



# Introduction to Electricity

Electricity is the most common form of energy used in the home. Different aspects of electricity are measured using different units:

Volts are the unit used to measure the 'strength' of electrical energy. This also includes its 'potential strength' when the electricity is not actually flowing. You can think of it like the water pressure in a pipe. The water flows at a certain pressure, and even if the tap is shut off, the pressure is there all the same. Mains electricity in Australia is 240V.

Amps (amperes) are the rate or current at which the electricity flows. As the word 'current' implies, you can think of it as the rate of flow of water in a pipe. If nothing is plugged in, no electricity is flowing, and the current is zero.



Watts indicate the 'power' of the electricity that flows. The power or 'strength' of water flowing out of the tap depends on the pressure/strength of flow in the pipe **and** the rate it is allowed to flow by the tap. To calculate the amount of power used, you multiply the strength of the flow (Volts) by the rate of the flow (Amps) to get the number of Watts (W). A 600W hairdryer uses 10 times more power than a 60W lightbulb. Similarly, a 6 kW air-conditioning unit uses 10 times more power than the 600W hairdryer.

## What does my electricity bill tell me?

The actual quantity of energy consumed is the power multiplied by the time it was consumed for. For electricity, it is normally measured in kilowatt-hours (kWh).

Using the water analogy, when the tap is opened, a bucket can be filled at a certain rate, say a litre per minute, and the quantity is the total volume of water that has flowed into it after a given time. On your electricity bill, the figure under "Usage" on the back of your bill tells you how many kilowatt-hours you have consumed. This is multiplied by the rate the electricity company charges per kWh used, to get the dollar amount.

## How can I reduce my electricity bill?

Obviously some of the things that you use in your home use up more electrical energy than others. Heating hot water by electricity and running air-conditioning or heaters are the major users of power, as are fridges. However, some of the smaller appliances can also use quite a lot. If you can buy a more energy efficient version of an item (check the star rating if possible – the more stars the better), it may cost more to purchase up front but will save you money (and greenhouse gases) in the long run. All electrical items should have on them or in their instruction manual how many watts they use, which you then multiply by the time you would use it for in an average week. Using this figure, you can roughly calculate how many hours you use the item per month or quarter, and from that you can calculate roughly how much of your electricity bill you are using on that item. From there you will know what your priorities are to reduce your overall usage (eg shorter showers) where possible and lower you bill!

### Example: 1 kilowatt hour of electricity (1 kWh) is used by the following:

- A 500 watt kettle running for **two hours**
- 10 light bulbs running at 100 watts (a bright standard light bulb) for **one hour**
- One 2000 watt bar radiator running for **half an hour**
- A 6000 watt airconditioner running for **ten minutes**.

## Standby power.

Many electrical goods have a high usage of power when on standby, so you should turn these appliances off when you are not using them. In most cases you cannot tell from the manual etc what the standby usage is. A voluntary standards programme has just been introduced for manufacturers with the aim of all appliances having a standby rate of 1Watt or less by 2012, but in the meantime turn your appliances off! Recently manufactured appliances will only need to be switched off at the 'on/off' switch, but some older appliances may need to be switched off at the wall as they can still draw power even if you have the 'on/off' switch set to 'off'.

**Up to 10 – 15 % of your electricity bill may be from leaving items on standby power!**

## What is off-peak electricity?

There are certain times in the day when less people overall use electricity, such as very late at night. This means that less electricity is required to be generated by electricity plants. However, it is currently more expensive to shut a plant down and start it up again later than it is to keep producing electricity when it's not needed. This means during these times, excess electricity is produced. Electricity suppliers at the moment charge the same rate regardless of when the electricity is used, despite the fact that the cost of supplying it goes up and down. However, in some states they are already starting to charge customers according to what time they use power, and there is a possibility this will eventually come into effect in the ACT. Off-peak items, such as off-peak hot water heaters, turn on during off-peak hours and store water or heat for use at other times of the day and can therefore be cheaper to run.

## What is Green Power?

About 90% of Australia's electricity is generated in coal-fired power stations, which create greenhouse gas emissions. The rest comes from renewable energy sources such as wind turbines, photovoltaic panels and hydro-electricity, which produce no greenhouse gas emissions but tend to be more expensive to produce than coal-fired electricity.

Green power is often used as a generic term to refer to renewable energy but it is also the name of a government-run national accreditation program that sets stringent environmental and reporting standards for

renewable energy products offered by electricity suppliers. These green power products place an additional charge per kWh on your electricity use for which the electricity supplier will buy the equivalent amount of electricity from renewable sources. This does not mean that your house is supplied exclusively with renewable electricity but that this amount of electricity is fed into the electricity grid as a whole and thus reduces the total amount of coal-fired electricity that is used. If you want to join a green power scheme, make sure that it is accredited to ensure that your electricity supplier spends your money only on genuine renewable energy.



## One last point about energy

Other kinds of energy, such as gas, are measured in joules, or, more conveniently, in millions of joules, or megajoules (MJ). To convert kWh to MJ, multiply by 3.6.

## More information

This fact sheet is produced by the Home Energy Advice Team (HEAT) to provide you with some basic information on electrical energy. If, after reading it you'd like more free information about this or any other topic to do with saving energy in your home, don't hesitate to contact us:

