

## LED into battle

With the phasing out of incandescent globes on the horizon, the industry is already evaluating alternatives. LEDs are starting to find their way into both interior and exterior applications.

The uptake of energy-efficient lighting in government buildings and city-wide applications has been slowly gaining momentum. Efficient alternatives based on light emitting diode (LED) technology are becoming readily available for most interior and exterior applications.

LEDs, semiconductor devices that emit narrow-spectrum light, were developed in the 1920s and until recently were found mainly in low-wattage applications such as indicator lights on small electrical devices.

The emergence of LEDs as one of the front-runners to replace incandescent globes

is largely due to their performance. LEDs will only light with positive electrical polarity, they produce more light per watt than incandescent bulbs, and they don't contain mercury. Compact fluorescent lamps – touted by many in the government and industry to be the ideal replacement for incandescents – contain a small quantity of mercury that should be dealt with carefully in the event of breakage.

Sam Milidoni, a director of LED manufacturer Long Life Lighting, says many businesses are using LED lighting in retail spaces, offices and even factories.

"This helps business owners save on the running and replacement costs of halogen and fluorescent lighting.

"And the public is now realising how each little thing we do affects the environment in various ways. People know they should use the most energy-efficient lighting available."

Sam says LED lighting is widely used in the medical, defence, photography and hospitality sectors. However, the quality of the electronics in recent years, offering brighter light, has increased the demand. Various lens techniques have resulted in larger beam angles, spreading the light more evenly.

Government departments and local councils now have the opportunity to adopt LED for everything from signage to street lights.

The view of a cityscape can do a lot for its identity. Darling Harbour and Surfers Paradise are known for their skyline, and signage plays a large part in bringing these areas to life.

The Philips LedFlex 1 is a LED-based

## Hazardous Areas, Lighting



70% of Victorian street lights still use 1960s mercury vapour technology. Philips hopes its Equinox street light is the next generation lighting option.

lighting system that can be mounted directly to the back plate or substrate of signage. Connected by flexible wires, the system is made up of white or coloured LEDs operating at 24VDC.

Meanwhile, to create stylish interior features, Victorian LED manufacturer LedFX has introduced the LedStar Luminaire to its Eco-LED range. Designed with bar fronts, hotels, restaurants, and residential wall features and splashbacks in mind, the 15-23mm thick panel is edge lit with LEDs.

The panel also features remote operation of full RGB colouring that allows the LEDs to change, fade and flash at the press of a button.

Philips Lighting chief executive Theo van Deursen says there are immense environmental benefits in switching over older lights to new technology, such as LEDs.

"New energy-efficient lighting technologies provide a unique win/win opportunity. The environment gains because of less CO<sub>2</sub> emissions, the taxpayer and user gain because of lower energy costs, and national competitiveness is enhanced with its consequences for jobs, investment and exports."

Theo says political leaders have an important role to play in encouraging, promoting and adopting energy-saving technologies that reduce CO<sub>2</sub> emissions. ▶



LED lighting is being used in retail spaces, offices and even factories to save on the running and replacement costs of halogen and fluorescent lighting, says Sam Milidoni.

The Philips Equinox street light luminaire casts a warm-white colour, ranging from 2,700K to 4,000K while consuming only 85W. The light output is bright enough to allow eight metres between masts, with an average horizontal illuminance of 10 lux.

However, figures from Victoria's local government Tool Box, an information portal on sustainable public lighting, states that LED lamps are not yet practical for public lighting, which requires relatively high wattages. White LEDs have a very low efficacy – being only 15% as efficient as a T5 tri-phosphor fluorescent – and produce less light when warm.

About 70% of street lights in Victoria use cheap but inefficient 1960s technology – mercury vapour lamps. Theo says these outdated lamps consume almost twice as much electricity as necessary. In addition, mercury vapour lamps produce high CO<sub>2</sub> emissions.

Rod Coulter, director of Gold Coast LED manufacturer Dart Lighting, says LEDs are 100% recyclable.

"They are fully sustainable and can

reduce greenhouse gas emissions by massive quantities.

"The best part about LEDs is that they don't need as much power input as standard incandescent globes. This directly affects how much water is used in the manufacturing process. The installation of LEDs can save 1,000L of water.

"Everything is connected – people need to realise that 1kW of power is the equivalent of 1L of water."

Rod says that the benefits are due, in part, to power input and output being so close.

"Our LEDs have a life of 100,000 hours continuous, and we can prove this mathematically – degradation versus current versus time. We are at the stage of development where we can offer dichroic direct lamp replacements with no change needed to the power supply, transformers or holders.

"A lot of other globes that claim 50,000 hours can't prove it, and some of them feature in-built starters, which means they have a limited number of times they can be switched on and off."

Like any emerging technology, LEDs have issues that need to be dealt with, one of them being the difference in wattage. Manufacturers such as Dart Lighting are working to ensure replacement options are available for all standard light fittings.

"The biggest downfall is the difference in performance between incandescents and LEDs, and at this stage we only have the equivalent of a 45W globe," Rod says.

"But a different spectrum does mean brighter colours, and we currently have 11 shades of white." ■

- Paul Skelton



LED lights are being mooted as a viable replacement for incandescent globes and are becoming available for most interior and exterior applications, including street lights.

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