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Department of Climate Change,
Energy, the Environment and Water
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**Lighting Council Australia Response to the National Energy Performance Strategy**

To whom it may concern

Lighting Council Australia appreciates the opportunity to respond to the Commonwealth Government National Energy Performance Strategy Consultation Paper. Lighting Council Australia members supply the majority of all lighting equipment in Australia across all application areas including residential, commercial, industrial and public lighting.

The most critical point for policy makers to note is that both lighting energy savings and quality lighting outcomes are possible to achieve now. However, a focus only on energy savings would drive reductions in lighting quality leading to negative impacts on health, productivity and the economy. Lighting energy performance requires both an improvement in installed lighting efficiency and the benefits of quality lighting design.

Lighting Council Australia recommends the following measures be undertaken to drive demand side energy performance improvements across all lighting application areas.

**Promote the benefits of good lighting design**

Light has visual, emotional, and biological effects on humans as well as the ability to significantly impact human health and productivity. Good lighting outcomes that lead to improvements in health and productivity should be central to Government considerations regarding lighting energy performance.

Optimal lighting energy performance is achieved through good lighting design that in turn achieves healthy, productive, functional, sustainable, welcoming built

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environments. Good lighting design takes energy consumption into account during the decision-making process.

Energy consumers, whether domestic, commercial, industrial, or public are all very aware of the current high costs of energy. Between the general populace flocking to LED lighting over the last decade, state government lighting upgrade schemes (e,g, Victorian Energy Upgrades and New South Wales Energy Savings Scheme), and the high cost of energy, all energy use sectors have been highly motivated and active to reduce lighting energy over the last decade and more.

As a result, the lighting industry has gone through a quantum shift - Indeed it is hardly recognisable compared to twenty years ago. Residential LED lighting products now save 90 per cent or more of the energy used by traditional residential lighting technologies (e.g. incandescent and halogen). Commercial LED products now save around 40 per cent of the energy traditionally used by commercial lighting technologies (e.g. fluorescent). The improvements continue voluntarily.

However, in the face of this significant market push towards efficiency gains it has been extremely challenging to maintain good lighting design (including health and productivity) as a focus over the simplistic focus on energy consumption alone. Good lighting design maximises energy efficiency and achieves quality lighting outcomes. As further evidence of this point, Australian lighting standards[1] express caution regarding a focus on energy savings alone at the expense of quality lighting outcomes.

To have the government still pushing hard on lighting energy savings (e.g. the proposed LED Minimum Energy Performance Standards under the Greenhouse and Energy Minimum Standards Act) is difficult to rationalise for the lighting industry. The LED genie is out of the bottle, and the largest efficacy improvements have already been achieved. Over time LED efficiency will continue to voluntarily improve (with diminishing returns) until technology limitations cause stabilisation. However, no amount of Government legislation will appreciably change the rate of improvement.

To improve lighting energy performance, Government focus must be shifted to good lighting design that includes the use of efficient products, the use of controls (that limit the use of artificial lighting when areas are not occupied) and quality lighting outcomes that maximise health and productivity.

**Recommendation 1: Government should recognise and promote the benefits of good lighting design to achieve optimal lighting energy performance.**

[1] AS/NZS 1680.2.2:2008 – Interior and Workplace lighting, Part 2.2: Specific applications – Office and screen based tasks, See clause 10.4.1.

**Plan and phase out traditional lighting technologies**

Lighting is in pole position to achieve gains in both energy efficiency and durability, thanks to LED lighting systems with controls. The majority of lighting applications can now be achieved using LED lighting. LED products are voluntarily and continuously improving in efficiency, durability, light quality and cost. A wide variety of quality LED products are available at prices similar to traditional lighting products and with lifetime costs significantly reduced compared to traditional.

While the cost of energy and the wide availability of quality LED products is leading the market towards improved lighting energy performance, small sections of the market are still being maintained using traditional, less efficient lighting technologies. To complete the transition, Government should plan to phase out the majority of traditional lighting technologies, where suitable LED replacements exist. This would leave mainly LED products on the market. Further consultation with the lighting industry should occur regarding a phase-out schedule.

Global and regional initiatives are already underway in this regard. For example, compact fluorescent lamps (containing mercury) will be phased out globally under the Minamata Convention in 2025 and the European Union will phase out all linear fluorescent lamps by late 2023. The European Union has already phased out the majority of filament lamps (e.g. incandescent and halogen lamps).

**Recommendation 2: Government should work with lighting market stakeholders to schedule the phase out of lower efficiency (e.g. traditional) lighting technologies.**

**Increased used of lighting controls will further drive demand side energy savings**

Lighting controls (e.g. occupancy sensors, photo electrical cells, timers and dimmers) and smart lighting systems further reduce demand side lighting energy consumption by automatically turning lights off when they are not needed (e.g. when areas are unoccupied or when there is enough light due to daylight). Numerous studies demonstrate the savings potential.

Unoccupied spaces should only be illuminated for considered reasons. Specific commercial building applications should be a target for the mandatory application of lighting controls to reduce overall consumption.

A meta-analysis study[2] concluded that lighting controls save a further 24% (occupancy sensing), 28% (daylighting), 31% (personal tuning), and 38% (multiple approaches) of lighting energy.

**Recommendation 3: Government should further expand the use of lighting controls (e.g. through National Construction Code deemed to satisfy requirements) for specific commercial building areas.**

**Enable the benefits of smart street lighting to be realised**

The energy savings benefits of smart street lighting systems are currently not able to be realised due to the current Australian regulatory approach to the metering of street lighting.

Smart street lighting systems include additional functionality compared to traditional street lighting. The term smart street lighting refers to street lighting infrastructure that is effective as a simple street light and has additional features designed to increase efficiencies, productivity and services.

Smart street lighting infrastructure comprises at least LED luminaires (able to be dimmed), data collection sensors, communication technology and non-traditional metering systems. Additional features could include digital signage, CCTV, speakers, 'push to talk' emergency system and electric vehicle charging.

The combination of the pole, data collection, data sharing, analytics and application development will increase services within the context of smart cities.

The ability to dim or ramp up street lighting illuminance levels can increase visibility at event precinct areas during events or dim to lower levels when streets are unoccupied. Both approaches require the street lighting system energy use to be measured rather than calculated.

One of the advantages of such systems is increased energy savings when lighting is dimmed. However, street lighting is currently unmetered and energy consumption is calculated and not measured. Unfortunately, there is reduced incentive for infrastructure owners to install smart street lighting systems as the bill savings cannot be realised.

[2] Williams, Atkinson, Garbesi, Rubinstein, A Meta-Analysis of Energy Savings from Lighting Controls in Commercial Buildings, Ernest Orlando Lawrence Berkeley National Laboratory , September 2011.

The current regulations do not accommodate new smart street lighting technology (e.g. there is a need to meter the new variable output loads and the new devices that will be included in the street lighting network).

Regulators are requested to develop the rules that can enable the development of this market. We recognise that the Australian Energy Market Commission (AEMC) is currently undertaking consultation[3] in this area and we would encourage the AEMC to complete this work to facilitate smart street lighting as soon as possible.

**Recommendation 4: Government should amend the National Electricity Rules to facilitate the smart street lighting market in Australia.**

**Increased alignment with international building standards is needed**

Australian building standards are set out in the Australian Building Codes Board's National Construction Code (NCC). The lighting energy efficiency rules are set out in section J6 of the NCC.

Unfortunately, the NCC's current approach is orientated to limit the amount of lighting installed (i.e. it limits lighting power density) rather than focusing on limiting the energy used by building lighting. This current approach is not focused on energy consumption and energy saving but rather uses lighting power density limitation as a proxy for energy limitation. This approach erroneously fails to focus solely on energy consumption and includes the drawback of limiting good lighting design options.

The NCC (and Standards Australia) should adopt the international standards for light and lighting in buildings and the standards for energy performance of lighting in buildings. The international standards are correctly focused on energy use rather than the damaging Australian NCC approach of simply limiting installed lighting power density. The international approach does not destroy lighting options and outcomes but rather places emphasis on the use of lighting controls to limit annual lighting energy.

The relevant international standards are: ISO/CIE 20086:2019 Light and lighting, Energy performance of lighting in buildings; ISO/CIE 8995 Lighting of workplaces.

**Recommendation 5: Government should encourage the Australian Building Codes Board to align the National Construction Code with international building lighting efficiency standards.**

[3] Australian Energy Market Commission Consultation Paper, National Electricity Amendment (Unlocking CER benefits through flexible trading) Rule, December 2022.

**Market education**

Due to the transformation in the lighting market over the last decade, market education is necessary to assist consumers and installers to purchase lighting products so that energy savings are realised.

Consumers and installers traditionally purchased lighting based on the power rating or wattage of a lamp. However, with LED lighting making such large efficiency improvements, the power rating of a suitable LED replacement product will be significantly lower than the equivalent (i.e. equivalent in terms of light output) traditional lighting product.

Consumers and installers should be educated to purchase lighting products based on the light output of the product and not the power rating. If selection is based only on power rating, then the possible energy savings will not be realised.

Lighting Council Australia and the Australian Government have previously collaborated to educate the market.[4] We would welcome further Government efforts towards market education.

**Recommendation 6: Government should educate consumers and installers to realise the full potential of lighting energy savings.**

**About Lighting Council Australia**

Lighting Council Australia is the peak body for Australia's lighting industry. Lighting Council's goal is to encourage the use of quality, environmentally appropriate, energy efficient lighting systems.

Yours faithfully

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[4] https://www.lightingcouncil.com.au/led-buyers-guide/index.html?pid=BR_LEDMANUAL_SINGLETILE_7777