

Energy efficient lighting



Changing to more efficient lighting is an important action when reducing both your energy bills and carbon footprint.

What is the problem?

Incandescent light globes

Incandescent light globes have been the most commonly used types of lights in Australia for a long time. They are the standard pear-shaped light globes that are very hot to touch. The issue with those regular lights is that a lot of the energy used for running the light is converted into heat rather than light, making them very inefficient.

The Australian Government has legislated a mandatory phase out of the least efficient incandescent lights (like the standard 40 W, 60 W, 75 W and 100 W household lights) and these can no longer be sold, as of the end of 2009. However, high-efficiency incandescent lights are still available; 28 W, 42 W, 53 W and 72 W high efficiency incandescent lights are on the market as a direct replacement for the old 40 W, 60 W, 75 W and 100 W incandescent lamps. These new incandescent globes are commonly marketed as halogen energy saver lights and while they are more efficient than old incandescent lights they are nowhere near as efficient as Compact Fluorescent Lights (CFLs).

So, to gain best efficiency when replacing your lights, all incandescent lights should be replaced with CFLs (see next page).

Halogen downlights

Another commonly used incandescent light is the popular low-voltage halogen downlight. These are also inefficient and should be avoided or replaced. It is often mistakenly assumed that low-voltage means low energy consumption but this is not the case. A low voltage halogen downlight uses about 50 watts and also needs a transformer to reduce the voltage of electricity supplied to the lights. The transformer itself uses about 10-15 watts meaning that each low voltage halogen downlight will use a total of 60-65 watts. So, remember: **low voltage doesn't mean low energy use!**

Low voltage halogen downlights distribute light in narrow angles and a significant proportion of the light produced can be lost to the roof space. This means that often at least 5-10 downlights need to be installed in a single area to provide an adequate level of light. This results in a very high level of energy consumption.

In addition, low-voltage halogen downlights are a fire hazard so large gaps in your ceiling insulation must be left around the light fitting. These gaps have a significant impact on the performance of the insulation and hence increase energy use for heating and cooling.

Energy efficient alternatives

The most common sort of energy efficient light is the Compact Fluorescent Light (CFL). Light Emitting Diode (LED) lights are another promising technology but they are not at the stage yet where they can completely replace CFLs.

CFLs

CFLs are simply smaller versions of full-sized tubular fluorescents, which emit light by causing a phosphor coating on the inside of a glass tube to glow. CFLs are four times more efficient and last up to 10 times longer than incandescent lights and are today the most commonly used type of efficient lighting.

They are a little more expensive than incandescent light globes, but the energy savings and reduced energy bills quickly make up for the extra cost.

LEDs

LEDs are a collection of small, solid light bulbs which are extremely energy-efficient. LED lights last up to 10 times longer than CFLs, and hence far longer than typical incandescent lights. They are well suited for outdoor lighting. LED lights may replace CFLs in the coming years as the technology is rapidly improving.

LED lights are a little more expensive than the CFLs, but again the energy savings and reduced energy bills make up for that extra cost.

Choosing the right CFLs

There are a range of different types of CFLs on the market. The most common types are the folded tubes, spiral light or the spherically shaped light bulb, all shown below:



When choosing your CFL, there are three main points to consider; **colour temperature**, **shape** and **light output**.

Colour temperature

It is sometimes thought that all CFLs produce cold white light, but this is not true. It is possible to get CFLs that produce warm light that is equivalent to the light produced by an incandescent light. It is also possible to get CFLs that produce cool white light. The type of light a CFL produces is usually stated clearly on the package.

You can also look at the colour temperature of a CFL which is measured in Kelvin (K). A temperature of about 2700 K represents a warm white colour, which is very similar to an incandescent light, whereas a cool white colour corresponds to a temperature of about 5000 K.

Shape

Choose a shape that will fit into your light fitting. When choosing the shape, it is beneficial to consider the way that the different shapes emit their light. For example, the folded tubes emit most of their light on the sides and should hence be installed with the side facing towards the area that needs to be illuminated.

Light output

The amount of energy a light uses is measured in watts. CFLs are more efficient at producing light than incandescent lights, so they will produce the same amount of light at a lower wattage.

So, when you are buying CFLs simply choose the wattage that corresponds to the incandescent light you are replacing. This information is usually stated on the package. You can also refer to the table below to help you choose a CFL that will deliver the same light output.

Incandescent watts	CFL watt range
40 W	8-10 W
60 W	13-18 W
75 W	18-22 W
100 W	23-28 W
150 W	34-42 W

Replacing halogen downlights

High efficiency halogen downlights, LEDs and micro fluorescent lighting can all be used to replace high energy using, low-voltage, halogen downlights.

High efficiency halogen downlights can be used in existing light fittings without any changes needing to be made.



Replace your 50 watt globes with the high efficiency halogen 35 watt globes. The 35 watt globes have the same light output but will reduce your energy use by 30%! You can also choose a 20 watt replacement which will provide around 80% of the light output while only using 40% of the energy.

A range of **LED halogen replacements** are also available. They are suitable for specialist applications such as task lighting. They are best used in locations where the item being lit is less than 1 meter from the LED and hence they are not always a suitable replacement. Replacing low voltage halogen downlights with LEDs removes the fire risk. You will most likely still need to leave some clearance between your recessed downlight fitting and any insulation installed in your ceiling but if you install CFLs the amount of clearance will probably be reduced. You will need to speak to your electrician or Energy Safe Victoria to determine the amount of clearance required.

Micro fluorescent lights only use between 7 and 11 watts and are another replacement for the high energy using low voltage downlights.

Both LEDs and micro fluorescent lights do not require a transformer as they don't use low voltage electricity. You will achieve the greatest energy savings by replacing your low voltage halogens with LEDs or micro fluorescent lights, but you need to use an electrician to remove the old transformers. While this will initially cost more, it will result in considerable energy and cost savings.

Recycling your CFLs

In Moreland there are three places that you can recycle your CFL globes:

- > Moreland Civic Centre, 90 Bell Street, Coburg
- > Brunswick Citizens Service Centre, 233 Sydney Road, Brunswick
- > Glenroy Citizens Service Centre, 796N Pascoe Vale Road, Glenroy.

For other areas, check with your local council.

For further information about efficient lighting

> More information on efficient lighting can be found on www.morelandsolarcity.org.au/index.php?nodeId=43

> Alternatives and prices for halogen downlights can be viewed on www.environmentshop.com.au/uploads/docs/infolighting.pdf

> For information about which lights are being phased out and when visit <http://www.environment.gov.au/settlements/energyefficiency/lighting/faq-phaseout.html>