GUIDANCE NOTE

HIA GreenSmart®

Lighting the Way

A well designed home incorporates passive design principles reducing the need for mechanical heating How many builders does it take to change a light bulb? This isn't a variation on the old joke — the traditional incandescent light bulb is no longer the dominant light source in our homes. Energy efficient products have come to the fore to provide a greater array of affordable choices to light the home.

Demographic research tells us there are fewer people per dwelling now than at any stage in our history, but the use of energy through lighting is increasing. We're building larger homes and installing more light fittings per home.

Lighting Options

One of the factors that should be considered at the design phase of the home is achieving the best possible solar orientation so that the most habitable rooms have good natural daylight. The amount of lighting required in the home is influenced by the tasks performed in different areas. As a general rule, kitchens, bathrooms and study areas require greater amounts of light than corridors and laundries.

So following natural light what is the best solution for the residential industry?

Incandescent lamps have been the most commonly used type of lighting. They are inexpensive to purchase but expensive to operate. This flows on to a high operating cost, as they only last between 800–1,000 hours. Incandescent lamps are appropriate only for use in rooms that are used infrequently and for short periods of time, for example toilets, laundry or storage rooms.

Verdict: short lifespan, low efficiency, expensive to run.

Halogen downlights are a type of incandescent lamp with a narrow beam that lasts up to 3,000 hours. First used within the home as a design feature, these are increasingly being used in the home for general lighting because of their compact look and inexpensive purchase cost. They incorporate a transformer and can produce a significant amount of heat; consequently they require ventilation, whilst insulation must not be placed within 200mm of the fitting. The transformer alone may consume 10–30 percent of the lamp's energy. This reduces any efficiency gain and could compromise the ceiling insulation properties of the home. Low voltage downlights with reflectors are also now available; however it is the wattage of the light not the voltage that is the key to energy efficiency.

Photo courtesy of Hotbeam

Galaxy 7607 an LED downlight that fits into 99.9% of downlight and bi-pin fittings.

Verdict: low efficiency, expensive to run, only appropriate for task lighting.

Fluorescent lamps are an energy efficient form of lighting for households. Fluorescent lamps use 70 percent less electricity than incandescent lamps to provide the same light and produce less heat, keeping your home cooler. Although slightly more expensive to buy, they are much cheaper to run, with quality products lasting over 8,000 hours. New technology, including improved ballasts, have removed many of the traditional concerns such as size, shape, colour and flickering are no longer a problem.

Verdict: Reliable and inexpensive to run.

Compact fluorescent lamps provide all the benefits of fluorescent tubes in a more compact size. Able to be fitted to a range of fittings, a 20 watt compact fluorescent provides the same amount of light as a 100 watt incandescent and costs approximately $10 to buy and $20 to run over its lifespan of between 6,000–8,000 hours. Over the same lifespan you would require eight incandescent 100 watt globes, which would cost $8 to buy and around $103 to run.

Verdict: Careful design means you can replace incandescent and halogen lights in most situations.

Light emitting diodes (LEDs) are a cool–running semiconductor device and one of the latest lighting products. They are used for illumination, strip lighting and as a replacement for halogen downlights, with some models using 10 times less power than fluorescents and lasting more than 100,000 hours. It is estimated that, using LEDs for localised and low–level lighting, a household can reduce power consumption by approximately 85 percent.

Verdict: Efficient, longest life span, inexpensive to run, higher upfront cost.

Latest Developments

The latest advances within this sector have been the development of affordable 240 volt compact fluorescent downlights that do not require a ransformer and LED downlights and strip lighting, which use as little as 3 watts and are available in a range of beam spread. These developments are important alternative solutions to traditional light fittings.

If changing 12 volt downlights in an existing home consider replacing 50W halogens with lower wattage bulbs or LED downlights. If selecting replacement bulbs, be vigilant to ensure that those selected will fit within the downlight fitting. A 240 volt compact fluorescent downlight can only be fitted with an adaptor kit that connects to the existing transformer.

In new homes or in renovations consider installing 240 volt compact fluorescent downlights, fluorescent lamps or LED downlights. As with all new developments the most efficient and long lasting products can appear costly upfront, however the return on investment with some bulbs lasting over 50,000 + hours makes these new products a great alternative for our environment and offers a reasonable payback period.

Photo courtesy of Hotbeam

The reduced energy use of LED Ribbon, LED Bar and LED downlights translates directly to reduced energy costs.

Solar street lighting, an estate based approach to energy efficient lighting.

Steps To Energy-efficient Lighting

By considering the following points, a new or existing house can become a more energy – efficient home.

- Maximise the use of daylight instead of artificial lights.
- Within the home's interior consider double glazed skylights, light shafts or highlight windows.
- Use light coloured paint in the home, dark wall colours absorbs light.
- Use the lowest wattage bulb that is necessary to complete the task.
- Use reflector–backed downlights or insert reflectors to the back of fluorescent lights to maximise light output.
- Install multiple switches to control lighting around the home.
- Use timers or movement sensors to control light operation.
- Fit downlight protectors to downlights to prevent air movement into the roof cavity.
- For exterior security lighting consider fluorescent or LED lighting with a motion sensor.
- To illuminate pathways and garden features consider solar powered LED lamps.
- Turn off lights when not required.

The type of lighting selected will affect the amount of energy used and the amount of greenhouse gas emissions produced. Whilst some of the products discussed are only available from specialist lighting and environmental stores or online retailers it is worth devoting a little time to the layout and type of light fittings to best suit the home design. Such decisions can help to improve light quality and reductions in energy costs.

For further information visit: www.yourhome.com.au or www.hotbeam.com

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