

# Lighting Fact Sheet

Throughout the world lighting consumes a significant percentage of global electricity use. It is estimated that more than 2,200 terawatt hours of energy is used every year at a cost of between \$190 and \$250 million. This is approximately 17.5% of total global energy use.

In Australia lighting can account for more than 60% of energy costs in a standard office. As a result any increases in lighting efficiency will produce big savings for an individual company.

Lighting components are more energy efficient than ever before, going longer without replacement and will result in significant savings over their lifetime. As a result the offices, depots and warehouses of transport and logistics companies can save substantial amounts in investing in the latest technology. However all industries may be slow to realise these potential savings. In the US a 2010 study by the National Electrical Manufacturers Association estimated that only 20% of existing commercial buildings (in the US) had some type of upgraded lighting technology, but what was most surprising was that the majority of the remaining buildings were still using lighting systems that were installed prior to 1986.

## Lighting Types

Incandescent lighting used to be the dominant lighting type in Australia. This lighting type is largely inefficient, (90% of the required energy is spend producing heat and not light) but they also have a much poorer lifespan, lasting for only about 8,000 to 16,000 hours. The purchase of incandescent bulbs has been regulated against in Australia when in 2010 legislation ensuring a minimum level of 15 lumens per watt practically outlawed the sale of the inefficient lighting source.

The greatest energy saving potentials in lighting fixtures available today is through the installation of Compact Fluorescent Lamps (CFL), Light-emitting diodes (LEDs) or High Intensity Discharge lamps.



### CFL

Compact Florescent lamps over between 8,000 – 16,000 hours of lighting over their lifetime, significantly more than incandescent bulbs. While CFL bulbs are more expensive this should more than balance out over the lifetime of the bulb. Furthermore CFL bulbs use about 70% – 80% less electricity than incandescent bulbs resulting in significant savings.

### LEDs

LED lighting is about as efficient as CFL bulbs but last about three times longer than CFL bulbs further producing savings over the lifetime of the bulb. For every LED globe installed over incandescent globes can produce savings of \$100 over its lifetime.



### High Intensity Discharge Lamps

HIDS are often used internally where ceilings are very high such as a warehouse or transport depot. Mercury HIDs are widely used in warehouses and factories but their overall efficiency is poor. Savings can be implemented by upgrading these lights to metal halide lamps.

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## Efficiency Gains

A 2012 report by the then federal Department of Climate Change and Energy Efficiency looked to calculate the potential savings and costs of more efficient design options for existing commercial building, including warehouses.

The report found that for the warehouse sector the biggest energy saving measure they can make is by upgrading their discharge lights. This was to produce saving benefits of 5% for refrigerated warehouses and 10% for non-refrigerated warehouses (when compared to the average warehouse throughout Australia). This is a rather expensive operation though with a likely cost of \$148,712 for the average refrigerated warehouse but has a payback period of just 4 years.

In fact the quickest payback periods identified in the report include changing Halogen to CFL lighting (2 years), upgrade fluorescent lights (2 years) and upgrade halogen lights (2.5 years)

## Other Potential Savings

Of course savings may be realised where companies realise they are illuminating their offices, warehouse or depots more than they need to. Australian standards exist to outline recommendations for illuminance in lux, lamp colour appearance and rendering. For the typical Australian office the recommendation is an office should be illuminated no less than 320 lux, but the recommendation depends on the type of activity being undertaken in that space.

For example a factory engaged in fine manufacturing the recommended maintenance illuminance is 800 lux. Depending on your space's type of activity savings may be possible through reducing the lighting that a space omits.

Of course the greatest energy efficiency opportunity may exist with the old light switch. Automatic lighting controls and sensors are one way the transport and logistics industry can continue to reduce their energy intensity. Automatic lighting controls are estimated to save 20% by the International Energy Agency of total lighting consumption. They do this by automatically turning off lights when they are not needed and by dimming the lights where and when natural light is available.

## In Context

CaronLab, a Geelong-based manufacturer and distributor took part in the GreenLight program, funded by the Beyond Waste Fund. After a cost of less than \$5,000 to design and implement energy efficiency improvements with an external energy audit the company found they were able to reduce their annual energy consumption by 3% but this was before a designed lighting upgrade was complete which will produce further savings of between \$6,000 and \$10,000 per annum.

