



The death knell for legacy lighting

BY PENNY JONES

Do you ever spare a thought for the old timers? One minute you're riding high above it all, looking down on humans scurrying around the night streets, illuminating workspaces, factories, hospitals, shops and schools; you're so important! Then, all of a sudden, these flashy interlopers arrive on the scene, boasting about their money-saving, energy-saving, sustainable prowess, and turn everything on its head.

We've said it before, and we'll say it again: LEDs have changed everything in the traditional lighting world. Now, except for a few niche applications, LEDs are finalising their take over. Yes, you heard it here folks, it's all over for legacy lighting. If you listen carefully, you can hear the death knell toll.

David Crossley, Technical Manager for Lighting Council Australia (LCA), explains that the term 'legacy lighting' refers to any general

lighting service technology that was developed and used prior to LED technology. For example, halogen, fluorescent, mercury vapour, high pressure sodium, metal halide and others.

"There has not been any research or development into legacy technology general lighting products for many years now. Market share for legacy products continues to decrease quickly in Australia and globally," he says.

"This reduction in demand is driving manufacturing prices higher and further reducing the viability of legacy technologies."

There have been many well-documented contributing factors to the decline including technology phase-outs, but by far the biggest contributors are the characteristics of LEDs themselves and their markets. LEDs have significantly reduced in price, they are very energy efficient, there are quality products to suit the majority of applications, and they are easy to retrofit.



The old timers now increasingly relegated to the recycling heap.

Halogen lights, for example (which are mostly used in residential and commercial applications), are expected to be banned in Australia from September 2021. This likely ban will mirror an EU directive which started the phase out of halogen bulbs in September 2018.

As for those still using mercury vapour lamps (which are still relatively common for large area overhead lighting such as factories, warehouses and streetlights) according to Graham Mawer, they will also soon have their hand forced.

Mawer is a Director of Next Energy and has worked in the Australian utilities sector since 1996. He is an advisor to IPWEA's Street Lighting and Smart Controls Programme and works for 75 councils around Australia as well as for the Commonwealth Government.

He says that over the last 20 months in particular, there has been a dawning recognition amongst his clients that the transition from mercury vapour lamps to LED is no longer optional. The primary reason for this is the Minamata Convention on Mercury, a global treaty to protect human health and the environment from the adverse effects of exposure to mercury.

The Convention bans the manufacturing and importing of lamps containing mercury vapour from the end of 2020. So far, over 90 countries have ratified it and as a result, global production and demand has significantly decreased.

"Although Australia has yet to ratify the Convention, we don't manufacture high pressure mercury vapour lamps so local customers, such as utilities, main road authorities and local governments, are starting to have difficulties sourcing them as a result of curtailed production overseas," explains Mawer.

"Essentially, soon it won't matter if your luminaire is still working. If you can't buy the lamp for it, then replacement is inevitable."

Mawer says IPWEA estimates that there are approximately 700-800,000 mercury vapour lamps still in use around the country that will need to be replaced at, broadly speaking, three or four times the natural rate of replacement.

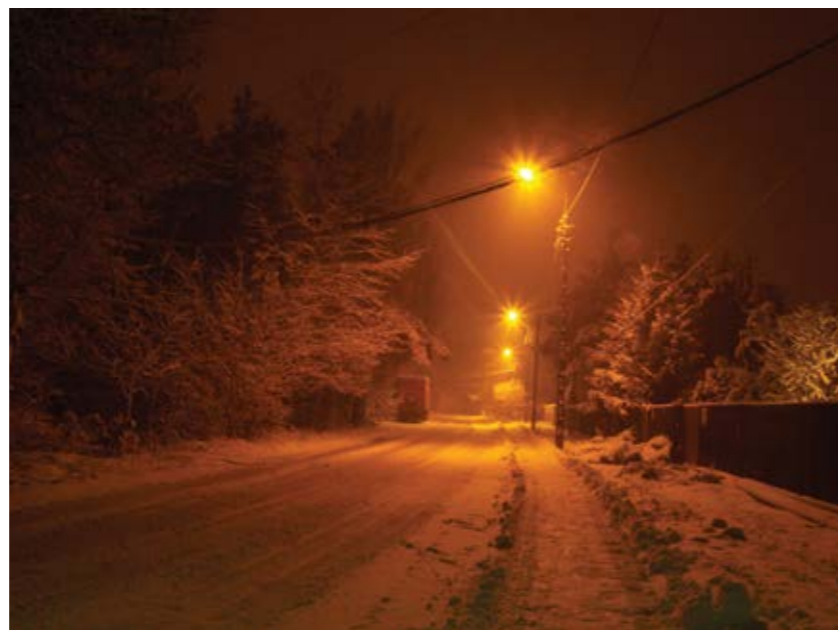
"In addition to other types of legacy lighting currently in use, I'd say we're looking at replacing approximately 40% of Australia's lighting stock, at a minimum, over the next three to four years," he continues.

"In my view, it's now no longer about whether councils, road authorities or utilities have decided to replace them. One way or another,



Credit: Zumtobel

Aachen, Germany – Zumtobel AMPHIBIA LED provide a stylish update as well as bill and maintenance savings.



they're going, and the replacement schedule is effectively pre-programmed."

On the supply side, Mawer says there is much preparation to be done, educating all levels of customers and advisors, and it can't be done fast enough. On the customer side, he says, if they haven't started planning for this replacement, they must do so now.

With the market shifting to LEDs for streetlights, new buildings, renovations and increasingly in the maintenance market as well, what will happen with existing luminaires currently in light sources and how long will legacy lights continue to be made?

High pressure sodium lamps are still common in many places worldwide, although LED luminaires are replacing both the lamp and luminaire.

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Linear fluorescent lamps may hang on for a few more years, but the clock is definitely ticking.



A small sample of the huge range of LED "lamps" as replacements for incandescent and fluorescent lamps for use in legacy luminaires.

Crossley says that the big companies that currently market traditional lighting technologies (i.e. the Philips (Signify) and Osrams of the world) will continue to maintain those products as long as they are economically viable. However, the viability of such products is fading quickly or has already passed. Products such as linear fluorescent lamps may hang on for a few more years. In the consumer market, compact fluorescent lamps are essentially dead and halogen lamps are not likely to be far behind.

Says Crossley: "In most cases, where a householder wants to keep their luminaire, replacement LED lamps are now available to maintain such fittings. Quality LED lamps from reputable suppliers will use less energy and have longer lifetimes than legacy lamps."

For most commercial and industrial legacy luminaires, except for specialist applications such as medical, therapeutic and imaging, Crossley strongly recommends replacing the entire fitting with an integrated LED luminaire. He sees no advantages in maintaining versus replacing legacy lighting for these non-niche industries.

"Maintaining legacy lighting using legacy lamps has no advantage except to short sighted businesses. It should be clear to well-run businesses that they should be planning to upgrade to more cost-effective lighting, or have already upgraded. With so many finance and service delivery options available now, there is no excuse to keep paying more than necessary," he continues.

This sentiment is echoed by David Calabro, the General Manager of Gamma Illumination, who says Gamma has an interesting bird's eye view of the whole transformation from legacy, (in their case primarily low-voltage halogen, metal halide and fluorescent), to exclusively LED.

"We have undertaken the whole journey, from designing the first LED products, to converting our existing products into LED, to phasing out legacy from our operations entirely," he explains.

"The only reason that some industries might still need legacy control gear and technology is that in these cases legacy products are still more reliable than LED. This might include higher temperature environments like factories with foundries and furnaces, or very harsh environments like mine or industrial sites," he says.

For Gamma's market, which is retailers, shopping centres, hospitality, schools, universities and general office lighting, Calabro says LED



Adelaide Oval's outstanding lighting for night cricket still comes mainly from metal halide lamps.

is now the only solution. "We would almost always recommend replacing the entire luminaire, but there are certain circumstances where a client may want to look at retrofitting, especially with some odd or bizarre legacy fittings," he continues.

"We did one project in a hospital in Melbourne which had these enormous round downlights, almost the size of a car tyre. For this we designed a complete kit i.e. a LED board with a driver, that made it easy for the electrician to screw the new module in, connect it, and convert the fitting to LED."

Calabro says in his opinion retrofitting is only applicable for odd shaped fittings, and perhaps linear fluorescent, which generally go into offices or some commercial buildings. "If we're talking about compact fluorescent, metal halide or high-pressure sodium, there's no retrofit alternatives for those."

On the retrofitting question, Crossley agrees that this can be a solution for maintaining period piece luminaires and comments that halogen/compact fluorescent lamps can be replaced with self-ballasted LED lamps. However, there are many attractive, quality LED fittings so consumers considering a refresh of their lighting only need consider new LED luminaires.

For commercial and industrial installations, maintaining HID luminaires and retrofitting with LED lamps is not attractive due to the need to re-wire the luminaire, reduced lighting performance

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Credit: Gamma Illumination.

Gamma retrofitted an LED board to replace an existing 55W T5 circular fluorescent lamp in a Melbourne hospital, adding an integrated microwave presence detector and ambient light sensor. Absolute lumens were matched with only 24W power consumption.

Soon customers won't even get the choice. With such a variety of high quality LEDs created for all our modern lighting needs, it'll be LEDs all the way.



(compared to dedicated LED fittings) and the additional replacement time and liability for the electrical contractor.

"If a contractor modifies a luminaire, then they are responsible for the safety and performance of that modified product from that point onwards. Maintaining extra-low voltage (ELV) luminaires that include transformers and retrofitting these with extra-low voltage LED lamps can also present problems due to the likelihood of incompatibility between dimmers, transformers and ELV LED lamps. It is better to replace with LED luminaires and the LED dimmer recommended by the supplier."

What is interesting about this whole LED discussion, is that it has hastened into the market a whole new range of ideas and ways to manage lighting. One that is starting to gain traction in Europe, in some parts of the U.S.A and to a small extent in commercial building markets in Australia is the concept of Lighting-as-a-Service (LaaS).

"There are a few different 'Lighting as a Service' models being marketed. However, the fundamentals are that businesses can now completely outsource the delivery of their lighting needs. Significantly, this will be at a lower ongoing cost compared to their current cost to run and maintain their existing lighting," explains Crossley.

"Essentially, the lighting service delivery company takes care of the up-front capital

costs of new lighting, as well as installation and maintenance requirements. The business purchasing the lighting service simply pays a monthly or quarterly fee for their lighting. They can then take ownership and responsibility for the new lighting assets after a period of time such as five or so years."

Mawer says that although he is well aware of the concept, it has yet to hit the Australian market. "I'm seeing movements towards this overseas, and have seen seven or eight major players, such as Ferroval (owner of Broadspectrum), VINCI Energies (owner of Electrix and J&P Richardson), Lend Lease and Downer, who look like they are positioning themselves to kick start this market in Australia, but with a majority of utility-owned lighting, there's currently no pathway to get LaaS widely introduced in this country," he says.

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"It will require state governments to take a position on opening up contestability. The same debate is happening all over the developed world wherever there is utility-owned lighting. It is pretty clear that cities that are in direct control of their lighting have been able to adopt LEDs and smart street lighting controls more quickly than utilities. And, many cities are doing this under various forms of public-private partnerships including LaaS. I think LaaS is one of those 'watch and wait' ideas at the moment."

Although there is a long way to go in the recycling debate across all types of waste in Australia, there have been some advances that impact on the lighting space. According to Brodie Easton, Public Affairs and Environment Manager at LCA, state-wide e-waste bans are now in play across Victoria and South Australia, meaning that the dumping of end-of-life electrical products (including legacy lighting) is now illegal.

"The E-waste ban is supported by a policy document from the Environment Protection Authority. Further to this, the AS/NZS 5377 standard enforces specific requirements within this policy," he says.

"With a focus on end-of-life and legacy lighting, Australian recyclers now possess the capabilities to recycle and recover the raw materials contained in the majority of lighting products. As waste bans are likely to strengthen across the nation,

infrastructure is currently being secured by recyclers to deal with the influx of recyclable products."

One major LCA recycling initiative that is gaining a lot of traction is Fluorocycle, a product stewardship scheme that is increasing the national recycling rate of mercury-containing lamps. In Australia, a horrifying 90 per cent of lamps that contain mercury are estimated to end up in landfill each year. They are the largest single category of consumer products that contain mercury.

"Lamp recycling can help reduce the amount of mercury being sent to landfill which is extremely hazardous to the environment and human health. Mercury in landfill converts to toxic methylmercury and spreads through the wider environment through air, water and soil," explains Easton.

"Our scheme targets the commercial and industrial sectors where the bulk of waste lamps are generated and provides a national, voluntary scheme which businesses, government agencies and other organisations can join as Signatories. The scheme gives public recognition to Signatories for their commitment to recycling and we encourage all relevant organisations to get on board," Easton continues. ■

MORE INFORMATION

For more information on recycling of end-of-life lamps, visit the Fluorocycle website here: <https://www.fluorocycle.org.au/>

Darlington, UK - A refurbishment project complete with THORN CiviTEQ, a cost-effective LED road lighting solution.

