



# Lighting

Household lighting energy use in Australia is increasing due to the construction of larger homes and the installation of more light fittings per home. Most homes could probably reduce the amount of energy they use for lighting by 50 percent or more.

## INCANDESCENT LAMPS

Incandescent lamps or bulbs are the most commonly used type of lighting. They are inexpensive to buy but their running costs are high.

Standard incandescent bulbs only last about a thousand hours and must be regularly replaced. Incandescent lamps are most suitable for areas where lighting is used infrequently and for short periods, such as laundries and toilets.

## LOW VOLTAGE HALOGEN LAMPS

Halogen lights are also a type of incandescent lamp. They are more expensive to buy but last up to two thousand hours. They can be either 240V bulbs, which are usually tubular and often used in up lighters and outdoor floodlights, or low voltage bulbs typically used in down lighting. All halogen lamps require special light fittings.

Low voltage halogen lamps are slightly more efficient than normal bulbs of the same wattage, but they use a transformer that can consume from 10 to 30 percent of the bulb energy, reducing the efficiency gain.

## LAMP EFFICIENCY AND LIFE

Lamp life and efficiencies vary dramatically. The table below gives an indication of the efficiency, lamp life and power consumption from a range of lamps.

Type	Wattage	Voltage	Price \$	Lumens/watt	Life (Hrs)
Incandescent Lamp	15 - 2000	Various	Various	5 - 20	1,000-2,000
Low Voltage Halogen	10, 20, 35, 50	12	3	15 -25	2,000
Compact Fluorescent	3 to 85	12, 240	Various	50-80	5,000 – 10,000
Fluorescent Tube	18 & 36	240	5	93	7,500
Fluorescent Tube T5	18 & 36	240		60	12,000
High Efficiency Halogen	35 & 50	12	10 to 15		4,000
Micro Fluoro's Downlights	7, 9,11	240	18 - 24	Over 60	7,000 - 15,000
LED's, (halogen replacements)	Up to 5	12	30 - 100	15 - 30	Up to 100,000

## FLUORESCENT LAMPS

Fluorescent lamps are the most energy efficient form of lighting for households. They work by causing a phosphor coating in the inside of a glass tube to glow. Different types of phosphor give different colour light. Although more expensive to buy they are much cheaper to run and can last up to ten thousand hours. With careful design they can replace incandescent and halogen lights in most situations.

## COMPACT FLUORESCENT LAMPS

Compact fluorescent lamps (CFLs), also known as long life bulbs, are usually designed to fit into conventional bayonet or screw fitting light sockets. They come in a range of shapes. CFLs can replace incandescent light bulbs in many light fittings.

When replacing an incandescent lamp with a CFL in an existing fitting, it is usually better to use a slightly higher wattage than recommended by the manufacturer to ensure adequate light output. The light distribution of CFLs is different and may appear less bright than the bulb they replace unless used in a specially designed fitting.



## ALTERNATIVES TO HALOGEN LAMPS

Halogen down lights have become very popular over recent years. Most lighting systems use low voltage lamps with 50 watt lamps and a transformer which uses around 10 watts. This means that if 6 down lights are used to light a room the lights will consume 360 watts. This is high energy consumption especially when you consider a room such as this could be lit with two 18 watt compact fluorescents. However many people have existing down lights or prefer down lights for their appearance. If this is the case there are still ways to save energy.

### High Efficiency and Low Wattage Halogen Lamps.

There are now a range of high efficiency low voltage halogen lamps. These lamps use innovative lamp and reflector technology to improve efficiency. As a result a 35 watt lamp can produce as much light output as a 50 watt lamp. Lamp life is also extended to 4,000 hours. Another option is to fit 20 watt lamps where the intensity of the 50 (or 35) watt lamps is not required.

### Micro Fluorescent Lighting

Another alternative is to fit micro fluoro lamps. These lamps use 7 or 9 watt fitting and give equivalent light outputs around 30 and 40 watts respectively. They also have a lamp life of approximately 15,000 hours (5 times that of a 12 volt halogen lamp). These lamps have no transformer and can be fitted to standard 240 volt halogen fittings. This means that existing low voltage fittings would have to be replaced with 240 volt halogen fittings, (cost around \$15.00).

### LED's

LED's or Light Emitting Diodes are semiconductor devices which emit light. They can potentially have a very long life (100,000 hours), offer reasonably high efficiencies (around 20 lumens per watt) and are compact and tough. A range of LED Halogen replacements are available. The most powerful at this stage use a 3 watt LED. 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.

## Other Lighting Equipment

### LED Strip Lights

The compact LED strips hold strings of 6 LED's and can be connected to light as much area as required. Perfect for hidden lighting applications or application with very little space. Come in white, red, blue, green and amber.

### SolarBrick

A quality, long life self contained solar powered light designed for paving, traffic and decorative uses. Uses ultracapacitor technology to give a life of in excess of 10 years. Charges in the sun or shade.

### Ground Flasher

A solar powered marker light that requires no maintenance and has a long life of more than 10 years. Comes in a variety of colours and modes including flashing, fading and permanently on.

Source: Some of this information was sourced from the Your Home Technical website at <http://www.greenhouse.gov.au/yourhome/technical/index.htm>