

How to use the **Save Power Kit**



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Overview

In NSW, our population is growing and the amount of power our homes use is going up because we have many more items that use electricity.

That's having a growing impact on our environment because almost all the electricity generated in NSW comes from coal-fired power stations. Burning coal to generate electricity causes a lot of carbon pollution (or greenhouse gases) to be released into the atmosphere.

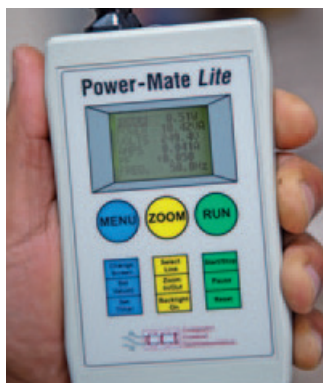
There are simple things we can all do to lower power bills and reduce our impact on the environment.

The Save Power Kit provides useful tools and information to help you understand and measure how you use power in your home. It will also identify simple actions you can take to save money, power and reduce our impact on the environment.

Before you get started:

- check your kit contains all of the items, and
- read through this 'how to' guide before you use each item. This will save you time and also ensure that you are using each item safely.

What's in **the Kit?**



Power-Mate Lite

Measures the amount of power drawn by an electrical appliance, then estimates the cost to run the appliance over a specified period of time and the carbon pollution it creates.



Flow cup

Taps are given a star rating depending on how efficient they are. You can check the star rating for taps in your home using this simple device.



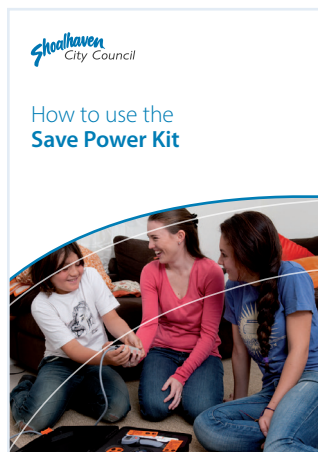
Infrared thermometer

Measures the surface temperature of objects from a distance. Find where heat is lost or gained in your home and take small actions to save power and money.



Thermometer

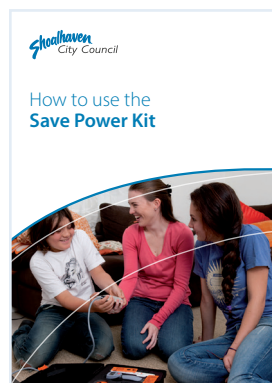
Measures room, fridge and freezer temperatures. Avoiding over heating or cooling will really cut your power use.



'How to' guide

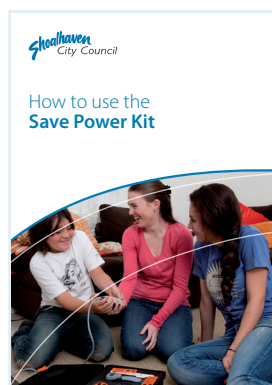
This booklet provides easy to use instructions and safety information for each kit item. It includes detailed information on how to use the items of the kit to obtain the measurements you need to identify your biggest power users. Additional activities are also listed here for your interest.

The following worksheets are for you to download:



Worksheet

Record your measurements here and identify simple actions that you can take to lower your power bills and reduce the impact on our environment.



Action Plan

Lists simple actions you can follow to lower your power bills.



Power-Mate Lite

The Power-Mate Lite (PML) is a device which measures the amount of power used by your electrical appliance (measured in watts). It can estimate the appliance's hourly, quarterly and yearly electricity use, running costs and carbon pollution.

Did you know that some appliances continue to use power even when you're not using them? This is called standby power. An appliance may be in standby mode if it is turned on at the power point or is not being used but has a clock, a little red light or it feels warm. You can use the Power-Mate Lite to measure the amount of power your appliances use when they are being used, on standby or left on at the switch.

Using the Power-Mate Lite will help you identify the biggest users of power in your home so you can reduce your electricity bill. When you measure your appliances to see how much power they use on standby, it may not seem like very much. But over a year, this can add up to as much as 10 per cent of your power bill. Just think about it – if your yearly electricity bill is \$1,000 you're paying \$100 on powering appliances that you're not even using! TVs, DVDs, set-top boxes, games consoles, stereos and computers are the ones to watch.

Did you know that mobile phone and other chargers, if left plugged in, use power even if they're not connected to your phone or equipment? In fact, a microwave oven can use more power and generate more carbon pollution running the digital clock than cooking food.

Understanding power measurement

The Power-Mate Lite measures the amount of power your appliances use. Power is usually measured in watts – one watt burns one joule of energy per second. A kilowatt (kW) equals 1,000 watts. The Power-Mate Lite will display electricity use in kilowatt hours (kWh). In one hour, a one kilowatt appliance uses one kWh of power.

Use the Power-Mate Lite to measure the power used by your:

- fridge
- freezer
- television
- DVD player
- microwave
- mobile phone charger
- coffee machine
- stereo
- kettle
- games console
- washing machine
- dryer
- computer/laptop
- plug in heater/cooler
- toothbrush charger
- fan

Do not test

- oven and stove units
- central air conditioner units
- hot water systems

How to use the Power-Mate Lite

The buttons on the PML have two functions. The first is a short, one second press or 'click', the other is a longer press or 'hold'. The words 'click' and 'hold' will be used to refer to each operation.

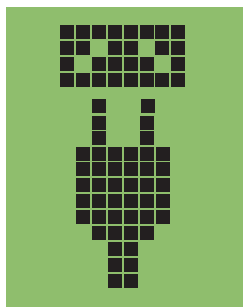
1. Plug in the appliance



Plug the appliance you are testing into the PML, then plug the PML into a power point and switch it on.

Note: Your appliance will continue to work while it is being measured.

2. Clear any stored data



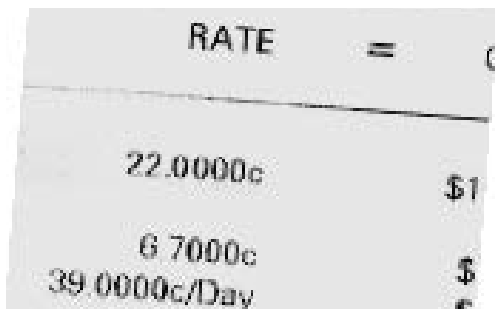
- a. Every time you use the PML you must clear the data that has been stored by the person who used it last. This will make sure that your measurement is accurate.

Note: The plug symbol means that the PML has been unplugged or there has been a power failure. If this occurs, it is best to clear the data and restart your measurement.



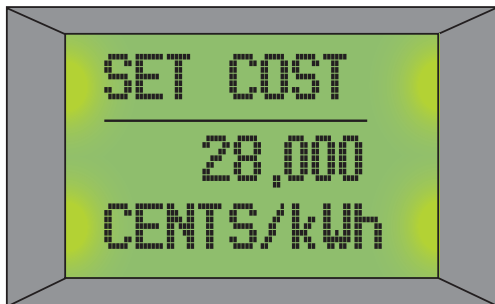
- b. Hold **RUN** until **CONFIRM CLR DATA?** is displayed.
- c. Click **RUN** to confirm 'YES'.

3. Enter the price of your electricity



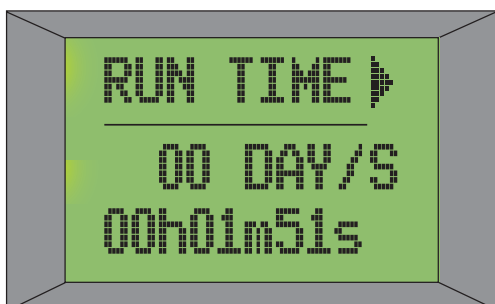
- a. Your latest electricity bill will tell you how much you pay for electricity per kilowatt hour (kWh).
- b. Write your electricity tariff on your worksheet. You can find this in the calculation section of your bill. If you are not able to find this information contact your electricity provider or you can use an electricity tariff of 28 cents/kWh*.

*Average charge across NSW can range from 25 - 40 cents per kWh (CanStarBlue 2022)

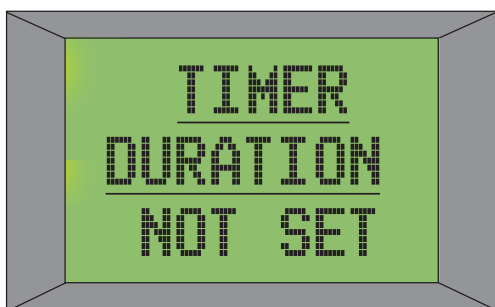


- c. Change the set price to match your electricity tariff.
 - i. Click **MENU** until the **COST** screen is displayed on the screen.
 - ii. Hold **MENU** until **SET COST** appears.
 - iii. Click **ZOOM** to scroll through the numbers. Click **RUN** to set number.
 - iv. Click **MENU** to return to the **COST** screen.

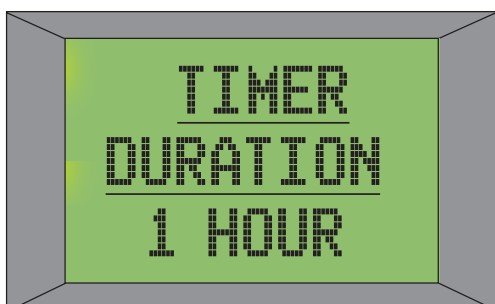
4. Set the timer



- a. Click **MENU** until **RUNTIME** or **ENDTIME** is displayed.

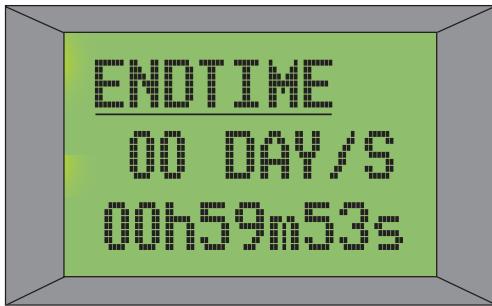


- b. Hold **MENU**. The words **TIMER DURATION** will be displayed.



- c. Click **ZOOM** to scroll through the timer options and click **MENU** to select the time.

Note: To clear the timer, repeat steps 4a-4c and select **NOT SET**.



d. When the timer is set, the screen will change from **RUNTIME** to **ENDTIME** and display the set time.

e. Click **RUN** to start timer.

Note: Some larger appliances such as the refrigerator or freezer switch on and off in cycles. For these appliances, the timer should be set for up to 24 hours.

5. Measure power

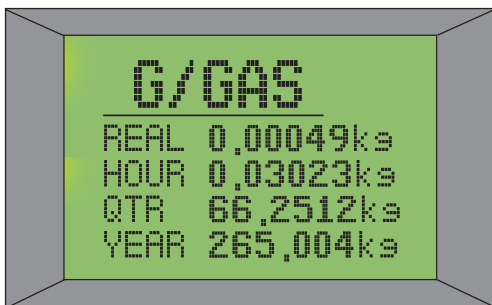


a. Click **RUN** to start a measurement period. A triangle will appear on the top left hand corner.

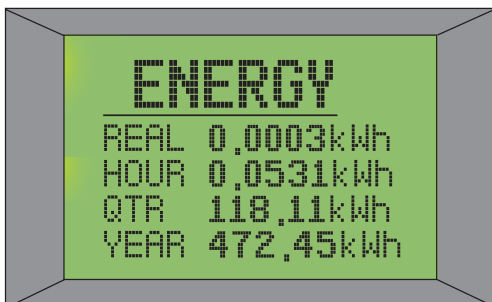
b. Click **MENU** to move between screens for

i. **COST** – displays the amount in \$ it costs to run the appliance.

Write the cost per **HOUR** on your worksheet (column C).

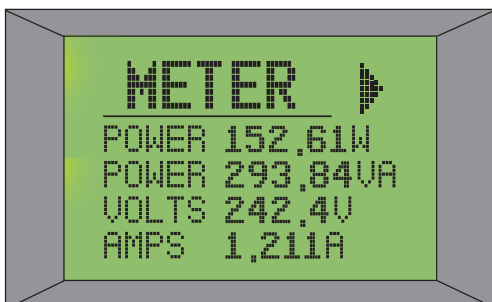


ii. **G/GAS** – displays how many kilograms of carbon pollution (greenhouse gas) are produced by the electricity your appliance uses.



iii. **ENERGY** – displays how much electricity your appliance uses in kilowatts per hour (kWh)

Write the kWh used per **HOUR** on your worksheet (column D).



iv. **METER** – displays technical information and

v. **RUNTIME** or **ENDTIME** displays the length of time the PML has been recording your electricity usage.

c. Wait for your reading to stabilise before recording your measurement. This should take about 5 minutes. However, if your reading is not stabilising you may wish to take a longer measurement for one hour by setting the timer (see step 4).

Safety

It is important that you only measure appliances that you plug into a power point.

- ✗ DO NOT attempt to use the Power-Mate Lite to measure:
 - oven and stove units
 - central air conditioner units
 - hot water system
- ✗ The Power-Mate Lite is intended for indoor use only
- ✗ Do not use the Power-Mate Lite if the case or cord is damaged
- ✗ Do not use the Power-Mate Lite if it becomes wet
- ✗ Avoid using the Power-Mate Lite in bathrooms or wet areas
- ✗ If you are using this on an inverter make sure it is labelled as “pure sine wave”. Do not use on “Quasi sine wave” or square wave inverters

- ✗ Do not expose the Power-Mate Lite to excessive heat (ie. in direct sunlight), to avoid damage to the case
- ✗ Do not dismantle the Power-Mate Lite. There are no user serviceable parts inside and a shock hazard exists

The PML is limited to a maximum capacity of 10 amps. If you are unsure of the power required for an appliance, the power (or current) rating is usually written on the unit’s label or even cast into the plastic or metal of the appliance.

Alternatively refer to the appliance’s user manual in the specification section or contact the manufacturer.

Note: For some appliances power use may change. When this occurs, take a measurement of the appliance for the entire use cycle. For example, measure the fridge for 24 hours, a washing machine for a load of washing, a kettle for the time it takes to boil.

The Power-Mate Lite assumes that the appliance will be used in the same way for a continuous hour, quarter or yearly time period.

As this is usually not the case, the hourly energy use and cost values are what will be used to make the energy calculations on the worksheet.

Energy rating

Purchase energy efficient appliances using the energy star rating label and reduce the amount of power you use over time.

This easy to recognise rating label tells you how much energy an appliance will use in a year, so you can compare different models. The more stars an appliance is awarded, the better. The highest rating is six stars. For example, new fridges are equipped with energy saving features like superior insulation, door seals, improved compressor efficiency and defrost mechanisms, all of which means improved energy efficiency and cost savings.

Find out more at energyrating.gov.au



 **DO NOT** attempt to use the Power-Mate Lite to measure:

- oven and stove units
- central air conditioner units
- hot water systems.



You will need

- Power-Mate Lite
- Calculator
- Your latest electricity bill
- Worksheet



Infrared Thermometer

The infrared thermometer can measure the surface temperature of objects from a distance. You can use the infrared thermometer to help you find draughts.

Poorly fitting windows and doors that rattle on windy days are not only annoying, they're also very costly. Draughts can increase your heating and cooling costs by up to 25 per cent by allowing cold air into your home during winter and hot air during summer. If you added together all the likely sources of draughts in a typical home (such as open fireplaces, wall vents, gaps and cracks around doors and windows) it would be the same as having a 1 x 1.5 metre hole in the side of the house!

A simple way to save power in your home is to install draught seals and weather stripping around doors and windows.

Tip: It can be easier to spot the difference if you measure on hot or cold days/times. Also checking ceilings, walls and roof-access manholes can show differences where insulation is not correctly installed

You can use the infrared thermometer to find draughts and hot spots in the following rooms:

- living room
- bedrooms
- kitchen
- laundry
- bathroom

Note: Take each measurement for 5-10 seconds.



You will need

- Infrared thermometer
- Worksheet

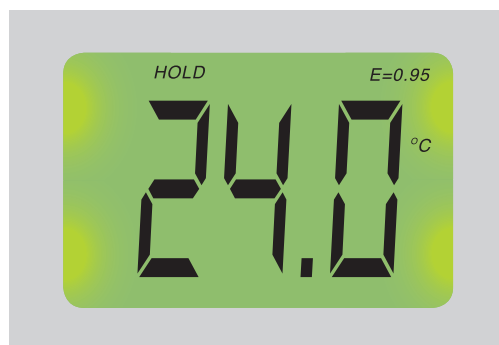
How to use the Infrared Thermometer



1. Point the thermometer towards the surface to be measured (hold it as close to the surface as possible).
2. Press and hold the trigger to turn on. While pressing, the SCAN display icon will appear in the upper left hand corner of the display.



3. If needed, while continuing to press the trigger, push the red laser button to turn on the laser pointer to help you aim (the laser icon will appear above the temperature on the display).



4. You will see the temperature of the item in the display.
5. If you continue to hold the trigger, the thermometer will continue to measure the temperature of the surface.
6. Release the trigger and the HOLD icon will appear on the screen, this means that the thermometer is no longer taking the temperature of the surface.
7. The thermometer will automatically power down about 7 seconds after you release the trigger.

Note: avoid measuring shiny or polished metal surfaces (stainless steel, aluminium etc) as this will give an inaccurate measurement.

Safety

Use extreme caution when the laser beam is turned on. The laser is to be used for aiming purposes only.

- ✗ Do not stare into the laser beam; do not point the laser beam into people's eyes.
- ✗ Do not point the laser at any gas which can explode.

Thermometer

A thermometer is used to measure air temperature. Making small adjustments to temperature thermostats around your home can save power, money and help reduce your impact on the environment. Use the thermometer to take the temperature of the rooms in your house and your fridge and freezer.



Heating and cooling

In winter don't over heat. Keep rooms at a comfortable 18-21°C. Every one degree increase in temperature can increase the heating component of your power bill by up to 15 per cent.

During summer, air conditioners account for a quarter of the electricity used by NSW households. Air conditioning your home can cost as much as \$1 an hour. This can really add up during a hot summer, compared to using ceiling fans that cost about one cent an hour. If you just can't live without your air conditioner, there are other ways to cut your summer power use. Cool, not icy, is best – keep rooms you are using at a comfortable 23–26°C. By raising the temperature setting on your air conditioner by just one degree, you can drop your cooling power use by up to 15 per cent.

You can also use ceiling fans with or instead of an air conditioner.

Ceiling fans can often be reversed in winter (on a low setting) to push warm air back down and reduce heating needs.

Fridge/freezer

Fridges and freezers are big power users – they can account for around 14 per cent of a household's annual power bills. But there are a few small adjustments that you can make that will help your fridge run more efficiently, and save you a few dollars too.

Fridges need to be set at 3–4°C and freezers at –18°C. Any lower and you're just paying for wasted power. Setting your fridge temperature at the right level and making sure that it is operating efficiently can shave about \$25 off your power bill and lower your household carbon pollution by 100kg (or 2,000 black balloons) a year. Just imagine the huge environmental savings if everyone in your street did the same thing!



You will need

- Thermometer
- Worksheet

How to use the Thermometer

1. Place the thermometer in the location you wish to measure the temperature.
2. Leave the thermometer for 15-30 minutes.
3. Read the temperature on the thermometer.

Safety

For further activities, a plumber is required if you want to change the temperature of your storage hot water system. Be careful not to touch the water when measuring hot water temperature.

Flow-cup

The waterflow cup is a simple device that can measure how much water your taps and showers are using in litres per minute. Fitting a flow restrictor to a tap, or using a low flow showerhead, can save lots of water and lots of energy - especially if you are using hot water.



How to use the **water flow measuring cup**

1. Place the flow cup under the running water, making sure the aerator is completely submerged.
2. Slowly open the handles until the water is level with the top rim.
3. Keeping the handles in position, turn off the water and read the water flow rate of the side of the cup.

Showerheads

A water efficient showerhead can save you money not only on your water bill, but also on your energy bill, because less water will need to be heated.

For a family of 4, replacing a showerhead that flows at 15L/min with:

- a 3-star shower at 9L/min can save 70kL and \$210 each year on water bills.
- a 4-star shower at 6L/min can save 105kL and \$315 each year on water bills.

Low-flow taps

You can install low-flow taps or aerators to reduce tap-water use from a standard 15-18L/min down to as little as 2L/min.

Water efficient fixtures and appliances

By using water-efficient appliances and fixtures, the average household could save \$175 each year.

The [Water Efficiency Labelling and Standards \(WELS\) scheme](#) helps Australians compare the water efficiency of a range of appliances and fixtures. WELS-regulated products include washing machines, dishwashers, showers, and toilets. Products are tested for water consumption and given a rating of up to 6 stars.

This guide was adapted from the Department of Planning,
Industry and Environment 'Save power kit' project,
an initiative of the NSW Energy Efficiency Strategy.



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