

# Electricity Saving Hints

Here are 17 ideas for reducing electricity use in your home. Every household is different but the point is that by making relatively small changes you can maintain your lifestyle but save hundreds of dollars on your electricity bills.

The Information Sheets in the HEAT provide more detail about potential savings and list many other options for making your home more electricity efficient.

## EASY, NO-COST ACTIONS (BUT YOU NEED TO MODIFY YOUR BEHAVIOUR)

1. Switch off: - turn off lights, TVs, heaters, radios and computers when they are not needed. It is easy to reduce electricity use by 1 to 2kWh per day, or more, saving \$75 to \$150 per year
2. Turn off at the power point all appliances that have remote controls if you are not using them (TVs, music systems, air conditioners, etc.). A typical house will save \$2 to \$5 per appliance per year. It all adds up.
3. Turn off at the power point any appliances with clocks if you do not need the clock. Each unnecessary clock costs you \$3 or \$4 per year in electricity.
4. Keep your refrigerator in as cool a spot as possible; make sure it is not in direct sunlight. Better positioning of your fridge or freezer could save \$30 to \$50 per year.
5. Make sure air can circulate behind and up the sides of your fridge or freezer. There should be a 3 to 5cm gap at the rear and 2 to 3cm each side. Poor ventilation can add up to \$100 to annual electricity bills.
6. Wash small loads of dishes in the sink instead of the dishwasher. Use of a dishwasher every day costs \$100 to \$150 per year in electricity.
7. Keep doors closed leading to unheated parts of your house. Savings will vary from house to house.
8. Dry your clothes on the line instead of in the clothes dryer whenever possible. It costs roughly 60 cents in electricity to dry a load of clothes in the dryer.
9. Try taking shorter showers – aim for a 4 minute shower and save on both water and electricity.

## LOW-COST ACTIONS

10. Add extra insulation to your hot water cylinder. Extra insulation on a typical hot water cylinder can save up to \$200 per year in electricity use.
11. Fit a water-efficient shower head. Reduced hot water use can save up to \$100 per year in electricity for a family of 4.
12. When buying new appliances, buy those with the most stars (i.e. the most efficient models) and the lowest annual energy use. Often these do not cost any more than less efficient models.
13. Good window treatments such as heavy, lined curtains and pelmets or 'honeycomb' blinds are very effective in keeping heat in your rooms in winter.
14. Draught-proof your living areas by sealing gaps and draught-taping doors and windows. Block off un-used chimneys.

## MEDIUM-COST ACTIONS

15. If you have a wooden floor, install insulation under the floor. Improved comfort and reduced heating costs can be substantial.
16. If you have no ceiling insulation, or very little, consider insulating the roof space, or at the very least the space above the rooms in which you spend most time. Big energy savings and improved comfort are possible. If your home has some ceiling insulation, consider adding additional insulation to improve the home's thermal performance.
17. Consider double glazing for your windows. This can be quite expensive so seek professional advice on costs and potential savings.

Go to the Sustainable Living Tasmania Sustainable Living Guides for more detailed information: <http://www.sustainablelivingtasmania.org.au/content/slg.htm>

# How to use the equipment in the kit

This Home Energy Audit Tool Kit includes:

- a Power-Mate electricity meter
- a Dick Smith infrared radiometer
- a thermometer
- a stopwatch
- a compass
- information sheets to help you understand how to reduce your electricity use

These notes provide instructions on the use of each of these items and some important safety precautions to always keep in mind when doing your audit. These items are not toys and should only be used by adults or children under close adult supervision.

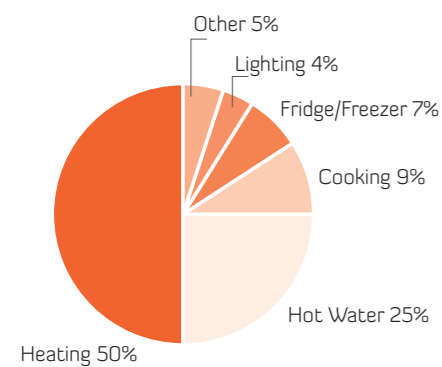


Reducing your electricity use is a little like a detective activity. You need to look for clues about why your electricity bill is as large as it is and then decide on practical ways to reduce your bill without disrupting your life too much.

The average Tasmanian household uses around 10,000 kWh of electricity each year. On present prices (Feb. 2011) this costs about \$2300 for the electricity plus about \$300 in fixed charges. With a little care it should be possible to cut your electricity use by 25%, giving savings of \$575 per year. If you are already very careful about how you use electricity it will be harder to make this much saving, but you might be able to improve your comfort levels without using more electricity.

The chart below shows where a typical Tasmanian household uses their electricity. Remember that every household is different. If you use a woodheater or a gas heater you will obviously use less electricity for heating.

Electricity use in a typical Tasmanian home



Some have electricity use quite close to the average but the mix between heating, hot water and other is not the same as the chart; others have much higher or much lower electricity use overall. This is why it is a good idea to understand your own household's electricity use before deciding on your best options for using less electricity. Start by checking your power bill. This will give you useful information about your daily use as well as your use for each quarter.

1. Some electrical appliances are high power and used for many hours at a time; these include electric space heaters (including heat pumps) and hot water cylinders. These consume a lot of electricity and account for most of your electricity bill. They need special attention when trying to cut electricity use and electricity bills.
2. Many appliances are high power but only used for short periods. These include microwave ovens, cook-tops/ovens, washing machines and dryers, dishwashers, hair dryers, vacuum cleaners, irons, toasters, electric jug/kettles and some workshop and garden tools. These are low to medium consumers of electricity when averaged over a year and sensible operation can make useful cuts to electricity bills.
3. There are also many appliances that have very small power consumption, but if they are on all the time they can add many dollars to electricity bills. In some cases simply turning an appliance off at the power point can save from a few dollars up to \$100 per year.

Everyone will have noticed that electricity prices have gone up over the past few years. It is likely that prices will continue to rise faster than inflation. They may double in just a few years. The best way of shielding yourself from these price increases is to use electricity more efficiently. It does not mean doing without warm homes or cooked meals, it means enjoying the benefits of electrical appliances but using them so that they consume less electricity.

Information sheets and the energy monitoring equipment in this kit will help you to understand why you pay as much as you do for electricity, but more importantly they will help you in making decisions that could save you hundreds of dollars each year.

Jot down the readings from the Power-Mate on the record sheet as you audit your home if you want to be serious about finding where you can save money.

Remember that the cost calculations in the information sheets are based on 23 cents per kilowatt hour and energy prices are subject to change.

Now read on to see how the gadgets in the kit are used.

If you require any assistance in the use of the HEAT please contact Sustainable Living Tasmania on 6234 5566.

#### POWER-MATE ELECTRICITY METER

This handy device measures how much electricity various appliances are using in your home. By recording some of the readings on the enclosed Audit Report Form you can work out how much different appliances cost to run and how much you could save if you use the appliances efficiently.

*Always turn off the electricity at the power point when plugging appliances into the Power-Mate and when unplugging appliances. Use only with mains power and do not use with appliances totalling more than 2.4kW. (The Power Mate overload message will be displayed.) Do not use where the Power-Mate could become wet.*

The information sheet 'Auditing guide: How the Power-Mate can help you' gives detailed instructions if you want to explore the full capacity of the Power-Mate. The Power-Mate may seem a bit tricky to use but it is actually very simple – you cannot damage it by pressing buttons so just try it out.

First try out the Power-Mate on a convenient household appliance, a TV or desk lamp for example.

1. Turn off the power point, unplug your appliance, plug the Power-Mate into the power point, plug your appliance into the back of the Power-Mate plug.
2. Turn on the power point and the Power-Mate screen will come on. The screen will switch between a number and the word POWER. This is showing the power used by the appliance at that moment measured in Watts (W). If it is zero (e.g. for a desk lamp when the lamp is off) it just means no power is being used. If a TV is plugged in (TV off) it will probably show a small number (e.g. 0.83) meaning that even when the TV is off it is using a little bit of electricity (0.83 W). When the lamp or TV is switched on the reading will jump to a larger reading which might be steady (e.g. a lamp reading 40.00, or 40 W) or it might change a bit (e.g. a TV with numbers jumping around from 58.00 to 70.00 as different scenes appear on the TV).

This is all that you need to do to measure the power (W) of any plug-in appliance in your home. In the other information sheets you will see how this can help you save money through sensible use of appliances. But some appliances switch motors or heating elements on and off automatically (e.g. a fridge or a dishwasher) so just measuring the power used at any single moment does not tell you the whole story. What you need to know is how much energy was used over a full day or cycle.

3. To measure the electrical energy (electricity used over a period of time) by an appliance you must first clear the Power-Mate (get its memory back to zero). This is easy. You push the 'Mode' button seven times until the screen shows CLEAR? Then press 'Enter'

and the screen will show donE and then change to SETUP? (See instruction 4 below for how to setup the Power-Mate with the cost of energy.). Now press 'Mode' and you will be back at the power reading.

Leave the Power-Mate operating with the light or TV on for a few minutes. Then press the 'Mode' button twice so that EnErgY appears on the screen. The screen will then flip to a number (e.g. 0.0057). This means that since you cleared the memory 0.0057 kilowatt-hours (kWh) of electricity has been consumed. If you watch, you will see that the number keeps going up, meaning that over time you are using more and more electricity. Press the 'Mode' button four more times and the screen will show HourS. This is the time (shown as hours:minutes:seconds) since you cleared the memory.

The energy reading is very useful for something like a dishwasher, washing machine or clothes dryer because you can set up the Power-Mate and leave it for a full wash or dry cycle and find out how much electricity was used for the full cycle.

4. To find out the cost of electricity used and to use the full potential of the Power-Mate you need to go to SETUP? By pushing the 'Mode' button. Then press 'Enter' and the screen will show S rAtE, press 'Enter' again and a number will appear with one digit flashing. (A bit like setting the time on your watch.) This is where you enter the cost of electricity. In Tasmania at the moment (2010) electricity costs about 23 cents per kWh. So if it is not showing 23.00 already you need to use the '+' and '-' buttons to adjust each number (to move from one digit to the next use the 'Enter' button). When you get back to S rAtE push the 'Mode' button and S gAS will appear. This is the amount of greenhouse gas emitted for each kWh of electricity. Push 'Enter' and then, using the '+' and '-' buttons, set it to 1.067. This is the average kg of greenhouse gas emitted for each kWh generated in eastern Australia: this is how much you save each time you avoid using 1 kWh of electricity.

5. When you see the instantaneous power your appliance is using; push 'Mode' and you see the cost of electricity (in dollars) used since you last cleared the memory; push 'Mode' again and you see the energy used (in kWh) since you last cleared the memory; push 'Mode' again and you see the greenhouse gas emissions (in kg of CO2) emitted by generating that much electricity; push 'Mode' again and you see what your voltage is; push mode again and you see how much current (in amps) your appliance is using; push 'Mode' again and you see the time since you cleared the memory; push 'Mode' again and you get to CLEAR? where you can clear the memory and start measuring energy from zero again; press 'Mode' again and you get to the setup and finally back to the starting point POWER.

#### INFRARED RADIOMETER

The infrared radiometer measures the surface temperature of whatever it is pointing at. This can be useful for finding hot spots or cold spots on walls, ceilings, floors, hot water cylinders, fridges. It is very simple to operate: just point at the surface and pull the trigger, the temperature will show on the screen.

The device also has a laser beam so you know exactly where you are pointing. To turn the laser on press the red button on the radiometer. Press it again to turn it off. Note that some councils have disabled the laser for safety reasons.

*A laser can cause permanent eye damage if shone into someone's face. For this reason young children should not be allowed to use the infrared radiometer.*

An infrared radiometer is a useful instrument because it measures the 'radiant' temperature of the surface it is pointing at. (If the surface is really shiny, the reading may not be accurate so you can stick a patch of thin matt black paper on the surface and take the reading after a few minutes.)

#### THERMOMETER

It is pretty obvious how the thermometer works, but you must be mindful of the fact it does not give a reading straight away. In air it is necessary to leave it for about 15 minutes to stabilize at the true air temperature. If testing your fridge temperature it is recommended that you leave it in the air in the fridge or in a glass of water in the fridge, for several hours. Read the temperature straight away when you take it out.

The thermometer can also help you manage your room heating and cooling and test the temperature of your hot water.

#### COMPASS

The red arrow of the compass points to the magnetic north pole. This is not exactly the same direction as true north, and true north is where you want to point your solar hot water system or photovoltaic array. The correction is about 15°. If you are holding your compass in front of you and you are facing due magnetic north then true north is 15° to the west (to your left). Use the compass to show you where you can make the most of winter sun.

#### STOPWATCH

The stopwatch can be used to time and measure the flow of water from your shower. Press mode unlock until the display shows all zeros. Use the start/stop button to time the flow. Press reset to run another test.

#### Using your Power-Mate

The '+' and '-' buttons can be used to access additional information as shown in the Table opposite. Probably most useful is the cost function because it shows how much it will cost if you use this appliance continuously for one hour, for a whole quarter, or for a whole year.

Screen	Press '+'	Press '-'	Press 'Enter'
POWER	Watts (now)	Watts* (peak)	Watts* (minimum)
COSt	Cost* (dollars)	Cost per year	Cost per quarter Cost per hour
EnErgY	Energy* (kWh)	Energy per year	Energy per quarter Energy per hour
G GAS	GHG* (kg CO2)	GHG per year	GHG per quarter GHG per hour
VoltS	Volts (V) (now)	Volts* (peak)	Volts* (minimum)
Curr	current (amps)	current* (peak)	current* (minimum)
HourS	Shows hour: minutes: seconds since clearing memory		
CLEAR?	To clear the memory press 'Enter'		
SETUP?	To set the electricity price (cents/kWh) and greenhouse gas intensity (kg/kWh)		

\* when the memory is cleared, these values go back to zero and start building up again