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Fact Sheet #7

Lighting

In this fact sheet you will discover:

- *The opportunity for energy efficiency*
- *How to interpret key lighting terminology*
- *Low cost actions to reduce energy usage now*
- *Investments to reduce costs over the longer-term*



The lighting opportunity

Lighting accounts for a significant portion of energy costs in a business and is one of the easiest areas to make changes and save money. Often, if you work together with an energy auditor and a licensed electrician about 50% of your lighting costs can be saved through energy efficiency. In some cases the savings are even greater.

Energy use associated with lighting systems can be reduced by up to 82% if energy efficient lighting practices are adopted.

Source: NSW Office of Environment & Heritage

Understanding lighting terminology

Lighting terminology can appear complex and confusing. Before upgrading your lights you should be aware of these key lighting terms, most of which can be found on the packaging or specifications of light bulbs and fittings:

Lamp type

Lamps are usually specified by an alphanumeric code. For example, regular screw fittings are referred to as **E27**. Knowing this code will ensure that you buy the right replacement.

Technology

Generally speaking **incandescent** and **halogen** lamps are the least energy efficient and **LED**, **fluorescent** and **metal-halide** are the most efficient.

Wattage

Lamp wattage will provide a rough comparison of energy usage and running costs. A 15 Watt lamp uses 75% less energy than a 60 Watt lamp.

Lifetime

Lamp lifetime is specified in hours and should be considered alongside other factors such as upfront cost.

Colour Temperature

Colour temperature refers to the output colour of the lamp. **Warm white** (around 2700K) is an 'incandescent' colour whereas **cool white** (around 4000K or higher) is a white 'fluorescent' type colour.



Lumens

Lumen is the standard measure of light output. It is useful for comparing lamps to see if they produce the same or similar amount of light.

Lux

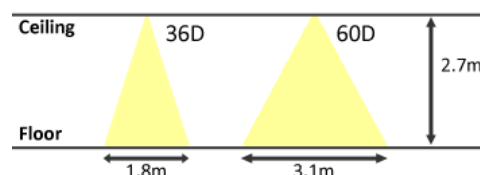
Lux is a measure of lumens per square metre. You can use a lux meter (at right) to measure light levels at a particular location. The Australian standard AS/NZS 1680 refers to recommended lux levels for interior and workplace lighting, such as:



- Lighting only required to aid movement (corridors) 40 lux
- Areas of intermittent use (storage rooms, loading bays) 80 lux
- Office work type areas (reading, typing, writing) 320 lux
- Visually difficult tasks (proof reading, fine painting) 600 lux
- Extremely difficult tasks (graphics inspection, hand tailoring) 1200 lux

Beam Angle

The angle of light output may not matter in all situations, but can have a major bearing on the amount of light available where it is actually needed.



Colour Rendition Index (CRI)

The closer a light bulb's CRI rating is to 100, the better its ability to show true colours to the human eye.

Low Cost Actions

1. Turn off un-used lights

This may sound obvious but lights are often left on unnecessarily. Putting up easy-to-read signs will help staff to remember to turn lights off when they leave an area. An occupancy sensor switch (installed by an electrician) is a great way to achieve the same outcome automatically.

2. Make use of natural light

Simple changes like opening blinds and clearing obstructions from windows can reduce dependency on electric light. Other options such as installing skylights or opaque roof panels should also be considered.

3. De-lamp fluorescent fittings

If you have fluorescent lamp fittings with two, three or four lamps per fitting, try removing one tube from each fitting in areas where bright lighting is not needed. This can often be done in areas such as next to walls, in corridors and directly above shelving. For adequate lighting in these areas, a single tube may work just as well on its own.

4. Reduce night-time lighting

Display signs and display cases need not be fully lit at night, if at all

5. Switch all incandescent lights to CFL or LED

Compact Fluorescent (CFL) and LED lamps use 80% less energy and can last up to ten times longer than the older incandescent globes.



LED, Compact Fluorescent (CFL) and Incandescent light bulbs

6. Keep surfaces light in colour and clean fittings

Paint the walls and ceilings in light colours and keep surfaces clean to maximise light reflection. Also, dirty or dusty lights and light fittings can reduce brightness by up to 50%. By cleaning lights and fittings regularly you may be able to use fewer lights to achieve the same brightness.

More Ways to Save

7. Install automated lighting controls

Occupancy sensors, light-level sensors and dimmers all help to reduce unnecessary lighting. Well-designed lighting controls can save up to 80% of energy use in some areas.

8. Improve manual controls

If some areas are used more than others, install multiple light switches so lights can be turned off without affecting others.

9. Upgrade to energy efficient alternatives

Common upgrade options include:

- Replace T8 fluorescent fittings with T5 fluorescent or LED fittings
- Replace halogen down-lights (50W) with IRC halogen (35W) or LED (~10W)
- Replace metal-halide shop-lighters (150W) with lower wattage lamps for the same fitting (75W) or new LED fittings
- Replace mercury-vapour hi-bay lighting (400W) with LED or induction fittings (~200W)

A load assessment or energy audit will help you determine which changes are profitable for your business (refer to Fact Sheet #1).



Examples of LED tubes, LED shop-lighter and LED down-light