay 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 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

Smarter Renovations Planner: www.sustainability.vic.gov.au/ services-and-advice/households/ energy-efficiency/smarter-renovations

Your Home Technical Manual: www.yourhome.gov.au

ReNew Magazine Issue 130, 'Design for a changing climate'. **www.renew.org.au** 

# Heating and cooling

Heating accounts for around 32% of the average Victorian household bill with cooling around 2% making this our highest hotspot. This equates to 20% 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.

consider a hot water bottle and extra blanket on the bed.



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.



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 lowpositioned 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.

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



### 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/ services-and-advice/households/ energy-efficiency/toolbox/how-to





## Make a Door Snake



Cut a rectangular piece of fabric about 40cm wide and at least 4cm longer than the width of your door.

fill cannot leak

through.

Turn inside out. so the raw edges are on the inside.

sure the stitching is tight so your





## 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.

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 Windows Energy Rating Scheme (WERS) website: www.wers.net.au or Sustainability Victoria how-to guides: www.sustainability.vic.gov.au/ services-and-advice/households/ energy-efficiency/toolbox/how-to

## **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 swisscheese effect that reduces the energy efficiency of your ceiling insulation.

For further information visit: Sustainability Victoria www.sustainability.vic.gov.au/ services-and-advice/households/ energy-efficiency/toolbox/how-to

## 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.

### **Evaporative coolers**

If fans are not appropriate then you next choice for mechanical cooling would be either a portable or central evaporative cooler. 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.



